



Bridges Career Academy

Trades and Manufacturing

Aitkin High School

Understand careers in the world of manufacturing. Experience working with a variety of metals, while designing, welding and machining parts. Learn skills in fabrication, machining, sign making, blueprint software, material selection, project billing and shop safety. Project-based, using real-life activities. Work on small engine and community projects. Gain entry-level employment or continue education.

Academic Courses

- Metals I
- Metals II
- Engines I
- Introduction to Engineering

Career Experiences

- Work on community projects
- Use current industry technologies
- Design and fabricate projects
- Attend the Bridges Career Exploration Day or other regional career fairs

Completion Standards

COMPLETE



3 of 4
courses

GRADES

B ↑

Earn a **certificate**
and **green cord**
at graduation



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Job Skills

In addition to having technical skills, employers expect workers in this industry to have these skills:

- Tool maintenance
- Attention to details
- Teamwork
- Shop safety
- Oral and written communications skills
- Ability to work with customers



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The Manufacturing Academy provides students with an understanding of the vast number of careers in the world of manufacturing and Engineering today. Students will experience working with a variety of materials and software, while designing, welding and machining parts and repairing community projects. Skills in metal fabrication, sign making, blueprint reading, and shop safety are essential elements of the courses. CAM and SketchUp software will be used for designing personal projects and projects for selling in the school store and throughout the community. When completing this academy, students will have the practical skills to enter the work force or transfer credits to higher education.

ACADEMY COURSES

Metals I: Intro to Welding and Fabrication — 1 High School Credit

Students learn the basic types and properties of metals, how to design a project and how to bill for materials. Students will cut, bend, fasten and melt metals demonstrating the basics of fabrication through various projects. Safety and effectively ARC weld, MIG weld, Oxy-Acetylene weld, and Tig weld using both steel and aluminum metals are part of the course. Student will demonstrate proficiencies in welding and fabrication through individualized projects and provide fabrication services to the community.

Metals II: Advanced Welding, Machining, and Manf. — 1 High School Credit and 3 College Credits

Students hone skills at welding by conduction various manufacturing projects. Projects require proficiency in ARC, MIG, Oxy-Acetylene and Tig welding using basic metal fabrication processes. Students will plan and conduct several group manufacturing projects that will be sold in the school store. Students cover the basics of machining and enhance their design capabilities by learning CAM and SketchUp software and implement these designs into personal projects.

Engines I: Small Engines and Power Technology — 1 High School Credit and 3 College Credits

The course is a hands-on and will cover the basics of 2 and 4 cycle engines. Students will learn the basic parts of the engine and how to disassemble, assemble and troubleshoot common problems with engines. Student put their knowledge to the test creating engine diagrams, overhauling a classroom engine and troubleshooting and fixing their own engines from home. The class will cover the basics of reading engine manuals and ordering replacement parts as well as providing customer service to community members seeking to fix engine problems.

Introduction to Engineering: Sign Making 101 — 1 High School Credit

This course explores the six steps of the engineering cycle and teaches concepts of engineering and design. Students put skills to work designing and creating signs for the school and local businesses. Students work with a variety of sign making materials including paper, wood, vinyl, plastic, metal and fabrics. Using a variety of software program such as Adobe Illustrator, SketchUp, MeshCam as well as operating 3D Printers, Laser Engravers, Plasma CAM, CNC Milling Machine, Laser Inkjet Printers, Grasshoppers and Wood CAM cutters will highlight the course. Student learn the importance of soft skills such as customer service and will create work bids. A student in this class will learn several practical skills in high demand by local businesses.

COMPLETION STANDARD

Students wishing to receive a certification for this academy must complete 3 of the 4 courses and pass each course with a B or better.

CAREER EXPERIENCES

Students will attend the Bridges Career Exploration Day event and other regional career fairs. Students will listen to industry speakers, tour local businesses, create metal fabricated projects, practice shop safety and problem conduct small engine repairs and maintenance.

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CAREER OPTIONS: www.careerwise.minnstate.edu/careers

JOB OUTLOOK: www.careerwise.minnstate.edu/jobs

POSTSECONDARY PROGRAMS: www.careerwise.minnstate.edu/education

