CTE PROGRAM OF STUDY Secondary & Post Secondary	**Industry Sector:**	Transportation
	Career Pathway:	Aviation & Aerospace Transportation Services
	Program:	Aviation Maintenance Technology- Community College Major

Levels	Grade	ELA	Math	Science	Social Science	CTE Courses	Other Required Courses	Other Recommended Courses and UC/CSU Requirements
SECONDARY	7					**Career Exploration**		Small Engine Repair
	8							Woodworking
	9	**California High School minimum graduation requirements** - History/Social Science *(3 years, including American Government and Economics)* - English *(3 years)* - Math *(2 years)* - Science *(2 years- Biology and Physical Science)* - Visual or Performing Arts or Foreign Language *(1 year required)* - PE *(2 years required)* *Other local requirements as required for graduation E.C. 51225.3* ***Students are encouraged to meet UC/CSU entrance requirements.*				Introduction to Transportation CBEDS # 5651		or Sheet Metal Repair
						Assessments, advising, or additional preparation		
	10					Automotive Mechanics, Combination CBEDS #5655		Drafting
						Assessments, advising, or additional preparation		
	11					Engine Performance/Electrical CBEDS # 5680		Into to Electronics
							Third Year of Math	or Welding
						Assessments, advising, or additional preparation		
	12					Aviation & Aerospace Transportation Services CBEDS # 5656		Machine Shop
						Assessments, advising, or additional preparation		
		** Denotes Articulated and Dual Credit courses. These must be taken and moved to the secondary level for credit purposes.						
POST SECONDARY	13	**Minimum Academic Requirements for AA Degree** *Semester/ Quarter Units- Min per Area* Area A-Natural Sciences (3/4) Area B- Social and Behavior Science (3/4) Area C- Humanities (3/4) Area D - Languages and Rationality (3/4) *Section 3- Ethnic Studies (as required)*				**CTE Sequence- First Semester**	**CTE Sequence - Second Semester**	
						Aviation Maintenance Technology- 1	Aviation Maintenance Technology- 2	
	14					Aviation Maintenance Technology- 3	Aviation Maintenance Technology- 4	
	15	**Suggested Majors:**				Aviation Management Aero Space Engineer		
	16					CTE Instructor Credential Aeronautical Engineering		

Sample Occupations Related to this pathway
Occupations requiring a high school diploma or equivalent
Ground Support Crew
Aircraft Detailer
Apprentice Program
Occupations requiring some post secondary
Mechanics Assistant
Ramp Service Worker
Flight Attendant
Occupations requiring 2 year degree
Avionics Technician
Airframe/Power-Plant Tech
Air Traffic Controller; Com. Pilot
Occupations requiring a BA / BS degree
Airline Pilot/Copilot/Flight Eng.
Shop or Fleet Manager
CTE Instructor
Parts/Service Manager
Astronaut

Industry recognized certifications, licenses, credentials/ apprenticeships related to this pathway
Airframe/Power-Plant Inspector
FCC license
Pilots license
Instrument Rating
Commercial Rating
Certified Flight Instructor
Designated Engineering Rep
FAA Maintenance Inspector
FAA Flight Inspector

CTE PROGRAM OF STUDY

Industry Sector: **Transportation** Career Pathway: **Aviation and Aerospace Transportation** Grade Level: **13 1st Sem.**
Program: **Aviation Maintenance Technology**

Course Title: **Aviation Maintenance 1** TOPS: **0950** School: **Reedley College** (sample template)

Critical Course Competencies/Skills/Concepts	Course Description
Determine the relationship of voltage, current, and resistance in electrical circuits. Calculate and measure electrical power. Measure voltage, current, resistance, and continuity. Read and interpret electrical circuit diagrams. Inspect and service batteries. Calculate and measure capacitance and inductance. Use drawing symbols and schematic diagrams. Draw sketches of repairs and alterations. Use blueprint information. Use graphs and charts. Weigh aircraft. Perform complete weight and balance checks and properly record data. Fabricate and install rigid and flexible fluid lines and fittings.	Skills and knowledge appropriate to FAA Regulation Part 147 to include: basic electricity, aircraft drawings, weight and balance, fluid lines and fittings, materials and processes, ground operation and servicing, cleaning and corrosion control, wood structures, aircraft covering, aircraft finishes, math maintenance forms and records, basic physics, maintenance publications, mechanic privileges and limitations, welding, and human factors. Computer subjects include terminology, storage devices, word processing, and computer based training applications. 17.5 units. 15 hrs lecture and 15 hrs lab. 18weeks

