



Prepares Students for College and Careers

▲ Automotive Technology I (g)

COURSE CODES:

▲ROP 67020 ▲WUHSD 8044A4 ▲ERUSD 0000 ▲State (CALPADS) 8531

Course Leads to: Post-Secondary Education and Employment

Industry Sector: Transportation

Career Pathway: Systems Diagnostics, Service and Repair - 221

Course Level: Concentrator

Classroom Hours: 180

Work Based Learning: 180 (optional)

Textbook/Curriculum: ShopKey Pro, All Data, NC3, SP/2

POST-SECONDARY EDUCATION	INDUSTRY CERTIFICATIONS:	EMPLOYMENT
Articulation with College Yes Dual Enrollment with College No UC Approved a-g elective credit Yes "g"	NC3, SP2, MACS, ALLDATA	Related Careers (O*NET) 49-3023.02 Automotive Specialty Technicians 49-3023.01 Automotive Master Mechanics 49-9071.00 Maintenance and Repair Workers, General 49-3023.00 Automotive Service Technicians and Mechanics
COLLEGE MAJORS Electrical Engineering Technology Engineering Technology Heating, Ventilation, Air-Conditioning, and Refrigeration Technology Mechanical Engineering Robotics Technology Industrial and Product Design	NEXT STEPS <ul style="list-style-type: none"> • ROP Automotive Tech II • Attend Rio Hondo College Degree program • Attend Community College certificate program • Enroll in private-post secondary institution 	

Prerequisites:

None

Course Description:

Automotive Technology I prepares students for employment where a broad skill set and general understanding of all automotive systems are required. Students will identify commonly used tools and equipment, know a variety of sources of service information, and perform basic vehicle service and maintenance related to engine performance, transmissions, suspension and steering, brakes, electrical/electronic systems, heating and air conditioning, and customer service procedures. There is an emphasis on safety in the workplace related to use of protective eye wear/clothing, general lab procedures, use of equipment and ventilation. Worksite learning is an optional component of this class and is available to eligible students.

Integrated throughout the course are standards for Career Ready Practice and Academic Content Standards which include: appropriate technical skills, and academic knowledge including industry-specific vocabulary; communication skills; career planning; applied technology; critical thinking and problem solving; personal health and financial literacy; citizenship, integrity, ethical leadership and effective management; work productively while integrating cultural and global competence; creativity and innovation; reliable research strategies, and environment, social and economic impacts of decisions.

COURSE OUTLINE

I. ORIENTATION

- A. Introduce course and facilities
- B. Discuss syllabus and major objectives
- C. Explain attendance, grading, classroom procedures, code of conduct

II CAREERS IN TRANSPORTATION

- A. Research and report on the specialized occupations within the Transportation industry sector
- B. Identify the steps in the hiring process from application to employment
- C. List the eligibility requirements for transportation industry positions
- D. Explain the impact of pre-service activities on employability (e.g., financial irresponsibility, criminal record, improper social media behavior, etc.)
- E. Describe the physical fitness requirements.
- F. Discuss environmentally-sound practices and sustainability within the industry sector

III PREPARING FOR COLLEGE AND CAREERS

- A. Review and Discuss California CTE Model Curriculum Standards for Career Ready Practice
- B. Create an Education Plan and a Career Plan aligned with personal goals
- C. Create a Resumé
- D. Create a Career Portfolio
- E. Complete a handwritten/hand-printed Job Application neatly, legibly and with no corrections or mistakes
- F. Practice a professional job interview
- G. Evening of Excellence Essay

IV. PERSONAL AND OCCUPATIONAL SAFETY

- A. Locate and demonstrate knowledge of material safety data sheets (MSDS)
- B. Comply with the required use of safety glasses, ear protection, gloves, and shoes during lab/shop activities
- C. Identify general shop safety rules and procedures
- D. Utilize safe procedures for handling of tools and equipment
- E. (P1) Research applicable vehicle and service information, vehicle service history, service precautions, and technical service bulletins
- F. Identify and use proper placement of floor jacks and jack stands
- G. Identify and use proper procedures for safe lift operation
- H. Utilize proper ventilation procedures for working within the lab/shop area
- I. Identify marked safety areas
- J. 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
- K. Identify the location and use of eye wash stations
- L. Identify the location of the posted evacuation routes
- M. Identify and wear appropriate clothing for lab/shop activities
- N. Secure hair and jewelry for lab/shop activities
- O. Demonstrate awareness of the safety aspects of supplemental restraint systems (SRS), electronic brake control systems, and hybrid vehicle high voltage circuits
- P. Demonstrate awareness of the safety aspects of high voltage circuits (such as high intensity discharge (HID) lamps, ignition systems, injection systems, etc.)
- Q. Demonstrate proper procedures of hazardous waste disposal

