

TECHNOLOGY, ENGINEERING, & DESIGN

Courses in the Technology, Engineering, & Design Department are organized according to the MN Department of Education and MN State Colleges and Universities Career Fields, Clusters, and Pathways model. These programs of study are designed for students to attain the specific knowledge, skills, and abilities needed to pursue a career of their choice. It is highly recommended that students enroll in a focus area's introductory courses before enrolling in that area's upper level courses.

Upon completion of all the courses in an entire learning area, students may apply for Advanced Design-Build, a practical applied engineering course that is meant to be a capstone course for any of the focus areas. The department also offers additional courses outside the main focus areas. These courses require no prerequisite and are meant to benefit a student's career or life skills.

SKILLS FOR LIFE COURSE-RECOMMENDED FOR ALL STUDENTS

1100 Problem Solving Home Repair

Grades: 9, 10, 11, 12

Prerequisite: None

Our homes are rooted in human-made products that are prone to malfunction or breakage. It is important for students to gain confidence in troubleshooting and problem solving, so that they may be well prepared for a future that will most certainly require such talents. Concepts such as troubleshooting, redesign and retrofitting, process implementation, tools, systems and safety, will all help to answer the ultimate engineering question: "How does this work?" This course is based in residential construction and how our home's systems and structures function. Additionally, knowing how to perform repairs can save people thousands of dollars over a lifetime.

1109 Pinterest Projects

Grades: 9, 10, 11, 12

Prerequisite: None

This intro course provides students with basic skills in safe tool operation while creating projects inspired by Pinterest Professionals. The projects of this course emphasize craft creation using primarily wood, but also mixed materials, like metal, vinyl, paint and engravings. Projects: Inspired by Popular Pinterest Posts - Custom signs for your home / room, laser-cut projects and even learn how to hang art, signs, shelves etc.

ARCHITECTURE AND CONSTRUCTION COURSES

1101 Intro to Woods

Grades: 9, 10, 11, 12

Prerequisite: None

This survey course provides students with basic skills in the safe and proper operation of power tools and techniques used in production. Classroom projects are designed to allow students the opportunity to use a variety of the current production machines in the classroom while learning industry terminology. In addition, activities will include squaring stock, basic joinery, gluing techniques and finishing.

1140 Cabinetmaking

Grades: 10, 11, 12

Prerequisite: Intro to Woods

This course focuses on the fundamental understanding of wood technology. Topics covered include wood harvesting and seasoning, species identification, project design, cost estimation, safety practices, and wood finishing technologies.

1141 Build Your Own Sport & Game Equipment

Grades: 10, 11, 12

Prerequisite: Intro to Woods

This course will provide students with the opportunity to construct sports equipment of their choice using the Technology Education shop area. This course is aimed towards students who wish to construct non-traditional technology education projects.

1102 Intro to Drafting

Grades: 9, 10, 11, 12

Prerequisite: None

This course introduces students to the language of drafting through the development of engineering and architectural projects. Designs will be developed through the use of CADD software. Technical drawings and 3D modeling are developed for each project. Drafting is considered the international symbol language and is a major communication medium of the information age.



NOTE: Successful completion of this course satisfies the 1 credit "Arts" requirement for students graduating in 2025, 2026, & 2027.

1131 Architecture and Landscaping Design

Grades: 10, 11, 12

Prerequisite: Intro to Drafting

This course is a study of interior and exterior residential architectural designs. Orthographic, isometric, oblique, perspective sketching techniques, wall section drawings and material/cost schedules will be covered. Students will create a complete set of residential working drawings to include: scaled floor plan, called foundation plan, scaled elevation drawing, electrical plan, plumbing plan, plot plan, wall section drawing and cost schedules.

MANUFACTURING COURSES**1103 Intro to Metals**

Grades: 9, 10, 11, 12

Prerequisite: None

This course is an introduction and orientation to the field of metal, manufacturing, and fabrication. Technical information in manufacturing and fabrication will be covered with emphasis on exercises for the development of fundamental skills and knowledge.

1137 Welding and Manufacturing

Grades: 10, 11, 12

Prerequisite: Intro to Metals

Hands-on exploratory experiences in the operation of metal machining will utilize the lathe, milling machine, and drill press. Gas, electric arc, MIG and TIG welding processes will also be explored. Material selection and processing will be emphasized.

SCIENCE, TECHNOLOGY, ENGINEERING, AND MATHEMATICS COURSES**1104 Intro to Engineering**

Grades: 9, 10, 11, 12

Prerequisite: None

This course is an introduction to the wide ranging field of engineering. Through projects, students will explore civil, mechanical, electrical and software engineering concepts. Through CAD/CAM and other design tools we explore taking ideas to reality. Bridge building, experimentation with Arduino, drones and robotics are used to explore our autonomous future.

1135 Intro to Fab Lab

Grades: 9, 10, 11, 12

Prerequisite: None

This course will be an introduction to the 2D, 3D and CNC controlled machines in the Fab Lab. Using the design process, students will use graphic design and CAD software to bring their ideas into reality using rapid-prototyping technology. With design projects like custom printed t-shirts, designing your own logo/brand and learning to operate/maintain Laser and additive manufacturing systems.

TRANSPORTATION, DISTRIBUTION, AND LOGISTICS COURSES**1144 Intro to PowerSports**

Grades: 9, 10, 11, 12

Prerequisite: None

This introductory course will cover the operation and component design of portable power sources. Students will disassemble, inspect, measure, clean, and reassemble an internal combustion engine. Maintenance, troubleshooting, basic electrical theory, and alternative power sources will be explored. Briggs and Stratton engines will be provided for hands-on learning experiences.

1146 PowerSports Technology

Grades: 10, 11, 12

Prerequisite: Intro to PowerSports

Would you like to have the ability to take something apart, make an adjustment or two, reassemble it and have it work better than ever? Do you love snowmobiling, jet skiing, riding around on your ATV? PowerSports will give you the hands-on experience you need to be successful as an owner, operator and/or technician. Partnering with the University of Polaris, this program offers detailed instruction in the operation, maintenance, and repair of outdoor power equipment while earning Polaris Technician Certificates.

1156 Auto Maintenance

Grades: 9, 10, 11, 12

Prerequisite: Intro to PowerSports

This course teaches students how to select, purchase, finance and insure a vehicle. In addition, students will learn how to prepare and perform the periodic maintenance procedures necessary on most current/common passenger vehicles. Students will not need any previous mechanical experience, but on occasion, have access to a vehicle for lab work.

ADVANCED COURSES**1150 Advanced Design Build**

Grades: 10, 11, 12

Prerequisite: Application Required

A practical approach to applied engineering. Independent use of machines and materials allows students to design and build a project of their choice. Students will be responsible for researching their project design, cost estimates, project procedures, material selection, and construction. This course will be an extensive personal development of advanced problem solving, with students working independently to the greatest extent possible. The instructor's role will be focused on the tasks of monitoring shop safety and providing expertise, knowledge and resources.