Identify and select aircraft hardware and materials. Identify and select appropriate nondestructive testing methods. Perform penetrant, chemical etching, and magnetic particle inspections. Perform precision measurements. Inspect and check welds. Start, ground operate, move, and secure aircraft and identify typical ground operation hazards. Identify and select fuels. Identify and select cleaning materials. Inspect, identify remove and treat aircraft corrosion and perform aircraft cleaning. Service and repair wood structures. Identify wood defects. Inspect wood structures. Inspect test and repair fabric. Select and apply fabric and fiberglass covering materials. Apply trim, letters, and touch-up paint. Identify and select aircraft finishing materials. Apply finishing materials. Inspect finishes and identify defects.	

Determine area and volumes of various geometrical shapes. Solve ratio, proportion and percentage problems. Perform algebraic operations involving addition, subtraction, multiplication, and division of positive and negative numbers. Extract roots and raise numbers to a given power. Demonstrate ability to read, comprehend and apply information contained in FAA and manufacture's aircraft maintenance specifications, data sheets, manuals and publications, related Federal Aviation Regulations, airworthiness directives and advisory material. Read, understand and relate technical material. Write descriptions of aircraft condition and work performed including aircraft discrepancies and corrective actions using typical aircraft maintenance records. Complete required maintenance forms, records and inspection reports. Exercise mechanic privileges with the limitations prescribed by Part 65 of the Federal Aviation Regulations. Use and understand the principles of simple machines; sound, dynamics, basic aerodynamics, aircraft structures, and theory of flight. Weld magnesium and titanium. Solder stainless steel. Solder, braze, gas-weld and arc-weld steel. Weld aluminum and stainless steel.	

Fabricate tubular structures. Understand the role human factors play in aviation safety. Operate a windows-based computer program for CBT training. Activate a personal computer and load/save Lab Volt data files and ATP (Aircraft Technical Publishers) type certificate data files. Access and use TDATA software to research and record aircraft airworthiness directives for aircraft. Access the internet at FAA.GOV and other sources to research aircraft airworthiness directives and to look up other pertinent aircraft information. Use e-mail messaging to request information from aircraft and aircraft parts vendors for product information.	

CTE PROGRAM OF STUDY

Industry Sector: **Transportation** Career Pathway: **Aviation and Aerospace Transportation** Grade Level: **13 2nd Sem.**
Program: **Aviation Maintenance Technology**

Course Title: **Aviation Maintenance 2** TOPS: **0950** School: **Reedley College** (sample template)

Critical Course Competencies/Skills/Concepts	Course Description
Inspect, check, troubleshoot, service and repair engine ice and rain control systems. Inspect, check, troubleshoot, service and repair airframe ice and rain control systems. Repair heating, cooling, air-conditioning, pressurization, and oxygen systems components. Inspect, check, troubleshoot, service and repair heating, cooling, air-conditioning, pressurization systems. Inspect, check, troubleshoot, service and repair oxygen systems. Inspect, check, troubleshoot, service and repair aircraft fire detection and extinguishing systems. Rig rotary-winged aircraft. Rig fixed-winged aircraft. Check alignment of structures. Assemble aircraft components including flight control surfaces. Balance and rig movable surfaces. Jack aircraft.	Skills and knowledge appropriate to FAA Regulation Part 147 to include: cabin atmosphere control systems, hydraulic and pneumatic power systems, aircraft fuel systems, fuel metering systems, aircraft landing gear systems, position and warning systems, ice and rain control systems, fire protection systems, engine fire protection systems, assembly and rigging and engine instrument systems. 17.5 units. 15 hrs lecture and 15 hrs lab. 18 weeks.