V. TOOLS AND EQUIPMENT

- A. Identify tools and their usage in automotive applications
- B. Identify standard and metric designation
- C. Demonstrate safe handling and use of appropriate tools
- D. Demonstrate proper cleaning, storage, and maintenance of tools and equipment
- E. Demonstrate proper use of precision measuring tools (i.e. micrometer, dial-indicator, dial-caliper)

COURSE OUTLINE

- A. (P1) Research applicable vehicle and service information, vehicle service history, service precautions, and technical service bulletins
- B. Locate and interpret vehicle and major component identification numbers (VIN, vehicle certification labels, and calibration decals)
- C. Complete work order to include customer information, vehicle identifying information, customer concern, related service history, cause, and correction
- D. Safety check, fill, and replace to proper fluid levels: oil, engine coolant, power steering fluid, brake fluid, windshield washer fluid, differential/transfer case fluid, transmission fluid, etc
- E. Identify information needed and the service requested on a repair order
- F. Identify purpose and demonstrate proper use of fender covers, mats
- G. Demonstrate use of the three C's (concern, cause, and correction)
- H. Review vehicle service history
- I. Complete work order to include customer information, vehicle identifying information, customer concern, related service history, cause, and correction
- J. Ensure vehicle is prepared to return to customer per school/company policy (floor mats, steering wheel cover, etc.)

VII. ENGINE REPAIR

- A. (P1) Perform cooling system pressure and dye tests to identify leaks; check coolant condition and level; inspect and test radiator, pressure cap, coolant recovery tank, and heater core; determine necessary action
- B. Retrieve and record stored OBD II diagnostic trouble codes; follow flow chart, diagnose, and clear codes
- C. (P1) Verify operation of the instrument panel engine warning indicators
- D. (P1) Inspect engine assembly for fuel, oil, coolant, and other leaks; determine necessary action
- E. (P1) Install engine covers using gaskets, seals, and sealers as required
- F. (P1) Remove and replace timing belt; verify correct camshaft timing
- G. (P3) Identify hybrid vehicle internal combustion engine service precautions

Cylinder Head and Valve Train

- A. (P1) Adjust valves (mechanical lifters)

Lubrication and Cooling Systems

- A. (P1) Inspect, replace, and adjust drive belts, tensioners, and pulleys; check pulley and belt alignment
- B. (P1) Inspect and test coolant; drain and recover coolant; flush and refill cooling system with recommended coolant; bleed air as required
- C. (P1) Perform engine oil and filter change

VIII. AUTOMATIC TRANSMISSION AND TRANSAXLE

- A. Retrieve and record OBDII diagnostic trouble codes for automatic transmission
- B. (P1) Check fluid level in a transmission or a transaxle equipped with a dip-stick
- C. (P1) Check fluid level in a transmission or a transaxle not equipped with a dip-stick
- D. (P2) Check transmission fluid condition; check for leaks

In-Vehicle Transmission/Transaxle

- A. (P2) Inspect external manual valve shift linkage, transmission range sensor/switch, and park/neutral position switch
- B. (P2) Inspect for leakage at external seals, gaskets, and bushings
- C. (P2) Inspect power train mounts
- D. (P1) Drain and replace fluid and filter(s)

Off-Vehicle Transmission/Transaxle

- A. (P3) Describe the operational characteristics of a continuously variable transmission (CVT)
- B. (P3) Describe the operational characteristics of a hybrid vehicle drive train

IX. MANUAL DRIVE TRAIN AND AXLE

- A. (P2) Check fluid condition; check for leaks
- B. Check fluids and change to proper levels

COURSE OUTLINE

- C. (P1) Drain and refill manual transmission/transaxle and final drive unit

Clutch

- A. (P1) Check and adjust clutch master cylinder fluid level
- B. (P1) Check for system leaks (Clutch)

Transmission/Transaxle

- A. (P3) Describe the operational characteristics of an electronically-controlled manual transmission/transaxle

Drive Shaft, Half Shafts, Universal and Constant-Velocity (CV) Joints

- A. (P2) Inspect front wheel drive (FWD) bearings, hubs, and seals
- B. (P2) Inspect, service, and replace shafts.

