

Florida Department of Education
Curriculum Framework

Program Title: Commercial Pilot
Career Cluster: Transportation, Distribution and Logistics

CCC	
CIP Number	0649010202
Program Type	College Credit Certificate (CCC)
Standard Length	24 credit hours
CTSO	SkillsUSA
SOC Codes (all applicable)	53-2012 – Commercial Pilots

Purpose

This certificate program is part of the Professional Pilot Technology AS degree program (1649010200).

A College Credit Certificate consists of a program of instruction of less than sixty (60) credits of college-level courses, which is part of an AS or AAS degree program and prepares students for entry into employment (Rule 6A-14.030, F.A.C.).

This program offers a sequence of courses that provides coherent and rigorous content aligned with challenging academic standards and relevant technical knowledge and skills needed to prepare for further education and careers in the Transportation, Distribution and Logistics career cluster; provides technical skill proficiency, and includes competency-based applied learning that contributes to the academic knowledge, higher-order reasoning and problem-solving skills, work attitudes, general employability skills, technical skills, and occupation-specific skills, and knowledge of all aspects of the Transportation, Distribution and Logistics career cluster.

The content includes but is not limited to communications skills, employability skills, safe and efficient work practices, FAA pilot certification procedures, aircraft systems and components, flight safety, and instrumentation. This program focuses on specific, transferable skills. It stresses understanding and demonstration of the following elements of the commercial pilot industry: flight planning, managing commercial flight operations, flight safety and environmental issues.

Additional Information relevant to this Career and Technical Education (CTE) program is provided at the end of this document.

Standards

After successfully completing this program, the student will be able to perform the following:

- 01.0 Demonstrate an understanding of safe and effective work practices.
- 02.0 Demonstrate an understanding of fundamentals of flight.
- 03.0 Understand and explain pertinent Federal Aviation Administration Regulations.
- 04.0 Demonstrate understanding of meteorology.
- 05.0 Demonstrate knowledge of aircraft communications equipment.
- 06.0 Demonstrate knowledge and an understanding of aircraft propulsion, and associated systems.
- 07.0 Demonstrate an understanding of navigation systems and procedures.
- 08.0 Demonstrate flight planning skills.

**Florida Department of Education
Student Performance Standards**

Program Title: Commercial Pilot
CIP Number: 0649010202
Program Length: 24 credit hours
SOC Code(s): 53-2012

This certificate program is part of the Professional Pilot Technology AS degree program (1649010200). At the completion of this program, the student will be able to:	
01.0	Demonstrate an understanding of safe and effective work practices.-The student will be able to:
01.01	Demonstrate an awareness and understanding of health and safety hazards, prevention and correction of environmental problems and know the solutions unique to the industry.
01.02	Demonstrate an awareness and understanding of fueling operations.
01.03	Demonstrate an understanding of situational awareness related to operational hazards.
01.04	Demonstrate an awareness of fire hazards, and awareness of proper techniques to control and extinguish fires.
01.05	Demonstrate an awareness and understanding for the need of safety devices, controls, guards and equipment.
02.0	Demonstrate an understanding of fundamentals of flight.-The student will be able to:
02.01	Name and compare the four forces of flight.
02.02	Describe an airfoil.
02.03	Explain how lift is produced.
02.04	Discuss how and why an airplane stalls and spins.
02.05	Describe and explain how pitot/static, vacuum, pressure, and engine instruments work.
02.06	Explain factors affecting aircraft design, performance, and operation.
02.07	Describe and explain how advanced avionics systems work.
03.0	Understand and explain Federal Aviation Administration Regulations.-The student will be able to:
03.01	Explain relevant portions of Parts 1, 61, 91, 110, 119, 121, 135, 141 and NTSB 830 of the Federal Aviation Regulations.
04.0	Demonstrate understanding of meteorology.-The student will be able to:
04.01	Describe the composition, circulation and stability of the atmosphere.
04.02	Demonstrate an understanding of air mass development, the movement of fronts and their effect on aviation.
04.03	Demonstrate an awareness of weather hazards to aviation and an understanding of how to avoid them.
04.04	Demonstrate the ability to access weather information prior to and during flights through a variety of media.

04.05	Interpret printed reports, forecasts and graphic weather products.
05.0	Demonstrate knowledge of aircraft communication equipment.-The student will be able to:
05.01	Use and explain aircraft voice communication equipment.
05.02	Explain function and use of ELT's, voice recorders, and other emergency communication systems.
05.03	Demonstrate use of proper phraseology in ATC communications.
05.04	Discuss uses and limitations of portable transceivers.
05.05	Demonstrate use of phonetic alphabet.
06.0	Demonstrate knowledge and understanding of aircraft propulsion and associated systems.-The student will be able to:
06.01	Describe and identify reciprocating and turbine engine components.
06.02	Describe a typical lubrication system.
06.03	Describe a typical magneto ignition system, including proper magneto checks.
06.04	Describe the difference between a normally aspirated engine and one that is supercharged or turbocharged.
06.05	Demonstrate basic operation of an aircraft engine, including proper interpretation of instruments and use of appropriate engine controls.
07.0	Demonstrate an understanding of navigation systems and procedures.-The student will be able to:
07.01	Define radio navigation using both conventional and advanced avionics.
07.02	Explain the magnetic compass.
07.03	Describe and demonstrate use of VOR equipment and navigation.
07.04	Describe and demonstrate use of GPS equipment and navigation.
07.05	Explain DME, GPS, and RNAV principles.
07.06	Demonstrate the use of a flight computer.
07.07	Interpret sectional charts.
07.08	Interpret en-route and terminal charts and approach plates.
07.09	Explain lost communications emergency procedures under VFR and IFR.
07.10	Read and interpret aircraft performance charts.
07.11	Plot and explain a cross-country course.
07.12	Describe the FAA national airspace system.
07.13	Define DP's and STAR's.
07.14	Read and interpret instrument approach charts and procedures.

08.0	Demonstrate flight planning skills.-The student will be able to:
08.01	Explain relevant portions of Parts 1, 91, 110, 121, 135, and NTSB 830 of the Federal Aviation Regulations.
08.02	Define weight and balance.
08.03	Define center of gravity, moment, datum line, CG envelope, basic empty weight, and gross weight.
08.04	Calculate, compute, and solve given weight and balance problems.
08.05	Determine route of flight.
08.06	Demonstrate acquisition of appropriate weather data.
08.07	Demonstrate proper selection of destination/en-route/alternate airports.
08.08	Explain fuel requirements.
08.09	Calculate aircraft performance.
08.10	Access and analyze NOTAMS.
08.11	Acquire, define, and validate a mission profile.
08.12	Demonstrate the creation of, and explain the effective use of a navigation log.
08.13	Demonstrate methods in VFR/IFR flight planning and demonstrate the ability to make a valid go / no-go decision.

Additional Information

Laboratory Activities

Laboratory investigations that include scientific inquiry, research, measurement, problem solving, emerging technologies, tools and equipment, as well as, experimental, quality, and safety procedures are an integral part of this career and technical program/course. Laboratory investigations benefit all students by developing an understanding of the complexity and ambiguity of empirical work, as well as the skills required to manage, operate, calibrate and troubleshoot equipment/tools used to make observations. Students understand measurement error; and have the skills to aggregate, interpret, and present the resulting data. Equipment and supplies should be provided to enhance hands-on experiences for students.

Special Notes

This course provides an expedited method of transition from an academic institution into the workforce. There are a number of students who wish to pursue their FAA licenses but do not want to seek a degree. Formalized training in an institution leads to safer pilot practices as demonstrated by statistical data. The Commercial Pilot Certificate supports entry level job functions in the pilot industry. The typical length of this program for the average achieving student is nine calendar months.

Prior to beginning flight training, students will be required to obtain an FAA medical certificate and comply with the TSA requirements. Community/State Colleges initiating this program are strongly encouraged to visit existing Florida Community/State Colleges with active programs.

Career and Technical Student Organization (CTSO)

SkillsUSA is the intercurricular career and technical student organization for providing leadership training and reinforcing specific career and technical skills. Career and Technical Student Organizations provide activities for students as an integral part of the instruction offered.

Accommodations

Federal and state legislation requires the provision of accommodations for students with disabilities to meet individual needs and ensure equal access. Postsecondary students with disabilities must self-identify, present documentation, request accommodations if needed, and develop a plan with their counselor and/or instructors. Accommodations received in postsecondary education may differ from those received in secondary education. Accommodations change the way the student is instructed. Students with disabilities may need accommodations in such areas as instructional methods and materials, assignments and assessments, time demands and schedules, learning environment, assistive technology and special communication systems. Documentation of the accommodations requested and provided should be maintained in a confidential file.

**Florida Department of Education
Curriculum Framework**

Program Title: Airline / Aviation Management
Career Cluster: Transportation, Distribution and Logistics

CCC

CIP Number	0649010403
Program Type	College Credit Certificate (CCC)
Standard Length	16 credit hours
CTSO	SkillsUSA
SOC Codes (all applicable)	53-2021 – Air Traffic Controllers

Purpose

This certificate program is part of the Aviation Administration AS degree program (1649010402) and the Aviation Administration AS degree program (1649010403).

A College Credit Certificate consists of a program of instruction of less than sixty (60) credits of college-level courses, which is part of an AS or AAS degree program and prepares students for entry into employment (Rule 6A-14.030, F.A.C.).

This program offers a sequence of courses that provides coherent and rigorous content aligned with challenging academic standards and relevant technical knowledge and skills needed to prepare for further education and careers in the Transportation, Distribution and Logistics career cluster; provides technical skill proficiency, and includes competency-based applied learning that contributes to the academic knowledge, higher-order reasoning and problem-solving skills, work attitudes, general employability skills, technical skills, and occupation-specific skills, and knowledge of all aspects of the Transportation, Distribution and Logistics career cluster.

As part of the AS degrees Aviation Administration and Aviation Administration, the purpose of this certificate program is to prepare students who are seeking employment with a fast track in the aviation/airline fields. Some of the students will be able to obtain opportunities in the federal, state and local government aviation fields, while others will find opportunities in airline fields, such as initial entry level jobs in customer service and operations as well as lower to middle level management positions. Others will find positions in supporting aviation entities, such as suppliers and service providers to airlines and government aviation agencies. This program will benefit both students who do not have any other college experience, as well as those who have an associate or bachelor’s degree in another area and would like to acquire the specific skills in this area.

The content includes but is not limited to, communication skills, leadership skills, directing, planning and controlling, human relations and employability skills, marketing, legal issues and Federal Aviation Regulations.

Additional Information relevant to this Career and Technical Education (CTE) program is provided at the end of this document.

Standards

After successfully completing this program, the student will be able to perform the following:

- 01.0 Demonstrate an understanding of basic aviation terminology and history.
- 02.0 Demonstrate an understanding of aviation operations practices, limitations and procedures.
- 03.0 Demonstrate an understanding of federal, state and other governmental laws, rules and policies as they relate to aviation.
- 04.0 Demonstrate an understanding of airline and airport management practices.
- 05.0 Demonstrate an understanding of aviation/airline marketing, customer service/sales, and reservations/ticketing.
- 06.0 Demonstrate employability skills.

**Florida Department of Education
Student Performance Standards**

Program Title: Airline / Aviation Management
CIP Number: 0649010403
Program Length: 16 credit hours
SOC Code(s): 53-2021

This certificate program is part of the Aviation Administration AS degree program (1649010402) and the Aviation Administration AS degree program (1649010403). At the completion of this program, the student will be able to:	
01.0	Demonstrate an understanding of basic aviation terminology and history.-The student will be able to:
01.01	Explain the overall scope and breadth of the aviation industry including its impact on the economy.
01.02	Distinguish the terms and vocabularies that are used in the aerospace and commercial aviation industry.
01.03	Describe the history of technological, governmental, social and economic developments of aviation.
01.04	Explain the different types and categories of aircraft in use in the industry by distinguishing and identifying: Various wide body, narrow body types and general aviation aircraft.
01.05	Demonstrate an understanding of the oversight role of the Federal Government and its effect on the aviation industry.
02.0	Demonstrate an understanding of aviation operations practices, limitations and procedures.-The student will be able to:
02.01	Demonstrate knowledge of aircraft systems as they apply to flight operations, including engines, fuel, electrical, hydraulics, pneumatics, flight controls and avionics.
02.02	Understand the various factors of aircraft performance, including takeoff, en-route and landing limitations and weight and balance.
02.03	Demonstrate knowledge of the function of flight operations, including pilot hiring, training, standards, safety issues, security issues, FAA and TSA regulations, documentation requirements, operations specifications, operating within the ATC system, and crew scheduling as well as flight attendant and aircraft dispatcher requirements.
02.04	Describe maintenance operations and their role and effect on flight operations.
02.05	Demonstrate an understanding of the role of the flight operations professional in the economic and planning functions.
02.06	Explain FAA requirements such as flight standards, types of certificates, training and record keeping, surveillance, and investigations, as well as the operator's response and its relationship with the FAA.
02.07	Describe the role of the National Transportation Safety Board in accident investigation, NASA's role in aviation safety reporting systems and research, and industry-specific safety reporting programs.
02.08	Demonstrate knowledge of the application of information technology systems in flight operations as they relate to flight planning systems, flight management systems, satellite communication and navigation systems, weight and balance, maintenance monitoring, and management information systems.
03.0	Demonstrate an understanding of federal, state and other governmental laws, rules and policies as they relate to aviation.-The student will be able to:

03.01	Demonstrate knowledge of the history and foundations of the legal and court system in the United States as it pertains to development of aviation law and regulations.
03.02	Explain the role and function of the U.S. DOT, FAA, TSA, and the NTSB as it relates to their legal responsibilities and authority.
03.03	Demonstrate knowledge of airmen rights and responsibilities, negligence, FAA enforcement, immunity, and degrees of care.
03.04	Explain state aviation law, relating to airports, fixed based operators, aircraft sales, registration, and taxation issues.
03.05	Demonstrate knowledge of the legal matters relating to the aircraft manufacturing and airline industry, including warranties, products liability, negligence, accident litigation, labor, and consumer issues.
03.06	Demonstrate knowledge of international air law, bilateral and multilateral agreements, international jurisdiction, and limits of liability and damages.
03.07	Demonstrate knowledge of legal issues that relate to aviation security.
04.0	Demonstrate an understanding of airline and airport management practices.-The student will be able to:
04.01	Describe how historical and current changes in competition, social factors, government policies, and technology affect aviation and airport management.
04.02	Demonstrate understanding of organizational design and functional areas of an aviation business.
04.03	Demonstrate understanding of the various functions of an airport, including airside and landside operations and management, financial planning, airport master plans, environmental issues, and land use.
04.04	Describe the factors of effective communication, leadership styles, and motivating employees in an aviation environment with an emphasis on individual performance.
04.05	Demonstrate an understanding of labor relations contract negotiations, and the grievance process in an aviation environment, including issues specific to airline labor relations.
04.06	Explain how strategic planning and control processes are used in the aviation industry.
05.0	Demonstrate an understanding of aviation/airline marketing, customer service/sales, and reservations/ticketing.-The student will be able to:
05.01	Explain the Marketing Concept and how it differs from the Product and Sales Concepts.
05.02	Analyze the various environmental factors that affect aviation/airline marketing.
05.03	Demonstrate an understanding of market demographics, segmentation, methods of market research and analysis, and pricing strategies.
05.04	Analyze why a customer buys a particular product or service.
05.05	Explain the advantages and disadvantages of the media available for aviation industry advertising and promotion.
05.06	Describe the factors of delivering quality customer service, why companies lose customer, and how to salvage a bad customer experience.
05.07	Explain the principles of reservations, ticketing, internet sales, e-ticketing, and travel agency functions.
06.0	Demonstrate employability skills.-The student will be able to:
06.01	Describe positions available and requirements for careers in aviation administration.
06.02	Describe qualification and certification requirements for careers in aviation administration.

Additional Information

Laboratory Activities

Laboratory investigations that include scientific inquiry, research, measurement, problem solving, emerging technologies, tools and equipment, as well as, experimental, quality, and safety procedures are an integral part of this career and technical program/course. Laboratory investigations benefit all students by developing an understanding of the complexity and ambiguity of empirical work, as well as the skills required to manage, operate, calibrate and troubleshoot equipment/tools used to make observations. Students understand measurement error; and have the skills to aggregate, interpret, and present the resulting data. Equipment and supplies should be provided to enhance hands-on experiences for students.

Career and Technical Student Organization (CTSO)

SkillsUSA is the intercurricular career and technical student organization for providing leadership training and reinforcing specific career and technical skills. Career and Technical Student Organizations provide activities for students as an integral part of the instruction offered.

Accommodations

Federal and state legislation requires the provision of accommodations for students with disabilities to meet individual needs and ensure equal access. Postsecondary students with disabilities must self-identify, present documentation, request accommodations if needed, and develop a plan with their counselor and/or instructors. Accommodations received in postsecondary education may differ from those received in secondary education. Accommodations change the way the student is instructed. Students with disabilities may need accommodations in such areas as instructional methods and materials, assignments and assessments, time demands and schedules, learning environment, assistive technology and special communication systems. Documentation of the accommodations requested and provided should be maintained in a confidential file.

Florida Department of Education
Curriculum Framework

Program Title: Air Cargo Management
Career Cluster: Transportation, Distribution and Logistics

CCC	
CIP Number	0649010404
Program Type	College Credit Certificate (CCC)
Standard Length	16 credit hours
CTSO	SkillsUSA
SOC Codes (all applicable)	53-1011 – Aircraft Cargo Handling Supervisors

Purpose

This certificate program is part of the Aviation Administration AS degree program (1649010402) and the Aviation Administration AS degree program (1649010403).

A College Credit Certificate consists of a program of instruction of less than sixty (60) credits of college-level courses, which is part of an AS or AAS degree program and prepares students for entry into employment (Rule 6A-14.030, F.A.C.).

This program offers a sequence of courses that provides coherent and rigorous content aligned with challenging academic standards and relevant technical knowledge and skills needed to prepare for further education and careers in the Transportation, Distribution and Logistics career cluster; provides technical skill proficiency, and includes competency-based applied learning that contributes to the academic knowledge, higher-order reasoning and problem-solving skills, work attitudes, general employability skills, technical skills, and occupation-specific skills, and knowledge of all aspects of the Transportation, Distribution and Logistics career cluster.

As part of the AS degrees Aviation Administration and Aviation Administration, the purpose of this certificate program is to prepare students who are seeking employment in the aviation/airline/air cargo fields in a fast track. Some of the students will be able to obtain opportunities in airline fields, such as initial entry level jobs in air cargo and customer service as well as lower level management positions. Others will find positions in supporting aviation entities, such as suppliers and service providers to air cargo airlines and government aviation agencies.

The content includes but is not limited to, customer service, human relations and employability skills, safe and efficient work practices, technical skills such as air cargo documentation and terminology, records management, Federal Aviation Regulations, and air cargo processes and practices.

Additional Information relevant to this Career and Technical Education (CTE) program is provided at the end of this document.

Standards

After successfully completing this program, the student will be able to perform the following:

- 01.0 Demonstrate an understanding of basic aviation terminology and history.
- 02.0 Demonstrate an understanding of aviation operations practices, limitations and procedures.
- 03.0 Demonstrate an understanding of aviation/airline marketing, customer service/sales, and reservations/ticketing.
- 04.0 Demonstrate an understanding of air cargo operations and procedures.
- 05.0 Demonstrate employability skills.

**Florida Department of Education
Student Performance Standards**

Program Title: Air Cargo Management
CIP Number: 0649010404
Program Length: 16 credit hours
SOC Code(s): 53-1011

<p>This certificate program is part of the Aviation Administration AS degree program (1649010402) and the Aviation Administration AS degree program (1649010403). At the completion of this program, the student will be able to:</p>	
01.0	Demonstrate an understanding of basic aviation terminology and history.-The student will be able to:
01.01	Explain the overall scope and breadth of the aviation industry including its impact on the economy.
01.02	Distinguish the terms and vocabularies that are used in the aerospace and commercial aviation industry.
01.03	Describe the history of technological, governmental, social and economic developments of aviation.
01.04	Explain the different types and categories of aircraft in use in the industry by distinguishing and identifying: Various wide body, narrow body types and general aviation aircraft.
01.05	Demonstrate an understanding of the oversight role of the Federal Government and its effect on the aviation industry.
02.0	Demonstrate an understanding of aviation operations practices, limitations and procedures.-The student will be able to:
02.01	Demonstrate knowledge of aircraft systems as they apply to flight operations, including engines, fuel, electrical, hydraulics, pneumatics, flight controls and avionics.
02.02	Understand the various factors of aircraft performance, including takeoff, en-route and landing limitations and weight and balance.
02.03	Demonstrate knowledge of the function of flight operations, including pilot hiring, training, standards, safety issues, security issues, FAA and TSA regulations, documentation requirements, operations specifications, operating within the ATC system, and crew scheduling as well as flight attendant and aircraft dispatcher requirements.
02.04	Describe maintenance operations and their role and effect on flight operations.
02.05	Demonstrate an understanding of the role of the flight operations professional in the economic and planning functions.
02.06	Explain FAA requirements such as flight standards, types of certificates, training and record keeping, surveillance, and investigations, as well as the operator's response and its relationship with the FAA.
02.07	Describe the role of the National Transportation Safety Board in accident investigation, NASA's role in aviation safety reporting systems and research, and industry-specific safety reporting programs.
02.08	Demonstrate knowledge of the application of information technology systems in flight operations as they relate to flight planning systems, flight management systems, satellite communication and navigation systems, weight and balance, maintenance monitoring, and management information systems.
03.0	Demonstrate an understanding of aviation/airline marketing, customer service/sales, and reservations/ticketing.-The student will be able to:
03.01	Explain the Marketing Concept and how it differs from the Product and Sales Concepts.

03.02	Analyze the various environmental factors that affect aviation/airline marketing.
03.03	Demonstrate an understanding of market demographics, segmentation, methods of market research and analysis, and pricing strategies.
03.04	Analyze why a customer buys a particular product or service.
03.05	Explain the advantages and disadvantages of the media available for aviation industry advertising and promotion.
03.06	Describe the factors of delivering quality customer service, why companies lose customer, and how to salvage a bad customer experience.
03.07	Explain the principles of reservations, ticketing, internet sales, e-ticketing, and travel agency functions.
04.0	Demonstrate an understanding of air cargo operations and procedures.-The student will be able to:
04.01	Describe the importance of air cargo to the economy.
04.02	Describe air cargo customers, freight forwarders, customs brokers, and how marketing is done in the air cargo industry.
04.03	Explain the different classes of air cargo, and the required documentation of each.
04.04	Describe and discuss cargo packaging and how cargo is loaded on an aircraft.
04.05	Describe HAZMAT classification, labeling, packaging, shipping requirements, and related incident/accident procedures and required reports.
04.06	Describe the security requirements for air cargo personnel, facilities, and aircraft.
05.0	Demonstrate employability skills.-The student will be able to:
05.01	Describe positions available and requirements for careers in aviation administration.
05.02	Describe qualification and certification requirements for careers in aviation administration.

Additional Information

Laboratory Activities

Laboratory investigations that include scientific inquiry, research, measurement, problem solving, emerging technologies, tools and equipment, as well as, experimental, quality, and safety procedures are an integral part of this career and technical program/course. Laboratory investigations benefit all students by developing an understanding of the complexity and ambiguity of empirical work, as well as the skills required to manage, operate, calibrate and troubleshoot equipment/tools used to make observations. Students understand measurement error; and have the skills to aggregate, interpret, and present the resulting data. Equipment and supplies should be provided to enhance hands-on experiences for students.

Career and Technical Student Organization (CTSO)

SkillsUSA is the intercurricular career and technical student organization for providing leadership training and reinforcing specific career and technical skills. Career and Technical Student Organizations provide activities for students as an integral part of the instruction offered.

Accommodations

Federal and state legislation requires the provision of accommodations for students with disabilities to meet individual needs and ensure equal access. Postsecondary students with disabilities must self-identify, present documentation, request accommodations if needed, and develop a plan with their counselor and/or instructors. Accommodations received in postsecondary education may differ from those received in secondary education. Accommodations change the way the student is instructed. Students with disabilities may need accommodations in such areas as instructional methods and materials, assignments and assessments, time demands and schedules, learning environment, assistive technology and special communication systems. Documentation of the accommodations requested and provided should be maintained in a confidential file.

**Florida Department of Education
Curriculum Framework**

Program Title: Airport Management
Career Cluster: Transportation, Distribution and Logistics

CCC	
CIP Number	0649010405
Program Type	College Credit Certificate (CCC)
Standard Length	16 credit hours
CTSO	SkillsUSA
SOC Codes (all applicable)	53-2021 – Air Traffic Controllers

Purpose

This certificate program is part of the Aviation Administration AS degree program (1649010402) and the Aviation Administration AS degree program (1649010403).

A College Credit Certificate consists of a program of instruction of less than sixty (60) credits of college-level courses, which is part of an AS or AAS degree program and prepares students for entry into employment (Rule 6A-14.030, F.A.C.).

This program offers a sequence of courses that provides coherent and rigorous content aligned with challenging academic standards and relevant technical knowledge and skills needed to prepare for further education and careers in the Transportation, Distribution and Logistics career cluster; provides technical skill proficiency, and includes competency-based applied learning that contributes to the academic knowledge, higher-order reasoning and problem-solving skills, work attitudes, general employability skills, technical skills, and occupation-specific skills, and knowledge of all aspects of the Transportation, Distribution and Logistics career cluster.

As part of the AS degrees Aviation Administration and Aviation Administration, the purpose of this certificate program is to prepare students who are seeking employment a fast track in the airport management field. Some of the students will be able to obtain opportunities in the federal, state and local government aviation fields, some will find opportunities in initial entry level jobs in airport customer service and operations as well as lower to middle level management positions. Others will find positions in supporting aviation entities, such as suppliers and service providers to government aviation agencies. This program will benefit both students who do not have any other college experience, as well as those who have an associate or bachelor's degree in another area and would like to acquire the specific skills in this area.

The content includes but is not limited to, communication skills, leadership skills, directing, planning and controlling, human relations and employability skills, safe and efficient work practices, airport facilities and planning, security issues, Federal Aviation Regulations, and other law related to aviation/airports.

Additional Information relevant to this Career and Technical Education (CTE) program is provided at the end of this document.

Standards

After successfully completing this program, the student will be able to perform the following:

- 01.0 Demonstrate an understanding of basic aviation terminology and history.
- 02.0 Demonstrate an understanding of aviation operations practices, limitations and procedures.
- 03.0 Demonstrate an understanding of federal, state and other governmental laws, rules and policies as they relate to aviation.
- 04.0 Demonstrate an understanding of airline and airport management practices.
- 05.0 Demonstrate an understanding of aviation security.
- 06.0 Demonstrate employability skills.

**Florida Department of Education
Student Performance Standards**

Program Title: Airport Management
CIP Number: 0649010405
Program Length: 16 credit hours
SOC Code(s): 53-2021

<p>This certificate program is part of the Aviation Administration AS degree program (1649010402) and the Aviation Administration AS degree program (1649010403). At the completion of this program, the student will be able to:</p>	
01.0	Demonstrate an understanding of basic aviation terminology and history.-The student will be able to:
01.01	Explain the overall scope and breadth of the aviation industry including its impact on the economy.
01.02	Distinguish the terms and vocabularies that are used in the aerospace and commercial aviation industry.
01.03	Describe the history of technological, governmental, social and economic developments of aviation.
01.04	Explain the different types and categories of aircraft in use in the industry by distinguishing and identifying: Various wide body, narrow body types and general aviation aircraft.
01.05	Demonstrate an understanding of the oversight role of the Federal Government and its effect on the aviation industry.
02.0	Demonstrate an understanding of aviation operations practices, limitations and procedures.-The student will be able to:
02.01	Demonstrate knowledge of aircraft systems as they apply to flight operations, including engines, fuel, electrical, hydraulics, pneumatics, flight controls and avionics.
02.02	Understand the various factors of aircraft performance, including takeoff, en-route and landing limitations and weight and balance.
02.03	Demonstrate knowledge of the function of flight operations, including pilot hiring, training, standards, safety issues, security issues, FAA and TSA regulations, documentation requirements, operations specifications, operating within the ATC system, and crew scheduling as well as flight attendant and aircraft dispatcher requirements.
02.04	Describe maintenance operations and their role and effect on flight operations.
02.05	Demonstrate an understanding of the role of the flight operations professional in the economic and planning functions.
02.06	Explain FAA requirements such as flight standards, types of certificates, training and record keeping, surveillance, and investigations, as well as the operator’s response and its relationship with the FAA.
02.07	Describe the role of the National Transportation Safety Board in accident investigation, NASA’s role in aviation safety reporting systems and research, and industry-specific safety reporting programs.
02.08	Demonstrate knowledge of the application of information technology systems in flight operations as they relate to flight planning systems, flight management systems, satellite communication and navigation systems, weight and balance, maintenance monitoring, and management information systems.
03.0	Demonstrate an understanding of federal, state and other governmental laws, rules and policies as they relate to aviation.-The student will be able to:

03.01	Demonstrate knowledge of the history and foundations of the legal and court system in the United States as it pertains to development of aviation law and regulations.
03.02	Explain the role and function of the U.S. DOT, FAA, TSA, and the NTSB as it relates to their legal responsibilities and authority.
03.03	Demonstrate knowledge of airmen rights and responsibilities, negligence, FAA enforcement, immunity, and degrees of care.
03.04	Explain state aviation law, relating to airports, fixed based operators, aircraft sales, registration, and taxation issues.
03.05	Demonstrate knowledge of the legal matters relating to the aircraft manufacturing and airline industry, including warranties, products liability, negligence, accident litigation, labor, and consumer issues.
03.06	Demonstrate knowledge of international air law, bilateral and multilateral agreements, international jurisdiction, and limits of liability and damages.
03.07	Demonstrate knowledge of legal issues that relate to aviation security.
04.0	Demonstrate an understanding of airline and airport management practices.-The student will be able to:
04.01	Describe how historical and current changes in competition, social factors, government policies, and technology affect aviation and airport management.
04.02	Demonstrate understanding of organizational design and functional areas of an aviation business.
04.03	Demonstrate understanding of the various functions of an airport, including airside and landside operations and management, financial planning, airport master plans, environmental issues, and land use.
04.04	Describe the factors of effective communication, leadership styles, and motivating employees in an aviation environment with an emphasis on individual performance.
04.05	Demonstrate an understanding of labor relations contract negotiations, and the grievance process in an aviation environment, including issues specific to airline labor relations.
04.06	Explain how strategic planning and control processes are used in the aviation industry.
05.0	Demonstrate an understanding of aviation security.-The student will be able to:
05.01	Describe aviation security threats and responses.
05.02	Discuss aspects of aviation security, such the Aviation Safety and Security Act of 2001, and FAR Parts 108 and 109.
05.03	Describe the components of a layered aviation security system, including personnel selection and training, and performance of security personnel.
05.04	Explain the importance of planning for security threats, and having contingency plans and responsive measures.
05.05	Explain the ground security measures and technology, including restricted access, inspections of personnel, baggage and goods, and effective screening techniques.
05.06	Discuss inflight threats and security procedures.
06.0	Demonstrate employability skills.-The student will be able to:
06.01	Describe positions available and requirements for careers in aviation administration.
06.02	Describe qualification and certification requirements for careers in aviation administration.

Additional Information

Laboratory Activities

Laboratory investigations that include scientific inquiry, research, measurement, problem solving, emerging technologies, tools and equipment, as well as, experimental, quality, and safety procedures are an integral part of this career and technical program/course. Laboratory investigations benefit all students by developing an understanding of the complexity and ambiguity of empirical work, as well as the skills required to manage, operate, calibrate and troubleshoot equipment/tools used to make observations. Students understand measurement error; and have the skills to aggregate, interpret, and present the resulting data. Equipment and supplies should be provided to enhance hands-on experiences for students.

Career and Technical Student Organization (CTSO)

SkillsUSA is the intercurricular career and technical student organization for providing leadership training and reinforcing specific career and technical skills. Career and Technical Student Organizations provide activities for students as an integral part of the instruction offered.

Accommodations

Federal and state legislation requires the provision of accommodations for students with disabilities to meet individual needs and ensure equal access. Postsecondary students with disabilities must self-identify, present documentation, request accommodations if needed, and develop a plan with their counselor and/or instructors. Accommodations received in postsecondary education may differ from those received in secondary education. Accommodations change the way the student is instructed. Students with disabilities may need accommodations in such areas as instructional methods and materials, assignments and assessments, time demands and schedules, learning environment, assistive technology and special communication systems. Documentation of the accommodations requested and provided should be maintained in a confidential file.

**Florida Department of Education
Curriculum Framework**

Program Title: Passenger Service Agent
Career Cluster: Transportation, Distribution and Logistics

CCC	
CIP Number	0649010406
Program Type	College Credit Certificate (CCC)
Standard Length	16 credit hours
CTSO	SkillsUSA
SOC Codes (all applicable)	43-4051 – Customer Service Representatives

Purpose

This certificate program is part of the Aviation Administration AS degree program (1649010402) and the Aviation Administration AS degree program (1649010403).

A College Credit Certificate consists of a program of instruction of less than sixty (60) credits of college-level courses, which is part of an AS or AAS degree program and prepares students for entry into employment (Rule 6A-14.030, F.A.C.).

This program offers a sequence of courses that provides coherent and rigorous content aligned with challenging academic standards and relevant technical knowledge and skills needed to prepare for further education and careers in the Transportation, Distribution and Logistics career cluster; provides technical skill proficiency, and includes competency-based applied learning that contributes to the academic knowledge, higher-order reasoning and problem-solving skills, work attitudes, general employability skills, technical skills, and occupation-specific skills, and knowledge of all aspects of the Transportation, Distribution and Logistics career cluster.

As part of the AS degrees Aviation Administration and Aviation Administration, the purpose of this certificate program is to prepare students who are seeking employment in the aviation/airline/airport fields as a passenger service agent. Some of the students will be able to obtain opportunities in the federal, state and local government aviation fields, while others will find opportunities in airline fields, such as initial entry level jobs in customer service and operations and ticketing.

The content includes but is not limited to, communication skills, customer service skills, ticketing and reservations, aviation security, human relations and employability skills, operations and terminology.

Additional Information relevant to this Career and Technical Education (CTE) program is provided at the end of this document.

Standards

After successfully completing this program, the student will be able to perform the following:

- 01.0 Demonstrate an understanding of aviation operations practices, limitations and procedures.
- 02.0 Demonstrate an understanding of aviation security.
- 03.0 Demonstrate an understanding of aviation/airline marketing, customer service/sales, and reservations/ticketing.
- 04.0 Demonstrate employability skills.

**Florida Department of Education
Student Performance Standards**

Program Title: Passenger Service Agent
CIP Number: 0649010406
Program Length: 16 credit hours
SOC Code(s): 43-4051

<p>This certificate program is part of the Aviation Administration AS degree program (1649010402) and the Aviation Administration AS degree program (1649010403). At the completion of this program, the student will be able to:</p>	
01.0	Demonstrate an understanding of aviation operations practices, limitations and procedures.-The student will be able to:
01.01	Demonstrate knowledge of aircraft systems as they apply to flight operations, including engines, fuel, electrical, hydraulics, pneumatics, flight controls and avionics.
01.02	Understand the various factors of aircraft performance, including takeoff, enroute and landing limitations and weight and balance.
01.03	Demonstrate knowledge of the function of flight operations, including pilot hiring, training, standards, safety issues, security issues, FAA and TSA regulations, documentation requirements, operations specifications, operating within the ATC system, and crew scheduling as well as flight attendant and aircraft dispatcher requirements.
01.04	Describe maintenance operations and their role and effect on flight operations.
01.05	Demonstrate an understanding of the role of the flight operations professional in the economic and planning functions.
01.06	Explain FAA requirements such as flight standards, types of certificates, training and record keeping, surveillance, and investigations, as well as the operator's response and its relationship with the FAA.
01.07	Describe the role of the National Transportation Safety Board in accident investigation, NASA's role in aviation safety reporting systems and research, and industry-specific safety reporting programs.
01.08	Demonstrate knowledge of the application of information technology systems in flight operations as they relate to flight planning systems, flight management systems, satellite communication and navigation systems, weight and balance, maintenance monitoring, and management information systems.
02.0	Demonstrate an understanding of aviation security.-The student will be able to:
02.01	Describe aviation security threats and responses.
02.02	Discuss aspects of aviation security, such the Aviation Safety and Security Act of 2001, and FAR Parts 108 and 109.
02.03	Describe the components of a layered aviation security system, including personnel selection and training, and performance of security personnel.
02.04	Explain the importance of planning for security threats, and having contingency plans and responsive measures.
02.05	Explain the ground security measures and technology, including restricted access, inspections of personnel, baggage and goods, and effective screening techniques.
02.06	Discuss inflight threats and security procedures.
03.0	Demonstrate an understanding of aviation/airline marketing, customer service/sales, and reservations/ticketing.-The student will be able to:

03.01	Explain the Marketing Concept and how it differs from the Product and Sales Concepts.
03.02	Analyze the various environmental factors that affect aviation/airline marketing.
03.03	Demonstrate an understanding of market demographics, segmentation, methods of market research and analysis, and pricing strategies.
03.04	Analyze why a customer buys a particular product or service.
03.05	Explain the advantages and disadvantages of the media available for aviation industry advertising and promotion.
03.06	Describe the factors of delivering quality customer service, why companies lose customer, and how to salvage a bad customer experience.
03.07	Explain the principles of reservations, ticketing, internet sales, e-ticketing, and travel agency functions.
04.0	Demonstrate employability skills.-The student will be able to:
04.01	Describe positions available and requirements for careers in aviation administration.
04.02	Describe qualification and certification requirements for careers in aviation administration.

Additional Information

Laboratory Activities

Laboratory investigations that include scientific inquiry, research, measurement, problem solving, emerging technologies, tools and equipment, as well as, experimental, quality, and safety procedures are an integral part of this career and technical program/course. Laboratory investigations benefit all students by developing an understanding of the complexity and ambiguity of empirical work, as well as the skills required to manage, operate, calibrate and troubleshoot equipment/tools used to make observations. Students understand measurement error; and have the skills to aggregate, interpret, and present the resulting data. Equipment and supplies should be provided to enhance hands-on experiences for students.

Career and Technical Student Organization (CTSO)

SkillsUSA is the intercurricular career and technical student organization for providing leadership training and reinforcing specific career and technical skills. Career and Technical Student Organizations provide activities for students as an integral part of the instruction offered.

Accommodations

Federal and state legislation requires the provision of accommodations for students with disabilities to meet individual needs and ensure equal access. Postsecondary students with disabilities must self-identify, present documentation, request accommodations if needed, and develop a plan with their counselor and/or instructors. Accommodations received in postsecondary education may differ from those received in secondary education. Accommodations change the way the student is instructed. Students with disabilities may need accommodations in such areas as instructional methods and materials, assignments and assessments, time demands and schedules, learning environment, assistive technology and special communication systems. Documentation of the accommodations requested and provided should be maintained in a confidential file.

**Florida Department of Education
Curriculum Framework**

Program Title: Aviation Mechanic
Career Cluster: Transportation, Distribution and Logistics

CCC	
CIP Number	0649010408
Program Type	College Credit Certificate (CCC)
Standard Length	12 credit hours
CTSO	SkillsUSA
SOC Codes (all applicable)	49-3011 – Aircraft Mechanics and Service Technicians

Purpose

This certificate program is part of the Aviation Maintenance Management AS degree program (1649010401).

A College Credit Certificate consists of a program of instruction of less than sixty (60) credits of college-level courses, which is part of an AS or AAS degree program and prepares students for entry into employment (Rule 6A-14.030, F.A.C.).

This program offers a sequence of courses that provides coherent and rigorous content aligned with challenging academic standards and relevant technical knowledge and skills needed to prepare for further education and careers in the Transportation, Distribution and Logistics career cluster; provides technical skill proficiency, and includes competency-based applied learning that contributes to the academic knowledge, higher-order reasoning and problem-solving skills, work attitudes, general employability skills, technical skills, and occupation-specific skills, and knowledge of all aspects of the Transportation, Distribution and Logistics career cluster.

The purpose of this program is to prepare students for employment or advanced training in the commercial and general aviation industry. Instruction is designed to prepare students for Federal Aviation Administration (FAA) license examinations for Airframe ratings. Federal Aviation Regulation (FAR) Part 147 identifies minimum requirements for AMT schools. Any changes to the FAA-approved course content must be approved in advance. This program prepares students as an Aviation Maintenance General Technician.

The content includes but is not limited to the Federal Aviation Regulations (FAR) Part 65 pertaining to eligibility for a mechanic certificate and rating(s). Instruction is designed to qualify students for Federal Aviation Administration (FAA) examinations for aviation maintenance airframe technician certification as prescribed by FAR 147. The program content should also include training in communication, management leadership, human relations, supervisory and employability skills; and safe, efficient work practices.

Additional Information relevant to this Career and Technical Education (CTE) program is provided at the end of this document.

Standards

After successfully completing this program, the student will be able to perform the following:

- 01.0 Perform basic electricity skills.
- 02.0 Perform basic aircraft drawing skills.
- 03.0 Demonstrate aircraft weight and balance skills.
- 04.0 Maintain aircraft fluid lines and fittings.
- 05.0 Perform aircraft materials and process skills.
- 06.0 Perform ground operations and servicing duties.
- 07.0 Perform cleaning and corrosion control operations.
- 08.0 Demonstrate mathematics skills.
- 09.0 Maintain forms and records.
- 10.0 Apply principles of basic physics.
- 11.0 Demonstrate the use of maintenance publications.
- 12.0 Interpret mechanic privileges.
- 13.0 Demonstrate knowledge of FAA aircraft mechanic licensing requirements.
- 14.0 Demonstrate the human relations skills necessary for success in supervision.
- 15.0 Demonstrate knowledge of skills and attitudes the supervisor needs for effective performance.
- 16.0 Demonstrate a practical approach to job management.
- 17.0 Demonstrate appropriate communication skills.
- 18.0 Demonstrate employability skills.
- 19.0 Demonstrate an understanding of computer skills.

Florida Department of Education
Student Performance Standards

Program Title: Aviation Mechanic
 CIP Numbers: 0649010408
 Program Length: 12 credit hours
 SOC Code(s): 49-3011

This certificate program is part of the Aviation Maintenance Management AS degree program (1649010401). At the completion of this program, the student will be able to:	FAA FAR Part 147
01.0 Perform basic electricity skills.-The student will be able to:	
01.01 Calculate and measure capacitance and inductance.	App. B, A, 1. Level 2
01.02 Calculate and measure electrical power.	App. B, A, 2. Level 2
01.03 Measure voltage, current, resistance, and continuity.	App. B, A, 3. Level 3
01.04 Determine the relationship of voltage, current, and resistance in electrical circuits.	App. B, A, 4. Level 3
01.05 Read and interpret aircraft electrical-circuit diagrams, including solid-state devices and logic functions.	App. B, A, 5. Level 3
01.06 Inspect and service batteries.	App. B, A, 6. Level 3
01.07 Utilize proper electrical safety procedures.	
01.08 Troubleshoot electrical systems.	
02.0 Perform basic aircraft drawing skills.-The student will be able to:	
02.01 Use aircraft drawings, symbols, and system schematics.	App. B, B, 7. Level 2
02.02 Draw sketches of repairs and alterations.	App. B, B, 8. Level 3
02.03 Use blueprint information.	App. B, B, 9. Level 3
02.04 Use graphs and charts.	App. B, B, 10. Level 3
03.0 Demonstrate aircraft weight and balance skills.-The student will be able to:	
03.01 Weigh aircraft.	App. B, C, 11. Level 2
03.02 Perform complete weight-and-balance check and record data.	App. B, C, 12. Level 3
04.0 Maintain aircraft fluid lines and fittings.-The student will be able to:	
04.01 Fabricate and install rigid and flexible fluid lines and fittings.	App. B, D, 13. Level 3
05.0 Perform aircraft materials and processes skills.-The student will be able to:	
05.01 Identify and select appropriate nondestructive testing methods.	App. B, E, 14. Level 1

05.02	Perform dye penetrant, eddy current, ultrasonic, and magnetic particle inspections.	App. B, E, 15. Level 2
05.03	Perform basic heat-treating processes.	App. B, E, 16. Level 1
05.04	Identify and select aircraft hardware and materials.	App. B, E, 17. Level 3
05.05	Inspect and check welds.	App. B, E, 18. Level 3
05.06	Perform precision measurements.	App. B, E, 19. Level 3
05.07	Perform safety wiring techniques.	
06.0	Perform ground operations and servicing duties.-The student will be able to:	
06.01	Start, ground operate, move, service, and secure aircraft and identify typical ground-operations hazards.	App. B, F, 20. Level 2
06.02	Identify and select fuels.	App. B, F, 21. Level 2
06.03	Comply with prescribed shop and personal safety procedures.	
07.0	Perform cleaning and corrosion control operations.-The student will be able to:	
07.01	Identify and select cleaning materials.	App. B, G, 22. Level 3
07.02	Inspect, identify, remove, and treat aircraft corrosion and perform aircraft cleaning.	App. B, G, 23. Level 3
07.03	Identify and utilize appropriate equipment for cleaning and corrosion control.	
07.04	Observe appropriate personal safety procedures for corrosive chemicals.	
08.0	Demonstrate mathematical skills.-The student will be able to:	
08.01	Extract roots and raise numbers to a given power.	App. B, H, 24. Level 3
08.02	Determine areas and volumes of various geometrical shapes by solving problems for volume, weight, area, circumference, and perimeter measurements for rectangles, squares, and cylinders.	App. B, H, 25. Level 3
08.03	Solve ratio, proportion, and percentage problems.	App. B, H, 26. Level 3
08.04	Perform algebraic operations involving addition, subtraction, multiplication, and division of positive and negative numbers.	App. B, H, 27. Level 3
08.05	Solve linear inequalities in one variable and applied problems.	
08.06	Factor polynomials.	
08.07	Simplify algebraic fractions, complex fractions and solve rational and literal equations and applied problems.	
08.08	Determine areas and volumes of various geometrical shapes.	
08.09	Solve ratio, proportion, and percentage problems.	
08.10	Perform algebraic operations involving addition, subtraction, multiplication, and division of positive and negative numbers.	

08.11	Graph linear equations and inequalities in two variables and solve graph systems of linear equations and inequalities in two variables.	
08.12	Solve and graph quadratic equations and inequalities with real solutions and solve related word problems.	
08.13	Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.	
08.14	Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.	
08.15	Add, subtract, multiply and divide using fractions, decimals, and whole numbers.	
08.16	Determine the correct purchase price, to include sales tax, for a materials list containing a minimum of six items.	
08.17	Demonstrate an understanding of federal, state and local taxes and their computation.	
09.0	Maintain forms and records.-The student will be able to:	
09.01	Write descriptions of work performed including aircraft discrepancies and corrective actions using typical aircraft maintenance records.	App. B, I, 28. Level 3
09.02	Complete required maintenance forms, records, and inspection reports.	App. B, I, 29. Level 3
10.0	Apply principles of basic physics.-The student will be able to:	
10.01	Use and understand the principles of simple machines; sound, fluid, and heat dynamics; basic aerodynamics; aircraft structures; and theory of flight.	App. B, J, 30. Level 2
10.02	Understand molecular action as a result of temperature extremes, chemical reactions, and moisture content.	
10.03	Draw conclusions or make inferences from data.	
10.04	Identify health-related problems which may result from exposure to work-related chemicals and hazardous materials, and know the proper precautions required for handling such materials.	
10.05	Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.	
11.0	Demonstrate the use of maintenance publications.-The student will be able to:	
11.01	Demonstrate ability to read, comprehend, and apply information contained in FAA and manufacturers' aircraft maintenance specifications, data sheets, manuals, publications, and related Federal Aviation Regulations, Airworthiness Directives, and Advisory material.	App. B, K, 31. Level 3
11.02	Read technical data.	App. B, K, 32. Level 3
12.0	Interpret mechanic privileges.-The student will be able to:	
12.01	Exercise mechanic privileges within the limitations prescribed by Part 65 of this chapter.	App. B, L, 33. Level 3
13.0	Demonstrate knowledge of FAA aircraft mechanic licensing requirements.-The student will be able to:	
13.01	Successfully complete the FAA power-plant written, oral and practical examinations.	
13.02	Display an FAA power-plant Mechanic's certificate.	

13.03	Successfully complete the FAA airframe written, oral and practical examinations.	
13.04	Display an FAA airframe mechanic's certificate.	
14.0	Demonstrate the human relations skills necessary for success in supervision.-The student will be able to:	
14.01	Exhibit the ability to get along with others.	
14.02	Discuss the importance of human relations.	
14.03	Develop and demonstrate the unique human relations skills needed for successful job attainment and progress in supervising others.	
15.0	Demonstrate knowledge of skills and attitudes the supervisor needs for effective performance.-The student will be able to:	
15.01	Describe leadership theory and its complexity.	
15.02	Discuss how a new supervisor is introduced to leadership responsibilities.	
15.03	Identify the legal and social environment for supervision.	
15.04	Discuss pertinent legislation and the role of government intervention.	
15.05	Describe problems in union and non-union organizations.	
16.0	Demonstrate a practical approach to job management.-The student will be able to:	
16.01	Assume responsibility in planning and coordinating resources.	
16.02	Demonstrate effective decision making and problem-solving techniques.	
16.03	Implement methods of work improvement.	
17.0	Demonstrate appropriate communication skills.-The student will be able to:	
17.01	Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.	
17.02	Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.	
17.03	Read and follow written and oral instructions.	
17.04	Answer and ask questions coherently and concisely.	
17.05	Read critically by recognizing assumptions and implications and by evaluating ideas.	
17.06	Demonstrate appropriate telephone/communication skills.	
17.07	Describe the importance of clear and concise writing.	
17.08	Demonstrate proficiency in the effective use of speech and vocabulary.	
17.09	Explain the importance of good listening skills.	
17.10	Discuss the role communication plays in management.	

17.11	Demonstrate the components of the communication process.	
17.12	Demonstrate effective written communication skills.	
17.13	Demonstrate effective oral communication skills.	
17.14	Write technical reports.	
18.0	Demonstrate employability skills.-The student will be able to:	
18.01	Conduct a job search.	
18.02	Secure information about a job.	
18.03	Identify documents which may be required when applying for a job.	
18.04	Complete a job application form correctly.	
18.05	Demonstrate competence in job interview techniques.	
18.06	Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.	
18.07	Identify acceptable work habits.	
18.08	Demonstrate knowledge of how to make appropriate job changes.	
18.09	Demonstrate acceptable employee health and grooming habits.	
18.10	Exhibit punctuality, initiative, courtesy, loyalty and honesty.	
18.11	Demonstrate knowledge of the Federal as recorded in (29 CFR-1910.1200).	
19.0	Demonstrate an understanding of computer skills.-The student will be able to:	
19.01	Demonstrate use of spreadsheets, databases and word processing.	
19.02	Demonstrate use of Internet including locating information, copying and printing web-based information.	
19.03	Demonstrate general knowledge of computer components.	
19.04	Demonstrate the location and use of antivirus capability.	
19.05	Demonstrate the ability to communicate by e-mail.	

Additional Information

Laboratory Activities

Laboratory investigations that include scientific inquiry, research, measurement, problem solving, emerging technologies, tools and equipment, as well as, experimental, quality, and safety procedures are an integral part of this career and technical program/course. Laboratory investigations benefit all students by developing an understanding of the complexity and ambiguity of empirical work, as well as the skills required to manage, operate, calibrate and troubleshoot equipment/tools used to make observations. Students understand measurement error; and have the skills to aggregate, interpret, and present the resulting data. Equipment and supplies should be provided to enhance hands-on experiences for students.

Special Notes

The purpose of this program is to prepare students for employment as aircraft mechanics (SOC 49-3011). Graduates will be eligible to pursue FAA certification as general mechanics and will be trained to troubleshoot maintenance problems in the aviation industry. This program also provides supplemental training for persons previously or currently employed in this occupation.

This program focuses on broad, transferable skills and stresses understanding and demonstration of the following elements of the Aviation industry; planning, technical and product skills, underlying principles of technology, health, safety, and environmental issues.

An important note to consider is that each FAR PART 147 school must be approved by the FAA before any students can be placed in the program.

Required FAA exams include GENERAL written, oral, and practical. The only way a person can get authorization to take these examinations is to (1) graduate from an approved school or (2) obtain permission from the FAA to take the test based on prior experience on certified aircraft. Schools cannot grant permission (FAA FAR, Part 65 and Part 147, Subpart C 147.31).

Since an Aviation Maintenance Technician School (AMTS) is certified and inspected by the FAA, satisfaction of FAR Part 147 requirements should be the primary concern of an AMTS. When local and state educational requirements conflict with the FAA's regulation of an AMTS, those requirements must be resolved to satisfy FAR Part 147. In other words, FAA standards take precedence over other requirements. The FAA specifies minimum hours required and encourages schools to exceed minimum standards for the curriculum. The course content specified by the FAA may not be lowered.

“FAA FAR Part 147” identifies standards required by the FAA. Minimum teaching levels expected by the FAA also appear:

Level 1: knowledge of general principles

Level 2: knowledge of general principles and limited practical application

Level 3: knowledge of general principles with a high degree of practical application and hands-on skill levels according to FAA FAR Part 147:

For subjects taught at Level 3, all special tools required to meet “return to service” standards must be in satisfactory working condition, properly calibrated/tested, and of the proper kind for the purpose for which they are intended. Tools should include an adequate supply of special tools appropriate to the ratings and curriculum. If students are required to provide hand tools, then the school should list the specific tools with the curriculum and provide a copy of this list to the students. Shop equipment and special tools should be maintained in good working order and be in a condition for safe operation. All tools and equipment should be maintained in good working order and be in a condition for safe operation.

FAA FAR Part 147 states: Each certified Aviation Maintenance Technician School shall provide facilities, equipment, and material equal to the standards currently required for the issue of the certificate and rating that it holds.

Refer to FAA FAR Part 147 and industry publications for more information about required levels of proficiency, hours of instruction, and updates to occupational titles and training requirements. Keeping pace with the standards of industry and maintaining a high quality of training requires ongoing linkages with industry and FAA representatives.

Career and Technical Student Organization (CTSO)

SkillsUSA is the intercurricular career and technical student organization for providing leadership training and reinforcing specific career and technical skills. Career and Technical Student Organizations provide activities for students as an integral part of the instruction offered.

Accommodations

Federal and state legislation requires the provision of accommodations for students with disabilities to meet individual needs and ensure equal access. Postsecondary students with disabilities must self-identify, present documentation, request accommodations if needed, and develop a plan with their counselor and/or instructors. Accommodations received in postsecondary education may differ from those received in secondary education. Accommodations change the way the student is instructed. Students with disabilities may need accommodations in such areas as instructional methods and materials, assignments and assessments, time demands and schedules, learning environment, assistive technology and special communication systems. Documentation of the accommodations requested and provided should be maintained in a confidential file.

**Florida Department of Education
Curriculum Framework**

Program Title: Aviation Airframe Mechanics
Career Cluster: Transportation, Distribution and Logistics

CCC	
CIP Number	0649010409
Program Type	College Credit Certificate (CCC)
Standard Length	24 credit hours
CTSO	SkillsUSA
SOC Codes (all applicable)	49-3011 – Aircraft Mechanics and Service Technicians

Purpose

This certificate program is part of the Aviation Maintenance Management AS degree program (1649010401).

A College Credit Certificate consists of a program of instruction of less than sixty (60) credits of college-level courses, which is part of an AS or AAS degree program and prepares students for entry into employment (Rule 6A-14.030, F.A.C.).

This program offers a sequence of courses that provides coherent and rigorous content aligned with challenging academic standards and relevant technical knowledge and skills needed to prepare for further education and careers in the Transportation, Distribution and Logistics career cluster; provides technical skill proficiency, and includes competency-based applied learning that contributes to the academic knowledge, higher-order reasoning and problem-solving skills, work attitudes, general employability skills, technical skills, and occupation-specific skills, and knowledge of all aspects of the Transportation, Distribution and Logistics career cluster.

The purpose of this program is to prepare students for employment or advanced training in the commercial and general aviation industry. Instruction is designed to prepare students for Federal Aviation Administration (FAA) license examinations for Airframe ratings. Federal Aviation Regulation (FAR) Part 147 identifies minimum requirements for AMT schools. Any changes to the FAA-approved course content must be approved in advance. This program prepares students for employment as an Aviation Maintenance General Technician, and an Aviation Airframe Maintenance Technician.

The content includes but is not limited to the Federal Aviation Regulations (FAR) Part 65 pertaining to eligibility for a mechanic certificate and rating(s). Instruction is designed to qualify students for Federal Aviation Administration (FAA) examinations for aviation maintenance airframe technician certification as prescribed by FAR 147. The program content should also include training in communication, management leadership, human relations, supervisory and employability skills; and safe, efficient work practices.

Additional Information relevant to this Career and Technical Education (CTE) program is provided at the end of this document.

Standards

After successfully completing this program, the student will be able to perform the following:

- 01.0 Maintain wood structures.
- 02.0 Perform aircraft covering.
- 03.0 Apply aircraft finishes.
- 04.0 Repair sheetmetal structures.
- 05.0 Perform aircraft welding.
- 06.0 Perform airframe assembly and rigging.
- 07.0 Perform airframe inspection.
- 08.0 Maintain aircraft landing gear systems.
- 09.0 Maintain hydraulic and pneumatic power systems.
- 10.0 Maintain cabin atmosphere control systems.
- 11.0 Maintain aircraft instrument systems.
- 12.0 Maintain communication and navigation systems.
- 13.0 Inspect and repair aircraft fuel systems.
- 14.0 Inspect or repair aircraft electrical systems.
- 15.0 Inspect and repair position and warning systems.
- 16.0 Maintain ice and rain control systems.
- 17.0 Inspect and repair aircraft fire protection systems.
- 18.0 Demonstrate knowledge of FAA aircraft mechanic licensing requirements.
- 19.0 Demonstrate the human relations skills necessary for success in supervision.
- 20.0 Demonstrate knowledge of skills and attitudes the supervisor needs for effective performance.
- 21.0 Demonstrate a practical approach to job management.
- 22.0 Demonstrate appropriate communication skills.
- 23.0 Demonstrate employability skills.
- 24.0 Demonstrate an understanding of computer skills.

Florida Department of Education
Student Performance Standards

Program Title: Aviation Airframe Mechanics
CIP Numbers: 0649010409
Program Length: 24 credit hours
SOC Code(s): 49-3011

This certificate program is part of the Aviation Maintenance Management AS degree program (1649010401). At the completion of this program, the student will be able to:	FAA FAR Part 147
01.0 Maintain wood structures.-The student will be able to:	
01.01 Service and repair wood structures.	App. C, I, A, 1. Level 1
01.02 Identify wood defects.	App. C, I, A, 2. Level 1
01.03 Inspect wood structures.	App. C, I, A, 3. Level 1
02.0 Perform aircraft covering.-The student will be able to:	
02.01 Select and apply fabric and fiberglass covering materials.	App. C, I, B, 4. Level 1
02.02 Inspect, test and repair fabric and fiberglass.	App. C, I, B, 5. Level 1
03.0 Apply aircraft finishes.-The student will be able to:	
03.01 Apply trim, letters and touch-up paint.	App. C, I, C, 6. Level 1
03.02 Identify and select aircraft finishing materials.	App. C, I, C, 7. Level 2
03.03 Apply finishing materials.	App. C, I, C, 8. Level 2
03.04 Inspect finishes and identify defects.	App. C, I, C, 9. Level 2
03.05 Demonstrate an understanding of common safety practices dealing with paints and solvents.	
04.0 Repair sheet metal structures.-The student will be able to:	
04.01 Select, install, and remove special fasteners for metallic, bonded, and composite structures.	App. C, I, D, 10. Level 2
04.02 Inspect bonded structures.	App. C, I, D, 11. Level 2
04.03 Inspect, test, and repair fiberglass, plastics, honeycomb, composite, and laminated primary and secondary structures.	App. C, I, D, 12. Level 2
04.04 Inspect, check, service, and repair windows, doors, and interior furnishings.	App. C, I, D, 13. Level 2
04.05 Inspect and repair sheet-metal structures.	App. C, I, D, 14. Level 3
04.06 Install conventional rivets.	App. C, I, D, 15. Level 3
04.07 Form, lay out, and bend sheet metal.	App. C, I, D, 16. Level 3

05.0	Perform aircraft welding.-The student will be able to:	
05.01	Weld magnesium and titanium.	App. C, I, E, 17. Level 1
05.02	Solder stainless steel.	App. C, I, E, 18. Level 1
05.03	Fabricate tubular structures.	App. C, I, E, 19. Level 1
05.04	Solder, braze, gas-weld and arc-weld steel.	App. C, I, E, 20. Level 2
05.05	Weld aluminum and stainless steel.	App. C, I, E, 21. Level 1
06.0	Perform airframe assembly and rigging.-The student will be able to:	
06.01	Rig rotary-wing aircraft.	App. C, I, F, 22. Level 1
06.02	Rig fixed-wing aircraft.	App. C, I, F, 23. Level 2
06.03	Check alignment of structures.	App. C, I, F, 24. Level 2
06.04	Assemble aircraft components, including flight control surfaces.	App. C, I, F, 25. Level 3
06.05	Balance, rig, and inspect movable primary and secondary flight control surfaces.	App. C, I, F, 26. Level 3
06.06	Jack aircraft.	App. C, I, F, 27. Level 3
07.0	Perform airframe inspection.-The student will be able to:	
07.01	Perform conformity and airworthiness inspections.	App. C, I, G, 28. Level 3
08.0	Maintain aircraft landing gear systems.-The student will be able to:	
08.01	Inspect, check, service, and repair landing gear, retraction systems, shock struts, bakes, wheels, tires, and steering systems.	App. C, II, A, 29. Level 3
08.02	Utilize proper safety procedures and equipment when working on aircraft with electrical or hydraulic power on.	
08.03	Utilize proper safety procedures when working on landing gear struts or wheel and tire assemblies.	
09.0	Maintain hydraulic and pneumatic power systems.-The student will be able to:	
09.01	Repair hydraulic and pneumatic power system components.	App. C, II, B, 30. Level 2
09.02	Identify and select hydraulic fluids.	App. C, II, B, 31. Level 3
09.03	Inspect, check, service, troubleshoot, and repair hydraulic and pneumatic power systems.	App. C, II, B, 32. Level 3
10.0	Maintain cabin atmosphere control systems.-The student will be able to:	
10.01	Inspect, check, troubleshoot, service, and repair heating, cooling, air-conditioning, pressurization systems, and air cycle machines.	App. C, II, C 33. Level 1
10.02	Inspect, check, troubleshoot, service, and repair heating, cooling, air-conditioning, and pressurization systems.	App. C, II, C 34. Level 1
10.03	Inspect, check, troubleshoot, service and repair oxygen systems.	App. C, II, C 35. Level 2
11.0	Maintain aircraft instrument systems.-The student will be able to:	

11.01	Inspect, check, service, troubleshoot and repair electronic flight instrument systems and both mechanical and electrical heading, speed, altitude, temperature, pressure, and position indicating systems to include the use of built-in test equipment.	App. C, II, D, 36. Level 1
11.02	Install instruments and perform a static pressure system leak test	App. C, II, D, 37. Level 2
12.0	Maintain communication and navigation systems.-The student will be able to:	
12.01	Inspect, check, and troubleshoot autopilot servos and approach coupling systems.	App. C, II, E, 38. Level 1
12.02	Inspect, check, and service aircraft electronic communications and navigation systems, including VHF, ILS, LORAN, Radar beacon transponders, flight management computers, and GPWS.	App. C, II, E, 39. Level 1
12.03	Inspect and repair antenna and electronic equipment installations.	App. C, II, E, 40. Level 2
13.0	Inspect and repair aircraft fuel systems.-The student will be able to:	
13.01	Check and service fuel dump systems.	App. C, II, F, 41. Level 1
13.02	Perform fuel management, transfer and defueling.	App. C, II, F, 42. Level 1
13.03	Inspect, check and repair pressure fueling systems.	App. C, II, F, 43. Level 1
13.04	Repair aircraft fuel system components.	App. C, II, F, 44. Level 2
13.05	Inspect and repair fluid quantity indicating systems.	App. C, II, F, 45. Level 2
13.06	Troubleshoot, service and repair fluid and temperature warning systems.	App. C, II, F, 46. Level 2
13.07	Inspect, check, service, troubleshoot and repair aircraft fuel systems.	App. C, II, F, 47. Level 3
14.0	Inspect and repair aircraft electrical systems.-The student will be able to:	
14.01	Repair and inspect aircraft electrical system components; crimp and splice wiring to manufacturers' specifications; and repair pins and sockets of aircraft connectors.	App. C, II, G, 48. Level 2
14.02	Install, check, and service airframe electrical wiring, controls, switches, indicators, and protective devices.	App. C, II, G, 49. Level 2
14.03	Inspect, check, troubleshoot, service and repair alternating and direct current electrical systems.	App. C, II, G, 50a. Level 3
14.04	Inspect, check, and troubleshoot constant speed and integrated speed drive generators.	App. C, II, G, 50b. Level 1
15.0	Inspect and repair position and warning systems.-The student will be able to:	
15.01	Inspect, check, and service speed and configuration warning systems, electrical brake controls, and anti-skid systems.	App. C, II, H, 51. Level 2
15.02	Inspect, check, troubleshoot, and service landing gear position indicating and warning systems.	App. C, II, H, 52. Level 3
16.0	Maintain ice and rain control systems.-The student will be able to:	
16.01	Inspect, check, troubleshoot, service, and repair airframe ice and rain control systems.	App. C, II, I, 53. Level 2
17.0	Inspect and repair aircraft fire protection systems.-The student will be able to:	
17.01	Inspect, check and service smoke and carbon monoxide detection systems.	App. C, II, J, 54. Level 1

17.02	Inspect, check, service, troubleshoot, and repair aircraft fire detection and extinguishing systems.	App. C, II, J, 55. Level 3
18.0	Demonstrate knowledge of FAA aircraft mechanic licensing requirements.-The student will be able to:	
18.01	Successfully complete the FAA airframe written, oral and practical examinations.	
18.02	Display an FAA airframe mechanic's certificate.	
19.0	Demonstrate the human relations skills necessary for success in supervision.-The student will be able to:	
19.01	Exhibit the ability to get along with others.	
19.02	Discuss the importance of human relations.	
19.03	Develop and demonstrate the unique human relations skills needed for successful job attainment and progress in supervising others.	
20.0	Demonstrate knowledge of skills and attitudes the supervisor needs for effective performance.-The student will be able to:	
20.01	Describe leadership theory and its complexity.	
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20.04	Discuss pertinent legislation and the role of government intervention.	
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21.0	Demonstrate a practical approach to job management.-The student will be able to:	
21.01	Assume responsibility in planning and coordinating resources.	
21.02	Demonstrate effective decision making and problem-solving techniques.	
21.03	Implement methods of work improvement.	
22.0	Demonstrate appropriate communication skills.-The student will be able to:	
22.01	Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.	
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22.06	Demonstrate appropriate telephone/communication skills.	
22.07	Describe the importance of clear and concise writing.	
22.08	Demonstrate proficiency in the effective use of speech and vocabulary.	

22.09	Explain the importance of good listening skills.	
22.10	Discuss the role communication plays in management.	
22.11	Demonstrate the components of the communication process.	
22.12	Demonstrate effective written communication skills.	
22.13	Demonstrate effective oral communication skills.	
22.14	Write technical reports.	
23.0	Demonstrate employability skills.-The student will be able to:	
23.01	Conduct a job search.	
23.02	Secure information about a job.	
23.03	Identify documents which may be required when applying for a job.	
23.04	Complete a job application form correctly.	
23.05	Demonstrate competence in job interview techniques.	
23.06	Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.	
23.07	Identify acceptable work habits.	
23.08	Demonstrate knowledge of how to make appropriate job changes.	
23.09	Demonstrate acceptable employee health and grooming habits.	
23.10	Exhibit punctuality, initiative, courtesy, loyalty and honesty.	
23.11	Demonstrate knowledge of the Federal as recorded in (29 CFR-1910.1200).	
24.0	Demonstrate an understanding of computer skills.-The student will be able to:	
24.01	Demonstrate use of spreadsheets, databases and word processing.	
24.02	Demonstrate use of Internet including locating information, copying and printing web-based information.	
24.03	Demonstrate general knowledge of computer components.	
24.04	Demonstrate the location and use of antivirus capability.	
24.05	Demonstrate the ability to communicate by e-mail.	

Additional Information

Laboratory Activities

Laboratory investigations that include scientific inquiry, research, measurement, problem solving, emerging technologies, tools and equipment, as well as, experimental, quality, and safety procedures are an integral part of this career and technical program/course. Laboratory investigations benefit all students by developing an understanding of the complexity and ambiguity of empirical work, as well as the skills required to manage, operate, calibrate and troubleshoot equipment/tools used to make observations. Students understand measurement error; and have the skills to aggregate, interpret, and present the resulting data. Equipment and supplies should be provided to enhance hands-on experiences for students.

Special Notes

The purpose of this program is to prepare students for employment as aircraft mechanics (SOC 49-3011). Graduates will be eligible to pursue FAA certification as airframe mechanics and will be trained to troubleshoot maintenance problems in the aviation industry. This program also provides supplemental training for persons previously or currently employed in this occupation.

This program focuses on broad, transferable skills and stresses understanding and demonstration of the following elements of the Aviation industry; planning, technical and product skills, underlying principles of technology, health, safety, and environmental issues.

An important note to consider is that each FAR PART 147 school must be approved by the FAA before any students can be placed in the program.

Required FAA exams include GENERAL written, oral, and practical; and AIRFRAME written, oral, and practical. The only way a person can get authorization to take these examinations is to (1) graduate from an approved school or (2) obtain permission from the FAA to take the test based on prior experience on certified aircraft. Schools cannot grant permission (FAA FAR, Part 65 and Part 147, Subpart C 147.31).

Since an Aviation Maintenance Technician School (AMTS) is certified and inspected by the FAA, satisfaction of FAR Part 147 requirements should be the primary concern of an AMTS. When local and state educational requirements conflict with the FAA's regulation of an AMTS, those requirements must be resolved to satisfy FAR Part 147. In other words, FAA standards take precedence over other requirements. The FAA specifies minimum hours required and encourages schools to exceed minimum standards for the curriculum. The course content specified by the FAA may not be lowered.

“FAA FAR Part 147” identifies standards required by the FAA. Minimum teaching levels expected by the FAA also appear:

Level 1: knowledge of general principles

Level 2: knowledge of general principles and limited practical application

Level 3: knowledge of general principles with a high degree of practical application and hands-on skill levels according to FAA FAR Part 147:

For subjects taught at Level 3, all special tools required to meet “return to service” standards must be in satisfactory working condition, properly calibrated/tested, and of the proper kind for the purpose for which they are intended. Tools should include an adequate supply of special tools appropriate to the ratings and curriculum. If students are required to provide hand tools, then the school should list the specific tools with the curriculum and provide a copy of this list to the students. Shop equipment and special tools should be maintained in good working order and be in a condition for safe operation. All tools and equipment should be maintained in good working order and be in a condition for safe operation.

FAA FAR Part 147 states: Each certified Aviation Maintenance Technician School shall provide facilities, equipment, and material equal to the standards currently required for the issue of the certificate and rating that it holds.

Refer to FAA FAR Part 147 and industry publications for more information about required levels of proficiency, hours of instruction, and updates to occupational titles and training requirements. Keeping pace with the standards of industry and maintaining a high quality of training requires ongoing linkages with industry and FAA representatives.

Career and Technical Student Organization (CTSO)

SkillsUSA is the intercurricular career and technical student organization for providing leadership training and reinforcing specific career and technical skills. Career and Technical Student Organizations provide activities for students as an integral part of the instruction offered.

Accommodations

Federal and state legislation requires the provision of accommodations for students with disabilities to meet individual needs and ensure equal access. Postsecondary students with disabilities must self-identify, present documentation, request accommodations if needed, and develop a plan with their counselor and/or instructors. Accommodations received in postsecondary education may differ from those received in secondary education. Accommodations change the way the student is instructed. Students with disabilities may need accommodations in such areas as instructional methods and materials, assignments and assessments, time demands and schedules, learning environment, assistive technology and special communication systems. Documentation of the accommodations requested and provided should be maintained in a confidential file.

**Florida Department of Education
Curriculum Framework**

Program Title: Aviation Powerplant Mechanics
Career Cluster: Transportation, Distribution and Logistics

CCC

CIP Number	0649010410
Program Type	College Credit Certificate (CCC)
Standard Length	24 credit hours
CTSO	SkillsUSA
SOC Codes (all applicable)	49-3011 – Aircraft Mechanics and Service Technicians

Purpose

This certificate program is part of the Aviation Maintenance Management AS degree program (1649010401).

A College Credit Certificate consists of a program of instruction of less than sixty (60) credits of college-level courses, which is part of an AS or AAS degree program and prepares students for entry into employment (Rule 6A-14.030, F.A.C.).

This program offers a sequence of courses that provides coherent and rigorous content aligned with challenging academic standards and relevant technical knowledge and skills needed to prepare for further education and careers in the Transportation, Distribution and Logistics career cluster; provides technical skill proficiency, and includes competency-based applied learning that contributes to the academic knowledge, higher-order reasoning and problem-solving skills, work attitudes, general employability skills, technical skills, and occupation-specific skills, and knowledge of all aspects of the Transportation, Distribution and Logistics career cluster.

The purpose of this program is to prepare students for employment or advanced training in the commercial and general aviation industry. Instruction is designed to prepare students for Federal Aviation Administration (FAA) license examinations for Powerplant ratings. Federal Aviation Regulation (FAR) Part 147 identifies minimum requirements for AMT schools. Any changes to the FAA-approved course content must be approved in advance. This program prepares students for employment as an Aviation Maintenance General Technician, and an Aviation Powerplant Maintenance Technician.

The content includes but is not limited to the Federal Aviation Regulations (FAR) Part 65 pertaining to eligibility for a mechanic certificate and rating(s). Instruction is designed to qualify students for Federal Aviation Administration (FAA) examinations for aviation maintenance powerplant technician certification as prescribed by FAR 147. The program content should also include training in communication, management leadership, human relations, supervisory and employability skills; and safe, efficient work practices.

Additional Information relevant to this Career and Technical Education (CTE) program is provided at the end of this document.

Standards

After successfully completing this program, the student will be able to perform the following:

- 01.0 Perform basic reciprocating engine skills.
- 02.0 Perform basic turbine engine skills.
- 03.0 Perform engine inspection.
- 04.0 Maintain engine instrument systems.
- 05.0 Maintain engine fire protection systems.
- 06.0 Maintain engine electrical systems.
- 07.0 Maintain lubrication systems.
- 08.0 Maintain ignition systems.
- 09.0 Maintain fuel metering systems.
- 10.0 Maintain engine fuel systems.
- 11.0 Maintain induction and engine airflow systems.
- 12.0 Maintain engine cooling systems.
- 13.0 Maintain engine exhaust systems.
- 14.0 Maintain aircraft propellers.
- 15.0 Maintain unducted fans.
- 16.0 Maintain auxiliary power units
- 17.0 Demonstrate knowledge of FAA aircraft mechanic licensing requirements.
- 18.0 Demonstrate the human relations skills necessary for success in supervision.
- 19.0 Demonstrate knowledge of skills and attitudes the supervisor needs for effective performance.
- 20.0 Demonstrate a practical approach to job management.
- 21.0 Demonstrate appropriate communication skills.
- 22.0 Demonstrate employability skills.
- 23.0 Demonstrate an understanding of computer skills.

