

Work-Based Learning - AES

Level: 4

Career Cluster: Advanced Manufacturing

Program: Engineering

Pathway(s): Aerospace Engineering Technician

Course Catalog Description

This course gives students the opportunity to apply technical and professional skills in authentic or simulated industry settings. Students strengthen workplace readiness through hands-on experience with safety, quality, documentation, testing, communication, and problem solving while preparing for postsecondary training and careers in aerospace and advanced manufacturing.

Summary

This work-based learning course provides students in the Aerospace Engineering Technician pathway with an opportunity to apply advanced technical knowledge and professional skills in authentic industry-aligned settings. Building on prior coursework in aerospace, engineering design, manufacturing, electronics, technical drawing, and technical writing, students engage in structured workplace or simulated workplace experiences that deepen their understanding of aerospace technician roles and responsibilities. Emphasis is placed on safety, quality assurance, technical documentation, testing procedures, problem solving, communication, and professional conduct as students contribute to tasks such as inspection, prototyping, assembly support, data collection, troubleshooting, and process improvement. Through collaboration with instructors, mentors, and industry partners, students develop employability skills including accountability, adaptability, teamwork, and effective communication while gaining exposure to postsecondary pathways, credentials, and career opportunities in aerospace and advanced manufacturing. The course culminates in reflection, portfolio development, and presentation of workplace learning, preparing students for continued education, apprenticeships, internships, and entry-level opportunities within Colorado's aerospace and engineering workforce.

Notes

Compared with the older generic course, this revised version is more pathway-specific, more detailed, and more clearly aligned to authentic aerospace industry practice. The previous course focused broadly on general work-based learning expectations such as identifying career goals, creating a training plan, documenting hours, completing a safety agreement, and receiving employer evaluation, with sample experiences drawn from multiple unrelated pathways rather than aerospace-specific contexts. In contrast, the new course organizes learning into targeted sections that emphasize aerospace technician responsibilities, including workplace safety and quality, applied technical experience, testing and troubleshooting, technical documentation, continuous improvement, postsecondary transition, and portfolio development. It also adds clearer real-world experience ideas, stronger connections to technical tasks such as assembly, inspection, testing, and data collection, and a more defined emphasis on communication.

Student Learning Outcomes

1. Career Launch and WBL Planning

Objective: *Students prepare for placement, identify career goals, and build the professional materials needed to begin a work-based learning experience.*

- Analyze aerospace engineering technician career roles, work environments, and expectations
- Identify individual interests in areas such as testing, manufacturing, quality control, systems support, documentation, or inspection
- Create or refine a resume, introductory statement, and interview responses
- Develop an individualized work-based learning plan with technical and employability goals
- Demonstrate understanding of workplace expectations, safety, accountability, and communication norms

Real-World Experience Ideas

- Complete a mock interview and revise career materials
- Join an aerospace career exploration visit
- Create a WBL training plan with a mentor
- Job shadow an aerospace technician

2. Workplace Safety, Quality, and Professional Practice

Objective: *Students connect technical work to safety, quality, compliance, and responsible workplace behavior.*

- Demonstrate safety habits appropriate to aerospace labs, shops, testing spaces, or production environments
- Explain how quality standards influence aerospace work
- Practice professional conduct, punctuality, and task accountability
- Use workplace communication practices to ask questions, document tasks, and respond to feedback
- Recognize the importance of precision and documentation in aerospace settings

Real-World Experience Ideas

- Complete a workplace safety walk-through
- Observe a quality assurance process
- Write a professionalism reflection
- Practice a compliance documentation task

3. Applied Aerospace Technical Experience

Objective: *Students perform technician-level tasks in a real aerospace setting.*

- Apply technical skills while supporting aerospace-related tasks or projects

- Use tools, procedures, and specifications accurately
- Assist with prototyping, assembly, inspection, or test preparation activities
- Read and apply technical instructions, schematics, drawings, or checklists
- Contribute to workplace tasks under teacher, mentor, or employer guidance

Real-World Experience Ideas

- Assist with a supervised assembly task
- Support a lab or manufacturing team
- Complete an internship-style task
- Contribute to an industry project

4. Testing, Data, and Troubleshooting

Objective: *Students participate in testing processes and learn to interpret evidence from technical work.*