Differential Case Assembly

- A. (P2) Clean and inspect differential housing; check for leaks; inspect housing vent
- B. (P1) Check and adjust differential housing fluid level
- C. (P1) Drain and refill differential housing

Drive Axles

- A. (P2) Inspect and replace drive axle wheel studs

Four-Wheel Drive/All-Wheel Drive

- A. (P3) Inspect front-wheel bearings and locking hubs
- B. (P2) Check for leaks at drive assembly seals; check vents; check lube level

X. SUSPENSION AND STEERING SYSTEMS

- A. (P1) Disable and enable supplemental restraint system (SRS)

Related Suspension and Steering Service

- A. (P1) Inspect rack and pinion steering gear inner tie rod ends (sockets) and bellows boots
- B. (P1) Determine proper power steering fluid type; inspect fluid level and condition
- C. (P1) Inspect for power steering fluid leakage; determine necessary action
- D. (P1) Remove, inspect, replace, and adjust power steering pump drive belt
- E. (P2) Inspect power steering hoses and fittings
- F. (P1) Inspect pitman arm, relay (centerlink/intermediate) rod, idler arm and mountings, and steering linkage damper
- G. (P1) Inspect tie rod ends (sockets), tie rod sleeves, and clamps
- H. (P1) Inspect upper and lower control arms, bushings, and shafts
- I. (P1) Inspect and replace rebound and jounce bumpers
- J. (P1) Inspect track bar, strut rods/radius arms, and related mounts and bushings
- K. (P1) Inspect upper and lower ball joints (with or without wear indicators)
- L. (P1) Inspect suspension system coil springs and spring insulators (silencers)
- M. (P1) Inspect suspension system torsion bars and mounts
- N. (P1) Inspect and replace front stabilizer bar (sway bar) bushings, brackets, and links
- O. (P1) Inspect strut cartridge or assembly
- P. (P1) Inspect front strut bearing and mount
- Q. (P1) Inspect rear suspension system lateral links/arms (track bars), control (trailing) arms
- R. (P1) Inspect rear suspension system leaf spring(s), spring insulators (silencers), shackles, brackets, bushings, center pins/bolts, and mounts
- S. (P1) Inspect, remove, and replace shock absorbers; inspect mounts and bushings
- T. (P3) Inspect electric power-assisted steering
- U. (P2) Identify hybrid vehicle power steering system electrical circuits and safety precautions
- V. (P3) Describe the function of the power steering pressure switch

Wheel Alignment

- A. (P1) Perform pre-alignment inspection and measure vehicle ride height; determine necessary action

Wheels and Tires

- A. (P1) Inspect tire condition; identify tire wear patterns; check for correct size and application (load and speed ratings) and adjust air pressure; determine necessary action
- B. (P1) Rotate tires according to manufacturer's recommendations

COURSE OUTLINE

- C. (P1) Dismount, inspect, and remount tire on wheel; balance wheel and tire assembly (static and dynamic)
- D. (P2) Dismount, inspect, and remount tire on wheel equipped with tire pressure monitoring system sensor
- E. (P1) Inspect tire and wheel assembly for air loss; perform necessary action
- F. (P1) Repair tire using internal patch
- G. (P2) Identify and test tire pressure monitoring systems (indirect and direct) for operation; verify operation of instrument panel lamps
- H. (P2) Demonstrate knowledge of steps required to remove and replace sensors in a tire pressure monitoring system