Florida Department of Education
Student Performance Standards

Program Title: Aviation Powerplant Mechanics
 CIP Numbers: 0649010410
 Program Length: 24 credit hours
 SOC Code(s): 49-3011

This certificate program is part of the Aviation Maintenance Management AS degree program (1649010401). At the completion of this program, the student will be able to:	FAA FAR Part 147
01.0 Perform basic reciprocating engine skills.-The student will be able to:	
01.01 Inspect and repair a radial engine.	App. D, I, A, 1. Level 1
01.02 Overhaul reciprocating engine.	App. D, I, A, 2. Level 2
01.03 Inspect, check, service, and repair reciprocating engines and engine installations.	App. D, I, A, 3. Level 3
01.04 Install, troubleshoot, and remove reciprocating engines.	App. D, I, A, 4. Level 3
02.0 Perform basic turbine engine skills.-The student will be able to:	
02.01 Overhaul turbine engine.	App. D, I, B, 5. Level 2
02.02 Inspect, check, service, and repair turbine engines and turbine engine installations.	App. D, I, B, 6. Level 3
02.03 Install, troubleshoot, and remove turbine engines.	App. D, I, B, 7. Level 3
03.0 Perform engine inspection.-The student will be able to:	
03.01 Perform powerplant conformity and air worthiness inspections.	App. D, I, C, 8. Level 3
04.0 Maintain engine instrument systems.-The student will be able to:	
04.01 Troubleshoot, service, and repair electrical and mechanical fluid rate-of-flow indicating systems.	App. D, II, A, 9. Level 2
04.02 Inspect, check, service, troubleshoot, and repair electrical and mechanical engine temperature, pressure, and revolutions per minute (rpm) indicating systems.	App. D, II, A, 10. Level 2
05.0 Maintain engine fire protection systems.-The student will be able to:	
05.01 Inspect, check service, troubleshoot, and repair engine fire detection and extinguishing systems.	App. D, II, B, 11. Level 3
06.0 Maintain engine electrical systems.-The student will be able to:	
06.01 Repair engine electrical system components.	App. D, II, C, 12. Level 2
06.02 Install, check and service engine electrical wiring, controls, indicators, and protective devices.	App. D, II, C, 13. Level 3
07.0 Maintain lubrication systems.-The student will be able to:	
07.01 Identify and select lubricants.	App. D, II, D, 14. Level 2

07.02	Repair engine lubrication system components.	App. D, II, D, 15. Level 2
07.03	Inspect, check, service, troubleshoot, and repair engine lubrication system.	App. D, II, D, 16. Level 3
08.0	Maintain ignition systems.-The student will be able to:	
08.01	Overhaul magneto and ignition harness.	App. D, II, E, 17. Level 2
08.02	Inspect, service, troubleshoot, and repair reciprocating and turbine engine ignition systems and components.	App. D, II, E, 18. Level 2
08.03	Inspect, service, troubleshoot, and repair turbine engine electrical starting systems.	App. D, II, E, 19a. Level 3
09.0	Maintain fuel metering systems.-The student will be able to:	
09.01	Troubleshoot and adjust turbine engine fuel metering systems and electronic engine fuel controls.	App. D, II, F, 20. Level 1
09.02	Overhaul carburetor.	App. D, II, F, 21. Level 1
09.03	Repair engine fuel metering system components.	App. D, II, F, 22. Level 2
09.04	Inspect, check, troubleshoot, and repair reciprocating and turbine engine fuel metering systems.	App. D, II, F, 23. Level 3
10.0	Maintain engine fuel systems.-The student will be able to:	
10.01	Repair engine fuel system components.	App. D, II, G, 24. Level 2
10.02	Inspect, check, service, troubleshoot, and repair engine fuel systems.	App. D, II, G, 25. Level 3
11.0	Maintain induction and engine airflow systems.-The student will be able to:	
11.01	Inspect, check, troubleshoot, service and repair engine ice and rain control systems.	App. D, II, H, 26. Level 2
11.02	Inspect, check, service, troubleshoot and repair heat exchangers, superchargers and turbine engine airflow and temperature control systems.	App. D, II, H, 27. Level 1
11.03	Inspect, check, service, and repair carburetor air intake and induction manifolds.	App. D, II, H, 28. Level 3
12.0	Maintain engine cooling systems.-The student will be able to:	
12.01	Repair engine cooling system components.	App. D, II, I, 29. Level 2
12.02	Inspect, check, troubleshoot, service and repair engine cooling systems.	App. D, II, I, 30. Level 3
13.0	Maintain engine exhaust systems.-The student will be able to:	
13.01	Repair engine exhaust system components.	App. D, II, J, 31. Level 2
13.02	Inspect, check, troubleshoot, service and repair engine exhaust systems.	App. D, II, J, 32a. Level 3
13.03	Troubleshoot and repair engine thrust reverser systems and related components.	App. D, II, J, 32b. Level 1
14.0	Maintain aircraft propellers.-The student will be able to:	
14.01	Inspect, check, service and repair propeller synchronizing and ice control systems.	App. D, II, K, 33. Level 1
14.02	Identify and select propeller lubricants.	App. D, II, K, 34. Level 2

14.03	Balance propellers.	App. D, II, K, 35. Level 1
14.04	Repair propeller control system components.	App. D, II, K, 36. Level 2
14.05	Inspect, check, service, and repair fixed-pitch, constant-speed, and feathering propellers, and propeller governing systems.	App. D, II, K, 37. Level 3
14.06	Install, troubleshoot and remove propellers.	App. D, II, K, 38. Level 3
14.07	Repair aluminum alloy propeller blades.	App. D, II, K, 39. Level 3
15.0	Maintain Unducted Fans.-The student will be able to:	
15.01	Inspect and troubleshoot unducted fan systems and components.	App. D, II, L, 40. Level 1
16.0	Maintain Auxiliary Power Units.-The student will be able to:	
16.01	Inspect, check, service, and troubleshoot turbine-driven auxiliary power units.	
17.0	Demonstrate knowledge of FAA aircraft mechanic licensing requirements.-The student will be able to:	
17.01	Successfully complete the FAA powerplant written, oral and practical examinations.	
17.02	Display an FAA powerplant Mechanic's certificate.	
18.0	Demonstrate the human relations skills necessary for success in supervision.-The student will be able to:	
18.01	Exhibit the ability to get along with others.	
18.02	Discuss the importance of human relations.	
18.03	Develop and demonstrate the unique human relations skills needed for successful job attainment and progress in supervising others.	
19.0	Demonstrate knowledge of skills and attitudes the supervisor needs for effective performance.-The student will be able to:	
19.01	Describe leadership theory and its complexity.	
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An important note to consider is that each FAR PART 147 school must be approved by the FAA before any students can be placed in the program.

Required FAA exams include GENERAL written, oral, and practical; and POWERPLANT written, oral, and practical. The only way a person can get authorization to take these examinations is to (1) graduate from an approved school or (2) obtain permission from the FAA to take the test based on prior experience on certified aircraft. Schools cannot grant permission (FAA FAR, Part 65 and Part 147, Subpart C 147.31).

Since an Aviation Maintenance Technician School (AMTS) is certified and inspected by the FAA, satisfaction of FAR Part 147 requirements should be the primary concern of an AMTS. When local and state educational requirements conflict with the FAA's regulation of an AMTS, those requirements must be resolved to satisfy FAR Part 147. In other words, FAA standards take precedence over other requirements. The FAA

specifies minimum hours required and encourages schools to exceed minimum standards for the curriculum. The course content specified by the FAA may not be lowered.

“FAA FAR Part 147” identifies standards required by the FAA. Minimum teaching levels expected by the FAA also appear:

Level 1: knowledge of general principles

Level 2: knowledge of general principles and limited practical application

Level 3: knowledge of general principles with a high degree of practical application and hands-on skill levels according to FAA FAR Part 147:

For subjects taught at Level 3, all special tools required to meet “return to service” standards must be in satisfactory working condition, properly calibrated/tested, and of the proper kind for the purpose for which they are intended. Tools should include an adequate supply of special tools appropriate to the ratings and curriculum. If students are required to provide hand tools, then the school should list the specific tools with the curriculum and provide a copy of this list to the students. Shop equipment and special tools should be maintained in good working order and be in a condition for safe operation. All tools and equipment should be maintained in good working order and be in a condition for safe operation.

FAA FAR Part 147 states: Each certified Aviation Maintenance Technician School shall provide facilities, equipment, and material equal to the standards currently required for the issue of the certificate and rating that it holds.

Refer to FAA FAR Part 147 and industry publications for more information about required levels of proficiency, hours of instruction, and updates to occupational titles and training requirements. Keeping pace with the standards of industry and maintaining a high quality of training requires ongoing linkages with industry and FAA representatives.

Career and Technical Student Organization (CTSO)

SkillsUSA is the intercurricular career and technical student organization for providing leadership training and reinforcing specific career and technical skills. Career and Technical Student Organizations provide activities for students as an integral part of the instruction offered.

Accommodations

Federal and state legislation requires the provision of accommodations for students with disabilities to meet individual needs and ensure equal access. Postsecondary students with disabilities must self-identify, present documentation, request accommodations if needed, and develop a plan with their counselor and/or instructors. Accommodations received in postsecondary education may differ from those received in secondary education. Accommodations change the way the student is instructed. Students with disabilities may need accommodations in such areas as instructional methods and materials, assignments and assessments, time demands and schedules, learning environment, assistive technology and special communication systems. Documentation of the accommodations requested and provided should be maintained in a confidential file.

**Florida Department of Education
Curriculum Framework**

Program Title: Airline Maintenance Procedures and Records Management
Career Cluster: Transportation, Distribution and Logistics

CCC	
CIP Number	0649010411
Program Type	College Credit Certificate (CCC)
Standard Length	18 credit hours
CTSO	SkillsUSA
SOC Codes (all applicable)	49-1011 – First-Line Supervisor of Mechanics, Installers, and Repairers 49-3011 – Aircraft Mechanics and Service Technicians

Purpose

This certificate program is part of the Aviation Maintenance Management AS degree program (1649010401).

College Credit Certificate consists of a program of instruction of less than sixty (60) credits of college-level courses, which is part of an AS or AAS degree program and prepares students for entry into employment (Rule 6A-14.030, F.A.C.).

This program offers a sequence of courses that provides coherent and rigorous content aligned with challenging academic standards and relevant technical knowledge and skills needed to prepare for further education and careers in the Transportation, Distribution and Logistics career cluster; provides technical skill proficiency, and includes competency-based applied learning that contributes to the academic knowledge, higher-order reasoning and problem-solving skills, work attitudes, general employability skills, technical skills, and occupation-specific skills, and knowledge of all aspects of the Transportation, Distribution and Logistics career cluster.

The content includes but is not limited to organize, review, and classify aircraft records to comply with FAA regulations, as well as successfully manage records at aircraft manufacturers, airlines, and maintenance repair operators. The program content should promote a wide range of classroom and hands-on training that will provide the student with the knowledge to successfully manage the aircraft records department in an aviation company. The program content should also include training in communication, management leadership, human relations, supervisory and employability skills; and safe, efficient work practices.

Additional Information relevant to this Career and Technical Education (CTE) program is provided at the end of this document.

Program Structure

This program is a planned sequence of instruction consisting of 18 credit hours.

Standards

After successfully completing this program, the student will be able to perform the following:

- 01.0 Perform aircraft materials and process skills.
- 02.0 Maintain forms and records.
- 03.0 Demonstrate the use of maintenance publications.
- 04.0 Interpret mechanic privileges.
- 05.0 Perform engine inspection.
- 06.0 Perform airframe inspection.
- 07.0 Inspect and repair aircraft fuel systems.
- 08.0 Inspect or repair aircraft electrical systems.
- 09.0 Inspect and repair position and warning systems.
- 10.0 Inspect and repair aircraft fire protection systems.
- 11.0 Demonstrate knowledge of FAA aircraft mechanic licensing requirements.
- 12.0 Demonstrate the human relations skills necessary for success in supervision.
- 13.0 Demonstrate knowledge of skills and attitudes the supervisor needs for effective performance.
- 14.0 Demonstrate a practical approach to job management.
- 15.0 Demonstrate appropriate communication skills.
- 16.0 Demonstrate employability skills.
- 17.0 Demonstrate an understanding of computer skills.

**Florida Department of Education
Student Performance Standards**

Program Title: Airline Maintenance Procedures and Records Management
CIP Numbers: 0649010411
Program Length: 18 credit hours
SOC Code(s): 49-1011, 49-3011

This certificate program is part of the Aviation Maintenance AS degree program (1649010401). At the completion of this program, the student will be able to:		FAA FAR Part 147
01.0	Perform aircraft materials and processes skills.--The student will be able to:	
01.01	Identify and select appropriate nondestructive testing methods.	App. B, E, 14. Level 1
01.02	Perform dye penetrant, eddy current, ultrasonic, and magnetic particle inspections.	App. B, E, 15. Level 2
01.03	Perform basic heat-treating processes.	App. B, E, 16. Level 1
01.04	Identify and select aircraft hardware and materials.	App. B, E, 17. Level 3
01.05	Inspect and check welds.	App. B, E, 18. Level 3
01.06	Perform precision measurements.	App. B, E, 19. Level 3
01.07	Perform safety wiring techniques.	
02.0	Maintain forms and records.--The student will be able to:	
02.01	Write descriptions of work performed including aircraft discrepancies and corrective actions using typical aircraft maintenance records.	App. B, I, 28. Level 3
02.02	Complete required maintenance forms, records, and inspection reports.	App. B, I, 29. Level 3
03.0	Demonstrate the use of maintenance publications.--The student will be able to:	
03.01	Demonstrate ability to read, comprehend, and apply information contained in FAA and manufacturers' aircraft maintenance specifications, data sheets, manuals, publications, and related Federal Aviation Regulations, Airworthiness Directives, and Advisory material.	App. B, K, 31. Level 3
03.02	Read technical data.	App. B, K, 32. Level 3
04.0	Interpret mechanic privileges.--The student will be able to:	

04.01	Exercise mechanic privileges within the limitations prescribed by Part 65 of this chapter.	App. B, L, 33. Level 3
05.0	Perform engine inspection.--The student will be able to:	
05.01	Perform powerplant conformity and air worthiness inspections.	App. D, I, C, 8. Level 3
06.0	Perform airframe inspection.--The student will be able to:	
06.01	Perform conformity and airworthiness inspections.	App. C, I, G, 28. Level 3
07.0	Inspect and repair aircraft fuel systems.--The student will be able to:	
07.01	Check and service fuel dump systems.	App. C, II, F, 41. Level 1
07.02	Perform fuel management, transfer and defueling.	App. C, II, F, 42. Level 1
07.03	Inspect, check and repair pressure fueling systems.	App. C, II, F, 43. Level 1
07.04	Repair aircraft fuel system components.	App. C, II, F, 44. Level 2
07.05	Inspect and repair fluid quantity indicating systems.	App. C, II, F, 45. Level 2
07.06	Troubleshoot, service and repair fluid and temperature warning systems.	App. C, II, F, 46. Level 2
07.07	Inspect, check, service, troubleshoot and repair aircraft fuel systems.	App. C, II, F, 47. Level 3
08.0	Inspect and repair aircraft electrical systems.--The student will be able to:	
08.01	Repair and inspect aircraft electrical system components; crimp and splice wiring to manufacturers' specifications; and repair pins and sockets of aircraft connectors.	App. C, II, G, 48. Level 2
08.02	Install, check, and service airframe electrical wiring, controls, switches, indicators, and protective devices.	App. C, II, G, 49. Level 2
08.03	Inspect, check, troubleshoot, service and repair alternating and direct current electrical systems.	App. C, II, G, 50a. Level 3
08.04	Inspect, check, and troubleshoot constant speed and integrated speed drive generators.	App. C, II, G, 50b. Level 1
09.0	Inspect and repair position and warning systems.--The student will be able to:	
09.01	Inspect, check, and service speed and configuration warning systems, electrical brake controls, and anti-skid systems.	App. C, II, H, 51. Level 2

09.02	Inspect, check, troubleshoot, and service landing gear position indicating and warning systems.	App. C, II, H, 52. Level 3
10.0	Inspect and repair aircraft fire protection systems.--The student will be able to:	
10.01	Inspect, check and service smoke and carbon monoxide detection systems.	App. C, II, J, 54. Level 1
10.02	Inspect, check, service, troubleshoot, and repair aircraft fire detection and extinguishing systems.	App. C, II, J, 55. Level 3
11.0	Demonstrate knowledge of FAA aircraft mechanic licensing requirements.--The student will be able to:	
11.01	Successfully complete the FAA powerplant written, oral and practical examinations.	
11.02	Display an FAA powerplant Mechanic's certificate.	
11.03	Successfully complete the FAA airframe written, oral and practical examinations.	
11.04	Display an FAA airframe mechanic's certificate.	
12.0	Demonstrate the human relations skills necessary for success in supervision.--The student will be able to:	
12.01	Exhibit the ability to get along with others.	
12.02	Discuss the importance of human relations.	
12.03	Develop and demonstrate the unique human relations skills needed for successful job attainment and progress in supervising others.	
13.0	Demonstrate knowledge of skills and attitudes the supervisor needs for effective performance.- -The student will be able to:	
13.01	Describe leadership theory and its complexity.	
13.02	Discuss how a new supervisor is introduced to leadership responsibilities.	
13.03	Identify the legal and social environment for supervision.	
13.04	Discuss pertinent legislation and the role of government intervention.	
13.05	Describe problems in union and non-union organizations.	
14.0	Demonstrate a practical approach to job management.--The student will be able to:	
14.01	Assume responsibility in planning and coordinating resources.	
14.02	Demonstrate effective decision making and problem-solving techniques.	

14.03	Implement methods of work improvement.	
15.0	Demonstrate appropriate communication skills.--The student will be able to:	
15.01	Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.	
15.02	Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.	
15.03	Read and follow written and oral instructions.	
15.04	Answer and ask questions coherently and concisely.	
15.05	Read critically by recognizing assumptions and implications and by evaluating ideas.	
15.06	Demonstrate appropriate telephone/communication skills.	
15.07	Describe the importance of clear and concise writing.	
15.08	Demonstrate proficiency in the effective use of speech and vocabulary.	
15.09	Explain the importance of good listening skills.	
15.10	Discuss the role communication plays in management.	
15.11	Demonstrate the components of the communication process.	
15.12	Demonstrate effective written communication skills.	
15.13	Demonstrate effective oral communication skills.	
15.14	Write technical reports.	
16.0	Demonstrate employability skills.--The student will be able to:	
16.01	Conduct a job search.	
16.02	Secure information about a job.	
16.03	Identify documents which may be required when applying for a job.	
16.04	Complete a job application form correctly.	
16.05	Demonstrate competence in job interview techniques.	
16.06	Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.	
16.07	Identify acceptable work habits.	

16.08	Demonstrate knowledge of how to make appropriate job changes.	
16.09	Demonstrate acceptable employee health and grooming habits.	
16.10	Exhibit punctuality, initiative, courtesy, loyalty and honesty.	
16.11	Demonstrate knowledge of the Federal as recorded in (29 CFR-1910.1200).	
17.0	Demonstrate an understanding of computer skills.--The student will be able to:	
17.01	Demonstrate use of spreadsheets, databases and word processing.	
17.02	Demonstrate use of Internet including locating information, copying and printing web-based information.	
17.03	Demonstrate general knowledge of computer components.	
17.04	Demonstrate the location and use of antivirus capability.	
17.05	Demonstrate the ability to communicate by e-mail.	

Additional Information

Laboratory Activities

Laboratory investigations that include scientific inquiry, research, measurement, problem solving, emerging technologies, tools and equipment, as well as, experimental, quality, and safety procedures are an integral part of this career and technical program/course. Laboratory investigations benefit all students by developing an understanding of the complexity and ambiguity of empirical work, as well as the skills required to manage, operate, calibrate and troubleshoot equipment/tools used to make observations. Students understand measurement error; and have the skills to aggregate, interpret, and present the resulting data. Equipment and supplies should be provided to enhance hands-on experiences for students.

Special Notes

The purpose of this program is to prepare students for employment as aircraft mechanics (SOC 49-3011). Graduates will be eligible to pursue FAA certification as airframe mechanics and will be trained to troubleshoot maintenance problems in the aviation industry. This program also provides supplemental training for persons previously or currently employed in this occupation.

This program focuses on broad, transferable skills and stresses understanding and demonstration of the following elements of the Aviation industry; planning, technical and product skills, underlying principles of technology, health, safety, and environmental issues.

An important note to consider is that each FAR PART 147 school must be approved by the FAA before any students can be placed in the program.

Required FAA exams include GENERAL written, oral, and practical; and AIRFRAME written, oral, and practical. The only way a person can get authorization to take these examinations is to (1) graduate from an approved school or (2) obtain permission from the FAA to take the test based on prior experience on certified aircraft. Schools cannot grant permission (FAA FAR, Part 65 and Part 147, Subpart C 147.31).

Since an Aviation Maintenance Technician School (AMTS) is certified and inspected by the FAA, satisfaction of FAR Part 147 requirements should be the primary concern of an AMTS. When local and state educational requirements conflict with the FAA's regulation of an AMTS, those requirements must be resolved to satisfy FAR Part 147. In other words, FAA standards take

precedence over other requirements. The FAA specifies minimum hours required and encourages schools to exceed minimum standards for the curriculum. The course content specified by the FAA may not be lowered.

“FAA FAR Part 147” identifies standards required by the FAA. Minimum teaching levels expected by the FAA also appear:

Level 1: knowledge of general principles

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Level 3: knowledge of general principles with a high degree of practical application and hands-on skill levels according to FAA FAR Part 147:

For subjects taught at Level 3, all special tools required to meet “return to service” standards must be in satisfactory working condition, properly calibrated/tested, and of the proper kind for the purpose for which they are intended. Tools should include an adequate supply of special tools appropriate to the ratings and curriculum. If students are required to provide hand tools, then the school should list the specific tools with the curriculum and provide a copy of this list to the students. Shop equipment and special tools should be maintained in good working order and be in a condition for safe operation. All tools and equipment should be maintained in good working order and be in a condition for safe operation.

FAA FAR Part 147 states: Each certified Aviation Maintenance Technician School shall provide facilities, equipment, and material equal to the standards currently required for the issue of the certificate and rating that it holds.

Refer to FAA FAR Part 147 and industry publications for more information about required levels of proficiency, hours of instruction, and updates to occupational titles and training requirements. Keeping pace with the standards of industry and maintaining a high quality of training requires ongoing linkages with industry and FAA representatives.

Career and Technical Student Organization (CTSO)

SkillsUSA is the intercurricular career and technical student organization for providing leadership training and reinforcing specific career and technical skills. Career and Technical Student Organizations provide activities for students as an integral part of the instruction offered.

Accommodations

Federal and state legislation requires the provision of accommodations for students with disabilities to meet individual needs and ensure equal access. Postsecondary students with disabilities must self-identify, present documentation, request accommodations if needed, and develop a plan with their counselor and/or instructors. Accommodations received in postsecondary education may differ from those received in secondary education. Accommodations change the way the student is instructed. Students with disabilities

may need accommodations in such areas as instructional methods and materials, assignments and assessments, time demands and schedules, learning environment, assistive technology and special communication systems. Documentation of the accommodations requested and provided should be maintained in a confidential file.

**Florida Department of Education
Curriculum Framework**

Program Title: International Freight Transportation
Career Cluster: Transportation, Distribution and Logistics

CCC

CIP Number	0652020302
Program Type	College Credit Certificate (CCC)
Standard Length	15 credit hours
CTSO	SkillsUSA
SOC Codes (all applicable)	11-3071 – Transportation, Storage and Distribution Managers 13-1081 – Logisticians 43-5011 – Cargo and Freight Agents 43-5071 – Shipping, Receiving and Traffic Clerks 53-1011 – Aircraft Cargo Handling Supervisors 53-1031 – First-Line Supervisors of Transportation and Material Moving Machine and Vehicle Operators

Purpose

This certificate program is part of the Transportation and Logistics AS degree program 0652020301

A College Credit Certificate consists of a program of instruction of less than sixty (60) credits of college-level courses, which is part of an AS degree program and prepares students for entry into employment (Rule 6A-14.030, F.A.C.).

This program offers a sequence of courses that provides coherent and rigorous content aligned with challenging academic standards and relevant technical knowledge and skills needed to prepare for further education and careers in the Transportation, Distribution and Logistics career cluster, provides technical skill proficiency, and includes competency-based applied learning that contributes to the academic knowledge, higher-order reasoning and problem-solving skills, work attitudes, general employability skills, technical skills, and occupation-specific skills, and knowledge of all aspects of the Transportation, Distribution and Logistics career cluster.

The content includes but is not limited to related business, accounting, and financial practices such as standard policies and operating procedures, negotiation techniques, planning, organizing, purchasing and inventory control theory.

The purpose of this program is to prepare students for initial employment with an occupational title or to provide supplemental training for persons previously or currently employed in these occupations with cross-functional skills necessary for planning, and operations of transportation systems and the flow and distribution of goods and people.

Additional Information relevant to this Career and Technical Education (CTE) program is provided at the end of this document.

Standards

After successfully completing this program, the student will be able to perform the following:

- 01.0 Demonstrate an understanding of the basic concepts and terms used in transportation and logistics
- 02.0 Demonstrate an understanding of the transportation and logistics regulatory environment
- 03.0 Identify risks and safety and security measures in transportation and logistics
- 04.0 Demonstrate the ability to use technology as it relates to transportation and logistics
- 05.0 Demonstrate knowledge of documentation (domestic, international, and customs) related to transportation and logistics
- 06.0 Demonstrate the ability to manipulate quantitative data including international weights and measures, as it relates to the movement of goods
- 07.0 Demonstrate an understanding of reverse logistics
- 08.0 Demonstrate knowledge of border security
- 09.0 Demonstrate knowledge of procurement, contracts and contract administration as it applies to transportation and logistics
- 10.0 Demonstrate knowledge of geography, culture, customs, and language in international trade
- 11.0 Demonstrate knowledge of pricing as it relates to shipping methods
- 12.0 Demonstrate knowledge of the air, sea, truck, and rail operations in the movement of freight
- 13.0 Distinguish the difference between domestic and international freight movements

**Florida Department of Education
Student Performance Standards**

Program Title: International Freight Transportation
CIP Numbers: 0652020302
Program Length: 15 Credits
SOC Code(s): 11-3071; 13-1081; 43-5011; 43-5071; 53-1011; 53-1031

This certificate program is part of the Transportation and Logistics AS degree program (0652020301). At the completion of this program, the student will be able to:	
01.0	Demonstrate an understanding of the basic concepts and terms used in transportation and logistics.-The student will be able to:
01.01	Compare various shipping options
01.02	Analyze types of goods and products and impact on logistics
01.03	Identify the characteristics of a full-service transportation organization
01.04	Demonstrate an understanding of intermodalism
01.05	Demonstrate knowledge of mode-specific logistics
01.06	Demonstrate knowledge of Incoterms versus Uniform Commercial Code (UCC)
01.07	Demonstrate knowledge of how goods move through freight forwarder and customs broker
01.08	Demonstrate knowledge of inventory and warehousing concepts
01.09	Explain the relevance of Just-in-Time (JIT) logistics
01.10	Demonstrate knowledge of shipment process for perishables
01.11	Demonstrate knowledge of packaging and labeling requirements
01.12	Demonstrate knowledge of the advantages and disadvantages of combining given modes of transportation air/sea/land)
01.13	Identify the various governmental regulatory agencies by their names and initials
01.14	Demonstrate the ability to read, write, and conduct a conversation using common terms of freight movement by transportation mode
02.0	Demonstrate an understanding of the transportation and logistics regulatory environment.-The student will be able to:
02.01	Demonstrate knowledge of the “alphabet soup” of regulatory agencies
02.02	Identify which agency (ies) have jurisdiction over a given transportation system
02.03	Demonstrate knowledge of DOT regulations
02.04	Identify who has regulatory authority over a given project
02.05	Identify regulatory requirements

02.06	Identify permits needed for a given project
02.07	Identify consequences of violations of regulatory requirements
02.08	Identify policy issues and political factors in a regulatory environment
02.09	Demonstrate skill in regulatory research
02.10	Demonstrate knowledge of labor laws
03.0	Identify risks and safety and security measures in transportation and logistics.-The student will be able to:
03.01	Establish an emergency management plan
03.02	Identify the need for security background check requirements
03.03	Demonstrate knowledge of OSHA and all agencies involved in the movement of goods including Customs and Border Protection, Transportation and Security Administration, U.S. Department of Agriculture
03.04	Demonstrate knowledge of the impact of technology on countering threats to transportation systems and border security
03.05	Identify differences in dealing with security threats for passenger versus freight/cargo transportation systems including the impact on supply chain logistics
03.06	Outline the primary federal, state, and local agencies in the U.S. that are affiliated with border security and transportation security
03.07	Identify the ethical parameters in which border security agencies operate
03.08	Identify the difference in safety and security threats as they relate to rail, seaport, trucking, and aviation
03.09	Identify the cost/benefit analysis of various safety and security measures
03.10	Implement a schedule
03.11	Analyze system performance
03.12	Develop process maps
03.13	Develop knowledge of process analysis
04.0	Demonstrate the ability to use technology as it relates to transportation and logistics.-The student will be able to:
04.01	Demonstrate the ability to use spreadsheet, word processing, and presentation software
04.02	Demonstrate the ability to use scheduling/planning software
04.03	Identify the electronic systems used in a modern transportation system
04.04	Utilize Internet resources
04.05	Demonstrate ability to use logistics software for bookings, shipments, consolidations, and shipment verifications
05.0	Demonstrate knowledge of documentation (domestic, international, and customs) related to transportation and logistics.-The student will be able to:
05.01	Identify basic documents used in freight forwarding and customs brokering

05.02	Prepare an airway bill
05.03	Demonstrate knowledge of letters of credit
05.04	Identify components of a bill of lading.
06.0	Demonstrate the ability to manipulate quantitative data including international weights and measures, as it relates to the movement of goods.-The student will be able to:
06.01	Convert standard weights and measures to metric and vice versa
06.02	Conduct currency exchange calculations
06.03	Demonstrate skill in practical math for transportation
06.04	Develop quantitative methods for assessing transportation loads
07.0	Demonstrate an understanding of reverse logistics.-The student will be able to:
07.01	Assess the nature and scope of reverse logistics
07.02	Explain the waste management process
08.0	Demonstrate knowledge of border security.-The student will be able to:
08.01	Identify the various agencies affiliated with border security
08.02	Construct a historical timeline reflecting significant transportation-related terrorist threats and events involving border security
08.03	Demonstrate an understanding of the social and cultural issues involved in border security
08.04	Classify the roles, functions, and interdependency between local, federal, and international law enforcement and military agencies to foster border security
09.0	Demonstrate knowledge of procurement, contracts and contract administration as it applies to transportation and logistics.-The student will be able to:
09.01	Identify the basic components of a contract
09.02	Identify the difference between “void” and “voidable” contracts
09.03	Demonstrate an understanding of the importance of being in compliance with the terms of a contract
09.04	Determine appropriate methods of procurement
09.05	Explain competitive bids, quotations, and proposals
09.06	Evaluate competitive bids to determine the best offer
09.07	Manage contracts and purchase orders from award to completion
09.08	Resolve contract and/or purchase order differences with suppliers
09.09	Explain payment problems with suppliers and user departments
09.10	Discuss the scope of compliance requirements

09.11	Conduct a negotiation
10.0	Demonstrate knowledge of geography, culture, customs, and language in international trade.-The student will be able to:
10.01	Demonstrate an understanding of world geography
10.02	Demonstrate knowledge of various cultural customs as it relates to conducting business
10.03	Abstain from the use of idioms when dealing with foreign customers and colleagues
10.04	Demonstrate knowledge of time and date differences in international trade
10.05	Identify customer service techniques that account for cultural differences when working with international clients
11.0	Demonstrate knowledge of pricing as it relates to shipping methods.-The student will be able to:
11.01	Identify the importance of time in a given shipment
11.02	Identify issues such as perishability, weight, fragility, and packing method
11.03	Identify best combination of shipping methods given knowledge of product and customer's requirements
11.04	Describe pricing strategies
12.0	Demonstrate knowledge of the air, sea, truck and rail operations for the movement of freight.-The student will be able to:
12.01	Describe the knowledge of the organizational structure for each mode of transportation relative to the movement of freight
12.02	Describe the basic function of each mode
12.03	Identify the important markets for the each mode
12.04	Identify the major companies in each mode
12.05	Compare the various key specializations within an intermodal cargo operation
13.0	Distinguish the difference between domestic and international freight movements.-The student will be able to:
13.01	Describe how legal standards vary
13.02	Describe how safety rules vary
13.03	Distinguish the cultural, political, and geographic effects on the international cargo operations
13.04	Describe the use of a foreign (free) trade zone its advantages

Additional Information

Laboratory Activities

Laboratory investigations that include scientific inquiry, research, measurement, problem solving, emerging technologies, tools and equipment, as well as, experimental, quality, and safety procedures are an integral part of this career and technical program/course. Laboratory investigations benefit all students by developing an understanding of the complexity and ambiguity of empirical work, as well as the skills required to manage, operate, calibrate and troubleshoot equipment/tools used to make observations. Students understand measurement error; and have the skills to aggregate, interpret, and present the resulting data. Equipment and supplies should be provided to enhance hands-on experiences for students.

Career and Technical Student Organization (CTSO)

SkillsUSA is the intercurricular career and technical student organization for providing leadership training and reinforcing specific career and technical skills. Career and Technical Student Organizations provide activities for students as an integral part of the instruction offered.

Accommodations

Federal and state legislation requires the provision of accommodations for students with disabilities to meet individual needs and ensure equal access. Postsecondary students with disabilities must self-identify, present documentation, request accommodations if needed, and develop a plan with their counselor and/or instructors. Accommodations received in postsecondary education may differ from those received in secondary education. Accommodations change the way the student is instructed. Students with disabilities may need accommodations in such areas as instructional methods and materials, assignments and assessments, time demands and schedules, learning environment, assistive technology and special communication systems. Documentation of the accommodations requested and provided should be maintained in a confidential file.

Florida Department of Education
Curriculum Framework

Program Title: Intermodal Freight Transportation
Career Cluster: Transportation, Distribution and Logistics

CCC	
CIP Number	0652020303
Program Type	College Credit Certificate (CCC)
Standard Length	18 credit hours
CTSO	SkillsUSA
SOC Codes (all applicable)	11-3071 – Transportation, Storage and Distribution Managers 13-1081 – Logisticians 43-5011 – Cargo and Freight Agents 43-5071 – Shipping, Receiving and Traffic Clerks 53-1011 – Aircraft Cargo Handling Supervisors 53-1031 – First-Line Supervisors of Transportation and Material Moving Machine and Vehicle Operators

Purpose

This certificate program is part of the Transportation and Logistics AS degree program 1652020301

A College Credit Certificate consists of a program of instruction of less than sixty (60) credits of college-level courses, which is part of an AS degree program and prepares students for entry into employment (Rule 6A-14.030, F.A.C.).

This program offers a sequence of courses that provides coherent and rigorous content aligned with challenging academic standards and relevant technical knowledge and skills needed to prepare for further education and careers in the Transportation, Distribution and Logistics career cluster, provides technical skill proficiency, and includes competency-based applied learning that contributes to the academic knowledge, higher-order reasoning and problem-solving skills, work attitudes, general employability skills, technical skills, and occupation-specific skills, and knowledge of all aspects of the Transportation, Distribution and Logistics career cluster.

The content includes but is not limited to related business, accounting, and financial practices such as standard policies and operating procedures, negotiation techniques, planning, organizing, purchasing and inventory control theory.

The purpose of this program is to prepare students for initial employment with an occupational title or to provide supplemental training for persons previously or currently employed in these occupations with cross-functional skills necessary for planning, and operations of transportation systems and the flow and distribution of goods.

Additional Information relevant to this Career and Technical Education (CTE) program is provided at the end of this document.

Standards

After successfully completing this program, the student will be able to perform the following:

- 01.0 Demonstrate an understanding of the basic concepts and terms used in transportation and logistics
- 02.0 Demonstrate an understanding of the transportation and logistics regulatory environment
- 03.0 Identify risks and safety and security measures in transportation and logistics
- 04.0 Demonstrate the ability to use technology as it relates to transportation and logistics
- 05.0 Demonstrate knowledge of contemporary issues in transportation and logistics
- 06.0 Demonstrate knowledge of documentation (domestic, international, and customs) related to transportation and logistics
- 07.0 Demonstrate an understanding of reverse logistics
- 08.0 Demonstrate knowledge of border security
- 09.0 Identify characteristics and benefits of intermodal transportation
- 10.0 Demonstrate knowledge of the air, sea, truck, and rail operations in the movement of freight
- 11.0 Describe the various control processes in freight movement
- 12.0 Demonstrate knowledge of the Port freight operations
- 13.0 Demonstrate knowledge of rail freight operations
- 14.0 Demonstrate knowledge of trucking operations
- 15.0 Demonstrate knowledge of air cargo operations

**Florida Department of Education
Student Performance Standards**

Program Title: Intermodal Freight Transportation
CIP Numbers: 0652020303
Program Length: 18 Credits
SOC Code(s): 11-3071; 13-1081; 43-5011; 43-5071; 53-1011; 53-1031

This certificate program is part of the Transportation and Logistics AS degree program (0652020301). At the completion of this program, the student will be able to:	
01.0	Demonstrate an understanding of the basic concepts and terms used in transportation and logistics.-The student will be able to:
01.01	Compare various shipping options
01.02	Analyze types of goods and products and impact on logistics
01.03	Identify the characteristics of a full-service transportation organization
01.04	Demonstrate an understanding of intermodalism
01.05	Demonstrate knowledge of mode-specific logistics
01.06	Demonstrate knowledge of Incoterms versus Uniform Commercial Code (UCC)
01.07	Demonstrate knowledge of how goods move through freight forwarder and customs broker
01.08	Demonstrate knowledge of inventory and warehousing concepts
01.09	Explain the relevance of Just-in-Time (JIT) logistics
01.10	Demonstrate knowledge of shipment process for perishables
01.11	Demonstrate knowledge of packaging and labeling requirements
01.12	Demonstrate knowledge of the advantages and disadvantages of combining given modes of transportation air/sea/land)
01.13	Identify the various governmental regulatory agencies by their names and initials
01.14	Demonstrate the ability to read, write, and conduct a conversation using common terms of freight movement by transportation mode
02.0	Demonstrate an understanding of the transportation and logistics regulatory environment.-The student will be able to:
02.01	Demonstrate knowledge of the “alphabet soup” of regulatory agencies
02.02	Identify which agency (ies) have jurisdiction over a given transportation system
02.03	Demonstrate knowledge of DOT regulations
02.04	Identify who has regulatory authority over a given project
02.05	Identify regulatory requirements

02.06	Identify permits needed for a given project
02.07	Identify consequences of violations of regulatory requirements
02.08	Identify policy issues and political factors in a regulatory environment
02.09	Demonstrate skill in regulatory research
02.10	Demonstrate knowledge of labor laws
03.0	Identify risks and safety and security measures in transportation and logistics.-The student will be able to:
03.01	Establish an emergency management plan
03.02	Identify the need for security background check requirements
03.03	Demonstrate knowledge of OSHA and all agencies involved in the movement of goods including Customs and Border Protection, Transportation and Security Administration, U.S. Department of Agriculture
03.04	Demonstrate knowledge of the impact of technology on countering threats to transportation systems and border security
03.05	Identify differences in dealing with security threats for passenger versus freight/cargo transportation systems including the impact on supply chain logistics
03.06	Outline the primary federal, state, and local agencies in the U.S. that are affiliated with border security and transportation security
03.07	Identify the ethical parameters in which border security agencies operate
03.08	Identify the difference in safety and security threats as they relate to rail, seaport, trucking, and aviation
03.09	Identify the cost/benefit analysis of various safety and security measures
03.10	Implement a schedule
03.11	Analyze system performance
03.12	Develop process maps
03.13	Develop knowledge of process analysis
04.0	Demonstrate the ability to use technology as it relates to transportation and logistics.-The student will be able to:
04.01	Demonstrate the ability to use spreadsheet, word processing, and presentation software
04.02	Demonstrate the ability to use scheduling/planning software
04.03	Identify the electronic systems used in a modern transportation system
04.04	Utilize Internet resources
04.05	Demonstrate ability to use logistics software for bookings, shipments, consolidations, and shipment verifications
05.0	Demonstrate knowledge of contemporary issues in transportation and logistics.-The student will be able to:
05.01	Identify the factors that influence changes in costs among the various modes of transportation
05.02	Demonstrate an understanding of current trends in containerized shipping

05.03	Identify current security issues among the various modes of transportation
05.04	Demonstrate knowledge of the effect of current technology on intermodal transportation systems
05.05	Describe the pros and cons of free trade agreements
05.06	Describe “push” versus “pull” logistics
05.07	Demonstrate knowledge of current trends in currency exchange rates
05.08	Demonstrate knowledge of advantages and disadvantages of logistics centers, intermodal container transfer facilities and intermodal rail yards
06.0	Demonstrate knowledge of documentation (domestic, international, and customs) related to transportation and logistics.-The student will be able to:
06.01	Identify basic documents used in freight forwarding and customs brokering
06.02	Prepare an airway bill
06.03	Demonstrate knowledge of letters of credit
06.04	Identify components of a bill of lading.
07.0	Demonstrate an understanding of reverse logistics.-The student will be able to:
07.01	Assess the nature and scope of reverse logistics
07.02	Explain the waste management process
08.0	Demonstrate knowledge of border security.-The student will be able to:
08.01	Identify the various agencies affiliated with border security
08.02	Construct a historical timeline reflecting significant transportation-related terrorist threats and events involving border security
08.03	Demonstrate an understanding of the social and cultural issues involved in border security
08.04	Classify the roles, functions, and interdependency between local, federal, and international law enforcement and military agencies to foster border security
09.0	Identify characteristics and benefits of intermodal transportation.-The student will be able to:
09.01	Compare various shipping options
09.02	Analyze types of goods and products and impact on logistics
09.03	Identify the characteristics of a full-service transportation organization
09.04	Demonstrate knowledge of mode-specific logistics
09.05	Demonstrate knowledge of contemporary issues in intermodal transportation
09.06	Demonstrate knowledge of Incoterms versus Uniform Commercial Codes (UCC)
09.07	Demonstrate knowledge of how goods move through freight forwarder and customs broker

09.08	Demonstrate knowledge of warehousing
09.09	Demonstrate knowledge of packaging and labeling requirements
09.10	Demonstrate knowledge of the advantages and disadvantages of combining given modes of transportation (air/sea/truck/rail)
10.0	Demonstrate knowledge of the air, sea, truck and rail operations for the movement of freight.-The student will be able to:
10.01	Describe the knowledge of the organizational structure for each mode of transportation relative to the movement of freight
10.02	Describe the basic function of each mode
10.03	Identify the important markets for the each mode
10.04	Identify the major companies in each mode
10.05	Compare the various key specializations within an intermodal cargo operation
11.0	Describe the various control processes in freight movement.-The student will be able to:
11.01	Demonstrate knowledge of budgeting and auditing
11.02	Demonstrate knowledge of quality measurements such as on-time performance
11.03	Demonstrate knowledge of customer complaints and quality issues
12.0	Demonstrate knowledge of the Port freight operations.-The student will be able to:
12.01	Describe the different types of Ports including seaports, waterway ports and inland ports
12.02	Identify the types of water-borne and inland freight and the types of cargo documentation required
12.03	Describe Port facilities for processing domestic and international cargo
12.04	Describe the types and functions of intermodal facilities at a Port
12.05	Describe the typical organizational structure of a Port and its operations
12.06	Define the role and impact of government and other regulatory agencies in this industry
12.07	Define various terms and abbreviations used in Port freight operations
12.08	Identify the types of hazardous materials moved through Ports and the rules governing this type of shipment
12.09	Describe process for movement of perishable goods
13.0	Demonstrate knowledge of rail freight operations.-The student will be able to:
13.01	Demonstrate knowledge of scheduling shipments and documentation procedures required
13.02	Identify the railroad companies serving the state and what areas their lines serve
13.03	Describe the function of intermodal rail yards, on-Port rail facilities, and intermodal container facilities
13.04	Identify the types of cargo moved by rail and the types of documentation required
13.05	Identify the types of hazardous materials moved by rail and the rules governing this type of shipment

13.06	Describe the role of rail at logistics centers
13.07	Describe the typical organizations structure of a railroad company and its operations
13.08	Describe the role and impact of government and other regulatory agencies in the rail industry
13.09	Define various terms and abbreviations used in the rail industry
13.10	Describe process for movement of perishable goods
14.0	Demonstrate knowledge of trucking operations.-The student will be able to:
14.01	Identify the advantages and disadvantages of trucking company versus owner-operator
14.02	Demonstrate knowledge of processing truck shipments and the driver scheduling issues
14.03	Identify the types of carriers and equipment
14.04	Demonstrate knowledge of weight and load distribution.
14.05	Identify the types of cargo moved by truck and the types of cargo documentation required
14.06	Describe the role of trucking at logistics centers
14.07	Identify the types of hazardous materials moved by truck and the rules governing this type of shipment
14.08	Demonstrate knowledge of intrastate, interstate and international trucking operations
14.09	Define the role and impact of government and other regulatory agencies in the trucking industry
14.10	Define various terms and abbreviations used in the trucking industry
14.11	Describe process for movement of perishable goods
15.0	Demonstrate knowledge of air cargo operations.-The student will be able to:
15.01	Demonstrate knowledge of intrastate, interstate and international air cargo operations
15.02	Describe the air industry as it is found today: the different types of cargo, the different types of carriers, the major players, upstarts, and the future of the industry
15.03	Identify sales and marketing ideals used in the industry, the various rates, and the various tariffs in the air cargo industry
15.04	Differentiate the various types of terminal facilities and equipment, including aircraft, used by the air cargo companies to run an operation
15.05	Define the role and impact of the government and other regulatory agencies in the air cargo industry
15.06	Define various terms and abbreviations used in the air cargo industry
15.07	Categorize the various types of cargo and its major classifications
15.08	Identify the types of hazardous materials moved by air and the regulations governing this type shipment
15.09	Describe the process for movement of perishable goods

Additional Information

Laboratory Activities

Laboratory investigations that include scientific inquiry, research, measurement, problem solving, emerging technologies, tools and equipment, as well as, experimental, quality, and safety procedures are an integral part of this career and technical program/course. Laboratory investigations benefit all students by developing an understanding of the complexity and ambiguity of empirical work, as well as the skills required to manage, operate, calibrate and troubleshoot equipment/tools used to make observations. Students understand measurement error; and have the skills to aggregate, interpret, and present the resulting data. Equipment and supplies should be provided to enhance hands-on experiences for students.

Career and Technical Student Organization (CTSO)

SkillsUSA is the intercurricular career and technical student organization for providing leadership training and reinforcing specific career and technical skills. Career and Technical Student Organizations provide activities for students as an integral part of the instruction offered.

Accommodations

Federal and state legislation requires the provision of accommodations for students with disabilities to meet individual needs and ensure equal access. Postsecondary students with disabilities must self-identify, present documentation, request accommodations if needed, and develop a plan with their counselor and/or instructors. Accommodations received in postsecondary education may differ from those received in secondary education. Accommodations change the way the student is instructed. Students with disabilities may need accommodations in such areas as instructional methods and materials, assignments and assessments, time demands and schedules, learning environment, assistive technology and special communication systems. Documentation of the accommodations requested and provided should be maintained in a confidential file.

**Florida Department of Education
Curriculum Framework**

Program Title: Logistics and Transportation Specialist
Career Cluster: Transportation, Distribution and Logistics

CCC	
CIP Number	0652020901
Program Type	College Credit Certificate (CCC)
Standard Length	18 credit hours
CTSO	SkillsUSA
SOC Codes (all applicable)	11-3071 – Transportation, Storage, and Distribution Managers

Purpose

This certificate program is part of the Supply Chain Management AS degree program (1652020900) and the Supply Chain Management AS degree program (1652020901).

A College Credit Certificate consists of a program of instruction of less than sixty (60) credits of college-level courses, which is part of an AS or AAS degree program and prepares students for entry into employment (Rule 6A-14.030, F.A.C.).

The purpose of this program is to prepare students for further education and employment in the Transportation, Distribution and Logistics career cluster. The program is designed to develop the student’s general employability by improving their work attitudes, communication, critical thinking, technical skills, problem-solving skills and occupation-specific skills relative to supply chain management.

The program content is broad-based to reflect the cross-functional relationships prevalent in supply chain management. Students are exposed to related business practices such as standard operating procedures, negotiation techniques, planning, organizing, and accounting concepts, purchasing, sustainability, warehousing, project management, quality control, import/export, and asset management theory. Emphasis is placed on understanding the planning, acquisition, flow, and distribution of goods and services while managing the complexity of operational linkages in a fast-paced global supply chain. Learning is promoted via team work, case studies, practitioner guest lectures, and visits to work sites.

This program prepares students for employment in roles such as: Integrated Logistics Planner, Purchasing Analyst, Cargo Scheduler, International Logistics Clerk, Quality Associate, Inventory Control Manager, Logistics Analyst, Junior Buyer, Customer Service Associate, Materials Analyst, Material Manager, Supply Manager, Dispatcher, Supply Technician, Operations Supervisor, Order Fulfillment Associate, Transportation Coordinator, Distribution Planning Analyst, Packing Supervisor, Transportation Clerk, Cargo Sales, Receiving/Shipping Supervisor, Transportation Specialist, Procurement Clerk, Product Tracing and Tracking Clerk, Warehouse Shift Supervisor, Import/Export Clerk, and Purchasing Agent.

The content includes but is not limited to related business and accounting practices such as: standard policies and operating procedures, negotiation techniques, planning, organizing, logistics concepts, purchasing and inventory control theory. Emphasis is placed on the development of business and managerial skills necessary for the efficient and effective performance of all operations within a company's supply chain.

Additional Information relevant to this Career and Technical Education (CTE) program is provided at the end of this document.

Standards

After successfully completing this program, the student will be able to perform the following:

- 01.0 Demonstrate an understanding of personal development and professional networking.
- 02.0 Demonstrate an understanding of professional effectiveness.
- 03.0 Demonstrate an understanding of logistics, and supply chain management basics.
- 04.0 Demonstrate an understanding of transportation systems.
- 05.0 Demonstrate an understanding of warehousing and materials handling.
- 06.0 Demonstrate an understanding of packaging.
- 07.0 Demonstrate an understanding of inventory and supply planning.
- 08.0 Demonstrate an understanding of reverse logistics.
- 09.0 Demonstrate an understanding of procurement/contracting.
- 10.0 Demonstrate an understanding of production.
- 11.0 Demonstrate an understanding of product management.
- 12.0 Demonstrate an understanding of pricing.
- 13.0 Demonstrate an understanding of customer relationship management.
- 14.0 Demonstrate an understanding of management practices.
- 15.0 Demonstrate an understanding of supply chain risk management.
- 16.0 Demonstrate an understanding of project and quality management.
- 17.0 Demonstrate an understanding of domestic and global business law, ethics and legal issues.
- 18.0 Demonstrate an understanding of writing and presenting documentation.
- 19.0 Demonstrate an understanding of the differences between a manufacturing and a services supply chain.

**Florida Department of Education
Student Performance Standards**

Program Title: Logistics and Transportation Specialist
CIP Number: 0652020901
Program Length: 18 credit hours
SOC Code(s): 11-3071

This certificate program is part of the Supply Chain Management AS degree program (1652020900) and the Supply Chain Management AS degree program (1652020901). At the completion of this program, the student will be able to:	
01.0	Demonstrate an understanding of personal development and professional networking.-The student will be able to:
01.01	Explore career pathways in supply chain management.
01.02	Explore professional development opportunities for a supply chain management professional.
01.03	Prepare for career advancement in supply chain management.
02.0	Demonstrate an understanding of professional effectiveness.-The student will be able to:
02.01	Explain professional responsibilities in supply chain management.
02.02	Develop self-management skills.
02.03	Demonstrate appropriate work ethics as they apply to supply chain management.
02.04	Apply problem-solving techniques.
02.05	Manage stressful situations.
02.06	Build professional communication skills.
02.07	Disseminate information.
02.08	Develop and achieve goals.
02.09	Manage change.
02.10	Identify time-management skills.
03.0	Demonstrate an understanding of logistics, and supply chain management basics.-The student will be able to:
03.01	Define and characterize supply chain management and logistics.
03.02	Describe the role of other business functional areas in supply chain management.
04.0	Demonstrate an understanding of transportation systems.-The student will be able to:
04.01	Assess the importance of the transportation system.
04.02	Explain the scope of the domestic and global transportation system.

04.03	Describe various services in the transportation industry and how these services are coordinated.
04.04	Explain the infrastructure and equipment used by the various modes of transportation.
04.05	Determine the costs/benefits of company-owned versus for-hire transportation.
04.06	Explain the scope and complexities of international transportation.
04.07	Explain the general costs included in transportation rates.
04.08	Calculate and analyze rate structures and transportation possibilities using electronic spreadsheets.
04.09	Determine multimodal rates.
04.10	Explain common transportation documents.
04.11	Explain procedures to expedite deliveries and conduct follow-up procedures as needed.
05.0	Demonstrate an understanding of warehousing and materials handling.-The student will be able to:
05.01	Explain the reasons for maintaining warehousing.
05.02	Explain the functions of warehouses and distribution centers.
05.03	Compare and contrast public and private warehouses.
05.04	Explain common warehouse documents.
05.05	Describe materials handling functions.
05.06	Explain the elements that influence space layout in warehousing (e.g. productivity, damage, safety, security, etc.)
05.07	Create a cost-benefit analysis.
05.08	Explain the product characteristics that impact logistics.
05.09	Explain order fulfillment procedures.
05.10	Analyze rate structures.
06.0	Demonstrate an understanding of packaging.-The student will be able to:
06.01	Assess types of packaging including customer requirements, and industry required labels.
06.02	Explain the functions of packaging.
06.03	Explain how packaging influences other logistic activities.
07.0	Demonstrate an understanding of inventory and supply planning.-The student will be able to:
07.01	Explain the importance of inventory.
07.02	Explain how inventory is measured and managed.
07.03	Analyze just-in time (JIT) inventory process.
07.04	Understand the use and output of various resource planning systems.

07.05	Calculate, analyze, and incorporate various inventory management tools, including spreadsheets, in order to understand the impact on logistics.
08.0	Demonstrate an understanding of reverse logistics.-The student will be able to:
08.01	Assess the nature and scope of reverse logistics.
08.02	Explain the waste management process.
08.03	Explain the disposition of assets.
09.0	Demonstrate an understanding of procurement/contracting.-The student will be able to:
09.01	Develop a procurement/acquisition plan.
09.02	Analyze organizational requirements for procurement requisitions.
09.03	Determine appropriate methods of procurement.
09.04	Work collaboratively to develop and review specifications, statements of work, performance terms, and/or acceptance criteria.
09.05	Identify and select potential sources of materials or services.
09.06	Explain competitive bids, quotations, and proposals.
09.07	Prepare and solicit competitive bids, quotations, and proposals.
09.08	Evaluate competitive bids to determine the best offer.
09.09	Conduct supplier visits and/or evaluations to determine suitability when needed.
09.10	Analyze elements of contracts.
09.11	Issue contracts.
09.12	Review legal implications of contracting, including the difference between a business decision and legal case.
09.13	Manage contracts and purchase orders from award to completion.
09.14	Resolve contract and/or purchase order differences with suppliers.
09.15	Explain payment problems with suppliers and user departments.
09.16	Discuss the scope of compliance requirements.
09.17	Conduct a negotiation.
10.0	Demonstrate an understanding of production.-The student will be able to:
10.01	Explain the relationship between manufacturing, purchasing, and logistics.
10.02	Explain the concept of production.
10.03	Plan production.
10.04	Apply best practices for production operations.

10.05	Explain impact of new production technology for profitability.
10.06	Analyze job costing using appropriate application software.
11.0	Demonstrate an understanding of product management.-The student will be able to:
11.01	Describe the factors involved in product/service operations.
11.02	Plan product/service management strategies.
11.03	Explain types of products and their impact on logistics.
11.04	Explain the impact of packaging on product/service management.
11.05	Explain the impact of product promotions within supply chain and logistics.
12.0	Demonstrate an understanding of pricing.-The student will be able to:
12.01	Explain pricing fundamentals.
12.02	Evaluate pricing fundamentals.
12.03	Explain how logistics cost can influence pricing decisions.
12.04	Determine prices for products/services.
13.0	Demonstrate an understanding of customer relationship management.-The student will be able to:
13.01	Explain basic customer relationship management (CRM) concepts.
13.02	Demonstrate quality customer service focus.
13.03	Describe the concept of order cycle time.
13.04	Explain the importance of logistic performance on customer service in generating revenue and managing profit and loss.
13.05	Explain the role of technology in order processing, tracking, and customer research.
13.06	Process orders and returns.
14.0	Demonstrate an understanding of management practices.-The student will be able to:
14.01	Explain basic management concepts.
14.02	Assess and manage human resources and integrated teams at domestic and international levels.
14.03	Provide leadership to procurement, acquisition, logistic, and supply chain management employees at domestic and international levels.
14.04	Apply sound decision-making strategies.
15.0	Demonstrate an understanding of supply chain risk management.-The student will be able to:
15.01	Explain types of risk.
15.02	Explain risk management.

15.03	Analyze safety/security risks.
16.0	Demonstrate an understanding of project and quality management.-The student will be able to:
16.01	Plan and coordinate the diverse components of a project.
16.02	Assess and manage a project.
16.03	Build interpersonal skills with individuals and teams.
16.04	Explain quality assurance.
16.05	Select and employ quality methodologies and tools. (i.e., Lean, Six Sigma, TL9000/ISO9001, etc.)
16.06	Examine quality cost implications.
17.0	Demonstrate an understanding of domestic and global business law, ethics and legal issues.-The student will be able to:
17.01	Review and discuss current legal and ethical considerations as they relate to supply chain management.
17.02	Evaluate policies for managing privacy and ethical issues.
18.0	Demonstrate an understanding of writing and presenting documentation.-The student will be able to:
18.01	Assess report writing requirements.
18.02	Create, write, and present reports using APA format.
19.0	Demonstrate an understanding of the differences between a manufacturing and a services supply chain.-The student will be able to:
19.01	Describe the basic concepts of manufacturing and service operations and their role in meeting customer needs.
19.02	Define the key elements and processes in manufacturing and service operations.
19.03	Describe how to assess the performance of manufacturing and service operations.

Additional Information

Laboratory Activities

Laboratory investigations that include scientific inquiry, research, measurement, problem solving, emerging technologies, tools and equipment, as well as, experimental, quality, and safety procedures are an integral part of this career and technical program/course. Laboratory investigations benefit all students by developing an understanding of the complexity and ambiguity of empirical work, as well as the skills required to manage, operate, calibrate and troubleshoot equipment/tools used to make observations. Students understand measurement error; and have the skills to aggregate, interpret, and present the resulting data. Equipment and supplies should be provided to enhance hands-on experiences for students.

Career and Technical Student Organization (CTSO)

SkillsUSA is the intercurricular career and technical student organization for providing leadership training and reinforcing specific career and technical skills. Career and Technical Student Organizations provide activities for students as an integral part of the instruction offered.

Accommodations

Federal and state legislation requires the provision of accommodations for students with disabilities to meet individual needs and ensure equal access. Postsecondary students with disabilities must self-identify, present documentation, request accommodations if needed, and develop a plan with their counselor and/or instructors. Accommodations received in postsecondary education may differ from those received in secondary education. Accommodations change the way the student is instructed. Students with disabilities may need accommodations in such areas as instructional methods and materials, assignments and assessments, time demands and schedules, learning environment, assistive technology and special communication systems. Documentation of the accommodations requested and provided should be maintained in a confidential file.

Florida Department of Education
Curriculum Framework

Program Title: Unmanned Vehicle Systems Operations
Career Cluster: Transportation, Distribution & Logistics

AS	
CIP Number	1615080102
Program Type	College Credit
Standard Length	62 College Credits
CTSO	SkillsUSA
SOC Codes (all applicable)	17-3021 - Aerospace Engineering and Operations Technicians 17-3024 - Electro-Mechanical Technicians

Purpose

This program offers a sequence of courses that provides coherent and rigorous content aligned with challenging academic standards and relevant technical knowledge and skills needed to prepare for further education and careers in the transportation, distribution and logistics career cluster; provides technical skill proficiency, and includes competency-based applied learning that contributes to the academic knowledge, higher-order reasoning and problem-solving skills, work attitudes, general employability skills, technical skills, and occupation-specific skills, and knowledge of all aspects of the transportation, distribution and logistics career cluster.

The content includes but is not limited to communications, ethics, mathematics, science, management, psychology, unmanned systems, private pilot ground school, electronics data acquisition and control, robotics, underwater and surface unmanned systems, operation and application of unmanned systems and techniques to defeat an unmanned vehicle.

Additional Information relevant to this Career and Technical Education (CTE) program is provided at the end of this document.

Program Structure

This program is a planned sequence of instruction consisting of 62 credit hours.

Standards

After successfully completing this program, the student will be able to perform the following:

- 01.0 Demonstrate the ability to communicate effectively.
- 02.0 Demonstrate the ability to think critically and ethically.
- 03.0 Apply appropriate mathematical and computational models and methods in problem solving.
- 04.0 Demonstrate a clear and logical understanding of the fundamental physics principles, laws and applications.
- 05.0 Demonstrate a comprehensive understanding of the theory, practice, ideals and realities of government and politics in the United States.
- 06.0 Demonstrate an understanding of weather variables, atmospheric motion participation and topics in modern weather science.
- 07.0 Apply fundamentals of management to solve problems and improve the organization and operation of business enterprises.
- 08.0 Demonstrate an understanding of human behavior.
- 09.0 Demonstrate understanding of unmanned vehicle systems emphasizing the military and commercial history growth and application of UVS's.
- 10.0 Demonstrate ability to operate a UVS in normal and abnormal conditions.
- 11.0 Demonstrate aeronautical knowledge required for certification as a private pilot with Airplane Single Engine Land rating.
- 12.0 Demonstrate personal, interpersonal, intellectual and social skills necessary to succeed in a flight-related college degree program.
- 13.0 Demonstrate competency in measurement of resistance, current and voltage in any electrical circuit.
- 14.0 Analyze and report sensor information pertinent to safety of flight and mission accomplishment.
- 15.0 Demonstrate a practical understanding of remote sensing systems, their respective capabilities and their relationship to unmanned vehicle systems (UVS).
- 16.0 Demonstrate the ability to operate an unmanned vehicle through either direct visual observation or the remote use of sensors.
- 17.0 Demonstrate fundamental knowledge of VFR tower terminal operations within US air traffic control system.
- 18.0 Demonstrate ability to apply knowledge of rules and regulations governing the legal, safe and ethical use of unmanned vehicle systems.
- 19.0 Demonstrate understanding of how to defeat an unmanned vehicle.

Florida Department of Education
Student Performance Standards

Program Title: Unmanned Vehicle Systems Operation
 CIP Number: 1615080102
 Program Length: 62 college credits
 SOC Code(s): 17-3021, 17-3024

Refer to Rule 6A-14.030 (4), F.A.C., for the minimum amount of general education coursework required in the Associate of Science (AS) degree. At the completion of this program, the student will be able to:	
01.0	Demonstrate the ability to communicate effectively.-The student will be able to:
01.01	Communicate effectively and accurately in writing.
01.02	Talk with others to effectively convey information.
01.03	Listen to others taking time to understand points being made.
01.04	Understand written sentences and paragraphs in work related documents.
02.0	Demonstrate the ability to think critically and ethically.-The student will be able to:
02.01	Use logic and analysis to identify strengths and weaknesses of alternative solutions, conclusions or approaches to problems.
02.02	Weigh the relative costs and benefits of a potential action to choose the most appropriate one.
02.03	Adhere to the highest level of ethical standards in the operation of unmanned vehicle systems.
03.0	Apply appropriate mathematical and computational models and methods in problem solving.-The student will be able to:
03.01	Add, subtract, multiply and divide using fractions, decimals, whole numbers, percentages and ratios.
03.02	Demonstrate knowledge of arithmetic, algebra and geometry, calculus, statistics and their applications
04.0	Demonstrate a clear and logical understanding of the fundamental physics principles, laws and applications.-The student will be able to:
04.01	Understand the basic concepts of physics and the methods scientist use to explore natural phenomena.
04.02	Describe the fundamental laws of physics and the application of each.
04.03	Apply problem solving skills regarding physical phenomena using relevant mathematical models.
05.0	Demonstrate a comprehensive understanding of the theory, practice, ideals and realities of government and politics in the United States.- The student will be able to:
05.01	Understand the structure and development of the American system of government.
05.02	Identify the structure and roles of the institutions of government.
06.0	Demonstrate an understanding of weather variables, atmospheric motion participation and topics in modern weather science.-The student will be able to:

06.01	Describe the compositions, circulation and stability of the atmosphere.
06.02	Demonstrate an understanding of air mass development, the movement of fronts and their effect on aviation.
06.03	Demonstrate an awareness of weather hazards to aviation and an understanding of how to avoid them.
06.04	Demonstrate the ability to access weather information prior to and during flights through a variety of media.
06.05	Interpret printed reports, forecasts and graphic weather products.
07.0	Apply fundamentals of management to solve problems and improve the organization and operation of business enterprises.-The student will be able to:
07.01	Identify what management is and what it does.
07.02	Describe and illustrate basic management functions.
07.03	Understand the planning, organizing, leading and controlling functions.
07.04	Create an awareness of the use of operating plans, policies, procedures and rules.
08.0	Demonstrate an understanding of human behavior.-The student will be able to:
08.01	Understand the vocabulary and concepts of psychology.
08.02	Understand how critical thinking skills are developed.
08.03	Understand the research upon which the knowledge of human thought and behavior is based.
09.0	Demonstrate understanding of unmanned vehicle systems emphasizing the military and commercial history growth and application of UVS.-The student will be able to:
09.01	Understand the history of UVS in the military.
09.02	Understand the history of unmanned vehicle systems in the commercial sector.
09.03	Describe the pros and cons of UVS in each sector.
09.04	Explain the concerns and challenges associated with the use of UVS in both sectors.
10.0	Demonstrate ability to operate a UVS in normal and abnormal conditions.-The student will be able to:
10.01	Operate a UVS in normal conditions.
10.02	Operate a UVS in abnormal conditions.
11.0	Demonstrate aeronautical knowledge required for certification as a private pilot with Airplane Single Engine Land rating.-The student will be able to:
11.01	Demonstrate understanding of the National Airspace System.
11.02	Demonstrate an understanding of aviation charts.
11.03	Demonstrate an understanding of operational weather factors and a practical understanding of obtaining a weather briefing and making the go-no decision.

11.04	Demonstrate understanding of the factors which affect airplane performance and a working knowledge of ground reference maneuvers.
11.05	Calculate weight and balance.
11.06	Demonstrate understanding of aerodynamics.
11.07	Demonstrate the ability to make good decisions.
11.08	Describe the FAA regulations and rules which individuals, private pilots, unmanned aircraft system operators, and general aviation flight must adhere to.
11.09	Understand the factors that impact safety in flight.
11.10	Demonstrate understanding of pre-solo maneuvers.
11.11	Demonstrate knowledge of take-off, landing and enroute performance.
11.12	Understand airports and airport procedures.
11.13	Understand pre-solo requirements.
11.14	Understand the fundamentals of visual navigation.
11.15	Understand flight planning and weather in planning for solo cross-country flight.
11.16	Demonstrate practical understanding of radio navigation and enroute navigation.
12.0	Demonstrate personal, interpersonal, intellectual and social skills necessary to succeed in a flight-related college degree program.-The student will be able to:
12.01	Understand strategies for effectively managing time.
12.02	Describe effective study skills.
12.03	Explain principles of learning.
12.04	Describe the importance of clarifying goals.
12.05	Identify strategies for coping with challenges.
13.0	Demonstrate competency in measurement of resistance, current and voltage in any electrical circuit.-The student will be able to:
13.01	Perform measurements and work with electricity in a safe manner.
13.02	Understand basic concepts.
13.03	Understand electrical quantities and units.
13.04	Understand basic circuits, laws and measurements.
14.0	Analyze and report sensor information pertinent to safety of flight and mission accomplishment.-The student will be able to:
14.01	Understand and be able to process and analyze remote sensory data.

15.0	Demonstrate a practical understanding of remote sensing systems, their respective capabilities and their relationship to unmanned vehicle systems (UVS).-The student will be able to:
15.01	Understand the overall concepts of sensors and uses.
15.02	Understand the applications of remote sensory data.
16.0	Demonstrate the ability to operate an unmanned vehicle through either direct visual observation or the remote use of sensors.-The student will be able to:
16.01	Examine control and system programming in the context of specific missions.
16.02	Operate unmanned vehicle systems.
17.0	Demonstrate fundamental knowledge of VFR tower terminal operations within US air traffic control system.-The student will be able to:
17.01	Understand controller and pilot phraseology.
17.02	Understand role and responsibilities of tower terminal operations.
18.0	Demonstrate ability to apply knowledge of rules and regulations governing the legal, safe and ethical use of unmanned vehicle systems.-The student will be able to:
18.01	Understand and be able to apply local, state and federal regulations regarding the operation of UVS.
18.02	Adhere to the highest ethical standards in the operation of UVS.
19.0	Demonstrate understanding of how to defeat an unmanned vehicle system.-The student will be able to:
19.01	Understand the components of UVS systems that are vulnerable to hacking.
19.02	Understand the concepts of GPS spoofing.
19.03	Understand spoofing attacks countermeasures.
19.04	Understand GPS signal jamming.
19.05	Understand the use of cyber-attacks malware against UVS.

Additional Information

Laboratory Activities

Laboratory investigations that include scientific inquiry, research, measurement, problem solving, emerging technologies, tools and equipment, as well as, experimental, quality, and safety procedures are an integral part of this career and technical program/course. Laboratory investigations benefit all students by developing an understanding of the complexity and ambiguity of empirical work, as well as the skills required to manage, operate, calibrate and troubleshoot equipment/tools used to make observations. Students understand measurement error; and have the skills to aggregate, interpret, and present the resulting data. Equipment and supplies should be provided to enhance hands-on experiences for students.

Special Notes

In order for this A.S. degree to be offered by a Florida college the facility and devices must undergo a safety inspection according to the guidelines of a recognized and/or accredited organization with expertise in the safe operation of unmanned vehicles. All faculty/instructors must also successfully complete safety training by a recognized organization with expertise in the safe operation of unmanned vehicles.

Schools offering this A.S. degree must ensure full compliance with Federal Aviation Administration (FAA) Federal Aviation Regulations (FAR) Part 107 in order to operate unmanned aerial systems.

Career and Technical Student Organization (CTSO)

SkillsUSA is the intercurricular career and technical student organization for providing leadership training and reinforcing specific career and technical skills. Career and Technical Student Organizations provide activities for students as an integral part of the instruction offered.

Accommodations

Federal and state legislation requires the provision of accommodations for students with disabilities to meet individual needs and ensure equal access. Postsecondary students with disabilities must self-identify, present documentation, request accommodations if needed, and develop a plan with their counselor and/or instructors. Accommodations received in postsecondary education may differ from those received in secondary education. Accommodations change the way the student is instructed. Students with disabilities may need accommodations in such areas as instructional methods and materials, assignments and assessments, time demands and schedules, learning environment, assistive technology and special communication systems. Documentation of the accommodations requested and provided should be maintained in a confidential file.

Florida Department of Education
Curriculum Framework

Program Title: Aviation Maintenance Administration
Career Cluster: Transportation, Distribution and Logistics

AS

CIP Number	1647060700
Program Type	College Credit
Standard Length	60 credit hours
CTSO	SkillsUSA
SOC Codes (all applicable)	49-3011 – Aircraft Mechanics and Service Technicians

Purpose

This program offers a sequence of courses that provides coherent and rigorous content aligned with challenging academic standards and relevant technical knowledge and skills needed to prepare for further education and careers in the Transportation, Distribution and Logistics career cluster; provides technical skill proficiency, and includes competency-based applied learning that contributes to the academic knowledge, higher-order reasoning and problem-solving skills, work attitudes, general employability skills, technical skills, and occupation-specific skills, and knowledge of all aspects of the Transportation, Distribution and Logistics career cluster.

The purpose of this program is to prepare students who are seeking employment as a supervisor or frontline manager in the aviation maintenance industry. Some students will be able to obtain opportunities in maintenance and repair facilities, corporate or airline maintenance operations, and similar fields.

The content includes but is not limited to, communications skills; leadership skills; directing, planning, and controlling job tasks; human relations and employability skills; safe and efficient work practices. Students will be provided with information on how to obtain Federal Aviation Administration (FAA) certification as and Aviation Maintenance Technician (AMT).

Additional Information relevant to this Career and Technical Education (CTE) program is provided at the end of this document.

Program Structure

This program is a planned sequence of instruction consisting of 60 credit hours.

Standards

After successfully completing this program, the student will be able to perform the following:

- 01.0 Demonstrate an understanding of basic aviation terminology and history.
- 02.0 Demonstrate an understanding of aviation operations practices, limitations and procedures.
- 03.0 Demonstrate an understanding of federal, state and other governmental laws, rules and policies as they relate to aviation.
- 04.0 Demonstrate an understanding of fundamentals of flight.
- 05.0 Demonstrate understanding of meteorology.
- 06.0 Demonstrate an understanding of aviation safety and human factors, including accident prevention.
- 07.0 Demonstrate the human relations skills necessary for success in supervision.
- 08.0 Demonstrate a practical approach to job management.
- 09.0 Demonstrate effective communication skills.
- 10.0 Demonstrate employability skills.

**Florida Department of Education
Student Performance Standards**

Program Title: Aviation Maintenance Administration
CIP Numbers: 1647060700
Program Length: 60 credit hours
SOC Code(s): 49-3011

Refer to Rule 6A-14.030 (4), F.A.C., for the minimum amount of general education coursework required in the Associate of Science (AS) degree. At the completion of this program, the student will be able to:	
01.0	Demonstrate an understanding of basic aviation terminology and history.-The student will be able to:
01.01	Explain the overall scope and breadth of the aviation industry including its impact on the economy.
01.02	Distinguish the terms and vocabularies that are used in the aerospace and commercial aviation industry.
01.03	Describe the history of technological, governmental, social and economic developments of aviation.
01.04	Explain the different types and categories of aircraft in use in the industry by distinguishing and identifying: Various wide body, narrow body types and general aviation aircraft.
01.05	Demonstrate an understanding of the oversight role of the Federal Government and its effect on the aviation industry.
02.0	Demonstrate an understanding of aviation operations practices, limitations and procedures.-The student will be able to:
02.01	Demonstrate knowledge of aircraft systems as they apply to flight operations, including engines, fuel, electrical, hydraulics, pneumatics, flight controls and avionics.
02.02	Understand the various factors of aircraft performance, including takeoff, enroute and landing limitations and weight and balance.
02.03	Demonstrate knowledge of the function of flight operations, including pilot hiring, training, standards, safety issues, security issues, FAA and TSA regulations, documentation requirements, operations specifications, operating within the ATC system, and crew scheduling as well as flight attendant and aircraft dispatcher requirements.
02.04	Describe maintenance operations and their role and effect on flight operations.
02.05	Demonstrate an understanding of the role of the flight operations professional in aviation economic and planning functions.
02.06	Explain FAA requirements such as flight standards, types of certificates, training and record keeping, surveillance, and investigations, as well as the operator's response and its relationship with the FAA.
02.07	Describe the role of the National Transportation Safety Board in accident investigation, NASA's role in aviation safety reporting systems and research, and industry-specific safety reporting programs.
02.08	Demonstrate knowledge of the application of information technology systems in flight operations as they relate to flight planning systems, flight management systems, satellite communication and navigation systems, weight and balance, maintenance monitoring, and management information systems.
03.0	Demonstrate an understanding of federal, state and other governmental laws, rules and policies as they relate to aviation.-The student will be able to:
03.01	Demonstrate knowledge of the history and foundations of the legal and court system in the United States as it pertains to development of aviation law and regulations.

03.02	Describe the state and federal system of trial, appellate and supreme courts as well as subject matter jurisdiction.
03.03	Explain the role and function of the U.S. DOT, FAA, TSA, and the NTSB as it relates to their legal responsibilities and authority.
03.04	Demonstrate knowledge of airmen rights and responsibilities, negligence, FAA enforcement, immunity, and degrees of care.
03.05	Explain state aviation law relating to airports, fixed based operators, aircraft sales, registration, and taxation issues.
03.06	Demonstrate knowledge of the legal matters relating to the aircraft manufacturing and airline industry, including warranties, products liability, negligence, accident litigation, labor, and consumer issues.
03.07	Demonstrate knowledge of international air law, bilateral and multilateral agreements, ICAO, IATA, international jurisdiction, and limits of liability and damages.
03.08	Demonstrate knowledge of legal issues that relate to aviation security.
04.0	Demonstrate an understanding of fundamentals of flight.-The student will be able to:
04.01	Name and compare the four forces of flight.
04.02	Describe an airfoil.
04.03	Explain how lift is produced.
04.04	Discuss how and why an airplane stalls and spins.
04.05	Describe and explain how pitot/static vacuum, pressure and engine instruments work.
04.06	Explain factors affecting aircraft design, performance, and operation.
05.0	Demonstrate understanding of meteorology.-The student will be able to:
05.01	Describe the composition, circulation and stability of the atmosphere.
05.02	Demonstrate an understanding of air mass development, the movement of fronts and their effect on aviation.
05.03	Demonstrate an awareness of weather hazards to aviation and an understanding of how to avoid them.
05.04	Demonstrate the ability to access weather information prior to and during flights through a variety of media.
05.05	Interpret printed reports, forecasts and graphic weather products.
06.0	Demonstrate an understanding of aviation safety and human factors, including accident prevention.-The student will be able to:
06.01	Describe the nature of human factors and sources of errors.
06.02	Discuss the issues of fatigue, body rhythms and sleep.
06.03	Describe the effects of fitness and health on human performance.
06.04	Discuss how motivation and leadership affects safety in aviation.
06.05	Discuss the role of training devices and education in reducing errors and increasing safety.
06.06	Describe how the physical layout of displays and controls and space relate to human factors errors.
06.07	Explain how documentation problems such as manuals and checklists, maps and charts can cause safety issues.