Inspect, check, service and repair landing gear, retraction systems, shock struts, brakes, wheels, tires, and steering systems. Inspect, check and service speed and take off warning systems, electrical brake controls and anti- skid systems. Inspect, check, troubleshoot, service and repair landing gear position indicating and warning systems. Inspect, check, troubleshoot, service and repair engine temperature, pressure and RPM indicating systems. Troubleshoot, service, and repair fluid rate indicting systems. Inspect, check and service smoke and carbon monoxide indicating systems. Repair hydraulic and pneumatic power system components. Identify and select hydraulic fluids. Inspect, check, troubleshoot, service and repair hydraulic and pneumatic power systems. Troubleshoot and adjust engine fuel metering systems and electronic fuel controls. Overhaul carburetors. Repair engine fuel metering system components. Inspect, check, troubleshoot, service and repair reciprocating and turbine engine fuel systems. Check and service fuel dump systems. Perform fuel management, transfer, and de-fueling.	

Inspect, check, and repair pressure fueling systems. Repair aircraft fuel systems components. Inspect and repair fluid quantity indicating systems. Troubleshoot, service, and repair fluid pressure and temperature warning systems. Inspect, check, troubleshoot, service and repair aircraft fuel systems.	

CTE PROGRAM OF STUDY

Industry Sector: **Transportation** Career Pathway: **Aviation and Aerospace Transportation** Grade Level: **14 1st Sem**.
Program: **Aviation Maintenance Technology**

Course Title: **Aviation Maintenance 3** TOPS: **0950** School: **Reedley College** (sample template)

Critical Course Competencies/Skills/Concepts	Course Description
Identify and select lubricants. Repair engine lubrication systems components. Inspect, check, service, troubleshoot, and repair engine lubrication systems. Inspect, check, service and repair propeller synchronizing and ice control systems. Identify and select propeller lubricants. Balance propellers. Repair propeller control system components. Inspect, check, service and repair fixed-pitch propellers, constant speed propellers, feathering propellers, and propeller governing systems. Install, troubleshoot, and remove propellers. Repair aluminum alloy propeller blades. Inspect and repair a radial engine. Overhaul reciprocating engine.	Skills and knowledge appropriate to FAA Regulation 147 to include: reciprocating engines, turbine engines, engine inspection, lubrication systems, ignition and starting systems, induction systems, engine cooling systems, engine exhaust and reverser systems, propellers, and auxiliary power units. 17.5 units. 15 lec hrs. and 15 lab hrs. 18 weeks.

Inspect, check, service and repair reciprocating engines and engine installations. Install, troubleshoot, and remove reciprocating engines. Overhaul turbine engines. Inspect, check, service and repair turbine engines and turbine engine installations. Install, troubleshoot, and remove turbine engines. Repair engine cooling system components. Inspect, check, service, troubleshoot, and repair engine cooling systems. Inspect, check, service and repair heat exchangers and superchargers. Inspect, check, service and repair carburetor air intake and induction manifolds. Repair engine exhaust system components. Inspect, check, service, troubleshoot, and repair engine exhaust systems. Inspect, service, troubleshoot and repair reciprocating and turbine engine ignition systems and components. Inspect, check, service and repair turbine pneumatic starting systems.	

CTE PROGRAM OF STUDY

Industry Sector: **Transportation** Career Pathway: **Aviation and Aerospace Transportation** Grade Level: **14 2nd Sem.**
Program: **Aviation Maintenance Technology**

Course Title: **Aviation Maintenance 4** TOPS: **0950** School: **Reedley College** (sample template)

Critical Course Competencies/Skills/Concepts	Course Description
Perform aircraft conformity and airworthiness inspections. Install special rivets and fasteners. Inspect and repair sheet metal structures. Install conventional rivets. Hand-form, layout and bend sheet metal. Inspect bonded structures. Inspect, test, and repair fiberglass, plastics, honeycomb, composite and laminated primary and secondary structures. Inspect, check, service and repair windows, doors and interiors. 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. Install instruments and perform a static pressure system leak. Inspect, check, and troubleshoot autopilot servos and approach control systems. Inspect, check, and service aircraft electronic communication and	Skills and knowledge appropriate to FAA Regulation Part 147 to include: sheet metal and non-metallic structures, airframe inspection, communication and navigation systems, aircraft electrical systems aircraft instrument systems, and engine electrical systems. 17.5 units. 15 lec hrs and 15 lab hrs. 18weeks.