XI. BRAKES

- A. (P1) Inspect brake lines, flexible hoses, and fittings for leaks, dents, kinks, rust, cracks, bulging, wear, loose fittings and supports; determine necessary action
- B. (P1) Remove, clean, inspect, and measure brake drum diameter; determine necessary action
- C. (P1) Clean and inspect rotor, measure rotor thickness, thickness variation, and lateral runout; determine necessary action
- D. (P1) Check vacuum supply (manifold or auxiliary pump) to vacuum-type power booster
- E. Check parking brake operation and parking brake indicator light system operation; determine necessary action
- F. (P1) Check operation of brake stop light system
- G. (P3) Identify traction control/vehicle stability control system components
- H. (P1) Describe procedure for performing a road test to check brake system operation, including an anti-lock brake system (ABS)

Hydraulic System

- A. (P1) Measure brake pedal height, travel, and free play (as applicable); determine necessary action
- B. (P1) Check master cylinder for external leaks and proper operation
- C. (P1) Select, handle, store, and fill brake fluids to proper level
- D. (P3) Identify components of brake warning light system
- E. (P1) Bleed and/or flush brake system
- F. (P1) Test brake fluid for contamination

Drum Brakes

- A. (P1) Refinish brake drum and measure final drum diameter; compare with specifications
- B. (P1) Remove, clean, inspect, and measure brake drum diameter; determine necessary action
- C. (P1) Refinish brake drum and measure final drum diameter; compare with specifications
- D. (P1) Remove, clean, and inspect brake shoes, springs, pins, clips, levers, adjusters/self-adjusters, other related brake hardware, and backing support plates; lubricate and reassemble
- E. (P2) Inspect wheel cylinders for leaks and proper operation; remove and replace as needed
- F. (P2) Pre-adjust brake shoes and parking brake; install brake drums or drum/hub assemblies and wheel bearings; make final checks and adjustments

Disc Brakes

- A. (P1) Remove and clean caliper assembly; inspect for leaks and damage/wear to caliper housing; determine necessary action
- B. (P1) Clean and inspect caliper mounting and slides/pins for proper operation, wear, and damage; determine necessary action
- C. (P1) Remove, inspect, and replace pads and retaining hardware; determine necessary action
- D. (P1) Lubricate and reinstall caliper, pads, and related hardware; seat pads and inspect for leaks
- E. (P1) Remove and reinstall rotor
- F. (P1) Refinish rotor on vehicle; measure final rotor thickness and compare with specifications
- G. (P1) Refinish rotor off vehicle; measure final rotor thickness and compare with specifications
- H. (P3) Retract and re-adjust caliper piston on an integral parking brake system
- I. (P2) Check brake pad wear indicator; determine necessary action

COURSE OUTLINE

- J. (P1) Describe importance of operating vehicle to burnish/break-in replacement brake pads according to manufacturer's recommendations

Power-Assist Units

- A. (P2) Check brake pedal travel with, and without, engine running to verify proper power booster operation

Miscellaneous (Wheel Bearings, Parking Breaks, Electrical, Etc.)

- A. (P1) Remove, clean, inspect, repack, and install wheel bearings; replace seals; install hub and adjust bearings
- B. (P2) Check parking brake cables and components for wear, binding, and corrosion; clean, lubricate, adjust or replace as needed

Electronic Brakes and Traction and Stability Control Systems

- A. (P3) Describe the operation of a regenerative braking system

XII. ELECTRICAL/ ELECTRONIC SYSTEMS

- A. (P1) Use wiring diagrams to trace electrical/electronic circuits
- B. (P1) Demonstrate proper use of a digital multi-meter (DMM) when measuring source voltage, voltage drop (including grounds), current flow, and resistance
- A. (P1) Perform solder repair of electrical wiring
- B. (P1) Perform battery state-of-charge test; determine necessary action
- C. (P1) Perform starter circuit voltage drop tests; determine necessary action
- D. Identify location of hybrid vehicle high voltage circuit disconnects (service plug) location and safety procedures
- E. Disarm and enable the airbag system for vehicle service
- F. (P1) Demonstrate knowledge of electrical/electronic series, parallel, and series-parallel circuits using principles of electricity (Ohm's Law)
- G. (P2) Demonstrate knowledge of the causes and effects from shorts, grounds, opens, and resistance problems in electrical/electronic circuits
- H. (P2) Check operation of electrical circuits with a test light
- I. (P2) Check operation of electrical circuits with fused jumper wires
- J. (P1) Measure key-off battery drain (parasitic draw)
- K. (P1) Inspect and test fusible links, circuit breakers, and fuses; determine necessary action
- L. (P1) Replace electrical connectors and terminal ends
- M. (P1) Confirm proper battery capacity for vehicle application; perform battery capacity test; determine necessary action
- N. (P1) Maintain or restore electronic memory functions
- O. (P1) Inspect and clean battery; fill battery cells; check battery cables, connectors, clamps, and hold-downs
- P. (P1) Perform slow/fast battery charge according to manufacturer's recommendations
- Q. (P1) Jump-start vehicle using jumper cables and a booster battery or an auxiliary power supply
- R. (P3) Identify high-voltage circuits of electric or hybrid electric vehicle and related safety precautions
- S. (P1) Identify electronic modules, security systems, radios, and other accessories that require re-initialization or code entry after reconnecting vehicle battery
- T. (P3) Identify hybrid vehicle auxiliary (12v) battery service, repair, and test procedures