06.08	Describe how an aviation safety program is designed to create an environment of safety awareness and accident prevention.
06.09	Discuss the importance of effective Single-Pilot and Crew Resource Management skills, as well as Dispatcher Resource Management skills.
07.0	Demonstrate the human relations skills necessary for success in supervision.-The student will be able to:
07.01	Develop and demonstrate the unique human relations skills needed for successful job attainment and progress in supervising others.
07.02	Identify the legal and social environment for supervision.
07.03	Discuss pertinent legislation and the role of government intervention.
07.04	Compare and contrast union and non-union organizations.
08.0	Demonstrate a practical approach to job management.-The student will be able to:
08.01	Identify techniques and strategies in planning and coordinating resources.
08.02	Demonstrate effective decision making and problem-solving techniques.
08.03	Compare and contrast methods of work improvement, including quality assurance techniques.
09.0	Demonstrate effective communication skills.-The student will be able to:
09.01	Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
09.02	Read and understand graphs, charts, diagrams and tables commonly used in this industry/occupational area.
09.03	Read and follow written and oral English instructions.
09.04	Answer and ask questions coherently and concisely.
09.05	Read critically by recognizing assumptions and implications and by evaluating ideas.
09.06	Demonstrate appropriate telephone/communication skills.
09.07	Demonstrate knowledge and use of appropriate computer skills.
09.08	Demonstrate effective interpersonal skills.
10.0	Demonstrate employability skills.-The student will be able to:
10.01	Describe positions available and requirements for careers in aviation administration.
10.02	Describe qualification and certification requirements for careers in aviation administration.
10.03	Describe the process of obtaining the FAA Aviation Maintenance Technician - Airframe Certificate
10.04	Describe the process of obtaining the FAA Aviation Maintenance Technician - Powerplant Certificate

Additional Information

Laboratory Activities

Laboratory investigations that include scientific inquiry, research, measurement, problem solving, emerging technologies, tools and equipment, as well as, experimental, quality, and safety procedures are an integral part of this career and technical program/course. Laboratory investigations benefit all students by developing an understanding of the complexity and ambiguity of empirical work, as well as the skills required to manage, operate, calibrate and troubleshoot equipment/tools used to make observations. Students understand measurement error; and have the skills to aggregate, interpret, and present the resulting data. Equipment and supplies should be provided to enhance hands-on experiences for students.

Career and Technical Student Organization (CTSO)

SkillsUSA is the intercurricular career and technical student organization for providing leadership training and reinforcing specific career and technical skills. Career and Technical Student Organizations provide activities for students as an integral part of the instruction offered.

Accommodations

Federal and state legislation requires the provision of accommodations for students with disabilities to meet individual needs and ensure equal access. Postsecondary students with disabilities must self-identify, present documentation, request accommodations if needed, and develop a plan with their counselor and/or instructors. Accommodations received in postsecondary education may differ from those received in secondary education. Accommodations change the way the student is instructed. Students with disabilities may need accommodations in such areas as instructional methods and materials, assignments and assessments, time demands and schedules, learning environment, assistive technology and special communication systems. Documentation of the accommodations requested and provided should be maintained in a confidential file.

**Florida Department of Education
Curriculum Framework**

Program Title: Professional Pilot Technology
Career Cluster: Transportation, Distribution and Logistics

AS	
CIP Number	1649010200
Program Type	College Credit
Standard Length	64 credit hours
CTSO	SkillsUSA
SOC Codes (all applicable)	53-2011 – Airline Pilots, Copilots, and Flight Engineers 53-2012 – Commercial Pilots

Purpose

This program offers a sequence of courses that provides coherent and rigorous content aligned with challenging academic standards and relevant technical knowledge and skills needed to prepare for further education and careers in the Transportation, Distribution and Logistics career cluster; provides technical skill proficiency, and includes competency-based applied learning that contributes to the academic knowledge, higher-order reasoning and problem-solving skills, work attitudes, general employability skills, technical skills, and occupation-specific skills, and knowledge of all aspects of the Transportation, Distribution and Logistics career cluster.

The purpose of this program is to prepare students for initial employment with occupational titles as aircraft pilot, airplane pilot, commercial (SOC 53-2012), or to provide supplemental training for persons previously or currently employed in these occupations.

The content includes but is not limited to, communications skills, leadership skills, human relations and employability skills, safe and efficient work practices, Federal Aviation Administration (FAA) pilot certification procedures, aircraft systems and components, flight safety, physics and aerodynamics, and instrumentation.

Additional Information relevant to this Career and Technical Education (CTE) program is provided at the end of this document.

Program Structure

This program is a planned sequence of instruction consisting of 64 credit hours.

Standards

After successfully completing this program, the student will be able to perform the following:

- 01.0 Demonstrate an understanding of safe and effective work practices.
- 02.0 Demonstrate an understanding of fundamentals of flight.
- 03.0 Understand and explain pertinent Federal Aviation Administration Regulations.
- 04.0 Demonstrate understanding of meteorology.
- 05.0 Demonstrate knowledge of aircraft communications equipment.
- 06.0 Demonstrate knowledge and an understanding of aircraft propulsion, and associated systems.
- 07.0 Demonstrate an understanding of navigation systems and procedures.
- 08.0 Demonstrate flight planning skills.
- 09.0 Demonstrate effective communication skills.
- 10.0 Demonstrate analytical skills.
- 11.0 Demonstrate understanding of applied sciences.
- 12.0 Demonstrate employability skills.
- 13.0 Demonstrate aircraft operations.

**Florida Department of Education
Student Performance Standards**

Program Title: Professional Pilot Technology
CIP Numbers: 1649010200
Program Length: 64 credit hours
SOC Code(s): 53-2011, 53-2012

Refer to Rule 6A-14.030 (4), F.A.C., for the minimum amount of general education coursework required in the Associate of Science (AS) degree. At the completion of this program, the student will be able to:	
01.0	Demonstrate an understanding of safe and effective work practices.-The student will be able to:
01.01	Demonstrate an awareness and understanding of health and safety hazards, prevention and correction of environmental problems and know the solutions unique to the industry.
01.02	Demonstrate an awareness and understanding of fueling operations.
01.03	Demonstrate an understanding of situational awareness related to operational hazards.
01.04	Demonstrate an awareness of fire hazards, and awareness of proper techniques to control and extinguish fires.
01.05	Demonstrate an awareness and understanding for the need of safety devices, controls, guards and equipment.
02.0	Demonstrate an understanding of fundamentals of flight.-The student will be able to:
02.01	Name and compare the four forces of flight.
02.02	Describe an airfoil.
02.03	Explain how lift is produced.
02.04	Discuss how and why an airplane stalls and spins.
02.05	Describe and explain how pitot/static, vacuum, pressure, and engine instruments work.
02.06	Explain factors affecting aircraft design, performance, and operation.
02.07	Describe and explain how advanced avionics systems work.
03.0	Understand and explain Federal Aviation Administration Regulations.-The student will be able to:
03.01	Explain relevant portions of Parts 1, 61, 91, 110, 119, 121, 135, 141 and NTSB 830 of the Federal Aviation Regulations.
04.0	Demonstrate understanding of meteorology.-The student will be able to:
04.01	Describe the composition, circulation and stability of the atmosphere.
04.02	Demonstrate an understanding of air mass development, the movement of fronts and their effect on aviation.
04.03	Demonstrate an awareness of weather hazards to aviation and an understanding of how to avoid them.
04.04	Demonstrate the ability to access weather information prior to and during flights through a variety of media.

04.05	Interpret printed reports, forecasts and graphic weather products.
05.0	Demonstrate knowledge of aircraft communication equipment.-The student will be able to:
05.01	Use and explain aircraft voice communication equipment.
05.02	Explain function and use of ELT's, voice recorders, and other emergency communication systems.
05.03	Demonstrate use of proper phraseology in ATC communications.
05.04	Discuss uses and limitations of portable transceivers.
05.05	Demonstrate use of phonetic alphabet.
06.0	Demonstrate knowledge and understanding of aircraft propulsion and associated systems.-The student will be able to:
06.01	Describe and identify reciprocating and turbine engine components.
06.02	Describe a typical engine lubrication system.
06.03	Describe a typical magneto ignition system, including proper magneto checks.
06.04	Describe the difference between a normally aspirated engine and one that is supercharged or turbocharged.
06.05	Demonstrate basic operation of an aircraft engine, including proper interpretation of instruments and use of appropriate engine controls.
07.0	Demonstrate an understanding of navigation systems and procedures.-The student will be able to:
07.01	Define radio navigation using both conventional and advanced avionics.
07.02	Explain the magnetic compass.
07.03	Describe and demonstrate use of VOR equipment and navigation.
07.04	Describe and demonstrate use of GPS equipment and navigation.
07.05	Explain DME, GPS, and RNAV principles.
07.06	Demonstrate the use of a flight computer.
07.07	Interpret sectional charts.
07.08	Interpret en route and terminal charts and approach plates.
07.09	Explain lost communications emergency procedures under VFR and IFR.
07.10	Read and interpret aircraft performance charts.
07.11	Plot and explain a cross-country course.
07.12	Describe the FAA national airspace system.
07.13	Define DP's and STAR's.
07.14	Read and interpret instrument approach charts and procedures.

08.0	Demonstrate flight planning skills.-The student will be able to:
08.01	Explain relevant portions of Parts 1, 91, 110, 121, 135, and NTSB 830 of the Federal Aviation Regulations.
08.02	Define weight and balance.
08.03	Define center of gravity, moment, datum line, CG envelope, basic empty weight, and gross weight.
08.04	Calculate, compute, and solve given weight and balance problems.
08.05	Determine route of flight.
08.06	Demonstrate acquisition of appropriate weather data.
08.07	Demonstrate proper selection of destination/enroute/alternate airports.
08.08	Explain fuel requirements.
08.09	Calculate aircraft performance.
08.10	Access and analyze NOTAMS.
08.11	Acquire, define, and validate a mission profile.
08.12	Demonstrate the creation of, and explain the effective use of a navigation log.
08.13	Demonstrate methods in VFR/IFR flight planning and demonstrate the ability to make a valid go / no-go decision.
09.0	Demonstrate effective communication skills.-The student will be able to:
09.01	Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
09.02	Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
09.03	Read and follow written and oral English instructions.
09.04	Answer and ask questions coherently and concisely.
09.05	Read critically by recognizing assumptions and implications and by evaluating ideas.
09.06	Demonstrate telephone/communication skills.
09.07	Demonstrate knowledge and use of appropriate computer skills.
09.08	Demonstrate effective interpersonal skills.
10.0	Demonstrate analytical skills.-The student will be able to:
10.01	Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
10.02	Add, subtract, multiply and divide using fractions, decimals, whole numbers, percentages, and ratios.
10.03	Demonstrate understanding and use of the metric system.
11.0	Demonstrate understanding of applied sciences.-The student will be able to:

11.01	Draw conclusions or make inferences from data.
11.02	Understand pressure measurement in terms of P.S.I., inches of mercury, and metric.
12.0	Demonstrate employability skills.-The student will be able to:
12.01	Explain the process for obtaining an FAA commercial pilot certification, single or multi-engine instrument rating.
13.0	Demonstrate aircraft operations.-The student will be able to:
13.01	Demonstrate the operation of aircraft in accordance with FARs, AFMs, and approved procedures and policies.
13.02	Identify specific aircraft handling characteristics.
13.03	Explain and demonstrate effective Single-Pilot and Crew Resource Management skills.
13.04	Demonstrate proper passenger briefing procedures.
13.05	Demonstrate completion of post-flight documentation.
13.06	Demonstrate situational awareness.
13.07	Demonstrate effective decision-making skills.

Additional Information

Laboratory Activities

Laboratory investigations that include scientific inquiry, research, measurement, problem solving, emerging technologies, tools and equipment, as well as, experimental, quality, and safety procedures are an integral part of this career and technical program/course. Laboratory investigations benefit all students by developing an understanding of the complexity and ambiguity of empirical work, as well as the skills required to manage, operate, calibrate and troubleshoot equipment/tools used to make observations. Students understand measurement error; and have the skills to aggregate, interpret, and present the resulting data. Equipment and supplies should be provided to enhance hands-on experiences for students.

Special Notes

Prior to beginning flight training, students will be required to obtain an FAA medical certificate and comply with the TSA requirements. Community/State Colleges initiating this program are strongly encouraged to visit existing Florida Community/State Colleges with active programs.

Career and Technical Student Organization (CTSO)

SkillsUSA is the intercultural career and technical student organization for providing leadership training and reinforcing specific career and technical skills. Career and Technical Student Organizations provide activities for students as an integral part of the instruction offered.

Accommodations

Federal and state legislation requires the provision of accommodations for students with disabilities to meet individual needs and ensure equal access. Postsecondary students with disabilities must self-identify, present documentation, request accommodations if needed, and develop a plan with their counselor and/or instructors. Accommodations received in postsecondary education may differ from those received in secondary education. Accommodations change the way the student is instructed. Students with disabilities may need accommodations in such areas as instructional methods and materials, assignments and assessments, time demands and schedules, learning environment, assistive technology and special communication systems. Documentation of the accommodations requested and provided should be maintained in a confidential file.

Certificate Programs

A College Credit Certificate consists of a program of instruction of less than sixty (60) credits of college-level courses, which is part of an AS or AAS degree program and prepares students for entry into employment (Rule 6A-14.030, F.A.C.). This AS degree program includes the following College Credit Certificates:

Commercial Pilot (0649010202) - 24 credit hours

Standards for the above certificate programs are contained in separate curriculum frameworks.

Florida Department of Education
Curriculum Framework

Program Title: Aviation Maintenance Management
Career Cluster: Transportation, Distribution and Logistics

AS	
CIP Number	1649010401
Program Type	College Credit
Standard Length	83 credit hours
CTSO	SkillsUSA
SOC Codes (all applicable)	49-3011 – Aircraft Mechanics and Service Technicians

Purpose

This program offers a sequence of courses that provides coherent and rigorous content aligned with challenging academic standards and relevant technical knowledge and skills needed to prepare for further education and careers in the Transportation, Distribution and Logistics career cluster; provides technical skill proficiency, and includes competency-based applied learning that contributes to the academic knowledge, higher-order reasoning and problem-solving skills, work attitudes, general employability skills, technical skills, and occupation-specific skills, and knowledge of all aspects of the Transportation, Distribution and Logistics career cluster.

The content includes but is not limited to the Federal Aviation Regulations (FAR) Part 65 pertaining to eligibility for a mechanic certificate and rating(s). Instruction is designed to qualify students for Federal Aviation Administration (FAA) examinations for aviation maintenance powerplant and airframe technician certification as prescribed by FAR 147. The program content should also include training in communication, management leadership, human relations, supervisory and employability skills; and safe, efficient work practices.

Additional Information relevant to this Career and Technical Education (CTE) program is provided at the end of this document.

Program Structure

This program is a planned sequence of instruction consisting of 83 credit hours.

Standards

After successfully completing this program, the student will be able to perform the following:

- 01.0 Perform basic electricity skills.
- 02.0 Perform basic aircraft drawing skills.
- 03.0 Demonstrate aircraft weight and balance skills.
- 04.0 Maintain aircraft fluid lines and fittings.
- 05.0 Perform aircraft materials and process skills.
- 06.0 Perform ground operations and servicing duties.
- 07.0 Perform cleaning and corrosion control operations.
- 08.0 Demonstrate mathematics skills.
- 09.0 Maintain forms and records.
- 10.0 Apply principles of basic physics.
- 11.0 Demonstrate the use of maintenance publications.
- 12.0 Interpret mechanic privileges.
- 13.0 Perform basic reciprocating engine skills.
- 14.0 Perform basic turbine engine skills.
- 15.0 Perform engine inspection.
- 16.0 Maintain engine instrument systems.
- 17.0 Maintain engine fire protection systems.
- 18.0 Maintain engine electrical systems.
- 19.0 Maintain lubrication systems.
- 20.0 Maintain ignition systems.
- 21.0 Maintain fuel metering systems.
- 22.0 Maintain engine fuel systems.
- 23.0 Maintain induction and engine airflow systems.
- 24.0 Maintain engine cooling systems.
- 25.0 Maintain engine exhaust systems.
- 26.0 Maintain aircraft propellers.
- 27.0 Maintain unducted fans.
- 28.0 Maintain auxiliary power units
- 29.0 Maintain wood structures.
- 30.0 Perform aircraft covering.
- 31.0 Apply aircraft finishes.
- 32.0 Repair sheetmetal structures.
- 33.0 Perform aircraft welding.
- 34.0 Perform airframe assembly and rigging.
- 35.0 Perform airframe inspection.
- 36.0 Maintain aircraft landing gear systems.
- 37.0 Maintain hydraulic and pneumatic power systems.
- 38.0 Maintain cabin atmosphere control systems.

- 39.0 Maintain aircraft instrument systems.
- 40.0 Maintain communication and navigation systems.
- 41.0 Inspect and repair aircraft fuel systems.
- 42.0 Inspect or repair aircraft electrical systems.
- 43.0 Inspect and repair position and warning systems.
- 44.0 Maintain ice and rain control systems.
- 45.0 Inspect and repair aircraft fire protection systems.
- 46.0 Demonstrate knowledge of FAA aircraft mechanic licensing requirements.
- 47.0 Demonstrate the human relations skills necessary for success in supervision.
- 48.0 Demonstrate knowledge of skills and attitudes the supervisor needs for effective performance.
- 49.0 Demonstrate a practical approach to job management.
- 50.0 Demonstrate appropriate communication skills.
- 51.0 Demonstrate employability skills.
- 52.0 Demonstrate an understanding of computer skills.

Florida Department of Education
Student Performance Standards

Program Title: Aviation Maintenance Management
 CIP Numbers: 1649010401
 Program Length: 83 credit hours
 SOC Code(s): 49-3011

Refer to Rule 6A-14.030 (4), F.A.C., for the minimum amount of general education coursework required in the Associate of Science (AS) degree. At the completion of this program, the student will be able to:	FAA FAR Part 147
01.0 Perform basic electricity skills.-The student will be able to:	
01.01 Calculate and measure capacitance and inductance.	App. B, A, 1. Level 2
01.02 Calculate and measure electrical power.	App. B, A, 2. Level 2
01.03 Measure voltage, current, resistance, and continuity.	App. B, A, 3. Level 3
01.04 Determine the relationship of voltage, current, and resistance in electrical circuits.	App. B, A, 4. Level 3
01.05 Read and interpret aircraft electrical-circuit diagrams, including solid-state devices and logic functions.	App. B, A, 5. Level 3
01.06 Inspect and service batteries.	App. B, A, 6. Level 3
01.07 Utilize proper electrical safety procedures.	
01.08 Troubleshoot electrical systems.	
02.0 Perform basic aircraft drawing skills.-The student will be able to:	
02.01 Use aircraft drawings, symbols, and system schematics.	App. B, B, 7. Level 2
02.02 Draw sketches of repairs and alterations.	App. B, B, 8. Level 3
02.03 Use blueprint information.	App. B, B, 9. Level 3
02.04 Use graphs and charts.	App. B, B, 10. Level 3
03.0 Demonstrate aircraft weight and balance skills.-The student will be able to:	
03.01 Weigh aircraft.	App. B, C, 11. Level 2
03.02 Perform complete weight-and-balance check and record data.	App. B, C, 12. Level 3
04.0 Maintain aircraft fluid lines and fittings.-The student will be able to:	
04.01 Fabricate and install rigid and flexible fluid lines and fittings.	App. B, D, 13. Level 3
05.0 Perform aircraft materials and processes skills.-The student will be able to:	
05.01 Identify and select appropriate nondestructive testing methods.	App. B, E, 14. Level 1

05.02	Perform dye penetrant, eddy current, ultrasonic, and magnetic particle inspections.	App. B, E, 15. Level 2
05.03	Perform basic heat-treating processes.	App. B, E, 16. Level 1
05.04	Identify and select aircraft hardware and materials.	App. B, E, 17. Level 3
05.05	Inspect and check welds.	App. B, E, 18. Level 3
05.06	Perform precision measurements.	App. B, E, 19. Level 3
05.07	Perform safety wiring techniques.	
06.0	Perform ground operations and servicing duties.-The student will be able to:	
06.01	Start, ground operate, move, service, and secure aircraft and identify typical ground-operations hazards.	App. B, F, 20. Level 2
06.02	Identify and select fuels.	App. B, F, 21. Level 2
06.03	Comply with prescribed shop and personal safety procedures.	
07.0	Perform cleaning and corrosion control operations.-The student will be able to:	
07.01	Identify and select cleaning materials.	App. B, G, 22. Level 3
07.02	Inspect, identify, remove, and treat aircraft corrosion and perform aircraft cleaning.	App. B, G, 23. Level 3
07.03	Identify and utilize appropriate equipment for cleaning and corrosion control.	
07.04	Observe appropriate personal safety procedures for corrosive chemicals.	
08.0	Demonstrate mathematical skills.-The student will be able to:	
08.01	Extract roots and raise numbers to a given power.	App. B, H, 24. Level 3
08.02	Determine areas and volumes of various geometrical shapes by solving problems for volume, weight, area, circumference, and perimeter measurements for rectangles, squares, and cylinders.	App. B, H, 25. Level 3
08.03	Solve ratio, proportion, and percentage problems.	App. B, H, 26. Level 3
08.04	Perform algebraic operations involving addition, subtraction, multiplication, and division of positive and negative numbers.	App. B, H, 27. Level 3
08.05	Solve linear inequalities in one variable and applied problems.	
08.06	Factor polynomials.	
08.07	Simplify algebraic fractions, complex fractions and solve rational and literal equations and applied problems.	
08.08	Determine areas and volumes of various geometrical shapes.	
08.09	Solve ratio, proportion, and percentage problems.	
08.10	Perform algebraic operations involving addition, subtraction, multiplication, and division of positive and negative numbers.	
08.11	Graph linear equations and inequalities in two variables and solve graph systems of linear equations	

	and inequalities in two variables.	
08.12	Solve and graph quadratic equations and inequalities with real solutions and solve related word problems.	
08.13	Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.	
08.14	Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.	
08.15	Add, subtract, multiply and divide using fractions, decimals, and whole numbers.	
08.16	Determine the correct purchase price, to include sales tax, for a materials list containing a minimum of six items.	
08.17	Demonstrate an understanding of federal, state and local taxes and their computation.	
09.0	Maintain forms and records.-The student will be able to:	
09.01	Write descriptions of work performed including aircraft discrepancies and corrective actions using typical aircraft maintenance records.	App. B, I, 28. Level 3
09.02	Complete required maintenance forms, records, and inspection reports.	App. B, I, 29. Level 3
10.0	Apply principles of basic physics.-The student will be able to:	
10.01	Use and understand the principles of simple machines; sound, fluid, and heat dynamics; basic aerodynamics; aircraft structures; and theory of flight.	App. B, J, 30. Level 2
10.02	Understand molecular action as a result of temperature extremes, chemical reactions, and moisture content.	
10.03	Draw conclusions or make inferences from data.	
10.04	Identify health-related problems which may result from exposure to work-related chemicals and hazardous materials, and know the proper precautions required for handling such materials.	
10.05	Understand pressure measurement in terms of P.S.I., inches of mercury and K.P.A.	
11.0	Demonstrate the use of maintenance publications.-The student will be able to:	
11.01	Demonstrate ability to read, comprehend, and apply information contained in FAA and manufacturers' aircraft maintenance specifications, data sheets, manuals, publications, and related Federal Aviation Regulations, Airworthiness Directives, and Advisory material.	App. B, K, 31. Level 3
11.02	Read technical data.	App. B, K, 32. Level 3
12.0	Interpret mechanic privileges.-The student will be able to:	
12.01	Exercise mechanic privileges within the limitations prescribed by Part 65 of this chapter.	App. B, L, 33. Level 3
13.0	Perform basic reciprocating engine skills.-The student will be able to:	
13.01	Inspect and repair a radial engine.	App. D, I, A, 1. Level 1
13.02	Overhaul reciprocating engine.	App. D, I, A, 2. Level 2

13.03	Inspect, check, service, and repair reciprocating engines and engine installations.	App. D, I, A, 3. Level 3
13.04	Install, troubleshoot, and remove reciprocating engines.	App. D, I, A, 4. Level 3
14.0	Perform basic turbine engine skills.-The student will be able to:	
14.01	Overhaul turbine engine.	App. D, I, B, 5. Level 2
14.02	Inspect, check, service, and repair turbine engines and turbine engine installations.	App. D, I, B, 6. Level 3
14.03	Install, troubleshoot, and remove turbine engines.	App. D, I, B, 7. Level 3
15.0	Perform engine inspection.-The student will be able to:	
15.01	Perform powerplant conformity and air worthiness inspections.	App. D, I, C, 8. Level 3
16.0	Maintain engine instrument systems.-The student will be able to:	
16.01	Troubleshoot, service, and repair electrical and mechanical fluid rate-of-flow indicating systems.	App. D, II, A, 9. Level 2
16.02	Inspect, check, service, troubleshoot, and repair electrical and mechanical engine temperature, pressure, and revolutions per minute (rpm) indicating systems.	App. D, II, A, 10. Level 2
17.0	Maintain engine fire protection systems.-The student will be able to:	
17.01	Inspect, check service, troubleshoot, and repair engine fire detection and extinguishing systems.	App. D, II, B, 11. Level 3
18.0	Maintain engine electrical systems.-The student will be able to:	
18.01	Repair engine electrical system components.	App. D, II, C, 12. Level 2
18.02	Install, check and service engine electrical wiring, controls, indicators, and protective devices.	App. D, II, C, 13. Level 3
19.0	Maintain lubrication systems.-The student will be able to:	
19.01	Identify and select lubricants.	App. D, II, D, 14. Level 2
19.02	Repair engine lubrication system components.	App. D, II, D, 15. Level 2
19.03	Inspect, check, service, troubleshoot, and repair engine lubrication system.	App. D, II, D, 16. Level 3
20.0	Maintain ignition systems.-The student will be able to:	
20.01	Overhaul magneto and ignition harness.	App. D, II, E, 17. Level 2
20.02	Inspect, service, troubleshoot, and repair reciprocating and turbine engine ignition systems and components.	App. D, II, E, 18. Level 2
20.03	Inspect, service, troubleshoot, and repair turbine engine electrical starting systems.	App. D, II, E, 19a. Level 3
21.0	Maintain fuel metering systems.-The student will be able to:	
21.01	Troubleshoot and adjust turbine engine fuel metering systems and electronic engine fuel controls.	App. D, II, F, 20. Level 1
21.02	Overhaul carburetor.	App. D, II, F, 21. Level 1
21.03	Repair engine fuel metering system components.	App. D, II, F, 22. Level 2

21.04	Inspect, check, troubleshoot, and repair reciprocating and turbine engine fuel metering systems.	App. D, II, F, 23. Level 3
22.0	Maintain engine fuel systems.-The student will be able to:	
22.01	Repair engine fuel system components.	App. D, II, G, 24. Level 2
22.02	Inspect, check, service, troubleshoot, and repair engine fuel systems.	App. D, II, G, 25. Level 3
23.0	Maintain induction and engine airflow systems.-The student will be able to:	
23.01	Inspect, check, troubleshoot, service and repair engine ice and rain control systems.	App. D, II, H, 26. Level 2
23.02	Inspect, check, service, troubleshoot and repair heat exchangers, superchargers and turbine engine airflow and temperature control systems.	App. D, II, H, 27. Level 1
23.03	Inspect, check, service, and repair carburetor air intake and induction manifolds.	App. D, II, H, 28. Level 3
24.0	Maintain engine cooling systems.-The student will be able to:	
24.01	Repair engine cooling system components.	App. D, II, I, 29. Level 2
24.02	Inspect, check, troubleshoot, service and repair engine cooling systems.	App. D, II, I, 30. Level 3
25.0	Maintain engine exhaust systems.-The student will be able to:	
25.01	Repair engine exhaust system components.	App. D, II, J, 31. Level 2
25.02	Inspect, check, troubleshoot, service and repair engine exhaust systems.	App. D, II, J, 32a. Level 3
25.03	Troubleshoot and repair engine thrust reverser systems and related components.	App. D, II, J, 32b. Level 1
26.0	Maintain aircraft propellers.-The student will be able to:	
26.01	Inspect, check, service and repair propeller synchronizing and ice control systems.	App. D, II, K, 33. Level 1
26.02	Identify and select propeller lubricants.	App. D, II, K, 34. Level 2
26.03	Balance propellers.	App. D, II, K, 35. Level 1
26.04	Repair propeller control system components.	App. D, II, K, 36. Level 2
26.05	Inspect, check, service, and repair fixed-pitch, constant-speed, and feathering propellers, and propeller governing systems.	App. D, II, K, 37. Level 3
26.06	Install, troubleshoot and remove propellers.	App. D, II, K, 38. Level 3
26.07	Repair aluminum alloy propeller blades.	App. D, II, K, 39. Level 3
27.0	Maintain Unducted Fans.-The student will be able to:	
27.01	Inspect and troubleshoot unducted fan systems and components.	App. D, II, L, 40. Level 1
28.0	Maintain Auxiliary Power Units.-The student will be able to:	
28.01	Inspect, check, service, and troubleshoot turbine-driven auxiliary power units.	
29.0	Maintain wood structures.-The student will be able to:	

29.01	Service and repair wood structures.	App. C, I, A, 1. Level 1
29.02	Identify wood defects.	App. C, I, A, 2. Level 1
29.03	Inspect wood structures.	App. C, I, A, 3. Level 1
30.0	Perform aircraft covering.-The student will be able to:	
30.01	Select and apply fabric and fiberglass covering materials.	App. C, I, B, 4. Level 1
30.02	Inspect, test and repair fabric and fiberglass.	App. C, I, B, 5. Level 1
31.0	Apply aircraft finishes.-The student will be able to:	
31.01	Apply trim, letters and touch-up paint.	App. C, I, C, 6. Level 1
31.02	Identify and select aircraft finishing materials.	App. C, I, C, 7. Level 2
31.03	Apply finishing materials.	App. C, I, C, 8. Level 2
31.04	Inspect finishes and identify defects.	App. C, I, C, 9. Level 2
31.05	Demonstrate an understanding of common safety practices dealing with paints and solvents.	
32.0	Repair sheet metal structures.-The student will be able to:	
32.01	Select, install, and remove special fasteners for metallic, bonded, and composite structures.	App. C, I, D, 10. Level 2
32.02	Inspect bonded structures.	App. C, I, D, 11. Level 2
32.03	Inspect, test, and repair fiberglass, plastics, honeycomb, composite, and laminated primary and secondary structures.	App. C, I, D, 12. Level 2
32.04	Inspect, check, service, and repair windows, doors, and interior furnishings.	App. C, I, D, 13. Level 2
32.05	Inspect and repair sheet-metal structures.	App. C, I, D, 14. Level 3
32.06	Install conventional rivets.	App. C, I, D, 15. Level 3
32.07	Form, lay out, and bend sheet metal.	App. C, I, D, 16. Level 3
33.0	Perform aircraft welding.-The student will be able to:	
33.01	Weld magnesium and titanium.	App. C, I, E, 17. Level 1
33.02	Solder stainless steel.	App. C, I, E, 18. Level 1
33.03	Fabricate tubular structures.	App. C, I, E, 19. Level 1
33.04	Solder, braze, gas-weld and arc-weld steel.	App. C, I, E, 20. Level 2
33.05	Weld aluminum and stainless steel.	App. C, I, E, 21. Level 1
34.0	Perform airframe assembly and rigging.-The student will be able to:	
34.01	Rig rotary-wing aircraft.	App. C, I, F, 22. Level 1

34.02	Rig fixed-wing aircraft.	App. C, I, F, 23. Level 2
34.03	Check alignment of structures.	App. C, I, F, 24. Level 2
34.04	Assemble aircraft components, including flight control surfaces.	App. C, I, F, 25. Level 3
34.05	Balance, rig, and inspect movable primary and secondary flight control surfaces.	App. C, I, F, 26. Level 3
34.06	Jack aircraft.	App. C, I, F, 27. Level 3
35.0	Perform airframe inspection.-The student will be able to:	
35.01	Perform conformity and airworthiness inspections.	App. C, I, G, 28. Level 3
36.0	Maintain aircraft landing gear systems.-The student will be able to:	
36.01	Inspect, check, service, and repair landing gear, retraction systems, shock struts, bakes, wheels, tires, and steering systems.	App. C, II, A, 29. Level 3
36.02	Utilize proper safety procedures and equipment when working on aircraft with electrical or hydraulic power on.	
36.03	Utilize proper safety procedures when working on landing gear struts or wheel and tire assemblies.	
37.0	Maintain hydraulic and pneumatic power systems.-The student will be able to:	
37.01	Repair hydraulic and pneumatic power system components.	App. C, II, B, 30. Level 2
37.02	Identify and select hydraulic fluids.	App. C, II, B, 31. Level 3
37.03	Inspect, check, service, troubleshoot, and repair hydraulic and pneumatic power systems.	App. C, II, B, 32. Level 3
38.0	Maintain cabin atmosphere control systems.-The student will be able to:	
38.01	Inspect, check, troubleshoot, service, and repair heating, cooling, air-conditioning, pressurization systems, and air cycle machines.	App. C, II, C 33. Level 1
38.02	Inspect, check, troubleshoot, service, and repair heating, cooling, air-conditioning, and pressurization systems.	App. C, II, C 34. Level 1
38.03	Inspect, check, troubleshoot, service and repair oxygen systems.	App. C, II, C 35. Level 2
39.0	Maintain aircraft instrument systems.-The student will be able to:	
39.01	Inspect, check, service, troubleshoot and repair electronic flight instrument systems and both mechanical and electrical heading, speed, altitude, temperature, pressure , and position indicating systems to include the use of built-in test equipment.	App. C, II, D, 36. Level 1
39.02	Install instruments and perform a static pressure system leak test	App. C, II, D, 37. Level 2
40.0	Maintain communication and navigation systems.-The student will be able to:	
40.01	Inspect, check, and troubleshoot autopilot servos and approach coupling systems.	App. C, II, E, 38. Level 1
40.02	Inspect, check, and service aircraft electronic communications and navigation systems, including VHF, ILS, LORAN, Radar beacon transponders, flight management computers, and GPWS.	App. C, II, E, 39. Level 1
40.03	Inspect and repair antenna and electronic equipment installations.	App. C, II, E, 40. Level 2

41.0	Inspect and repair aircraft fuel systems.-The student will be able to:	
41.01	Check and service fuel dump systems.	App. C, II, F, 41. Level 1
41.02	Perform fuel management, transfer and defueling.	App. C, II, F, 42. Level 1
41.03	Inspect, check and repair pressure fueling systems.	App. C, II, F, 43. Level 1
41.04	Repair aircraft fuel system components.	App. C, II, F, 44. Level 2
41.05	Inspect and repair fluid quantity indicating systems.	App. C, II, F, 45. Level 2
41.06	Troubleshoot, service and repair fluid and temperature warning systems.	App. C, II, F, 46. Level 2
41.07	Inspect, check, service, troubleshoot and repair aircraft fuel systems.	App. C, II, F, 47. Level 3
42.0	Inspect and repair aircraft electrical systems.-The student will be able to:	
42.01	Repair and inspect aircraft electrical system components; crimp and splice wiring to manufacturers' specifications; and repair pins and sockets of aircraft connectors.	App. C, II, G, 48. Level 2
42.02	Install, check, and service airframe electrical wiring, controls, switches, indicators, and protective devices.	App. C, II, G, 49. Level 2
42.03	Inspect, check, troubleshoot, service and repair alternating and direct current electrical systems.	App. C, II, G, 50a. Level 3
42.04	Inspect, check, and troubleshoot constant speed and integrated speed drive generators.	App. C, II, G, 50b. Level 1
43.0	Inspect and repair position and warning systems.-The student will be able to:	
43.01	Inspect, check, and service speed and configuration warning systems, electrical brake controls, and anti-skid systems.	App. C, II, H, 51. Level 2
43.02	Inspect, check, troubleshoot, and service landing gear position indicating and warning systems.	App. C, II, H, 52. Level 3
44.0	Maintain ice and rain control systems.-The student will be able to:	
44.01	Inspect, check, troubleshoot, service, and repair airframe ice and rain control systems.	App. C, II, I, 53. Level 2
45.0	Inspect and repair aircraft fire protection systems.-The student will be able to:	
45.01	Inspect, check and service smoke and carbon monoxide detection systems.	App. C, II, J, 54. Level 1
45.02	Inspect, check, service, troubleshoot, and repair aircraft fire detection and extinguishing systems.	App. C, II, J, 55. Level 3
46.0	Demonstrate knowledge of FAA aircraft mechanic licensing requirements.-The student will be able to:	
46.01	Successfully complete the FAA powerplant written, oral and practical examinations.	
46.02	Display an FAA powerplant Mechanic's certificate.	
46.03	Successfully complete the FAA airframe written, oral and practical examinations.	
46.04	Display an FAA airframe mechanic's certificate.	
47.0	Demonstrate the human relations skills necessary for success in supervision.-The student will be able to:	

47.01	Exhibit the ability to get along with others.	
47.02	Discuss the importance of human relations.	
47.03	Develop and demonstrate the unique human relations skills needed for successful job attainment and progress in supervising others.	
48.0	Demonstrate knowledge of skills and attitudes the supervisor needs for effective performance.-The student will be able to:	
48.01	Describe leadership theory and its complexity.	
48.02	Discuss how a new supervisor is introduced to leadership responsibilities.	
48.03	Identify the legal and social environment for supervision.	
48.04	Discuss pertinent legislation and the role of government intervention.	
48.05	Describe problems in union and non-union organizations.	
49.0	Demonstrate a practical approach to job management.-The student will be able to:	
49.01	Assume responsibility in planning and coordinating resources.	
49.02	Demonstrate effective decision making and problem-solving techniques.	
49.03	Implement methods of work improvement.	
50.0	Demonstrate appropriate communication skills.-The student will be able to:	
50.01	Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.	
50.02	Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.	
50.03	Read and follow written and oral instructions.	
50.04	Answer and ask questions coherently and concisely.	
50.05	Read critically by recognizing assumptions and implications and by evaluating ideas.	
50.06	Demonstrate appropriate telephone/communication skills.	
50.07	Describe the importance of clear and concise writing.	
50.08	Demonstrate proficiency in the effective use of speech and vocabulary.	
50.09	Explain the importance of good listening skills.	
50.10	Discuss the role communication plays in management.	
50.11	Demonstrate the components of the communication process.	
50.12	Demonstrate effective written communication skills.	
50.13	Demonstrate effective oral communication skills.	

50.14	Write technical reports.	
51.0	Demonstrate employability skills.-The student will be able to:	
51.01	Conduct a job search.	
51.02	Secure information about a job.	
51.03	Identify documents which may be required when applying for a job.	
51.04	Complete a job application form correctly.	
51.05	Demonstrate competence in job interview techniques.	
51.06	Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.	
51.07	Identify acceptable work habits.	
51.08	Demonstrate knowledge of how to make appropriate job changes.	
51.09	Demonstrate acceptable employee health and grooming habits.	
51.10	Exhibit punctuality, initiative, courtesy, loyalty and honesty.	
51.11	Demonstrate knowledge of the Federal as recorded in (29 CFR-1910.1200).	
52.0	Demonstrate an understanding of computer skills.-The student will be able to:	
52.01	Demonstrate use of spreadsheets, databases and word processing.	
52.02	Demonstrate use of Internet including locating information, copying and printing web-based information.	
52.03	Demonstrate general knowledge of computer components.	
52.04	Demonstrate the location and use of antivirus capability.	
52.05	Demonstrate the ability to communicate by e-mail.	

Additional Information

Laboratory Activities

Laboratory investigations that include scientific inquiry, research, measurement, problem solving, emerging technologies, tools and equipment, as well as, experimental, quality, and safety procedures are an integral part of this career and technical program/course. Laboratory investigations benefit all students by developing an understanding of the complexity and ambiguity of empirical work, as well as the skills required to manage, operate, calibrate and troubleshoot equipment/tools used to make observations. Students understand measurement error; and have the skills to aggregate, interpret, and present the resulting data. Equipment and supplies should be provided to enhance hands-on experiences for students.

Special Notes

The purpose of this program is to prepare students for employment as aircraft mechanics (SOC 49-3011), aircraft maintenance supervisors, or aviation maintenance managers. Graduates will be eligible to pursue FAA certification as airframe and powerplant mechanics and will be trained to troubleshoot maintenance problems and supervise mechanics in the aviation industry. This program also provides supplemental training for persons previously or currently employed in this occupation.

This program focuses on broad, transferable skills and stresses understanding and demonstration of the following elements of the Aviation industry; planning, management, finance, technical and product skills, underlying principles of technology, labor issues, community issues and health, safety, and environmental issues. Since 83 credit hours are required in this curriculum, two summer terms will probably be required to complete the program within two years. Consideration should be given to making one or both summer terms a hands-on cooperative work experience for 5 credit hours.

An important note to consider is that each FAR PART 147 school must be approved by the FAA before any students can be placed in the program.

Required FAA exams include GENERAL written, oral, and practical; AIRFRAME written, oral, and practical; and POWERPLANT written, oral and practical. The only way a person can get authorization to take these examinations is to (1) graduate from an approved school or (2) obtain permission from the FAA to take the test based on prior experience on certified aircraft. Schools cannot grant permission (FAA FAR, Part 65 and Part 147, Subpart C 147.31).

Since an Aviation Maintenance Technician School (AMTS) is certified and inspected by the FAA, satisfaction of FAR Part 147 requirements should be the primary concern of an AMTS. When local and state educational requirements conflict with the FAA's regulation of an AMTS, those requirements must be resolved to satisfy FAR Part 147. In other words, FAA standards take precedence over other requirements. The FAA specifies minimum hours required and encourages schools to exceed minimum standards for the curriculum. The course content specified by the FAA may not be lowered.

“FAA FAR Part 147” identifies standards required by the FAA. Minimum teaching levels expected by the FAA also appear:

Level 1: knowledge of general principles

Level 2: knowledge of general principles and limited practical application

Level 3: knowledge of general principles with a high degree of practical application and hands-on skill levels according to FAA FAR Part 147:

For subjects taught at Level 3, all special tools required to meet “return to service” standards must be in satisfactory working condition, properly calibrated/tested, and of the proper kind for the purpose for which they are intended. Tools should include an adequate supply of special tools appropriate to the ratings and curriculum. If students are required to provide hand tools, then the school should list the specific tools with the curriculum and provide a copy of this list to the students. Shop equipment and special tools should be maintained in good working order and be in a condition for safe operation. All tools and equipment should be maintained in good working order and be in a condition for safe operation. The types of tools and equipment required for Aviation General, Airframe, and Powerplant teaching include the ones listed below: Common hand tools, portable tools, precision tools, machine tools, torsion tools, shop equipment and machinery, specialized tools and equipment, airframe structures, aircraft, airframes, powerplants, propellers, and components of this equipment.

FAA FAR Part 147 states: Each certified Aviation Maintenance Technician School shall provide facilities, equipment, and material equal to the standards currently required for the issue of the certificate and rating that it holds.

Refer to FAA FAR Part 147 and industry publications for more information about required levels of proficiency, hours of instruction, and updates to occupational titles and training requirements. Keeping pace with the standards of industry and maintaining a high quality of training requires ongoing linkages with industry and FAA representatives.

Career and Technical Student Organization (CTSO)

SkillsUSA is the intercurricular career and technical student organization for providing leadership training and reinforcing specific career and technical skills. Career and Technical Student Organizations provide activities for students as an integral part of the instruction offered.

Accommodations

Federal and state legislation requires the provision of accommodations for students with disabilities to meet individual needs and ensure equal access. Postsecondary students with disabilities must self-identify, present documentation, request accommodations if needed, and develop a plan with their counselor and/or instructors. Accommodations received in postsecondary education may differ from those received in secondary education. Accommodations change the way the student is instructed. Students with disabilities may need accommodations in such areas as instructional methods and materials, assignments and assessments, time demands and schedules, learning environment, assistive technology and special communication systems. Documentation of the accommodations requested and provided should be maintained in a confidential file.

Certificate Programs

A College Credit Certificate consists of a program of instruction of less than sixty (60) credits of college-level courses, which is part of an AS or AAS degree program and prepares students for entry into employment (Rule 6A-14.030, F.A.C.). This AS degree program includes the following College Credit Certificates:

- Airline Maintenance Procedures and Records Management (0649010411) – 18 credit hours
- Aviation Airframe Mechanics (0649010409) – 24 credit hours
- Aviation Mechanic (0649010408) – 12 credit hours
- Aviation Powerplant Mechanics (0649010410) – 24 credit hours

Standards for the above certificate programs are contained in separate curriculum frameworks.

**Florida Department of Education
Curriculum Framework**

Program Title: Aviation Administration
Career Cluster: Transportation, Distribution and Logistics

AS	
CIP Number	1649010403
Program Type	College Credit
Standard Length	60 credit hours
CTSO	SkillsUSA
SOC Codes (all applicable)	53-2022 – Airfield Operations Specialists 53-2021 – Air Traffic Controllers 53-1011 – Aircraft Cargo Handling Supervisors 43-4051 – Customer Service Representatives

Purpose

This program offers a sequence of courses that provides coherent and rigorous content aligned with challenging academic standards and relevant technical knowledge and skills needed to prepare for further education and careers in the Transportation, Distribution and Logistics career cluster; provides technical skill proficiency, and includes competency-based applied learning that contributes to the academic knowledge, higher-order reasoning and problem-solving skills, work attitudes, general employability skills, technical skills, and occupation-specific skills, and knowledge of all aspects of the Transportation, Distribution and Logistics career cluster.

The purpose of this program is to prepare students who are seeking employment in the aviation/airline/airport fields. Some of the students will be able to obtain opportunities in the federal, state and local government aviation fields, while others will find opportunities in airline fields, such as initial entry level jobs in customer service and operations and air cargo as well as lower to middle level management positions. Others will find positions in supporting aviation entities, such as suppliers and service providers to airlines, government aviation agencies, air traffic control, and aircraft dispatch.

The aviation-specific content covered by this framework includes, but is not limited to airport facility equipment, ground equipment; aircraft operating requirements/limitations, navigational equipment, aviation weather reports and conditions, air traffic control equipment/procedures; customer service information technology tools, Federal Aviation Administration regulations, and air cargo ground handling equipment and procedures.

The general administrative content covered in this framework includes but is not limited to, communication skills, leadership skills, directing, planning and controlling, human relations and employability skills, safe and efficient work practices, technical skills such as aircraft and ground equipment operations and terminology, records management, security issues.

Additional Information relevant to this Career and Technical Education (CTE) program is provided at the end of this document.

Program Structure

This program is a planned sequence of instruction consisting of sixty credit hours. Standards

After successfully completing this program, the student will be able to perform the following:

- 01.0 Demonstrate an understanding of basic aviation terminology and history.
- 02.0 Demonstrate effective communication skills.
- 03.0 Demonstrate an understanding of aviation operations practices, limitations and procedures.
- 04.0 Demonstrate an understanding of federal, state and other governmental laws, rules and policies as they relate to aviation.
- 05.0 Demonstrate an understanding of aviation and airport management practices.
- 06.0 Demonstrate an understanding of aviation security.
- 07.0 Demonstrate an understanding of aviation/airline marketing, customer service/sales, and reservations/ticketing.
- 08.0 Demonstrate an understanding of fundamentals of flight.
- 09.0 Demonstrate an understanding of meteorology.
- 10.0 Demonstrate an understanding of aviation safety and human factors, including accident prevention.
- 11.0 Demonstrate an understanding of air traffic control procedures and policies.
- 12.0 Demonstrate an understanding of air cargo operations and procedures.
- 13.0 Demonstrate employability skills.

**Florida Department of Education
Student Performance Standards**

Program Title: Aviation Administration
CIP Numbers: 1649010403
Program Length: 60 credit hours
SOC Code(s): 53-2022, 53-2021, 53-1011, 43-4051

Refer to Rule 6A-14.030 (4), F.A.C., for the minimum amount of general education coursework required in the Associate of Science (AS) degree. At the completion of this program, the student will be able to:	
01.0	Demonstrate an understanding of basic aviation terminology and history.-The student will be able to:
01.01	Explain the overall scope and breadth of the aviation industry including its impact on the economy.
01.02	Distinguish the terms and vocabularies that are used in the aerospace and commercial aviation industry.
01.03	Describe the history of technological, governmental, social and economic developments of aviation.
01.04	Explain the different types and categories of aircraft in use in the industry by distinguishing and identifying: Various wide body, narrow body types and general aviation aircraft.
01.05	Demonstrate an understanding of the oversight role of the Federal Government and its effect on the aviation industry.
02.0	Demonstrate effective communication skills.-The student will be able to:
02.01	Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
02.02	Read and understand graphs, charts, diagrams and tables commonly used in this industry/occupational area.
02.03	Read and follow written and oral English instructions.
02.04	Answer and ask questions coherently and concisely.
02.05	Read critically by recognizing assumptions and implications and by evaluating ideas.
02.06	Demonstrate appropriate telephone/communications skills.
02.07	Demonstrate knowledge and use of appropriate computer skills.
02.08	Demonstrate effective interpersonal skills.
03.0	Demonstrate an understanding of aviation operations practices, limitations and procedures.-The student will be able to:
03.01	Demonstrate knowledge of aircraft systems as they apply to flight operations, including engines, fuel, electrical, hydraulics, pneumatics, flight controls and avionics.
03.02	Understand the various factors of aircraft performance, including takeoff, enroute and landing limitations and weight and balance.
03.03	Demonstrate knowledge of the function of flight operations, including pilot hiring, training, standards, safety issues, security issues, FAA and TSA regulations, documentation requirements, operations specifications, operating within the ATC system, and crew scheduling as well as flight attendant and aircraft dispatcher requirements.

03.04	Describe maintenance operations and their role and effect on flight operations.
03.05	Demonstrate an understanding of the role of the flight operations professional in the economic and planning functions.
03.06	Explain FAA requirements such as flight standards, types of certificates, training and record keeping, surveillance, and investigations, as well as the operator's response and its relationship with the FAA.
03.07	Describe the role of the National Transportation Safety Board in accident investigation, NASA's role in aviation safety reporting systems and research, and industry-specific safety reporting programs.
03.08	Demonstrate knowledge of the application of information technology systems in flight operations as they relate to flight planning systems, flight management systems, satellite communication and navigation systems, weight and balance, maintenance monitoring, and management information systems.
04.0	Demonstrate an understanding of federal, state and other governmental laws, rules and policies as they relate to aviation.-The student will be able to:
04.01	Demonstrate knowledge of the history and foundations of the legal and court system in the United States as it pertains to development of aviation law and regulations.
04.02	Explain the role and function of the U.S. DOT, FAA, TSA, and the NTSB as it relates to their legal responsibilities and authority.
04.03	Demonstrate knowledge of airmen rights and responsibilities, negligence, FAA enforcement, immunity, and degrees of care.
04.04	Explain state aviation law, relating to airports, fixed based operators, aircraft sales, registration, and taxation issues.
04.05	Demonstrate knowledge of the legal matters relating to the aircraft manufacturing and airline industry, including warranties, products liability, negligence, accident litigation, labor, and consumer issues.
04.06	Demonstrate knowledge of international air law, bilateral and multilateral agreements, international jurisdiction, and limits of liability and damages.
04.07	Demonstrate knowledge of legal issues that relate to aviation security.
05.0	Demonstrate an understanding of aviation and airport management practices.-The student will be able to:
05.01	Describe how historical and current changes in competition, social factors, government policies, and technology affect aviation and airport management.
05.02	Demonstrate understanding of organizational design and functional areas of an aviation business.
05.03	Demonstrate understanding of the various functions of an airport, including airside and landside operations and management, financial planning, airport master plans, environmental issues, and land use.
05.04	Describe the factors of effective communication, leadership styles, and motivating employees in an aviation environment with an emphasis on individual performance.
05.05	Demonstrate an understanding of labor relations contract negotiations, and the grievance process in an aviation environment, including issues specific to airline labor relations.
05.06	Explain how strategic planning and control processes are used in the aviation industry.
06.0	Demonstrate an understanding of aviation security.-The student will be able to:
06.01	Describe aviation security threats and responses.
06.02	Discuss aspects of aviation security, such the Aviation Safety and Security Act of 2001, and FAR Parts 108 and 109.

06.03	Describe the components of a layered aviation security system, including personnel selection and training, and performance of security personnel.
06.04	Explain the importance of planning for security threats, and having contingency plans and responsive measures.
06.05	Explain the ground security measures and technology, including restricted access, inspections of personnel, baggage and goods, and effective screening techniques.
06.06	Discuss inflight threats and security procedures.
07.0	Demonstrate an understanding of aviation/airline marketing, customer service/sales, and reservations/ticketing.-The student will be able to:
07.01	Explain the Marketing Concept and how it differs from the Product and Sales Concepts.
07.02	Analyze the various environmental factors that affect aviation/airline marketing.
07.03	Demonstrate an understanding of market demographics, segmentation, methods of market research and analysis, and pricing strategies.
07.04	Analyze why a customer buys a particular product or service.
07.05	Explain the advantages and disadvantages of the media available for aviation industry advertising and promotion.
07.06	Describe the factors of delivering quality customer service, why companies lose customer, and how to salvage a bad customer experience.
07.07	Explain the principles of reservations, ticketing, internet sales, e-ticketing, and travel agency functions.
08.0	Demonstrate an understanding of fundamentals of flight.-The student will be able to:
08.01	Name and compare the four forces of flight.
08.02	Describe an airfoil.
08.03	Explain how lift is produced.
08.04	Discuss how and why an airplane stalls and spins.
08.05	Describe and explain how pitot/static vacuum, pressure and engine instruments work.
08.06	Explain factors affecting aircraft design, performance, and operation.
09.0	Demonstrate understanding of meteorology.-The student will be able to:
09.01	Describe the composition, circulation and stability of the atmosphere.
09.02	Demonstrate an understanding of air mass development, the movement of fronts and their effect on aviation.
09.03	Demonstrate an awareness of weather hazards to aviation and an understanding of how to avoid them.
09.04	Demonstrate the ability to access weather information prior to and during flights through a variety of media.
09.05	Interpret printed reports, forecasts and graphic weather products.
10.0	Demonstrate an understanding of aviation safety and human factors, including accident prevention.-The student will be able to:
10.01	Describe the nature of human factors and sources of errors.

10.02	Discuss the issues of fatigue, body rhythms and sleep.
10.03	Describe the effects of fitness and health on human performance.
10.04	Discuss how motivation and leadership affects safety in aviation.
10.05	Discuss the role of training devices and education in reducing errors and increasing safety.
10.06	Describe how the physical layout of displays and controls and space relate to human factors errors.
10.07	Explain how documentation problems such as manuals and checklists, maps and charts can cause safety issues.
10.08	Describe how an aviation safety program is designed to create an environment of safety awareness and accident prevention.
10.09	Describe the importance of effective single-pilot and crew resource management skills, as well as dispatcher resource management skills.
11.0	Demonstrate an understanding of air traffic control procedures and policies.-The student will be able to:
11.01	Discuss the basic terminology and communications phraseology that is used in air traffic control.
11.02	Describe airspace classifications that are used in air traffic control.
11.03	Discuss separation of aircraft requirements.
11.04	Demonstrate an understanding of the Federal Aviation Regulations that apply to air traffic control.
11.05	Explain aircraft characteristics and recognition.
11.06	Describe instrument procedures, for departure, arrival and for IFR flight plans.
11.07	Discuss the weather hazards to aircraft, including wake turbulence, downbursts and restrictions to visibility.
11.08	Review ATC Clearances, including their purpose and the different types of ATC clearances, the appropriate sequence and pilot responsibilities for compliance.
11.09	Describe the fundamentals of radar, including information about primary and secondary radar systems.
11.10	Explain strip marking (radar and non-radar), including the basic outline for strip marking and the associated symbologies for En Route, Terminal, and Flight Service Options.
11.11	Explain non-radar procedures, including horizontal and vertical separation, timed approaches.
12.0	Demonstrate an understanding of air cargo operations and procedures.-The student will be able to:
12.01	Describe the importance of air cargo to the economy.
12.02	Describe air cargo customers, freight forwarders, customs brokers, and how marketing is done in the air cargo industry.
12.03	Explain the different classes of air cargo, and the required documentation of each.
12.04	Describe and discuss cargo packaging and how cargo is loaded on an aircraft.
12.05	Describe HAZMAT classification, labeling, packaging, shipping requirements, and related incident/accident procedures and required reports.
12.06	Describe the security requirements for air cargo personnel, facilities, and aircraft.

13.0	Demonstrate employability skills.-The student will be able to:
13.01	Describe positions available and requirements for careers in aviation administration.
13.02	Describe qualification and certification requirements for careers in aviation administration.

Additional Information

Laboratory Activities

Laboratory investigations that include scientific inquiry, research, measurement, problem solving, emerging technologies, tools and equipment, as well as, experimental, quality, and safety procedures are an integral part of this career and technical program/course. Laboratory investigations benefit all students by developing an understanding of the complexity and ambiguity of empirical work, as well as the skills required to manage, operate, calibrate and troubleshoot equipment/tools used to make observations. Students understand measurement error; and have the skills to aggregate, interpret, and present the resulting data. Equipment and supplies should be provided to enhance hands-on experiences for students.

Career and Technical Student Organization (CTSO)

SkillsUSA is the intercurricular career and technical student organization for providing leadership training and reinforcing specific career and technical skills. Career and Technical Student Organizations provide activities for students as an integral part of the instruction offered.

Accommodations

Federal and state legislation requires the provision of accommodations for students with disabilities to meet individual needs and ensure equal access. Postsecondary students with disabilities must self-identify, present documentation, request accommodations if needed, and develop a plan with their counselor and/or instructors. Accommodations received in postsecondary education may differ from those received in secondary education. Accommodations change the way the student is instructed. Students with disabilities may need accommodations in such areas as instructional methods and materials, assignments and assessments, time demands and schedules, learning environment, assistive technology and special communication systems. Documentation of the accommodations requested and provided should be maintained in a confidential file.

Certificate Programs

A College Credit Certificate consists of a program of instruction of less than sixty (60) credits of college-level courses, which is part of an AS or AAS degree program and prepares students for entry into employment (Rule 6A-14.030, F.A.C.). This AS degree program includes the following College Credit Certificates:

- Airline/Aviation Management (0649010403) – 16 credit hours
- Air Cargo Management (0649010404) – 16 credit hours
- Airport Management (0649010405) – 16 credit hours
- Passenger Agent (0649010406) – 16 credit hours

Standards for the above certificate programs are contained in separate curriculum frameworks.

Florida Department of Education
Curriculum Framework

Program Title: Aviation Operations
Career Cluster: Transportation, Distribution and Logistics

AS	
CIP Number	1649010404
Program Type	College Credit
Standard Length	60 credit hours
CTSO	SkillsUSA
SOC Codes (all applicable)	53-2022 – Airfield Operations Specialists

Purpose

This program offers a sequence of courses that provides coherent and rigorous content aligned with challenging academic standards and relevant technical knowledge and skills needed to prepare for further education and careers in the Transportation, Distribution and Logistics career cluster; provides technical skill proficiency, and includes competency-based applied learning that contributes to the academic knowledge, higher-order reasoning and problem-solving skills, work attitudes, general employability skills, technical skills, and occupation-specific skills, and knowledge of all aspects of the Transportation, Distribution and Logistics career cluster.

The purpose of this program is to prepare students for initial employment as communication, transportation, utility management, air station managers or provide supplemental training for persons previously or currently employed in these occupations.

The content includes but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, technical writing, records management, security, Federal Aviation Administration regulations, data processing, and air cargo transportation.

Additional Information relevant to this Career and Technical Education (CTE) program is provided at the end of this document.

Program Structure

This program is a planned sequence of instruction consisting of 60 credit hours.

Standards

After successfully completing this program, the student will be able to perform the following:

- 01.0 Demonstrate understanding of safe and efficient work practices.
- 02.0 Demonstrate understanding of federal and state security procedures.
- 03.0 Demonstrate appropriate math skills.
- 04.0 Demonstrate understanding of Federal Aviation Administration, state and other governmental laws, rules and policies.
- 05.0 Demonstrate understanding of business law and management pertaining to aviation operations.
- 06.0 Demonstrate understanding of personnel management.
- 07.0 Demonstrate understanding of aviation safety and accident prevention and investigation.
- 08.0 Demonstrate appropriate communication skills.
- 09.0 Prepare, analyze and evaluate technical reports and data.
- 10.0 Demonstrate appropriate understanding of basic science.
- 11.0 Demonstrate employability skills.
- 12.0 Demonstrate an understanding of entrepreneurship.

Florida Department of Education
Student Performance Standards

Program Title: Aviation Operations
 CIP Numbers: 1649010400
 Program Length: 60 credit hours
 SOC Code(s): 53-2022

Refer to Rule 6A-14.030 (4), F.A.C., for the minimum amount of general education coursework required in the Associate of Science (AS) degree. At the completion of this program, the student will be able to:	
01.0	Demonstrate an understanding of safe and efficient work practices.-The student will be able to:
01.01	Demonstrate an awareness and understanding of health and safety hazards, prevention and correction of ecological problems and know the solutions unique to the industry.
01.02	Demonstrate an awareness and understanding of fueling hazards.
01.03	Demonstrate an awareness and understanding of physical hazards.
01.04	Demonstrate an awareness and understanding of fire hazards.
01.05	Demonstrate an awareness of the proper techniques to control and extinguish fires.
01.06	Demonstrate an awareness and understanding of the need for safety devices, controls, guards and equipment.
01.07	Demonstrate full awareness and understanding of personal protective equipment (PPE).
02.0	Demonstrate understanding of federal and state security procedures.-The student will be able to:
02.01	Describe passenger security systems in use.
02.02	Describe and define federal security laws.
02.03	Identify the role of local law enforcement agencies.
02.04	List known security risk features.
02.05	Describe standard cargo theft precautions used at airports and related facilities.
02.06	Describe the International Air Transport Association.
02.07	List the more common labels found in the Restricted Articles Regulations; as published in bulletins by IATA.
03.0	Demonstrate appropriate math skills.-The student will be able to:
03.01	Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
03.02	Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
03.03	Add, subtract, multiply and divide using fractions, decimals, and whole numbers.

04.0	Demonstrate understanding of federal aviation administration, state and other governmental laws, rules and policies.-The student will be able to:
04.01	Describe the economic, social and political importance of commercial aviation, general aviation and aircraft manufacturing in the United States.
04.02	Describe the function, basic organization and responsibility of the National Transportation Safety Board.
04.03	Explain major portions of relevant Parts of Federal Aviation Regulations and ICAO standards.
04.04	List and describe the federal statutes pertaining to the economic regulation of the airline industry.
04.05	Demonstrate an understanding of federal, state and local taxes.
04.06	List and describe the major federal statutes pertaining to the regulation of aviation safety.
04.07	Describe the historical and current relationship between the U.S. Post Office and the aviation industry.
04.08	List and describe six categories of general aviation.
04.09	Describe the development of aviation laws and their analogy to the Law of the Sea.
04.10	Describe how aviation is affected by state departments of transportation, including aircraft sales, maintenance, and passenger transport.
04.11	Describe and explain Title II (Safety and Pilot training improvement) of the Airline Safety and Federal Aviation Administration Extension Act of 2010.
05.0	Demonstrate understanding of business law and management pertaining to aviation operations.-The student will be able to:
05.01	Describe and identify in what manner and under what conditions an airport may be exposed to a lawsuit.
05.02	Identify and discuss fundamental aspects of business law that relate to aviation operations.
05.03	Explain how an employee's action or inaction may subject an aviation organization to a lawsuit.
05.04	Describe the classification of airports and their economic role as well as management issues facing airport systems.
05.05	Discuss the importance of integrating airport planning with federal, state and local interests in developing airport systems.
05.06	Describe the major components that go into the overall operating and capital expenditure programs related to aviation operations including revenue sources.
06.0	Demonstrate understanding of personnel management.-The student will be able to:
06.01	Name and describe the basic guides in personnel management.
06.02	Discuss governmental relations in personnel management.
06.03	Explain the general nature of personnel problems, and approaches to problem solving.
06.04	Demonstrate knowledge of the minimum standard for work practices.
06.05	Describe training, education, and professional development available to personnel.
06.06	Calculate the staff necessary to attain goals; and equipment and resources they will require.
06.07	Explain how the requirements to attain stated goals will necessitate the allocation of stated budgets.

06.08	Name and describe the rules/regulations associated with Americans with Disabilities Act.
07.0	Demonstrate understanding of aviation safety, accident prevention and investigation.-The student will be able to:
07.01	State and discuss the portion of the Federal Aviation Act of 1958 as amended, which is generally described as Title VI, Safety Regulations of Civil Aeronautics.
07.02	Demonstrate knowledge of the minimum standards governing design, materials workmanship, performance of aircraft, inspection, servicing, overhaul of aircraft, and parts and appliances, equipment and facilities, as required by section 601(a) of Federal Aviation Act of 1958 Section 601(a).
07.03	Discuss the maximum hours of service for airmen and other employees, and other practices, methods, and procedures as required by Section 601(a) of the Federal Aviation Act of 1958.
07.04	Explain the Federal Aviation Regulations (FAR's) promulgated by the Administrator to implement the authority granted by the Federal Aviation Act of 1958, in the area of safety, and to prevent accidents.
07.05	Demonstrate full knowledge of 14 CFR 830 and be able to explain the notification and reporting criteria of aircraft accidents or incidents.
07.06	Identify health-related problems, which may result from exposure to work-related chemicals and hazardous materials, and know the use of Safety Data Sheets (SDS) and the proper precautions required for handling such materials.
08.0	Demonstrate appropriate communication skills.-The student will be able to:
08.01	Write logical and understandable statements, or phrases, to complete with accuracy the forms/invoices commonly used in business and industry.
08.02	Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
08.03	Read and follow written and oral instructions.
08.04	Answer and ask questions coherently and concisely.
08.05	Read critically by recognizing assumptions and implications and by evaluating ideas.
08.06	Demonstrate appropriate verbal and electronic communication skills.
09.0	Prepare, analyze and evaluate technical reports and data.-The student will be able to:
09.01	State the five basic guidelines for preparation of technical reports.
09.02	Compare the difference between technical and literary description.
09.03	Describe the techniques used in technical report writing.
09.04	Discuss the arrangement of the technical written report – such as: cause and effect, inductive and deductive, enumeration and classification, problems and solution.
09.05	Explain the preparatory work or stages in the process, such as the writing, the drafts, use of the library, and polishing style.
09.06	List types of reports, and describe use of illustrations.
09.07	Discuss the steps in developing an oral presentation.
10.0	Demonstrate appropriate understanding of basic science.-The student will be able to:
10.01	Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.

10.02	Draw conclusions or make inferences from data.
10.03	Identify health-related problems, which may result from exposure to work-related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
10.04	Understand pressure measurement in terms of P.S.I., inches of mercury, and K.P.A.
11.0	Demonstrate employability skills.-The student will be able to:
11.01	Conduct a job search.
11.02	Secure information about a job.
11.03	Identify documents which may be required when applying for a job interview.
11.04	Complete a job application form correctly.
11.05	Demonstrate competence in job interview techniques.
11.06	Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
11.07	Identify acceptable work habits.
11.08	Demonstrate knowledge of how to make appropriate job changes.
11.09	Demonstrate acceptable employee health habits.
11.10	Demonstrate knowledge of the Federal Law as recorded in (29 CFR-1910.1200).
12.0	Demonstrate an understanding of entrepreneurship.-The student will be able to:
12.01	Define entrepreneurship.
12.02	Describe the importance of entrepreneurship to the American economy.
12.03	List the advantages and disadvantages of business ownership.
12.04	Identify the risks involved in ownership of a business.
12.05	Identify the necessary personal characteristics of a successful entrepreneur.
12.06	Identify the business skills needed to operate a small business efficiently and effectively.

Additional Information

Laboratory Activities

Laboratory investigations that include scientific inquiry, research, measurement, problem solving, emerging technologies, tools and equipment, as well as, experimental, quality, and safety procedures are an integral part of this career and technical program/course. Laboratory investigations benefit all students by developing an understanding of the complexity and ambiguity of empirical work, as well as the skills required to manage, operate, calibrate and troubleshoot equipment/tools used to make observations. Students understand measurement error; and have the skills to aggregate, interpret, and present the resulting data. Equipment and supplies should be provided to enhance hands-on experiences for students.

Special Notes

The American Association of Airport Executives, National Air Transportation Association (NATA), National Association of State Aviation Officials (NASAO), and Florida Department of Transportation – Aviation Office (FDOT) are additional organizations for providing leadership training and for reinforcing specific skills. Organizations for students such as those mentioned, when provided shall be an integral part of the vocational instructional program.

Career and Technical Student Organization (CTSO)

SkillsUSA is the intercultural career and technical student organization for providing leadership training and reinforcing specific career and technical skills. Career and Technical Student Organizations provide activities for students as an integral part of the instruction offered.

Accommodations

Federal and state legislation requires the provision of accommodations for students with disabilities to meet individual needs and ensure equal access. Postsecondary students with disabilities must self-identify, present documentation, request accommodations if needed, and develop a plan with their counselor and/or instructors. Accommodations received in postsecondary education may differ from those received in secondary education. Accommodations change the way the student is instructed. Students with disabilities may need accommodations in such areas as instructional methods and materials, assignments and assessments, time demands and schedules, learning environment, assistive technology and special communication systems. Documentation of the accommodations requested and provided should be maintained in a confidential file.

**Florida Department of Education
Curriculum Framework**

Program Title: Transportation and Logistics
Career Cluster: Transportation, Distribution and Logistics

AS	
CIP Number	1652020301
Program Type	College Credit
Standard Length	64 credit hours
CTSO	SkillsUSA
SOC Codes (all applicable)	11-3071 – Transportation, Storage and Distribution Managers 13-1081 – Logisticians 43-5011 – Cargo and Freight Agents 43-5071 – Shipping, Receiving and Traffic Clerks 53-1011 – Aircraft Cargo Handling Supervisors 53-1031 – First-Line Supervisors of Transportation and Material Moving Machine and Vehicle Operators

Purpose

This program offers a sequence of courses that provides coherent and rigorous content aligned with challenging academic standards and relevant technical knowledge and skills needed to prepare students for further education and careers in the Transportation, Distribution, and Logistics career cluster; provides technical skill proficiency, and includes competency-based applied learning that contributes to the academic knowledge, higher-order reasoning and problem-solving skills, work attitudes, general employability skills, technical skills, and occupation-specific skills, and knowledge of all aspects of the Transportation, Distribution, and Logistics career cluster.

The content includes, but is not limited to, related business, accounting, and financial practices such as standard policies and operating procedures, negotiation techniques, planning, organizing, purchasing and inventory control theory. Emphasis is placed on planning and scheduling skills associated with transportation operations.

Additional Information relevant to this Career and Technical Education (CTE) program is provided at the end of this document.

Program Structure

This program is a planned sequence of instruction consisting of sixty-four credit hours.