navigation systems, including VHF passenger address interphones and static discharge devices, aircraft VOR, ILS, LORAN, Radar beacon transponders, flight management computers, and GPWS. Inspect and repair antenna and electronic equipment installations. Repair engine electrical system components. Install, check, and service engine electrical wiring, controls, switches, and protective devices. Repair aircraft electrical system components: crimp and splice wiring to manufactures' specifications: and repair pins and sockets of aircraft connectors. Install, check, and service airframe electrical wiring, controls, switches, and protective devices. Inspect, check, service, troubleshoot, and repair alternating current and direct current electrical systems. Inspect, check, and troubleshoot constant speed and integrated speed drive generators.	

CTE PROGRAM OF STUDY

Industry Sector: **Transportation** Career Pathway: **Aviation and Aerospace Transportation Services** Grade Level: **9th**

Course Title: **Introduction to Transportation** CBEDS: **5651** School: **Secondary** (sample template)

Critical Course Competencies/Skills/Concepts	Course Description
Understand the advantages and disadvantages of aviation and aerospace transportation systems and the effects of those systems on the environment. (A1.4) Understand new and emerging aviation and aerospace transportation energy systems, materials resources, and technology (e.g., carbon fiber) and the related implications on the environment. (A1.5) Understand current industry practices and strategies for work processes. (A2.2) Use technical vocabulary, technical reports and manuals, electronic systems, and related technical data resources specific to components and systems in the aviation/aerospace transportation industry. (A3.2) Use appropriate personal protective equipment and safety practices. (C1.5) Understand and use appropriate tools and equipment, such as wrenches, sockets, and pliers, to maintain and repair systems and components. (C2.1) Know and understand how to access technical reports, manuals, electronic retrieval systems, and related technical data sources. (C2.6) Understand the applications of alternative power sources. (C3.4)	This introductory course enables an individual to sample the many courses and programs included in the power, energy, and transportation cluster. The purpose of the course is to assist an individual in understanding the basic skills and knowledge needed to pursue further study in the cluster and to aid in making intelligent and meaningful career and educational choices. Instructional activities focus on the theory, maintenance, and servicing of machines and devices especially on energy sources, small gasoline engines, basic electricity, and methods of transmitting power. 2 semesters, 1 year

Understand the principles of converting energy from one form to another. (C3.6) Understand the basic principles of electricity, electronics and electrical power generation, and distribution systems. (C3.5)	

CTE PROGRAM OF STUDY

Industry Sector: **Transportation** Career Pathway: **Aviation and Aerospace Transportation Services** Grade Level: **10th**

Course Title: **Automotive Mechanics, Combination** CBEDS: **5655** School: **Secondary** (sample template)

Critical Course Competencies/Skills/Concepts	Course Description
This automotive class is a recommended prerequisite for aviation in the 12th grade. Understand the generation of waste gasses, emissions, and other environmentally destructive gasses and substances and the effect of such substances on the environment. (A1.3) Understand current industry practices and strategies for work processes (A2.2) Know and understand common environmental conservation practices and their applications. (C1.1) Use tools, equipment, and machines to safely measure, test, diagnose, and analyze components and systems (e.g., electrical and electronic circuits, alternating and direct-current applications, fluid/hydraulic and air/pneumatic systems). (C2.2) Select and use the appropriate measurement device(s) and use mathematical functions necessary to perform required fabrication, maintenance, and operation procedures. (C2.3) Understand the function and principles of air conditioning and heating systems. (C3.2) Understand the basic principles of pneumatic and hydraulic power and their applications. (C3.3)	This instructional program prepares individuals for employment as automotive service technicians. This comprehensive program includes instruction in the maintenance and repair of automatic transmissions and transaxles, brakes, electrical systems, engine performance systems, engine heating and air-conditioning systems, manual drive trains and axles, and suspension and steering systems. 2 semsters, 1 year

Perform general engine maintenance, diagnosis, service, and repair in accordance with portable national industry standards, such as the National Automotive Technicians Education Foundation and the Equipment and Engine Training Council. (C6.1) Understand how to maintain, diagnose, and repair electrical systems. (C7.1)	