Starting System

- A. (P1) Perform starter current draw test; determine necessary action
- B. (P2) Inspect and test starter relays and solenoids; determine necessary action
- C. (P1) Remove and install starter in a vehicle
- D. (P2) Inspect and test switches, connectors, and wires of starter control circuits; determine necessary action

Charging System

- A. (P1) Perform charging system output test; determine necessary action
- B. (P1) Inspect, adjust, or replace generator (alternator) drive belts; check pulleys and tensioners for wear; check pulley and belt alignment

COURSE OUTLINE

- C. (P2) Remove, inspect, and re-install generator (alternator)
- D. (P1) Perform charging circuit voltage drop tests; determine necessary action

Lighting Systems

- A. (P1) Inspect interior and exterior lamps and sockets including headlights and auxiliary lights (fog lights/driving lights); replace as needed
- B. (P2) Identify system voltage and safety precautions associated with high-intensity discharge headlights

Accessories

- A. (P1) Disable and enable airbag system for vehicle service; verify indicator lamp operation
- B. (P3) Describe the operation of keyless entry/remote-start systems
- C. (P1) Verify operation of instrument panel gauges and warning/indicator lights; reset maintenance indicators
- D. (P1) Verify windshield wiper and washer operation; replace wiper blades

XIII. HEATING AND AIR CONDITIONING

- A. (P1) Inspect and replace A/C compressor drive belts, pulleys, and tensioners; determine necessary action
- B. (P2) Identify hybrid vehicle A/C system electrical circuits and the service/safety precautions
- C. (P1) Inspect A/C condenser for airflow restrictions; determine necessary action
- D. (P1) Inspect engine cooling and heater systems hoses; perform necessary action
- E. (P1) Inspect A/C-heater ducts, doors, hoses, cabin filters, and outlets; perform necessary action
- F. (P2) Identify the source of A/C system odors

IXX. ENGINE PERFORMANCE

- A. (P1) Perform engine absolute (vacuum/boost) manifold pressure tests; determine necessary action
- B. (P2) Perform cylinder power balance test; determine necessary action
- C. (P1) Perform cylinder cranking and running compression tests; determine necessary action
- D. (P1) Perform cylinder leakage test; determine necessary action
- E. (P1) Verify engine operating temperature
- F. (P1) Remove and replace spark plugs; inspect secondary ignition components for wear and damage

Computerized Engine Controls

- A. (P1) Retrieve and record diagnostic trouble codes, OBD monitor status, and freeze frame data; clear codes when applicable
- B. (P1) Describe the importance of operating all OBDII monitors for repair verification

Fuel, Air Induction, and Exhaust Systems

- A. (P1) Inspect, service, or replace air filters, filter housings, and intake duct work
- B. (P1) Inspect integrity of the exhaust manifold, exhaust pipes, muffler(s), catalytic converter(s), resonator(s), tail pipe(s), and heat shields; determine necessary action
- C. (P1) Inspect condition of exhaust system hangers, brackets, clamps, and heat shields; repair or replace as needed
- D. (P3) Check and refill diesel exhaust fluid (DEF)

Emissions Control Systems

- A. (P2) Inspect, test, and service positive crankcase ventilation (PCV) filter/breather cap, valve, tubes, orifices, and hoses; perform necessary action

ESSENTIAL STANDARDS AND KEY ASSIGNMENTS
INDUSTRY SECTOR: Transportation

ESSENTIAL PATHWAY STANDARD – C1.0

Demonstrate the practice of personal and occupational safety and protecting the environment by using material and processes in accordance with manufacturer and industry standards

KEY ASSIGNMENT

Complete SP/2 Mechanical Safety and Pollution Prevention material.

