

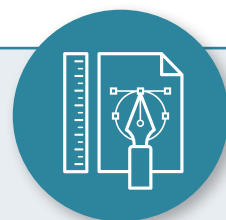


Skilled and Technical: Manufacturing Production

Manufacturing is a vital sector of the economy in Washington state where many companies produce high-quality products and services for various industries. Some of the top-rated manufacturing companies hiring in Washington state include PepsiCo, Nike, Boeing, and Microsoft. These companies offer a range of jobs for manufacturing engineers, technicians, managers, and other professionals. The average salary for a manufacturing engineer in Washington State is higher than the national average. Manufacturing engineers also enjoy various benefits, such as flexible spending account, health savings account, life insurance, paid time off, parental leave, and professional development assistance. Manufacturing engineers are responsible for designing, developing, testing, and improving manufacturing processes and systems. They work closely with other engineers, technicians, and managers to ensure quality, efficiency, and safety standards are met. A career in manufacturing can be rewarding and fulfilling for anyone who is interested in creating innovative products and solutions. Students who take two credits in Manufacturing Production meet the requirements for a CTE graduation pathway.

Students in this pathway will:

- ➔ Be able to participate in high school apprenticeships through AJAC.
- ➔ Be able to participate in SkillsUSA and TSA clubs.
- ➔ Be able to receive dual credit (college credit) through Everett Community College.
- ➔ Be prepared to receive additional training at a two-year college or apprenticeship program.



What high-demand careers are related to the Manufacturing Production Pathway?

| High-demand careers | Annual salary in Washington | Required training after high school | Schools offering degrees or certification |
|--|-----------------------------|-------------------------------------|--|
| Computer numerically controlled tool operators | \$50,056 | High school diploma | Lake Washington Institute of Technology Everett Community College Renton Technical College |
| Machinists | \$53,275 | High school diploma | Lake Washington Institute of Technology Everett Community College Renton Technical College |
| Structural metal fabricators and fitters | Not available | High school diploma | University of Washington Washington State University Western Washington University |
| Welders, cutters, solderers, and brazers | \$62,021 | High school diploma | Renton Technical College Everett Community College Bates Technical College |
| Architectural and engineering managers | \$159,758 | Bachelor's degree | Lake Washington Institute of Technology Everett Community College Renton Technical College |

* Information from Washington State Employment Security Department, 2023

What courses are offered in the Manufacturing Production Pathway?

| Middle school courses in this pathway | College credit offered | | | Leads to a certification? | Equivalencies offered to meet graduation requirements |
|---|------------------------|----------------------------|----|-----------------------------|---|
| Exploring Engineering I | N/A | | | N/A | N/A |
| Exploring Engineering II | N/A | | | N/A | N/A |
| Computer Aided Drafting (Centennial Middle School only) | N/A | | | N/A | N/A |
| High school courses in this pathway | College credit offered | | | Leads to a certification? | Equivalencies offered to meet graduation requirements |
| | CTE dual credit | College in the High School | AP | | |
| Shop 1: Shop Technology (0.5 credit) | | | | | |
| Welding Science (0.5 credit) | | | | OSHA 10 certification (SHS) | 0.5 3rd year science credit |
| Shop 2: Core Plus Manufacturing (SHS - 1.0 credit) | X | | | Core Plus certification | 0.5 science credit |
| Shop 2/3: Manufacturing Technology (GPHS - 1.0 credit) | | | | | 0.5 science credit |
| Shop 4 Fabrication lab (GPHS - 1.0 credit) | | | | | |

Suggested course sequence - Manufacturing Production Pathway:

Snohomish High School



Glacier Peak High School



Middle school courses

Exploring Engineering I – This is a semester-long exploratory STEM course that incorporates project-based learning, with a focus on the engineering cycle. Students will learn about a variety of topics, including power tool safety and operation, measurement, robotics, CNC manufacturing, CADD, robotics, and more.

Exploring Engineering II – This is a semester-long exploratory STEM course that incorporates project-based learning, with a focus on the engineering, cycle. Students will apply problem solving, visual communication, and industrial skills to design and build challenging and exciting projects. Units of study include power tool safety and operation, manufacturing, electricity/electronics, CADD, and more. Engineering I is not a prerequisite for this course.