Standards

After successfully completing this program, the student will be able to perform the following:

- 01.0 Demonstrate an understanding of the basic concepts and terms used in transportation and logistics
- 02.0 Demonstrate an understanding of the transportation and logistics regulatory environment
- 03.0 Identify risks and safety and security measures in transportation and logistics
- 04.0 Demonstrate the ability to use technology as it relates to transportation and logistics
- 05.0 Demonstrate knowledge of management
- 06.0 Demonstrate an understanding of accounting and finance
- 07.0 Demonstrate an understanding of economics
- 08.0 Demonstrate knowledge of contemporary issues in transportation and logistics
- 09.0 Demonstrate knowledge of documentation (domestic, international, and customs) related to transportation and logistics
- 10.0 Demonstrate the ability to manipulate quantitative data including international weights and measures, as it relates to the movement of goods
- 11.0 Demonstrate an understanding of reverse logistics
- 12.0 Demonstrate knowledge of border security
- 13.0 Identify characteristics and benefits of intermodal transportation
- 14.0 Demonstrate knowledge of procurement, contracts and contract administration as it applies to transportation and logistics
- 15.0 Demonstrate knowledge of performance and quality measurements
- 16.0 Demonstrate knowledge of human resources and labor relations
- 17.0 Demonstrate knowledge and basic skills in project management
- 18.0 Demonstrate public speaking skills
- 19.0 Demonstrate knowledge of geography, culture, customs, and language in international trade
- 20.0 Demonstrate knowledge of professional development and networking
- 21.0 Demonstrate knowledge of supply chain management
- 22.0 Demonstrate knowledge of pricing as it relates to shipping methods
- 23.0 Demonstrate knowledge of market research
- 24.0 Demonstrate knowledge of the air, sea, truck, and rail operations in the movement of freight
- 25.0 Describe the various control processes in freight movement
- 26.0 Distinguish the difference between domestic and international freight movements
- 27.0 Demonstrate knowledge of the Port freight operations
- 28.0 Demonstrate knowledge of rail freight operations
- 29.0 Demonstrate knowledge of trucking operations
- 30.0 Demonstrate knowledge of air cargo operations

Florida Department of Education
Student Performance Standards

Program Title: Transportation and Logistics
 CIP Numbers: 1652020301
 Program Length: 64 Credits
 SOC Code(s): 11-3071; 13-1081; 43-5011; 43-5071; 53-1011; 53-1031

Refer to Rule 6A-14.030 (4), F.A.C., for the minimum amount of general education coursework required in the Associate of Science (AS) degree. At the completion of this program, the student will be able to:	
01.0	Demonstrate an understanding of the basic concepts and terms used in transportation and logistics.-The student will be able to:
01.01	Compare various shipping options
01.02	Analyze types of goods and products and impact on logistics
01.03	Identify the characteristics of a full-service transportation organization
01.04	Demonstrate an understanding of intermodalism
01.05	Demonstrate knowledge of mode-specific logistics
01.06	Demonstrate knowledge of Incoterms versus Uniform Commercial Code (UCC)
01.07	Demonstrate knowledge of how goods move through freight forwarder and customs broker
01.08	Demonstrate knowledge of inventory and warehousing concepts
01.09	Explain the relevance of Just-in-Time (JIT) logistics
01.10	Demonstrate knowledge of shipment process for perishables
01.11	Demonstrate knowledge of packaging and labeling requirements
01.12	Demonstrate knowledge of the advantages and disadvantages of combining given modes of transportation air/sea/land)
01.13	Identify the various governmental regulatory agencies by their names and initials
01.14	Demonstrate the ability to read, write, and conduct a conversation using common terms of freight movement by transportation mode
02.0	Demonstrate an understanding of the transportation and logistics regulatory environment.-The student will be able to:
02.01	Demonstrate knowledge of the “alphabet soup” of regulatory agencies
02.02	Identify which agency(ies) have jurisdiction over a given transportation system
02.03	Demonstrate knowledge of DOT regulations
02.04	Identify who has regulatory authority over a given project
02.05	Identify regulatory requirements

02.06	Identify permits needed for a given project
02.07	Identify consequences of violations of regulatory requirements
02.08	Identify policy issues and political factors in a regulatory environment
02.09	Demonstrate skill in regulatory research
02.10	Demonstrate knowledge of labor laws
03.0	Identify risks and safety and security measures in transportation and logistics.-The student will be able to:
03.01	Establish an emergency management plan
03.02	Identify the need for security background check requirements
03.03	Demonstrate knowledge of OSHA and all agencies involved in the movement of goods including Customs and Border Protection, Transportation and Security Administration, U.S. Department of Agriculture
03.04	Demonstrate knowledge of the impact of technology on countering threats to transportation systems and border security
03.05	Identify differences in dealing with security threats for passenger versus freight/cargo transportation systems including the impact on supply chain logistics
03.06	Outline the primary federal, state, and local agencies in the U.S. that are affiliated with border security and transportation security
03.07	Identify the ethical parameters in which border security agencies operate
03.08	Identify the difference in safety and security threats as they relate to rail, seaport, trucking, and aviation
03.09	Identify the cost/benefit analysis of various safety and security measures
03.10	Implement a schedule
03.11	Analyze system performance
03.12	Develop process maps
03.13	Develop knowledge of process analysis
04.0	Demonstrate the ability to use technology as it relates to transportation and logistics.-The student will be able to:
04.01	Demonstrate the ability to use spreadsheet, word processing, and presentation software
04.02	Demonstrate the ability to use scheduling/planning software
04.03	Identify the electronic systems used in a modern transportation system
04.04	Utilize Internet resources
04.05	Demonstrate ability to use logistics software for bookings, shipments, consolidations, and shipment verifications
05.0	Demonstrate knowledge of management.-The student will be able to:
05.01	Explain management concepts
05.02	Assess and manage human resources and integrated teams

05.03	Provide leadership to procurement, acquisition, logistic, and supply chain management employees
05.04	Apply sound decision-making strategies
05.05	Identify ethical and social responsibility issues
06.0	Demonstrate an understanding of accounting and finance.-The student will be able to:
06.01	Conduct R.O.I. analysis
06.02	Develop a departmental budget
06.03	Monitor a departmental budget
06.04	Demonstrate an understanding of fund accounting
06.05	Demonstrate a basic understanding of cost (managerial) accounting
06.06	Demonstrate an understanding of resource development in a public transportation system
06.07	Conduct cost/benefit analysis
06.08	Conduct post cost analysis
06.09	Identify various revenue streams
06.10	Demonstrate knowledge of financial and credit processes in international shipping
06.11	Demonstrate knowledge of currency exchange methods
06.12	Demonstrate grant writing ability
06.13	Demonstrate grants administration and accounting skills
06.14	Demonstrate understanding of fund accounting
06.15	Demonstrate knowledge of managerial (cost) accounting
06.16	Demonstrate knowledge of an "enterprise fund"
07.0	Demonstrate an understanding of economics.-The student will be able to:
07.01	Compare basic features of different economic systems
07.02	Explain importance of resources to the economy
07.03	Explain concept of organized labor and business
07.04	Apply business economic concepts
07.05	Analyze economic indicators and trends
07.06	Explain measures used to analyze economic conditions
07.07	Explain the nature of international trade
07.08	Explain the impact of cultural and social environments on world trade

07.09	Compare/contrast influences on a nation's ability to trade
08.0	Demonstrate knowledge of contemporary issues in transportation and logistics.-The student will be able to:
08.01	Identify the factors that influence changes in costs among the various modes of transportation
08.02	Demonstrate an understanding of current trends in containerized shipping
08.03	Identify current security issues among the various modes of transportation
08.04	Demonstrate knowledge of the effect of current technology on intermodal transportation systems
08.05	Describe the pros and cons of free trade agreements
08.06	Describe "push" versus "pull" logistics
08.07	Demonstrate knowledge of current trends in currency exchange rates
08.08	Demonstrate knowledge of advantages and disadvantages of logistics centers, intermodal container transfer facilities and intermodal rail yards
09.0	Demonstrate knowledge of documentation (domestic, international, and customs) related to transportation and logistics.-The student will be able to:
09.01	Identify basic documents used in freight forwarding and customs brokering
09.02	Prepare an airway bill
09.03	Demonstrate knowledge of letters of credit
09.04	Identify components of a bill of lading.
10.0	Demonstrate the ability to manipulate quantitative data including international weights and measures, as it relates to the movement of goods.-The student will be able to:
10.01	Convert standard weights and measures to metric and vice versa
10.02	Conduct currency exchange calculations
10.03	Demonstrate skill in practical math for transportation
10.04	Develop quantitative methods for assessing transportation loads
11.0	Demonstrate an understanding of reverse logistics.-The student will be able to:
11.01	Assess the nature and scope of reverse logistics
11.02	Explain the waste management process
12.0	Demonstrate knowledge of border security.-The student will be able to:
12.01	Identify the various agencies affiliated with border security
12.02	Construct a historical timeline reflecting significant transportation-related terrorist threats and events involving border security
12.03	Demonstrate an understanding of the social and cultural issues involved in border security

12.04	Classify the roles, functions, and interdependency between local, federal, and international law enforcement and military agencies to foster border security
13.0	Identify characteristics and benefits of intermodal transportation.-The student will be able to:
13.01	Compare various shipping options
13.02	Analyze types of goods and products and impact on logistics
13.03	Identify the characteristics of a full-service transportation organization
13.04	Demonstrate knowledge of mode-specific logistics
13.05	Demonstrate knowledge of contemporary issues in intermodal transportation
13.06	Demonstrate knowledge of Incoterms versus Uniform Commercial Codes (UCC)
13.07	Demonstrate knowledge of how goods move through freight forwarder and customs broker
13.08	Demonstrate knowledge of warehousing
13.09	Demonstrate knowledge of packaging and labeling requirements
13.10	Demonstrate knowledge of the advantages and disadvantages of combining given modes of transportation (air/sea/truck/rail)
14.0	Demonstrate knowledge of procurement, contracts and contract administration as it applies to transportation and logistics.-The student will be able to:
14.01	Identify the basic components of a contract
14.02	Identify the difference between “void” and “voidable” contracts
14.03	Demonstrate an understanding of the importance of being in compliance with the terms of a contract
14.04	Determine appropriate methods of procurement
14.05	Explain competitive bids, quotations, and proposals
14.06	Evaluate competitive bids to determine the best offer
14.07	Manage contracts and purchase orders from award to completion
14.08	Resolve contract and/or purchase order differences with suppliers
14.09	Explain payment problems with suppliers and user departments
14.10	Discuss the scope of compliance requirements
14.11	Conduct a negotiation
15.0	Demonstrate knowledge of performance and quality measurements.-The student will be able to:
15.01	Develop/track performance measures
15.02	Analyze system performance
15.03	Develop contingency plans

15.04	Demonstrate knowledge of process analysis
15.05	Identify various quality initiatives (ISO, Six Sigma, etc.)
16.0	Demonstrate knowledge of human resources and labor relations.-The student will be able to:
16.01	Demonstrate knowledge of labor contracts
16.02	Conduct conflict resolution
16.03	Identify training needs
16.04	Monitor employee performance
16.05	Evaluate employee performance
16.06	Ensure necessary training
16.07	Identify workload issues
16.08	Identify necessary tools and resources
16.09	Identify need for security/background checks
16.10	Identify impact of union/labor agreements
16.11	Demonstrate knowledge of labor laws
16.12	Demonstrate effective supervisory techniques
17.0	Demonstrate knowledge and skill in project management.-The student will be able to:
17.01	Utilize project management software
17.02	Identify planning/scheduling techniques such as PERT and Critical Path Method
17.03	Develop a project management plan
17.04	Coordinate a project
17.05	Demonstrate an understanding of the connection between time and money
18.0	Demonstrate public speaking skills.-The student will be able to:
18.01	Use public speaking skills to conduct media relations
18.02	Use public speaking skills to conduct public relations
18.03	Use public speaking skills to make a presentation
18.04	Use presentation software to deliver a presentation
19.0	Demonstrate knowledge of geography, culture, customs, and language in international trade.-The student will be able to:
19.01	Demonstrate an understanding of world geography
19.02	Demonstrate knowledge of various cultural customs as it relates to conducting business

19.03	Abstain from the use of idioms when dealing with foreign customers and colleagues
19.04	Demonstrate knowledge of time and date differences in international trade
19.05	Identify customer service techniques that account for cultural differences when working with international clients
20.0	Demonstrate knowledge of professional development and networking.-The student will be able to:
20.01	Create a professional network
20.02	Read industry journals
20.03	Join appropriate professional organizations
20.04	Attend industry/trade shows
20.05	Establish global networks
21.0	Demonstrate knowledge of supply chain management.-The student will be able to:
21.01	Characterize the nature of business
21.02	Explain the nature and scope of logistics
21.03	Explain the importance of inventory
21.04	Explain inventory management methods
21.05	Analyze just in time (JIT) inventory process
21.06	Analyze the Materials Requirement Planning (MRP) system
21.07	Explain the dangers of single-vendor supplier
22.0	Demonstrate knowledge of pricing as it relates to shipping methods.-The student will be able to:
22.01	Identify the importance of time in a given shipment
22.02	Identify issues such as perishability, weight, fragility, and packing method
22.03	Identify best combination of shipping methods given knowledge of product and customer's requirements
22.04	Describe pricing strategies
23.0	Demonstrate knowledge of market research.-The student will be able to:
23.01	Describe market research
23.02	Differentiate between basic market research tools
23.03	Use online market research tools
23.04	Use data collection methods
23.05	Analyze information from various sources
23.06	Analyze and conduct research

23.07	Analyze customer feedback surveys
24.0	Demonstrate knowledge of the air, sea, truck and rail operations for the movement of freight.-The student will be able to:
24.01	Describe the knowledge of the organizational structure for each mode of transportation relative to the movement of freight
24.02	Describe the basic function of each mode
24.03	Identify the important markets for the each mode
24.04	Identify the major companies in each mode
24.05	Compare the various key specializations within an intermodal cargo operation
25.0	Describe the various control processes in freight movement.-The student will be able to:
25.01	Demonstrate knowledge of budgeting and auditing
25.02	Demonstrate knowledge of quality measurements such as on-time performance
25.03	Demonstrate knowledge of customer complaints and quality issues
26.0	Distinguish the difference between domestic and international freight movements.-The student will be able to:
26.01	Describe how legal standards vary
26.02	Describe how safety rules vary
26.03	Distinguish the cultural, political, and geographic effects on the international cargo operations
26.04	Describe the use of a foreign (free) trade zone its advantages
27.0	Demonstrate knowledge of the Port freight operations.-The student will be able to:
27.01	Describe the different types of Ports including seaports, waterway ports and inland ports
27.02	Identify the types of water-borne and inland freight and the types of cargo documentation required
27.03	Describe Port facilities for processing domestic and international cargo
27.04	Describe the types and functions of intermodal facilities at a Port
27.05	Describe the typical organizational structure of a Port and its operations
27.06	Define the role and impact of government and other regulatory agencies in this industry
27.07	Define various terms and abbreviations used in Port freight operations
27.08	Identify the types of hazardous materials moved through Ports and the rules governing this type of shipment
27.09	Describe process for movement of perishable goods
28.0	Demonstrate knowledge of rail freight operations.-The student will be able to:
28.01	Demonstrate knowledge of scheduling shipments and documentation procedures required
28.02	Identify the railroad companies serving the state and what areas their lines serve

28.03	Describe the function of intermodal rail yards, on-Port rail facilities, and intermodal container facilities
28.04	Identify the types of cargo moved by rail and the types of documentation required
28.05	Identify the types of hazardous materials moved by rail and the rules governing this type of shipment
28.06	Describe the role of rail at logistics centers
28.07	Describe the typical organizations structure of a railroad company and its operations
28.08	Describe the role and impact of government and other regulatory agencies in the rail industry
28.09	Define various terms and abbreviations used in the rail industry
28.10	Describe process for movement of perishable goods
29.0	Demonstrate knowledge of trucking operations.-The student will be able to:
29.01	Identify the advantages and disadvantages of trucking company versus owner-operator
29.02	Demonstrate knowledge of processing truck shipments and the driver scheduling issues
29.03	Identify the types of carriers and equipment
29.04	Demonstrate knowledge of weight and load distribution.
29.05	Identify the types of cargo moved by truck and the types of cargo documentation required
29.06	Describe the role of trucking at logistics centers
29.07	Identify the types of hazardous materials moved by truck and the rules governing this type of shipment
29.08	Demonstrate knowledge of intrastate, interstate and international trucking operations
29.09	Define the role and impact of government and other regulatory agencies in the trucking industry
29.10	Define various terms and abbreviations used in the trucking industry
29.11	Describe process for movement of perishable goods
30.0	Demonstrate knowledge of air cargo operations.-The student will be able to:
30.01	Demonstrate knowledge of intrastate, interstate and international air cargo operations
30.02	Describe the air industry as it is found today: the different types of cargo, the different types of carriers, the major players, upstarts, and the future of the industry
30.03	Identify sales and marketing ideals used in the industry, the various rates, and the various tariffs in the air cargo industry
30.04	Differentiate the various types of terminal facilities and equipment, including aircraft, used by the air cargo companies to run an operation
30.05	Define the role and impact of the government and other regulatory agencies in the air cargo industry
30.06	Define various terms and abbreviations used in the air cargo industry
30.07	Categorize the various types of cargo and its major classifications

30.08	Identify the types of hazardous materials moved by air and the regulations governing this type shipment
30.09	Describe the process for movement of perishable goods

Additional Information

Laboratory Activities

Laboratory investigations that include scientific inquiry, research, measurement, problem solving, emerging technologies, tools and equipment, as well as, experimental, quality, and safety procedures are an integral part of this career and technical program/course. Laboratory investigations benefit all students by developing an understanding of the complexity and ambiguity of empirical work, as well as the skills required to manage, operate, calibrate and troubleshoot equipment/tools used to make observations. Students understand measurement error; and have the skills to aggregate, interpret, and present the resulting data. Equipment and supplies should be provided to enhance hands-on experiences for students.

Career and Technical Student Organization (CTSO)

SkillsUSA is the intercurricular career and technical student organization for providing leadership training and reinforcing specific career and technical skills. Career and Technical Student Organizations provide activities for students as an integral part of the instruction offered.

Accommodations

Federal and state legislation requires the provision of accommodations for students with disabilities to meet individual needs and ensure equal access. Postsecondary students with disabilities must self-identify, present documentation, request accommodations if needed, and develop a plan with their counselor and/or instructors. Accommodations received in postsecondary education may differ from those received in secondary education. Accommodations change the way the student is instructed. Students with disabilities may need accommodations in such areas as instructional methods and materials, assignments and assessments, time demands and schedules, learning environment, assistive technology and special communication systems. Documentation of the accommodations requested and provided should be maintained in a confidential file.

Certificate Programs

A College Credit Certificate consists of a program of instruction of less than sixty (60) credits of college-level courses, which is part of an AS or AAS degree program and prepares students for entry into employment (Rule 6A-14.030, F.A.C.). This AS degree program includes the following College Credit Certificates:

- Intermodal Freight Transportation (0652020303) – 18 credit hours
- International Freight Transportation (0652020302) – 15 credit hours

Standards for the above certificate programs are contained in separate curriculum frameworks.

**Florida Department of Education
Curriculum Framework**

Program Title: Supply Chain Management
Career Cluster: Transportation, Distribution and Logistics

AS

CIP Number	1652020901
Program Type	College Credit
Standard Length	60 credit hours
CTSO	SkillsUSA
SOC Codes (all applicable)	53-1031 – First-Line Supervisors of Transportation and Material-Moving Machine and Vehicle Operators 11-3071 – Transportation, Storage, and Distribution Managers

Purpose

The purpose of this program is to prepare students for further education and employment in the Transportation, Distribution and Logistics career cluster. The program is designed to develop the student’s general employability by improving their work attitudes, communication, critical thinking, technical skills, problem-solving skills and occupation-specific skills relative to supply chain management.

The program content is broad-based to reflect the cross-functional relationships prevalent in supply chain management. Students are exposed to related business practices such as standard operating procedures, negotiation techniques, planning, organizing, and accounting concepts, purchasing, sustainability, warehousing, project management, quality control, import/export, and asset management theory. Emphasis is placed on understanding the planning, acquisition, flow, and distribution of goods and services while managing the complexity of operational linkages in a fast-paced global supply chain. Learning is promoted via team work, case studies, practitioner guest lectures, and visits to work sites.

This program prepares students for employment in roles such as: Integrated Logistics Planner, Purchasing Analyst, Cargo Scheduler, International Logistics Clerk, Quality Associate, Inventory Control Manager, Logistics Analyst, Junior Buyer, Customer Service Associate, Materials Analyst, Material Manager, Supply Manager, Dispatcher, Supply Technician, Operations Supervisor, Order Fulfillment Associate, Transportation Coordinator, Distribution Planning Analyst, Packing Supervisor, Transportation Clerk, Cargo Sales, Receiving/Shipping Supervisor, Transportation Specialist, Procurement Clerk, Product Tracing and Tracking Clerk, Warehouse Shift Supervisor, Import/Export Clerk, and Purchasing Agent.

Additional Information relevant to this Career and Technical Education (CTE) program is provided at the end of this document.

Program Structure

This program is a planned sequence of instruction consisting of sixty credit hours.

Standards

After successfully completing this program, the student will be able to perform the following:

- 01.0 Demonstrate an understanding of personal development and professional networking.
- 02.0 Demonstrate an understanding of professional effectiveness.
- 03.0 Demonstrate an understanding of logistics, and supply chain management basics.
- 04.0 Demonstrate an understanding of transportation systems.
- 05.0 Demonstrate an understanding of warehousing and materials handling.
- 06.0 Demonstrate an understanding of packaging.
- 07.0 Demonstrate an understanding of inventory and supply planning.
- 08.0 Demonstrate an understanding of reverse logistics.
- 09.0 Demonstrate an understanding of procurement/contracting.
- 10.0 Demonstrate an understanding of production.
- 11.0 Demonstrate an understanding of product management.
- 12.0 Demonstrate an understanding of pricing.
- 13.0 Demonstrate an understanding of customer relationship management.
- 14.0 Demonstrate an understanding of appropriate finance skills.
- 15.0 Demonstrate an understanding of management practices.
- 16.0 Demonstrate an understanding of supply chain risk management.
- 17.0 Demonstrate an understanding of project and quality management.
- 18.0 Demonstrate an understanding of domestic and global business law, ethics and legal issues.
- 19.0 Demonstrate an understanding of economics.
- 20.0 Demonstrate an understanding of supply chain information management.
- 21.0 Demonstrate an understanding of market research for procurement decisions.
- 22.0 Demonstrate an understanding of writing and presenting documentation.
- 23.0 Demonstrate an understanding of demand planning.
- 24.0 Demonstrate an understanding of the differences between a manufacturing and a services supply chain.

Florida Department of Education
Student Performance Standards

Program Title: Supply Chain Management
 CIP Numbers: 1652020901
 Program Length: 60 credit hours
 SOC Code(s): 53-1031; 11-3071

Refer to Rule 6A-14.030 (4), F.A.C., for the minimum amount of general education coursework required in the Associate of Science (AS) degree. At the completion of this program, the student will be able to:	
01.0	Demonstrate an understanding of personal development and professional networking.-The student will be able to:
01.01	Explore career pathways in supply chain management.
01.02	Explore professional development opportunities for a supply chain management professional.
01.03	Prepare for career advancement in supply chain management.
02.0	Demonstrate an understanding of professional effectiveness.-The student will be able to:
02.01	Explain professional responsibilities in supply chain management.
02.02	Develop self-management skills.
02.03	Demonstrate appropriate work ethics as they apply to supply chain management.
02.04	Apply problem-solving techniques.
02.05	Manage stressful situations.
02.06	Build professional communication skills.
02.07	Disseminate information.
02.08	Develop and achieve goals.
02.09	Manage change.
02.10	Identify time-management skills.
03.0	Demonstrate an understanding of logistics, and supply chain management basics.-The student will be able to:
03.01	Define and characterize supply chain management and logistics.
03.02	Describe the role of other business functional areas in supply chain management.
04.0	Demonstrate an understanding of transportation systems.-The student will be able to:
04.01	Assess the importance of the transportation system.
04.02	Explain the scope of the domestic and global transportation system.

04.03	Describe various services in the transportation industry and how these services are coordinated.
04.04	Explain the infrastructure and equipment used by the various modes of transportation.
04.05	Determine the costs/benefits of company-owned versus for-hire transportation.
04.06	Explain the scope and complexities of international transportation.
04.07	Explain the general costs included in transportation rates.
04.08	Calculate and analyze rate structures and transportation possibilities using electronic spreadsheets.
04.09	Determine multimodal rates.
04.10	Explain common transportation documents.
04.11	Explain procedures to expedite deliveries and conduct follow-up procedures as needed.
05.0	Demonstrate an understanding of warehousing and materials handling.-The student will be able to:
05.01	Explain the reasons for maintaining warehousing.
05.02	Explain the functions of warehouses and distribution centers.
05.03	Compare and contrast public and private warehouses.
05.04	Explain common warehouse documents.
05.05	Describe materials handling functions.
05.06	Explain the elements that influence space layout in warehousing (e.g. productivity, damage, safety, security, etc.)
05.07	Create a cost-benefit analysis.
05.08	Explain the product characteristics that impact logistics.
05.09	Explain order fulfillment procedures.
05.10	Analyze rate structures.
06.0	Demonstrate an understanding of packaging.-The student will be able to:
06.01	Assess types of packaging including customer requirements, and industry required labels.
06.02	Explain the functions of packaging.
06.03	Explain how packaging influences other logistic activities.
07.0	Demonstrate an understanding of inventory and supply planning.-The student will be able to:
07.01	Explain the importance of inventory.
07.02	Explain how inventory is measured and managed.
07.03	Analyze just-in time (JIT) inventory process.
07.04	Understand the use and output of various resource planning systems.

07.05	Calculate, analyze, and incorporate various inventory management tools, including spreadsheets, in order to understand the impact on logistics.
08.0	Demonstrate an understanding of reverse logistics.-The student will be able to:
08.01	Assess the nature and scope of reverse logistics.
08.02	Explain the waste management process.
08.03	Explain the disposition of assets.
09.0	Demonstrate an understanding of procurement/contracting.-The student will be able to:
09.01	Develop a procurement/acquisition plan.
09.02	Analyze organizational requirements for procurement requisitions.
09.03	Determine appropriate methods of procurement.
09.04	Work collaboratively to develop and review specifications, statements of work, performance terms, and/or acceptance criteria.
09.05	Identify and select potential sources of materials or services.
09.06	Explain competitive bids, quotations, and proposals.
09.07	Prepare and solicit competitive bids, quotations, and proposals.
09.08	Evaluate competitive bids to determine the best offer.
09.09	Conduct supplier visits and/or evaluations to determine suitability when needed.
09.10	Analyze elements of contracts.
09.11	Issue contracts.
09.12	Review legal implications of contracting, including the difference between a business decision and legal case.
09.13	Manage contracts and purchase orders from award to completion.
09.14	Resolve contract and/or purchase order differences with suppliers.
09.15	Explain payment problems with suppliers and user departments.
09.16	Discuss the scope of compliance requirements.
09.17	Conduct a negotiation.
10.0	Demonstrate an understanding of production.-The student will be able to:
10.01	Explain the relationship between manufacturing, purchasing, and logistics.
10.02	Explain the concept of production.
10.03	Plan production.
10.04	Apply best practices for production operations.

10.05	Explain impact of new production technology for profitability.
10.06	Analyze job costing using appropriate application software.
11.0	Demonstrate an understanding of product management.-The student will be able to:
11.01	Describe the factors involved in product/service operations.
11.02	Plan product/service management strategies.
11.03	Explain types of products and their impact on logistics.
11.04	Explain the impact of packaging on product/service management.
11.05	Explain the impact of product promotions within supply chain and logistics.
12.0	Demonstrate an understanding of pricing.-The student will be able to:
12.01	Explain pricing fundamentals.
12.02	Evaluate pricing fundamentals.
12.03	Explain how logistics cost can influence pricing decisions.
12.04	Determine prices for products/services.
13.0	Demonstrate an understanding of customer relationship management.-The student will be able to:
13.01	Explain basic customer relationship management (CRM) concepts.
13.02	Demonstrate quality customer service focus.
13.03	Describe the concept of order cycle time.
13.04	Explain the importance of logistic performance on customer service in generating revenue and managing profit and loss.
13.05	Explain the role of technology in order processing, tracking, and customer research.
13.06	Process orders and returns.
14.0	Demonstrate an understanding of appropriate finance skills.-The student will be able to:
14.01	Explain how logistic costs impact net profit.
14.02	Understand and apply various inventory valuation methods, including COGS and Purchase Price Variance (PPV).
14.03	Explain how an income statement and a balance sheet are derived.
14.04	Review and understand the key components of a Profit & Loss statement.
15.0	Demonstrate an understanding of management practices.-The student will be able to:
15.01	Explain basic management concepts.
15.02	Assess and manage human resources and integrated teams at domestic and international levels.

15.03	Provide leadership to procurement, acquisition, logistic, and supply chain management employees at domestic and international levels.
15.04	Apply sound decision-making strategies.
16.0	Demonstrate an understanding of supply chain risk management.-The student will be able to:
16.01	Explain types of risk.
16.02	Explain risk management.
16.03	Analyze safety/security risks.
17.0	Demonstrate an understanding of project and quality management.-The student will be able to:
17.01	Plan and coordinate the diverse components of a project.
17.02	Assess and manage a project.
17.03	Build interpersonal skills with individuals and teams.
17.04	Explain quality assurance.
17.05	Select and employ quality methodologies and tools. (i.e., Lean, Six Sigma, TL9000/ISO9001, etc.)
17.06	Examine quality cost implications.
18.0	Demonstrate an understanding of domestic and global business law, ethics and legal issues.-The student will be able to:
18.01	Review and discuss current legal and ethical considerations as they relate to supply chain management.
18.02	Evaluate policies for managing privacy and ethical issues.
19.0	Demonstrate an understanding of economics.-The student will be able to:
19.01	Compare basic features of different economic systems.
19.02	Explain importance of resources to the economy.
19.03	Explain concept of organized labor and business.
19.04	Apply business economic concepts.
19.05	Analyze economic indicators and trends.
19.06	Explain measures used to analyze economic conditions.
19.07	Explain the nature of international trade and global supply networks.
19.08	Explain the impact of cultural and social environments on world trade.
19.09	Compare/contrast influences on a nation's ability to trade.
20.0	Demonstrate an understanding of supply chain information management.-The student will be able to:
20.01	Explain supply chain management information management.

20.02	Explain and demonstrate use of databases and spreadsheets in organizing supply chain data.
20.03	Examine data using common statistical procedures.
21.0	Demonstrate an understanding of market research for procurement decisions.-The student will be able to:
21.01	Describe market research.
21.02	Differentiate between basic market research resources.
21.03	Use online market research portals.
21.04	Use data collection methods.
21.05	Analyze information from various sources.
21.06	Evaluate and conduct research.
22.0	Demonstrate an understanding of writing and presenting documentation.-The student will be able to:
22.01	Assess report writing requirements.
22.02	Create, write, and present reports using APA format.
23.0	Demonstrate an understanding of demand planning.-The student will be able to:
23.01	Interpret the general concept of demand planning and trend analysis.
23.02	Explain the seasonal influences on forecasts.
23.03	Contrast balancing supply and demand.
23.04	Forecast demand.
24.0	Demonstrate an understanding of the differences between a manufacturing and a services supply chain.-The student will be able to:
24.01	Describe the basic concepts of manufacturing and service operations and their role in meeting customer needs.
24.02	Define the key elements and processes in manufacturing and service operations.
24.03	Describe how to assess the performance of manufacturing and service operations.

Additional Information

Laboratory Activities

Laboratory investigations that include scientific inquiry, research, measurement, problem solving, emerging technologies, tools and equipment, as well as, experimental, quality, and safety procedures are an integral part of this career and technical program/course. Laboratory investigations benefit all students by developing an understanding of the complexity and ambiguity of empirical work, as well as the skills required to manage, operate, calibrate and troubleshoot equipment/tools used to make observations. Students understand measurement error; and have the skills to aggregate, interpret, and present the resulting data. Equipment and supplies should be provided to enhance hands-on experiences for students.

Career and Technical Student Organization (CTSO)

SkillsUSA is the intercurricular career and technical student organization for providing leadership training and reinforcing specific career and technical skills. Career and Technical Student Organizations provide activities for students as an integral part of the instruction offered.

Accommodations

Federal and state legislation requires the provision of accommodations for students with disabilities to meet individual needs and ensure equal access. Postsecondary students with disabilities must self-identify, present documentation, request accommodations if needed, and develop a plan with their counselor and/or instructors. Accommodations received in postsecondary education may differ from those received in secondary education. Accommodations change the way the student is instructed. Students with disabilities may need accommodations in such areas as instructional methods and materials, assignments and assessments, time demands and schedules, learning environment, assistive technology and special communication systems. Documentation of the accommodations requested and provided should be maintained in a confidential file.

Certificate Programs

A College Credit Certificate consists of a program of instruction of less than sixty (60) credits of college-level courses, which is part of an AS or AAS degree program and prepares students for entry into employment (Rule 6A-14.030, F.A.C.). This AS degree program includes the following College Credit Certificates:

Logistics and Transportation Specialist (0652020901) – 18 credit hours

Standards for the above certificate programs are contained in separate curriculum frameworks.

Florida Department of Education
Curriculum Framework

Program Title: Advanced Automotive Service Technology
Program Type: Career Preparatory
Career Cluster: Transportation, Distribution and Logistics

Career Certificate Program – Career Preparatory

Program Number	I470604
CIP Number	0647060406
Grade Level	30, 31
Standard Length	2400 hours
Teacher Certification	Refer to the Program Structure section
CTSO	SkillsUSA
SOC Codes (all applicable)	49-3023 – Automotive Service Technicians and Mechanics
Basic Skills Level	Mathematics: 10 Language: 10 Reading: 10

Purpose

This program offers a sequence of courses that provides coherent and rigorous content aligned with challenging academic standards and relevant technical knowledge and skills needed to prepare for further education and careers in the Transportation, Distribution and Logistics career cluster; provides technical skill proficiency, and includes competency-based applied learning that contributes to the academic knowledge, higher-order reasoning and problem-solving skills, work attitudes, general employability skills, technical skills, and occupation-specific skills, and knowledge of all aspects of the Transportation, Distribution and Logistics career cluster.

The content includes but is not limited to broad, transferable skills and stresses understanding and demonstration of the following elements of the Automotive industry; planning, management, finance, technical and product skills, underlying principles of technology, labor issues, community issues and health, safety, and environmental issues.

Additional Information relevant to this Career and Technical Education (CTE) program is provided at the end of this document.

Program Structure

This program is a planned sequence of instruction consisting of nine occupational completion points.

NOTE: It is recommended that students complete **OCP-A (Automotive Maintenance Technician)** and/or demonstrate mastery of the outcomes in **OCP-A (Automotive Maintenance Technician)** prior to enrolling in additional Advanced Automotive Service Technology courses. **The sequence of OCP's, after completing and/or demonstrating mastery of OCP-A (Automotive Maintenance Technician), is at the discretion of the instructor.**

For institutions using this framework, the National Automotive Technicians Education Foundation (NATEF) highly recommends the Master Automotive Service Technology (MAST) program Certification/Accreditation. Florida Statute (F.S.) 1004.925 – Automotive service technology education programs; certification. – requires all automotive service technology education programs shall be industry certified in accordance with rules adopted by the State Board of Education.

Benchmarks identified with a designation of ASE P-1, P-2, or P-3 are ASE tasks.

When offered at the postsecondary adult career and technical level, this program is comprised of courses which have been assigned course numbers in the SCNS (Statewide Course Numbering System) in accordance with Section 1007.24 (1), F.S. Career and Technical credit shall be awarded to the student on a transcript in accordance with Section 1001.44 (3)(b), F.S.

To teach the course(s) listed below, instructors must hold at least one of the teacher certifications indicated for that course.

The following table illustrates the postsecondary program structure:

OCP	Course Number	Course Title	Teacher Certification	Length	SOC Code
A	AER0011	Automotive Maintenance Technician	AUTO IND @7 %7 %G AUTO MECH @7 7G	400 hours	49-3023
B	AER0118	Advanced Engine Repair Technician		200 hours	49-3023
C	AER0258	Advanced Automatic Transmission and Transaxle Technician		200 hours	49-3023
D	AER0275	Advanced Manual Drivetrain and Axle Technician		200 hours	49-3023
E	AER0459	Advanced Automotive Suspension and Steering Technician		200 hours	49-3023
F	AER0419	Advanced Automotive Brake System Technician		200 hours	49-3023
G	AER0319	Advanced Automotive Electrical/Electronic System Technician		400 hours	49-3023
H	AER0173	Advanced Automotive Heating and Air Conditioning Technician		200 hours	49-3023
I	AER0506	Advanced Automotive Engine Performance Technician		400 hours	49-3023

Common Career Technical Core – Career Ready Practices

Career Ready Practices describe the career-ready skills that educators should seek to develop in their students. These practices are not exclusive to a Career Pathway, program of study, discipline or level of education. Career Ready Practices should be taught and reinforced in all career exploration and preparation programs with increasingly higher levels of complexity and expectation as a student advances through a program of study.

1. Act as a responsible and contributing citizen and employee.
2. Apply appropriate academic and technical skills.
3. Attend to personal health and financial well-being.
4. Communicate clearly, effectively and with reason.
5. Consider the environmental, social and economic impacts of decisions.
6. Demonstrate creativity and innovation.
7. Employ valid and reliable research strategies.
8. Utilize critical thinking to make sense of problems and persevere in solving them.
9. Model integrity, ethical leadership and effective management.
10. Plan education and career path aligned to personal goals.
11. Use technology to enhance productivity.
12. Work productively in teams while using cultural/global competence.

Standards

After successfully completing this program, the student will be able to perform the following:

- 01.0 Proficiently explain and apply required shop and personal safety tasks relating to the automotive industry.
- 02.0 Demonstrate proficiency in preparing vehicle for routine pre/post maintenance and customer services.
- 03.0 Explain and apply proficiently the diagnosis, service and repair of engines, cylinder heads, valve train, engine block, lubrication and cooling systems.
- 04.0 Explain and apply proficiently the diagnosis, service, repair and overhaul of automatic transmissions/transaxles.
- 05.0 Explain and apply proficiently the operation, assembly, diagnosis, service and repair of manual drivetrains, clutches, transmissions/transaxles, drive and half-shaft universals, constant velocity joints, rear axle differential assembly, limited slip, four-wheel drive and all-wheel drive.
- 06.0 Explain and apply proficiently the diagnosis, service and repair of front and rear suspensions systems, wheel alignment, and wheels and tires.
- 07.0 Explain and apply proficiently the diagnosis, service and repair of drum\disc brake, hydraulics, power assist units, electronic brakes, traction control, stability control systems and miscellaneous (wheel bearings, parking brake, electrical, etc.) systems.
- 08.0 Explain and apply proficiently the diagnosis, service and repair of electrical/electronic system components, battery, starting, charging, lighting, gauges, warning devices, driver information, horn, wiper/washer and accessory systems.
- 09.0 Explain and apply proficiently the diagnosis, service and repair of heating and air conditioning, refrigeration, compressors, compressor clutches, evaporators, receiver driers, accumulators, condensers, heating and engine cooling, related control systems, refrigerant recovery, and recycling and handling.
- 10.0 Explain and apply proficiently the diagnosis, service and repair of engines, ignition, fuel, air induction, exhaust, computer engine and emission control systems.

Florida Department of Education
Student Performance Standards

Program Title: **Advanced Automotive Technology**
Career Certificate Program Number: **I470604**

Course Number: **AER0011**
Occupational Completion Point: **A**
Automotive Maintenance Technician – 400 Hours – SOC Code 49-3023

Course Description:

The Automotive Maintenance Technician course prepares students for entry into the Automotive Service industry. Content emphasizes beginning skills and concepts as a recommended requisite. Students study shop and personal safety skills, tools and equipment, pre/post maintenance, and customer service.

Abbreviations:

ASE = Supplemental Tasks

For every task in Automotive Maintenance Technician course, the following safety requirement MUST be strictly enforced:

Comply with personal and environmental safety practices associated with clothing; eye protection; hand tools; power equipment; proper ventilation; and the handling, storage, and disposal of chemicals/materials in accordance with local, state, and federal safety and environmental regulations.

CTE Standards and Benchmarks		Priority Number
01.0	Proficiently explain and apply required shop and personal safety tasks relating to the automotive industry.-The student will be able to:	
01.01	Identify general shop safety rules and procedures.	ASE
01.02	Utilize safe procedures for handling of tools and equipment.	ASE
01.03	Identify and use proper placement of floor jacks and jack stands.	ASE
01.04	Identify and use proper procedures for safe lift operation.	ASE
01.05	Utilize proper ventilation procedures for working within the lab/shop area.	ASE
01.06	Identify marked safety areas.	ASE
01.07	Identify the location and the types of fire extinguishers and other fire safety equipment; demonstrate knowledge of the procedures for using fire extinguishers and other fire safety equipment.	ASE
01.08	Identify the location and use of eye wash stations.	ASE
01.09	Identify the location of the posted evacuation routes.	ASE

CTE Standards and Benchmarks	Priority Number
01.10 Comply with the required use of safety glasses, ear protection, gloves, and shoes during lab/shop activities.	ASE
01.11 Identify and wear appropriate clothing for lab/shop activities.	ASE
01.12 Secure hair and jewelry for lab/shop activities.	ASE
01.13 Demonstrate awareness of the safety aspects of supplemental restraint systems (SRS), electronic brake control systems, and hybrid vehicle high voltage circuits.	ASE
01.14 Demonstrate awareness of the safety aspects of high voltage circuits (such as high intensity discharge (HID) lamps, ignition systems, injection systems, etc.).	ASE
01.15 Locate and demonstrate knowledge of safety data sheets (SDS).	ASE
01.16 Identify tools and their usage in automotive applications.	ASE
01.17 Identify standard and metric designation.	ASE
01.18 Demonstrate safe handling and use of appropriate tools.	ASE
01.19 Demonstrate proper cleaning, storage, and maintenance of tools and equipment.	ASE
01.20 Demonstrate proper use of precision measuring tools (i.e. micrometer, dial-indicator, dial caliper).	ASE
01.21 Identify information needed and the service requested on a repair order.	ASE
01.22 Identify purpose and demonstrate proper use of fender covers, mats.	ASE
01.23 Demonstrate use of the three C's (concern, cause, and correction).	ASE
01.24 Review vehicle service history.	ASE
01.25 Complete work order to include customer information, vehicle identifying information, customer concern, related service history, cause, and correction.	ASE
01.26 Ensure vehicle is prepared to return to customer per school/company policy (floor mats, steering wheel cover, etc.).	ASE
01.27 Identify appropriate emergency first aid procedures.	
01.28 Identify proper procedures for safe pit usage.	
01.29 Use proper handling procedures for automotive fluids.	
01.30 Identify and describe typical automotive lubricants and lubricant properties.	
01.31 Research, identify, and interpret the Federal Law as recorded in (29 CFR-1910.1200).	
01.32 Identify and describe typical automotive seals and gaskets.	
01.33 Explain the effects of chemical/substance abuse.	
01.34 Identify principles of stress management.	
01.35 Identify and define career opportunities in the automotive service industry.	

CTE Standards and Benchmarks	Priority Number
01.36 Demonstrate knowledge of appropriate automotive industry certifications.	
01.37 Disable supplemental restraint systems (SRS) in accordance with manufacturers' procedures.	
02.0 Demonstrate proficiency in preparing vehicle for routine pre/post maintenance and customer services.-The student will be able to:	
02.01 Identify automobiles according to engine location, cylinders, type of drive system, purpose, etc.	
02.02 Locate and use Vehicle identification Number (VIN) vehicle information placards, decals, tags, as required.	
02.03 Conduct an appropriate pre-service evaluation and report or note any concerns not already on the repair order.	
02.04 Demonstrate retrieving stored diagnostic trouble codes.	
02.05 Reset product specific service indicator.	
02.06 Identify acceptable customer relations.	
02.07 Identify and demonstrate proper customer relations skills.	
02.08 Identify and define payroll deductions (taxes, insurance, and social security) employee benefits and pay systems.	
02.09 Identify principles of time management.	
02.10 Demonstrate proficiency in manufacturer electronic service information system, including flat rate manuals, technical service bulletins and replacement part identification; where applicable.	
02.11 Use proper chemicals for cleaning and lubrication.	
02.12 Determine the presence of a Tire Pressure Monitoring System (TPMS).	
02.13 Identify service considerations when equipped with a Tire Pressure Monitoring System (TPMS).	
02.14 Determine the presence of wheel locks.	
02.15 Determine the presence of an air suspension system.	
02.16 Check operation and status of instrument panel warning lights and gauges.	
02.17 Inspect under hood area for leaks, damage, and unusual conditions.	
02.18 Inspect undercar area for leaks, damage, and unusual conditions.	
02.19 Inspect engine assembly for fuel, oil, coolant, and other leaks.	
02.20 Determine fluid type requirements and identify fluid.	
02.21 Check engine oil level and condition; service as required.	
02.22 Check engine coolant level and condition; service as required.	
02.23 Inspect cooling system pipes and hoses for wear, damage, and proper routing.	

CTE Standards and Benchmarks	Priority Number
02.24 Check power steering fluid level and condition; service as required.	
02.25 Lubricate driveline, suspension and steering systems as applicable.	
02.26 Inspect and replace power steering hoses and fittings.	
02.27 Inspect struts, springs, and related components; service as required.	
02.28 Inspect stabilizer bar, bushings, brackets, and links; service as required.	
02.29 Inspect springs, torsion bars, and related components; service as required.	
02.30 Inspect shock absorbers and related components.	
02.31 Check windshield washer fluid level and condition; service as required.	
02.32 Check automatic transmission fluid level and condition; service as required.	
02.33 Check differential/transfer case fluid level; note unusual conditions; service as required.	
02.34 Check manual transmission fluid level; note unusual conditions; service as required.	
02.35 Service transmission; perform visual inspection; replace fluids and filters.	
02.36 Check hydraulic clutch fluid and condition; service as required.	
02.37 Check rear axle drive assembly seals and vents; check lube level.	
02.38 Inspect constant velocity (CV) axle shaft boots; service as required.	
02.39 Remove, inspect, and service front and rear wheel bearings on non-drive axles.	
02.40 Check wheel bearings for play and other signs of wear.	
02.41 Inspect, replace and adjust drive belts; inspect tensioners and pulleys.	
02.42 Inspect and replace air filter.	
02.43 Inspect and replace cabin air filter.	
02.44 Inspect tires, diagnose tire wear patterns, inspect spare and mounting system; check and adjust tire pressure; where applicable.	
02.45 Rotate tires according to manufacturer's recommendations.	
02.46 Balance wheel and tire assembly (static, dynamic and road force balance); where applicable.	
02.47 Dismount, inspect, repair, and remount tire on wheel.	
02.48 Repair tire according to industry standards.	
02.49 Identify nitrogen-filled tires.	
02.50 Reinstall wheel; torque wheel fasteners to specification.	

CTE Standards and Benchmarks	Priority Number
02.51 Perform a visual inspection of a brake drum system.	
02.52 Perform a visual inspection of a disc brake system.	
02.53 Check parking brake operation; check parking brake components for unusual conditions.	
02.54 Check master cylinder for internal and external leaks and proper operation.	
02.55 Fill master cylinder with recommended fluid and seat pads.	
02.56 Check brake fluid level and condition; service as required.	
02.57 Inspect brake lines, flexible hoses, and fittings for leaks, dents, kinks, rust, cracks, bulging or wear.	
02.58 Identify and use the proper procedures required for cutting tubing and double and ISO flaring.	
02.59 Inspect flexible brake hoses for leaks, kinks, cracks, bulging or wear; tighten loose fittings and supports.	
02.60 Inspect fuel tank, fuel cap and seal; inspect and replace fuel lines, fittings, and hoses; as applicable.	
02.61 Inspect and replace fuel filters as applicable.	
02.62 Inspect exhaust manifold, exhaust pipes, mufflers, resonators, tail pipes, and heat shields; repair or replace as needed.	
02.63 Inspect, test head lamps, tail lamps and stop lamps. Aim headlights.	
02.64 Inspect and replace exterior and courtesy lamps.	
02.65 Check wiper blades, inserts, and arms; replace wiper blades or inserts.	
02.66 Lubricate door latches and hinges.	
02.67 Perform slow/fast battery charge.	
02.68 Inspect, clean, fill, and replace battery.	
02.69 Inspect and clean battery cables, connectors, clamps, and hold-downs; repair or replace as needed.	
02.70 Perform battery, starting, and charging system tests using appropriate tester.	
02.71 Perform battery test; determine needed service.	
02.72 Start a vehicle using jumper cables or a battery auxiliary power supply (jump box).	
02.73 Demonstrate knowledge of abnormal key-off battery drain.	
02.74 Perform starter current draw and circuit voltage drop test; determine necessary action.	
02.75 Remove and replace/reinstall starter.	
02.76 Remove, inspect, and replace/reinstall alternator.	
02.77 Observe dash warning lamps during bulb check.	

CTE Standards and Benchmarks	Priority Number
02.78 Practice recommended precautions when handling static sensitive devices.	
02.79 Check 12 volt non-computer electrical circuits with a test light; determine necessary action.	
02.80 Check voltage and voltage drop in electrical circuits using a digital multi-meter (DMM).	
02.81 Obtain and interpret digital multi-meter (DMM) readings.	
02.82 Check current flow in electrical/electronic circuits and components using an ammeter.	
02.83 Check electrical circuits using fused jumper wires.	
02.84 Inspect and test fusible links, circuit breakers, and fuses; confirm proper circuit operation; replace as needed.	
02.85 Maintain or restore electronic memory functions if required.	
02.86 Inspect and test positive crankcase ventilation (PCV) filter/breather cap, valve, tubes, orifices, and hoses; service or replace as needed.	
02.87 Remove and replace valve cover gaskets.	
02.88 Return cores for rebuilt and exchange items.	
02.89 Inspect driver and passenger restraint system.	
02.90 Demonstrate knowledge of manufacturer policies and procedures.	
02.91 Perform product specific service procedures.	
02.92 Identify and maintain product specific engine systems.	
02.93 Identify and maintain product specific automatic transmission systems.	
02.94 Identify and maintain product specific manual transmission systems.	
02.95 Identify and maintain product specific electrical and electronic systems.	
02.96 Identify and maintain product specific heating and A/C systems.	
02.97 Identify and maintain product specific steering and suspension systems.	
02.98 Identify and maintain product specific brake systems.	
02.99 Identify and maintain product specific audio systems.	
02.100 Identify and maintain product specific safety systems.	
02.101 Identify and maintain product specific accessories.	
02.102 Identify product specific engine performance and emission related components	
02.103 Use manufacturer specific scan tool to retrieve P, B, C and U type diagnostic trouble codes.	

**Florida Department of Education
Student Performance Standards**

Course Number: AER0018
Occupational Completion Point: B
Advanced Engine Repair Technician – 200 Hours – SOC Code 49-3023

Course Description:

The Advanced Engine Repair Technician course prepares students for entry into the Automotive Service industry. Content emphasizes beginning skills and concepts as a recommended requisite. Students study engine theory and repair, cylinder heads, valve trains, engine blocks, lubrication, and cooling systems.

Abbreviations:

ER = Engine Repair

For every task in Advanced Engine Repair Technician course, the following safety requirement MUST be strictly enforced:

Comply with personal and environmental safety practices associated with clothing; eye protection; hand tools; power equipment; proper ventilation; and the handling, storage, and disposal of chemicals/materials in accordance with local, state, and federal safety and environmental regulations.

ER Task List:	
P-1 =	24
P-2 =	16
P-3 =	11
Total	51

CTE Standards and Benchmarks		Priority Number
03.0	Explain and apply proficiently the diagnosis, service and repair of engines, cylinder heads, valve train, engine block, lubrication and cooling systems.-The student will be able to:	
General: Engine Diagnosis; Removal and Reinstallation (R&R)		
03.01	Complete work order to include customer information, vehicle identifying information, customer concern, related service history, cause, and correction.	P-1
03.02	Research vehicle service information including fluid type, internal engine operation, vehicle service history, service precautions, and technical service bulletins.	P-1
03.03	Verify operation of the instrument panel engine warning indicators.	P-1
03.04	Inspect engine assembly for fuel, oil, coolant, and other leaks; determine needed action.	P-1
03.05	Install engine covers using gaskets, seals, and sealers as required.	P-1
03.06	Verify engine mechanical timing.	P-1
03.07	Perform common fastener and thread repair, to include: remove broken bolt, restore internal and external threads, and repair internal threads with thread insert.	P-1
03.08	Inspect, remove and/or replace engine mounts.	P-2

CTE Standards and Benchmarks	Priority Number
03.09 Identify service precautions related to service of the internal combustion engine of a hybrid vehicle.	P-2
03.10 Remove and reinstall engine on a newer vehicle equipped with OBD; reconnect all attaching components and restore the vehicle to running condition.	P-3
Cylinder Head and Valve Train Diagnosis and Repair	
03.11 Remove cylinder head; inspect gasket condition; install cylinder head and gasket; tighten according to manufacturer's specification and procedure.	P-1
03.12 Clean and visually inspect a cylinder head for cracks; check gasket surface areas for warpage and surface finish; check passage condition.	P-1
03.13 Inspect pushrods, rocker arms, rocker arm pivots and shafts for wear, bending, cracks, looseness, and blocked oil passages (orifices); determine needed action.	P-2
03.14 Adjust valves (mechanical or hydraulic lifters).	P-1
03.15 Inspect and replace camshaft and drive belt/chain; includes checking drive gear wear and backlash, end play, sprocket and chain wear, overhead cam drive sprocket(s), drive belt(s), belt tension, tensioners, camshaft reluctor ring/tone-wheel, and valve timing components; verify correct camshaft timing.	P-1
03.16 Establish camshaft position sensor indexing.	P-1
03.17 Inspect valve springs for squareness and free height comparison; determine needed action.	P-3
03.18 Replace valve stem seals on an assembled engine; inspect valve spring retainers, locks/keepers, and valve lock/keeper grooves; determine needed action.	P-3
03.19 Inspect valve guides for wear; check valve stem-to-guide clearance; determine needed action.	P-3
03.20 Inspect valves and valve seats; determine needed action.	P-3
03.21 Check valve spring assembled height and valve stem height; determine needed action.	P-3
03.22 Inspect valve lifters; determine needed action.	P-2
03.23 Inspect and/or measure camshaft for runout, journal wear and lobe wear.	P-3
03.24 Inspect camshaft bearing surface for wear, damage, out-of-round, and alignment; determine needed action.	P-3
Engine Block Assembly Diagnosis and Repair	
03.25 Remove, inspect, and/or replace crankshaft vibration damper (harmonic balancer).	P-1
03.26 Disassemble engine block; clean and prepare components for inspection and reassembly.	P-1
03.27 Inspect engine block for visible cracks, passage condition, core and gallery plug condition, and surface warpage; determine needed action.	P-2
03.28 Inspect and measure cylinder walls/sleeves for damage, wear, and ridges; determine needed action.	P-2
03.29 Deglaze and clean cylinder walls.	P-2
03.30 Inspect and measure camshaft bearings for wear, damage, out-of-round, and alignment; determine needed action.	P-3

CTE Standards and Benchmarks	Priority Number
03.31 Inspect crankshaft for straightness, journal damage, keyway damage, thrust flange and sealing surface condition, and visual surface cracks; check oil passage condition; measure end play and journal wear; check crankshaft position sensor reluctor ring (where applicable); determine needed action.	P-1
03.32 Inspect main and connecting rod bearings for damage and wear; determine needed action.	P-2
03.33 Identify piston and bearing wear patterns that indicate connecting rod alignment and main bearing bore problems; determine needed action.	P-3
03.34 Inspect and measure piston skirts and ring lands; determine needed action.	P-2
03.35 Determine piston-to-bore clearance.	P-2
03.36 Inspect, measure, and install piston rings.	P-2
03.37 Inspect auxiliary shaft(s) (balance, intermediate, idler, counterbalance and/or silencer); inspect shaft(s) and support bearings for damage and wear; determine needed action; reinstall and time.	P-2
03.38 Assemble engine block.	P-1
Lubrication and Cooling Systems Diagnosis and Repair	
03.39 Perform cooling system pressure and dye tests to identify leaks; check coolant condition and level; inspect and test radiator, pressure cap, coolant recovery tank, heater core, and galley plugs; determine needed action.	P-1
03.40 Identify causes of engine overheating.	P-1
03.41 Inspect, replace, and/or adjust drive belts, tensioners, and pulleys; check pulley and belt alignment.	P-1
03.42 Inspect and/or test coolant; drain and recover coolant; flush and refill cooling system; use proper fluid type per manufacturer specification; bleed air as required.	P-1
03.43 Inspect, remove, and replace water pump.	P-2
03.44 Remove and replace radiator.	P-2
03.45 Remove, inspect, and replace thermostat and gasket/seal.	P-1
03.46 Inspect and test fan(s), fan clutch (electrical or mechanical), fan shroud, and air dams; determine needed action.	P-1
03.47 Perform oil pressure tests; determine needed action.	P-1
03.48 Perform engine oil and filter change; use proper fluid type per manufacturer specification.	P-1
03.49 Inspect auxiliary coolers; determine needed action.	P-3
03.50 Inspect, test, and replace oil temperature and pressure switches and sensors.	P-2
03.51 Inspect oil pump gears or rotors, housing, pressure relief devices, and pump drive; perform needed action.	P-2
Manufacturer Specific Engine Repair Tasks	
03.52 Inspect and replace engine cooling and heater system hoses.	

CTE Standards and Benchmarks	Priority Number
03.53 Service product specific water pumps.	
03.54 Service product specific belt drive and tensioner systems.	
03.55 Service product specific engine systems.	
03.56 Diagnose engine noises and vibrations; determine necessary action.	
03.57 Diagnose the cause of excessive oil consumption, coolant consumption, unusual engine exhaust color and odor; determine necessary action.	
03.58 Perform engine vacuum tests; determine necessary action.	
03.59 Service product specific cam drive systems.	
03.60 Perform product specific valve adjustments.	
03.61 Perform cylinder power balance tests; determine necessary action.	
03.62 Perform cylinder cranking and running compression tests; determine necessary action.	
03.63 Perform cylinder leakage tests; determine necessary action.	
03.64 Remove and replace piston pin; where applicable.	
03.65 Service product specific engines	
03.66 Perform product specific relearn procedure	

**Florida Department of Education
Student Performance Standards**

Course Number: AER0258

Occupational Completion Point: C

Advanced Automatic Transmission and Transaxle Technician – 200 Hours – SOC Code 49-3023

Course Description:

The Advanced Automatic Transmission and Transaxle Technician course prepares students for entry into the Automotive Service industry. Content emphasizes beginning skills and concepts as a recommended requisite. Students study automatic transmission/transaxle diagnosis, service, and repair.

Abbreviations:

AT = Automatic Transmission/Transaxle

For every task in Advanced Automatic Transmission and Transaxle Technician course, the following safety requirement MUST be strictly enforced:

Comply with personal and environmental safety practices associated with clothing; eye protection; hand tools; power equipment; proper ventilation; and the handling, storage, and disposal of chemicals/materials in accordance with local, state, and federal safety and environmental regulations.

AT Task List:	
P-1 =	17
P-2 =	19
P-3 =	3
Total	39

CTE Standards and Benchmarks		Priority Number
04.0	Explain and apply proficiently the diagnosis, service, repair and overhaul of automatic transmissions/transaxles.-The student will be able to:	
General: Transmission and Transaxle Diagnosis		
04.01	Identify and interpret transmission/transaxle concerns, differentiate between engine performance and transmission/transaxle concerns; determine needed action.	P-1
04.02	Research vehicle service information including fluid type, vehicle service history, service precautions, and technical service bulletins.	P-1
04.03	Diagnose fluid loss and condition concerns; determine needed action.	P-1
04.04	Check fluid level in a transmission or a transaxle equipped with a dip-stick.	P-1
04.05	Check fluid level in a transmission or a transaxle not equipped with a dip-stick.	P-1
04.06	Perform pressure tests (including transmissions/transaxles equipped with electronic pressure control); determine needed action.	P-1
04.07	Diagnose noise and vibration concerns; determine needed action.	P-2
04.08	Perform stall test; determine needed action.	P-2

CTE Standards and Benchmarks	Priority Number
04.09 Perform lock-up converter system tests; determine needed action.	P-3
04.10 Diagnose transmission/transaxle gear reduction/multiplication concerns using driving, driven, and held member (power flow) principles.	P-1
04.11 Diagnose electronic transmission/transaxle control systems using appropriate test equipment and service information.	P-1
04.12 Diagnose pressure concerns in a transmission using hydraulic principles (Pascal's Law).	P-2
In-Vehicle Transmission/Transaxle Maintenance Repair	
04.13 Inspect, adjust, and/or replace external manual valve shift linkage, transmission range sensor/switch, and/or park/neutral position switch.	P-1
04.14 Inspect for leakage; replace external seals, gaskets, and bushings.	P-2
04.15 Inspect, test, adjust, repair, and/or replace electrical/electronic components and circuits including computers, solenoids, sensors, relays, terminals, connectors, switches, and harnesses; demonstrate understanding of the relearn procedure.	P-1
04.16 Drain and replace fluid and filter(s); use proper fluid type per manufacturer specification.	P-1
04.17 Inspect, replace and align powertrain mounts.	P-2
Off-Vehicle Transmission and Transaxle Repair	
04.18 Remove and reinstall transmission/transaxle and torque converter; inspect engine core plugs, rear crankshaft seal, dowel pins, dowel pin holes, and mounting surfaces.	P-2
04.19 Inspect, leak test, flush, and/or replace transmission/transaxle oil cooler, lines, and fittings.	P-1
04.20 Inspect converter flex (drive) plate, converter attaching bolts, converter pilot, converter pump drive surfaces, converter end play, and crankshaft pilot bore.	P-2
04.21 Describe the operational characteristics of a continuously variable transmission (CVT).	P-3
04.22 Describe the operational characteristics of a hybrid vehicle drive train.	P-3
04.23 Disassemble, clean, and inspect transmission/transaxle.	P-1
04.24 Inspect, measure, clean, and replace valve body (includes surfaces, bores, springs, valves, switches, solenoids, sleeves, retainers, brackets, check valves/balls, screens, spacers, and gaskets).	P-2
04.25 Inspect servo and accumulator bores, pistons, seals, pins, springs, and retainers; determine needed action.	P-2
04.26 Assemble transmission/transaxle.	P-1
04.27 Inspect, measure, and reseal oil pump assembly and components.	P-2
04.28 Measure transmission/transaxle end play and/or preload; determine needed action.	P-1
04.29 Inspect, measure, and/or replace thrust washers and bearings.	P-2
04.30 Inspect oil delivery circuits, including seal rings, ring grooves, and sealing surface areas, feed pipes, orifices, and check valves/balls.	P-2

CTE Standards and Benchmarks	Priority Number
04.31 Inspect bushings; determine needed action.	P-2
04.32 Inspect and measure planetary gear assembly components; determine needed action.	P-2
04.33 Inspect case bores, passages, bushings, vents, and mating surfaces; determine needed action.	P-2
04.34 Diagnose and inspect transaxle drive, link chains, sprockets, gears, bearings, and bushings; perform needed action.	P-2
04.35 Inspect measure, repair, adjust or replace transaxle final drive components.	P-2
04.36 Inspect clutch drum, piston, check-balls, springs, retainers, seals, friction plates, pressure plates, and bands; determine needed action.	P-2
04.37 Measure clutch pack clearance; determine needed action.	P-1
04.38 Air test operation of clutch and servo assemblies.	P-1
04.39 Inspect one-way clutches, races, rollers, sprags, springs, cages, retainers; determine needed action.	P-2
Manufacturer Specific Automatic Transmission Tasks	
04.40 Install and seat torque converter to engage drive/splines.	
04.41 Inspect bands and drums; determine necessary action.	
04.42 Service product specific automatic transmissions/transaxles.	
04.43 Perform product specific relearn procedure.	
04.44 Diagnose electronic transmission control systems using appropriate test equipment, service information, technical service bulletins, and schematics; diagnose shorts, grounds, opens, and resistance problems in electrical/electronic circuits; determine necessary action.	
04.45 Differentiate between engine performance, or other vehicle systems, and transmission/transaxle related problems; determine necessary action.	
04.46 Diagnose shift quality concerns resulting from problems in the electronic transmission control system; determine necessary action.	

Florida Department of Education
Student Performance Standards

Course Number: AER0275
Occupational Completion Point: D
Advanced Manual Drivetrain and Axle Technician – 200 Hours – SOC Code 49-3023

Course Description:

The Advanced Manual Drivetrain and Axle Technician course prepares students for entry into the Automotive Service industry. Content emphasizes beginning skills and concepts as a recommended requisite. Students study manual drivetrain, clutch, transmission/transaxle, drive and half-shaft universals, constant velocity joints, rear axle differential, limited slip, four-wheel drive, all-wheel drive operation, assembly, diagnosis, service and repair.

Abbreviations:

MD = Manual Drivetrain and Axles

For every task in Advanced Manual Drivetrain and Axle Technician course, the following safety requirement MUST be strictly enforced:

Comply with personal and environmental safety practices associated with clothing; eye protection; hand tools; power equipment; proper ventilation; and the handling, storage, and disposal of chemicals/materials in accordance with local, state, and federal safety and environmental regulations.

MD Task List:	
	P-1 = 18
	P-2 = 16
	P-3 = 16
Total	50

CTE Standards and Benchmarks		Priority Number
05.0	Explain and apply proficiently the operation, assembly, diagnosis, service and repair of manual drivetrains, clutches, transmissions/transaxles, drive and half-shaft universals, constant velocity joints, rear axle differential assembly, limited slip, four-wheel drive and all-wheel drive.-The student will be able to:	
General: Drive Train Diagnosis		
05.01	Identify and interpret drive train concerns; determine needed action.	P-1
05.02	Research vehicle service information including fluid type, vehicle service history, service precautions, and technical service bulletins.	P-1
05.03	Check fluid condition; check for leaks; determine needed action.	P-1
05.04	Drain and refill manual transmission/transaxle and final drive unit; use proper fluid type per manufacturer specification.	P-1
Clutch Diagnosis and Repair		
05.05	Diagnose clutch noise, binding, slippage, pulsation, and chatter; determine needed action.	P-1

CTE Standards and Benchmarks	Priority Number
05.06 Inspect clutch pedal linkage, cables, automatic adjuster mechanisms, brackets, bushings, pivots, and springs; perform needed action.	P-1
05.07 Inspect and/or replace clutch pressure plate assembly, clutch disc, release (throw-out) bearing, linkage, and pilot bearing/bushing (as applicable).	P-1
05.08 Bleed clutch hydraulic system.	P-1
05.09 Check and adjust clutch master cylinder fluid level; check for leaks; use proper fluid type per manufacturer specification.	P-1
05.10 Inspect flywheel and ring gear for wear, cracks, and discoloration; determine needed action.	P-1
05.11 Measure flywheel runout and crankshaft end play; determine needed action.	P-2
05.12 Describe the operation and service of a system that uses a dual mass flywheel.	P-3
Transmission/Transaxle Diagnosis and Repair	
05.13 Inspect, adjust, lubricate, and/or replace shift linkages, brackets, bushings, cables, pivots, and levers.	P-2
05.14 Describe the operational characteristics of an electronically-controlled manual transmission/transaxle.	P-2
05.15 Diagnose noise concerns through the application of transmission/transaxle power-flow principles.	P-2
05.16 Diagnose hard shifting and jumping out of gear concerns; determine needed action.	P-2
05.17 Diagnose transaxle final drive assembly noise and vibration concerns; determine needed action.	P-3
05.18 Disassemble, inspect clean, and reassemble internal transmission/transaxle components.	P-2
Drive Shaft and Half Shaft, Universal and Constant-Velocity (CV) Joint Diagnosis and Repair (Front, Rear, All-Wheel, and Four-Wheel drive)	
05.19 Diagnose constant-velocity (CV) joint noise and vibration concerns; determine needed action.	P-1
05.20 Diagnose universal joint noise and vibration concerns; perform needed action.	P-2
05.21 Inspect, remove, and/or replace bearings, hubs, and seals.	P-1
05.22 Inspect, service, and/or replace shafts, yokes, boots, and universal/CV joints.	P-1
05.23 Check shaft balance and phasing; measure shaft runout; measure and adjust driveline angles.	P-2
Drive Axle Diagnosis and Repair – Ring and Pinion Gears and Differential Case Assembly	
05.24 Clean and inspect differential case; check for leaks; inspect housing vent.	P-1
05.25 Check and adjust differential case fluid level; use proper fluid type per manufacturer specification.	P-1
05.26 Drain and refill differential case; use proper fluid type per manufacturer specifications .	P-1
05.27 Diagnose noise and vibration concerns; determine needed action.	P-2
05.28 Inspect and replace companion flange and/or pinion seal; measure companion flange runout.	P-2

CTE Standards and Benchmarks	Priority Number
05.29 Inspect ring gear and measure runout; determine needed action.	P-3
05.30 Remove, inspect, reinstall and/or drive pinion and ring gear, spacers, sleeves, and bearings.	P-3
05.31 Measure and adjust drive pinion depth.	P-3
05.32 Measure and adjust drive pinion bearing preload.	P-3
05.33 Measure and adjust side bearing preload and ring and pinion gear total backlash and backlash variation on a differential carrier assembly (threaded cup or shim types).	P-3
05.34 Check ring and pinion tooth contact patterns; perform needed action.	P-3
05.35 Disassemble, inspect, measure, adjust, and/or replace differential pinion gears (spiders), shaft, side gears, side bearings, thrust washers, and case.	P-3
05.36 Reassemble and reinstall differential case assembly; measure runout; determine needed action.	P-3
Drive Axle Diagnosis and Repair – Limited Slip Differential	
05.37 Diagnose noise, slippage, and chatter concerns; determine needed action.	P-3
05.38 Measure rotating torque; determine needed action.	P-3
Drive Axle Diagnosis and Repair – Drive Axles	
05.39 Inspect and replace drive axle wheel studs.	P-1
05.40 Remove and replace drive axle shafts.	P-1
05.41 Inspect and replace drive axle shaft seals, bearings, and retainers.	P-2
05.42 Measure drive axle flange runout and shaft end play; determine needed action.	P-2
05.43 Diagnose drive axle shafts, bearings, and seals for noise, vibration, and fluid leakage concerns; determine needed action.	P-2
Four-Wheel Drive/All-Wheel Drive Component Diagnosis and Repair	
05.44 Inspect, adjust, and repair shifting controls (mechanical, electrical, and vacuum), bushings, mounts, levers, and brackets.	P-3
05.45 Inspect locking hubs; determine needed action.	P-3
05.46 Check for leaks at drive assembly and transfer case seals; check vents; check fluid level; use proper fluid type per manufacturer specification.	P-3
05.47 Identify concerns related to variations in tire circumference and/or final drive ratios.	P-2
05.48 Diagnose noise, vibration, and unusual steering concerns; determine needed action.	P-3
05.49 Diagnose, test, adjust, and/or replace electrical/electronic components of four-wheel drive/all-wheel drive systems.	P-2
05.50 Disassemble, service, and reassemble transfer case and components.	P-2

CTE Standards and Benchmarks	Priority Number
Manufacturer Specific Manual Drivetrain and Axle Tasks	
05.51 Locate and interpret vehicle major drivetrain components and identification numbers.	
05.52 Diagnose fluid loss, level, and condition concerns; determine necessary action.	
05.53 Inspect hydraulic clutch slave and master cylinders, lines, and hoses; determine necessary action.	
05.54 Inspect engine block, core plugs, rear main engine oil seal, clutch (bell) housing, transmission/transaxle case mating surfaces, and alignment dowels; determine necessary action.	
05.55 Remove and reinstall manual transmission/transaxle.	
05.56 Inspect transmission/transaxle case, extension housing, case mating surfaces, bores, bushings, and vents; perform necessary action.	
05.57 Inspect, replace, and align powertrain mounts.	
05.58 Inspect and replace gaskets, seals, and sealants; inspect sealing surfaces.	
05.59 Remove and replace transaxle final drive.	
05.60 Inspect, adjust, and reinstall shift cover, forks, levers, grommets, shafts, sleeves, detent mechanism, interlocks, and springs.	
05.61 Measure end play or preload (shim or spacer selection procedure) on transmission/transaxle shafts; perform necessary action.	
05.62 Inspect and reinstall synchronizer hub, sleeve, keys (inserts), springs, and blocking rings.	
05.63 Remove, inspect, measure, adjust, and reinstall transaxle final drive pinion gears (spiders), shaft, side gears, side bearings, thrust washers, and case assembly.	
05.64 Inspect lubrication devices (oil pump or slingers); perform necessary action.	
05.65 Inspect, test, and replace transmission/transaxle sensors and switches.	
05.66 Inspect, service, and replace shaft center support bearings.	
05.67 Diagnose noise and vibration concerns; determine necessary action.	
05.68 Inspect and reinstall limited slip differential components.	
05.69 Remove and reinstall transfer case.	
05.70 Service product specific clutch assembly	
05.71 Service product specific manual transmission/transaxles	
05.72 Service product specific driveaxles/driveshafts	
05.73 Service product specific transfer cases	

**Florida Department of Education
Student Performance Standards**

Course Number: AER0459
Occupational Completion Point: E
Advanced Automotive Suspension and Steering Technician – 200 Hours – SOC Code 49-3023

Course Description:

The Advanced Automotive Suspension and Steering Technician course prepares students for entry into the Automotive Service industry. Content emphasizes beginning skills and concepts as a recommended requisite. Students study front and rear suspension systems, wheel alignment, wheels and tire, diagnosis, service, and repair.

Abbreviations:

SS = Suspension and Steering

For every task in Advanced Automotive Suspension and Steering Technician course, the following safety requirement MUST be strictly enforced:

Comply with personal and environmental safety practices associated with clothing; eye protection; hand tools; power equipment; proper ventilation; and the handling, storage, and disposal of chemicals/materials in accordance with local, state, and federal safety and environmental regulations.

SS Task List:	
	P-1 = 27
	P-2 = 20
	P-3 = 10
Total	57

CTE Standards and Benchmarks		Priority Number
06.0	Explain and apply proficiently the diagnosis, service and repair of front and rear suspensions systems, wheel alignment, and wheels and tires.-The student will be able to:	
General: Suspension and Steering Systems		
06.01	Research vehicle service information including fluid type, vehicle service history, service precautions, and technical service bulletins.	P-1
06.02	Identify and interpret suspension and steering system concerns; determine needed action.	P-1
Steering Systems Diagnosis and Repair		
06.03	Disable and enable supplemental restraint system (SRS); verify indicator lamp operation.	P-1
06.04	Remove and replace steering wheel; center/time supplemental restraint system (SRS) coil (clock spring).	P-1
06.05	Diagnose steering column noises, looseness, and binding concerns (including tilt/telescoping mechanisms); determine needed action.	P-2
06.06	Diagnose power steering gear (non-rack and pinion) binding, uneven turning effort, looseness, hard steering, and noise concerns; determine needed action.	P-2

CTE Standards and Benchmarks	Priority Number
06.07 Diagnose power steering gear (rack and pinion) binding, uneven turning effort, looseness, hard steering, and noise concerns; determine needed action.	P-2
06.08 Inspect steering shaft universal-joint(s), flexible coupling(s), collapsible column, lock cylinder mechanism, and steering wheel; determine needed action.	P-2
06.09 Remove and replace rack and pinion steering gear; inspect mounting bushings and brackets.	P-2
06.10 Inspect rack and pinion steering gear inner tie rod ends (sockets) and bellows boots; replace as needed.	P-1
06.11 Inspect power steering fluid level and condition.	P-1
06.12 Flush, fill, and bleed power steering system; use proper fluid type per manufacturer specification.	P-2
06.13 Inspect for power steering fluid leakage; determine needed action.	P-1
06.14 Remove, inspect, replace, and/or adjust power steering pump drive belt.	P-1
06.15 Remove and reinstall power steering pump.	P-2
06.16 Remove and reinstall press fit power steering pump pulley; check pulley and belt alignment.	P-2
06.17 Inspect, remove and/or replace power steering hoses and fittings.	P-2
06.18 Inspect, remove and/or replace pitman arm, relay (center-link/intermediate) rod, idler arm, mountings, and steering linkage damper.	P-2
06.19 Inspect, replace, and/or adjust tie rod ends (sockets), tie rod sleeves, and clamps.	P-1
06.20 Inspect, test and diagnose electrically- assisted power steering systems (including using a scan tool); determine needed action.	P-2
06.21 Identify hybrid vehicle power steering system electrical circuits and safety precautions.	P-2
06.22 Test power steering system pressure; determine needed action.	P-2
Suspension Systems Diagnosis and Repair	
06.23 Diagnose short and long arm suspension system noises, body sway, and uneven ride height concerns; determine needed action.	P-1
06.24 Diagnose strut suspension system noises, body sway, and uneven ride height concerns; determine needed action.	P-1
06.25 Inspect, remove, and/or replace upper and lower control arms, bushings, shafts, and rebound bumpers.	P-3
06.26 Inspect, remove, and/or replace strut rods and bushings.	P-3
06.27 Inspect, remove, and/or replace upper and/or lower ball joints (with or without wear indicators).	P-2
06.28 Inspect, remove, and/or replace steering knuckle assemblies.	P-3
06.29 Inspect, remove and/or replace short and long arm suspension system coil springs and spring insulators.	P-3
06.30 Inspect, remove, and/or replace torsion bars and mounts	P-3

CTE Standards and Benchmarks	Priority Number
06.31 Inspect, remove, and/or replace front/rear stabilizer bar (sway bar) bushings, brackets, and links.	P-3
06.32 Inspect, remove, and/or replace strut cartridge or assembly, strut coil spring, insulators (silencers), and upper strut bearing mount.	P-3
06.33 Inspect, remove, and/or replace track bar, strut rods/radius arms, and related mounts and bushings.	P-3
06.34 Inspect rear suspension system leaf spring(s), spring insulators (silencers), shackles, brackets, bushings, center pins/bolts, and mounts.	P-1
Related Suspension and Steering Service	
06.35 Inspect, remove, and/or replace shock absorbers; inspect mounts and bushings.	P-1
06.36 Remove, inspect, service and/or replace front and rear wheel bearings.	P-1
06.37 Describe the function of suspension and steering control systems and components, (i.e. active suspension and stability control).	P-3
Wheel Alignment Diagnosis, Adjustment, and Repair	
06.38 Diagnose vehicle wander, drift, pull, hard steering, bump steer, memory steer, torque steer, and steering return concerns; determine needed action.	P-1
06.39 Perform pre-alignment inspection; measure vehicle ride height; determine needed action.	P-1
06.40 Prepare vehicle for wheel alignment on alignment machine; perform four-wheel alignment by checking and adjusting front and rear wheel caster, camber and toe as required; center steering wheel.	P-1
06.41 Check toe-out-on-turns (turning radius); determine needed action.	P-2
06.42 Check steering axis inclination (SAI) and included angle; determine needed action.	P-2
06.43 Check rear wheel thrust angle; determine needed action.	P-1
06.44 Check for front wheel setback; determine needed action.	P-2
06.45 Check front and/or rear cradle (sub-frame) alignment; determine needed action.	P-3
06.46 Reset steering angle sensor.	P-2
Wheels and Tires Diagnosis and Repair	
06.47 Inspect tire condition; identify tire wear patterns; check for correct tire size, application (load and speed ratings), and air pressure as listed on the tire information placard/label.	P-1
06.48 Diagnose wheel/tire vibration, shimmy, and noise; determine needed action.	P-2
06.49 Rotate tires according to manufacturer's recommendation including vehicles equipped with tire pressure monitoring systems (TPMS)	P-1
06.50 Measure wheel, tire, axle flange, and hub runout; determine needed action.	P-2
06.51 Diagnose tire pull problems; determine needed action.	P-1
06.52 Dismount, inspect, and remount tire on wheel; balance wheel and tire assembly.	P-1

CTE Standards and Benchmarks	Priority Number
06.53 Dismount, inspect, and remount tire on wheel equipped with tire pressure monitoring system sensor.	P-1
06.54 Inspect tire and wheel assembly for air loss; perform needed action.	P-1
06.55 Repair tire following vehicle manufacturer approved procedure.	P-1
06.56 Identify indirect and direct tire pressure monitoring system (TPMS); calibrate system; verify operation of instrument panel lamps.	P-1
06.57 Demonstrate knowledge of steps required to remove and replace sensors in a tire pressure monitoring system (TPMS) including relearn procedure	P-1
Manufacturer Specific Steering and Suspension Tasks	
06.58 Service product specific suspension systems.	
06.59 Service product specific ride height control systems.	
06.60 Locate and interpret vehicle major suspension components and identification numbers.	
06.61 Adjust non-rack and pinion worm bearing preload and sector lash.	
06.62 Reinstall wheel; torque lug nuts.	
06.63 Service product specific tire pressure monitoring systems	
06.64 Service product specific electric power steering systems	
06.65 Reset product specific steering wheel sensors	
06.66 Interpret diagnostic trouble codes (DTCs) and scan tool data related to the steering and suspension control systems; determine necessary action.	
06.67 Perform multiplex check to determine that all steering and suspension components are communicating and are performing within specifications.	

Florida Department of Education
Student Performance Standards

Course Number: AER0419
Occupational Completion Point: F
Advanced Automotive Brake System Technician – 200 Hours – SOC Code 49-3023

Course Description:

The Advanced Automotive Brake System Technician course prepares students for entry into the Automotive Service industry. Content emphasizes beginning skills and concepts as a recommended requisite. Students study drum/disc brakes, hydraulics, power assist units, electronic brakes, traction control, stability control, and miscellaneous diagnostics, service, and repair.

Abbreviations:

BR = Brakes

For every task in Advanced Automotive Brake System Technician course, the following safety requirement MUST be strictly enforced:

Comply with personal and environmental safety practices associated with clothing; eye protection; hand tools; power equipment; proper ventilation; and the handling, storage, and disposal of chemicals/materials in accordance with local, state, and federal safety and environmental regulations.