- Assist with readiness checks, test setups, or system evaluation tasks
- Record observations, measurements, and test results accurately
- Identify issues, discrepancies, or irregularities and communicate them appropriately
- Analyze test information to support troubleshooting or improvement
- Explain how evidence and data inform engineering decisions

Real-World Experience Ideas

- Help set up a test procedure
- Collect and organize test data
- Troubleshoot a minor systems issue
- Write a short data summary

5. Technical Documentation and Communication

Objective: *Students communicate technical work clearly to instructors, mentors, and stakeholders.*

- Produce logs, reports, summaries, or process documentation connected to workplace tasks
- Organize technical information for visual, written, and oral communication
- Use accurate aerospace and engineering vocabulary
- Present work progress, findings, and recommendations clearly
- Reflect on communication effectiveness for different audiences

Real-World Experience Ideas

- Maintain a technician logbook
- Write a technical task summary
- Present progress to a mentor
- Revise documentation after feedback

6. Industry Problem Solving and Continuous Improvement

Objective: *Students use evidence, reflection, and quality thinking to improve products, processes, or performance.*

- Analyze process or product challenges in an aerospace-related task
- Apply structured problem-solving methods to identify possible improvements
- Consider safety, quality, efficiency, and documentation when proposing solutions
- Collaborate with peers, mentors, or supervisors to refine ideas
- Reflect on how workplace expectations influence decision-making and performance

Real-World Experience Ideas

- Analyze a recurring task issue
- Discuss workflow or quality improvements
- Use root cause analysis on a problem
- Reflect on improvement decisions

7. Postsecondary Transition and Workforce Readiness

Objective: *Students prepare for next-step options in aerospace education and employment.*

- Investigate postsecondary programs, credentials, apprenticeships, and careers related to aerospace engineering technician work
- Compare options such as two-year programs, four-year programs, training, internships, and apprenticeship opportunities
- Revise a professional resume and portfolio using evidence from WBL experiences
- Practice interview responses and professional self-presentation
- Develop a transition plan for the first year after graduation

Real-World Experience Ideas

- Compare aerospace programs and credentials
- Attend a college or employer info session
- Update a resume and portfolio
- Practice a mock hiring interview

8. Portfolio and Presentation

Objective: *Students synthesize their learning into a professional portfolio and final presentation.*

- Compile artifacts showing technical growth, workplace readiness, and reflection
- Present a summary of work completed, skills developed, and lessons learned
- Explain how classroom learning connected to workplace tasks
- Evaluate strengths, challenges, and areas for continued growth
- Communicate future education and career goals with evidence

Additional Information

WBL Experience Options (Learning THROUGH → AT Work)

- Colorado aerospace workforce initiatives now include work-based learning and credential pathways through PROPEL Colorado | Aerospace Workforce Development.
- Colorado's state guidance says approved WBL models include internships, industry-sponsored projects, pre-apprenticeships
- High School Programs | Lockheed Martin explicitly lists high school internships for students interested in STEM careers, including locations in Denver, and says the program includes on-the-job training, mentoring, professional development, networking, and tours.
- Aerospace lab internship
- Aerospace manufacturing support placement
- Industry-sponsored testing/documentation project
- Pre-apprenticeship exploration
- High school internship with an aerospace employer, when available locally

End-of-Course Outcomes

- Apply aerospace engineering technician knowledge in authentic workplace settings.
- Demonstrate safe, ethical, and professional behavior in aerospace-related work environments.
- Use technical documentation, communication, and reporting practices appropriate for aerospace and engineering contexts.
- Contribute to tasks involving testing, prototyping, inspection, quality assurance, manufacturing support, or systems troubleshooting.
- Demonstrate employability skills such as punctuality, teamwork, responsibility, adaptability, and professional communication.
- Analyze feedback from instructors, mentors, or employers and improve performance over time.
- Develop a professional portfolio showing technical work, reflections, workplace artifacts, and career readiness evidence.
- Evaluate postsecondary and career options in aerospace engineering technician pathways.

Assessment Structure

- Work-Based Learning Training Plan
- Employer or Mentor Evaluation
- Weekly Reflection Logs
- Technical Task Checklist
- Testing / Quality Documentation
- Resume and Updated Career Materials
- Portfolio of Artifacts
- Final Presentation