ESSENTIAL PATHWAY STANDARD – C2.0

Practice the safe and appropriate use of tools, equipment, and work processes.

KEY ASSIGNMENT

Using shop vehicle, lift, remove and replace wheel including torque.

ESSENTIAL PATHWAY STANDARD – C3.0

Use scientific principles in relation to chemical, mechanical, and physical functions for various engine and vehicle systems.

KEY ASSIGNMENT

Using shop vehicle perform power balance test.

ESSENTIAL PATHWAY STANDARD – C4.0

Perform and document maintenance procedures in accordance with the recommendations of the manufacturer.

KEY ASSIGNMENT

Using shop vehicle perform oil change and inspection.

ESSENTIAL PATHWAY STANDARDS – C5.0

Apply and understand appropriate business practices.

KEY ASSIGNMENT

Using ShopKey create an estimate and invoice.

ESSENTIAL PATHWAY STANDARDS – C7.0

Demonstrate the function, principles, and operation of electrical and electronic systems using manufacturer and industry standards.

KEY ASSIGNMENT

Understand battery and charging systems. Pass NC3 certification program.

ESSENTIAL PATHWAY STANDARDS – C8.0

Demonstrate the function and principles of automotive drivetrain, steering and suspension, brake, and tire and wheel components and systems in accordance with national industry standards.

KEY ASSIGNMENT

Using shop car perform disc brake job. Using shop car disassemble and assemble strut.

STANDARDS FOR CAREER READY PRACTICE

1. Apply appropriate technical skills and academic knowledge. Career-ready individuals readily access and use the knowledge and skills acquired through experience and education. They make connections between abstract concepts with real-world applications and recognize the value of academic preparation for solving problems, communicating with others, calculating measures, and performing other work-related practices.

2. Communicate clearly, effectively, and with reason. Career-ready individuals communicate thoughts, ideas, and action plans with clarity, using written, verbal, electronic, and/or visual methods. They are skilled at interacting with others: they are active listeners who speak clearly and with purpose, and they are comfortable with terminology that is common to workplace environments. Career-ready individuals consider the audience for their communication and prepare accordingly to ensure the desired outcome.

3. Develop an education and career plan aligned with personal goals. Career-ready individuals take personal ownership of their educational and career goals and manage their individual plan to attain these goals. They recognize the value of each step in the educational and experiential process, and they understand that nearly all career paths require ongoing education and experience to adapt to practices, procedures, and expectations of an ever-changing work environment. They seek counselors, mentors, and other experts to assist in the planning and execution of education and career plans.

4. Apply technology to enhance productivity. Career-ready individuals find and maximize the productive value of existing and new technology to accomplish workplace tasks and solve workplace problems. They are flexible and adaptive in acquiring and using new technology. They understand the inherent risks—personal and organizational—of technology applications, and they take actions to prevent or mitigate these risks.

5. Utilize critical thinking to make sense of problems and persevere in solving them. Career-ready individuals recognize problems in the workplace, understand the nature of the problems, and devise effective plans to solve the problems. They thoughtfully investigate the root cause of a problem prior to introducing solutions. They carefully consider options to solve a problem and, once agreed upon, follow through to ensure the problem is resolved.

6. Practice personal health and understand financial literacy. Career-ready individuals understand the relationship between personal health and workplace performance. They contribute to their personal well-being through a healthy diet, regular exercise, and mental health activities. Career-ready individuals also understand that financial literacy leads to a secure future that enables career success.

7. Act as a responsible citizen in the workplace and the community. Career-ready individuals understand the obligations and responsibilities of being a member of a community and demonstrate this understanding every day through their interactions with others. They are aware of the impacts of their decisions on others and the environment around them, and they think about the short-term and long-term consequences of their actions. They are reliable and consistent in going beyond minimum expectations and in participating in activities that serve the greater good.

