

Work-Based Learning - ENG

Level: 4

Career Cluster: Advanced Manufacturing

Program: Engineering

Pathway(s): Engineering

Course Catalog Description

This course provides students with an opportunity to apply engineering knowledge and technical skills in authentic workplace settings through supervised work-based learning experiences. Students build professional, technical, and career-readiness skills while engaging in internships, industry projects, mentorship, or other real-world engineering experiences that support transition to employment or postsecondary pathways.

Summary

This course provides students with an extended opportunity to apply classroom knowledge in authentic professional settings while deepening technical skills, workplace readiness, and career awareness. Through internships, industry-sponsored projects, job shadowing, mentorship, pre-apprenticeship experiences, or other supervised work-based learning placements, students engage in meaningful engineering-related tasks that connect directly to career pathways in areas such as manufacturing, robotics, civil engineering, design, construction, and systems development. Students develop and follow an individualized training plan, demonstrate professional communication and collaboration, practice problem-solving in real-world contexts, and use industry tools, processes, and documentation methods to complete workplace assignments. Emphasis is placed on safety, accountability, ethical practice, technical proficiency, and the ability to reflect on learning through ongoing logs, feedback, and evaluation. As students progress toward greater independence, they build a professional portfolio that highlights work samples, project contributions, and personal growth, culminating in a final presentation that demonstrates readiness for employment, apprenticeships, or postsecondary education in engineering and related technical fields.

Notes

This updated course reflects a significant shift from the previous version by moving from a broad, generic work-based learning structure to a more pathway-specific Engineering course with clearer organization, stronger emphasis on authentic industry application, and more detailed expectations for student performance. The revised course now includes a focused engineering context throughout the summary, outcomes, and real-world experience examples, replacing generalized work-based learning language with pathway-aligned experiences such as CAD design, prototyping, robotics, construction planning, and engineering problem solving. In addition, the updated version expands the course structure to include more clearly defined sections on workplace readiness, applied engineering experience, industry collaboration, advanced work-based learning, and a culminating portfolio and presentation, which creates a more coherent progression from career preparation to independent workplace performance.

Student Learning Outcomes

1. Career Alignment & WBL Planning

Objective: Establish readiness for Learning *THROUGH* Work. Students participate in one or more sustained experiences (**30+ hours** recommended in Colorado).

- Align personal career interests with engineering career pathways
- Develop an individualized Work-Based Learning Plan (training agreement)
- Identify workplace expectations, safety standards, and legal requirements
- Set measurable professional and technical goals

Real-World Experience Ideas

- Resume + portfolio development
- Mock interviews with industry partners
- Employer matching / placement process
- Job shadow or short-term site visits (if needed for placement confirmation)

2. Workplace Readiness & Professional Skills

Objective: Strengthen employability and workplace success skills.

- Demonstrate professional communication with supervisors and teams
- Apply workplace norms (attendance, punctuality, accountability)
- Use collaboration and problem-solving strategies in real work settings
- Practice workplace documentation and reporting

Real-World Experience Ideas

- Weekly check-ins
- Workplace communication logs
- Safety training certifications (OSHA 10, etc., if applicable)

3. Applied Engineering Experience

Objective: Apply core Learning *THROUGH* Work experiences.

- Apply technical engineering skills in a workplace industry setting
- Contribute to real projects such as design, testing, fabrication, or analysis
- Use industry tools, technologies, and processes
- Document work using professional engineering practices

Real-World Experience Ideas

- Designing CAD models for a local company
- Assisting with manufacturing or prototyping
- Supporting infrastructure or construction planning
- Robotics programming and testing
- Data analysis for engineering performance

4. Industry Collaboration & Problem Solving

Objective: *Engage in authentic problem-solving and mentorship.*

- Work with industry mentors to solve engineering challenges
- Analyze constraints (budget, materials, sustainability, safety)
- Apply iterative design and testing processes
- Communicate progress and solutions to stakeholders

Real-World Experience Ideas

- Industry-sponsored design challenge
- Engineering consulting-style project
- Team collaboration with company partners

5. Advanced Work-Based Learning (Toward Learning AT Work)

Objective: *Advance toward career training and workplace independence.*

- Demonstrate independence in workplace responsibilities
- Apply technical and employability skills with minimal supervision
- Meet employer expectations for performance and productivity
- Understand pathways to employment, apprenticeships, or postsecondary programs

Real-World Experience Ideas

- Extended internship hours
- Paid work experience (if available)
- Credential or certification attainment

6. Engineering Portfolio & Presentation

Objective: *Demonstrate learning through a culminating portfolio and presentation.*

- Develop a professional portfolio including:
 - Work samples
 - Project documentation
 - Reflection artifacts
- Present a project to industry and/or school panel
- Evaluate personal readiness for postsecondary education or employment

Additional Information

WBL Experience Options (Learning THROUGH → AT Work)

- Engineering Internship (civil firm, manufacturing plant, robotics lab)
- Industry-Sponsored Engineering Design Project
- Pre-Apprenticeship (construction, machining, electrical systems)
- Supervised Entrepreneurship (engineering-based startup, prototyping business)
- School-Based Enterprise (engineering fabrication lab, makerspace production)

End-of-Course Outcomes

- Apply the engineering design process to solve authentic, industry-defined problems
- Demonstrate technical proficiency in a specific engineering pathway (mechanical, civil, manufacturing, robotics, etc.)
- Collaborate with industry mentors to complete workplace tasks and projects
- Exhibit professional workplace behaviors, including communication, time management, and accountability
- Evaluate career pathways and develop a postsecondary transition plan
- Produce and present a portfolio demonstrating workplace learning and impact
- Reflect on workplace experiences to identify strengths, challenges, and growth areas

Assessment Structure

- Work-Based Learning Training Plan (student + employer + teacher)
- Employer Evaluations (performance + employability skills)
- Weekly Reflection Logs
- Technical Skill Demonstrations
- Project & Portfolio Presentation