BR Task List:	
P-1 =	40
P-2 =	11
P-3 =	5
Total	56

CTE Standards and Benchmarks		Priority Number
07.0	Explain and apply proficiently the diagnosis, service and repair of drum\disc brake, hydraulics, power assist units, electronic brakes, traction control, stability control systems and miscellaneous (wheel bearings, parking brake, electrical, etc.) systems.-The student will be able to:	
General: Brake Systems Diagnosis		
07.01	Identify and interpret brake system concerns; determine needed action.	P-1
07.02	Research vehicle service information including fluid type, vehicle service history, service precautions, and technical service bulletins.	P-1
07.03	Describe procedure for performing a road test to check brake system operation including an anti-lock brake system (ABS).	P-1
07.04	Install wheel and torque lug nuts.	P-1
Hydraulic System Diagnosis and Repair		
07.05	Diagnose pressure concerns in the brake system using hydraulic principles (Pascal’s Law).	P-1
07.06	Measure brake pedal height, travel, and free play (as applicable); determine needed action.	P-1

CTE Standards and Benchmarks	Priority Number
07.07 Check master cylinder for internal/external leaks and proper operation; determine needed action.	P-1
07.08 Remove, bench bleed, and reinstall master cylinder.	P-1
07.09 Diagnose poor stopping, pulling or dragging concerns caused by malfunctions in the hydraulic system; determine needed action.	P-1
07.10 Inspect brake lines, flexible hoses, and fittings for leaks, dents, kinks, rust, cracks, bulging, wear; and loose fittings/supports; determine needed action.	P-1
07.11 Replace brake lines, hoses, fittings, and supports.	P-2
07.12 Fabricate brake lines using proper material and flaring procedures (double flare and ISO types).	P-2
07.13 Select, handle, store, and fill brake fluids to proper level; use proper fluid type per manufacturer specification.	P-1
07.14 Inspect, test, and/or replace components of brake warning light system.	P-3
07.15 Identify components of hydraulic brake warning light system.	P-2
07.16 Bleed and/or flush brake system.	P-1
07.17 Test brake fluid for contamination.	P-1
Drum Brake Diagnosis and Repair	
07.18 Diagnose poor stopping, noise, vibration, pulling, grabbing, dragging or pedal pulsation concerns; determine needed action.	P-1
07.19 Remove, clean, and inspect brake drum; measure brake drum diameter; determine serviceability.	P-1
07.20 Refinish brake drum and measure final drum diameter; compare with specification.	P-1
07.21 Remove, clean, inspect, and/or replace brake shoes, springs, pins, clips, levers, adjusters/self-adjusters, other related brake hardware, and backing support plates; lubricate and reassemble.	P-1
07.22 Inspect wheel cylinders for leaks and proper operation; remove and replace as needed.	P-2
07.23 Pre-adjust brake shoes and parking brake; install brake drums or drum/hub assemblies and wheel bearings; perform final checks and adjustments.	P-1
Disc Brake Diagnosis and Repair	
07.24 Diagnose poor stopping, noise, vibration, pulling, grabbing, dragging, or pulsation concerns; determine needed action.	P-1
07.25 Remove and clean caliper assembly; inspect for leaks, damage, and wear; determine needed action.	P-1
07.26 Inspect caliper mounting and slides/pins for proper operation, wear, and damage; determine needed action.	P-1
07.27 Remove, inspect, and/or replace brake pads and retaining hardware; determine needed action.	P-1
07.28 Lubricate and reinstall caliper, brake pads, and related hardware; seat brake pads; inspect for leaks.	P-1
07.29 Clean and inspect rotor and mounting surface; measure rotor thickness, thickness variation, and lateral runout; determine needed action.	P-1

CTE Standards and Benchmarks	Priority Number
07.30 Remove and reinstall/replace rotor.	P-1
07.31 Refinish rotor on vehicle; measure final rotor thickness and compare with specification.	P-1
07.32 Refinish rotor off vehicle; measure final rotor thickness and compare with specification.	P-1
07.33 Retract and re-adjust caliper piston on an integrated parking brake system.	P-2
07.34 Check brake pad wear indicator; determine needed action.	P-1
07.35 Describe importance of operating vehicle to burnish/break-in replacement brake pads according to manufacturer's recommendations.	P-1
Power-Assist Units Diagnosis and Repair	
07.36 Check brake pedal travel with and without engine running to verify proper power booster operation.	P-2
07.37 Identify components of the brake power assist system (vacuum and hydraulic); check vacuum supply (manifold or auxiliary pump) to vacuum- type power booster.	P-1
07.38 Inspect vacuum-type power booster unit for leaks; inspect the check-valve for proper operation; determine needed action.	P-1
07.39 Inspect and test hydraulically-assisted power brake system for leaks and proper operation; determine needed action.	P-3
07.40 Measure and adjust master cylinder pushrod length.	P-3
Related Systems (i.e. Wheel Bearings, Parking Brakes, Electrical) Diagnosis and Repair	
07.41 Diagnose wheel bearing noises, wheel shimmy, and vibration concerns; determine needed action.	P-1
07.42 Remove, clean, inspect, repack, and install wheel bearings; replace seals; install hub and adjust bearings.	P-2
07.43 Check parking brake system and components for wear, binding, and corrosion; clean, lubricate, adjust and/or replace as needed.	P-1
07.44 Check parking brake operation and parking brake indicator light system operation; determine needed action.	P-1
07.45 Check operation of brake stop light system.	P-1
07.46 Replace wheel bearing and race.	P-3
07.47 Remove, reinstall, and/or replace sealed wheel bearing assembly.	P-1
07.48 Inspect and replace wheel studs.	P-1
Electronic Brake Control Systems: Antilock Brake (ABS), Traction Control (TCS), and Electronic Stability Control (ESC) Systems Diagnosis and Repair	
07.49 Identify and inspect electronic brake control system components (ABS, TCS, and ESC); determine needed action.	P-1
07.50 Describe the operation of a regenerative braking system.	P-3
07.51 Diagnose poor stopping, wheel lock-up, abnormal pedal feel, unwanted application, and noise concerns associated with the electronic brake control system; determine needed action.	P-2

CTE Standards and Benchmarks	Priority Number
07.52 Diagnose electronic brake control system electronic control(s) and components by retrieving diagnostic trouble codes, and/or using recommended test equipment; determine needed action.	P-2
07.53 Depressurize high-pressure components of an electronic brake control system.	P-2
07.54 Bleed the electronic brake control system hydraulic circuits.	P-1
07.55 Test, diagnose, and service electronic brake control system speed sensors (digital and analog), toothed ring (tone wheel), and circuits using a graphing multi-meter (GMM)/digital storage oscilloscope (DSO) (includes output signal, resistance, shorts to voltage/ground, and frequency data).	P-2
07.56 8. Diagnose electronic brake control system braking concerns caused by vehicle modifications (tire size, curb height, final drive ratio, etc.).	P-1
Manufacturer Specific Brake, Traction Control and Vehicle Stability Control Tasks	
07.57 Service product specific anti-lock brake systems	
07.58 Service product specific traction control systems.	
07.59 Locate and interpret vehicle major brake component and identification numbers (VIN, vehicle certification labels, calibration decals).	
07.60 Inspect, test, and/or replace metering (hold-off), proportioning (balance), pressure differential, and combination valves.	
07.61 Install wheel, torque lug nuts, and make final checks and adjustments associated with drum brakes.	
07.62 Install wheel, torque lug nuts, and make final checks and adjustments associated with disc brakes.	
07.63 Remove and install electronic brake control system electrical/electronic and hydraulic components.	
07.64 Service product specific braking systems.	
07.65 Perform product specific brakes relearn procedures	
07.66 Interpret diagnostic trouble codes (DTCs) and scan tool data related to the brake, traction control and vehicle stability control systems; determine necessary action.	
07.67 Perform multiplex check to determine that all brake, traction control and vehicle stability control components are communicating and are performing within specifications.	

**Florida Department of Education
Student Performance Standards**

Course Number: AER0319
Occupational Completion Point: G
Advanced Automotive Electrical/Electronic System Technician – 400 Hours – SOC Code 49-3023

Course Description:

The Advanced Automotive Electrical/Electronic System Technician course prepares students for entry into the Automotive Service industry. Content emphasizes beginning skills and concepts as a recommended requisite. Students study electrical/electronic system components, battery, starting, charging, lighting, gauges, warning devices, driver information, horn, wiper/washer and accessory systems diagnostics, service, and repair.

Abbreviations:

EE = Electrical/Electronic Systems

For every task in Advanced Automotive Electrical/Electronic System Technician course, the following safety requirement MUST be strictly enforced:

Comply with personal and environmental safety practices associated with clothing; eye protection; hand tools; power equipment; proper ventilation; and the handling, storage, and disposal of chemicals/materials in accordance with local, state, and federal safety and environmental regulations.

EE Task List:	
	P-1 = 29
	P-2 = 16
	P-3 = 1
Total	46

CTE Standards and Benchmarks		Priority Number
08.0	Explain and apply proficiently the diagnosis, service and repair of electrical/electronic system components, battery, starting, charging, lighting, gauges, warning devices, driver information, horn, wiper/washer and accessory systems.-The student will be able to:	
	General: Electrical System Diagnosis	
08.01	Research vehicle service information including vehicle service history, service precautions, and technical service bulletins.	P-1
08.02	Demonstrate knowledge of electrical/electronic series, parallel, and series-parallel circuits using principles of electricity (Ohm’s Law).	P-1
08.03	Demonstrate proper use of a digital multi-meter (DMM) when measuring source voltage, voltage drop (including grounds), current flow and resistance.	P-1
08.04	Demonstrate knowledge of the causes and effects from shorts, grounds, opens, and resistance problems in electrical/electronic circuits.	P-1
08.05	Demonstrate proper use of a test light on an electrical circuit.	P-1
08.06	Use fused jumper wires to check operation of electrical circuits.	P-1
08.07	Use wiring diagrams during the diagnosis (troubleshooting) of electrical/electronic circuit problems.	P-1

CTE Standards and Benchmarks	Priority Number
08.08 Diagnose the cause(s) of excessive key-off battery drain (parasitic draw); determine needed action.	P-1
08.09 Inspect and test fusible links, circuit breakers, and fuses; determine needed action.	P-1
08.10 Inspect, test, repair, and/or replace components, connectors, terminals, harnesses, and wiring in electrical/electronic systems (including solder repairs); determine needed action.	P-1
08.11 Check electrical/electronic circuit waveforms; interpret readings and determine needed repairs.	P-2
08.12 Repair data bus wiring harness.	P-1
Battery Diagnosis and Service	
08.13 Perform battery state-of-charge test; determine needed action.	P-1
08.14 Confirm proper battery capacity for vehicle application; perform battery capacity and load test; determine needed action.	P-1
08.15 Maintain or restore electronic memory functions.	P-1
08.16 Inspect and clean battery; fill battery cells; check battery cables, connectors, clamps, and hold-downs.	P-1
08.17 Perform slow/fast battery charge according to manufacturer's recommendations.	P-1
08.18 Jump-start vehicle using jumper cables and a booster battery or an auxiliary power supply.	P-1
08.19 Identify safety precautions for high voltage systems on electric, hybrid, hybrid-electric, and diesel vehicles.	P-2
08.20 Identify electrical/electronic modules, security systems, radios, and other accessories that require re-initialization or code entry after reconnecting vehicle battery.	P-1
08.21 Identify hybrid vehicle auxiliary (12v) battery service, repair, and test procedures.	P-2
Starting System Diagnosis and Repair	
08.22 Perform starter current draw tests; determine needed action.	P-1
08.23 Perform starter circuit voltage drop tests; determine needed action.	P-1
08.24 Inspect and test starter relays and solenoids; determine needed action.	P-2
08.25 Remove and install starter in a vehicle.	P-1
08.26 Inspect and test switches, connectors, and wires of starter control circuits; determine needed action.	P-2
08.27 Differentiate between electrical and engine mechanical problems that cause a slow-crank or a no-crank condition.	P-2
08.28 Demonstrate knowledge of an automatic idle-stop/start-stop system.	P-2
Charging System Diagnosis and Repair	
08.29 Perform charging system output test; determine needed action.	P-1
08.30 Diagnose (troubleshoot) charging system for causes of undercharge, no-charge, or overcharge conditions.	P-1

CTE Standards and Benchmarks	Priority Number
08.31 Inspect, adjust, and/or replace generator (alternator) drive belts; check pulleys and tensioners for wear; check pulley and belt alignment.	P-1
08.32 Remove, inspect, and/or replace generator (alternator).	P-1
08.33 Perform charging circuit voltage drop tests; determine needed action.	P-1
Lighting Systems Diagnosis and Repair	
08.34 Diagnose (troubleshoot) the causes of brighter-than-normal, intermittent, dim, or no light operation; determine needed action.	P-1
08.35 Inspect interior and exterior lamps and sockets including headlights and auxiliary lights (fog lights/driving lights); replace as needed.	P-1
08.36 Aim headlights.	P-2
08.37 Identify system voltage and safety precautions associated with high-intensity discharge headlights.	P-2
Instrument Cluster and Driver Information Systems Diagnosis and Repair	
08.38 Inspect and test gauges and gauge sending units for causes of abnormal readings; determine needed action.	P-2
08.39 Diagnose (troubleshoot) the causes of incorrect operation of warning devices and other driver information systems; determine needed action.	P-2
08.40 Reset maintenance indicators as required.	P-2
Body Electrical Systems Diagnosis and Repair	
08.41 Diagnose operation of comfort and convenience accessories and related circuits (such as: power window, power seats, pedal height, power locks, truck locks, remote start, moon roof, sun roof, sun shade, remote keyless entry, voice activation, steering wheel controls, back-up camera, park assist, cruise control, and auto dimming headlamps); determine needed repairs.	P-2
08.42 Diagnose operation of security/anti-theft systems and related circuits (such as: theft deterrent, door locks, remote keyless entry, remote start, and starter/fuel disable); determine needed repairs.	P-2
08.43 Diagnose operation of entertainment and related circuits (such as: radio, DVD, remote CD changer, navigation, amplifiers, speakers, antennas, and voice-activated accessories); determine needed repairs.	P-3
08.44 Diagnose operation of safety systems and related circuits (such as: horn, airbags, seat belt pretensioners, occupancy classification, wipers, washers, speed control/collision avoidance, heads-up display, park assist, and back-up camera); determine needed repairs.	P-1
08.45 Diagnose body electronic systems circuits using a scan tool; check for module communication errors (data communication bus systems); determine needed action.	P-2
08.46 Describe the process for software transfer, software updates, or reprogramming of electronic modules.	P-2
Manufacturer Specific Electrical and Electronic Related Tasks	
08.47 Service and repair product specific electrical/electronic systems.	

CTE Standards and Benchmarks	Priority Number
08.48 Perform product specific diagnostic procedures.	
08.49 Locate and interpret vehicle major electrical/electronic components and identification numbers.	
08.50 Identify location of hybrid vehicle high voltage circuits disconnect (service plug) location and safety procedures.	
08.51 Manufacturer specific battery test; determine necessary action.	
08.52 Inspect and test sensors, connectors, and wires of electronic (digital) instrument circuits; determine necessary action.	
08.53 Diagnose incorrect heated glass, mirror, or seat operation; determine necessary action.	
08.54 Perform product specific electrical/electronic relearning procedures	
08.55 Diagnose operation of entertainment and related circuits (such as: radio, DVD, remote CD changer, navigation, amplifiers, speakers, antennas, and voice activated accessories); determine needed repairs.	
08.56 Diagnose operation of heated and cooled accessories and related circuits (such as: heated/cooled seats, heated steering wheel, heated mirror, heated glass, and heated/cooled cup holders); determine needed repairs.	
08.57 Diagnose operation of safety systems and related circuits (such as: airbags, seat belt pretensioners, occupancy classification, wipers, washers, speed control/collision avoidance, heads-up display, park assist, and back up camera); determine needed repairs.	
08.58 Diagnose operation of comfort and convenience accessories and related circuits (such as: power windows, power seats, pedal height, power locks, truck locks, remote start, moon roof, sun roof, sun shade, remote keyless entry, voice activation, steering wheel controls, back-up camera, park assist, and auto dimming headlamps); determine needed repairs.	

**Florida Department of Education
Student Performance Standards**

Course Number: AER0173
Occupational Completion Point: H
Advanced Automotive Heating and Air Conditioning Technician – 200 Hours – SOC Code 49-3023

Course Description:

The Advanced Automotive Heating and Air Conditioning Technician course prepares students for entry into the Automotive Service industry. Content emphasizes beginning skills and concepts as a recommended requisite. Students study heating and air conditioning, refrigeration, compressors, compressor clutches, evaporators, receiver driers, accumulators, condensers, heating and engine cooling, related control systems, refrigerant recovery, recycling and handling, diagnostics, service, and repair.

Abbreviations:

HA = Heating and Air Conditioning

For every task in Advanced Automotive Heating and Air Conditioning Technician course, the following safety requirement MUST be strictly enforced:

Comply with personal and environmental safety practices associated with clothing; eye protection; hand tools; power equipment; proper ventilation; and the handling, storage, and disposal of chemicals/materials in accordance with local, state, and federal safety and environmental regulations.

HA Task List:	
P-1	= 16
P-2	= 16
P-3	= 4
Total	36

CTE Standards and Benchmarks		Priority Number
09.0	Explain and apply proficiently the diagnosis, service and repair of heating and air conditioning, refrigeration, compressors, compressor clutches, evaporators, receiver driers, accumulators, condensers, heating and engine cooling, related control systems, refrigerant recovery, and recycling and handling.-The student will be able to:	
	General: A/C System Diagnosis and Repair	
09.01	Identify and interpret heating and air conditioning problems; determine needed action.	P-1
09.02	Research vehicle service information including refrigerant/oil type, vehicle service history, service precautions, and technical service bulletins.	P-1
09.03	Performance test A/C system; identify problems.	P-1
09.04	Identify abnormal operating noises in the A/C system; determine needed action.	P-2
09.05	Identify refrigerant type; select and connect proper gauge set/test equipment; record temperature and pressure readings.	P-1
09.06	Leak test A/C system; determine needed action.	P-1
09.07	Inspect condition of refrigerant oil removed from A/C system; determine needed action.	P-2

CTE Standards and Benchmarks	Priority Number
09.08 Determine recommended oil and oil capacity for system application.	P-1
09.09 Using a scan tool, observe and record related HVAC data and trouble codes.	P-3
Refrigeration System Component Diagnosis and Repair	
09.10 Inspect, remove, and/or replace A/C compressor drive belts, pulleys, tensioners and visually inspect A/C components for signs of leaks; determine needed action.	P-1
09.11 Inspect, test, service and/or replace A/C compressor clutch components and/or assembly; check compressor clutch air gap; adjust as needed.	P-2
09.12 Remove, inspect, reinstall, and/or replace A/C compressor and mountings; determine recommended oil type and quantity.	P-2
09.13 Identify hybrid vehicle A/C system electrical circuits and service/safety precautions.	P-2
09.14 Determine need for an additional A/C system filter; perform needed action.	P-3
09.15 Remove and inspect A/C system mufflers, hoses, lines, fittings, O-rings, seals, and service valves; perform needed action.	P-2
09.16 Inspect for proper A/C condenser airflow; determine needed action.	P-1
09.17 Remove, inspect, and replace receiver/drier or accumulator/drier; determine recommended oil type and quantity.	P-2
09.18 Remove, inspect, and install expansion valve or orifice (expansion) tube.	P-1
09.19 Inspect evaporator housing water drain; perform needed action.	P-1
09.20 Diagnose A/C system conditions that cause the protection devices (pressure, thermal, and/or control module) to interrupt system operation; determine needed action.	P-2
09.21 Determine procedure to remove and reinstall evaporator; determine required oil type and quantity.	P-2
Heating, Ventilation, and Engine Cooling Systems Diagnosis and Repair	
09.22 Inspect engine cooling and heater systems hoses and pipes; perform needed action.	P-1
09.23 Inspect and test heater control valve(s); perform needed action.	P-2
09.24 Diagnose temperature control problems in the HVAC system; determine needed action.	P-2
09.25 Determine procedure to remove, inspect, reinstall, and/or replace heater core.	P-2
Operating Systems and Related Controls Diagnosis and Repair	
09.26 Inspect and test HVAC system blower motors, resistors, switches, relays, wiring, and protection devices; determine needed action.	P-1
09.27 Diagnose A/C compressor clutch control systems; determine needed action.	P-2
09.28 Diagnose malfunctions in the vacuum, mechanical, and electrical components and controls of the heating, ventilation, and A/C (HVAC) system; determine needed action.	P-2

CTE Standards and Benchmarks	Priority Number
09.29 Inspect and test HVAC system control panel assembly; determine needed action.	P-3
09.30 Inspect and test HVAC system control cables, motors, and linkages; perform needed action.	P-3
09.31 Inspect HVAC system ducts, doors, hoses, cabin filters, and outlets; perform needed action.	P-1
09.32 Identify the source of HVAC system odors.	P-2
09.33 Check operation of automatic or semi-automatic HVAC control systems; determine needed action.	P-2
Refrigerant Recovery, Recycling, and Handling	
09.34 Perform correct use and maintenance of refrigerant handling equipment according to equipment manufacturer's standards.	P-1
09.35 Identify A/C system refrigerant; test for sealants; recover, evacuate, and charge A/C system; add refrigerant oil as required.	P-1
09.36 Recycle, label, and store refrigerant.	P-1
Manufacturer Specific Heating and Air Conditioning Related Tasks	
09.37 Service product specific climate control systems.	
09.38 Locate and interpret vehicle heating and air conditioning major components and identification numbers.	
09.39 Perform cooling system pressure tests; check coolant condition, inspect and test radiator, cap (pressure/vacuum), coolant recovery tank, and hoses; perform necessary action.	
09.40 Inspect, test, and replace thermostat and gasket/seal.	
09.41 Determine coolant condition and coolant type for vehicle application; drain and recover coolant.	
09.42 Flush system; refill system with recommended coolant; bleed system.	
09.43 Inspect and test cooling fan, fan clutch, fan shroud, and air dams; perform necessary action.	
09.44 Inspect and test electric cooling fan, fan control system and circuits; determine necessary action.	
09.45 Service product specific hybrid heating and A/C systems.	
09.46 Perform product specific heating and A/C relearn procedure	
09.47 Interpret diagnostic trouble codes (DTCs) and scan tool data related to the Heating and Air Conditioning systems; determine necessary action.	
09.48 Perform multiplex check to determine that Heating and Air Conditioning components are communicating and are performing within specifications.	
09.49 Identify proper service precautions and procedures for R1234yf systems.	

Florida Department of Education
Student Performance Standards

Course Number: AER0506
Occupational Completion Point: I
Advanced Automotive Engine Performance Technician – 400 Hours – SOC Code 49-3023

Course Description:

The Advanced Automotive Engine Performance Technician course prepares students for entry into the Automotive Service industry. Content emphasizes beginning skills and concepts as a recommended requisite. Students study engines, ignition, fuel, air induction, exhaust, computer, engine and emission control systems diagnostics, service, and repair.

Abbreviations:

EP = Engine Performance

For every task in Advanced Automotive Engine Performance Technician course, the following safety requirement MUST be strictly enforced:

Comply with personal and environmental safety practices associated with clothing; eye protection; hand tools; power equipment; proper ventilation; and the handling, storage, and disposal of chemicals/materials in accordance with local, state, and federal safety and environmental regulations.

EP Task List:	
P-1	= 21
P-2	= 20
P-3	= 2
Total	43

CTE Standards and Benchmarks		Priority Number
10.0	Explain and apply proficiently the diagnosis, service and repair of engines, ignition, fuel, air induction, exhaust, computer engine and emission control systems.-The student will be able to:	
General: Engine Diagnosis		
10.01	Identify and interpret engine performance concerns; determine needed action.	P-1
10.02	Research vehicle service information including vehicle service history, service precautions, and technical service bulletins.	P-1
10.03	Diagnose abnormal engine noises or vibration concerns; determine needed action.	P-3
10.04	Diagnose the cause of excessive oil consumption, coolant consumption, unusual exhaust color, odor, and sound; determine needed action.	P-2
10.05	Perform engine absolute manifold pressure tests (vacuum/boost); determine needed action.	P-1
10.06	Perform cylinder power balance test; determine needed action.	P-2
10.07	Perform cylinder cranking and running compression tests; determine needed action.	P-1
10.08	Perform cylinder leakage test; determine needed action.	P-1

CTE Standards and Benchmarks	Priority Number
10.09 Diagnose engine mechanical, electrical, electronic, fuel, and ignition concerns; determine needed action.	P-2
10.10 Verify engine operating temperature; determine needed action.	P-1
10.11 Verify correct camshaft timing including engines equipped with variable valve timing systems (VVT).	P-1
Computerized Controls Diagnosis and Repair	
10.12 Retrieve and record diagnostic trouble codes (DTC), OBD monitor status, and freeze frame data; clear codes when applicable.	P-1
10.13 Access and use service information to perform step-by-step (troubleshooting) diagnosis.	P-1
10.14 Perform active tests of actuators using a scan tool; determine needed action.	P-1
10.15 Describe the use of OBD monitors for repair verification.	P-1
10.16 Diagnose the causes of emissions or drive-ability concerns with stored or active diagnostic trouble codes (DTC); obtain, graph, and interpret scan tool data.	P-1
10.17 Diagnose emissions or drive-ability concerns without stored or active diagnostic trouble codes; determine needed action.	P-1
10.18 Inspect and test computerized engine control system sensors, powertrain/engine control module (PCM/ECM), actuators, and circuits using a graphing multi-meter (GMM)/digital storage oscilloscope (DSO); perform needed action.	P-2
10.19 Diagnose drive-ability and emissions problems resulting from malfunctions of interrelated systems (cruise control, security alarms, suspension controls, traction controls, HVAC, automatic transmissions, non-OEM installed accessories, or similar systems); determine needed action.	P-2
Ignition System Diagnosis and Repair	
10.20 Diagnose (troubleshoot) ignition system related problems such as no-starting, hard starting, engine misfire, poor drive-ability, spark knock, power loss, poor mileage, and emissions concerns; determine needed action.	P-2
10.21 Inspect and test crankshaft and camshaft position sensor(s); determine needed action.	P-1
10.22 Inspect, test, and/or replace ignition control module, powertrain/engine control module; reprogram/initialize as needed.	P-3
10.23 Remove and replace spark plugs; inspect secondary ignition components for wear and damage.	P-1
Fuel, Air Induction, and Exhaust Systems Diagnosis and Repair	
10.24 Diagnose (troubleshoot) hot or cold no-starting, hard starting, poor drive-ability, incorrect idle speed, poor idle, flooding, hesitation, surging, engine misfire, power loss, stalling, poor mileage, dieseling, and emissions problems; determine needed action.	P-2
10.25 Check fuel for contaminants; determine needed action.	P-2
10.26 Inspect and test fuel pump(s) and pump control system for pressure, regulation, and volume; perform needed action.	P-1
10.27 Replace fuel filter(s) where applicable.	P-2

CTE Standards and Benchmarks	Priority Number
10.28 Inspect, service, or replace air filters, filter housings, and intake duct work.	P-1
10.29 Inspect throttle body, air induction system, intake manifold and gaskets for vacuum leaks and/or unmetered air.	P-2
10.30 Inspect, test, and/or replace fuel injectors.	P-2
10.31 Verify idle control operation.	P-1
10.32 Inspect integrity of the exhaust manifold, exhaust pipes, muffler(s), catalytic converter(s), resonator(s), tail pipe(s), and heat shields; perform needed action.	P-1
10.33 Inspect condition of exhaust system hangers, brackets, clamps, and heat shields; determine needed action.	P-1
10.34 Perform exhaust system back-pressure test; determine needed action.	P-2
10.35 Check and refill diesel exhaust fluid (DEF).	P-2
10.36 Test the operation of turbocharger/supercharger systems; determine needed action.	P-2
Emissions Control Systems Diagnosis and Repair	
10.37 Diagnose oil leaks, emissions, and drive-ability concerns caused by the positive crankcase ventilation (PCV) system; determine needed action.	P-3
10.38 Inspect, test, service, and/or replace positive crankcase ventilation (PCV) filter/breather, valve, tubes, orifices, and hoses; perform needed action.	P-2
10.39 Diagnose emissions and drive-ability concerns caused by the exhaust gas recirculation (EGR) system; inspect, test, service and/or replace electrical/electronic sensors, controls, wiring, tubing, exhaust passages, vacuum/pressure controls, filters, and hoses of exhaust gas recirculation (EGR) systems; determine needed action.	P-2
10.40 Diagnose emissions and drive-ability concerns caused by the secondary air injection system; inspect, test, repair, and/or replace electrical/electronically-operated components and circuits of secondary air injection systems; determine needed action.	P-2
10.41 Diagnose emissions and drive-ability concerns caused by the evaporative emissions control (EVAP) system; determine needed action.	P-1
10.42 Diagnose emission and drive-ability concerns caused by catalytic converter system; determine needed action.	P-2
10.43 Interpret diagnostic trouble codes (DTCs) and scan tool data related to the emissions control systems; determine needed action.	P-2
Manufacturer Specific Engine Performance Related Tasks	
10.44 Adjust valves on engines with mechanical or hydraulic lifters.	
10.45 Remove and replace timing belt; verify correct camshaft timing.	
10.46 Remove and replace thermostat and gasket/seal.	

CTE Standards and Benchmarks	Priority Number
10.47 Inspect and test mechanical/electrical fans, fan clutch, fan shroud/ducting, air dams, and fan control devices; perform necessary action.	
10.48 Perform common fastener and thread repairs, to include: remove broken bolt, restore internal and external threads, and repair internal threads with a threaded insert.	
10.49 Inspect engine oil and/or filter for condition and determine necessary action.	
10.50 Identify hybrid vehicle internal combustion engine service precautions.	
10.51 Demonstrate proficiency in use of computer-based information systems.	
10.52 Perform product specific OBD II drive cycle diagnostic tests.	
10.53 Service product specific ignition systems.	
10.54 Inspect and test distributor; service as needed.	
10.55 Perform exhaust system back-pressure test; determine needed action.	
10.56 Service product specific fuel injection systems.	
10.57 Locate and interpret vehicle engine performance major components and identification numbers.	
10.58 Demonstrate knowledge of using a 4 or 5 gas analyzer, interpret readings, and determine necessary action.	
10.59 Perform cooling system pressure tests; check coolant condition; inspect and test radiator, pressure cap, coolant recovery tank, and hoses; perform necessary action.	
10.60 Check for module communication (including CAN/BUS systems) errors using a scan tool.	
10.61 Inspect and test ignition primary and secondary circuit wiring and solid state components; test ignition coil(s); perform necessary action.	
10.62 Inspect and test mechanical components of secondary air injection systems; perform necessary action.	
10.63 Demonstrate knowledge of direct injection systems.	
10.64 Interpret diagnostic trouble codes (DTCs) and scan tool data related to the engine control systems; determine necessary action.	
10.65 Perform multiplex check to determine that engine control components are communicating and are performing within specifications.	
10.66 Perform universal drive cycle to run monitors and erase permanent DTCs.	

Additional Information

Laboratory Activities

Laboratory investigations that include scientific inquiry, research, measurement, problem solving, emerging technologies, tools and equipment, as well as, experimental, quality, and safety procedures are an integral part of this career and technical program/course. Laboratory investigations benefit all students by developing an understanding of the complexity and ambiguity of empirical work, as well as the skills required to manage, operate, calibrate and troubleshoot equipment/tools used to make observations. Students understand measurement error; and have the skills to aggregate, interpret, and present the resulting data. Equipment and supplies should be provided to enhance hands-on experiences for students.

Special Notes

Benchmarks identified with a designation of P-1, P-2, or P-3 are ASE tasks.

It is highly recommended that the program be NATEF Master Certified and be approved by the appropriate industry manufacturer to provide manufacturer certification. Instructors must meet the specific manufacturer certification and be A1-A8 ASE Master certified, Advanced Engine Performance (L1) ASE Certification is also recommended. Program must meet the equipment and specialty tool requirement as specified by the manufacturer sponsor. Program must offer EPA section 609 recognized refrigerant-recycling certification training.

MyCareerShines is an interactive resource to assist students in identifying their ideal career and to enhance preparation for employment. Teachers are encouraged to integrate this resource into the program curriculum to meet the employability goals for each student.

Career and Technical Student Organization (CTSO)

SkillsUSA is the intercurricular career and technical student organization(s) providing leadership training and reinforcing specific career and technical skills. Career and Technical Student Organizations provide activities for students as an integral part of the instruction offered.

Cooperative Training – OJT

On-the-job training is appropriate but not required for this program. Whenever offered, the rules, guidelines, and requirements specified in the OJT framework apply.

Basic Skills

In a Career Certificate Program offered for 450 hours or more, in accordance with Rule 6A-10.040, F.A.C., the minimum basic skills grade levels required for postsecondary adult career and technical students to complete this program are: Mathematics 10.0, Language 10.0, and Reading 10.0. These grade level numbers correspond to a grade equivalent score obtained on a state designated basic skills examination.

Adult students with disabilities, as defined in Section 1004.02(7), Florida Statutes, may be exempted from meeting the Basic Skills requirements (Rule 6A-10.040). Students served in exceptional student education (except gifted) as defined in s. 1003.01(3)(a), F.S., may also be exempted from meeting the Basic Skills requirement. Each school district and Florida College must adopt a policy addressing procedures for exempting eligible students with disabilities from the Basic Skills requirement as permitted in Section 1004.91(3), F.S.

Students who possess a college degree at the Associate of Applied Science level or higher; who have completed or are exempt from the college entry-level examination; or who have passed a state, national, or industry licensure exam are exempt from meeting the Basic Skills requirement (Rule 6A-10.040, F.A.C.) Exemptions from state, national or industry licensure are limited to the certifications listed on the Basic Skills and Licensure Exemption List which may be accessed from the CTE Program Resources page.

Accommodations

Federal and state legislation requires the provision of accommodations for students with disabilities to meet individual needs and ensure equal access. Postsecondary students with disabilities must self-identify, present documentation, request accommodations if needed, and develop a plan with their counselor and/or instructors. Accommodations received in postsecondary education may differ from those received in secondary education. Accommodations change the way the student is instructed. Students with disabilities may need accommodations in such areas as instructional methods and materials, assignments and assessments, time demands and schedules, learning environment, assistive technology and special communication systems. Documentation of the accommodations requested and provided should be maintained in a confidential file.

Note: postsecondary curriculum and regulated secondary programs cannot be modified.

**Florida Department of Education
Curriculum Framework**

Program Title: Diesel Systems Technician
Program Type: Career Preparatory
Career Cluster: Transportation, Distribution and Logistics

Career Certificate Program – Career Preparatory

Program Number	I470605
CIP Number	0647060501
Grade Level	30, 31
Standard Length	1800 hours
Teacher Certification	Refer to the Program Structure section
CTSO	SkillsUSA
SOC Codes (all applicable)	49-3031 – Bus and Truck Mechanics and Diesel Engine Specialists 49-9098 – Helpers—Installations, Maintenance, and Repair Workers
Basic Skills Level	Mathematics: 9 Language: 9 Reading: 9

Purpose

This program offers a sequence of courses that provides coherent and rigorous content aligned with challenging academic standards and relevant technical knowledge and skills needed to prepare for further education and careers in the Transportation, Distribution and Logistics career cluster; provides technical skill proficiency, and includes competency-based applied learning that contributes to the academic knowledge, higher-order reasoning and problem-solving skills, work attitudes, general employability skills, technical skills, and occupation-specific skills, and knowledge of all aspects of the Transportation, Distribution and Logistics career cluster.

The purpose of this program is to prepare students for employment as bus, truck and diesel engine mechanics, diesel mechanics helpers, mobile heavy equipment mechanics, construction equipment mechanics, industrial truck mechanics. The content includes but is not limited to maintaining and repairing diesel engines and electrical systems; reconditioning diesel fuel injection systems; overhauling diesel engines; and performing diesel engine preventive maintenance.

The course content should also include training in communication, leadership, human relations and employability skills; and safe efficient work practices.

Additional Information relevant to this Career and Technical Education (CTE) program is provided at the end of this document.

Program Structure

This program is a planned sequence of instruction consisting of nine occupational completion points.

The courses after the core (OCP-A) may be taken in any sequence. However, an individual must take the Diesel Engine Preventive Maintenance course (DIM0103).

Benchmarks identified with a designation of P-1, P-2, or P-3 are ASE tasks.

When offered at the postsecondary level, this program is comprised of courses which have been assigned course numbers in the SCNS (Statewide Course Numbering System) in accordance with Section 1007.24 (1), F.S. Career and Technical credit shall be awarded to the student on a transcript in accordance with Section 1001.44 (3) (b), F.S.

To teach the course(s) listed below, instructors must hold at least one of the teacher certifications indicated for that course.

The following table illustrates the postsecondary program structure:

OCP	Course Number	Course Title	Teacher Certification	Length	SOC Code
A	DIM0101	Diesel Engine Mechanic/Technician Helper	DIESEL MECH @7 7G	150 hours	49-9098
B	DIM0102	Diesel Electrical and Electronics Technician		300 hours	49-3031
C	DIM0103	Diesel Engine Preventative Maintenance Technician		150 hours	49-3031
D	DIM0104	Diesel Engine Technician		300 hours	49-3031
E	DIM0105	Diesel Brakes Technician		300 hours	49-3031
F	DIM0106	Diesel Heating and Air Conditioning Technician		150 hours	49-3031
G	DIM0107	Diesel Steering and Suspension Technician		150 hours	49-3031
H	DIM0108	Diesel Drivetrain Technician		150 hours	49-3031
I	DIM0109	Diesel Hydraulics Technician		150 hours	49-3031

Common Career Technical Core – Career Ready Practices

Career Ready Practices describe the career-ready skills that educators should seek to develop in their students. These practices are not exclusive to a Career Pathway, program of study, discipline or level of education. Career Ready Practices should be taught and reinforced in all career exploration and preparation programs with increasingly higher levels of complexity and expectation as a student advances through a program of study.

1. Act as a responsible and contributing citizen and employee.
2. Apply appropriate academic and technical skills.
3. Attend to personal health and financial well-being.
4. Communicate clearly, effectively and with reason.
5. Consider the environmental, social and economic impacts of decisions.
6. Demonstrate creativity and innovation.
7. Employ valid and reliable research strategies.
8. Utilize critical thinking to make sense of problems and persevere in solving them.
9. Model integrity, ethical leadership and effective management.
10. Plan education and career path aligned to personal goals.
11. Use technology to enhance productivity.
12. Work productively in teams while using cultural/global competence.

Standards

After successfully completing this program, the student will be able to perform the following:

- 01.0 Proficiently explain and apply required shop and personal safety tasks.
- 02.0 Identify the basic diesel components and functions.
- 03.0 Explain and apply required tasks associated with the proper use and handling of tools and equipment.
- 04.0 Identify principles, assemblies, and systems of engine operation.
- 05.0 Demonstrate proficiency in preparing vehicle for routine pre/post maintenance and customer services.
- 06.0 Demonstrate workplace employability skills related to personal standards and work habits/ethics.
- 07.0 Diagnose and repair General electrical systems.
- 08.0 Diagnose and repair Battery systems.
- 09.0 Diagnose and repair Starting systems.
- 10.0 Diagnose and repair Charging systems.
- 11.0 Diagnose and repair Lighting systems.
- 12.0 Diagnose and repair Gauges and warning devices.
- 13.0 Diagnose and repair related electrical systems.
- 14.0 Inspect and service Engine Systems record findings as needed.
- 15.0 Diagnose and repair Fuel system
- 16.0 Diagnose and repair Air induction and exhaust system
- 17.0 Diagnose and repair Cooling system
- 18.0 Diagnose and repair Lubrication system
- 19.0 Diagnose and repair Instruments and controls
- 20.0 Diagnose and repair Safety equipment
- 21.0 Diagnose and repair Hardware
- 22.0 Diagnose and repair Heating, ventilation, and air conditioning (HVAC)
- 23.0 Diagnose and repair Battery and starting systems
- 24.0 Diagnose and repair Electrical/Electronic charging systems
- 25.0 Diagnose and repair Lighting systems.
- 26.0 Diagnose and repair Air brake systems.
- 27.0 Diagnose and repair Hydraulic brake systems.
- 28.0 Inspect, service and record Drive Train systems.
- 29.0 Diagnose and repair Suspension and steering systems.
- 30.0 Diagnose and repair Tires and wheels.
- 31.0 Diagnose and repair Frame and fifth wheel.
- 32.0 General engine diagnosis and repair.
- 33.0 Cylinder head and valve train diagnosis and repair.
- 34.0 Engine block diagnosis and repair.
- 35.0 Lubrication systems diagnosis and repair.
- 36.0 Cooling system diagnosis and repair.
- 37.0 Air induction and exhaust systems diagnosis and repair.
- 38.0 Fuel system diagnosis and repair.

- 39.0 Diagnose and repair engine brakes.
- 40.0 Diagnose and repair air supply and service systems.
- 41.0 Diagnose and repair mechanical/foundation air brake systems.
- 42.0 Diagnose and repair parking brakes.
- 43.0 Diagnose and repair hydraulic systems.
- 44.0 Diagnose and repair mechanical/foundation hydraulic brake systems.
- 45.0 Diagnose and repair power assist units.
- 46.0 Diagnose and repair air and hydraulic antilock brake systems (ABS) and automatic traction control (ATC).
- 47.0 Diagnose and repair wheel bearings.
- 48.0 HVAC systems diagnosis, service, and repair.
- 49.0 A/C system and component diagnosis, service, and repair.
- 50.0 Diagnose and repair Compressor and clutch.
- 51.0 Diagnose and repair Evaporator, condenser, and related components.
- 52.0 Heating and engine cooling systems diagnosis, service, and repair.
- 53.0 Electrical system diagnosis, service, and repair.
- 54.0 Air/vacuum/mechanical diagnosis, service, and repair.
- 55.0 Refrigerant recovery, recycling, and handling.
- 56.0 Steering column diagnosis, service, and repair.
- 57.0 Steering units diagnosis, service, and repair.
- 58.0 Steering linkage diagnosis, service, and repair.
- 59.0 Suspension systems diagnosis and repair.
- 60.0 Wheel alignment diagnosis, adjustment, and repair.
- 61.0 Wheels and tires diagnosis, service, and repair.
- 62.0 Frame and coupling diagnosis, service, and repair.
- 63.0 Clutch diagnosis and repair.
- 64.0 Transmission diagnosis and repair.
- 65.0 Driveshaft and universal joint diagnosis and repair.
- 66.0 Drive axle diagnosis and repair.
- 67.0 General hydraulic system diagnosis and repair.
- 68.0 Diagnose and repair hydraulic pumps.
- 69.0 Diagnose and repair hydraulic filtration/reservoirs (tanks).
- 70.0 Diagnose and repair hydraulic hoses, fittings, and connections.
- 71.0 Diagnose and repair hydraulic control valves.
- 72.0 Diagnose and repair hydraulic actuators.

Florida Department of Education
Student Performance Standards

Program Title: Diesel Systems Technician
Career Certificate Program Number: I470605

Course Number: DIM0101
Occupational Completion Point: A
Diesel Engine Mechanic/Technician Helper – 150 Hours – SOC Code 49-9098

Course Description:

The Diesel Engine Mechanic/Technician Helper course prepares students for entry into the Diesel Engine Service industry. Content emphasizes beginning skills and concepts as a recommended requisite. Students study shop and personal safety skills, basic diesel components, tools and equipment, occupational safety, engine operation, and workplace employment skills.

For every task in Diesel Engine Mechanic/Technician Helper, the following safety task must be strictly enforced:

Comply with personal and environmental safety practices associated with clothing; eye protection; hand protection; proper lifting practices; hand tools; power equipment; proper ventilation; and the handling, storage, and disposal of fuels/chemicals/materials in accordance with federal, state, and local regulations.

ASE = Required Supplemental Tasks

CTE Standards and Benchmarks	Priority Number
01.0 Proficiently explain and apply required shop and personal safety tasks.-The student will be able to:	
01.01 Identify basic shop organization and management regulations.	
01.02 Identify and apply general and required shop safety rules and procedures.	ASE
01.03 Utilize safe procedures for handling of tools and equipment.	ASE
01.04 Identify and use proper placement of floor jacks and jack stands.	ASE
01.05 Identify and use proper procedures for safe lift operation.	ASE
01.06 Utilize proper ventilation procedures for working within the lab/shop area.	ASE
01.07 Identify the location and the types of fire extinguishers and other fire safety equipment; demonstrate knowledge of the procedures for using fire extinguishers and other fire safety equipment.	ASE
01.08 Identify the location and use of eye wash stations.	ASE
01.09 Identify and comply with the required use of PPE during lab/shop activities.	ASE

CTE Standards and Benchmarks	Priority Number
01.10 Secure hair and jewelry for lab/shop activities.	ASE
01.11 Demonstrate awareness of the safety aspects of supplemental restraint systems (SRS), electronic brake control systems, and hybrid vehicle high voltage circuits.	ASE
01.12 Demonstrate awareness of the safety aspects of high voltage circuits (such as high intensity discharge (HID) lamps, ignition systems, injection systems, etc.).	ASE
01.13 Locate and demonstrate knowledge of Safety Data Sheets (SDS).	ASE
01.14 Assist in activities and job tasks, in accordance with local, state, and federal safety and environmental regulations.	
01.15 Identify and comply with personal and environmental safety practices associated with the handling, storage, and disposal of chemicals and hazardous materials.	
02.0 Identify the basic diesel components and functions.-The student will be able to:	
02.01 Identify seals, gaskets, and bearings.	
02.02 Identify drive train components and functions.	
02.03 Identify threaded fasteners by size, type, thread series, thread classes, material hardness, and compatibility	
03.0 Explain and apply required tasks associated with the proper use and handling of tools and equipment.-The student will be able to:	
03.01 Identify tools and demonstrate their proper usage.	ASE
03.02 Identify standard and metric designation.	ASE
03.03 Demonstrate proper cleaning, storage, and maintenance of tools and equipment.	ASE
03.04 Demonstrate proper use of precision measuring tools (i.e. micrometer, dial-indicator, dial-caliper, etc.).	ASE
04.0 Identify principles, assemblies, and systems of engine operation.-The student will be able to:	
04.01 Explain the basic principles in the operation of the four-stroke-cycle diesel engine	
04.02 Identify engine assemblies and systems.	
04.03 Identify the components of and explain the operating principles of two and four-stroke cycle engines.	
04.04 Identify governor types and their operating principles.	
05.0 Demonstrate proficiency in preparing vehicle for routine pre/post maintenance and customer services.-The student will be able to:	
05.01 Identify information needed and the service requested on a repair order.	ASE
05.02 Identify purpose and demonstrate proper use of fender covers, mats.	ASE
05.03 Demonstrate use of the three C's (Concern, Cause, and Correction).	ASE
05.04 Complete work order to include customer information, vehicle identifying information, customer concern, related service history, cause, and correction.	ASE

CTE Standards and Benchmarks	Priority Number
05.05 Ensure vehicle is prepared to return to customer per school/company policy (floor mats, steering wheel cover, etc.)	ASE
06.0 Demonstrate workplace employability skills related to personal standards and work habits/ethics.-The student will be able to:	
06.01 Reports to work daily on time; able to take directions and motivated to accomplish the task at hand.	ASE
06.02 Dresses appropriately and uses language and manners suitable for the workplace.	ASE
06.03 Maintains appropriate personal hygiene.	ASE
06.04 Meets and maintains employment eligibility criteria, such as drug/alcohol-free status, clean driving record, etc.	ASE
06.05 Demonstrates honesty, integrity and reliability.	ASE
06.06 Complies with workplace policies/laws	ASE
06.07 Contributes to the success of the team, assists others and requests help when needed.	ASE
06.08 Works well with all customers and coworkers.	ASE
06.09 Negotiates solutions to interpersonal and workplace conflicts.	ASE
06.10 Contributes ideas and initiative.	ASE
06.11 Follows directions.	ASE
06.12 Communicates (written and verbal) effectively with customers and coworkers.	ASE
06.13 Reads and interprets workplace documents; writes clearly and concisely.	ASE
06.14 Analyzes and resolves problems that arise in completing assigned tasks.	ASE
06.15 Organizes and implements a productive plan of work.	ASE
06.16 Uses scientific, technical, engineering and mathematics principles and reasoning to accomplish assigned tasks.	ASE
06.17 Identifies and address the needs of all customers, providing helpful, courteous and knowledgeable service and advice as needed.	ASE

**Florida Department of Education
Student Performance Standards**

Course Number: DIM0102
Occupational Completion Point: B
Diesel Electrical and Electronics Technician – 300 Hours – SOC Code 49-3031

Course Description:

The Diesel Electrical and Electronics Technician course prepares students for entry into the Diesel Engine Service industry. Content emphasizes beginning skills and concepts as a recommended requisite. Students study general electrical systems, batteries, starting, charging, lighting, gauges, warning devices, and related electrical system diagnostics, service, and repair.

For every task in Diesel Electrical and Electronics Technician, the following safety task must be strictly enforced:

Comply with personal and environmental safety practices associated with clothing; eye protection; hand protection; proper lifting practices; hand tools; power equipment; proper ventilation; and the handling, storage, and disposal of fuels/chemicals/materials in accordance with federal, state, and local regulations.

The first task in Diesel Electrical and Electronics Technician is to listen to and verify the operator’s concern, review past maintenance and repair documents, and determine necessary action.

EE Task List:	
	P-1 = 38
	P-2 = 15
	P-3 = 12
Total	65

CTE Standards and Benchmarks	Priority Number
07.0 Diagnose and repair general electrical systems.-The student will be able to:	
07.01 Read and interpret electrical/electronic circuits using wiring diagrams.	P-1
07.02 Check continuity in electrical/electronic circuits using appropriate test equipment.	P-1
07.03 Check applied voltages, circuit voltages, and voltage drops in electrical/electronic circuits using appropriate test equipment.	P-1
07.04 Check current flow in electrical/electronic circuits and components using appropriate test equipment.	P-1
07.05 Check resistance in electrical/electronic circuits and components using appropriate test equipment.	P-1
07.06 Locate shorts, grounds, and opens in electrical/electronic circuits.	P-1
07.07 Diagnose parasitic (key-off) battery drain problems; perform tests; determine needed action.	P-1
07.08 Inspect and test fusible links, circuit breakers, relays, solenoids, and fuses; replace as needed.	P-1
07.09 Inspect and test spike suppression devices; replace as needed.	P-3
07.10 Check frequency and pulse width signal in electrical/electronic circuits using appropriate test equipment.	P-3
08.0 Diagnose and repair battery systems.-The student will be able to:	

CTE Standards and Benchmarks	Priority Number
08.01 Identify battery type; perform appropriate battery load test; determine needed action.	P-1
08.02 Determine battery state of charge using an open circuit voltage test.	P-1
08.03 Inspect, clean, and service battery; replace as needed.	P-1
08.04 Inspect and clean battery boxes, mounts, and hold downs; repair or replace as needed.	P-1
08.05 Charge battery using appropriate method for battery type.	P-1
08.06 Inspect, test, and clean battery cables and connectors; repair or replace as needed.	P-1
08.07 Jump start a vehicle using jumper cables and a booster battery or auxiliary power supply using proper safety procedures.	P-1
08.08 Perform battery capacitance test; determine needed action.	P-2
08.09 Identify and test low voltage disconnect (LVD) systems; determine needed repair.	P-2
09.0 Diagnose and repair starting systems.-The student will be able to:	
09.01 Perform starter circuit cranking voltage and voltage drop tests; determine needed action.	P-1
09.02 Inspect and test components (key switch, push button and/or magnetic switch) and wires and harnesses in the starter control circuit; replace as needed	P-2
09.03 Inspect and test starter relays and solenoids/switches; replace as needed.	P-1
09.04 Remove and replace starter; inspect flywheel ring gear or flex plate.	P-1
10.0 Diagnose and repair charging systems.-The student will be able to:	
10.01 Test instrument panel mounted volt meters and/or indicator lamps; determine needed action.	P-1
10.02 Identify causes of a no charge, low charge, or overcharge problems; determine needed action.	P-1
10.03 Inspect and replace alternator drive belts, pulleys, fans, tensioners, and mounting brackets; adjust drive belts and check alignment.	P-1
10.04 Perform charging system voltage and amperage output tests; perform AC ripple test; determine needed action.	P-1
10.05 Perform charging circuit voltage drop tests; determine needed action.	P-1
10.06 Remove and replace alternator.	P-1
10.07 Inspect, repair, or replace cables, wires, and connectors in the charging circuit.	P-1
11.0 Diagnose and repair lighting systems.-The student will be able to:	
11.01 Interface with vehicle's on-board computer; perform diagnostic procedures using recommended electronic service tool(s) (including PC based software and/or data scan tools); determine needed action.	P-1
11.02 Identify causes of brighter than normal, intermittent, dim, or no headlight and daytime running light (DRL) operation.	P-1

CTE Standards and Benchmarks	Priority Number
11.03 Test, aim, and replace headlights.	P-1
11.04 Test headlight and dimmer circuit switches, relays, wires, terminals, connectors, sockets, and control components/modules; repair or replace as needed.	P-1
11.05 Inspect and test switches, bulbs/LEDs, sockets, connectors, terminals, relays, and control components/modules of parking, clearance, and taillight circuits; repair or replace as needed.	P-1
11.06 Inspect and test instrument panel light circuit switches, relays, bulbs/LEDs, sockets, connectors, terminals, wires, and printed circuits/control modules; repair or replace as needed.	P-2
11.07 Inspect and test interior cab light circuit switches, bulbs/LEDs, sockets, low voltage disconnect (LVD), connectors, terminals, wires, and control components/modules; repair or replace as needed.	P-2
11.08 Inspect and test tractor-to-trailer multi-wire connector(s); repair or replace as needed.	P-1
11.09 Inspect, test, and adjust stoplight circuit switches, bulbs/LEDs, sockets, connectors, terminals, wires and control components/modules; repair or replace as needed.	P-1
11.10 Inspect and test turn signal and hazard circuit flasher(s), switches, relays, bulbs/LEDs, sockets, connectors, terminals, wires and control components/modules; repair or replace as needed.	P-1
11.11 Inspect and test reverse lights and warning device circuit switches, bulbs/LEDs, sockets, horns, buzzers, connectors, terminals, wires and control components/modules; repair or replace as needed.	P-1
12.0 Diagnose and repair gauges and warning devices.-The student will be able to:	
12.01 Interface with vehicle's on-board computer; perform diagnostic procedure, verify instrument cluster operations using recommended electronic service tool(s) (including PC based software and/or data scan tools); determine needed action.	P-1
12.02 Identify causes of intermittent, high, low, or no gauge readings; determine needed action.	P-2
12.03 Identify causes of data bus-driven gauge malfunctions; determine needed action.	P-3
12.04 Inspect and test gauge circuit sensor/sending units, gauges, connectors, terminals, and wires; repair or replace as needed.	P-2
12.05 Inspect and test warning devices (lights and audible) circuit sensor/sending units, bulbs/LEDs, sockets, connectors, wires, and control components/modules; repair or replace as needed.	P-1
12.06 Inspect, test, replace, and calibrate (if applicable) electronic speedometer, odometer, and tachometer systems.	P-2
13.0 Diagnose and repair related electrical systems.-The student will be able to:	
13.01 Interface with vehicle's on-board computer; perform diagnostic procedures using recommended electronic service tool(s) (including PC based software and/or data scan tools); determine needed action.	P-1
13.02 Identify causes of constant, intermittent, or no horn operation; determine needed action.	P-1
13.03 Inspect and test horn circuit relays, horns, switches, connectors, wires, clock springs, and control components/modules; repair or replace as needed.	P-2
13.04 Identify causes of constant, intermittent, or no wiper operation; diagnose the cause of wiper speed control and/or park problems; determine needed action.	P-2

CTE Standards and Benchmarks	Priority Number
13.05 Inspect and test wiper motor, resistors, park switch, relays, switches, connectors, wires and control components/modules; repair or replace as needed.	P-2
13.06 Inspect wiper motor transmission linkage, arms, and blades; adjust or replace as needed.	P-2
13.07 Inspect and test windshield washer motor or pump/relay assembly, switches, connectors, terminals, wires, and control components/modules; repair or replace as needed.	P-3
13.08 Inspect and test side view mirror motors, heater circuit grids, relays, switches, connectors, terminals, wires, and control components/modules; repair or replace as needed.	P-3
13.09 Inspect and test heater and A/C electrical components including: A/C clutches, motors, resistors, relays, switches, connectors, terminals, wires, and control components/modules; repair or replace as needed.	P-3
13.10 Inspect and test auxiliary power outlet, integral fuse, connectors, terminals, wires, and control components/modules; repair or replace as needed.	P-3
13.11 Identify causes of slow, intermittent, or no power window operation; determine needed action.	P-3
13.12 Inspect and test motors, switches, relays, connectors, terminals, wires, and control components/modules of power window circuits; repair or replace as needed.	P-3
13.13 Inspect and test block heaters; determine needed repairs.	P-2
13.14 Inspect and test cruise control electrical components; repair or replace as needed.	P-3
13.15 Inspect and test switches, relays, controllers, actuator/solenoids, connectors, terminals, and wires of electric door lock circuits.	P-3
13.16 Check operation of keyless and remote lock/unlock devices; determine needed action.	P-3
13.17 Inspect and test engine cooling fan electrical control components/modules, wiring; repair or replace as needed.	P-2
13.18 Identify causes of data bus communication problems; determine needed action.	P-2

**Florida Department of Education
Student Performance Standards**

Course Number: DIM0103
Occupational Completion Point: C
Diesel Engine Preventative Maintenance Technician – 150 Hours – SOC Code 49-3031

Course Description:

The Diesel Engine Preventative Maintenance Technician course prepares students for entry into the Diesel Engine Service industry. Content emphasizes beginning skills and concepts as a recommended requisite. Students study engine system, cab and hood systems, electrical/electronic systems, frame and chassis systems diagnostics, service, and repair.

For every task in Diesel Engine Preventative Maintenance Technician, the following safety task must be strictly enforced:

Comply with personal and environmental safety practices associated with clothing; eye protection; hand protection; proper lifting practices; hand tools; power equipment; proper ventilation; and the handling, storage, and disposal of fuels/chemicals/materials in accordance with federal, state, and local regulations.

The tasks included in the Diesel Engine Preventative Maintenance Technician area are entry-level technician inspection tasks designed to introduce the student to correct procedures and practices of vehicle inspection in a teaching/learning environment. They are not intended to satisfy the Annual Federal Vehicle Inspection requirement as prescribed in the Federal Motor Carrier Safety Regulations, Part 396, Appendix G to Subchapter B, Minimum Periodic Inspection Standards.

PM Task List:	
P-1 =	132
P-2 =	11
P-3 =	0
Total	143

The first task in Diesel Engine Preventative Maintenance Technician is to listen to and verify the operator’s concern, review past maintenance and repair documents, and determine necessary action.

CTE Standards and Benchmarks		Priority Number
14.0	Inspect and service Engine Systems record findings as needed.-The student will be able to:	
14.01	Check engine starting/operation (including unusual noises, vibrations, exhaust smoke, etc.); record idle and governed rpm.	P-1
14.02	Inspect vibration damper.	P-1
14.03	Inspect belts, tensioners, and pulleys; check and adjust belt tension; check belt alignment.	P-1
14.04	Check engine oil level and condition; check dipstick seal.	P-1
14.05	Inspect engine mounts for looseness and deterioration.	P-1
14.06	Check engine for oil, coolant, air, fuel and exhaust leaks (Engine Off and Running).	P-1
14.07	Check engine compartment wiring harnesses, connectors, and seals for damage and proper routing.	P-1

CTE Standards and Benchmarks		Priority Number
14.08	Check electrical wiring, routing, and hold-down clamps, including Engine Control Module/Powertrain Control Module (ECM/PCM).	
15.0	Diagnose and repair Fuel system.-The student will be able to:	
15.01	Check fuel tanks, mountings, lines, caps, and vents.	P-1
15.02	Drain water from fuel system.	P-1
15.03	Service water separator/fuel heater; replace fuel filter(s); prime and bleed fuel system.	P-1
16.0	Diagnose and repair Air induction and exhaust system.-The student will be able to:	
16.01	Check exhaust system mountings for looseness and damage.	P-1
16.02	Check engine exhaust system for leaks, proper routing, and damaged or missing components to include exhaust gas recirculation (EGR) system and after treatment devices, if equipped.	P-1
16.03	Check air induction system: piping, charge air cooler, hoses, clamps, and mountings; check for air restrictions and leaks.	P-1
16.04	Inspect turbocharger for leaks; check mountings and connections.	P-1
16.05	Check operation of engine compression/exhaust brake.	P-2
16.06	Service or replace air filter as needed; check and reset air filter restriction indicator.	P-1
16.07	Inspect and service crankcase ventilation system.	P-1
16.08	Inspect diesel exhaust fluid (DEF) system, to include tanks, lines, gauge pump, and filter (if equipped).	P-1
16.09	Inspect selective catalyst reduction (SCR) system; including diesel exhaust fluid (DEF) for proper levels, leaks, mounting and connections (if equipped).	P-2
17.0	Diagnose and repair Cooling system.-The student will be able to:	
17.01	Check operation of fan clutch.	P-1
17.02	Inspect radiator (including air flow restriction, leaks, and damage) and mountings.	P-1
17.03	Inspect fan assembly and shroud.	P-1
17.04	Pressure test cooling system and radiator cap.	P-1
17.05	Inspect coolant hoses and clamps.	P-1
17.06	Inspect coolant recovery system.	P-1
17.07	Check coolant for contamination, additive package concentration, aeration, and protection level (freeze point).	P-1
17.08	Service coolant filter (if equipped).	P-1
17.09	Inspect water pump.	P-1

CTE Standards and Benchmarks		Priority Number
18.0	Diagnose and repair Lubrication system.-The student will be able to:	
18.01	Change engine oil and filters; visually check oil for coolant or fuel contamination; inspect and clean magnetic drain plugs.	P-1
18.02	Take an engine oil sample for analysis.	P-1
19.0	Diagnose and repair Instruments and control systems.-The student will be able to:	
19.01	Inspect key condition and operation of ignition switch.	P-1
19.02	Check warning indicators.	P-1
19.03	Check instruments; record oil pressure and system voltage.	P-1
19.04	Check operation of electronic power take off (PTO) and engine idle speed controls (if applicable)	P-2
19.05	Check HVAC controls.	P-1
19.06	Check operation of all accessories.	P-1
19.07	Using electronic service tool(s) or on-board diagnostic system; retrieve engine monitoring information; check and record diagnostic codes and trip/operational data (including engine, transmission, ABS, and other systems).	P-1
19.08	Check mechanical and electronic engine speed controls (if equipped).	
20.0	Diagnose and repair Safety equipment.-The student will be able to:	
20.01	Check operation of electric/air horns and back-up warning devices.	P-1
20.02	Check condition of spare fuses, safety triangles, fire extinguisher, and all required decals.	P-1
20.03	Inspect seat belts and sleeper restraints.	P-1
20.04	Inspect wiper blades and arms.	P-1
21.0	Diagnose and repair Hardware.-The student will be able to:	
21.01	Check operation of wiper and washer.	P-1
21.02	Inspect windshield glass for cracks or discoloration; check sun visor.	P-1
21.03	Check seat condition, operation, and mounting.	P-1
21.04	Check door glass and window operation.	P-1
21.05	Inspect steps, catwalks, and grab handles (if applicable).	P-1
21.06	Inspect mirrors, mountings, brackets, and glass.	P-1
21.07	Record all observed physical damage.	P-2
21.08	Lubricate all cab and hood grease fittings.	P-2

CTE Standards and Benchmarks	Priority Number
21.09 Inspect and lubricate door and hood hinges, latches, strikers, lock cylinders, safety latches, linkages, and cables.	P-1
21.10 Inspect cab mountings, hinges, latches, linkages and ride height; service as needed.	P-1
21.11 Inspect tilt cab hydraulic pump, lines, and cylinders for leakage; inspect safety devices; service as needed.	
22.0 Diagnose and repair Heating, ventilation, and air conditioning (HVAC).-The student will be able to:	
22.01 Inspect A/C condenser and lines for condition and visible leaks; check mountings.	P-2
22.02 Inspect A/C compressor and lines for condition and visible leaks; check mountings.	P-2
22.03 Check A/C system condition and operation; check A/C monitoring system, if applicable.	P-1
22.04 Check HVAC air inlet filters and ducts; service as needed.	P-1
23.0 Diagnose and repair Electrical/Electronic battery and starting systems.-The student will be able to:	
23.01 Inspect battery box(es), cover(s), and mountings.	P-1
23.02 Inspect battery hold-downs, connections, cables, and cable routing; service as needed.	P-1
23.03 Check/record battery state-of-charge (open circuit voltage) and condition.	P-1
23.04 Perform battery test (load and/or capacitance).	P-1
23.05 Inspect starter, mounting, and connections.	P-1
23.06 Engage starter; check for unusual noises, starter drag, and starting difficulty.	P-1
24.0 Diagnose and repair Electrical/Electronic charging systems.-The student will be able to:	
24.01 Inspect alternator, mountings, cable, wiring, and wiring routing; determine needed action.	P-1
24.02 Perform alternator output tests.	P-1
25.0 Diagnose and repair Electrical/Electronic lighting systems.-The student will be able to:	
25.01 Check operation of interior lights; determine needed action.	P-1
25.02 Check all exterior lights, lenses, reflectors, and conspicuity tape; check headlight alignment; determine needed action.	P-1
25.03 Inspect and test tractor-to-trailer multi-wire connector(s), cable(s), and holder(s); determine needed action.	P-1
26.0 Diagnose and repair Air brake systems.-The student will be able to:	
26.01 Check operation of parking brake.	P-1
26.02 Record air governor cut-in and cut-out setting (psi).	P-1
26.03 Check operation of air reservoir/tank drain valves.	P-1
26.04 Check air system for leaks (brakes released).	P-1

CTE Standards and Benchmarks	Priority Number
26.05 Check air system for leaks (brakes applied).	P-1
26.06 Test one-way and double-check valves.	P-1
26.07 Check low air pressure warning devices.	P-1
26.08 Check emergency (spring) brake control/modulator valve, if applicable.	P-1
26.09 Check tractor protection valve.	P-1
26.10 Test air pressure build-up time.	P-1
26.11 Inspect coupling air lines, holders, and glad-hands.	P-1
26.12 Check brake chambers and air lines for secure mounting and damage.	P-1
26.13 Check operation of air drier.	P-1
26.14 Inspect and record brake shoe/pad condition, thickness, and contamination.	P-1
26.15 Inspect and record condition of brake drums/rotors.	P-1
26.16 Check antilock brake system wiring, connectors, seals, and harnesses for damage and proper routing	P-1
26.17 Check operation and adjustment of brake automatic slack adjusters (ASA); check and record push rod stroke.	P-1
26.18 Lubricate all brake component grease fittings.	P-1
26.19 Check condition and operation of hand brake (trailer) control valve, if applicable.	P-2
26.20 Perform antilock brake system (ABS) operational system self-test.	P-1
26.21 Drain air tanks and check for contamination.	P-1
26.22 Check condition of pressure relief (safety) valves.	P-1
27.0 Diagnose and repair Hydraulic brake systems.-The student will be able to:	
27.01 Check master cylinder fluid level and condition.	P-1
27.02 Inspect brake lines, fittings, flexible hoses, and valves for leaks and damage.	P-1
27.03 Check parking brake operation; inspect parking brake application and holding devices; adjust as needed.	P-1
27.04 Check operation of hydraulic system: pedal travel, pedal effort, pedal feel.	P-1
27.05 Inspect calipers for leakage, binding and damage.	P-1
27.06 Inspect brake assist system (booster), hoses and control valves; check for leaks.	P-1
27.07 Inspect and record brake lining/pad condition, thickness, and contamination.	P-1
27.08 Inspect and record condition of brake rotors.	P-1

CTE Standards and Benchmarks	Priority Number
27.09 Check antilock brake system wiring, connectors, seals, and harnesses for damage and proper routing.	P-1
27.10 Check drum brakes for proper adjustment.	
28.0 Inspect, service and record Drive Train systems.-The student will be able to:	
28.01 Check operation of clutch, clutch brake, and gearshift.	P-1
28.02 Check clutch linkage/cable for looseness or binding, if applicable.	P-1
28.03 Check hydraulic clutch slave and master cylinders, lines, fittings, and hoses, if applicable.	P-1
28.04 Check clutch adjustment; adjust as needed.	P-1
28.05 Check transmission case, seals, filter, hoses, lines and cooler for cracks and leaks.	P-1
28.06 Inspect transmission breather.	P-1
28.07 Inspect transmission mounts.	P-1
28.08 Check transmission oil level, condition, determine proper type and service as needed.	P-1
28.09 Inspect U-joints, yokes, driveshafts, boots/seals, center bearings, and mounting hardware for looseness, damage, and proper phasing.	P-1
28.10 Inspect axle housing(s) for cracks and leaks.	P-1
28.11 Inspect axle breather(s).	P-1
28.12 Lubricate all drivetrain grease fittings.	P-1
28.13 Check drive axle(s) oil level, condition, determine proper type, and service as needed.	P-1
28.14 Change drive axle(s) oil and filter/screen, if applicable; check and clean magnetic plugs.	P-2
28.15 Check transmission wiring, connectors, seals, and harnesses for damage and proper routing.	P-1
28.16 Change transmission oil and filter, if applicable; check and clean magnetic plugs.	P-2
28.17 Check inter-axle differential lock operation.	P-1
28.18 Check transmission range shift operation.	P-1
29.0 Diagnose and repair Suspension and steering systems.-The student will be able to:	
29.01 Check steering wheel operation for free play and binding.	P-1
29.02 Check power steering pump, mounting, and hoses for leaks, condition, and routing; check fluid level.	P-1
29.03 Change power steering fluid and filter.	P-1
29.04 Inspect steering gear for leaks and secure mounting.	P-1
29.05 Inspect steering shaft U-joints, pinch bolts, splines, pitman arm-to-steering sector shaft, tie rod ends, and linkages.	P-1

CTE Standards and Benchmarks	Priority Number
29.06 Check kingpins for wear.	P-1
29.07 Check wheel bearings for looseness and noise; adjust as necessary.	P-1
29.08 Check oil level and condition in all non-drive hubs; check for leaks.	P-1
29.09 Inspect springs, pins, hangers, shackles, spring U-bolts, and insulators.	P-1
29.10 Inspect shock absorbers for leaks and secure mounting.	P-1
29.11 Inspect air suspension springs, mounts, hoses, valves, linkage, and fittings for leaks and damage.	P-1
29.12 Check and record suspension ride height.	P-1
29.13 Lubricate all suspension and steering grease fittings.	P-1
29.14 Check axle locating components (radius, torque, and/or track rods).	P-1
30.0 Diagnose and repair Tires and wheels.-The student will be able to:	
30.01 Inspect tires for wear patterns and proper mounting.	P-1
30.02 Inspect tires for cuts, cracks, bulges, and sidewall damage.	P-1
30.03 Inspect valve caps and stems; determine needed action.	P-1
30.04 Measure and record tread depth; probe for imbedded debris.	P-1
30.05 Check and record air pressure; adjust air pressure in accordance with manufacturers' specifications.	P-1
30.06 Check wheel mounting hardware condition; determine needed action.	P-1
30.07 Inspect wheel/rims for proper application, load range and design; ensure dual rims are properly clocked to access valve stems; determine needed action.	P-1
30.08 Check tire matching (diameter and tread) on single and dual tire applications.	P-1
30.09 Re-torque lugs in accordance with manufacturer's specifications.	
31.0 Diagnose and repair Frame and fifth wheel.-The student will be able to:	
31.01 Inspect fifth wheel mounting, bolts, air lines, and locks.	P-1
31.02 Test operation of fifth wheel locking device; adjust if necessary.	P-1
31.03 Check quarter fenders, mud flaps, and brackets.	P-1
31.04 Check pintle hook assembly and mounting; if applicable.	P-2
31.05 Lubricate all fifth wheel grease fittings and plate; if applicable	P-1
31.06 Inspect frame and frame members for cracks and damage.	P-1

**Florida Department of Education
Student Performance Standards**

Course Number: DIM0104
Occupational Completion Point: D
Diesel Engine Technician – 300 Hours – SOC Code 49-3031

Course Description:

The Diesel Engine Technician course prepares students for entry into the Diesel Engine Service industry. Content emphasizes beginning skills and concepts as a recommended requisite. Students study engine, cylinder head, valve train, engine block, lubrication, cooling, air induction, exhaust, fuel, and engine brakes diagnostics, service, and repair.

For every task in Diesel Engine Technician, the following safety task must be strictly enforced:

Comply with personal and environmental safety practices associated with clothing; eye protection; hand protection; proper lifting practices; hand tools; power equipment; proper ventilation; and the handling, storage, and disposal of fuels/chemicals/materials in accordance with federal, state, and local regulations.

The first task in Diesel Engine Technician is to listen to and verify the operator’s concern, review past maintenance and repair documents, and determine necessary action.

DE Task List:	
	P-1 = 35
	P-2 = 32
	P-3 = 21
Total	88

CTE Standards and Benchmarks	Priority Number
32.0 General engine diagnosis and repair.-The student will be able to:	
32.01 Inspect fuel, oil, Diesel Exhaust Fluid (DEF) and coolant levels, and condition; determine needed action.	P-1
32.02 Identify and diagnose the causes of engine fuel, oil, coolant, air, and other leaks; determine needed action.	P-1
32.03 Listen and interpret engine noises; determine needed action.	P-3
32.04 Observe engine exhaust smoke color and quantity; determine needed action.	P-2
32.05 Check and diagnose no cranking, cranks but fails to start, hard starting, and starts but does not continue to run problems; determine needed action.	P-1
32.06 Identify and diagnose causes of engine surging, rough operation, misfiring, low power, slow deceleration, slow acceleration, and shutdown problems; determine needed action.	P-1
32.07 Identify and diagnose engine vibration problems; determine needed action.	P-2
32.08 Check, record, and clear electronic diagnostic (fault) codes; monitor electronic data; determine needed action.	P-1
32.09 Perform air intake system restriction and leakage tests; determine needed action.	
32.10 Perform intake manifold pressure (boost) test; determine needed action.	