Computer Aided Drafting (Centennial Middle School only) – This course starts out by exploring how to use the computer-aided drafting program, Rhino. Students will be using Rhino to design 3D models of projects that they will manufacture in the shop with 3-D printers, laser cutters, vinyl cutters, and CNC routers. Students who take this class and receive an “A” grade can waive “Computer Aided Design Fundamentals” at Snohomish High School.

High school courses

Shop 1: Shop Technology – This is an exploratory course focused on engineering and technology. Students will look at various technology systems, manufacturing processes and associated careers. Using demonstrations, hands-on activities, and small projects, students learn how to apply STEM skills to real-world engineering problems.

Shop 2: Core Plus Manufacturing (Snohomish High School only) – In this class, students plan, fabricate, stage, and assemble aerospace components from engineering blueprints and specifications. Students will be prepared for engineering programs, immediate manufacturing employment, advanced certifications, and further employment. In addition, special employment agreements between Boeing and Core Plus certified students exist, like participating in the summer Boeing internship and direct employment from the class. Students may receive a Core Plus Manufacturing Certificate. 17 college credits are available to students through CTE dual credit. 0.5 science equivalency credit is available.

Shop 2/3: Manufacturing Technology (Glacier Peak High School only) – Manufacturing Technology is a one-year class with a strong emphasis on creating, planning, and completing hands-on projects. This is a course utilizing leading-edge manufacturing processes in woods, composites, metals, and material science. Students will use and care for hand tools, power tools, and stationary equipment. 0.5 science equivalency credit is available.

Shop 4: Fabrication Lab (Glacier Peak High School only) – In this course, participants will produce a project combining concepts learned in previous manufacturing and design coursework. Introduction to planning, scheduling, cost estimating, and advanced production processes are integral to this class. An emphasis will be placed on creativity, design, digital graphics work, and automated machine proficiency.

Welding Science – In this course students will use advanced welding techniques and fabrication equipment to join, cut, bend, and manipulate metal components for industrial and artistic applications. Students will also control fire and electricity to design, dismantle, and weld a wide range of metal products using the same equipment and techniques as industry leaders. The instructors will also ask students to solve challenging problems using high-tech materials, machines, and techniques that are used in industry. 0.5 3rd year of science equivalency credit is available.

What clubs are offered to practice career-related skills and leadership?

In high school, SkillsUSA is one CTE co-curricular opportunity (called a Career and Technical Student Organization) that is related to the Manufacturing Production career pathway. SkillsUSA is a prominent student organization that empowers young individuals with technical and leadership skills, preparing them for successful careers in trade, technical, and skilled service occupations. Through SkillsUSA, students engage in a variety of hands-on activities, competitions, and workshops that enhance their expertise in fields such as construction, manufacturing, automotive technology, healthcare, and more. Members have the opportunity to develop practical skills, collaborate with peers, and demonstrate their abilities in regional, state, and national competitions. As they progress through their education, SkillsUSA students hone their problem-solving, teamwork, and communication skills, positioning them for a broad spectrum of careers. Following high school, many SkillsUSA alumni embark on pathways in fields such as welding, engineering, healthcare technology, culinary arts, and other skilled trades, contributing to industries that are vital to economic growth and innovation.

TSA (Technology Student Association) is the other CTE co-curricular opportunity (called a Career and Technical Student Organization) that is related to the Manufacturing Production pathway. In TSA, students engage in a wide spectrum of hands-on activities, competitions, and projects that encourage creativity, problem-solving, and technological skills development. Members have the opportunity to explore diverse fields such as robotics, engineering, coding, graphic design, and environmental sciences. As TSA students advance through their educational journey, they acquire practical experience, collaborate on innovative projects, and refine their technical expertise. Following high school, many TSA alumni pursue careers in engineering, computer science, architecture, industrial design, information technology, and other technology-related fields, contributing to advancements in technology and its applications across industries, from sustainability to entertainment and beyond.

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