CTE PROGRAM OF STUDY

Industry Sector: **Transportation** Career Pathway: **Aviation and Aerospace Transportation Services** Grade Level: **11th**

Course Title: **Engine Performance/Electrical Systems, Combination** CBEDS: **5680** School: **Secondary** (sample template)

Critical Course Competencies/Skills/Concepts	Course Description
This automotive class is a recommended prerequisite for aviation in the 12th grade. Practice fundamental, application-specific work processes, safety concepts, and required behaviors. (A1.1) Practice fundamental, application-specific biological health-hazard safety concepts and required behaviors. (A1.2) Understand industry-standard measurement scales, devices, and systems used to perform design, fabrication, diagnostic, maintenance, and repair procedures. (A3.1) Practice the safe handling and storage of chemicals and hazardous wastes in accordance with material safety data sheets and the requirements of local, state and federal regulatory agencies. (C1.2) Understand the way in which waste gasses, emissions, and other environmentally destructive substances are generated and their effects on the environment. (C1.3) Know and understand how to access technical reports, manuals, electronic retrieval systems, and related technical data sources. (C2.6) Understand how to maintain, diagnose, and repair electrical systems. (C7.1) Perform necessary procedures to maintain, diagnose, service, and	This instructional program prepares individuals for employment as combination engine performance and electrical systems specialists. This specialty program includes instruction in the combined skills of the separate engine performance and electrical systems programs. 2 semesters, 1 year

repair vehicle electrical and electronic systems and malfunctions. (C7.7) Understand how to maintain, diagnose, and repair computerized engine control systems and other engine-related systems. (C6.3) Maintain, diagnose, service, and repair ignition, electronic, and computerized engine controls and fuel management systems. (C6.4)	

CTE PROGRAM OF STUDY

Industry Sector: **Transportation** Career Pathway: **Aviation and Aerospace Transportation Services** Grade Level: **12th**

Course Title: **Aviation & Aerospace Transportation Services** CBEDS: **5656** School: **Secondary** (sample template)

Critical Course Competencies/Skills/Concepts	Course Description
A1.1 Practice fundamental, application-specific work processes, safety concepts, and required behaviors. A1.2 Practice fundamental, application-specific biological health-hazard safety concepts and required behaviors. A1.3 Understand the generation of waste gasses, emissions, and other environmentally destructive gasses and substances and the effect of such substances on the environment. A1.4 Understand the advantages and disadvantages of aviation and aerospace transportation systems and the effects of those systems on the environment. A1.5 Understand new and emerging aviation and aerospace transportation energy systems, materials resources, and technology (e.g., carbon fiber) and the related implications on the environment. A1.6 Understand the elements of combustion, fire classifications, and fire-fighting equipment and techniques specific to the aviation and aerospace industries. A2.1 Understand how aviation/aerospace industry tools and equipment are used to perform systems and component maintenance and repair operations. A2.2 Understand current industry practices and strategies for work processes. A2.3 Use appropriate tools, equipment, and machines common to	This instructional program prepares the individual for employment as an airframe mechanic, a power plant mechanic, or a combination of airframe and power (A & P) mechanic. It includes instruction in inspection, repair, service, and overhaul of airplane parts, including engines, propellers, instruments, airframes, fuel and oil tanks, control cables, and hydraulic units. This program is designed to meet Federal Aviation Administration (FAA) licensure requirements. The Aviation and Aerospace Transportation Services pathway prepares students for postsecondary education and employment in the aviation and aerospace industries. 2 semesters, 1 year

aviation/aerospace components and systems. A2.4 Use tools, equipment, and machines to safely measure, test, diagnose, and analyze aviation/aerospace components and systems (e.g., electrical and electronic circuits, alternating- and direct-current applications, fluid/hydraulic, and air/ pneumatic systems). A3.1 Understand industry-standard measurement scales, devices, and systems used to perform design, fabrication, diagnostic, maintenance, and repair procedures. A3.2 Use technical vocabulary, technical reports and manuals, electronic systems, and related technical data resources specific to components and systems in the aviation/aerospace transportation industry.	