CTE Standards and Benchmarks	Priority Number
32.11 Perform exhaust back pressure test; determine needed action.	
32.12 Perform cylinder contribution test; determine needed action.	
33.0 Cylinder head and valve train diagnosis and repair.-The student will be able to:	
33.01 Inspect cylinder head for cracks/damage; check mating surfaces for warpage; check condition of passages; inspect core/expansion and gallery plugs; determine needed action.	P-2
33.02 Disassemble head and inspect valves, guides, seats, springs, retainers, rotators, locks, and seals; determine needed action.	P-3
33.03 Measure valve head height relative to deck, valve face-to-seat contact; determine needed action.	P-3
33.04 Inspect injector sleeves and seals; measure injector tip or nozzle protrusion; perform needed action.	P-3
33.05 Inspect valve train components; determine needed action.	P-1
33.06 Reassemble cylinder head.	P-3
33.07 Inspect, measure, and replace/reinstall overhead camshaft; measure/adjust end play and backlash.	P-3
33.08 Inspect electronic wiring harness and brackets for wear, bending, cracks, and looseness; determine needed action.	P-1
33.09 Inspect and adjust valve bridges (crossheads); adjust valve clearances and injector settings.	P-2
33.10 Remove, clean, inspect for visible damage, and replace cylinder head(s) assembly.	
33.11 Clean and inspect threaded holes, studs, and bolts for serviceability; determine needed action.	
33.12 Inspect pushrods, rocker arms, rocker arm shafts, and blocked oil passages; perform needed action.	
33.13 Inspect cam followers; perform needed action.	
34.0 Engine block diagnosis and repair.-The student will be able to:	
34.01 Perform crankcase pressure test; determine needed action	P-1
34.02 Remove, inspect, service, and install pans, covers, gaskets, seals, wear rings, and crankcase ventilation components.	P-2
34.03 Disassemble, clean, and inspect engine block for cracks/damage; measure mating surfaces for warpage; check condition of passages, core/expansion and gallery plugs; inspect threaded holes, studs, dowel pins, and bolts for serviceability; determine needed action.	P-2
34.04 Inspect cylinder sleeve counter bore and lower bore; check bore distortion; determine needed action.	P-2
34.05 Clean, inspect, and measure cylinder walls or liners for wear and damage; determine needed action.	P-2
34.06 Replace/reinstall cylinder liners and seals; check and adjust liner height (protrusion).	P-2
34.07 Inspect in-block camshaft bearings for wear and damage; determine needed action.	P-3
34.08 Inspect, measure, and replace/reinstall in-block camshaft; measure/adjust end play.	P-3

CTE Standards and Benchmarks	Priority Number
34.09 Clean and inspect crankshaft for surface cracks and journal damage; check condition of oil passages; check passage plugs; measure journal diameter; determine needed action.	P-2
34.10 Inspect main bearings for wear patterns and damage; replace as needed; check bearing clearances; check and correct crankshaft end play.	P-2
34.11 Inspect, install, and time gear train; measure gear backlash; determine needed action.	P-2
34.12 Inspect connecting rod and bearings for wear patterns; measure pistons, pins, retainers, and bushings; perform needed action.	P-3
34.13 Determine piston-to-cylinder wall clearance; check ring-to-groove fit and end gap; install rings on pistons.	P-3
34.14 Assemble pistons and connecting rods; install in block; install rod bearings and check clearances.	P-2
34.15 Check condition of piston cooling jets (nozzles); determine needed action.	P-2
34.16 Inspect and measure crankshaft vibration damper; determine needed action.	P-3
34.17 Install and align flywheel housing; inspect flywheel housing(s) to transmission housing/engine mating surface(s) and measure flywheel housing face and bore runout; determine needed action.	P-3
34.18 Inspect flywheel/flex-plate (including ring gear) and mounting surfaces for cracks and wear; measure runout; determine needed action.	P-2
35.0 Lubrication systems diagnosis and repair.-The student will be able to:	
35.01 Test engine oil pressure and check operation of pressure sensor, gauge, and/or sending unit, test engine oil temperature and check operation of temperature sensor; determine needed action.	P-1
35.02 Check engine oil level, condition, and consumption; determine needed action.	P-1
35.03 Inspect and measure oil pump, drives, inlet pipes, and pick-up screens; check drive gear clearances; determine needed action.	P-3
35.04 Inspect oil pressure regulator valve(s), by-pass and pressure relief valve(s), oil thermostat, and filters; determine needed action.	P-3
35.05 Inspect, clean, and test oil cooler and components; determine needed action.	P-3
35.06 Inspect turbocharger lubrication system; determine needed action.	P-2
35.07 Determine proper lubricant and perform oil and filter change.	P-1
36.0 Cooling system diagnosis and repair.-The student will be able to:	
36.01 Check engine coolant type, level, condition, and consumption; test coolant for freeze protection and additive package concentration; determine needed action.	P-1
36.02 Test coolant temperature and check operation of temperature and level sensors, gauge, and/or sending unit; determine needed action.	P-1
36.03 Inspect and reinstall/replace pulleys, tensioners and drive belts; adjust drive belts and check alignment.	P-1
36.04 Inspect thermostat(s), by-passes, housing(s), and seals; replace as needed.	P-2
36.05 Recover coolant, flush, and refill with recommended coolant/additive package; bleed cooling system.	P-1

CTE Standards and Benchmarks		Priority Number
36.06	Inspect coolant conditioner/filter assembly for leaks; inspect valves, lines, and fittings; replace as needed (if equipped).	P-1
36.07	Inspect water pump and hoses; replace as needed.	P-1
36.08	Inspect, clean, and pressure test radiator. Pressure test cap, tank(s), and recovery systems; determine needed action.	P-1
36.09	Inspect thermostatic cooling fan system (hydraulic, pneumatic, and electronic) and fan shroud; replace as needed.	P-1
36.10	Inspect turbo charger cooling systems; determine needed action.	P-2
37.0	Air induction and exhaust systems diagnosis and repair.-The student will be able to:	
37.01	Perform air intake system restriction and leakage test; determine needed action.	P-1
37.02	Perform intake manifold pressure (boost) test; determine needed action.	P-3
37.03	Check exhaust back pressure; determine needed action.	P-3
37.04	Inspect turbocharger(s), wastegate, and piping systems; determine needed action.	P-2
37.05	Inspect turbocharger(s) (variable ratio/geometry VGT), pneumatic, hydraulic, electronic controls, and actuators.	P-2
37.06	Check air induction system: piping, hoses, clamps, and mounting; service or replace air filter as needed.	P-1
37.07	Remove and reinstall turbocharger/wastegate assembly.	P-3
37.08	Inspect intake manifold, gaskets, and connections; replace as needed.	P-3
37.09	Inspect, clean, and test charge air cooler assemblies; replace as needed.	P-2
37.10	Inspect exhaust manifold, piping, mufflers, and mounting hardware; repair or replace as needed.	P-2
37.11	Inspect exhaust after treatment devices; determine necessary action.	P-2
37.12	Inspect and test preheater/inlet air heater, or glow plug system and controls; perform needed action.	P-2
37.13	Inspect exhaust gas recirculation (EGR) system including EGR valve, cooler, piping, filter, electronic sensors, controls, and wiring; determine needed action.	P-2
38.0	Fuel system diagnosis and repair.-The student will be able to:	
38.01	Fuel supply system	
38.01.1	Check fuel level, and condition; determine needed action.	P-1
38.01.2	Perform fuel supply and return system tests; determine needed action.	P-1
38.01.3	Inspect fuel tanks, vents, caps, mounts, valves, screens, crossover system, supply and return lines and fittings; determine needed action.	P-1
38.01.4	Inspect, clean, and test fuel transfer (lift) pump, pump drives, screens, fuel/water separators/indicators, filters, heaters, coolers, ECM cooling plates, and mounting hardware;	P-1

CTE Standards and Benchmarks		Priority Number
	determine needed action.	
38.01.5	Inspect and test pressure regulator systems (check valves, pressure regulator valves, and restrictive fittings); determine needed action.	P-1
38.01.6	Check fuel system for air; determine needed action; prime and bleed fuel system; check primer pump.	P-1
38.02	Electronic fuel management system	
38.02.1	Inspect and test power and ground circuits and connections; measure and interpret voltage, voltage drop, amperage, and resistance readings using a digital multi-meter (DMM); determine needed action.	P-1
38.02.2	Interface with vehicle's on-board computer; perform diagnostic procedures using electronic service tool(s) (to include PC based software and/or data scan tools); determine needed action.	P-1
38.02.3	Check and record electronic diagnostic codes and trip/operational data; monitor electronic data; clear codes; determine further diagnosis.	P-1
38.02.4	Locate and use relevant service information (to include diagnostic procedures, flow charts, and wiring diagrams).	P-1
38.02.5	Inspect and replace electrical connector terminals, seals, and locks.	P-1
38.02.6	Inspect and test switches, sensors, controls, actuator components, and circuits; adjust or replace as needed.	P-1
38.02.7	Using electronic service tool(s) access and interpret customer programmable parameters.	P-1
38.02.8	Perform on-engine inspections, test and adjustments on electronic unit injectors (EUI); determine needed action	P-2
38.02.9	Remove and install electronic unit injectors (EUI) and related components; recalibrate ECM (if applicable).	P-2
38.02.10	Perform cylinder contribution test utilizing electronic service tool(s).	P-1
38.02.11	Perform on-engine inspections and tests on hydraulic electronic unit injectors (HEUI) and system electronic controls; determine needed action.	P-2
38.02.12	Perform on-engine inspections and tests on hydraulic electronic unit injector (HEUI) high pressure oil supply and control systems; determine needed action.	P-2
38.02.13	Perform on-engine inspections and tests on high pressure common rail (HPCR) type injection systems; determine needed action.	P-2
38.02.14	Inspect high pressure injection lines, hold downs, fittings and seals; determine needed action.	P-2
39.0	Diagnose and repair engine brakes.-The student will be able to:	
39.01	Inspect and adjust engine compression/exhaust brakes; determine needed action.	P-2
39.02	Inspect, test, and adjust engine compression/exhaust brake control circuits, switches, and solenoids; determine needed action.	P-3

CTE Standards and Benchmarks	Priority Number
39.03 Inspect engine compression/exhaust brake housing, valves, seals, lines, and fittings; repair or replace as needed.	P-3

**Florida Department of Education
Student Performance Standards**

Course Number: DIM0105
Occupational Completion Point: E
Diesel Brakes Technician – 300 Hours – SOC Code 49-3031

Course Description:

The Diesel Brakes Technician course prepares students for entry into the Diesel Engine Service industry. Content emphasizes beginning skills and concepts as a recommended requisite. Students study diagnostic, service, and repair of air, and hydraulic brakes.

For every task in Diesel Brakes Technician, the following safety task must be strictly enforced:

Comply with personal and environmental safety practices associated with clothing; eye protection; hand protection; proper lifting practices; hand tools; power equipment; proper ventilation; and the handling, storage, and disposal of fuels/chemicals/materials in accordance with federal, state, and local regulations.

The first task in Diesel Brakes Technician is to listen to and verify the operator’s concern, review past maintenance and repair documents, and determine necessary action.

BR Task List:	
P-1 =	39
P-2 =	9
P-3 =	7
Total	55

CTE Standards and Benchmarks		Priority Number
40.0	Diagnose and repair air supply and service systems.-The student will be able to:	
40.01	Identify and diagnose poor stopping, air leaks, premature wear, pulling, grabbing, dragging, or balance problems caused by supply and service system malfunctions; determine needed action.	P-1
40.02	Check air system build-up time; determine needed action.	P-1
40.03	Drain air reservoir/tanks; check for oil, water, and foreign material; determine needed action.	P-1
40.04	Inspect air compressor drive gear, belts and coupling; adjust or replace as needed.	P-3
40.05	Inspect air compressor inlet; inspect oil supply and coolant lines, fittings, and mounting brackets; repair or replace as needed.	P-1
40.06	Inspect and test air system pressure controls: governor, unloader assembly valves, filters, lines, hoses, and fittings; replace as needed.	P-1
40.07	Inspect air system lines, hoses, fittings, and couplings; repair or replace as needed.	P-1
40.08	Inspect and test air tank relief (safety) valves, one-way (single) check valves, two-way (double) check-valves, manual and automatic drain valves; replace as needed.	P-1
40.09	Inspect and clean air drier systems, filters, valves, heaters, wiring, and connectors; repair or replace as needed.	P-1
40.10	Inspect and test brake application (foot/treadle) valve, fittings, and mounts; check pedal operation; replace as needed.	P-1

CTE Standards and Benchmarks	Priority Number
40.11 Inspect and test stop light circuit switches, wiring, and connectors; repair or replace as needed.	P-1
40.12 Inspect and test hand brake (trailer) control valve, lines, fittings, and mountings; repair or replace as needed.	P-1
40.13 Inspect and test brake relay valve; replace as needed.	P-1
40.14 Inspect and test quick release valves; replace as needed.	P-1
40.15 Inspect and test tractor protection valve; replace as needed.	P-1
40.16 Inspect and test emergency (spring) brake control/modulator valve(s); replace as needed. (as applicable)	P-1
40.17 Inspect and test low pressure warning devices, wiring, and connectors; repair or replace as needed.	P-1
40.18 Inspect and test air pressure gauges, lines, and fittings; replace as needed.	P-2
41.0 Diagnose and repair mechanical/foundation air brake systems.-The student will be able to:	
41.01 Identify and diagnose poor stopping, brake noise, premature wear, pulling, grabbing, or dragging problems caused by the foundation brake, slack adjuster, and brake chamber problems; determine needed action.	P-1
41.02 Inspect and test service brake chambers, diaphragm, clamp, spring, pushrod, clevis, and mounting brackets; repair or replace as needed.	P-1
41.03 Identify type, inspect and service slack adjusters; perform needed action.	P-1
41.04 Inspect camshafts, tubes, rollers, bushings, seals, spacers, retainers, brake spiders, shields, anchor pins, and springs; replace as needed.	P-1
41.05 Inspect, clean, and adjust air disc brake caliper assemblies; determine needed repairs.	P-2
41.06 Inspect and measure brake shoes or pads; perform needed action.	P-1
41.07 Inspect and measure brake drums or rotors; perform needed action.	P-1
42.0 Diagnose and repair parking brakes.-The student will be able to:	
42.01 Inspect and test parking (spring) brake chamber diaphragm and seals; replace parking (spring) brake chamber; dispose of removed chambers in accordance with local regulations.	P-1
42.02 Inspect and test parking (spring) brake check valves, lines, hoses, and fittings; replace as needed.	P-1
42.03 Inspect and test parking (spring) brake application and release valve; replace as needed.	P-1
42.04 Manually release (cage) and reset (uncage) parking (spring) brakes in accordance with manufacturers' recommendations.	P-1
42.05 Identify and test anti compounding brake function.	P-1
43.0 Diagnose and repair hydraulic systems.-The student will be able to:	
43.01 Identify and diagnose poor stopping, premature wear, pulling, dragging, balance, or pedal feel problems caused by the hydraulic system; determine needed action.	P-2
43.02 Inspect and test master cylinder for internal/external leaks and damage; replace as needed.	P-1

CTE Standards and Benchmarks	Priority Number
43.03 Inspect hydraulic system brake lines for leaks and damage, flexible hoses, and fittings for leaks and damage; replace as needed.	P-1
43.04 Inspect and test metering (hold-off), load sensing/proportioning, proportioning, and combination valves; replace as needed.	P-3
43.05 Inspect and test brake pressure differential valve and warning light circuit switch, bulbs/LEDs, wiring, and connectors; repair or replace as needed.	P-2
43.06 Inspect disc brake caliper assemblies; replace as needed.	P-1
43.07 Inspect/test brake fluid; bleed and/or flush system; determine proper fluid type.	P-1
43.08 Check and adjust brake pedal pushrod length.	
43.09 Inspect and clean wheel cylinders; replace as needed.	
43.10 Test and adjust brake stop light switch, bulbs, wiring, and connectors; repair or replace as needed.	
44.0 Diagnose and repair mechanical/foundation hydraulic brake systems.-The student will be able to:	
44.01 Identify and diagnose poor stopping, brake noise, premature wear, pulling, grabbing, dragging, or pedal feel problems caused by mechanical components; determine needed action.	P-2
44.02 Inspect and measure rotors; perform needed action.	P-1
44.03 Inspect and measure disc brake pads; inspect mounting hardware; perform needed action.	P-1
44.04 Check parking brake operation; inspect parking brake application and holding devices; adjust and replace as needed.	P-2
44.05 Inspect and measure drum brake shoes and linings; inspect mounting hardware, adjuster mechanisms, and backing plates; perform needed action.	
45.0 Diagnose and repair power assist units.-The student will be able to:	
45.01 Identify and diagnose stopping problems caused by the brake assist (booster) system; determine needed action.	P-3
45.02 Inspect, test, repair, or replace hydraulic brake assist (booster), hoses, and control valves; determine proper fluid type.	P-3
45.03 Check emergency (back-up, reserve) brake assist system.	P-3
46.0 Diagnose and repair air and hydraulic antilock brake systems (ABS) and automatic traction control (ATC).-The student will be able to:	
46.01 Observe antilock brake system (ABS) warning light operation (includes trailer and dash mounted ABS warning light); determine needed action.	P-1
46.02 Diagnose antilock brake system (ABS) electronic control(s) and components using self-diagnosis and/or electronic service tool(s); determine needed action.	P-1
46.03 Identify poor stopping and wheel lock-up caused by failure of the antilock brake system (ABS); determine needed action.	P-1

CTE Standards and Benchmarks	Priority Number
46.04 Test and check operation of antilock brake system (ABS) air, hydraulic, electrical, and mechanical components; perform needed action.	P-1
46.05 Test antilock brake system (ABS) wheel speed sensors and circuits; adjust or replace as needed.	P-1
46.06 Bleed the ABS hydraulic circuits according to manufacturers' procedures.	P-2
46.07 Observe automatic traction control (ATC) warning light operation; determine needed action.	P-3
46.08 Diagnose automatic traction control (ATC) electronic control(s) and components using self-diagnosis and/or specified test equipment (scan tool, PC computer); determine needed action.	P-3
46.09 Verify power line carrier (PLC) operations.	P-2
46.10 Diagnose, service, and adjust antilock brake system (ABS) wheel speed sensors and circuits following manufacturers' recommended procedures (including voltage output, resistance, shorts to voltage/ground, and frequency data).	
47.0 Diagnose and repair wheel bearings.-The student will be able to:	
47.01 Clean, inspect, lubricate and replace wheel bearings and races/cups; replace seals and wear rings; inspect spindle/tube; inspect and replace retaining hardware; adjust wheel bearings. Verify end play with dial indicator method.	P-1
47.02 Identify, inspect or replace unitized/preset hub bearing assemblies.	P-2

**Florida Department of Education
Student Performance Standards**

Course Number: DIM0106
Occupational Completion Point: F
Diesel Heating and Air Conditioning Technician – 150 Hours – SOC Code 49-3031

Course Description:

The Diesel Heating and Air Conditioning Technician course prepares students for entry into the Diesel Engine Service industry. Content emphasizes beginning skills and concepts as a recommended requisite. Students study diagnostic, service, and repair of HVAC, and A/C systems.

For every task in Diesel Heating and Air Conditioning Technician, the following safety task must be strictly enforced:

Comply with personal and environmental safety practices associated with clothing; eye protection; hand protection; proper lifting practices; hand tools; power equipment; proper ventilation; and the handling, storage, and disposal of fuels/chemicals/materials in accordance with federal, state, and local regulations.

HV Task List:	
P-1 =	31
P-2 =	17
P-3 =	10
Total	58

The first task in Diesel Heating and Air Conditioning Technician is to listen to and verify the operator’s concern, review past maintenance and repair documents, and determine necessary action.

CTE Standards and Benchmarks		Priority Number
48.0	HVAC systems diagnosis, service, and repair.-The student will be able to:	
48.01	Verify the need for service or repair of HVAC systems based on unusual operating noises; determine needed action.	P-1
48.02	Verify the need for service or repair of HVAC systems based on unusual visual, smell, and touch conditions; determine needed action.	P-1
48.03	Identify system type and components (cycling clutch orifice tube - CCOT, expansion valve) and conduct performance test(s) on HVAC systems; determine needed action.	P-1
48.04	Retrieve diagnostic codes; determine needed action.	P-3
49.0	A/C system and component diagnosis, service, and repair.-The student will be able to:	
49.01	Identify causes of temperature control problems in the A/C system; determine needed action.	P-1
49.02	Identify refrigerant and lubricant types; check for contamination; determine needed action.	P-1
49.03	Identify A/C system problems indicated by pressure gauge and temperature readings; determine needed action.	P-1
49.04	Identify A/C system problems indicated by visual, audible, smell, and touch procedures; determine needed action.	P-1
49.05	Perform A/C system leak test; determine needed action.	P-1

CTE Standards and Benchmarks		Priority Number
49.06	Recover, evacuate, and recharge A/C system using appropriate equipment.	P-1
49.07	Identify contamination in the A/C system components; determine needed action.	P-3
49.08	Interface with vehicle's on-board computer; perform diagnostic procedures using recommended electronic service tool(s) (including PC based software and/or data scan tools); determine needed action.	P-2
50.0	Diagnose and repair Compressor and clutch.-The student will be able to:	
50.01	Identify and diagnose A/C system problems that cause protection devices (pressure, thermal, and electronic) to interrupt system operation; determine needed action.	P-1
50.02	Inspect, test, and replace A/C system pressure, thermal, and electronic protection devices.	P-2
50.03	Inspect, and replace A/C compressor drive belts, pulleys, and tensioners; adjust belt tension and check alignment.	P-1
50.04	Inspect, test, adjust, service, or replace A/C compressor clutch components or assembly.	P-2
50.05	Inspect and correct A/C compressor lubricant level (if applicable).	P-2
50.06	Inspect, test, or replace A/C compressor.	P-1
50.07	Inspect, repair, or replace A/C compressor mountings and hardware.	P-2
51.0	Diagnose and repair Evaporator, condenser, and related components.-The student will be able to:	
51.01	Correct system lubricant level when replacing the evaporator, condenser, receiver/drier or accumulator/drier, and hoses.	P-1
51.02	Inspect A/C system hoses, lines, filters, fittings, and seals; determine needed action.	P-1
51.03	Inspect and test A/C system condenser. Check for proper airflow and mountings; determine needed action.	P-1
51.04	Inspect and replace receiver/drier or accumulator/drier.	P-1
51.05	Inspect and test cab/sleeper refrigerant solenoid, expansion valve(s); check placement of thermal bulb (capillary tube); determine needed action.	P-3
51.06	Remove and replace orifice tube.	P-1
51.07	Inspect and test cab/sleeper evaporator core; determine needed action.	P-3
51.08	Inspect, clean, and repair evaporator housing and water drain; inspect and service/replace evaporator air filter.	P-1
51.09	Identify and inspect A/C system service ports (gauge connections); determine needed action.	P-1
51.10	Identify the cause of system failures resulting in refrigerant loss from the A/C system high pressure relief device; determine needed action.	P-2
52.0	Heating and engine cooling systems diagnosis, service, and repair.-The student will be able to:	
52.01	Identify causes of outlet air temperature control problems in the HVAC system; determine needed action.	P-1

CTE Standards and Benchmarks	Priority Number
52.02 Diagnose window fogging problems; determine needed action.	P-2
52.03 Perform engine cooling system tests for leaks, protection level, contamination, coolant level, coolant type, temperature, and conditioner concentration; determine needed action.	P-1
52.04 Inspect engine cooling and heating system hoses, lines, and clamps; determine needed action.	P-1
52.05 Inspect and test radiator, pressure cap, and coolant recovery system (surge tank); determine needed action.	P-1
52.06 Inspect water pump; determine needed action.	P-1
52.07 Inspect and test thermostats, by-passes, housings, and seals; determine needed repairs.	P-2
52.08 Recover, flush and refill with recommended coolant/additive package; bleed cooling system.	P-1
52.09 Inspect thermostatic cooling fan system (hydraulic, pneumatic, and electronic) and fan shroud; replace as needed.	P-2
52.10 Inspect and test heating system coolant control valve(s) and manual shut-off valves; determine needed action.	P-2
52.11 Inspect and flush heater core; determine needed action.	P-3
53.0 Electrical system diagnosis, service, and repair.-The student will be able to:	
53.01 Identify causes of HVAC electrical control system problems; determine needed action.	P-1
53.02 Inspect and test A/C heater blower motors, resistors, switches, relays, modules, wiring, and protection devices; determine needed action.	P-2
53.03 Inspect and test A/C compressor clutch relays, modules, wiring, sensors, switches, diodes, and protection devices; determine needed action.	P-2
53.04 Inspect and test A/C related electronic engine control systems; determine needed action.	P-2
53.05 Inspect and test engine cooling/condenser fan motors, relays, modules, switches, sensors, wiring, and protection devices; determine needed action.	P-2
53.06 Inspect and test electric actuator motors, relays/modules, switches, sensors, wiring, and protection devices; determine needed action.	P-2
53.07 Inspect and test HVAC system electrical/electronic control panel assemblies; determine needed action.	P-2
53.08 Interface with vehicle's on-board computer; perform diagnostic procedures using recommended electronic service tool(s) (including PC based software and/or data scan tools); determine needed action.	P-2
54.0 Air/vacuum/mechanical diagnostics, service, and repair.-The student will be able to:	
54.01 Identify causes of HVAC air and mechanical control problems; determine needed action.	P-3
54.02 Inspect and test HVAC system air and mechanical control panel assemblies; determine needed action.	P-3
54.03 Inspect, test, and adjust HVAC system air and mechanical control cables and linkages; determine needed action.	P-3
54.04 Inspect and test HVAC system actuators and hoses; determine needed action.	P-3

CTE Standards and Benchmarks	Priority Number
54.05 Inspect, test, and adjust HVAC system ducts, doors, and outlets; determine needed action.	P-3
NOTE: Tasks 1 through 5 should be accomplished in accordance with appropriate EPA regulations and SAE "J" standards.	
55.0 Refrigerant recovery, recycling, and handling.-The student will be able to:	
55.01 Maintain and verify correct operation of certified equipment.	P-1
55.02 Identify and recover A/C system refrigerant.	P-1
55.03 Recycle or properly dispose of refrigerant.	P-1
55.04 Handle, label, and store refrigerant.	P-1
55.05 Test recycled refrigerant for non-condensable gases.	P-1
55.06 Demonstrate knowledge of federal requirements for the handling of refrigerants.	

**Florida Department of Education
Student Performance Standards**

Course Number: DIM0107
Occupational Completion Point: G
Diesel Steering and Suspension Technician – 150 Hours – SOC Code 49-3031

Course Description:

The Diesel Steering and Suspension Technician course prepares students for entry into the Diesel Engine Service industry. Content emphasizes beginning skills and concepts as a recommended requisite. Students study diagnostic, service, and repair of steering, suspension, wheel alignment, wheels, tires, and frame systems.

For every task in Diesel Steering and Suspension Technician, the following safety task must be strictly enforced:

Comply with personal and environmental safety practices associated with clothing; eye protection; hand protection; proper lifting practices; hand tools; power equipment; proper ventilation; and the handling, storage, and disposal of fuels/chemicals/materials in accordance with federal, state, and local regulations.

SS Task List:	
	P-1 = 23
	P-2 = 14
	P-3 = 8
Total	45

The first task in Diesel Steering and Suspension Technician is to listen to and verify the operator’s concern, review past maintenance and repair documents, and determine necessary action.

CTE Standards and Benchmarks		Priority Number
56.0	Steering column diagnosis, service, and repair.-The student will be able to:	
56.01	Identify and diagnose fixed and driver adjustable steering column and shaft noise, looseness, and binding problems; determine needed action.	P-1
56.02	Inspect and service steering shaft U-joint(s), slip joints, bearings, bushings, and seals; phase shaft.	P-1
56.03	Check cab mounting and adjust ride height.	P-2
56.04	Remove the steering wheel (includes steering wheels equipped with electrical/electronic controls and components); install and center the steering wheel. Inspect, test, replace and calibrate steering angle sensor.	P-1
56.05	Disable and enable supplemental restraint system (SRS) in accordance with manufacturers’ procedures.	P-1
57.0	Steering units diagnosis, service, and repair.-The student will be able to:	
57.01	Identify and diagnose power steering system noise, steering binding, darting/oversteer, reduced wheel cut, steering wheel kick, pulling, non-recovery, turning effort, looseness, hard steering, overheating, fluid leakage, and fluid aeration problems; determine needed action.	P-1
57.02	Determine recommended type of power steering fluid; check level and condition; determine needed action.	P-1
57.03	Flush and refill power steering system; purge air from system.	P-2

CTE Standards and Benchmarks	Priority Number
57.04 Perform power steering system pressure, temperature, and flow tests; determine needed action.	P-3
57.05 Inspect, service, or replace power steering reservoir including filter, seals, and gaskets.	P-2
57.06 Inspect power steering pump drive gear and coupling; replace as needed.	P-3
57.07 Inspect, adjust, or replace power steering pump, mountings, and brackets.	P-3
57.08 Inspect and replace power steering system cooler, lines, hoses, clamps/mountings, hose routings, and fittings.	P-2
57.09 Inspect, adjust, repair, or replace integral type power steering gear(s) (single and/or dual) and mountings.	P-2
58.0 Steering linkage diagnosis, service, and repair.-The student will be able to:	
58.01 Inspect and align pitman arm; replace as needed.	P-1
58.02 Check and adjust steering (wheel) stops; verify relief pressures.	P-1
58.03 Inspect and lubricate steering components.	P-1
58.04 Inspect drag link (relay rod) and tie rod ends; adjust or replace as needed.	
58.05 Inspect steering arm and levers, and linkage pivot joints; replace as needed.	
58.06 Inspect clamps and retainers on cross tube/relay rod/centerline/tie rod; position or replace as needed.	
59.0 Suspension systems diagnosis, service, and repair.-The student will be able to:	
59.01 Inspect front axles and attaching hardware; determine needed action.	P-1
59.02 Inspect and service kingpins, steering knuckle bushings, locks, bearings, seals, and covers; determine needed action.	P-1
59.03 Inspect shock absorbers, bushings, brackets, and mounts; replace as needed.	P-1
59.04 Inspect leaf springs, center bolts, clips, pins and bushings, shackles, U-bolts, insulators, brackets, and mounts; determine needed action.	P-1
59.05 Inspect axle aligning devices such as radius rods, track bars, stabilizer bars, torque arms, related bushings, mounts, shims, and cams; determine needed action.	P-1
59.06 Inspect tandem suspension equalizer components; determine needed action.	P-3
59.07 Inspect and test air suspension pressure regulator and height control valves, lines, hoses, dump valves, and fittings; adjust, repair or replace as needed.	P-1
59.08 Inspect air springs, mounting plates, springs, suspension arms, and bushings; replace as needed.	P-1
59.09 Measure and adjust vehicle ride height; determine needed action.	P-1
59.10 Identify rough ride problems; determine needed action.	P-3

CTE Standards and Benchmarks	Priority Number
59.11 Inspect walking beams, center (cross) tube, bushings, mounts, load pads, and saddles/caps; replace as needed.	
60.0 Wheel alignment diagnosis, adjustment, and repair.-The student will be able to:	
60.01 Identify and diagnose vehicle wandering, pulling, shimmy, hard steering and off-center steering wheel problems; adjust or repair as needed.	P-1
60.02 Check camber; determine needed action.	P-2
60.03 Check caster; adjust as needed.	P-2
60.04 Check and adjust toe settings.	P-1
60.05 Check rear axle(s) alignment (thrust line/centerline) and tracking; adjust or repair as needed.	P-2
60.06 Diagnose turning/Ackerman angle (toe-out-on-turns) problems; determine needed action.	P-3
60.07 Check front axle alignment (centerline); adjust or repair as needed.	P-2
61.0 Wheels and tires diagnosis, service, and repair.-The student will be able to:	
61.01 Identify and diagnose tire wear patterns; check tread depth and pressure; determine needed action.	P-1
61.02 Identify and diagnose wheel/tire vibration, shimmy, pounding, hop (tramp) problems; determine needed action.	P-2
61.03 Remove and install steering and drive axle wheel/tire assemblies; torque mounting hardware to specifications with a torque wrench.	P-1
61.04 Inspect tire for proper application, (size, load range, position, and tread design); determine needed action.	P-2
61.05 Inspect wheel/rims for flaws, proper application, load range and design; ensure dual rims are properly clocked to access valve stems; determine needed action.	P-2
61.06 Check operation of tire pressure monitoring system (TPMS); determine needed action if applicable.	P-3
62.0 Frame and coupling diagnosis, service, and repair.-The student will be able to:	
62.01 Inspect, service, and/or adjust fifth wheel, pivot pins, bushings, locking mechanisms, and mounting hardware.	P-1
62.02 Inspect and service sliding fifth wheel, tracks, stops, locking systems, air cylinders, springs, lines, hoses, and controls.	P-2
62.03 Inspect frame and frame members for cracks, breaks, corrosion, distortion, elongated holes, looseness, and damage; determine needed repairs.	P-1
62.04 Inspect, install, or repair frame hangers, brackets, and cross members in accordance with manufacturers' recommended procedures.	P-3
62.05 Inspect, repair or replace pintle hooks and draw bars, if applicable.	P-2

**Florida Department of Education
Student Performance Standards**

Course Number: DIM0108
Occupational Completion Point: H
Diesel Drivetrain Technician – 150 Hours – SOC Code 49-3031

Course Description:

The Diesel Drivetrain Technician course prepares students for entry into the Diesel Engine Service industry. Content emphasizes beginning skills and concepts as a recommended requisite. Students study diagnostic, service, and repair of clutch, transmission, driveshaft, universal joint, and drive axle systems.

For every task in Diesel Drivetrain Technician, the following safety task must be strictly enforced:

Comply with personal and environmental safety practices associated with clothing; eye protection; hand protection; proper lifting practices; hand tools; power equipment; proper ventilation; and the handling, storage, and disposal of fuels/chemicals/materials in accordance with federal, state, and local regulations.

The first task in Diesel Drivetrain Technician is to listen to and verify the operator’s concern, review past maintenance and repair documents, and determine necessary action.

DT Task List:	
	P-1 = 27
	P-2 = 18
	P-3 = 12
Total	57

CTE Standards and Benchmarks		Priority Number
63.0	Clutch diagnosis and repair.-The student will be able to:	
63.01	Identify causes of clutch noise, binding, slippage, pulsation, vibration, grabbing, dragging, and chatter problems; determine needed action.	P-1
63.02	Inspect and adjust clutch linkage, cables, levers, brackets, bushings, pivots, springs, and clutch safety switch (includes push and pull-type assemblies); check pedal height and travel; perform needed action.	P-1
63.03	Inspect, adjust, repair, and replace hydraulic clutch slave and master cylinders, lines, and hoses; bleed system.	P-2
63.04	Inspect, adjust, lubricate or replace release (throw-out) bearing, sleeve, bushings, springs, housing, levers, release fork, fork pads, rollers, shafts, and seals.	P-1
63.05	Inspect, adjust, and replace single-disc clutch pressure plate and clutch disc.	P-1
63.06	Inspect, adjust, and replace two-plate clutch pressure plate, clutch discs, intermediate plate, and drive pins/lugs.	P-1
63.07	Inspect and/or replace clutch brake assembly; inspect input shaft and bearing retainer; perform needed action.	P-1
63.08	Inspect, adjust, and replace self-adjusting/continuous-adjusting clutch mechanisms.	P-1
63.09	Inspect and replace pilot bearing.	P-1

CTE Standards and Benchmarks	Priority Number
63.10 Remove and reinstall flywheel, inspect mounting area on crankshaft, rear main oil seal, and measure crankshaft end play; determine needed action.	P-1
63.11 Inspect flywheel, starter ring gear and measure flywheel face and pilot bore runout; determine needed action.	P-1
63.12 Inspect flywheel housing(s) to transmission housing/engine mating surface(s) and measure flywheel housing face and bore runout; determine needed action.	P-2
64.0 Transmission diagnosis and repair.-The student will be able to:	
64.01 Identify causes of transmission noise, shifting concerns, lockup, jumping-out-of-gear, overheating, and vibration problems; determine needed action.	P-1
64.02 Inspect, test, repair, or replace air shift controls, lines, hoses, valves, regulators, filters, and cylinder assemblies.	P-2
64.03 Inspect and replace transmission mounts, insulators, and mounting bolts.	P-1
64.04 Inspect for leakage and replace transmission cover plates, gaskets, seals, and cap bolts; inspect seal surfaces and vents; repair as needed.	P-1
64.05 Check transmission fluid level and condition; determine needed service; add proper type of lubricant.	P-1
64.06 Inspect, adjust, and replace transmission shift lever, cover, rails, forks, levers, bushings, sleeves, detents, interlocks, springs, and lock bolts/safety wires.	P-2
64.07 Remove and reinstall transmission.	P-1
64.08 Inspect input shaft, gear, spacers, bearings, retainers, and slingers; determine needed action.	P-3
64.09 Inspect transmission oil filters and coolers and related components; replace as needed.	P-2
64.10 Inspect speedometer components; determine needed action.	P-2
64.11 Inspect and adjust power take-off (P.T.O.) assemblies, controls, and shafts; determine needed action.	P-3
64.12 Inspect and test function of reverse light, neutral start, and warning device circuits; determine needed action.	P-1
64.13 Inspect and test transmission temperature gauge, wiring harnesses and sensor/sending unit; determine needed action.	P-2
64.14 Inspect and test operation of automated mechanical transmission and manual electronic shift controls, shift, range and splitter solenoids, shift motors, indicators, speed and range sensors, electronic/transmission control units (ECU/TCU) neutral/in gear and reverse switches, and wiring harnesses; determine needed action.	P-2
64.15 Inspect and test operation of automated mechanical transmission electronic shift selectors, air and electrical switches, displays and indicators, wiring harnesses, and air lines; determine needed action.	P-2
64.16 Use appropriate electronic service tool(s) and procedures to diagnose automated mechanical transmission problems; check and record diagnostic codes, clear codes, and interpret digital multimeter (DMM) readings; determine needed action.	P-1

CTE Standards and Benchmarks	Priority Number
64.17 Inspect and test operation of automatic transmission electronic shift controls, shift solenoids, shift motors, indicators, speed and range sensors, electronic/transmission control units (ECU/TCU), neutral/in gear and reverse switches, and wiring harnesses.	P-2
64.18 Inspect and test operation of automatic transmission electronic shift selectors, switches, displays and indicators, wiring harnesses.	P-2
64.19 Use appropriate electronic service tool(s) and procedures to diagnose automatic transmission problems; check and record diagnostic codes, clear codes, and interpret digital multi-meter (DMM) readings; determine needed repairs.	P-3
64.20 Diagnose transmission component failure cause, both before and during disassembly procedures; determine needed action.	
64.21 Inspect, adjust, service, repair, or replace transmission remote shift linkages, brackets, bushings, pivots, and levers.	
64.22 Inspect and adjust main shaft, gears, sliding clutches, washers, spacers, bushings, bearings, auxiliary drive assemblies, retainers, and keys; replace as needed.	
64.23 Inspect countershafts, gears, bearings, retainers, and keys; adjust bearing preload and time multiple countershaft gears; replace as needed.	
64.24 Inspect output shafts, gears, washers, spacers, bearings, retainers, and keys; replace as needed.	
64.25 Inspect and/or replace reverse idler shafts, gears, bushings, bearings, thrust washers, and retainers; check reverse idler gear end play (where applicable).	
64.26 Inspect synchronizer hub, sleeve, keys (inserts), springs, blocking rings, synchronizer plates, blocker pins, and sliding clutches; replace as needed.	
64.27 Inspect transmission cases including surfaces, bores, bushings, pins, studs, and magnets; replace as needed.	
64.28 Inspect transmission lubrication system pumps, troughs, collectors, and slingers; service or replace as needed.	
65.0 Driveshaft and universal joint diagnosis and repair.-The student will be able to:	
65.01 Identify causes of driveshaft and universal joint noise and vibration problems; determine needed action.	P-1
65.02 Inspect, service, or replace driveshaft, slip joints, yokes, drive flanges, and universal joints; driveshaft boots and seals, and retaining hardware; check phasing of all shafts.	P-1
65.03 Inspect driveshaft center support bearings and mounts; determine needed action.	P-1
65.04 Measure drive line angles; determine needed action.	P-1
66.0 Drive axle diagnosis and repair.-The student will be able to:	
66.01 Identify causes of drive axle(s) drive unit noise and overheating problems; determine needed action.	P-2
66.02 Check and repair fluid leaks; inspect and replace drive axle housing cover plates, gaskets, sealants, vents, magnetic plugs, and seals.	P-1
66.03 Check drive axle fluid level and condition; determine needed service; add proper type of lubricant.	P-1

CTE Standards and Benchmarks	Priority Number
66.04 Remove and replace differential carrier assembly.	P-2
66.05 Inspect and replace differential case assembly including spider gears, cross shaft, side gears, thrust washers, case halves, and bearings.	P-3
66.06 Inspect and replace components of locking differential case assembly.	P-3
66.07 Inspect differential carrier housing and caps, side bearing bores, and pilot (spigot, pocket) bearing bore; determine needed action.	P-3
66.08 Measure ring gear runout; determine needed action.	P-2
66.09 Inspect and replace ring and drive pinion gears, spacers, sleeves, bearing cages, and bearings.	P-3
66.10 Measure and adjust drive pinion bearing preload.	P-3
66.11 Measure and adjust drive pinion depth.	P-3
66.12 Measure and adjust side bearing preload and ring gear backlash.	P-2
66.13 Check and interpret ring gear and pinion tooth contact pattern; determine needed action.	P-2
66.14 Inspect, adjust, or replace ring gear thrust block/bolt.	P-3
66.15 Inspect power divider (inter-axle differential) assembly; determine needed action.	P-3
66.16 Inspect, adjust, repair, or replace air operated power divider (inter-axle differential) lockout assembly including diaphragms, seals, springs, yokes, pins, lines, hoses, fittings, and controls.	P-2
66.17 Inspect, repair, or replace drive axle lubrication system: pump, troughs, collectors, slingers, tubes, and filters.	P-3
66.18 Inspect and replace drive axle shafts.	P-1
66.19 Remove and replace wheel assembly; check rear wheel seal and axle flange gasket for leaks; perform needed action.	P-1
66.20 Identify causes of drive axle wheel bearing noise and check for damage; perform needed action.	P-1
66.21 Inspect and test drive axle temperature gauge, wiring harnesses, and sending unit/sensor; determine needed action.	P-2
66.22 Clean, inspect, lubricate and replace wheel bearings; replace seals and wear rings; inspect and replace retaining hardware; adjust drive axle wheel bearings. Verify end play with dial indicator method	P-1

**Florida Department of Education
Student Performance Standards**

Course Number: DIM0109
Occupational Completion Point: I
Diesel Hydraulics Technician – 150 Hours – SOC Code 49-3031

Course Description:

The Diesel Hydraulics Technician course prepares students for entry into the Diesel Engine Service industry. Content emphasizes beginning skills and concepts as a recommended requisite. Students study diagnostic, service, and repair of hydraulic, pumps, filtration/reservoir, hoses, fittings, connectors, control valves, and actuator systems.

For every task in Diesel Hydraulics Technician, the following safety task must be strictly enforced:

Comply with personal and environmental safety practices associated with clothing; eye protection; hand protection; proper lifting practices; hand tools; power equipment; proper ventilation; and the handling, storage, and disposal of fuels/chemicals/materials in accordance with federal, state, and local regulations.

HY Task List:	
P-1 =	27
P-2 =	5
P-3 =	0
Total	32

The first task in Diesel Hydraulics Technician is to listen to and verify the operator’s concern, review past maintenance and repair documents, and determine necessary action.

CTE Standards and Benchmarks	Priority Number
67.0 General hydraulic system diagnosis and repair.-The student will be able to:	
67.01 Identify system type (closed and open) and verify proper operation.	P-1
67.02 Read and interpret system diagrams and schematics.	P-1
67.03 Perform system temperature, pressure, flow, and cycle time tests; determine needed action.	P-1
67.04 Verify placement of equipment /component safety labels and placards; determine needed action.	P-1
68.0 Diagnose and repair hydraulic pumps.-The student will be able to:	
68.01 Identify system fluid type.	P-1
68.02 Identify causes of pump failure, unusual pump noises, temperature flow, and leakage problems; determine needed action.	P-1
68.03 Determine pump type, rotation, and drive system.	P-1
68.04 Remove and install pump; prime and/or bleed system.	P-2
68.05 Inspect pump inlet for restrictions and leaks; determine needed action.	P-2
68.06 Inspect pump outlet for restrictions and leaks; determine needed action.	P-2

CTE Standards and Benchmarks	Priority Number
69.0 Diagnose and repair hydraulic filtration/reservoirs (tanks).-The student will be able to:	
69.01 Identify type of filtration system; verify filter application and flow direction.	P-1
69.02 Service filters and breathers.	P-1
69.03 Identify causes of system contamination; determine needed action.	P-2
69.04 Take a hydraulic oil sample for analysis.	P-1
69.05 Check reservoir fluid level and condition; determine needed action.	P-1
69.06 Inspect and repair or replace reservoir, sight glass, vents, caps, mounts, valves, screens, supply and return lines.	P-1
70.0 Diagnose and repair hydraulic hoses, fittings, and connections.-The student will be able to:	
70.01 Diagnose causes of component leakage, damage, and restriction; determine needed action.	P-2
70.02 Inspect hoses and connections (length, size, routing, bend radii, and protection); repair or replace as needed.	P-1
70.03 Assemble hoses, tubes, connectors, and fittings in accordance with manufacturers' specifications; use proper procedures to avoid contamination.	P-1
70.04 Inspect and replace fitting seals and sealants.	P-1
71.0 Diagnose and repair hydraulic control valves.-The student will be able to:	
71.01 Pressure test system safety relief valve; determine needed action.	P-1
71.02 Perform control valve operating pressure and flow tests; determine needed action.	P-1
71.03 Inspect, test, and adjust valve controls (electrical/electronic, mechanical, and pneumatic).	P-1
71.04 Identify causes of control valve leakage problems (internal/external); determine needed action.	P-1
71.05 Inspect pilot control valve linkages, cables, and PTO controls; adjust, repair, or replace as needed.	P-1
72.0 Diagnose and repair hydraulic actuators.-The student will be able to:	
Comply with manufacturers' and industry accepted safety practices associated with equipment lock out/tag out; pressure line release; implement/support (blocked or resting on ground); and articulated cylinder devices/machinery safety locks.	
72.01 Identify actuator type (single/double acting, multi-stage/telescopic, and motors).	P-1
72.02 Identify the cause of seal failure; determine needed repairs.	P-1
72.03 Identify the cause of incorrect actuator movement and leakage (internal and external); determine needed repairs.	P-1
72.04 Inspect actuator mounting, frame components, and hardware for looseness, cracks, and damage; determine needed action.	P-1
72.05 Remove, repair, and/or replace actuators in accordance with manufacturers' recommended procedures.	P-1

CTE Standards and Benchmarks	Priority Number
72.06 Inspect actuators for dents, cracks, damage, and leakage; determine needed action.	P-1
72.07 Purge and/or bleed system in accordance with manufacturers' recommended procedures.	P-1

Additional Information

Laboratory Activities

Laboratory investigations that include scientific inquiry, research, measurement, problem solving, emerging technologies, tools and equipment, as well as, experimental, quality, and safety procedures are an integral part of this career and technical program/course. Laboratory investigations benefit all students by developing an understanding of the complexity and ambiguity of empirical work, as well as the skills required to manage, operate, calibrate and troubleshoot equipment/tools used to make observations. Students understand measurement error; and have the skills to aggregate, interpret, and present the resulting data. Equipment and supplies should be provided to enhance hands-on experiences for students.

Special Notes

Benchmarks identified with a designation of P-1, P-2, or P-3 are ASE tasks.

The safety guidelines in the student performance standards have been recommended in the ASE Program Certification Standards for Medium/Heavy Truck Technician Training Program administered by National Automotive Technicians Education Foundation (NATEF).

MyCareerShines is an interactive resource to assist students in identifying their ideal career and to enhance preparation for employment. Teachers are encouraged to integrate this resource into the program curriculum to meet the employability goals for each student. A

Career and Technical Student Organization (CTSO)

SkillsUSA is the intercurricular career and technical student organization(s) providing leadership training and reinforcing specific career and technical skills. Career and Technical Student Organizations provide activities for students as an integral part of the instruction offered.

Cooperative Training – OJT

On-the-job training is appropriate but not required for this program. Whenever offered, the rules, guidelines, and requirements specified in the OJT framework apply.

Basic Skills

In a Career Certificate Program offered for 450 hours or more, in accordance with Rule 6A-10.040, F.A.C., the minimum basic skills grade levels required for postsecondary adult career and technical students to complete this program are: Mathematics 9.0, Language 9.0, and Reading 9.0. These grade level numbers correspond to a grade equivalent score obtained on a state designated basic skills examination.

Adult students with disabilities, as defined in Section 1004.02(7), Florida Statutes, may be exempted from meeting the Basic Skills requirements (Rule 6A-10.040). Students served in exceptional student education (except gifted) as defined in s. 1003.01(3)(a), F.S., may also be exempted from meeting the Basic Skills requirement. Each school district and Florida College must adopt a policy addressing procedures for exempting eligible students with disabilities from the Basic Skills requirement as permitted in Section 1004.91(3), F.S.

Students who possess a college degree at the Associate of Applied Science level or higher; who have completed or are exempt from the college entry-level examination; or who have passed a state, national, or industry licensure exam are exempt from meeting the Basic Skills requirement (Rule 6A-10.040, F.A.C.) Exemptions from state, national or industry licensure are limited to the certifications listed on the Basic Skills and Licensure Exemption List which may be accessed from the CTE Program Resources page.

Accommodations

Federal and state legislation requires the provision of accommodations for students with disabilities to meet individual needs and ensure equal access. Postsecondary students with disabilities must self-identify, present documentation, request accommodations if needed, and develop a plan with their counselor and/or instructors. Accommodations received in postsecondary education may differ from those received in secondary education. Accommodations change the way the student is instructed. Students with disabilities may need accommodations in such areas as instructional methods and materials, assignments and assessments, time demands and schedules, learning environment, assistive technology and special communication systems. Documentation of the accommodations requested and provided should be maintained in a confidential file.

Note: postsecondary curriculum and regulated secondary programs cannot be modified.

Florida Department of Education
Curriculum Framework

Program Title: Automotive Service Technology
Program Type: Career Preparatory
Career Cluster: Transportation, Distribution and Logistics

Career Certificate Program – Career Preparatory

Program Number	I470608
CIP Number	0647060405
Grade Level	30, 31
Standard Length	1800 hours
Teacher Certification	Refer to the Program Structure section
CTSO	SkillsUSA
SOC Codes (all applicable)	49-3023 – Automotive Service Technicians and Mechanics
Basic Skills Level	Mathematics: 10 Language: 9 Reading: 9

Purpose

This program offers a sequence of courses that provides coherent and rigorous content aligned with challenging academic standards and relevant technical knowledge and skills needed to prepare for further education and careers in the Transportation, Distribution and Logistics career cluster; provides technical skill proficiency, and includes competency-based applied learning that contributes to the academic knowledge, higher-order reasoning and problem-solving skills, work attitudes, general employability skills, technical skills, and occupation-specific skills, and knowledge of all aspects of the Transportation, Distribution and Logistics career cluster.

The content includes but is not limited to broad, transferable skills and stresses understanding and demonstration of the following elements of the Automotive industry; planning, management, finance, technical and product skills, underlying principles of technology, labor issues, community issues and health, safety, and environmental issues.

Additional Information relevant to this Career and Technical Education (CTE) program is provided at the end of this document.

Program Structure

This program is a planned sequence of instruction consisting of nine occupational completion points.

NOTE: It is recommended that students complete **OCP-A (Automobile Services Assistor)** and/or demonstrate mastery of the outcomes in **OCP-A (Automobile Services Assistor)** prior to enrolling in additional Automotive Service Technology courses. **The sequence of OCP's, after completing and/or demonstrating mastery of OCP-A (Automobile Services Assistor), is at the discretion of the instructor.**

For institutions using this framework, the National Automotive Technicians Education Foundation (NATEF) highly recommends the Master Automotive Service Technology (MAST) program Certification/Accreditation. Florida Statute (F.S.) 1004.925 – Automotive service technology education programs; certification. – requires all automotive service technology education programs shall be industry certified in accordance with rules adopted by the State Board of Education.

Benchmarks identified with a designation of P-1, P-2, or P-3 are ASE tasks.

When offered at the postsecondary level, this program is comprised of courses which have been assigned course numbers in the SCNS (Statewide Course Numbering System) in accordance with Section 1007.24 (1), F.S. Career and Technical credit shall be awarded to the student on a transcript in accordance with Section 1001.44 (3) (b), F.S.

To teach the course(s) listed below, instructors must hold at least one of the teacher certifications indicated for that course.

The following table illustrates the postsecondary program structure:

OCP	Course Number	Course Title	Teacher Certification	Length	SOC Code
A	AER0014	Automobile Services Assistor	AUTO IND @7 %7 %G AUTO MECH @7 7G	300 hours	49-3023
B	AER0110	Engine Repair Technician		150 hours	49-3023
C	AER0257	Automatic Transmission and Transaxle Technician		150 hours	49-3023
D	AER0274	Manual Drivetrain and Axle Technician		150 hours	49-3023
E	AER0453	Automobile Suspension and Steering Technician		150 hours	49-3023
F	AER0418	Automotive Brake System Technician		150 hours	49-3023
G	AER0360	Automotive Electrical/Electronic System Technician		300 hours	49-3023
H	AER0172	Automotive Heating and Air Conditioning Technician		150 hours	49-3023
I	AER0503	Automotive Engine Performance Technician		300 hours	49-3023

Common Career Technical Core – Career Ready Practices

Career Ready Practices describe the career-ready skills that educators should seek to develop in their students. These practices are not exclusive to a Career Pathway, program of study, discipline or level of education. Career Ready Practices should be taught and reinforced in all career exploration and preparation programs with increasingly higher levels of complexity and expectation as a student advances through a program of study.

1. Act as a responsible and contributing citizen and employee.
2. Apply appropriate academic and technical skills.
3. Attend to personal health and financial well-being.
4. Communicate clearly, effectively and with reason.
5. Consider the environmental, social and economic impacts of decisions.
6. Demonstrate creativity and innovation.
7. Employ valid and reliable research strategies.
8. Utilize critical thinking to make sense of problems and persevere in solving them.
9. Model integrity, ethical leadership and effective management.
10. Plan education and career path aligned to personal goals.
11. Use technology to enhance productivity.
12. Work productively in teams while using cultural/global competence.

Standards

After successfully completing this program, the student will be able to perform the following:

- 01.0 Proficiently explain and apply required shop and personal safety tasks relating to the automotive industry.
- 02.0 Explain and apply required tasks associated with the proper use and handling of tools and equipment relating to the automotive industry.
- 03.0 Demonstrate proficiency in preparing vehicle for routine pre/post maintenance and customer services.
- 04.0 Explain and apply proficiently the diagnosis, service and repair of engines, cylinder heads, valve train, engine block, lubrication and cooling systems.
- 05.0 Explain and apply proficiently the diagnosis, service, repair and overhaul of automatic transmissions/transaxles.
- 06.0 Explain and apply proficiently the operation, assembly, diagnosis, service and repair of manual drivetrains, clutches, transmissions/transaxles, drive and half-shaft universals, constant velocity joints, rear axle differential assembly, limited slip, four-wheel drive and all-wheel drive.
- 07.0 Explain and apply proficiently the diagnosis, service and repair of front and rear suspensions systems, wheel alignment, and wheels and tires.
- 08.0 Explain and apply proficiently the diagnosis, service and repair of drum\disc brake, hydraulics, power assist units, electronic brakes, traction control, stability control systems and miscellaneous (wheel bearings, parking brake, electrical, etc.) systems.
- 09.0 Explain and apply proficiently the diagnosis, service and repair of electrical/electronic system components, battery, starting, charging, lighting, gauges, warning devices, driver information, horn, wiper/washer and accessory systems.
- 10.0 Explain and apply proficiently the diagnosis, service and repair of heating and air conditioning, refrigeration, compressors, compressor clutches, evaporators, receiver driers, accumulators, condensers, heating and engine cooling, related control systems, refrigerant recovery, and recycling and handling.
- 11.0 Explain and apply proficiently the diagnosis, service and repair of engines, ignition, fuel, air induction, exhaust, computer engine and emission control systems.

**Florida Department of Education
Student Performance Standards**

Program Title: Automotive Service Technology
Career Certificate Program Number: I470608

Course Number: AER0014
Occupational Completion Point: A
Automotive Services Assistor – 300 Hours – SOC Code 49-3023

Course Description:

The Automotive Service Assistor course prepares students for entry into the automotive service industry. Students explore career opportunities and requirements of a professional auto mechanic. Students study equipment skills, safety regulations, routine maintenance, and customer service.

Abbreviations:

ASE = Supplemental Tasks

For every task in Automotive Services Assistor course, the following safety requirement MUST be strictly enforced:

Comply with personal and environmental safety practices associated with clothing; eye protection; hand tools; power equipment; proper ventilation; and the handling, storage, and disposal of chemicals/materials in accordance with local, state, and federal safety and environmental regulations.

CTE Standards and Benchmarks	Priority Number
01.0 Proficiently explain and apply required shop and personal safety tasks relating to the automotive industry.-The student will be able to:	
01.01 Identify and apply general shop safety rules and procedures, EPA and OSHA standards.	ASE
01.02 Demonstrate knowledge of appropriate automotive industry certifications.	
01.03 Identify and define career opportunities in the automotive service industry.	
01.04 Research, identify, and interpret the Federal Law as recorded in (29 CFR-1910.1200).	
01.05 Identify appropriate emergency first aid procedures.	
01.06 Utilize and demonstrate safe procedures for handling of tools and equipment.	ASE
01.07 Identify and use proper placement of floor jacks and jack stands.	ASE
01.08 Identify and use proper procedures for safe lift operation.	ASE
01.09 Utilize proper ventilation procedures for working within the lab/shop area.	ASE
01.10 Identify proper procedures for safe pit usage.	

CTE Standards and Benchmarks	Priority Number
01.11 Identify marked safety areas.	ASE
01.12 Identify the location and the types of fire extinguishers and other fire safety equipment.	ASE
01.13 Demonstrate knowledge of the procedures for using fire extinguishers and other safety equipment.	ASE
01.14 Identify the location and use of eye wash stations.	ASE
01.15 Identify the location of the posted evacuation routes.	ASE
01.16 Comply with the required use of safety glasses, ear protection, gloves, and shoes during lab/shop activities.	ASE
01.17 Identify and wear appropriate clothing for lab/shop activities.	ASE
01.18 Secure hair and jewelry for lab/shop activities.	ASE
01.19 Use proper handling procedures for automotive fluids.	
01.20 Identify and describe typical automotive lubricants and lubricant properties.	
01.21 Identify and describe typical automotive seals and gaskets.	
01.22 Demonstrate awareness of the safety aspects of supplemental restraint systems (SRS), electronic brake control systems, and hybrid vehicle high voltage circuits.	ASE
01.23 Disable supplemental restraint systems (SRS) in accordance with manufacturers' procedures.	
01.24 Demonstrate awareness of the safety aspects of high voltage circuits (such as high intensity discharge (HID) lamps, ignition systems, injection systems, etc.)	ASE
01.25 Locate and demonstrate knowledge of Safety Data Sheets (SDS).	ASE
02.0 Explain and apply required tasks associated with the proper use and handling of tools and equipment relating to the automotive industry.-The student will be able to:	
02.01 Identify tools and equipment and their appropriate usage in automotive applications.	ASE
02.02 Identify and use standard and metric measurement skills and designation.	ASE
02.03 Demonstrate proper cleaning, storage, and maintenance of tools and equipment.	ASE
02.04 Demonstrate proper use of precision-measuring tools (i.e. micrometer, digital/dial-indicator, digital/dial caliper) and torque methods.	ASE
03.0 Demonstrate proficiency in preparing vehicle for routine pre/post maintenance and customer services.-The student will be able to:	
03.01 Identify information needed and the service requested on a repair order.	ASE
03.02 Identify automobiles according to engine location, cylinders, type of drive system, purpose, etc.	
03.03 Identify purpose and demonstrate proper use of fender covers, floor mats and other vehicle protection equipment.	ASE
03.04 Demonstrate use of the three C's (Concern, Cause, and Correction).	ASE

CTE Standards and Benchmarks	Priority Number
03.05 Review vehicle service history.	ASE
03.06 Complete work order to include customer information, vehicle identifying information, customer concern, related service history, cause, and correction.	ASE
03.07 Conduct an appropriate pre-service evaluation and report or note any concerns not already on the repair order.	
03.08 Determine the presence of a Tire Pressure Monitoring System (TPMS).	
03.09 Determine the presence of wheel locks.	
03.10 Determine the presence of an air suspension system.	
03.11 Check operation and status of instrument panel warning lights and gauges.	
03.12 Locate and use Vehicle identification Number (VIN) vehicle information placards, decals, tags, as required.	
03.13 Demonstrate proficiency in manufacturer electronic service information system, including flat rate manuals, technical service bulletins and replacement part identification; where applicable.	
03.14 Use proper chemicals for cleaning and lubrication.	
03.15 Reset maintenance indicators; as applicable.	
03.16 Ensure vehicle is prepared to return to customer per school/company policy (floor mats, steering wheel cover, etc.).	ASE
03.17 Inspect under-hood area for leaks, damage, and unusual conditions.	
03.18 Determine fluid type requirements and identify fluid.	
03.19 Check engine oil level and condition; service as required.	
03.20 Check engine coolant level and condition; service as required.	
03.21 Check power steering fluid level and condition; service as required.	
03.22 Check brake fluid level and condition; service as required.	
03.23 Check hydraulic clutch fluid and condition; service as required.	
03.24 Check windshield washer fluid level and condition; service as required.	
03.25 Check automatic transmission fluid level and condition; service as required.	
03.26 Inspect undercar area for leaks, damage, and unusual conditions.	
03.27 Check differential/transfer case fluid level; note unusual conditions; service as required.	
03.28 Check manual transmission fluid level; note unusual conditions; service as required.	
03.29 Inspect brake lines, flexible hoses, and fittings for leaks, dents, kinks, rust, cracks, bulging or wear.	
03.30 Lubricate driveline, suspension and steering systems; as applicable.	

CTE Standards and Benchmarks	Priority Number
03.31 Inspect cooling system pipes and hoses for wear, damage, and proper routing.	
03.32 Change engine oil and filter.	
03.33 Inspect and replace fuel filters; as applicable.	
03.34 Inspect and replace air filter.	
03.35 Inspect and replace cabin air filter.	
03.36 Inspect, replace and adjust drive belts; inspect tensioners and pulleys.	
03.37 Document observed damage, unusual conditions, and concerns.	
03.38 Inspect struts, springs, and related components; service as required.	
03.39 Inspect stabilizer bar, bushings, brackets, and links; service as required.	
03.40 Inspect springs, torsion bars, and related components; service as required.	
03.41 Inspect shock absorbers and related components.	
03.42 Inspect constant velocity (CV) axle shaft boots; service as required.	
03.43 Identify service considerations when equipped with a Tire Pressure Monitoring System (TPMS).	
03.44 Identify nitrogen-filled tires.	
03.45 Inspect tires, diagnose tire wear patterns, inspect spare and mounting system; check and adjust tire pressure; where applicable.	
03.46 Rotate tires according to manufacturer's recommendations.	
03.47 Balance wheel and tire assembly (static, dynamic and road force balance); where applicable.	
03.48 Dismount, inspect, and remount tire on wheel.	
03.49 Repair tire according to industry standards.	
03.50 Reinstall wheel; torque wheel fasteners to specification.	
03.51 Check wheel bearings for play and other signs of wear.	
03.52 Perform a visual inspection of a brake drum system.	
03.53 Perform a visual inspection of a disc brake system.	
03.54 Check parking brake operation; check parking brake components for unusual conditions.	
03.55 Check wiper blades, inserts, and arms; replace wiper blades or inserts.	
03.56 Lubricate door latches and hinges.	
03.57 Inspect fuel tank, fuel cap and seal; inspect and replace fuel lines, fittings, and hoses; as applicable.	

CTE Standards and Benchmarks	Priority Number
03.58 Perform slow/fast battery charge.	
03.59 Inspect and clean battery cables, connectors, clamps, and hold-downs; repair or replace as needed.	
03.60 Perform battery, starting, and charging system tests using appropriate tester.	
03.61 Start a vehicle using jumper cables or a battery auxiliary power supply (jump box).	
03.62 Maintain or restore electronic memory functions if required.	
03.63 Inspect and test fusible links, circuit breakers, and fuses; confirm proper circuit operation; replace as needed.	
03.64 Inspect and replace exterior and courtesy lamps.	

Florida Department of Education
Student Performance Standards

Course Number: AER0110
Occupational Completion Point: B
Engine Repair Technician – 150 Hours – SOC Code 49-3023

Course Description:

The Engine Repair Technician prepares students for entry into the automotive service industry. Students explore career opportunities and requirements of a professional auto mechanic. Students study diagnostics and repair of general engine, cylinder heads, valve trains, engine block, lubrication, and cooling systems.

Abbreviations:

ER = Engine Repair

For every task in Engine Repair Technician course, the following safety requirement MUST be strictly enforced:

Comply with personal and environmental safety practices associated with clothing; eye protection; hand tools; power equipment; proper ventilation; and the handling, storage, and disposal of chemicals/materials in accordance with local, state, and federal safety and environmental regulations.

ER Task List:	
P-1 =	24
P-2 =	16
P-3 =	11
Total	51

CTE Standards and Benchmarks		Priority Number
04.0	Explain and apply proficiently the diagnosis, service and repair of engines, cylinder heads, valve train, engine block, lubrication and cooling systems.-The student will be able to:	
	General: Engine Diagnosis; Removal and Reinstallation (R&R)	
04.01	Complete work order to include customer information, vehicle identifying information, customer concern, related service history, cause, and correction.	P-1
04.02	Research vehicle service information including fluid type, internal engine operation, vehicle service history, service precautions, and technical service bulletins.	P-1
04.03	Verify operation of the instrument panel engine warning indicators.	P-1
04.04	Inspect engine assembly for fuel, oil, coolant, and other leaks; determine needed action.	P-1
04.05	Install engine covers using gaskets, seals, and sealers as required.	P-1
04.06	Verify engine mechanical timing.	P-1
04.07	Perform common fastener and thread repair, to include: remove broken bolt, restore internal and external threads, and repair internal threads with thread insert.	P-1
04.08	Inspect, remove and/or replace engine mounts.	P-2

CTE Standards and Benchmarks	Priority Number
04.09 Identify service precautions related to service of the internal combustion engine of a hybrid vehicle.	P-2
04.10 Remove and reinstall engine on a newer vehicle equipped with OBD; reconnect all attaching components and restore the vehicle to running condition.	P-3
04.11 Identify and interpret engine concern; determine necessary action.	
04.12 Locate and interpret vehicle and major component identification numbers.	
04.13 Diagnose engine noises and vibrations; determine necessary action.	
04.14 Diagnose the cause of excessive oil consumption, coolant consumption, unusual engine exhaust color and odor; determine necessary action.	
04.15 Perform engine vacuum tests; determine necessary action.	
04.16 Perform cylinder power balance tests; determine necessary action.	
04.17 Perform cylinder cranking and running compression tests; determine necessary action.	
04.18 Perform cylinder leakage tests; determine necessary action.	
Cylinder Head and Valve Train Diagnosis and Repair	
04.19 Remove cylinder head; inspect gasket condition; install cylinder head and gasket; tighten according to manufacturer's specification and procedure.	P-1
04.20 Clean and visually inspect a cylinder head for cracks; check gasket surface areas for warpage and surface finish; check passage condition.	P-1
04.21 Inspect pushrods, rocker arms, rocker arm pivots and shafts for wear, bending, cracks, looseness, and blocked oil passages (orifices); determine needed action.	P-2
04.22 Adjust valves (mechanical or hydraulic lifters).	P-1
04.23 Inspect and replace camshaft and drive belt/chain; includes checking drive gear wear and backlash, end play, sprocket and chain wear, overhead cam drive sprocket(s), drive belt(s), belt tension, tensioners, camshaft reluctor ring/tone-wheel, and valve timing components; verify correct camshaft timing.	P-1
04.24 Establish camshaft position sensor indexing.	P-1
04.25 Inspect valve springs for squareness and free height comparison; determine needed action.	P-3
04.26 Replace valve stem seals on an assembled engine; inspect valve spring retainers, locks/keepers, and valve lock/keeper grooves; determine needed action.	P-3
04.27 Inspect valve guides for wear; check valve stem-to-guide clearance; determine needed action.	P-3
04.28 Inspect valves and valve seats; determine needed action.	P-3
04.29 Check valve spring assembled height and valve stem height; determine needed action.	P-3
04.30 Inspect valve lifters; determine needed action.	P-2
04.31 Inspect and/or measure camshaft for runout, journal wear and lobe wear.	P-3

CTE Standards and Benchmarks	Priority Number
04.32 Inspect camshaft bearing surface for wear, damage, out-of-round, and alignment; determine needed action.	P-3
Engine Block Assembly Diagnosis and Repair	
04.33 Remove, inspect, and/or replace crankshaft vibration damper (harmonic balancer).	P-1
04.34 Disassemble engine block; clean and prepare components for inspection and reassembly.	P-1
04.35 Inspect engine block for visible cracks, passage condition, core and gallery plug condition, and surface warpage; determine needed action.	P-2
04.36 Inspect and measure cylinder walls/sleeves for damage, wear, and ridges; determine needed action.	P-2
04.37 Deglaze and clean cylinder walls.	P-2
04.38 Inspect and measure camshaft bearings for wear, damage, out-of-round, and alignment; determine needed action.	P-3
04.39 Inspect crankshaft for straightness, journal damage, keyway damage, thrust flange and sealing surface condition, and visual surface cracks; check oil passage condition; measure end play and journal wear; check crankshaft position sensor reluctor ring (where applicable); determine needed action.	P-1
04.40 Inspect main and connecting rod bearings for damage and wear; determine needed action.	P-2
04.41 Identify piston and bearing wear patterns that indicate connecting rod alignment and main bearing bore problems; determine needed action.	P-3
04.42 Inspect and measure piston skirts and ring lands; determine needed action.	P-2
04.43 Determine piston-to-bore clearance.	P-2
04.44 Inspect, measure, and install piston rings.	P-2
04.45 Inspect auxiliary shaft(s) (balance, intermediate, idler, counterbalance and/or silencer); inspect shaft(s) and support bearings for damage and wear; determine needed action; reinstall and time.	P-2
04.46 Assemble engine block.	P-1
04.47 Remove and replace piston pin; where applicable.	
Lubrication and Cooling Systems Diagnosis and Repair	
04.48 Perform cooling system pressure and dye tests to identify leaks; check coolant condition and level; inspect and test radiator, pressure cap, coolant recovery tank, heater core, and galley plugs; determine needed action.	P-1
04.49 Identify causes of engine overheating.	P-1
04.50 Inspect, replace, and/or adjust drive belts, tensioners, and pulleys; check pulley and belt alignment.	P-1
04.51 Inspect and/or test coolant; drain and recover coolant; flush and refill cooling system; use proper fluid type per manufacturer specification; bleed air as required.	P-1
04.52 Inspect, remove, and replace water pump.	P-2

CTE Standards and Benchmarks	Priority Number
04.53 Remove and replace radiator.	P-2
04.54 Remove, inspect, and replace thermostat and gasket/seal.	P-1
04.55 Inspect and test fan(s), fan clutch (electrical or mechanical), fan shroud, and air dams; determine needed action.	P-1
04.56 Perform oil pressure tests; determine needed action.	P-1
04.57 Perform engine oil and filter change; use proper fluid type per manufacturer specification.	P-1
04.58 Inspect auxiliary coolers; determine needed action.	P-3
04.59 Inspect, test, and replace oil temperature and pressure switches and sensors.	P-2
04.60 Inspect oil pump gears or rotors, housing, pressure relief devices, and pump drive; perform needed action.	P-2
04.61 Inspect and replace engine cooling and heater system hoses.	

**Florida Department of Education
Student Performance Standards**

Course Number: AER0257
Occupational Completion Point: C
Automatic Transmission and Transaxle Technician – 150 Hours – SOC Code 49-3023

Course Description:

The Automatic Transmission and Transaxle Technician prepare students for entry into the automotive service industry. Students explore career opportunities and requirements of a professional auto mechanic. Students study diagnostics, repair, service, and operation of automatic transmission/transaxles.

Abbreviations:

AT = Automatic Transmission/Transaxle

For every task in Automatic Transmission and Transaxle Technician course, the following safety requirement MUST be strictly enforced:

Comply with personal and environmental safety practices associated with clothing; eye protection; hand tools; power equipment; proper ventilation; and the handling, storage, and disposal of chemicals/materials in accordance with local, state, and federal safety and environmental regulations.

AT Task List:	
P-1 =	17
P-2 =	19
P-3 =	3
Total	39

CTE Standards and Benchmarks		Priority Number
05.0	Explain and apply proficiently the diagnosis, service, repair and overhaul of automatic transmissions/transaxles.-The student will be able to:	
General: Transmission and Transaxle Diagnosis		
05.01	Identify and interpret transmission/transaxle concerns, differentiate between engine performance and transmission/transaxle concerns; determine needed action.	P-1
05.02	Research vehicle service information including fluid type, vehicle service history, service precautions, and technical service bulletins.	P-1
05.03	Diagnose fluid loss and condition concerns; determine needed action.	P-1
05.04	Check fluid level in a transmission or a transaxle equipped with a dip-stick.	P-1
05.05	Check fluid level in a transmission or a transaxle not equipped with a dip-stick.	P-1
05.06	Perform pressure tests (including transmissions/transaxles equipped with electronic pressure control); determine needed action.	P-1
05.07	Diagnose noise and vibration concerns; determine needed action.	P-2
05.08	Perform stall test; determine needed action.	P-2

CTE Standards and Benchmarks	Priority Number
05.09 Perform lock-up converter system tests; determine needed action.	P-3
05.10 Diagnose transmission/transaxle gear reduction/multiplication concerns using driving, driven, and held member (power flow) principles.	P-1
05.11 Diagnose electronic transmission/transaxle control systems using appropriate test equipment and service information.	P-1
05.12 Diagnose pressure concerns in a transmission using hydraulic principles (Pascal's Law).	P-2
In-Vehicle Transmission/Transaxle Maintenance and Repair	
05.13 Inspect, adjust, and/or replace external manual valve shift linkage, transmission range sensor/switch, and/or park/neutral position switch.	P-1
05.14 Inspect for leakage; replace external seals, gaskets, and bushings.	P-2
05.15 Inspect, test, adjust, repair, and/or replace electrical/electronic components and circuits including computers, solenoids, sensors, relays, terminals, connectors, switches, and harnesses; demonstrate understanding of the relearn procedure.	P-1
05.16 Drain and replace fluid and filter(s); use proper fluid type per manufacturer specification.	P-1
05.17 Inspect, replace and align powertrain mounts.	P-2
05.18 Diagnose electronic transmission control systems using a scan tool; determine necessary action.	
Off-Vehicle Transmission and Transaxle Repair	
05.19 Remove and reinstall transmission/transaxle and torque converter; inspect engine core plugs, rear crankshaft seal, dowel pins, dowel pin holes, and mounting surfaces.	P-2
05.20 Inspect, leak test, flush, and/or replace transmission/transaxle oil cooler, lines, and fittings.	P-1
05.21 Inspect converter flex (drive) plate, converter attaching bolts, converter pilot, converter pump drive surfaces, converter end play, and crankshaft pilot bore.	P-2
05.22 Describe the operational characteristics of a continuously variable transmission (CVT).	P-3
05.23 Describe the operational characteristics of a hybrid vehicle drive train.	P-3
05.24 Disassemble, clean, and inspect transmission/transaxle.	P-1
05.25 Inspect, measure, clean, and replace valve body (includes surfaces, bores, springs, valves, switches, solenoids, sleeves, retainers, brackets, check valves/balls, screens, spacers, and gaskets).	P-2
05.26 Inspect servo and accumulator bores, pistons, seals, pins, springs, and retainers; determine needed action.	P-2
05.27 Assemble transmission/transaxle.	P-1
05.28 Inspect, measure, and reseal oil pump assembly and components.	P-2
05.29 Measure transmission/transaxle end play and/or preload; determine needed action.	P-1
05.30 Inspect, measure, and/or replace thrust washers and bearings.	P-2

CTE Standards and Benchmarks	Priority Number
05.31 Inspect oil delivery circuits, including seal rings, ring grooves, and sealing surface areas, feed pipes, orifices, and check valves/balls.	P-2
05.32 Inspect bushings; determine needed action.	P-2
05.33 Inspect and measure planetary gear assembly components; determine needed action.	P-2
05.34 Inspect case bores, passages, bushings, vents, and mating surfaces; determine needed action.	P-2
05.35 Diagnose and inspect transaxle drive, link chains, sprockets, gears, bearings, and bushings; perform needed action.	P-2
05.36 Inspect measure, repair, adjust or replace transaxle final drive components.	P-2
05.37 Inspect clutch drum, piston, check-balls, springs, retainers, seals, friction plates, pressure plates, and bands; determine needed action.	P-2
05.38 Measure clutch pack clearance; determine needed action.	P-1
05.39 Air test operation of clutch and servo assemblies.	P-1
05.40 Inspect one-way clutches, races, rollers, sprags, springs, cages, retainers; determine needed action.	P-2
05.41 Install and seat torque converter to engage drive/splines.	
05.42 Inspect bands and drums; determine necessary action.	

**Florida Department of Education
Student Performance Standards**

Course Number: AER0274
Occupational Completion Point: D
Manual Drivetrain and Axle Technician – 150 Hours – SOC Code 49-3023

Course Description:

The Manual Drivetrain and Axle Technician prepare students for entry into the automotive service industry. Students explore career opportunities and requirements of a professional auto mechanic. Students study diagnostics and repair of drive train, clutch, transmission, transaxle, half shaft universal, constant-velocity joint, rear axle, ring and pinion gears, differential case assemble, limited slip differential, drive shaft, and four wheel drive/all-wheel drive.

Abbreviations:

MD = Manual Drivetrain and Axles

For every task in Manual Drivetrain and Axle Technician course, the following safety requirement MUST be strictly enforced:

Comply with personal and environmental safety practices associated with clothing; eye protection; hand tools; power equipment; proper ventilation; and the handling, storage, and disposal of chemicals/materials in accordance with local, state, and federal safety and environmental regulations.

MD Task List:	
	P-1 = 18
	P-2 = 16
	P-3 = 16
Total	50

CTE Standards and Benchmarks		Priority Number
06.0	Explain and apply proficiently the operation, assembly, diagnosis, service and repair of manual drivetrains, clutches, transmissions/transaxles, drive and half-shaft universals, constant velocity joints, rear axle differential assembly, limited slip, four-wheel drive and all-wheel drive.-The student will be able to:	
General: Drive Train Diagnosis		
06.01	Identify and interpret drive train concerns; determine needed action.	P-1
06.02	Research vehicle service information including fluid type, vehicle service history, service precautions, and technical service bulletins.	P-1
06.03	Check fluid condition; check for leaks; determine needed action.	P-1
06.04	Drain and refill manual transmission/transaxle and final drive unit; use proper fluid type per manufacturer specification.	P-1
06.05	Diagnose fluid loss, level, and condition concerns; determine necessary action.	
Clutch Diagnosis and Repair		
06.06	Diagnose clutch noise, binding, slippage, pulsation, and chatter; determine needed action.	P-1

CTE Standards and Benchmarks	Priority Number
06.07 Inspect clutch pedal linkage, cables, automatic adjuster mechanisms, brackets, bushings, pivots, and springs; perform needed action.	P-1
06.08 Inspect and/or replace clutch pressure plate assembly, clutch disc, release (throw-out) bearing, linkage, and pilot bearing/bushing (as applicable).	P-1
06.09 Bleed clutch hydraulic system.	P-1
06.10 Check and adjust clutch master cylinder fluid level; check for leaks; use proper fluid type per manufacturer specification.	P-1
06.11 Inspect flywheel and ring gear for wear, cracks, and discoloration; determine needed action.	P-1
06.12 Measure flywheel runout and crankshaft end play; determine needed action.	P-2
06.13 Describe the operation and service of a system that uses a dual mass flywheel.	P-3
06.14 Inspect hydraulic clutch slave and master cylinders, lines, and hoses; determine necessary action.	
06.15 Inspect engine block, core plugs, rear main engine oil seal, clutch (bell) housing, transmission/transaxle case mating surfaces, and alignment dowels; determine necessary action.	
Transmission/Transaxle Diagnosis and Repair	
06.16 Inspect, adjust, lubricate, and/or replace shift linkages, brackets, bushings, cables, pivots, and levers.	P-2
06.17 Describe the operational characteristics of an electronically-controlled manual transmission/transaxle.	P-2
06.18 Diagnose noise concerns through the application of transmission/transaxle powerflow principles.	P-2
06.19 Diagnose hard shifting and jumping out of gear concerns; determine needed action.	P-2
06.20 Diagnose transaxle final drive assembly noise and vibration concerns; determine needed action.	P-3
06.21 Disassemble, inspect clean, and reassemble internal transmission/transaxle components.	P-2
06.22 Remove and reinstall manual transmission/transaxle.	
06.23 Inspect transmission/transaxle case, extension housing, case mating surfaces, bores, bushings, and vents; perform necessary action.	
06.24 Inspect, replace, and align powertrain mounts.	
06.25 Inspect and replace gaskets, seals, and sealants; inspect sealing surfaces.	
06.26 Remove and replace transaxle final drive.	
06.27 Inspect, adjust, and reinstall shift cover, forks, levers, grommets, shafts, sleeves, detent mechanism, interlocks, and springs.	
06.28 Measure end play or preload (shim or spacer selection procedure) on transmission/transaxle shafts; perform necessary action.	
06.29 Inspect and reinstall synchronizer hub, sleeve, keys (inserts), springs, and blocking rings.	
06.30 Inspect lubrication devices (oil pump or slingers); perform necessary action.	