8. Model integrity, ethical leadership, and effective management. Career-ready individuals consistently act in ways that align with personal and community-held ideals and principles. They employ ethical behaviors and actions that positively influence others. They have a clear understanding of integrity and act on this understanding in every decision. They use a variety of means to positively impact the direction and actions of a team or organization, and they recognize the short-term and long-term effects that management's actions and attitudes can have on productivity, morale, and organizational culture.

9. Work productively in teams while integrating cultural and global competence. Career-ready individuals contribute positively to every team, as both team leaders and team members. To avoid barriers to productive and positive interaction, they apply an awareness of cultural differences. They interact effectively and sensitively with all members of the team and find ways to increase the engagement and contribution of other members.

10. Demonstrate creativity and innovation. Career-ready individuals recommend ideas that solve problems in new and different ways and contribute to the improvement of the organization. They consider unconventional ideas and suggestions by others as solutions to issues, tasks, or problems. They discern which ideas and suggestions may have the greatest value. They seek new methods, practices, and ideas from a variety of sources and apply those ideas to their own workplace practices.

11. Employ valid and reliable research strategies. Career-ready individuals employ research practices to plan and carry out investigations, create solutions, and keep abreast of the most current findings related to workplace environments and practices. They use a reliable research process to search for new information and confirm the validity of sources when considering the use and adoption of external information or practices.

12. Understand the environmental, social, and economic impacts of decisions. Career-ready individuals understand the interrelated nature of their actions and regularly make decisions that positively impact other people, organizations, the workplace, and the environment. They are aware of and utilize new technologies, understandings, procedures, and materials and adhere to regulations affecting the nature of their work. They are cognizant of impacts on the social condition, environment, workplace, and profitability of the organization.

1: Academics

Analyze and apply appropriate academic standards required for successful industry sector pathway completion leading to postsecondary education and employment. Refer to the industry sector alignment matrix for identification of standards. Note: alignment listed within each sector Anchor Standard

2: Communications Language Standard

Acquire and accurately use general academic and domain-specific words and phrases sufficient for reading, writing, speaking, and listening at the (career and college) readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression. LS 9-10, 11-12.6 Anchor Standard

3: Career Planning and Management Speaking and Listening Standard

Integrate multiple sources of information presented in diverse formats and media (e.g., visually, quantitatively, orally) in order to make informed decisions and solve problems, evaluating the credibility and accuracy of each source and noting any discrepancies among the data. SLS 11-12.2 Anchor Standard

4: Technology Writing Standard

Use technology, including the Internet, to produce, publish, and update individual or shared writing products in response to ongoing feedback, including new arguments and information. WS 11-12.6 Anchor Standard

5: Problem Solving and Critical Thinking Writing Standard

Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem, narrow or broaden the inquiry when appropriate, and synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation. WS 11-12.7 Anchor Standard

6: Health and Safety Reading Standards for Science and Technical Subjects

Determine the meaning of symbols, key words, and other domain-specific words and phrases as they are used in a specific scientific or technical context. RSTS 9-10 11-12.4 Anchor Standard

7: Responsibility and Flexibility Speaking and Listening Standard

Initiate and participate effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners, building on others' ideas and expressing their own clearly and persuasively. SLS 9-10 11-12.1 Anchor Standard

8: Ethics and Legal Responsibilities Speaking and Listening Standard

Respond thoughtfully to diverse perspectives; synthesize comments, claims, and evidence made on all sides of an issue; resolve contradictions when possible; and determine what additional information or research is required to deepen the investigation or complete the work. SLS 11-12.1d Anchor Standard

9: Leadership and Teamwork Speaking and Listening Standard

Work with peers to promote civil, democratic discussions and decision making; set clear goals and deadlines; and establish individual roles as needed. SLS 11-12.1b Anchor Standard

10: Technical Knowledge and Skills Writing Standard

Use technology, including the Internet, to produce, publish, and update individual or shared writing products in response to ongoing feedback, including new arguments or information. WS 11-12.6 Anchor Standard

11: Demonstration and Application

Demonstrate and apply the knowledge and skills contained in the industry-sector anchor standards, pathway standards, and performance indicators in classroom, laboratory, and workplace settings, and the career technical student organization.