CTE Standards and Benchmarks	Priority Number
06.31 Inspect, test, and replace transmission/transaxle sensors and switches.	
Drive Shaft and Half Shaft, Universal and Constant-Velocity (CV) Joint Diagnosis and Repair (Front, Rear, All-Wheel, and Four-Wheel drive)	
06.32 Diagnose constant-velocity (CV) joint noise and vibration concerns; determine needed action.	P-1
06.33 Diagnose universal joint noise and vibration concerns; perform needed action.	P-2
06.34 Inspect, remove, and/or replace bearings, hubs, and seals.	P-1
06.35 Inspect, service, and/or replace shafts, yokes, boots, and universal/CV joints.	P-1
06.36 Check shaft balance and phasing; measure shaft runout; measure and adjust driveline angles.	P-2
06.37 Inspect, service, and replace shaft center support bearings.	
Drive Axle Diagnosis and Repair – Ring and Pinion Gears and Differential Case Assembly	
06.38 Clean and inspect differential case; check for leaks; inspect housing vent.	P-1
06.39 Check and adjust differential case fluid level; use proper fluid type per manufacturer specification.	P-1
06.40 Drain and refill differential case; use proper fluid type per manufacturer specifications.	P-1
06.41 Diagnose noise and vibration concerns; determine needed action.	P-2
06.42 Inspect and replace companion flange and/or pinion seal; measure companion flange runout.	P-2
06.43 Inspect ring gear and measure runout; determine needed action.	P-3
06.44 Remove, inspect, reinstall and/or drive pinion and ring gear, spacers, sleeves, and bearings.	P-3
06.45 Measure and adjust drive pinion depth.	P-3
06.46 Measure and adjust drive pinion bearing preload.	P-3
06.47 Measure and adjust side bearing preload and ring and pinion gear total backlash and backlash variation on a differential carrier assembly (threaded cup or shim types).	P-3
06.48 Check ring and pinion tooth contact patterns; perform needed action.	P-3
06.49 Disassemble, inspect, measure, adjust, and/or replace differential pinion gears (spiders), shaft, side gears, side bearings, thrust washers, and case.	P-3
06.50 Reassemble and reinstall differential case assembly; measure runout; determine needed action.	P-3
06.51 Diagnose noise and vibration concerns; determine necessary action.	
Drive Axle Diagnosis and Repair – Limited Slip Differential	
06.52 Diagnose noise, slippage, and chatter concerns; determine needed action.	P-3
06.53 Measure rotating torque; determine needed action.	P-3

CTE Standards and Benchmarks	Priority Number
06.54 Inspect and reinstall limited slip differential components.	
Drive Axle Diagnosis and Repair – Drive Axles	
06.55 Inspect and replace drive axle wheel studs.	P-1
06.56 Remove and replace drive axle shafts.	P-1
06.57 Inspect and replace drive axle shaft seals, bearings, and retainers.	P-2
06.58 Measure drive axle flange runout and shaft end play; determine needed action.	P-2
06.59 Diagnose drive axle shafts, bearings, and seals for noise, vibration, and fluid leakage concerns; determine needed action.	P-2
Four-Wheel Drive/All-Wheel Drive Component Diagnosis and Repair	
06.60 Inspect, adjust, and repair shifting controls (mechanical, electrical, and vacuum), bushings, mounts, levers, and brackets.	P-3
06.61 Inspect locking hubs; determine needed action.	P-3
06.62 Check for leaks at drive assembly and transfer case seals; check vents; check fluid level; use proper fluid type per manufacturer specification.	P-3
06.63 Identify concerns related to variations in tire circumference and/or final drive ratios.	P-2
06.64 Diagnose noise, vibration, and unusual steering concerns; determine needed action.	P-3
06.65 Diagnose, test, adjust, and/or replace electrical/electronic components of four-wheel drive/all-wheel drive systems.	P-2
06.66 Disassemble, service, and reassemble transfer case and components.	P-2
06.67 Remove and reinstall transfer case.	

Florida Department of Education
Student Performance Standards

Course Number: AER0453
Occupational Completion Point: E
Automotive Suspension and Steering Technician – 150 Hours – SOC Code 49-3023

Course Description:

The Automotive Suspension and Steering Technician prepare students for entry into the automotive service industry. Students explore career opportunities and requirements of a professional auto mechanic. Students study diagnostics and repair of general suspension, steering systems, front suspensions, rear suspensions, wheel alignment, and tires.

Abbreviations:

SS = Suspension and Steering

For every task in Automotive Suspension and Steering Technician course, the following safety requirement MUST be strictly enforced:

Comply with personal and environmental safety practices associated with clothing; eye protection; hand tools; power equipment; proper ventilation; and the handling, storage, and disposal of chemicals/materials in accordance with local, state, and federal safety and environmental regulations.

SS Task List:	
P-1 =	27
P-2 =	20
P-3 =	10
Total	57

CTE Standards and Benchmarks		Priority Number
07.0	Explain and apply proficiently the diagnosis, service and repair of front and rear suspensions systems, wheel alignment, and wheels and tires.-The student will be able to:	
General: Suspension and Steering Systems		
07.01	Research vehicle service information including fluid type, vehicle service history, service precautions, and technical service bulletins.	P-1
07.02	Identify and interpret suspension and steering system concerns; determine needed action.	P-1
Steering Systems Diagnosis and Repair		
07.03	Disable and enable supplemental restraint system (SRS); verify indicator lamp operation.	P-1
07.04	Remove and replace steering wheel; center/time supplemental restraint system (SRS) coil (clock spring).	P-1
07.05	Diagnose steering column noises, looseness, and binding concerns (including tilt/telescoping mechanisms); determine needed action.	P-2
07.06	Diagnose power steering gear (non-rack and pinion) binding, uneven turning effort, looseness, hard steering, and noise concerns; determine needed action.	P-2

CTE Standards and Benchmarks	Priority Number
07.07 Diagnose power steering gear (rack and pinion) binding, uneven turning effort, looseness, hard steering, and noise concerns; determine needed action.	P-2
07.08 Inspect steering shaft universal-joint(s), flexible coupling(s), collapsible column, lock cylinder mechanism, and steering wheel; determine needed action.	P-2
07.09 Remove and replace rack and pinion steering gear; inspect mounting bushings and brackets.	P-2
07.10 Inspect rack and pinion steering gear inner tie rod ends (sockets) and bellows boots; replace as needed.	P-1
07.11 Inspect power steering fluid level and condition.	P-1
07.12 Flush, fill, and bleed power steering system; use proper fluid type per manufacturer specification.	P-2
07.13 Inspect for power steering fluid leakage; determine needed action.	P-1
07.14 Remove, inspect, replace, and/or adjust power steering pump drive belt.	P-1
07.15 Remove and reinstall power steering pump.	P-2
07.16 Remove and reinstall press fit power steering pump pulley; check pulley and belt alignment.	P-2
07.17 Inspect, remove and/or replace power steering hoses and fittings.	P-2
07.18 Inspect, remove and/or replace pitman arm, relay (center-link/intermediate) rod, idler arm, mountings, and steering linkage damper.	P-2
07.19 Inspect, replace, and/or adjust tie rod ends (sockets), tie rod sleeves, and clamps.	P-1
07.20 Inspect, test and diagnose electrically- assisted power steering systems (including using a scan tool); determine needed action.	P-2
07.21 Identify hybrid vehicle power steering system electrical circuits and safety precautions.	P-2
07.22 Test power steering system pressure; determine needed action.	P-2
Suspension Systems Diagnosis and Repair	
07.23 Diagnose short and long arm suspension system noises, body sway, and uneven ride height concerns; determine needed action.	P-1
07.24 Diagnose strut suspension system noises, body sway, and uneven ride height concerns; determine needed action.	P-1
07.25 Inspect, remove, and/or replace upper and lower control arms, bushings, shafts, and rebound bumpers.	P-3
07.26 Inspect, remove, and/or replace strut rods and bushings.	P-3
07.27 Inspect, remove, and/or replace upper and/or lower ball joints (with or without wear indicators).	P-2
07.28 Inspect, remove, and/or replace steering knuckle assemblies.	P-3
07.29 Inspect, remove and/or replace short and long arm suspension system coil springs and spring insulators.	P-3
07.30 Inspect, remove, and/or replace torsion bars and mounts	P-3

CTE Standards and Benchmarks	Priority Number
07.31 Inspect, remove, and/or replace front/rear stabilizer bar (sway bar) bushings, brackets, and links.	P-3
07.32 Inspect, remove, and/or replace strut cartridge or assembly, strut coil spring, insulators (silencers), and upper strut bearing mount.	P-3
07.33 Inspect, remove, and/or replace track bar, strut rods/radius arms, and related mounts and bushings.	P-3
07.34 Inspect rear suspension system leaf spring(s), spring insulators (silencers), shackles, brackets, bushings, center pins/bolts, and mounts.	P-1
Related Suspension and Steering Service	
07.35 Inspect, remove, and/or replace shock absorbers; inspect mounts and bushings.	P-1
07.36 Remove, inspect, service and/or replace front and rear wheel bearings.	P-1
07.37 Describe the function of suspension and steering control systems and components, (i.e. active suspension and stability control).	P-3
Wheel Alignment Diagnosis, Adjustment, and Repair	
07.38 Diagnose vehicle wander, drift, pull, hard steering, bump steer, memory steer, torque steer, and steering return concerns; determine needed action.	P-1
07.39 Perform pre-alignment inspection; measure vehicle ride height; determine needed action.	P-1
07.40 Prepare vehicle for wheel alignment on alignment machine; perform four-wheel alignment by checking and adjusting front and rear wheel caster, camber and toe as required; center steering wheel.	P-1
07.41 Check toe-out-on-turns (turning radius); determine needed action.	P-2
07.42 Check steering axis inclination (SAI) and included angle; determine needed action.	P-2
07.43 Check rear wheel thrust angle; determine needed action.	P-1
07.44 Check for front wheel setback; determine needed action.	P-2
07.45 Check front and/or rear cradle (sub-frame) alignment; determine needed action.	P-3
07.46 Reset steering angle sensor.	P-2
Wheels and Tires Diagnosis and Repair	
07.47 Inspect tire condition; identify tire wear patterns; check for correct tire size, application (load and speed ratings), and air pressure as listed on the tire information placard/label.	P-1
07.48 Diagnose wheel/tire vibration, shimmy, and noise; determine needed action.	P-2
07.49 Rotate tires according to manufacturer's recommendation including vehicles equipped with tire pressure monitoring systems (TPMS)	P-1
07.50 Measure wheel, tire, axle flange, and hub runout; determine needed action.	P-2
07.51 Diagnose tire pull problems; determine needed action.	P-1
07.52 Dismount, inspect, and remount tire on wheel; balance wheel and tire assembly.	P-1

CTE Standards and Benchmarks	Priority Number
07.53 Dismount, inspect, and remount tire on wheel equipped with tire pressure monitoring system sensor.	P-1
07.54 Inspect tire and wheel assembly for air loss; perform needed action.	P-1
07.55 Repair tire following vehicle manufacturer approved procedure.	P-1
07.56 Identify indirect and direct tire pressure monitoring system (TPMS); calibrate system; verify operation of instrument panel lamps.	P-1
07.57 Demonstrate knowledge of steps required to remove and replace sensors in a tire pressure monitoring system (TPMS) including relearn procedure	P-1
07.58 Reinstall wheel; torque lug nuts.	

Florida Department of Education
Student Performance Standards

Course Number: AER0418
Occupational Completion Point: F
Automotive Brake System Technician – 150 Hours – SOC Code 49-3023

Course Description:

The Automotive Brake System Technician prepares students for entry into the automotive service industry. Students explore career opportunities and requirements of a professional auto mechanic. Students study diagnostics and repair of brake systems, drum brakes, disc brakes, power assist units, electronic brakes, traction, and stability control.

Abbreviations:

BR = Brakes

For every task in Automotive Brake System Technician course, the following safety requirement MUST be strictly enforced:

Comply with personal and environmental safety practices associated with clothing; eye protection; hand tools; power equipment; proper ventilation; and the handling, storage, and disposal of chemicals/materials in accordance with local, state, and federal safety and environmental regulations.

BR Task List:	
	P-1 = 40
	P-2 = 11
	P-3 = 5
Total	56

CTE Standards and Benchmarks		Priority Number
08.0	Explain and apply proficiently the diagnosis, service and repair of drum\disc brake, hydraulics, power assist units, electronic brakes, traction control, stability control systems and miscellaneous (wheel bearings, parking brake, electrical, etc.) systems.-The student will be able to:	
General: Brake Systems Diagnosis		
08.01	Identify and interpret brake system concerns; determine needed action.	P-1
08.02	Research vehicle service information including fluid type, vehicle service history, service precautions, and technical service bulletins.	P-1
08.03	Describe procedure for performing a road test to check brake system operation including an anti-lock brake system (ABS).	P-1
08.04	Install wheel and torque lug nuts.	P-1
08.05	Locate and interpret vehicle and major component identification numbers (VIN, vehicle certification labels, calibration decals).	
Hydraulic System Diagnosis and Repair		
08.06	Diagnose pressure concerns in the brake system using hydraulic principles (Pascal’s Law).	P-1

CTE Standards and Benchmarks	Priority Number
08.07 Measure brake pedal height, travel, and free play (as applicable); determine needed action.	P-1
08.08 Check master cylinder for internal/external leaks and proper operation; determine needed action.	P-1
08.09 Remove, bench bleed, and reinstall master cylinder.	P-1
08.10 Diagnose poor stopping, pulling or dragging concerns caused by malfunctions in the hydraulic system; determine needed action.	P-1
08.11 Inspect brake lines, flexible hoses, and fittings for leaks, dents, kinks, rust, cracks, bulging, wear; and loose fittings/supports; determine needed action.	P-1
08.12 Replace brake lines, hoses, fittings, and supports.	P-2
08.13 Fabricate brake lines using proper material and flaring procedures (double flare and ISO types).	P-2
08.14 Select, handle, store, and fill brake fluids to proper level; use proper fluid type per manufacturer specification.	P-1
08.15 Inspect, test, and/or replace components of brake warning light system.	P-3
08.16 Identify components of hydraulic brake warning light system.	P-2
08.17 Bleed and/or flush brake system.	P-1
08.18 Test brake fluid for contamination.	P-1
08.19 Inspect, test, and/or replace metering (hold-off), proportioning (balance), pressure differential, and combination valves.	
Drum Brake Diagnosis and Repair	
08.20 Diagnose poor stopping, noise, vibration, pulling, grabbing, dragging or pedal pulsation concerns; determine needed action.	P-1
08.21 Remove, clean, and inspect brake drum; measure brake drum diameter; determine serviceability.	P-1
08.22 Refinish brake drum and measure final drum diameter; compare with specification.	P-1
08.23 Remove, clean, inspect, and/or replace brake shoes, springs, pins, clips, levers, adjusters/self-adjusters, other related brake hardware, and backing support plates; lubricate and reassemble.	P-1
08.24 Inspect wheel cylinders for leaks and proper operation; remove and replace as needed.	P-2
08.25 Pre-adjust brake shoes and parking brake; install brake drums or drum/hub assemblies and wheel bearings; perform final checks and adjustments.	P-1
Disc Brake Diagnosis and Repair	
08.26 Diagnose poor stopping, noise, vibration, pulling, grabbing, dragging, or pulsation concerns; determine needed action.	P-1
08.27 Remove and clean caliper assembly; inspect for leaks, damage, and wear; determine needed action.	P-1
08.28 Inspect caliper mounting and slides/pins for proper operation, wear, and damage; determine needed action.	P-1
08.29 Remove, inspect, and/or replace brake pads and retaining hardware; determine needed action.	P-1

CTE Standards and Benchmarks	Priority Number
08.30 Lubricate and reinstall caliper, brake pads, and related hardware; seat brake pads; inspect for leaks.	P-1
08.31 Clean and inspect rotor and mounting surface; measure rotor thickness, thickness variation, and lateral runout; determine needed action.	P-1
08.32 Remove and reinstall/replace rotor.	P-1
08.33 Refinish rotor on vehicle; measure final rotor thickness and compare with specification.	P-1
08.34 Refinish rotor off vehicle; measure final rotor thickness and compare with specification.	P-1
08.35 Retract and re-adjust caliper piston on an integrated parking brake system.	P-2
08.36 Check brake pad wear indicator; determine needed action.	P-1
08.37 Describe importance of operating vehicle to burnish/break-in replacement brake pads according to manufacturer's recommendations.	P-1
08.38 Disassemble and clean caliper assembly; inspect parts for wear, rust, scoring, and damage; replace seal, boot, and damaged or worn parts.	
Power-Assist Units Diagnosis and Repair	
08.39 Check brake pedal travel with and without engine running to verify proper power booster operation.	P-2
08.40 Identify components of the brake power assist system (vacuum and hydraulic); check vacuum supply (manifold or auxiliary pump) to vacuum- type power booster.	P-1
08.41 Inspect vacuum-type power booster unit for leaks; inspect the check-valve for proper operation; determine needed action.	P-1
08.42 Inspect and test hydraulically-assisted power brake system for leaks and proper operation; determine needed action.	P-3
08.43 Measure and adjust master cylinder pushrod length.	P-3
Related Systems (i.e. Wheel Bearings, Parking Brakes, Electrical) Diagnosis and Repair	
08.44 Diagnose wheel bearing noises, wheel shimmy, and vibration concerns; determine needed action.	P-1
08.45 Remove, clean, inspect, repack, and install wheel bearings; replace seals; install hub and adjust bearings.	P-2
08.46 Check parking brake system and components for wear, binding, and corrosion; clean, lubricate, adjust and/or replace as needed.	P-1
08.47 Check parking brake operation and parking brake indicator light system operation; determine needed action.	P-1
08.48 Check operation of brake stop light system.	P-1
08.49 Replace wheel bearing and race.	P-3
08.50 Remove, reinstall, and/or replace sealed wheel bearing assembly.	P-1
08.51 Inspect and replace wheel studs.	P-1
Electronic Brake Control Systems: Antilock Brake (ABS), Traction Control (TCS), and Electronic Stability Control (ESC) Systems Diagnosis and Repair	

CTE Standards and Benchmarks	Priority Number
08.52 Identify and inspect electronic brake control system components (ABS, TCS, ESC); determine needed action.	P-1
08.53 Describe the operation of a regenerative braking system.	P-3
08.54 Diagnose poor stopping, wheel lock-up, abnormal pedal feel, unwanted application, and noise concerns associated with the electronic brake control system; determine needed action.	P-2
08.55 Diagnose electronic brake control system electronic control(s) and components by retrieving diagnostic trouble codes, and/or using recommended test equipment; determine needed action.	P-2
08.56 Depressurize high-pressure components of an electronic brake control system.	P-2
08.57 Bleed the electronic brake control system hydraulic circuits.	P-1
08.58 Test, diagnose, and service electronic brake control system speed sensors (digital and analog), toothed ring (tone wheel), and circuits using a graphing multi-meter (GMM)/digital storage oscilloscope (DSO) (includes output signal, resistance, shorts to voltage/ground, and frequency data).	P-2
08.59 8. Diagnose electronic brake control system braking concerns caused by vehicle modifications (tire size, curb height, final drive ratio, etc.).	P-1
08.60 Remove and install electronic brake control system electrical/electronic and hydraulic components.	

Florida Department of Education
Student Performance Standards

Course Number: AER0360
Occupational Completion Point: G
Automotive Electrical/Electronic System Technician – 300 Hours – SOC Code 49-3023

Course Description:

The Automotive Electrical/Electronic System Technician prepares students for entry into the automotive service industry. Students explore career opportunities and requirements of a professional auto mechanic. Students study diagnostics and repair of electrical/electronics, battery, starting, charging, lighting, gauges, warning devices, driver information, horn, wiper/washer and accessory systems.

Abbreviations:

EE = Electrical/Electronic Systems

For every task in Automotive Electrical/Electronic System Technician course, the following safety requirement MUST be strictly enforced:

Comply with personal and environmental safety practices associated with clothing; eye protection; hand tools; power equipment; proper ventilation; and the handling, storage, and disposal of chemicals/materials in accordance with local, state, and federal safety and environmental regulations.

EE Task List:	
P-1 =	29
P-2 =	16
P-3 =	1
Total	46

CTE Standards and Benchmarks		Priority Number
09.0	Explain and apply proficiently the diagnosis, service and repair of electrical/electronic system components, battery, starting, charging, lighting, gauges, warning devices, driver information, horn, wiper/washer and accessory systems.-The student will be able to:	
General: Electrical System Diagnosis		
09.01	Research vehicle service information including vehicle service history, service precautions, and technical service bulletins.	P-1
09.02	Demonstrate knowledge of electrical/electronic series, parallel, and series-parallel circuits using principles of electricity (Ohm’s Law).	P-1
09.03	Demonstrate proper use of a digital multi-meter (DMM) when measuring source voltage, voltage drop (including grounds), current flow and resistance.	P-1
09.04	Demonstrate knowledge of the causes and effects from shorts, grounds, opens, and resistance problems in electrical/electronic circuits.	P-1
09.05	Demonstrate proper use of a test light on an electrical circuit.	P-1
09.06	Use fused jumper wires to check operation of electrical circuits.	P-1
09.07	Use wiring diagrams during the diagnosis (troubleshooting) of electrical/electronic circuit problems.	P-1

CTE Standards and Benchmarks	Priority Number
09.08 Diagnose the cause(s) of excessive key-off battery drain (parasitic draw); determine needed action.	P-1
09.09 Inspect and test fusible links, circuit breakers, and fuses; determine needed action.	P-1
09.10 Inspect, test, repair, and/or replace components, connectors, terminals, harnesses, and wiring in electrical/electronic systems (including solder repairs); determine needed action.	P-1
09.11 Check electrical/electronic circuit waveforms; interpret readings and determine needed repairs.	P-2
09.12 Repair data bus wiring harness.	P-1
09.13 Identify and interpret electrical/electronic system concern; determine necessary action.	
09.14 Identify location of hybrid vehicle high voltage circuit disconnect (service plug) location and safety procedures.	
Battery Diagnosis and Service	
09.15 Perform battery state-of-charge test; determine needed action.	P-1
09.16 Confirm proper battery capacity for vehicle application; perform battery capacity and load test; determine needed action.	P-1
09.17 Maintain or restore electronic memory functions.	P-1
09.18 Inspect and clean battery; fill battery cells; check battery cables, connectors, clamps, and hold-downs.	P-1
09.19 Perform slow/fast battery charge according to manufacturer's recommendations.	P-1
09.20 Jump-start vehicle using jumper cables and a booster battery or an auxiliary power supply.	P-1
09.21 Identify safety precautions for high voltage systems on electric, hybrid, hybrid-electric, and diesel vehicles.	P-2
09.22 Identify electrical/electronic modules, security systems, radios, and other accessories that require re-initialization or code entry after reconnecting vehicle battery.	P-1
09.23 Identify hybrid vehicle auxiliary (12v) battery service, repair, and test procedures.	P-2
09.24 Perform battery conductance test; determine necessary action.	
Starting System Diagnosis and Repair	
09.25 Perform starter current draw tests; determine needed action.	P-1
09.26 Perform starter circuit voltage drop tests; determine needed action.	P-1
09.27 Inspect and test starter relays and solenoids; determine needed action.	P-2
09.28 Remove and install starter in a vehicle.	P-1
09.29 Inspect and test switches, connectors, and wires of starter control circuits; determine needed action.	P-2
09.30 Differentiate between electrical and engine mechanical problems that cause a slow-crank or a no-crank condition.	P-2
09.31 Demonstrate knowledge of an automatic idle-stop/start-stop system.	P-2

CTE Standards and Benchmarks	Priority Number
Charging System Diagnosis and Repair	
09.32 Perform charging system output test; determine needed action.	P-1
09.33 Diagnose (troubleshoot) charging system for causes of undercharge, no-charge, or overcharge conditions.	P-1
09.34 Inspect, adjust, and/or replace generator (alternator) drive belts; check pulleys and tensioners for wear; check pulley and belt alignment.	P-1
09.35 Remove, inspect, and/or replace generator (alternator).	P-1
09.36 Perform charging circuit voltage drop tests; determine needed action.	P-1
Lighting Systems Diagnosis and Repair	
09.37 Diagnose (troubleshoot) the causes of brighter-than-normal, intermittent, dim, or no light operation; determine needed action.	P-1
09.38 Inspect interior and exterior lamps and sockets including headlights and auxiliary lights (fog lights/driving lights); replace as needed.	P-1
09.39 Aim headlights.	P-2
09.40 Identify system voltage and safety precautions associated with high-intensity discharge headlights.	P-2
09.41 Inspect and diagnose incorrect turn signal or hazard light operation; perform necessary action.	
Instrument Cluster and Driver Information Systems Diagnosis and Repair	
09.42 Inspect and test gauges and gauge sending units for causes of abnormal readings; determine needed action.	P-2
09.43 Diagnose (troubleshoot) the causes of incorrect operation of warning devices and other driver information systems; determine needed action.	P-2
09.44 Reset maintenance indicators as required.	P-2
09.45 Inspect and test sensors, connectors, and wires of electronic (digital) instrument circuits; determine necessary action.	
Body Electrical Systems Diagnosis and Repair	
09.46 Diagnose operation of comfort and convenience accessories and related circuits (such as: power window, power seats, pedal height, power locks, truck locks, remote start, moon roof, sun roof, sun shade, remote keyless entry, voice activation, steering wheel controls, back-up camera, park assist, cruise control, and auto dimming headlamps); determine needed repairs.	P-2
09.47 Diagnose operation of security/anti-theft systems and related circuits (such as: theft deterrent, door locks, remote keyless entry, remote start, and starter/fuel disable); determine needed repairs.	P-2
09.48 Diagnose operation of entertainment and related circuits (such as: radio, DVD, remote CD changer, navigation, amplifiers, speakers, antennas, and voice-activated accessories); determine needed repairs.	P-3
09.49 Diagnose operation of safety systems and related circuits (such as: horn, airbags, seat belt pretensioners, occupancy classification, wipers, washers, speed control/collision avoidance, heads-up display, park assist, and back-up camera); determine needed repairs.	P-1

CTE Standards and Benchmarks	Priority Number
09.50 Diagnose body electronic systems circuits using a scan tool; check for module communication errors (data communication bus systems); determine needed action.	P-2
09.51 Describe the process for software transfer, software updates, or reprogramming of electronic modules.	P-2
09.52 Diagnose incorrect heated glass, mirror, or seat operation; determine necessary action.	

**Florida Department of Education
Student Performance Standards**

Course Number: AER0172
Occupational Completion Point: H
Automotive Heating and Air Conditioning Technician – 150 Hours – SOC Code 49-3023

Course Description:

The Automotive Heating and Air Conditioning Technician prepare students for entry into the automotive service industry. Students explore career opportunities and requirements of a professional auto mechanic. Students study the diagnosis, service and repair of heating and air conditioning, refrigeration, compressors, compressor clutches, evaporators, receiver driers, accumulators, condensers, heating and engine cooling, related control systems, refrigerant recovery, and recycling and handling.

Abbreviations:

HA = Heating and Air Conditioning

For every task in Automotive Heating and Air Conditioning Technician course, the following safety requirement MUST be strictly enforced:

Comply with personal and environmental safety practices associated with clothing; eye protection; hand tools; power equipment; proper ventilation; and the handling, storage, and disposal of chemicals/materials in accordance with local, state, and federal safety and environmental regulations.

HA Task List:	
P-1 =	16
P-2 =	16
P-3 =	4
Total	36

CTE Standards and Benchmarks		Priority Number
10.0	Explain and apply proficiently the diagnosis, service and repair of heating and air conditioning, refrigeration, compressors, compressor clutches, evaporators, receiver driers, accumulators, condensers, heating and engine cooling, related control systems, refrigerant recovery, and recycling and handling.-The student will be able to:	
General: A/C System Diagnosis and Repair		
10.01	Identify and interpret heating and air conditioning problems; determine needed action.	P-1
10.02	Research vehicle service information including refrigerant/oil type, vehicle service history, service precautions, and technical service bulletins.	P-1
10.03	Performance test A/C system; identify problems.	P-1
10.04	Identify abnormal operating noises in the A/C system; determine needed action.	P-2
10.05	Identify refrigerant type; select and connect proper gauge set/test equipment; record temperature and pressure readings.	P-1
10.06	Leak test A/C system; determine needed action.	P-1
10.07	Inspect condition of refrigerant oil removed from A/C system; determine needed action.	P-2

CTE Standards and Benchmarks	Priority Number
10.08 Determine recommended oil and oil capacity for system application.	P-1
10.09 Using a scan tool, observe and record related HVAC data and trouble codes.	P-3
Refrigeration System Component Diagnosis and Repair	
10.10 Inspect, remove, and/or replace A/C compressor drive belts, pulleys, tensioners and visually inspect A/C components for signs of leaks; determine needed action.	P-1
10.11 Inspect, test, service and/or replace A/C compressor clutch components and/or assembly; check compressor clutch air gap; adjust as needed.	P-2
10.12 Remove, inspect, reinstall, and/or replace A/C compressor and mountings; determine recommended oil type and quantity.	P-2
10.13 Identify hybrid vehicle A/C system electrical circuits and service/safety precautions.	P-2
10.14 Determine need for an additional A/C system filter; perform needed action.	P-3
10.15 Remove and inspect A/C system mufflers, hoses, lines, fittings, O-rings, seals, and service valves; perform needed action.	P-2
10.16 Inspect for proper A/C condenser airflow; determine needed action.	P-1
10.17 Remove, inspect, and replace receiver/drier or accumulator/drier; determine recommended oil type and quantity.	P-2
10.18 Remove, inspect, and install expansion valve or orifice (expansion) tube.	P-1
10.19 Inspect evaporator housing water drain; perform needed action.	P-1
10.20 Diagnose A/C system conditions that cause the protection devices (pressure, thermal, and/or control module) to interrupt system operation; determine needed action.	P-2
10.21 Determine procedure to remove and reinstall evaporator; determine required oil type and quantity.	P-2
10.22 Perform cooling system pressure tests; check coolant condition, inspect and test radiator, cap (pressure/vacuum), coolant recovery tank, and hoses; perform necessary action.	
Heating, Ventilation, and Engine Cooling Systems Diagnosis and Repair	
10.23 Inspect engine cooling and heater systems hoses and pipes; perform needed action.	P-1
10.24 Inspect and test heater control valve(s); perform needed action.	P-2
10.25 Diagnose temperature control problems in the HVAC system; determine needed action.	P-2
10.26 Determine procedure to remove, inspect, reinstall, and/or replace heater core.	P-2
10.27 Inspect, test, and replace thermostat and gasket/seal.	
10.28 Determine coolant condition and coolant type for vehicle application; drain and recover coolant.	
10.29 Flush system; refill system with recommended coolant; bleed system.	
10.30 Inspect and test cooling fan, fan clutch, fan shroud, and air dams; perform necessary action.	

CTE Standards and Benchmarks	Priority Number
10.31 Inspect and test electric cooling fan, fan control system and circuits; determine necessary action.	
Operating Systems and Related Controls Diagnosis and Repair	
10.32 Inspect and test HVAC system blower motors, resistors, switches, relays, wiring, and protection devices; determine needed action.	P-1
10.33 Diagnose A/C compressor clutch control systems; determine needed action.	P-2
10.34 Diagnose malfunctions in the vacuum, mechanical, and electrical components and controls of the heating, ventilation, and A/C (HVAC) system; determine needed action.	P-2
10.35 Inspect and test HVAC system control panel assembly; determine needed action.	P-3
10.36 Inspect and test HVAC system control cables, motors, and linkages; perform needed action.	P-3
10.37 Inspect HVAC system ducts, doors, hoses, cabin filters, and outlets; perform needed action.	P-1
10.38 Identify the source of HVAC system odors.	P-2
10.39 Check operation of automatic or semi-automatic HVAC control systems; determine needed action.	P-2
Refrigerant Recovery, Recycling, and Handling	
10.40 Perform correct use and maintenance of refrigerant handling equipment according to equipment manufacturer's standards.	P-1
10.41 Identify A/C system refrigerant; test for sealants; recover, evacuate, and charge A/C system; add refrigerant oil as required.	P-1
10.42 Recycle, label, and store refrigerant.	P-1

Florida Department of Education
Student Performance Standards

Course Number: AER0503
Occupational Completion Point: I
Automotive Engine Performance Technician – 300 Hours – SOC Code 49-3023

Course Description:

The Automotive Engine Performance Technician course prepares students for entry into the automotive service industry. Students explore career opportunities and requirements of a professional auto mechanic. Students study the diagnosis, service and repair of engines, ignition, fuel, air induction, exhaust, computer, engine and emission control systems.

Abbreviations:

EP = Engine Performance

For every task in Automotive Engine Performance Technician course, the following safety requirement MUST be strictly enforced:

Comply with personal and environmental safety practices associated with clothing; eye protection; hand tools; power equipment; proper ventilation; and the handling, storage, and disposal of chemicals/materials in accordance with local, state, and federal safety and environmental regulations.

EP Task List:	
P-1 =	21
P-2 =	20
P-3 =	2
Total	43

CTE Standards and Benchmarks		Priority Number
11.0	Explain and apply proficiently the diagnosis, service and repair of engines, ignition, fuel, air induction, exhaust, computer engine and emission control systems.-The student will be able to:	
General: Engine Diagnosis		
11.01	Identify and interpret engine performance concerns; determine needed action.	P-1
11.02	Research vehicle service information including vehicle service history, service precautions, and technical service bulletins.	P-1
11.03	Diagnose abnormal engine noises or vibration concerns; determine needed action.	P-3
11.04	Diagnose the cause of excessive oil consumption, coolant consumption, unusual exhaust color, odor, and sound; determine needed action.	P-2
11.05	Perform engine absolute manifold pressure tests (vacuum/boost); determine needed action.	P-1
11.06	Perform cylinder power balance test; determine needed action.	P-2
11.07	Perform cylinder cranking and running compression tests; determine needed action.	P-1
11.08	Perform cylinder leakage test; determine needed action.	P-1

CTE Standards and Benchmarks	Priority Number
11.09 Diagnose engine mechanical, electrical, electronic, fuel, and ignition concerns; determine needed action.	P-2
11.10 Verify engine operating temperature; determine needed action.	P-1
11.11 Verify correct camshaft timing including engines equipped with variable valve timing systems (VVT).	P-1
11.12 Inspect engine assembly for fuel, oil, coolant, and other leaks; determine necessary action.	
11.13 Demonstrate knowledge of using a 4 or 5 gas analyzer, interpret readings, and determine necessary action.	
11.14 Perform cooling system pressure tests; check coolant condition; inspect and test radiator, pressure cap, coolant recovery tank, and hoses; perform necessary action.	
Computerized Controls Diagnosis and Repair	
11.15 Retrieve and record diagnostic trouble codes (DTC), OBD monitor status, and freeze frame data; clear codes when applicable.	P-1
11.16 Access and use service information to perform step-by-step (troubleshooting) diagnosis.	P-1
11.17 Perform active tests of actuators using a scan tool; determine needed action.	P-1
11.18 Describe the use of OBD monitors for repair verification.	P-1
11.19 Diagnose the causes of emissions or drive-ability concerns with stored or active diagnostic trouble codes (DTC); obtain, graph, and interpret scan tool data.	P-1
11.20 Diagnose emissions or drive-ability concerns without stored or active diagnostic trouble codes; determine needed action.	P-1
11.21 Inspect and test computerized engine control system sensors, powertrain/engine control module (PCM/ECM), actuators, and circuits using a graphing multi-meter (GMM)/digital storage oscilloscope (DSO); perform needed action.	P-2
11.22 Diagnose drive-ability and emissions problems resulting from malfunctions of interrelated systems (cruise control, security alarms, suspension controls, traction controls, HVAC, automatic transmissions, non-OEM installed accessories, or similar systems); determine needed action.	P-2
11.23 Check for module communication (including CAN/BUS systems) errors using a scan tool.	
Ignition System Diagnosis and Repair	
11.24 Diagnose (troubleshoot) ignition system related problems such as no-starting, hard starting, engine misfire, poor drive-ability, spark knock, power loss, poor mileage, and emissions concerns; determine needed action.	P-2
11.25 Inspect and test crankshaft and camshaft position sensor(s); determine needed action.	P-1
11.26 Inspect, test, and/or replace ignition control module, powertrain/engine control module; reprogram/initialize as needed.	P-3
11.27 Remove and replace spark plugs; inspect secondary ignition components for wear and damage.	P-1
11.28 Inspect and test ignition primary and secondary circuit wiring and solid state components; test ignition coil(s); perform necessary action.	
Fuel, Air Induction, and Exhaust Systems Diagnosis and Repair	

CTE Standards and Benchmarks	Priority Number
11.29 Diagnose (troubleshoot) hot or cold no-starting, hard starting, poor drive-ability, incorrect idle speed, poor idle, flooding, hesitation, surging, engine misfire, power loss, stalling, poor mileage, dieseling, and emissions problems; determine needed action.	P-2
11.30 Check fuel for contaminants; determine needed action.	P-2
11.31 Inspect and test fuel pump(s) and pump control system for pressure, regulation, and volume; perform needed action.	P-1
11.32 Replace fuel filter(s) where applicable.	P-2
11.33 Inspect, service, or replace air filters, filter housings, and intake duct work.	P-1
11.34 Inspect throttle body, air induction system, intake manifold and gaskets for vacuum leaks and/or unmetered air.	P-2
11.35 Inspect, test, and/or replace fuel injectors.	P-2
11.36 Verify idle control operation.	P-1
11.37 Inspect integrity of the exhaust manifold, exhaust pipes, muffler(s), catalytic converter(s), resonator(s), tail pipe(s), and heat shields; perform needed action.	P-1
11.38 Inspect condition of exhaust system hangers, brackets, clamps, and heat shields; determine needed action.	P-1
11.39 Perform exhaust system back-pressure test; determine needed action.	P-2
11.40 Check and refill diesel exhaust fluid (DEF).	P-2
11.41 Test the operation of turbocharger/supercharger systems; determine needed action.	P-2
Emissions Control Systems Diagnosis and Repair	
11.42 Diagnose oil leaks, emissions, and drive-ability concerns caused by the positive crankcase ventilation (PCV) system; determine needed action.	P-3
11.43 Inspect, test, service, and/or replace positive crankcase ventilation (PCV) filter/breather, valve, tubes, orifices, and hoses; perform needed action.	P-2
11.44 Diagnose emissions and drive-ability concerns caused by the exhaust gas recirculation (EGR) system; inspect, test, service and/or replace electrical/electronic sensors, controls, wiring, tubing, exhaust passages, vacuum/pressure controls, filters, and hoses of exhaust gas recirculation (EGR) systems; determine needed action.	P-2
11.45 Diagnose emissions and drive-ability concerns caused by the secondary air injection system; inspect, test, repair, and/or replace electrical/electronically-operated components and circuits of secondary air injection systems; determine needed action.	P-2
11.46 Diagnose emissions and drive-ability concerns caused by the evaporative emissions control (EVAP) system; determine needed action.	P-1
11.47 Diagnose emission and drive-ability concerns caused by catalytic converter system; determine needed action.	P-2
11.48 Interpret diagnostic trouble codes (DTCs) and scan tool data related to the emissions control systems; determine needed action.	P-2

CTE Standards and Benchmarks	Priority Number
11.49 Inspect and test mechanical components of secondary air injection systems; perform necessary action.	
11.50 Adjust valves on engines with mechanical or hydraulic lifters; as applicable.	
11.51 Remove and replace timing belt; verify correct camshaft timing.	
11.52 Inspect and test mechanical/electrical fans, fan clutch, fan shroud/ducting, air dams, and fan control devices; perform necessary action.	
11.53 Inspect engine oil and/or filter for condition and determine necessary action.	
11.54 Identify hybrid vehicle internal combustion engine service precautions.	

Additional Information

Laboratory Activities

Laboratory investigations that include scientific inquiry, research, measurement, problem solving, emerging technologies, tools and equipment, as well as, experimental, quality, and safety procedures are an integral part of this career and technical program/course. Laboratory investigations benefit all students by developing an understanding of the complexity and ambiguity of empirical work, as well as the skills required to manage, operate, calibrate and troubleshoot equipment/tools used to make observations. Students understand measurement error; and have the skills to aggregate, interpret, and present the resulting data. Equipment and supplies should be provided to enhance hands-on experiences for students.

Special Notes

Benchmarks identified with a designation of P-1, P-2, or P-3 are ASE tasks.

It is recommended that the program be NATEF Master Certified (MAST) and the instructors be A1-A8 ASE Master and Advanced Engine Performance (L1) ASE Certified.

MyCareerShines is an interactive resource to assist students in identifying their ideal career and to enhance preparation for employment. Teachers are encouraged to integrate this resource into the program curriculum to meet the employability goals for each student.

Career and Technical Student Organization (CTSO)

SkillsUSA is the intercurricular career and technical student organization(s) providing leadership training and reinforcing specific career and technical skills. Career and Technical Student Organizations provide activities for students as an integral part of the instruction offered.

Cooperative Training – OJT

On-the-job training is appropriate but not required for this program. Whenever offered, the rules, guidelines, and requirements specified in the OJT framework apply.

Basic Skills

In a Career Certificate Program offered for 450 hours or more, in accordance with Rule 6A-10.040, F.A.C., the minimum basic skills grade levels required for postsecondary adult career and technical students to complete this program are: Mathematics 10.0, Language 9.0, and Reading 9.0. These grade level numbers correspond to a grade equivalent score obtained on a state designated basic skills examination.

Adult students with disabilities, as defined in Section 1004.02(7), Florida Statutes, may be exempted from meeting the Basic Skills requirements (Rule 6A-10.040). Students served in exceptional student education (except gifted) as defined in s. 1003.01(3)(a), F.S., may also be exempted from meeting the Basic Skills requirement. Each school district and Florida College must adopt a policy addressing procedures for exempting eligible students with disabilities from the Basic Skills requirement as permitted in Section 1004.91(3), F.S.

Students who possess a college degree at the Associate of Applied Science level or higher; who have completed or are exempt from the college entry-level examination; or who have passed a state, national, or industry licensure exam are exempt from meeting the Basic Skills requirement (Rule 6A-10.040, F.A.C.) Exemptions from state, national or industry licensure are limited to the certifications listed on the Basic Skills and Licensure Exemption List which may be accessed from the CTE Program Resources page.

Accommodations

Federal and state legislation requires the provision of accommodations for students with disabilities to meet individual needs and ensure equal access. Postsecondary students with disabilities must self-identify, present documentation, request accommodations if needed, and develop a plan with their counselor and/or instructors. Accommodations received in postsecondary education may differ from those received in secondary education. Accommodations change the way the student is instructed. Students with disabilities may need accommodations in such areas as instructional methods and materials, assignments and assessments, time demands and schedules, learning environment, assistive technology and special communication systems. Documentation of the accommodations requested and provided should be maintained in a confidential file.

Note: postsecondary curriculum and regulated secondary programs cannot be modified.

Florida Department of Education
Curriculum Framework

Program Title: Commercial Vehicle Driving
Program Type: Career Preparatory
Career Cluster: Transportation, Distribution and Logistics

Career Certificate Program – Career Preparatory

Program Number	I490205
CIP Number	0649020500
Grade Level	30, 31
Standard Length	320 hours
Teacher Certification	Refer to the Program Structure section
CTSO	SkillsUSA
SOC Codes (all applicable)	53-3032 – Heavy and Tractor-Trailer Truck Drivers
Basic Skills Level	N/A

Purpose

This program offers a sequence of courses that provides coherent and rigorous content aligned with challenging academic standards and relevant technical knowledge and skills needed to prepare for further education and careers in the Transportation, Distribution and Logistics career cluster; provides technical skill proficiency, and includes competency-based applied learning that contributes to the academic knowledge, higher-order reasoning and problem-solving skills, work attitudes, general employability skills, technical skills, and occupation-specific skills, and knowledge of all aspects of the Transportation, Distribution and Logistics career cluster.

The purpose of this program is to prepare students for a Class “A” Commercial Driver License.

This program focuses on broad, transferable skills and stresses understanding and demonstration of the following elements of the Commercial Vehicle Driving industry; planning, management, labor issues, community issues and health, safety, and environmental issues. The content includes but is not limited to the following: Loading and unloading cargo; reporting delays or accidents on the road; verifying load against shipping papers; and keeping records.

Additional Information relevant to this Career and Technical Education (CTE) program is provided at the end of this document.

Program Structure

This program is a planned sequence of instruction consisting of one occupational completion point.

This program is comprised of courses which have been assigned course numbers in the SCNS (Statewide Course Numbering System) in accordance with Section 1007.24 (1), F.S. Career and Technical credit shall be awarded to the student on a transcript in accordance with Section 1001.44(3)(b), F.S.

To teach the course(s) listed below, instructors must hold at least one of the teacher certifications indicated for that course.

The following table illustrates the postsecondary program structure:

OCP	Course Number	Course Title	Teacher Certification	Length	SOC Code
A	TRA0080	Tractor Trailer Truck Driver	COMM DRIV @7 7G	320 hours	53-3032

Common Career Technical Core – Career Ready Practices

Career Ready Practices describe the career-ready skills that educators should seek to develop in their students. These practices are not exclusive to a Career Pathway, program of study, discipline or level of education. Career Ready Practices should be taught and reinforced in all career exploration and preparation programs with increasingly higher levels of complexity and expectation as a student advances through a program of study.

1. Act as a responsible and contributing citizen and employee.
2. Apply appropriate academic and technical skills.
3. Attend to personal health and financial well-being.
4. Communicate clearly, effectively and with reason.
5. Consider the environmental, social and economic impacts of decisions.
6. Demonstrate creativity and innovation.
7. Employ valid and reliable research strategies.
8. Utilize critical thinking to make sense of problems and persevere in solving them.
9. Model integrity, ethical leadership and effective management.
10. Plan education and career path aligned to personal goals.
11. Use technology to enhance productivity.
12. Work productively in teams while using cultural/global competence.

Standards

After successfully completing this program, the student will be able to perform the following:

- 01.0 Understand vehicle safety and accident prevention procedures.
- 02.0 Understand and comply with vehicle operating regulations.
- 03.0 Demonstrate proper cargo handling and documentation procedures.
- 04.0 Demonstrate trip planning preparation procedures.
- 05.0 Demonstrate vehicle inspection procedures.
- 06.0 Perform vehicle maintenance and servicing procedures.
- 07.0 Demonstrate basic vehicle control procedures.
- 08.0 Demonstrate backing skills and basic vehicle maneuvers.
- 09.0 Demonstrate coupling and uncoupling skills.
- 10.0 Demonstrate road driving skills.
- 11.0 Demonstrate hazardous driving skills.
- 12.0 Apply concepts learned for obtaining a Commercial Driver's License (CDL).

**Florida Department of Education
Student Performance Standards**

Program Title: Commercial Vehicle Driving
Career Certificate Program Number: I490205

Course Number: TRA0080
Occupational Completion Point: A
Tractor Trailer Truck Driver – 320 Hours – SOC Code 53-3032

Course Description:

The Tractor Trailer Truck Driver course prepares students for entry into the trucking and logistics industry. Students explore career opportunities and requirements of a professional tractor trailer driver. Students study vehicle safety, accident prevention, operating regulations, cargo handling, documentation procedures, pre-trip preparation, vehicle inspection, maintenance, service, control procedures, backing, coupling, uncoupling, maneuvering, road and hazardous driving skills, and licensing requirements.

CTE Standards and Benchmarks	
01.0	Understand vehicle safety and accident prevention procedures.-The student will be able to:
01.01	Understand, identify and explain the use of vehicle safety equipment.
01.02	Understand the use of fire extinguishers.
01.03	Utilize seat belts and personal protection gear appropriate to type of operation.
01.04	Demonstrate safe lifting procedures through use of hands-on labs or through viewing safety video.
01.05	Describe personal safety equipment and procedures.
01.06	Describe actions applicable for vehicle accidents.
01.07	Complete reports in a classroom activity.
01.08	Understand accident reporting requirements (company, state, federal).
01.09	Identify all information needed for accident reports to the State, the employer and the insurance company.
01.10	Complete an accident report.
01.11	Describe procedures for protecting the scene of an accident.
01.12	Describe personal liability requirements.
01.13	Identify hazardous road conditions that are a potential threat to the safety of the truck driver.
01.14	Describe activities and characteristics of other road users that make them potentially dangerous.
01.15	Describe the potential consequences of excessive speed.

01.16	Describe the potential consequences of use of drugs or alcohol.
01.17	Describe and demonstrate safety procedures for entering and exiting vehicles.
02.0	Understand and comply with vehicle operating regulations.-The student will be able to:
02.01	Understand and comply with Hours of Service regulations.
02.02	Maintain a complete, neat and accurate driver's duty status log including discussion of electronic logs.
02.03	Keep accurate records required by hours of service regulations.
02.04	Perform mathematical calculations necessary to recap and apply totals to the hours of service regulations.
02.05	Determine driving hours remaining on a particular day or tour of duty.
02.06	Understand and comply with applicable United States Department of Transportation regulations including Federal Motor Carrier Safety Administration rules and regulations - Compliance, Safety, and Accountability (CSA) particularly the role of drivers and motor carriers.
02.07	Understand and comply with Federal, State and local traffic laws including restrictions on vehicle size and weight including permits when required.
03.0	Demonstrate proper cargo handling and documentation procedures.-The student will be able to:
03.01	Understand how to load and unload cargo safely and efficiently.
03.02	Understand legal gross weight and axle weight.
03.03	Describe cargo load to meet legal weight and safety requirements.
03.04	Understand how to secure cargo using blocking, bracing, packing, rope, cable, chains and strapping.
03.05	Identify types of hazardous cargoes.
03.06	Understand the placement of placards when carrying hazardous materials.
03.07	Understand procedure for use of common cargo handling equipment, including pallets, jacks, dollies, hand trucks, nets, slings, poles and other equipment.
03.08	Understand categories of hazardous materials and the need for specialized training to handle hazardous materials.
03.09	Understand hazardous materials documentation requirements.
03.10	Verify nature, amount and condition of cargo on both pickup and delivery.
03.11	Verify information on bill of lading and properly record and report discrepancies and damage to the cargo.
03.12	Verify appropriate signatures on delivery receipts and other required forms.
03.13	Prepare a bill of lading/manifest.
03.14	Verify door seal number against shipping document.
03.15	Describe the handling of C.O.D. shipments.
03.16	Comply with port of entry or exit and other inspection station procedures.

04.0	Demonstrate trip planning preparation procedures.-The student will be able to:
04.01	Check vehicle registration and permit.
04.02	Check accident report packets for proper contents.
04.03	Plan a route from one point to another that is optimal in terms of travel time, fuel costs, potential hazards and federal, state and local travel restrictions.
04.04	Describe the use of manual and contemporary GPS navigation systems.
04.05	Arrange to secure permits required by the nature of the vehicle, its cargo and route to be traveled.
04.06	Arrange a secure place for vehicle on layovers, especially when transporting hazardous materials.
04.07	Demonstrate map reading skills.
04.08	Estimate travel time and plan rest stops and layovers.
04.09	Estimate fuel consumption and plan fuel stops.
04.10	Estimate expense money and obtain funds and/or credit cards.
05.0	Demonstrate vehicle inspection procedures.-The student will be able to:
05.01	Check for previous days DVIR.
05.02	Check general appearance and condition of vehicle.
05.03	Check fuel, oil, water levels and automatic transmission fluid level and diesel emissions fluid (DEF).
05.04	Check signal lights, stop lights and running lights.
05.05	Check tires, rims and suspension.
05.06	Check horn, windshield wipers, mirrors and reflectors.
05.07	Check fifth wheel, trailer hook-up and brake lines.
05.08	Check emergency bi-directional reflective triangles and fire extinguishers.
05.09	Check instruments for normal readings.
05.10	Check steering system, brake action and tractor protection valve.
05.11	Check cargo-blocking, bracing and tie down.
05.12	Perform enroute inspections.
05.13	Perform post-trip inspection of vehicle and all systems.
06.0	Perform vehicle maintenance and servicing procedures.-The student will be able to:
06.01	Describe function and operation of principle vehicle systems including, engine, engine auxiliary brake, drive train, coupling, suspension and electrical system, DEP engines, and regeneration processes where applicable.
06.02	Check engine fuel, oil, coolant, battery and filters.

06.03	Check tire air pressure.
06.04	Check for proper tire and wheel mounting.
06.05	Drain moisture from air brake supply reservoirs.
06.06	Check brakes and related systems.
06.07	Clean and repair lights.
06.08	Check fuses and reset circuit breakers.
06.09	Clean interior and exterior of vehicle.
06.10	Check mud/rain flaps.
06.11	Check and adjust tandem and fifth-wheel slides, if so equipped.
07.0	Demonstrate basic vehicle control procedures.-The student will:
07.01	Place transmission in neutral before starting engine.
07.02	Start, warm up and shut down the engine, according to the manufacturer's specifications.
07.03	Build full pressure (90-120 PSI) in air tanks or to governed cut-out.
07.04	Test parking brake and service brake before moving/driving vehicle.
07.05	Coordinate use of accelerator and clutch to achieve smooth acceleration and avoid clutch abuse.
07.06	Maintain proper engine RPM while driving.
07.07	Properly modulate air brakes to bring vehicle to a smooth stop.
07.08	Properly shift up and down through all gears using clutch.
07.09	Double clutch non-synchronized transmissions and time shift for smooth and fuel efficient performance.
07.10	Select proper gear for speed and highway conditions.
07.11	Operate manual, automatic and semiautomatic transmissions as available training equipment allows.
07.12	Coordinate steering, braking and acceleration to take the vehicle through a desired path forward and backward in a straight line.
07.13	Adequately judge the path trailer will take (off tracking) as vehicle negotiates left or right curves and turns.
07.14	Use clutch and gears to maintain proper operating range/power/RPM of the motor while slowing the vehicle.
07.15	Park the vehicle, set brakes and shut off the engine.
07.16	Properly chock/block wheels where and when required.
08.0	Demonstrate backing skills and basic vehicle maneuvers.-The student will:
08.01	Check area before and during backing.
08.02	Properly utilize guides and mirrors.

08.03	Properly back in straight line and curved paths.
08.04	Properly back into an alley dock.
08.05	Back 100 feet through an alley.
08.06	Make proper straight in approach during offset backing maneuvers.
08.07	Properly position unit for backing into a loading dock.
08.08	Properly back to a dock. (actual or simulated)
08.09	Properly stop unit within 36 inches of the dock without contacting dock. (actual or simulated)
08.10	Properly Parallel Park.
08.11	Judge side, rear and overhead clearances and path of the trailer.
08.12	Make a straight-in approach to an alley.
08.13	Drive forward through an alley for 100 feet.
09.0	Demonstrate coupling and uncoupling skills.-The student will be able to:
09.01	Reverse-steer and articulate a vehicle.
09.02	Align the tractor properly to connect with trailer.
09.03	Back and secure the tractor properly into the trailer kingpin without damage.
09.04	Perform tug test against the locking mechanisms and visual checks to make sure coupling is secure.
09.05	Connect electrical and air lines properly.
09.06	Set in-cab air brake controls properly.
09.07	Retract and secure landing gear after coupling is secure.
09.08	Properly uncouple and secure the trailer.
10.0	Demonstrate road driving skills.-The student will be able to:
10.01	Carefully enter traffic from parked position.
10.02	Use clutch and gears properly.
10.03	Proceed from a stopped position without rolling backward.
10.04	Use mirrors properly.
10.05	Signal intention to turn well in advance of turn.
10.06	Get into proper lane to turn well in advance of turn.
10.07	Check traffic conditions and turn only when intersection is clear.
10.08	Restrict traffic from passing on right when preparing to complete a right hand turn. Maintain 3 feet or less on right side of vehicle.

10.09	Execute a right hand turn maintaining 3 feet or less on right side of vehicle.
10.10	Complete a turn promptly and safely and not impede other traffic.
10.11	Select and shift to proper gear prior to beginning any turn.
10.12	Obey all traffic signals.
10.13	Plan stop in advance and adjust speed correctly.
10.14	Use brakes properly on grades.
10.15	Plan stops far enough in advance to avoid hard braking.
10.16	Stop clear of crosswalks.
10.17	Come to a complete stop at all stop signs.
10.18	Yield right of way at intersections having yield signs.
10.19	Check for cross traffic regardless of traffic signals.
10.20	Approach all intersections prepared to stop if necessary.
10.21	Stop a minimum of 15 feet but not more than 50 feet before railroad grade crossing if stop is necessary.
10.22	Select proper gear to avoid shifting gears on railroad grade crossing.
10.23	Determine sufficient space required for passing.
10.24	Pass only in safe locations.
10.25	Pass on two-lane highway.
10.26	Pass on four or more lane highway.
10.27	Signal lane changes before and after passing.
10.28	Pass only when appropriate to avoid impeding other traffic.
10.29	Return to right lane promptly, but only when safe to do so.
10.30	Observe speed limits.
10.31	Adjust speed properly to road, weather and traffic conditions.
10.32	Slowdown in advance of curves, danger zones and intersections.
10.33	Maintain consistent speed where possible.
10.34	Yield right of way.
10.35	Allow faster traffic to pass.
10.36	Understand or demonstrate the proper procedures for navigating a weigh station.
10.37	Use horn only when necessary.

10.38	Park only in legally permissible parking areas.
10.39	Check instruments at regular intervals.
10.40	Maintain proper engine RPM while driving.
10.41	Determine minimum front-to-rear distances when following other vehicles using industry recognized standards.
11.0	Demonstrate hazardous driving skills.-The student will be able to:
11.01	Understand preparation for operation in cold weather.
11.02	Demonstrate proper procedure for expelling moisture from the air tanks after each trip.
11.03	Understand proper procedure for checking ice accumulation on brakes, slack adjuster, air hoses, electrical wiring and radiator shutters during operation.
11.04	Perform operational adjustments necessary to maintain control in all weather conditions, including speed selection, braking and following distance.
11.05	Describe procedures to check safe operation of brakes after driving through deep water.
11.06	Perform proper use of windshield wipers, washers and defrosters to maintain visibility.
11.07	Observe and evaluate changing road surface conditions.
11.08	Demonstrate or understand ability for recognizing conditions that produce low traction, including initial rainfall, ice, snow and mud.
11.09	Describe and understand procedures to avoid skidding and jackknifing.
11.10	Understand procedures to avoid hydroplaning and describe the road and vehicle conditions that produce it.
11.11	Understand procedures for mounting and dismounting tire chains.
11.12	Understand procedures for extricating the vehicle from snow, sand and mud by maneuvering or towing.
11.13	Demonstrate ability to adjust rate of change in speed and direction to accommodate road conditions to avoid skidding.
11.14	Describe procedures required to coordinate acceleration and shifting to overcome the resistance of snow, sand and mud.
11.15	Demonstrate ability to perform brake checks on equipment prior to mountain driving.
11.16	Understand procedures required to use right lane or special truck lane going up grades.
11.17	Understand procedures required to place transmission in appropriate gear for engine braking before starting downgrade.
11.18	Understand procedures required to use proper braking techniques and maintain proper engine braking before starting downgrades.
11.19	Understand proper use of truck escape ramp when brakes fail on a downgrade.
11.20	Understand procedure required for observing temperature gauge frequently when pulling heavy loads up long grades.
11.21	Understand the effect of vehicle weight and speed upon braking and shifting ability on long downgrades.
11.22	Identify the meaning and use of percent of grade signs.
11.23	Understand bringing the truck to a stop in the shortest possible distance while maintaining directional control on a dry surface.

11.24	Understand procedures to make an evasive turn off the roadway and return to the roadway while maintaining directional control.
11.25	Understand procedures to bring the vehicle to a stop in the event of a brake failure.
11.26	Understand procedures to maintain control of the vehicle in the event of a blowout.
11.27	Understand procedures to bring truck to a stop in the shortest possible distance while maintaining directional control when operating on a slippery surface.
11.28	Understand procedures to recover from vehicle skids induced by snow, ice, water, oil, sand, wet leaves or other slippery surfaces.
11.29	Understand procedures to counter steer out of a skid in a way that will regain directional control and not produce another skid.
11.30	Understand procedure to operate brakes properly to provide maximum braking without loss of control.
12.0	Apply concepts learned for obtaining a Commercial Driver's License (CDL).-The student will be able to:
12.01	Demonstrate competence in performing basic Commercial Vehicle Driving skills utilizing the CDL testing criteria.
12.02	Demonstrate understanding and knowledge of Commercial Vehicle Driving Laws as required, to safely and legally operate a commercial vehicle.

Additional Information

Laboratory Activities

Laboratory investigations that include scientific inquiry, research, measurement, problem solving, emerging technologies, tools and equipment, as well as, experimental, quality, and safety procedures are an integral part of this career and technical program/course. Laboratory investigations benefit all students by developing an understanding of the complexity and ambiguity of empirical work, as well as the skills required to manage, operate, calibrate and troubleshoot equipment/tools used to make observations. Students understand measurement error; and have the skills to aggregate, interpret, and present the resulting data. Equipment and supplies should be provided to enhance hands-on experiences for students.

Special Notes

Students entering this program must exhibit a safe driving record, be at least 18 years of age and comply with State and Federal licensing requirements as outlined by the Federal Motor Carrier Safety Administration (FMCSA). Instruction will include 1000 miles of road driving under the supervision of a qualified commercial vehicle driver prior to completion of the program. Road driving activities will include experience on two-lane, four-lane, interstate, and city streets and highways. Twenty percent or more of the experience will occur at night on both wet and/or dry roads. Instruction in driving bob-tail, empty and loaded vehicles will be given. All students with a Commercial Learners Permit (CLP) must be accompanied by an instructor.

Recommended student to instructor ratios:

Classroom – 12 to 1

Lab – Variable

Range – 6 to 1

Road Instruction – 4 to 1 per vehicle

MyCareerShines is an interactive resource to assist students in identifying their ideal career and to enhance preparation for employment. Teachers are encouraged to integrate this resource into the program curriculum to meet the employability goals for each student.

Career and Technical Student Organization (CTSO)

SkillsUSA is the intercurricular career and technical student organization(s) providing leadership training and reinforcing specific career and technical skills. Career and Technical Student Organizations provide activities for students as an integral part of the instruction offered. The activities of such organizations are defined as part of the curriculum in accordance with Rule 6A-6.065, F.A.C.

Cooperative Training – OJT

On-the-job training is appropriate but not required for this program. Whenever offered, the rules, guidelines, and requirements specified in the OJT framework apply.

Accommodations

Federal and state legislation requires the provision of accommodations for students with disabilities to meet individual needs and ensure equal access. Postsecondary students with disabilities must self-identify, present documentation, request accommodations if needed, and develop a plan with their counselor and/or instructors. Accommodations received in postsecondary education may differ from those received in secondary education. Accommodations change the way the student is instructed. Students with disabilities may need accommodations in such areas as instructional methods and materials, assignments and assessments, time demands and schedules, learning environment, assistive technology and special communication systems. Documentation of the accommodations requested and provided should be maintained in a confidential file.

Note: postsecondary curriculum and regulated secondary programs cannot be modified.

Florida Department of Education
Curriculum Framework

Program Title: Commercial Class “B” Driving
Program Type: Career Preparatory
Career Cluster: Transportation, Distribution and Logistics

Career Certificate Program – Career Preparatory

Program Number	I490251
CIP Number	0649020502
Grade Level	30, 31
Standard Length	150 hours
Teacher Certification	Refer to the Program Structure section
CTSO	SkillsUSA
SOC Codes (all applicable)	53-3033 – Light Truck or Delivery Service Drivers
Basic Skills Level	N/A

Purpose

This program offers a sequence of courses that provides coherent and rigorous content aligned with challenging academic standards and relevant technical knowledge and skills needed to prepare for further education and careers in the Transportation, Distribution and Logistics career cluster; provides technical skill proficiency, and includes competency-based applied learning that contributes to the academic knowledge, higher-order reasoning and problem-solving skills, work attitudes, general employability skills, technical skills, and occupation-specific skills, and knowledge of all aspects of the Transportation, Distribution and Logistics career cluster.

The purpose of this program is to prepare students for a Class “B” Commercial Driver License.

This program focuses on broad, transferable skills and stresses understanding and demonstration of the following elements of the Commercial Vehicle Driving industry; planning, management, labor issues, community issues and health, safety, and environmental issues. The content includes but is not limited to the following: Loading and unloading cargo; reporting delays or accidents on the road; verifying load against shipping papers; and keeping records.

Additional Information relevant to this Career and Technical Education (CTE) program is provided at the end of this document.

Program Structure

This program is a planned sequence of instruction consisting of one occupational completion point.

This program is comprised of courses which have been assigned course numbers in the SCNS (Statewide Course Numbering System) in accordance with Section 1007.24 (1), F.S. Career and Technical credit shall be awarded to the student on a transcript in accordance with Section 1001.44(3)(b), F.S.

To teach the course(s) listed below, instructors must hold at least one of the teacher certifications indicated for that course.

The following table illustrates the postsecondary program structure:

OCP	Course Number	Course Title	Teacher Certification	Length	SOC Code
A	TRA0084	Truck Driver Heavy Florida Class "B"	COMM DRIV @7 7G	150 hours	53-3033

Common Career Technical Core – Career Ready Practices

Career Ready Practices describe the career-ready skills that educators should seek to develop in their students. These practices are not exclusive to a Career Pathway, program of study, discipline or level of education. Career Ready Practices should be taught and reinforced in all career exploration and preparation programs with increasingly higher levels of complexity and expectation as a student advances through a program of study.

1. Act as a responsible and contributing citizen and employee.
2. Apply appropriate academic and technical skills.
3. Attend to personal health and financial well-being.
4. Communicate clearly, effectively and with reason.
5. Consider the environmental, social and economic impacts of decisions.
6. Demonstrate creativity and innovation.
7. Employ valid and reliable research strategies.
8. Utilize critical thinking to make sense of problems and persevere in solving them.
9. Model integrity, ethical leadership and effective management.
10. Plan education and career path aligned to personal goals.
11. Use technology to enhance productivity.
12. Work productively in teams while using cultural/global competence.

Standards

After successfully completing this program, the student will be able to perform the following:

- 01.0 Understand vehicle safety and accident prevention procedures.
- 02.0 Understand and comply with vehicle operating regulations.
- 03.0 Demonstrate proper cargo handling and documentation procedures.
- 04.0 Demonstrate trip planning preparation procedures.
- 05.0 Demonstrate vehicle inspection procedures.
- 06.0 Perform vehicle maintenance and servicing procedures.
- 07.0 Demonstrate basic vehicle control procedures.
- 08.0 Demonstrate backing skills and basic vehicle maneuvers.
- 09.0 Demonstrate road driving skills.
- 10.0 Demonstrate hazardous driving skills.
- 11.0 Apply concepts learned for obtaining a Commercial Driver's License (CDL).

Florida Department of Education
Student Performance Standards

Program Title: Commercial Class “B” Driving
Career Certificate Program Number: I490251

Course Number: TRA0084
Occupational Completion Point: A
Truck Driver Heavy Florida Class “B” – 150 Hours – SOC Code 53-3033

Course Description:

The Truck Driver Heavy Florida Class "B" course prepares students for entry into the trucking and logistics industry. Students explore career opportunities and requirements of a professional class "B" truck driver. Students study vehicle safety, accident prevention, operating regulations, cargo handling, documentation procedures, pre-trip preparation, vehicle inspection, maintenance, service, control procedures, backing, maneuvering, road and hazardous driving skills, and licensing requirements.

CTE Standards and Benchmarks	
01.0	Understand vehicle safety and accident prevention procedures.-The student will be able to:
01.01	Understand, identify and explain the use of vehicle safety equipment.
01.02	Understand the use of fire extinguishers.
01.03	Utilize seat belts and personal protection gear appropriate to type of operation.
01.04	Describe safe lifting procedures.
01.05	Describe personal safety equipment and procedures.
01.06	Describe actions applicable for vehicle accidents.
01.07	Complete reports in a classroom activity.
01.08	Understand accident reporting requirements (company, state, federal).
01.09	Identify all information needed for accident reports to the State, the employer and the insurance company.
01.10	Complete an accident report.
01.11	Describe procedures for protecting the scene of an accident.
01.12	Describe personal liability requirements.
01.13	Identify hazardous road conditions that are a potential threat to the safety of the truck driver.
01.14	Describe activities and characteristics of other road users that make them potentially dangerous.

01.15	Describe the potential consequences of excessive speed.
01.16	Describe the potential consequences of use of drugs or alcohol.
01.17	Describe and demonstrate safety procedures for entering and exiting vehicles.
02.0	Understand and comply with vehicle operating regulations.-The student will be able to:
02.01	Understand and comply with Hours of Service regulations.
02.02	Maintain a complete, neat and accurate driver's duty status log including discussion of electronic logs.
02.03	Keep accurate records required by hours of service regulations.
02.04	Perform mathematical calculations necessary to recap and apply totals to the hours of service regulations.
02.05	Determine driving hours remaining on a particular day or tour of duty.
02.06	Understand and comply with applicable United States Department of Transportation regulations including Federal Motor Carrier Safety Administration rules and regulations - Compliance, Safety, and Accountability (CSA) particularly the role of drivers and motor carriers.
02.07	Understand and comply with Federal, State and local traffic laws including restrictions on vehicle size and weight including permits when required.
03.0	Demonstrate proper cargo handling and documentation procedures.-The student will be able to:
03.01	Understand how to load and unload cargo safely and efficiently.
03.02	Understand legal gross weight and axle weight.
03.03	Describe cargo load to meet legal weight and safety requirements.
03.04	Understand how to secure cargo using blocking, bracing, packing, rope, cable, chains and strapping.
03.05	Identify types of hazardous cargoes.
03.06	Understand the placement of placards when carrying hazardous materials.
03.07	Understand procedure for use of common cargo handling equipment, including pallets, jacks, dollies, handtrucks, nets, slings, poles and other equipment.
03.08	Understand categories of hazardous materials and the need for specialized training to handle hazardous materials.
03.09	Understand hazardous materials documentation requirements.
03.10	Verify nature, amount and condition of cargo on both pickup and delivery.
03.11	Verify information on bill of lading and properly record and report discrepancies and damage to the cargo.
03.12	Verify appropriate signatures on delivery receipts and other required forms.
03.13	Prepare a bill of lading/manifest.
03.14	Verify door seal number against shipping document.

03.15	Describe the handling of C.O.D. shipments.
03.16	Comply with inspection station procedures.
04.0	Demonstrate trip planning preparation procedures.-The student will be able to:
04.01	Check vehicle registration and permit.
04.02	Check accident report packets for proper contents.
04.03	Plan a route from one point to another that is optimal in terms of travel time, fuel costs, potential hazards and federal, state and local travel restrictions.
04.04	Describe the use of manual and contemporary GPS navigation systems.
04.05	Arrange a secure place for vehicle on layovers, especially when transporting hazardous materials.
04.06	Demonstrate map reading skills.
04.07	Estimate travel time and plan rest stops and layovers.
04.08	Estimate fuel consumption and plan fuel stops.
04.09	Estimate expense money and obtain funds and/or credit cards.
05.0	Demonstrate vehicle inspection procedures.-The student will be able to:
05.01	Check for previous days DVIR.
05.02	Check general appearance and condition of vehicle.
05.03	Check fuel, oil, water levels, automatic transmission fluid level and diesel emissions fluid (DEF).
05.04	Check signal lights, stoplights and running lights.
05.05	Check tires, rims and suspension.
05.06	Check horn, windshield wipers, mirrors and reflectors.
05.07	Check emergency bi-directional reflective triangles and fire extinguishers.
05.08	Check instruments for normal readings.
05.09	Check steering system, brake action and tractor protection valve.
05.10	Check cargo blocking, bracing and tie down.
05.11	Perform enroute inspections.
05.12	Perform post-trip inspection of vehicle and all systems.
06.0	Perform vehicle maintenance and servicing procedures.-The student will be able to:
06.01	Describe function and operation of principle vehicle systems including, engine, engine auxiliary brake, drive train, coupling, suspension and electrical system, DEP engines, and regeneration processes where applicable.

06.02	Check engine fuel, oil, coolant, battery and filters.
06.03	Check tire air pressure.
06.04	Check for proper tire and wheel mounting.
06.05	Drain moisture from air brake supply reservoirs.
06.06	Check brakes and related systems.
06.07	Clean and repair lights.
06.08	Check fuses and reset circuit breakers.
06.09	Clean interior and exterior of vehicle.
06.10	Check mud/rain flaps.
07.0	Demonstrate basic vehicle control procedures.-The student will be able to:
07.01	Place transmission in neutral before starting engine.
07.02	Start, warm up and shut down the engine, according to the manufacturer's specifications.
07.03	Build full pressure (120-140 PSI) in air tanks or to governed cut-out.
07.04	Test parking brake and service brake before moving/driving vehicle.
07.05	Coordinate use of accelerator and clutch to achieve smooth acceleration and avoid clutch abuse.
07.06	Maintain proper engine RPM while driving.
07.07	Properly modulate air brakes to bring vehicle to a smooth stop.
07.08	Properly shift up and down through all gears using clutch.
07.09	Double clutch non-synchronized transmissions and time shift for smooth and fuel efficient performance.
07.10	Select proper gear for speed and highway conditions.
07.11	Operate automatic and semiautomatic transmissions.
07.12	Coordinate steering, braking and acceleration to take the vehicle through a desired path forward and backward in a straight line.
07.13	Use clutch and gears to maintain proper operating range/power/RPM of the motor while slowing the vehicle.
07.14	Park the vehicle, set brakes and shut off the engine.
07.15	Properly chock/block wheels where and when required.
08.0	Demonstrate backing skills and basic vehicle maneuvers.-The student will:
08.01	Check area before and during backing.
08.02	Properly utilize guides and mirrors.

08.03	Properly back in straight line and curved paths.
08.04	Properly back into an alley dock.
08.05	Back 100 feet through an alley.
08.06	Make proper straight in approach during offset backing maneuvers.
08.07	Properly position unit for backing into a loading dock.
08.08	Properly back to a dock. (actual or simulated)
08.09	Properly stop unit within 36 inches of the dock without contacting dock. (actual or simulated)
08.10	Properly Parallel Park.
08.11	Judge side, rear and overhead clearances and path of the trailer.
08.12	Make a straight-in approach to an alley.
08.13	Drive forward through an alley for 100 feet.
09.0	Demonstrate road driving skills.-The student will be able to:
09.01	Carefully enter traffic from parked position.
09.02	Use clutch and gears properly.
09.03	Proceed from a stopped position without rolling backward.
09.04	Use mirrors properly.
09.05	Signal intention to turn well in advance of turn.
09.06	Get into proper lane well in advance of turn.
09.07	Check traffic conditions and turn only when intersection is clear.
09.08	Restrict traffic from passing on right when preparing to complete a right hand turn. Maintain 3 feet or less on right side of vehicle.
09.09	Execute a right hand turn maintaining 3 feet or less on right side of vehicle.
09.10	Complete a turn promptly and safely and not impede other traffic.
09.11	Select and shift to proper gear prior to beginning any turn.
09.12	Obey all traffic signals.
09.13	Plan stop in advance and adjust speed correctly.
09.14	Use brakes properly on grades.
09.15	Plan stops far enough in advance to avoid hard braking.
09.16	Stop clear of crosswalks.

09.17	Come to a complete stop at all stop signs.
09.18	Yield right of way at intersections having yield signs.
09.19	Check for cross traffic regardless of traffic signals.
09.20	Approach all intersections prepared to stop if necessary.
09.21	Stop a minimum of 15 feet but not more than 50 feet before railroad grade crossing if stop is necessary.
09.22	Select proper gear to avoid shifting gears on railroad grade crossing.
09.23	Determine sufficient space required for passing.
09.24	Pass only in safe locations.
09.25	Pass on two-lane highway, only when safe to do so.
09.26	Pass on four or more lane highway.
09.27	Signal lane changes before and after passing.
09.28	Pass only when appropriate to avoid impeding other traffic.
09.29	Return to right lane promptly, but only when safe to do so.
09.30	Observe speed limits.
09.31	Adjust speed properly to road, weather and traffic conditions.
09.32	Slow down in advance of curves, danger zones and intersections.
09.33	Maintain consistent speed where possible.
09.34	Yield right of way.
09.35	Allow faster traffic to pass.
09.36	Understand or demonstrate the proper procedures for navigating a weigh station.
09.37	Use horn only when necessary.
09.38	Park only in legally permissible parking areas.
09.39	Check instruments at regular intervals.
09.40	Maintain proper engine RPM while driving.
09.41	Determine minimum front-to-rear distances when following other vehicles using industry recognized standards.
10.0	Demonstrate hazardous driving skills.-The student will be able to:
10.01	Understand preparation for operation in cold weather.
10.02	Demonstrate proper procedure for expelling moisture from the air tanks after each trip.

10.03	Understand proper procedure for checking ice accumulation on brakes, slack adjuster, air hoses, electrical wiring and radiator shutters during operation.
10.04	Perform operational adjustments necessary to maintain control in all weather conditions, including speed selection, braking and following distance.
10.05	Describe procedures to check safe operation of brakes after driving through deep water.
10.06	Perform proper use of windshield wipers, washers and defrosters to maintain visibility.
10.07	Observe and evaluate changing road surface conditions.
10.08	Demonstrate or understand ability for recognizing conditions that produce low traction, including initial rainfall, ice, snow and mud.
10.09	Describe and understand procedures to avoid skidding.
10.10	Understand procedures to avoid hydroplaning and describe the road and vehicle conditions that produce it.
10.11	Understand procedures for mounting and dismounting tire chains.
10.12	Understand procedures for extricating the vehicle from snow, sand and mud by maneuvering or towing.
10.13	Demonstrate ability to adjust rate of change in speed and direction to accommodate road conditions to avoid skidding.
10.14	Describe procedures required to coordinate acceleration and shifting to overcome the resistance of snow, sand and mud.
10.15	Demonstrate ability to perform brake checks on equipment prior to mountain driving.
10.16	Understand procedures required to use right lane or special truck lane going up grades.
10.17	Understand procedures required to place transmission in appropriate gear for engine braking before starting downgrade.
10.18	Understand procedures required to use proper braking techniques and maintain proper engine braking before starting downgrades.
10.19	Understand proper use of truck escape ramp when brakes fail on a downgrade.
10.20	Understand procedure required for observing temperature gauge frequently when pulling heavy loads up long grades.
10.21	Understand the effect of vehicle weight and speed upon braking and shifting ability on long downgrades.
10.22	Identify the meaning and use of percent of grade signs.
10.23	Understand bringing the truck to a stop in the shortest possible distance while maintaining directional control on a dry surface.
10.24	Understand procedures to make an evasive turn off the roadway and return to the roadway while maintaining directional control.
10.25	Understand procedures to bring the vehicle to a stop in the event of a brake failure.
10.26	Understand procedures to maintain control of the vehicle in the event of a blowout.
10.27	Understand procedures to bring truck to a stop in the shortest possible distance while maintaining directional control when operating on a slippery surface.
10.28	Understand procedures to recover from vehicle skids induced by snow, ice, water, oil, sand, wet leaves or other slippery surfaces.
10.29	Understand procedures to counter-steer out of a skid in a way that will regain directional control and not produce another skid.

10.30	Understand procedure to operate brakes properly to provide maximum braking without loss of control.
11.0	Apply concepts learned for obtaining a Commercial Driver's License (CDL).-The student will be able to:
11.01	Demonstrate competence in performing basic Commercial Vehicle Driving skills utilizing the CDL testing criteria.
11.02	Demonstrate understanding and knowledge of Commercial Vehicle Driving Laws as required, to safely and legally operate a commercial vehicle.

Additional Information

Laboratory Activities

Laboratory investigations that include scientific inquiry, research, measurement, problem solving, emerging technologies, tools and equipment, as well as, experimental, quality, and safety procedures are an integral part of this career and technical program/course. Laboratory investigations benefit all students by developing an understanding of the complexity and ambiguity of empirical work, as well as the skills required to manage, operate, calibrate and troubleshoot equipment/tools used to make observations. Students understand measurement error; and have the skills to aggregate, interpret, and present the resulting data. Equipment and supplies should be provided to enhance hands-on experiences for students.

Special Notes

Students entering this program must exhibit a safe driving record, be at least 18 years of age and comply with State and Federal licensing requirements as outlined by the Federal Motor Carrier Safety Administration (FMCSA). Instruction will include 200 miles of road driving under the supervision of a qualified commercial vehicle driver prior to completion of the program. Road driving activities will include experience on two-lane, four-lane, interstate, and city streets and highways. Twenty percent or more of the experience will occur at night on both wet and/or dry roads. All students with a Commercial Learners Permit (CLP) must be accompanied by an instructor.

Recommended student to instructor ratios:

Classroom – 12 to 1

Lab – Variable

Range – 6 to 1

Road Instruction – 4 to 1 per vehicle

MyCareerShines is an interactive resource to assist students in identifying their ideal career and to enhance preparation for employment. Teachers are encouraged to integrate this resource into the program curriculum to meet the employability goals for each student.

Career and Technical Student Organization (CTSO)

SkillsUSA is the intercurricular career and technical student organization(s) providing leadership training and reinforcing specific career and technical skills. Career and Technical Student Organizations provide activities for students as an integral part of the instruction offered. The activities of such organizations are defined as part of the curriculum in accordance with Rule 6A-6.065, F.A.C.

Cooperative Training – OJT

On-the-job training is appropriate but not required for this program. Whenever offered, the rules, guidelines, and requirements specified in the OJT framework apply.

Accommodations

Federal and state legislation requires the provision of accommodations for students with disabilities to meet individual needs and ensure equal access. Postsecondary students with disabilities must self-identify, present documentation, request accommodations if needed, and develop a plan with their counselor and/or instructors. Accommodations received in postsecondary education may differ from those received in secondary education. Accommodations change the way the student is instructed. Students with disabilities may need accommodations in such areas as instructional methods and materials, assignments and assessments, time demands and schedules, learning environment, assistive technology and special communication systems. Documentation of the accommodations requested and provided should be maintained in a confidential file.

Note: postsecondary curriculum and regulated secondary programs cannot be modified.

Florida Department of Education
Curriculum Framework

Program Title: Global Logistics and Supply Chain Technology
Program Type: Career Preparatory
Career Cluster: Transportation, Distribution and Logistics

Career Certificate Program – Career Preparatory

Program Number	T300100
CIP Number	0652020300
Grade Level	30, 31
Standard Length	600 hours
Teacher Certification	Refer to the Program Structure section
CTSO	SkillsUSA
SOC Codes (all applicable)	11-3071 – Transportation, Storage, and Distribution Managers 43-5071 – Shipping, Receiving, and Traffic Clerks 13-1081 – Logisticians 15-1151 – Computer User Support Specialists
Basic Skills Level	Mathematics: 9 Language: 9 Reading: 9

Purpose

This program offers a sequence of courses that provides coherent and rigorous content aligned with challenging academic standards and relevant technical knowledge and skills needed to prepare for further education and careers in the Transportation, Distribution and Logistics career cluster; provides technical skill proficiency, and includes competency-based applied learning that contributes to the academic knowledge, higher-order reasoning and problem-solving skills, work attitudes, general employability skills, technical skills, and occupation-specific skills, and knowledge of all aspects of the Transportation, Distribution and Logistics career cluster.

The content includes but is not limited to: the global supply chain, the logistics environment, safety principles, quality control principles, work communication practices, teamwork-workplace behavior- and problem solving, supply chain computer systems, supply chain life cycle, product receiving and stocking, product order processing, product shipment, safe operation and use of equipment, inventory control, safe handling of hazardous materials, customs process/free trade, modes of transportation (air, sea, truck, and rail), dispatch operations, routing and tracking operations, and customer relations.

Additional Information relevant to this Career and Technical Education (CTE) program is provided at the end of this document.

Program Structure

This program is a planned sequence of instruction consisting of four occupational completion points.

This program is comprised of courses which have been assigned course numbers in the SCNS (Statewide Course Numbering System) in accordance with Section 1007.24 (1), F.S. Career and Technical credit shall be awarded to the student on a transcript in accordance with Section 1001.44 (3)(b), F.S.

To teach the course(s) listed below, instructors must hold at least one of the teacher certifications indicated for that course.

The following table illustrates the postsecondary program structure:

OCP	Course Number	Course Title	Teacher Certification	Length	SOC Code
A	TRA0180	Packer	BUS ED 1 LOG TECH 7G	150 hours	11-3071
B	TRA0181	Material Handler		150 hours	15-1151
		OR			
B	OTA0040	Information Technology Assistant	OTA0040 Teacher Certifications	150 hours	15-1151
C	TRA0182	Shipping, Receiving and Traffic Clerk	BUS ED 1 LOG TECH 7G	150 hours	43-5071
D	TRA0183	Logistics Technician		150 hours	13-1081

Common Career Technical Core – Career Ready Practices

Career Ready Practices describe the career-ready skills that educators should seek to develop in their students. These practices are not exclusive to a Career Pathway, program of study, discipline or level of education. Career Ready Practices should be taught and reinforced in all career exploration and preparation programs with increasingly higher levels of complexity and expectation as a student advances through a program of study.

1. Act as a responsible and contributing citizen and employee.
2. Apply appropriate academic and technical skills.
3. Attend to personal health and financial well-being.
4. Communicate clearly, effectively and with reason.
5. Consider the environmental, social and economic impacts of decisions.
6. Demonstrate creativity and innovation.
7. Employ valid and reliable research strategies.
8. Utilize critical thinking to make sense of problems and persevere in solving them.
9. Model integrity, ethical leadership and effective management.
10. Plan education and career path aligned to personal goals.
11. Use technology to enhance productivity.
12. Work productively in teams while using cultural/global competence.

Standards

After successfully completing this program, the student will be able to perform the following:

- 01.0 Demonstrate an understanding of global logistics and supply chain
- 02.0 Demonstrate an understanding of transportation systems
- 03.0 Demonstrate professional communication skills
- 04.0 Demonstrate customer service skills

Material Handler (TRA0181)

- 05.0 Demonstrate knowledge and skill of information technology applications related to logistics and supply chain management.
- 06.0 Demonstrate knowledge and skill of common software applications.
- 07.0 Demonstrate knowledge and skill in using technology to enhance the effectiveness of communication skills utilizing word processing applications.
- 08.0 Demonstrate knowledge and skill in using technology to enhance communication skills utilizing presentation applications.
- 09.0 Demonstrate knowledge and skill in using technology to enhance the effectiveness of communication utilizing spreadsheet and database applications.
- 10.0 Demonstrate knowledge and skill in using technology to enhance communication skills utilizing electronic mail.
- 11.0 Demonstrate proficiency using computer networks, internet, and online databases to facilitate collaborative communication.
- 12.0 Develop an awareness of emerging technologies.
- 13.0 Investigate individual assessment and job/career exploration and individual career planning that reflect the transition from school to work, lifelong learning, and personal and professional goals.
- 14.0 Incorporate appropriate leadership and supervision techniques, customer service strategies, and standards of personal ethics to accomplish job objectives and enhance workplace performance.

OR

Information Technology Assistant (OTA0040) – Standards 15.0 – 28.0 are associated with this course.

- 15.0 Demonstrate knowledge, skill, and application of information systems to accomplish job objectives and enhance workplace performance.
- 16.0 Develop an awareness of microprocessors and digital computers.
- 17.0 Demonstrate an understanding of operating systems.
- 18.0 Use technology to enhance the effectiveness of communication skills utilizing word processing applications.
- 19.0 Use technology to enhance communication skills utilizing presentation applications.
- 20.0 Use technology to enhance the effectiveness of communication utilizing spreadsheet and database applications.
- 21.0 Use technology to enhance communication skills utilizing electronic mail.
- 22.0 Investigate individual assessment and job/career exploration and individual career planning that reflect the transition from school to work, lifelong learning, and personal and professional goals.
- 23.0 Incorporate appropriate leadership and supervision techniques, customer service strategies, and standards of personal ethics to accomplish job objectives and enhance workplace performance.
- 24.0 Demonstrate competence using computer networks, internet and online databases to facilitate collaborative or individual learning and communication.
- 25.0 Demonstrate competence in page design applicable to the WWW.

- 26.0 Develop an awareness of emerging technologies.
- 27.0 Develop awareness of computer languages and software applications.
- 28.0 Demonstrate comprehension and communication skills.

- 29.0 Demonstrate an understanding of warehouse operations
- 30.0 Demonstrate an understanding of storage and control operations
- 31.0 Demonstrate an understanding of protection skills
- 32.0 Demonstrate an understanding of economics
- 33.0 Demonstrate an understanding of career readiness
- 34.0 Demonstrate employability skills
- 35.0 Demonstrate competencies in a specific career
- 36.0 Demonstrate career acquisition
- 37.0 Demonstrate career retention
- 38.0 Demonstrate integrated learning and life skills
- 39.0 Demonstrate technology and information

**Florida Department of Education
Student Performance Standards**

Program Title: Global Logistics and Supply Chain Technology
Career Certificate Program Number: T300100

Course Number: TRA0180
Occupational Completion Point: A
Packer – 150 Hours – SOC Code 11-3071

Course Description:

The Packer course prepares students for entry into the logistics and supply chain industry. Students explore career opportunities and requirements of a professional logistician. Content emphasizes beginning skills key to the success of working in the logistics and supply chain industry. Students study and gain a basic understanding of global logistics and supply chain technology, transportation systems, communication skills, and customer service skills.

CTE Standards and Benchmarks	
01.0	Demonstrate an understanding of global logistics and supply chain.-The student will be able to:
01.01	Discuss the history, career fields, and benefits of the global supply chain industry.
01.02	Describe principal elements of the logistics environment and logistics systems.
01.03	Explore career pathways within global logistics and supply chain.
01.04	Explain ways in which handling of product throughout supply chain logistics affects company's viability and profitability.
01.05	Define basic principles of cost effectiveness throughout supply chain logistics.
01.06	Define basic principles of just-in-time purchasing and inventory control.
01.07	Identify major security requirements applicable to the logistics environment.
01.08	Cite examples of environmental and financial impacts of logistics activities.
01.09	Describe the alignment between the supply chain strategy and business strategy.
01.10	Define basic principles of customs, free trade and international issues in Supply Chain Management, including foreign trade zones and why they exist.
01.11	Describe factors in the marketplace that can impact decision making.
01.12	Identify local chambers of commerce as well as industry professional associations.
02.0	Demonstrate an understanding of transportation systems.-The student will be able to:
02.01	Identify various transportation modes, and what authority (local or national) regulates each one.

CTE Standards and Benchmarks

02.02	Describe and contrast the different modes of transportation and their advantages/disadvantages.
02.03	List the main considerations in determining the best mode.
02.04	Explain how to use the information on performance and costs for mode selection to enhance rapid decision making.
02.05	Give examples of transportation documentation, dispatch, routing and tracking.
02.06	Describe and assess global freight transportation systems.
02.07	Describe the government's involvement in transportation and explain freight transportation laws, regulations, and policies.
02.08	Determine which transportation method is most appropriate for various situations.
03.0	Demonstrate professional communication skills.-The student will be able to:
03.01	Show effective methods for communications between shifts.
03.02	Identify effective communications to both internal and external customers.
03.03	Identify ways to elicit clear statements of customer requirements and specifications.
03.04	Provide examples of effective written communications in logistics/supply chain workplace.
03.05	Provide examples of effective oral communications in logistics/supply chain workplace.
03.06	Demonstrate an understanding of teamwork and good professional workplace behavior to solve problems.
03.07	Describe a high-performance team.
03.08	List characteristics of an effective team member.
03.09	Explain ways to set team goals.
03.10	Identify use of team environment to solve problems and resolve conflicts.
03.11	Describe typical requirements for good workplace conduct.
03.12	Demonstrate understanding of social media platforms.
03.13	Read and comprehend technical and non-technical reading assignments related to course content, including, books, magazines and electronic sources.
03.14	Use listening, speaking, telecommunication and nonverbal skills and strategies to communicate effectively with supervisors, co-workers, and customers.
03.15	Apply the writing process to the creation of appropriate documents following designated business formats. (e.g., note taking, research, MLA/APA)
03.16	Demonstrate an awareness of project management concepts and tools. (e.g., timelines, deadlines, resource allocation, time management, delegation of tasks, collaboration)
04.0	Demonstrate customer service skills.-The student will be able to:

CTE Standards and Benchmarks

04.01	Exhibit acceptable workplace dress or attire, including safety clothing requirements where applicable.
04.02	Exhibit punctuality, initiative, courtesy, loyalty, and honesty.
04.03	Use a personality inventory for personal improvement.
04.04	Exhibit the ability to get along with others.
04.05	Discuss the importance of human relations.
04.06	Develop and demonstrate the unique human relations skills needed for successful entry and progress in the customer service occupations or marketing occupations selected as a career objective.
04.07	Differentiate between an acceptable and an unacceptable code of business ethical conduct.
04.08	Compare and contrast various international business customs.

**Florida Department of Education
Student Performance Standards**

Course Number: TRA0181
Occupational Completion Point: B
Material Handler – 150 Hours – SOC Code 11-3071

Course Description:

The Material Handler course is designed to build on the skills and knowledge students learned in the Packer course for entry into the logistics and supply chain industry. Students explore career opportunities and requirements of a professional logistician. Content emphasizes knowledge and skills of information technology applications, common software applications, word processing, presentation, spreadsheet, and database applications. Additionally, content knowledge and skills related to electronic communication methods, understanding computer networking, awareness of emerging technologies, college and career readiness, and appropriate leadership techniques.

CTE Standards and Benchmarks	
05.0	Demonstrate knowledge and skill of information technology applications related to logistics and supply chain management.-The student will be able to:
05.01	Describe the impact of technology on society.
05.02	Develop keyboarding skills to enter and manipulate text and data.
05.03	Explain main uses of computer systems by front-line workers.
05.04	Identify technologies used to capture and store logistics information.
05.05	Explain the concepts and use of various information technologies in logistics.
05.06	Research, describe, access, and evaluate Internet-based business models.
05.07	Describe and use current and emerging computer technologies and software to perform business tasks.
05.08	Identify and describe types of file systems and classify common file extensions based on software application programs.
05.09	Use reference materials. (e.g. on-line help, tutorials, manuals, vendor bulletin boards)
05.10	Demonstrate basic computer file management skills and file naming conventions to accurately organize files into hierarchies by labeling file folders for easy accessibility.
05.11	Describe and understand the general architecture of a microcomputer system.
05.12	Discuss the process of troubleshooting problems with computer hardware, input and output devices.
05.13	Differentiate between diagnosing and troubleshooting.
05.14	Explain the need for and use of peripherals.

CTE Standards and Benchmarks

05.15	Describe ethical issues and problems associated with computers and information systems, including federal laws against anti-piracy with computers and PC software security protection.
05.16	Demonstrate proficiency with file management and structure. (e.g., folder creation file creation, backup copy, delete, open, save)
05.17	Compare and contrast various computer operating systems.
05.18	Select and apply an information technology application for procurement, acquisition, logistics, and supply chain management.
06.0	Demonstrate knowledge and skill of common software applications.-The student will be able to:
06.01	Compare and contrast the appropriate use of various software applications. (e.g., word processing, desktop publishing, graphics design, web browser, e-mail, presentation, database, scheduling, financial management, Java applet, music)
06.02	Demonstrate the use of various software applications. (e.g., word processing, desktop publishing, graphics design, web browser, e-mail, presentation, database, scheduling, financial management, Java applet, music)
07.0	Demonstrate knowledge and skill in using technology to enhance the effectiveness of communication skills utilizing word processing applications.-The student will be able to:
07.01	Select and use word processing software and accompanying features to enhance written business communications.
07.02	Share and maintain documents by applying different views and protection to a document and manage document versions.
07.03	Share and save a document and apply a template. (e.g., pdf, html, blog, hyperlinks)
07.04	Format content to a document by applying font, paragraph attributes, indent and tab settings to text and paragraphs.
07.05	Apply spacing settings to text and paragraphs.
07.06	Navigate and search through a document, create and manipulate tables.
07.07	Apply page layout and reusable content by editing and manipulating page setup settings and applying themes.
07.08	Create and manipulate page backgrounds, headers and footers.
07.09	Use image design theory and software to create illustrations, shapes, and graphics and include a selection in a document.
07.10	Insert and format graphic images.
07.11	Apply and manipulate text boxes.
07.12	Proofread documents by validating content through the use of spell and grammar check.
07.13	Configure autocorrect settings, insert and modify comments in a document.
07.14	Apply references and hyperlinks, create end and footnotes, and create a table of contents in a document.
07.15	Perform various mail merge options, macros and tracking revisions
08.0	Demonstrate knowledge and skill in using technology to enhance communication skills utilizing presentation applications.-The student will be able to:
08.01	Manage and configure the presentation software environment, including: adjusting views, manipulating window, configuring toolbar and file options.

CTE Standards and Benchmarks

08.02	Create slide presentations utilizing various project development elements, including: adding and removing slides, slide layouts, format slide design, insert or format placeholders.
08.03	Locate, create and incorporate graphical and multimedia elements, including: shapes, graphics, images, bullets, hyperlinks, video, and audio into a slide presentation appropriate for the project.
08.04	Explore and apply design and color theory to create dynamic and appealing visuals.
08.05	Create and manipulate graphical and multimedia elements to improve or develop new contacts appropriate for the project, including: creation of images, color selections, tone, hue and contrast.
08.06	Demonstrate various business-related elements that can be created, embedded and manipulated in a slide presentation, including: charts, graphs, tables, spreadsheets, flowcharts, and organizational charts.
08.07	Apply slide transitions and create custom animations to slide presentations appropriate for the target audience.
08.08	Demonstrate different delivery methods for slide presentations, including: packaging for CD delivery, video projection – on mouse click, rehearsed timings, printing options - outlines, handouts, slides and notes.
09.0	Demonstrate knowledge and skill in using technology to enhance the effectiveness of communication utilizing spreadsheet and database applications.-The student will be able to:
09.01	Manage the worksheet environment by navigating through and printing a worksheet.
09.02	Personalize the environment by manipulating the ribbon tabs, group settings, importing data/database, manipulating properties, files and folders.
09.03	Create cell data, apply auto fill and hyperlinks.
09.04	Format cells and worksheets by applying cell formats, merging and splitting cells, create row and column titles, hide and unhide column titles, rows and columns.
09.05	Manipulate page set up options.
09.06	Create and apply cell styles.
09.07	Manage worksheets and workbooks by creating and formatting worksheets and manipulating views/themes.
09.08	Apply formulas and functions by creating formulas, enforcing precedence and cell formula references.
09.09	Apply conditional formula logic, name and cell ranges.
09.10	Demonstrate data visually by creating and modifying charts and images. (e.g., pivot tables)
09.11	Share worksheet data through email, changing file type and different versions. (e.g., mail merge)
09.12	Analyze and organize data through filters, sorting and applying conditional formatting. (e.g., macros)
09.13	Create different forms for inputting data into a database application.
09.14	Interpret queries for specialized reports using a database application.
09.15	Interpret data on line graphs, pie charts, diagrams, and tables commonly used in spreadsheet software applications that incorporate industry data.
10.0	Demonstrate knowledge and skill in using technology to enhance communication skills utilizing electronic mail.-The student will be able to:

CTE Standards and Benchmarks

10.01	Describe and perform e-mail capabilities and functions.
10.02	Create and send messages, manage signature and automated messages.
10.03	Save, send, schedule, and manage junk mail, e-mail and spam.
10.04	Configure message sensitivity, security and delivery options.
10.05	Use the Internet to perform e-mail activities, including: attaching external files, saving e-mail attachments, viewing mailbox details, establishing appointments, creating contact groups, and sending a meeting to a contact group to communicate in the workplace.
10.06	Manage tasks and organize information. (e.g., forward e-mail)
11.0	Demonstrate proficiency using computer networks, internet, and online databases to facilitate collaborative communication.-The student will be able to:
11.01	Demonstrate how to connect to the Internet and use appropriate Internet protocol.
11.02	Identify and describe web terminology, addresses and how browsers work.
11.03	Demonstrate proficiency using basic features of GUI browsers, including: bookmarks, basic configurations, e-mail configurations, and address books.
11.04	Describe appropriate browser security configurations.
11.05	Describe information technology terminology, including Internet, intranet, ethics, copyright laws, and regulatory control.
11.06	Demonstrate proficiency using search engines and search tools.
11.07	Use various web tools, including: downloading files, transfer of files, telnet, PDF, plug-ins, cloud-based storage, and data compression.
11.08	Identify and use Boolean search strategies.
11.09	Understand and apply level one Universal Resource Locator (URL) and associated protocols (e.g., .com, .org, .edu, .gov, .net, etc.)
11.10	Explain the need for web-based applications. (dangers of piracy, copyright, plagiarism)
11.11	Describe appropriate use of social networking sites and applications, blogs and collaborative tools for file sharing.
11.12	Describe web applications, including sharing photos and video clips, messaging, chatting and collaborating.
12.0	Develop an awareness of emerging technologies.-The student will be able to:
12.01	Compare and contrast emerging technologies and describe how they impact business in the global marketplace. (e.g., wireless, wireless web, cell phones, portables/handhelds, smart appliances, home networks, peer-to-peer, robotics, unmanned aerial systems, etc.)
13.0	Investigate individual assessment and job/career exploration and individual career planning that reflect the transition from school to work, lifelong learning, and personal and professional goals.-The student will be able to:
13.01	Analyze personal skills and aptitudes in comparison with various business related job and career options.
13.02	Use career resources to develop an information base that reflects local and global business related occupations and opportunities for continuing education and workplace experience.

CTE Standards and Benchmarks

13.03	Demonstrate job-seeking skills required for entry-level employment. (e.g., resume, cover letter, thank you letter, online/hard copy application, company research, mock interview, and follow-up call)
13.04	Design, initiate, refine and implement a plan to facilitate growth and skill development related to anticipated job requirements and career expectations.
13.05	Demonstrate an awareness of specific job requirements and career paths (e.g., requirements, characteristics needed) in business environments.
13.06	Demonstrate an awareness of the potential impact of local and global trends on career plans and life goals.
13.07	Describe the importance of building community and mentor relationships in a variety of professional and workplace situations.
13.08	Simulate work-based projects in an information technology environment.
14.0	Incorporate appropriate leadership and supervision techniques, customer service strategies, and standards of personal ethics to accomplish job objectives and enhance workplace performance.-The student will be able to:
14.01	Demonstrate awareness of the following workplace essentials: Quality customer service; business ethics; confidentiality of information; copyright violations; accepted workplace rules, regulations, policies, procedures, processes, and workplace safety, and appropriate attire and grooming.
14.02	Demonstrate ways of accepting constructive criticism on team projects within the workplace.
14.03	Apply appropriate strategies to manage and resolve conflicts in work situations.
14.04	Demonstrate human relations, personal and interpersonal skills appropriate for the workplace, including: responsibility, dependability, punctuality, integrity, positive attitude, initiative, respect for self and others, and professional dress.
14.05	Demonstrate awareness of international business cultures.

**Florida Department of Education
Student Performance Standards**

Course Number: OTA0040
Occupational Completion Point: B
Information Technology Assistant – 150 Hours – SOC Code 15-1151

Course Description:

This course is designed to provide a basic overview of current business and information systems and trends, and to introduce students to fundamental skills required for today's business and academic environments. Emphasis is placed on developing fundamental computer skills. The intention of this course is to prepare students to be successful both personally and professionally in an information based society. Digital Information Technology includes the exploration and use of: databases, the internet, spreadsheets, presentation applications, management of personal information and email, word processing and document manipulation, HTML, web page design, and the integration of these programs using software that meets industry standards. After successful completion of this course, students will have met Occupational Completion Point B, Information Technology Assistant - SOC Code 15-1151.

Information Technology Assistant (OTA0040) is part of several programs across various CTE career clusters. To ensure consistency, the standards and benchmarks for this course (15.0 – 28.0) have been placed in a separate document.

**Florida Department of Education
Student Performance Standards**

Course Number: TRA0182
Occupational Completion Point: C
Shipping, Receiving and Traffic Clerk – 150 Hours – SOC Code 43-5071

Course Description:

The Shipping, Receiving and Traffic Clerk course is designed to build on the skills and knowledge students learned in the Packer and the Materials Handler courses for entry into the logistics and supply chain industry. Students explore career opportunities and requirements of a professional logistician. Content emphasizes an understanding of warehouse operations, storage and control operations, protection, and economics.

CTE Standards and Benchmarks	
29.0	Demonstrate an understanding of warehouse operations.-The student will be able to:
29.01	Identify and discuss the characteristics, purpose and importance of warehouse operations and supply chain management.
29.02	Define material handling logistics as it applies to the warehousing function.
29.03	Describe procedures for using computerized warehouse data.
29.04	Define movement in a warehouse and explain the concept of movement and the vital role that efficient movement of materials plays in the total functionality of the warehouse.
29.05	Define movement in a warehouse and identify the various locations within the warehouse where planned efficient movement of materials takes place.
29.06	Explain channels of distribution.
29.07	Discuss safety regulatory requirements and procedures.
29.08	Explain the importance of storage in a warehouse.
29.09	Define control as it applies to warehousing.
29.10	Explain the relationship between physical structure and protection.
29.11	Identify various types of equipment available to enhance the efficient movement of materials within a warehouse.
29.12	Identify the various types of loading docks and cross docking.
29.13	Define the term "peaks and valleys" as it applies to warehouse activity.
29.14	Explain the importance of staging and JIT.
29.15	Identify the primary types of hand-operated pieces of warehouse equipment.
29.16	Identify the important characteristics of industrial trucks.

CTE Standards and Benchmarks

29.17	Explain the concept of "balancing" as it applies to counterbalanced lift trucks.
29.18	Define the term narrow aisle as it applies to fork trucks.
29.19	Identify warehouse documents (e.g., pick tickets, special orders, inventory forms).
29.20	Display and interpret inventory screens, receive, inspect, and stock inventory.
30.0	Demonstrate an understanding of storage and control operations.-The student will be able to:
30.01	Explain the concepts involved in determining the best method for storage and the equipment needed to facilitate a cost effective and efficient warehouse.
30.02	Identify the factors that are involved with the calculating and estimating of the storage area needed for retention of materials in a warehouse.
30.03	Identify the possibilities and combinations of systems and equipment that can be used for storage areas in a warehouse.
30.04	Define the following storage related terms: Size, Volume, Density, Pallet, and Case.
30.05	Define the terms packaging, SKU, stacking frame, term "Logistics Execution Systems" (LES), signage and signposting, "real time" and barcoding.
30.06	Explain how the volume of materials, space usage, and control affect the design of storage space in a warehouse design.
30.07	Explain various inventory control methods and their importance.
30.08	Identify and analyze various warehouse storage systems.
30.09	Identify the two key issues in planning block stacking.
30.10	Identify the basic configuration for pallet rack.
30.11	Explain the concept of control in the broadest possible context and the importance of keeping track of materials and goods.
30.12	Identify the various types of technologies developed over the years to keep track of goods within the warehouse.
30.13	Identify various labeling and packaging schemes available for securing and tracking the movement of items through a warehouse.
30.14	Define the components of an LES.
30.15	Explain the importance of addresses in signage.
30.16	Define information-filled labeling.
30.17	Identify key magnetic devices used in automatic data capture.
30.18	Define radio frequency identification (RFID).
30.19	Explain the importance of automation in warehousing.
30.20	Identify the value of emerging technologies related to warehouse operations.
31.0	Demonstrate an understanding of protection skills.-The student will be able to:

CTE Standards and Benchmarks

31.01	Identify the role that protection plays in the total concept of "warehousing".
31.02	Identify the various forms of unit load formation equipment that is used for protecting materials.
31.03	Identify the types of load containment materials which include the machinery that dispenses them.
31.04	Situations where they are most advantageously used.
31.05	Explain the following: the need and means for protecting warehouse personnel and materials as they go about their duties.
31.06	Identify the advantages and disadvantages of open-air or soft-wall warehousing for protection of warehoused items.
31.07	Compliance issues.
32.0	Demonstrate economics.-The student will be able to:
32.01	Demonstrate understanding of goals, resources and structure of an organization.
32.02	Understand the concepts and contributions of entrepreneurship.
32.03	Compare and contrast the advantages and disadvantages of the various forms of business ownership.
32.04	Understand economic principles affecting business cycles and the workforce.
32.05	Analyze possible solutions to specific business problems.
32.06	Apply economic decisions related to personal financial affairs, the successful operation of organizations and within a global economy.
32.07	Understand the role of a consumer, producer, saver and investor in the market system.
32.08	Understand the concepts and laws pertaining to customs and free trade.

**Florida Department of Education
Student Performance Standards**

Course Number: TRA0183
Occupational Completion Point: D
Logistics Technician – 150 Hours – SOC Code 13-1081

Course Description:

The Logistics Technician course is designed to build on the skills and knowledge students learned in the Packer, Materials Handler, and Shipping, Receiving and Traffic Clerk courses for entry into the logistics and supply chain industry. Students explore career opportunities and requirements of a professional logistician. Content emphasizes knowledge, skills, and understanding of college and career readiness, employability skills, career acquisition and retention, life skills, and technological literacy.

CTE Standards and Benchmarks	
33.0	Demonstrate an understanding of career readiness.-The student will be able to:
33.01	Explain the importance of life-long learning.
33.02	Evaluate/research occupational interests.
33.03	Demonstrate attitudes/ethics needed for career success.
33.04	Assess personal strengths, talents, values and interests to appropriate jobs and careers to maximize career potential.
33.05	Use a variety of research tools (e.g., computer-assisted programs, newspapers, books, industry tours, job shadows, career fairs and the Internet) in the career exploration process.
33.06	Evaluate postsecondary training opportunities related to career interests, including certification, licensing, apprenticeships, college and military options.
33.07	Relate and identify career interests and transferable skills necessary for opportunities in the global workforce.
33.08	Develop an individual career plan and portfolio.
33.09	Analyze needs of business and industry on labor and economic trends.
33.10	Describe the changing roles including non-traditional occupations in the workplace.
34.0	Demonstrate employability skills.-The student will be able to:
34.01	Identify and utilize resources used in a job search (e.g., newspaper, Internet, networking).
34.02	Discuss importance of drug tests and criminal background checks in identifying possible employment options.
34.03	Identify steps in the job application process including arranging for references and proper documentation.
34.04	Identify procedures and complete documents required when applying for a job (e.g., application, W-4, I-9).

CTE Standards and Benchmarks

34.05	Prepare a resume (electronic and traditional), cover letter, letter of application, follow-up letter, acceptance/rejection letter, and letter of resignation.
34.06	Demonstrate appropriate dress and grooming for employment.
34.07	Demonstrate effective interviewing skills (e.g., behavioral).
34.08	Describe methods for handling illegal interview and application questions.
34.09	Discuss state and federal labor laws regulating the workplace (e.g., Child Labor Law, sexual harassment, EEOC, ADA, FMLA).
34.10	Identify positive work attitudes and behaviors such as honesty, compassion, respect, responsibility, fairness, trustworthiness, and caring.
34.11	Describe importance of producing quality work and meeting performance standards.
34.12	Identify personal and business ethics (e.g., preventing theft, pilfering, and unauthorized discounting).
34.13	Demonstrate orderly and systematic behavior by creating and maintaining a personal planner.
34.14	Identify qualities typically required for promotion (e.g., productivity, dependability, responsibility).
34.15	Identify how to prepare for job separation and re-employment.
34.16	Create and maintain a career portfolio (e.g., resume, letters of recommendation, awards, evidence of participation in school/community/volunteer activities, employer evaluations).
35.0	Demonstrate competencies in a specific career.-The student will able to:
35.01	Demonstrate job performance skills as outlined in the training plan
35.02	Exhibit effective workplace safety practices including use of protective devices
35.03	Display an acceptable level of productivity and quality control
35.04	Demonstrate effective written and oral communication and listening skills when interacting with customers, co-workers, and managers
35.05	Demonstrate decision making and problem solving processes and techniques used in the workplace.
35.06	Demonstrate acceptable work habits and conduct in the workplace as defined by company policy
35.07	Demonstrate an understanding of the company's vision and mission statements.
35.08	Demonstrate an understanding of the company's goals and objectives
35.09	Demonstrate familiarity with the company's products and services
35.10	Demonstrate the ability to identify authority, rights, and responsibilities of both employers and employees
36.0	Demonstrate career acquisition.-The student will be able to:
36.01	Participate in work-based learning opportunities such as: mentoring, cooperative work, job shadows, apprenticeships and internships.

CTE Standards and Benchmarks

36.02	Demonstrate effective oral and written communication skills necessary for employment.
36.03	Demonstrate job search skills using a variety of resources.
36.04	Apply the decision-making process to the various stages of the work life cycle.
36.05	Identify and demonstrate employability skills including job search, selection, the interviewing process, proper dress and presentation.
36.06	Compare and contrast compensation packages that include varying levels of wages and benefits.
37.0	Demonstrate career retention.-The student will be able to:
37.01	Demonstrate positive personal qualities and self-management skills (i.e. time management, organization, punctuality and attendance).
37.02	Describe how productivity, work ethic and quality affect job stability.
37.03	Demonstrate communication team-building and leadership skills.
37.04	Demonstrate personal health and workplace safety procedures.
37.05	Identify biases, harassment and discriminatory behaviors impacting job success and advancement.
37.06	Acknowledge and respond to constructive criticism and employment evaluation.
37.07	Understand the importance of following company policy and procedures and the legal ramifications of labor laws impacting employment.
37.08	Understand the role of compromise in conflict resolution.
38.0	Demonstrate integrated learning and life skills.-The student will be able to:
38.01	Demonstrate the integration and application of academic and occupational skills in school, work and personal lives.
38.02	Use communication, mathematical and technical skills to compare compute, and analyze complex information.
38.03	Discuss how personal choices, experiences, technology, education/training and other factors correlate with earning a living.
38.04	Discuss how income from employment is affected by factors such as supply and demand, geographic location, level of education, type of industry, union membership, productivity skill level and work ethic.
38.05	Compare and contract strategies for personal finance and risk management.
38.06	Demonstrate the ability to set, monitor and achieve clearly defined goals.
39.0	Demonstrate technology and information.-The students will be able to:
39.01	Apply knowledge of technology to identify and solve problems.
39.02	Identify and evaluate how information technology developments have changed the way people work.
39.03	Select, apply and troubleshoot software and hardware as they apply to a variety of work applications.
39.04	Describe how new developments in varied fields or technology affect the job market and the level of worker's responsibilities.

CTE Standards and Benchmarks

39.05 Analyze the ethical issues surrounding access, privacy and confidentiality of information in emerging technologies.

39.06 Explore current and future positions and career paths in field of technology.

39.07 Identify job tasks that presently are and will be in the future performed in the specified occupation (training plan).

39.08 Create a training plan indicating competencies mastered.

39.09 Maintain a record of employment hours and wages for auditing and budgetary purposes (e.g., time cards, budget sheets).

39.10 Maintain an up-to-date, signed training agreement.

Additional Information

Laboratory Activities

Laboratory investigations that include scientific inquiry, research, measurement, problem solving, emerging technologies, tools and equipment, as well as, experimental, quality, and safety procedures are an integral part of this career and technical program/course. Laboratory investigations benefit all students by developing an understanding of the complexity and ambiguity of empirical work, as well as the skills required to manage, operate, calibrate and troubleshoot equipment/tools used to make observations. Students understand measurement error; and have the skills to aggregate, interpret, and present the resulting data. Equipment and supplies should be provided to enhance hands-on experiences for students.

Special Notes

MyCareerShines is an interactive resource to assist students in identifying their ideal career and to enhance preparation for employment. Teachers are encouraged to integrate this resource into the program curriculum to meet the employability goals for each student.

Career and Technical Student Organization (CTSO)

SkillsUSA is the intercurricular career and technical student organization(s) providing leadership training and reinforcing specific career and technical skills. Career and Technical Student Organizations provide activities for students as an integral part of the instruction offered.

Cooperative Training – OJT

On-the-job training is appropriate but not required for this program. Whenever offered, the rules, guidelines, and requirements specified in the OJT framework apply.

Basic Skills

In a Career Certificate Program offered for 450 hours or more, in accordance with Rule 6A-10.040, F.A.C., the minimum basic skills grade levels required for postsecondary adult career and technical students to complete this program are: Mathematics 9.0, Language 9.0, and Reading 9.0. These grade level numbers correspond to a grade equivalent score obtained on a state designated basic skills examination.

Adult students with disabilities, as defined in Section 1004.02(7), Florida Statutes, may be exempted from meeting the Basic Skills requirements (Rule 6A-10.040). Students served in exceptional student education (except gifted) as defined in s. 1003.01(3)(a), F.S., may also be exempted from meeting the Basic Skills requirement. Each school district and Florida College must adopt a policy addressing procedures for exempting eligible students with disabilities from the Basic Skills requirement as permitted in Section 1004.91(3), F.S.

Students who possess a college degree at the Associate of Applied Science level or higher; who have completed or are exempt from the college entry-level examination; or who have passed a state, national, or industry licensure exam are exempt from meeting the Basic Skills requirement (Rule 6A-10.040, F.A.C.) Exemptions from state, national or industry licensure are limited to the certifications listed on the Basic Skills and Licensure Exemption List which may be accessed from the CTE Program Resources page.

Accommodations

Federal and state legislation requires the provision of accommodations for students with disabilities to meet individual needs and ensure equal access. Postsecondary students with disabilities must self-identify, present documentation, request accommodations if needed, and develop a plan with their counselor and/or instructors. Accommodations received in postsecondary education may differ from those received in secondary education. Accommodations change the way the student is instructed. Students with disabilities may need accommodations in such areas as instructional methods and materials, assignments and assessments, time demands and schedules, learning environment, assistive technology and special communication systems. Documentation of the accommodations requested and provided should be maintained in a confidential file.

Note: postsecondary curriculum and regulated secondary programs cannot be modified.

Florida Department of Education
Curriculum Framework

Program Title: Marine Service Technologies
Program Type: Career Preparatory
Career Cluster: Transportation, Distribution and Logistics

Career Certificate Program – Career Preparatory

Program Number	T400210
CIP Number	0647061611
Grade Level	30,31
Standard Length	1350
Teacher Certification	Refer to the Program Structure section
CTSO	SkillsUSA
SOC Codes (all applicable)	49-3051 – Motorboat Mechanics and Service Technicians
Basic Skills Level	Mathematics: 9 Language: 9 Reading: 9

Purpose

This program offers a sequence of courses that provides coherent and rigorous content aligned with challenging academic standards and relevant technical knowledge and skills needed to prepare for further education and careers in the Transportation, Distribution and Logistics career cluster; provides technical skill proficiency, and includes competency-based applied learning that contributes to the academic knowledge, higher-order reasoning and problem-solving skills, work attitudes, general employability skills, technical skills, and occupation-specific skills, and knowledge of all aspects of the Transportation, Distribution and Logistics career cluster.

The content includes but is not limited to the following: service, repair and overhaul of four-stroke and two-stroke cycle engines and outboard motors; and service and repair of boating accessories. With regard to the above, course content will include electrical systems, fuel systems, power transfer systems, ignition systems, cooling systems, lubrication systems, drive systems and boat and trailer rigging.

The course content should also include training in communication, leadership, human relations and employability skills; and safe, efficient work practices.

Additional Information relevant to this Career and Technical Education (CTE) program is provided at the end of this document.

Program Structure

This program is a planned sequence of instruction consisting of six occupational completion points.

This program is comprised of courses which have been assigned course numbers in the SCNS (Statewide Course Numbering System) in accordance with Section 1007.24 (1), F.S. Career and Technical credit shall be awarded to the student on a transcript in accordance with Section 1001.44 (3) (b), F.S.

To teach the course(s) listed below, instructors must hold at least one of the teacher certifications indicated for that course.

The following table illustrates the postsecondary program structure:

OCP	Course Number	Course Title	Teacher Certification	Length	SOC Code
A	MTE0003	Marine Rigger	DIESEL MECH @7 7G GASENG RPR @7 7G	300 hours	49-3051
B	MTE0090	Outboard Engine Technician		300 hours	49-3051
C	MTE0074	Outboard Engine Diagnostics Technician		150 hours	49-3051
D	MTE0092	Inboard Gas Engine Technician		300 hours	49-3051
E	MTE0093	Drive Train Technician		150 hours	49-3051
F	MTE0056	Inboard Diesel Technician		150 hours	49-3051

Common Career Technical Core – Career Ready Practices

Career Ready Practices describe the career-ready skills that educators should seek to develop in their students. These practices are not exclusive to a Career Pathway, program of study, discipline or level of education. Career Ready Practices should be taught and reinforced in all career exploration and preparation programs with increasingly higher levels of complexity and expectation as a student advances through a program of study.

1. Act as a responsible and contributing citizen and employee.
2. Apply appropriate academic and technical skills.
3. Attend to personal health and financial well-being.
4. Communicate clearly, effectively and with reason.
5. Consider the environmental, social and economic impacts of decisions.
6. Demonstrate creativity and innovation.
7. Employ valid and reliable research strategies.
8. Utilize critical thinking to make sense of problems and persevere in solving them.
9. Model integrity, ethical leadership and effective management.
10. Plan education and career path aligned to personal goals.
11. Use technology to enhance productivity.
12. Work productively in teams while using cultural/global competence.

Standards

After successfully completing this program, the student will be able to perform the following:

- 01.0 Demonstrate an understanding of workplace safety and workplace organization.
- 02.0 Adjust and repair trailers.
- 03.0 Use marine woods, metals, and fiberglass.
- 04.0 Maintain and repair basic two-stroke cycle outboard engines.
- 05.0 Maintain and repair fuel systems on boats.
- 06.0 Maintain and repair electrical systems.
- 07.0 Prepare delivery checklist.
- 08.0 Maintain and repair outboard capacitor discharge ignition systems.
- 09.0 Maintain and repair outboard fuel systems.
- 10.0 Parts specialist and computer skills to industry standards.
- 11.0 Maintain and repair basic four-stroke cycle outboard engines.
- 12.0 Maintain and repair outboard charging systems.
- 13.0 Maintain and repair outboard battery/EFI ignition systems.
- 14.0 Maintain and repair outboard cranking systems.
- 15.0 Maintain and repair outboard lubrication systems.
- 16.0 Maintain and repair outboard cooling systems.
- 17.0 Maintain and repair outboard lower gear cases.
- 18.0 Assemble and maintain outboard lower units and housing assemblies.
- 19.0 Demonstrate employability skills.
- 20.0 Demonstrate an understanding of entrepreneurship.
- 21.0 Apply basic computer skills.
- 22.0 Troubleshoot and solve problems with outboard engines using industry recognized computer-based diagnostic equipment.
- 23.0 Set up electric and digital control box, and gauges.
- 24.0 Maintain and repair basic four-stroke cycle inboard gas engine.
- 25.0 Maintain and repair inboard fuel systems.
- 26.0 Maintain and repair inboard gas cooling systems.
- 27.0 Maintain and repair inboard gas lubrication systems.
- 28.0 Maintain and repair electronic ignition systems.
- 29.0 Maintain and repair capacitor discharge ignition systems.
- 30.0 Maintain and repair stern drive upper gear cases.
- 31.0 Maintain and repair stern drive lower gear cases.
- 32.0 Maintain and repair stern drive intermediate housing.
- 33.0 Maintain and repair inboard gas transmissions.
- 34.0 Maintain and repair inboard diesel fuel systems.
- 35.0 Maintain and repair inboard diesel cooling systems.
- 36.0 Maintain and repair inboard diesel lubrication systems.
- 37.0 Maintain and repair inboard diesel charging systems.

**Florida Department of Education
Student Performance Standards**

Program Title: Marine Service Technologies
Career Certificate Program Number: T400210

Course Number: MTE0003
Occupational Completion Point: A
Marine Rigger – 300 Hours – SOC Code 49-3051

Course Description:

Students will learn entry-level skills for the outboard marine service industry. Hands-on training combined with laboratory and classroom experiences gives the student a full understanding of workplace safety and organization, trailer service, various boat materials, 2-stroke cycle outboard engines, fuel systems on boats, marine electrical systems, procedures for preparing boats to customers, capacitor discharge ignition systems, outboard engine fuel systems, and proper use of computer systems related to parts specialization.

CTE Standards and Benchmarks	
01.0	Demonstrate an understanding of workplace safety and workplace organization.-The student will be able to:
01.01	Identify safety requirements for manual, electrical-powered, and pneumatic tools.
01.02	Demonstrate, apply, and provide evidence of safely using manual, electrical-powered, and pneumatic tools.
01.03	Identify safety requirements for operation of automated machines and equipment.
01.04	Demonstrate, apply, and provide evidence of safely operating automated machines and equipment.
01.05	Identify threaded fasteners by size, type, thread series, thread classes, material hardness and compatibility.
01.06	Read, interpret, and apply service manuals.
01.07	Identify the safe use of paints, chemicals, fiberglass, and compounds
01.08	Demonstrate, apply, and provide evidence of safely using paints, chemicals, fiberglass, and compounds.
01.09	Identify the safe use of electrical connectors and cords.
01.10	Demonstrate, apply, and provide evidence of safely using electrical connectors and cords.
01.11	Identify, demonstrate, apply, and provide evidence of understanding of shop safety rules on an ongoing basis.
01.12	Demonstrate and identify the proper procedures for extinguishing class A, B, and C type fires.
01.13	Identify various workplace injuries related to the marine industry.
01.14	Demonstrate and practice knowledge of first aid and first response procedures appropriate for this course.
01.15	Identify and apply safety procedures in case of smoke or chemical inhalation.
01.16	Demonstrate and apply material handling techniques to safely move materials.

CTE Standards and Benchmarks

01.17	Demonstrate and apply proper techniques for lifting loads.
01.18	Research and identify Occupational Safety Health Administration (OSHA) safety standards related to the marine industry.
01.19	Demonstrate, apply, and provide evidence of understanding Occupational Safety Health Administration (OSHA) safety standards related to the marine industry.
01.20	Demonstrate knowledge of safety requirements for material handling equipment such as rigging, ladders, and scaffolds related to the marine industry.
01.21	Demonstrate knowledge of National Institute of Occupational Safety and Health (NIOSH), Environmental Protection Agency (EPA) and other regulatory agencies recommendations, guidelines and best practices.
01.22	Describe "Right-to-Know" Law as recorded in (29 CFR-1910.1200)
01.23	Locate Safety Data Sheets (SDS).
01.24	Demonstrate understanding and knowledge of using and applying the information located on Safety Data Sheets (SDS).
01.25	Proactively respond to a safety concern and then document occurrences.
01.26	Identify and report unsafe conditions.
01.27	Determine the appropriate corrective action after an unsafe condition is identified.
01.28	Demonstrate knowledge of various emergency alarms and procedures.
01.29	Demonstrate knowledge and apply clean-up procedures for spills.
01.30	Identify and apply procedures for handling hazardous material.
01.31	Perform safety and environmental inspections.
01.32	Perform leak checks to determine if toxic or hazardous material is escaping from a piece of equipment.
01.33	Demonstrate knowledge of proper and safe installation techniques as described in manuals, checklists, and regulations.
01.34	Demonstrate and apply proper equipment shutdown procedures.
01.35	Identify, select, and use personal protective equipment (PPE).
01.36	Identify, demonstrate, and apply ergonomic work techniques.
01.37	Train other students to use and apply safety skills outlined in this standard.
02.0	Adjust and repair trailers.-The student will be able to:
02.01	Make boat to trailer adjustments.
02.02	Remove and replace lighting systems.
02.03	Remove, inspect, repack, and replace wheel bearings and springs.
02.04	Remove and replace brakes.

CTE Standards and Benchmarks

02.05 Check lug nuts on trailer for correct torque.

03.0 Use marine woods, metals, and fiberglass.-The student will be able to:

03.01 Explain the hazards of a marine environment to woods, metals and fiberglass.

03.02 Explain a galvanic series.

03.03 Explain the theory for using given materials in boat repair activities.

04.0 Maintain and repair basic two-stroke cycle outboard engines.-The student will be able to:

04.01 Explain the basic principles of the operation of two-stroke cycle internal combustion engines.

04.02 Identify types of two-stroke cycle engines.

04.03 Locate engine serial and model numbers.

04.04 Set up and use precision measurement tools.

04.05 Drill and remove broken studs and install helicoils.

04.06 Demonstrate appropriate heating techniques and skills.

04.07 Identify engine assemblies and systems.

04.08 Disassemble engines.

04.09 Remove, clean and inspect heads for cracks, warpage and damaged spark plug threads.

04.10 Diagnose head problems by use of the visual inspection method.

04.11 Diagnose head problems by use of the compression tester method.

04.12 Diagnose head problems by use of the stethoscope method.

04.13 Remove, clean and inspect piston rods and assemblies.

04.14 Measure out-of-round of pistons and cylinders.

04.15 Hone cylinders.

04.16 Check the total bearing surface of connecting rod bearings.

04.17 Measure piston skirts and ring grooves.

04.18 Measure the piston ring gap in cylinder bores.

04.19 Install piston pins according to manufacturer's specifications.

04.20 Check rod and piston assembly alignment.

04.21 Install rings on pistons.

CTE Standards and Benchmarks

04.22 Install piston rod assemblies.

04.23 Measure and check crankshafts with a micrometer.

04.24 Check needle bearings.

04.25 Inspect crankshafts and install seal.

04.26 Inspect, clean and/or replace reed valves.

04.27 Reassemble engines.

05.0 Maintain and repair fuel systems on boats.-The student will be able to:

05.01 Identify and locate fuel system components (fuel tanks, lines, filters, etc.).

05.02 Sketch and label the parts of total fuel systems.

05.03 Service fuel lines and primer bulbs (vacuum test).

05.04 Describe or demonstrate the process for removing, cleaning, inspecting and installing fuel tanks.

05.05 Locate and identify fuel pumps and test the vacuum and pressure.

05.06 Determine and make appropriate fuel oil mixtures.

06.0 Maintain and repair electrical systems.-The student will be able to:

06.01 Locate and match electrical units by their symbols on a wiring diagram.

06.02 Set up and use voltmeters, ammeters and ohmmeters.

06.03 Locate and identify electrical circuit components.

06.04 Sketch a typical circuit using a single wire system.

06.05 Test storage batteries using proper industry recognized battery testing equipment.

06.06 Charge storage batteries.

06.07 Remove and replace batteries and service battery boxes.

06.08 Repair damaged wire and electrical harnesses.

06.09 Diagnose circuit troubles using continuity or a test light and low reading voltmeters to record voltage drop.

06.10 Sketch and label typical fuel gauge systems.

06.11 Remove and replace gauges or indicating lights.

06.12 Remove and replace fuel-sending units.

06.13 Diagnose gages and accessory system troubles using voltmeters, ammeters or detached sending units.

CTE Standards and Benchmarks

06.14	Sketch typical circuits such as those for auto bilge pumps or navigation lights.
06.15	Locate opens, shorts and grounds.
06.16	Demonstrate proficiency in applying industry standard wire terminal practices.
06.17	Demonstrate proper installation of 2 position and 3 position battery switches.
06.18	Demonstrate correct procedure for connecting batteries in series and parallel.
06.19	Check alternator output voltage with engine running compare with specifications.
07.0	Prepare delivery checklist.-The student will be able to:
07.01	Make center line measurements for outboard motor installation.
07.02	Locate manufacturers' I.D. plates.
07.03	Mount control boxes at the helm.
07.04	Place wiring and cables in a neat and orderly manner.
07.05	Adjust the control cables from the engine to the control box.
07.06	Center the steering cable to the engine.
07.07	Find suitable locations for accessories and mount them to the boat.
07.08	Lubricate shafts, install propellers and fasten both securely.
07.09	Check for proper levels.
07.10	Check manufacturers' specifications.
07.11	Describe how to or test-run boats.
07.12	Recheck work completed.
07.13	Demonstrate proper procedures for checking oil level capacity.
07.14	Install or connect drain plugs, petcocks, hose clamps, hoses, etc.
07.15	Remove and replace running lights.
07.16	Troubleshoot lighting systems and accessories.
07.17	Check and adjust throttles, cables, horns, lights and tachometers.
07.18	Check steering system for proper operation.
08.0	Maintain and repair outboard capacitor discharge ignition systems.-The student will be able to:
08.01	Sketch and label electrical symbols.

CTE Standards and Benchmarks

08.02	Set up and use ohmmeters.
08.03	Set up and use a DVA tester or equivalent.
08.04	Set up and use spark testers.
08.05	Set up and use timing lights.
08.06	Set up and use multi-meter.
08.07	Locate and identify parts of capacitor discharge ignition systems.
08.08	Locate and match electrical units by their symbols on a wiring diagram.
08.09	Sketch and label complete C/D ignition systems.
08.10	Check coil resistance, shorts and grounds with an ohmmeter.
08.11	Check stator windings with an ohmmeter.
08.12	Check sensor coils, charge coils, ignition coils and shorts to ground with a DVA tester or equivalent.
08.13	Check power packs with an ohmmeter and a DVA tester or equivalent.
09.0	Maintain and repair outboard fuel systems.-The student will be able to:
09.01	Identify the major types of carburetors.
09.02	Check and adjust throttle.
09.03	Identify and service different types of EFI/DFI systems.
09.04	Identify air cleaners.
09.05	Identify basic carburetor circuits (chokes, floats, fuel inlets; idle, intermediate and high speeds; mains, etc.)
09.06	Diagnose carburetor problems.
09.07	Remove, clean, overhaul, replace and make final adjustments to carburetors.
09.08	Diagnose exhaust problems such as back pressure.
10.0	Parts specialist and computer skills to industry standards.-The student will be able to:
10.01	Identify the skills needed to be a service writer.
10.02	Identify the skills needed to be a parts specialist.
10.03	Demonstrate appropriate computer skills.
10.04	Demonstrate knowledge of different parts and accessories.

**Florida Department of Education
Student Performance Standards**

Course Number: MTE0090
Occupational Completion Point: B
Outboard Engine Technician – 300 Hours – SOC Code 49-3051

Course Description:

Students will learn entry-level skills for the outboard marine service industry. Hands-on training combined with laboratory and classroom experiences gives the student a full understanding of outboard 4-stroke cycle engines, charging systems, battery ignition systems, cranking systems, lubrication systems, cooling systems, lower gear cases, lower units and housing assemblies, employability, and entrepreneurship.

CTE Standards and Benchmarks	
11.0	Maintain and repair basic four-stroke cycle outboard engines.-The student will be able to:
11.01	Explain the basic principles of the operation of four-stroke cycle internal combustion engines.
11.02	Identify types of four-stroke cycle engines.
11.03	Locate engine serial and model numbers.
11.04	Identify engine assemblies and systems.
11.05	Diagnose valve and head problems by use of the visual inspection method.
11.06	Diagnose valve and head problems by use of the compression tester method.
11.07	Disassemble engines and inspect parts.
11.08	Clean and inspect heads for cracks, warpage and damaged spark plug threads.
11.09	Inspect valves for warpage, burns, cracks, stem wear, tip wear and margin.
11.10	Adjust valves.
11.11	Remove and inspect camshafts and lifters.
11.12	Clean and inspect lifters for wear.
11.13	Time valve drive assemblies.
11.14	Reassemble engines.
11.15	Inspect oil seals.
11.16	Inspect/replace timing belt/chain.
12.0	Maintain and repair outboard charging systems.-The student will be able to:

CTE Standards and Benchmarks

12.01	Sketch and label the units of complete charging circuits.
12.02	Disassemble charging systems and identify the components.
12.03	Perform stator and rectifier testing on charging systems.
12.04	Reassemble and test charging systems.
12.05	Set up and use ohmmeters.
12.06	Reassemble and test complete units.
13.0	Maintain and repair outboard battery/EFI ignition systems.-The student will be able to:
13.01	Locate and identify parts of battery ignition systems.
13.02	Locate and match electrical units by their symbols on a wiring diagram.
13.03	Sketch and label complete battery ignition systems.
13.04	Check coil resistance with an ohmmeter.
13.05	Set up and use test equipment.
13.06	Set timing using timing light.
13.07	Clean and re-gap spark plugs.
14.0	Maintain and repair outboard cranking systems.-The student will be able to:
14.01	Disassemble recoil starters.
14.02	Inspect components of recoil starters.
14.03	Reassemble recoil starters.
14.04	Identify components of electrical starting systems.
14.05	Bench test switches.
14.06	Troubleshoot starting systems using multi-meter.
14.07	Locate opens, short and grounds.
15.0	Maintain and repair outboard lubrication systems.-The student will be able to:
15.01	Identify the types and functions of lubrication systems.
15.02	Explain the principles of lubrication systems.
15.03	Identify and locate components of lubrication systems.
15.04	Check engines for oil leaks.
15.05	Change engine oil and filters.

CTE Standards and Benchmarks

15.06	Check engine oil pressure and level.
15.07	Recognize and use only recommended oil.
15.08	Inspect and service oil metering systems.
16.0	Maintain and repair outboard cooling systems.-The student will be able to:
16.01	Explain the principles of cooling systems.
16.02	Trace water flow through cooling systems.
16.03	Disassemble, examine for problems and reassemble water pumps.
16.04	Remove, check and replace thermostats.
16.05	Service poppet valves.
16.06	Service or replace thermostat and thermostat housings.
17.0	Maintain and repair outboard lower gear cases.-The student will be able to:
17.01	Remove and replace lower gear cases.
17.02	Identify the components of lower gear case.
17.03	Refill lower gear cases with specified oil.
17.04	Determine propeller pitch diameter and hub type.
18.0	Assemble and maintain outboard lower units and housing assemblies.-The student will be able to:
18.01	Disassemble and reassemble steering handle groups.
18.02	Understand the process for disassembling and assembling exhaust housings and water tube assemblies.
18.03	Understand the process for replacing motor mounts and shock absorbers.
18.04	Lubricate all fittings.
18.05	Pressure and vacuum test gear cases.
18.06	Understand the process for removing and servicing cylinders and rams.
18.07	Adjust the trim and tilt.
18.08	Determine the differences between mechanical, electrical and hydraulic shifting units.
18.09	Explain the shifting theory of the lower unit.
18.10	Perform correct procedure for filling trim and tilt with hydraulic oil.
19.0	Demonstrate employability skills.-The student will be able to:
19.01	Conduct a job search using periodicals and the internet.
19.02	Secure information about a job.

CTE Standards and Benchmarks

19.03	Identify documents that may be required when applying for a job interview.
19.04	Complete a job application form correctly.
19.05	Demonstrate competence in job interview techniques.
19.06	Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
19.07	Identify acceptable work habits.
19.08	Demonstrate knowledge of how to make appropriate job changes.
19.09	Demonstrate acceptable employee health habits.
19.10	Describe "Right-to-Know" Law as recorded in (29 CFR-1910.1200).
20.0	Demonstrate an understanding of entrepreneurship.-The student will be able to:
20.01	Define entrepreneurship.
20.02	Describe the importance of entrepreneurship to the American economy.
20.03	List the advantages and disadvantages of business ownership.
20.04	Identify and explain the risks involved in ownership of a business.
20.05	Identify and explain the necessary personal characteristics of a successful entrepreneur.
20.06	Identify and explain the business skills needed to operate a small business efficiently and effectively.
20.07	Identify and explain the various types of business structures, e.g. sole proprietor, S-Corporation, etc.

**Florida Department of Education
Student Performance Standards**

Course Number: MTE0074

Occupational Completion Point: C

Outboard Engine Diagnostics Technician – 150 Hours – SOC Code 49-3051

Course Description:

Students will learn entry-level skills for the outboard marine service industry. Hands-on training combined with laboratory and classroom experiences gives the student a full understanding of basic computer skills, computer-based diagnostic equipment, electrical, control box, and gauges.

CTE Standards and Benchmarks	
21.0	Apply basic computer skills.-The student will be able to:
21.01	Identify and apply the proper procedures for turning on, and turning off a computer.
21.02	Identify and apply the proper procedures for logging on, and logging off a computer.
21.03	Demonstrate knowledge of properly using and navigating operating systems.
21.04	Identify and properly use various peripheral devices. (e.g., printers, scanners, external storage devices)
21.05	Demonstrate and apply the process for locating, copying, pasting, saving, and backing up a file and folder
21.06	Demonstrate the process for opening and saving a file using program specific extensions. (e.g., .docx, .pdf, .txt)
21.07	Identify and apply the proper procedures for securely uploading and downloading files over external and internal networks.
21.08	Demonstrate the proper procedures for using and navigating e-mail programs.
21.09	Create and send electronic messages using proper e-mail communication etiquette.
21.10	Show understanding for properly attaching a file within an e-mail message.
22.0	Troubleshoot and solve problems with outboard engines using industry recognized computer-based diagnostic equipment.-The student will be able to:
22.01	Demonstrate and understand the proper procedures for connecting diagnostic equipment to an outboard engine.
22.02	Identify and demonstrate the proper procedures for opening and closing diagnostic programs.
22.03	Use multiple research techniques to identify faults and data to be used to solve outboard engine trouble.
22.04	Formulate a plan to repair outboard engines given the data found.
22.05	Download, save, and print output data from an outboard engine.
23.0	Set up electric and digital control box, and gauges.-The student will be able to:

CTE Standards and Benchmarks

23.01 Assign position to outboard engines.

23.02 Set up trim and tilt limits.

23.03 Set up digital gauges.

2019 - 2020

**Florida Department of Education
Student Performance Standards****Course Number: MTE0092****Occupational Completion Point: D****Inboard Gas Engine Technician – 300 Hours – SOC Code 49-3051****Course Description:**

Students will learn skills for the inboard marine service industry. Hands-on training combined with laboratory and classroom experiences gives the student an understanding of basic four-stroke cycle engines, fuel systems, cooling systems, lubrication systems, ignition systems, and capacitor discharge ignition systems.

CTE Standards and Benchmarks

24.0 Maintain and repair basic four-stroke cycle inboard gas engines.-The student will be able to:

24.01 Diagnose valve and head problems by use of the visual inspection method.

24.02 Diagnose valve and head problems by use of the compression tester method.

24.03 Disassemble engines and inspect parts.

24.04 Clean and inspect heads for cracks, warpage and damaged spark plug threads.

24.05 Inspect valves for warpage, burns, cracks, stem wear, tip wear and margin.

24.06 Adjust valves.

24.07 Understand the process for removing and inspecting camshafts and lifters.

CTE Standards and Benchmarks

24.08	Understand the process for cleaning and inspecting lifters for wear.
24.09	Time valve drive assemblies.
24.10	Understand the process for removing pistons from rod assemblies.
24.11	Understand the process for measuring out-of-round and cylinder taper with a dial bore gage or micrometer.
24.12	Understand the process for checking piston pins and bosses for wear.
24.13	Understand the process for measuring piston ring lands width, out-of-round and taper.
24.14	Understand the process for measuring the piston ring gap in cylinder bores.
24.15	Understand the process for installing and fitting piston pins.
24.16	Understand the process for checking rod and piston assembly alignment.
24.17	Understand the process for removing and replacing rod bearings.
24.18	Hone and clean cylinders.
24.19	Install rings on pistons.
24.20	Measure and check crankshafts with a micrometer.
24.21	Check for end play.
24.22	Understand the process for checking bearing bores with a telescoping gage.
24.23	Reassemble engines.
24.24	Install oil seals.
24.25	Inspect/replace timing belt/chain.
25.0	Maintain and repair inboard fuel systems.-The student will be able to:
25.01	Identify and locate fuel system components (fuel tanks, lines, filters, etc.).
25.02	Sketch and label typical fuel gauge systems.
25.03	Sketch and label the parts of total fuel systems.
25.04	Remove and replace fuel gauges.
25.05	Service fuel lines.
25.06	Remove and replace fuel-sending units.
25.07	Describe or demonstrate the process for removing, cleaning, inspecting and installing fuel tanks.
25.08	Vacuum test fuel system.

CTE Standards and Benchmarks

25.09	Remove, replace service and check the pressure of fuel pumps.
25.10	Remove, clean and replace in-line filters.
25.11	Identify the major types of carburetors.
25.12	Check and adjust throttle linkages.
25.13	Identify and service different types of EFI systems.
25.14	Identify and understand different types of Vapor Separator Tank (VST) systems.
25.15	Remove, service, and replace flame arrestors.
26.0	Maintain and repair inboard gas cooling systems.-The student will be able to:
26.01	Explain the principles of cooling systems, including fresh water cooling systems.
26.02	Trace water flow through cooling systems.
26.03	Disassemble and reassemble water pumps.
26.04	Remove, check and replace thermostats.
26.05	Check thermostat pressure relief systems.
26.06	Service manifolds, risers and thermostat housings.
27.0	Maintain and repair inboard gas lubrication systems.-The student will be able to:
27.01	Identify the types and functions of lubrication systems.
27.02	Explain the principles of lubrication systems.
27.03	Identify and locate components of lubrication systems.
27.04	Check engines for oil leaks.
27.05	Change engine oil and filters.
27.06	Check engine oil pressure and level.
27.07	Recognize and use only recommended oil.
28.0	Maintain and repair electronic ignition systems.-The student will be able to:
28.01	Locate and match electrical units by their symbols on a wiring diagram.
28.02	Sketch and label complete battery ignition systems.
28.03	Set up and use test equipment.
28.04	Set timing using a timing light

CTE Standards and Benchmarks

29.0	Maintain and repair capacitor discharge ignition systems.-The student will be able to:
29.01	Sketch and label electrical symbols.
29.02	Set up and use multi-meters.
29.03	Set up and use appropriate test equipment.
29.04	Set up and use spark testers.
29.05	Set up and use timing lights.
29.06	Locate and identify parts of capacitor discharge ignition systems.
29.07	Locate and match electrical units by their symbols on a wiring diagram.
29.08	Check coil resistance, shorts and grounds with an ohmmeter.
29.09	Check sensor coils, charge coils, ignition coils and shorts to ground with appropriate test equipment.

Florida Department of Education
Student Performance Standards

Course Number: MTE0093

Occupational Completion Point: E

Drive Train Technician – 150 Hours – SOC Code 49-3051

Course Description:

Students will learn entry-level skills for the outboard marine service industry. Hands-on training combined with laboratory and classroom experiences gives the student a full understanding of stern drive upper and lower cases, intermediate housings, and inboard gas transmissions.

CTE Standards and Benchmarks	
30.0	Maintain and repair stern drive upper gear case.-The student will be able to:
30.01	Identify components of upper gear case.
30.02	Use the proper oil to refill upper and lower gear cases.
30.03	Check manufacturers' installation procedures for stern drive units.
31.0	Maintain and repair stern drive lower gear cases.-The student will be able to:
31.01	Identify components of lower gear case.
31.02	Remove and replace lower gear cases.
31.03	Refill lower gear cases with specified oil.
31.04	Determine propeller pitch, diameter and hub type.
32.0	Maintain and repair stern drive intermediate housings.-The student will be able to:
32.01	Check engine alignment.
32.02	Check electrical components with proper test equipment.
32.03	Understand the process for removing and replace "U" joints.
32.04	Identify components of transom plates.
32.05	Service, install, and adjust trim and tilt systems.
33.0	Maintain and repair inboard gas transmissions.-The student will be able to:
33.01	Remove and replace transmissions.
33.02	Drain transmissions.
33.03	Determine capacity using the transmission service manuals.

CTE Standards and Benchmarks

33.04 Refill transmissions according to manufacturers' specifications.

2019 - 2020

**Florida Department of Education
Student Performance Standards****Course Number: MTE0056****Occupational Completion Point: F****Inboard Diesel Technician – 150 Hours – SOC Code 49-3051****Course Description:**

Students will learn entry-level skills for the diesel marine service industry. Hands-on training combined with laboratory and classroom experiences gives the student a full understanding of diesel fuel, cooling, lubrication, and charging systems.

CTE Standards and Benchmarks

34.0 Maintain and repair inboard diesel fuel systems.-The student will be able to:

34.01 Identify and locate fuel system components (fuel tanks, lines, filters, etc.).

34.02 Sketch and label the parts of total fuel systems.

34.03 Service fuel lines.

34.04 Describe or demonstrate the process for removing, cleaning, inspecting and installing fuel tanks.

34.05 Identify and locate fuel control devices.

34.06 Remove, clean and replace in-line filters.

34.07 Check and adjust throttle and governor linkages.

34.08 Check fuel systems for leaks.

34.09 Bleed systems for starting.

34.10 Set the injection pump angle (timing).

34.11 Check or replace glow plugs.

34.12 Check; stop solenoids.

CTE Standards and Benchmarks

35.0 Maintain and repair inboard diesel cooling systems.-The student will be able to:

35.01 Disassemble and reassemble water pumps.

35.02 Remove, check and replace thermostats.

35.03 Use thermostat pressure relief systems.

35.04 Service manifolds, risers and thermostat housings.

35.05 Service water-cooling systems for diesel engines.

36.0 Maintain and repair inboard diesel lubrication systems.-The student will be able to:

36.01 Identify the types and functions of lubrication systems.

36.02 Explain the principles of lubrication systems.

36.03 Identify and locate components of lubrication systems.

36.04 Check engines for oil leaks.

36.05 Change engine oil and filters.

36.06 Check engine oil pressure and level.

36.07 Recognize and use only recommended oil.

37.0 Maintain and repair inboard diesel charging systems.-The student will be able to:

37.01 Inspect, remove and replace alternator belts.

37.02 Check the output of charging systems.

37.03 Analyze malfunctions.

Additional Information

Laboratory Activities

Laboratory investigations that include scientific inquiry, research, measurement, problem solving, emerging technologies, tools and equipment, as well as, experimental, quality, and safety procedures are an integral part of this career and technical program/course. Laboratory investigations benefit all students by developing an understanding of the complexity and ambiguity of empirical work, as well as the skills required to manage, operate, calibrate and troubleshoot equipment/tools used to make observations. Students understand measurement error; and have the skills to aggregate, interpret, and present the resulting data. Equipment and supplies should be provided to enhance hands-on experiences for students.

Special Notes

MyCareerShines is an interactive resource to assist students in identifying their ideal career and to enhance preparation for employment. Teachers are encouraged to integrate this resource into the program curriculum to meet the employability goals for each student.

Career and Technical Student Organization (CTSO)

SkillsUSA is the intercurricular career and technical student organization(s) providing leadership training and reinforcing specific career and technical skills. Career and Technical Student Organizations provide activities for students as an integral part of the instruction offered.

Cooperative Training – OJT

On-the-job training is appropriate but not required for this program. Whenever offered, the rules, guidelines, and requirements specified in the OJT framework apply.

Basic Skills

In a Career Certificate Program offered for 450 hours or more, in accordance with Rule 6A-10.040, F.A.C., the minimum basic skills grade levels required for postsecondary adult career and technical students to complete this program are: Mathematics 9.0, Language 9.0, and Reading 9.0. These grade level numbers correspond to a grade equivalent score obtained on a state designated basic skills examination.

Adult students with disabilities, as defined in Section 1004.02(7), Florida Statutes, may be exempted from meeting the Basic Skills requirements (Rule 6A-10.040). Students served in exceptional student education (except gifted) as defined in s. 1003.01(3)(a), F.S., may also be exempted from meeting the Basic Skills requirement. Each school district and Florida College must adopt a policy addressing procedures for exempting eligible students with disabilities from the Basic Skills requirement as permitted in Section 1004.91(3), F.S.

Students who possess a college degree at the Associate of Applied Science level or higher; who have completed or are exempt from the college entry-level examination; or who have passed a state, national, or industry licensure exam are exempt from meeting the Basic Skills requirement (Rule 6A-10.040, F.A.C.) Exemptions from state, national or industry licensure are limited to the certifications listed on the Basic Skills and Licensure Exemption List which may be accessed from the CTE Program Resources page.

Accommodations

Federal and state legislation requires the provision of accommodations for students with disabilities to meet individual needs and ensure equal access. Postsecondary students with disabilities must self-identify, present documentation, request accommodations if needed, and develop a plan with their counselor and/or instructors. Accommodations received in postsecondary education may differ from those received in secondary education. Accommodations change the way the student is instructed. Students with disabilities may need accommodations in such areas as instructional methods and materials, assignments and assessments, time demands and schedules, learning environment, assistive technology and special communication systems. Documentation of the accommodations requested and provided should be maintained in a confidential file.

Note: postsecondary curriculum and regulated secondary programs cannot be modified.