



Technical and Multimedia Education Courses

SKILLS FOR LIFE
Recommended for All Students

1100 Problem Solving Home Repair
Essential skills in home repair, construction, maintenance, & systems

CONSTRUCTION
MN Career Field

1101 Intro to Woods
1140 Cabinetmaking
1141 Sports Equipment

STEM
MN Career Field

1135 Intro to Fab Lab
1104 Intro to Engineering

MANUFACTURING
MN Career Field

1103 Intro to Metals
1137 Welding & Milling

Transportation
MN Career Field

1144 Intro to Small Engines
1156 Auto Maintenance

Adv. Design-Build
(Students that have completed all courses in a chosen career field will create their own project).

SELF-GUIDED

ARCHITECTURE
MN Career Field

1102 Intro to Drafting
1131 Architecture & Landscape Design

COMMUNICATIONS
MN Career Field

- *Irish Update ABC*
- *IU: Broadcast Journalism ABC*
**See English Dept.*

RELATED CAREER DEVELOPMENT
District-Wide Two Hour Block Courses

> Vehicle Services (& Adv.)	> Aviation
> Computer Hardware/ Software & Game Design	> Computer Network Technology: CISCO

TECHNICAL AND MULTIMEDIA EDUCATION COURSES

Courses in the Technology and Engineering 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 two 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.

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 Sports 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.

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 development of fundamental skills and knowledge.

-  **1137 Welding and Machining** 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.

STEM COURSES

-  **1104 Intro to Engineering** Grades 9, 10, 11, 12
Prerequisite: None

This course is an introduction to the field of engineering. Through projects, students will explore civil, mechanical, and electrical concepts; three of the major branches of engineering. Numerous sub disciplines and interdisciplinary subjects are derived from concentrations, combinations or extensions of these three major branches of engineering.

TECHNICAL AND MULTIMEDIA EDUCATION COURSES

1135 Intro to Fab Lab

Grades 9, 10, 11, 12

Prerequisite: Intro to Engineering

Be one of the first to explore the new Fab Lab and all it has to offer! This course will be an introduction to the 2D, 3D and CNC controlled machines in the Fab Lab. Students will also be introduced to the design process and documentation used in engineering related fields. Students will be expected to complete rudimentary tasks necessary for basic operation of the Fab Lab equipment. Basic hands-on projects will be designed and created throughout the course to demonstrate mastery of the equipment operations.

ARCHITECTURE COURSES

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.

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.

TRANSPORTATION COURSES

1144 Intro to Small Engines

Grades 9, 10, 11, 12

Prerequisite None

This course will cover theory of operation and component design of small gas engines. Students will disassemble, measure, clean and reassemble an internal combustion engine. In addition, troubleshooting and repair of two and four cycle engines will be covered.

1156 Auto Maintenance

Grades 10, 11, 12

Prerequisite: Intro to Small Engines

This course teaches students how to select, purchase, finance and insure a vehicle. In addition, students will learn how to 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 car for lab work.

COMMUNICATIONS COURSES

0337 IU: Broadcast Journalism A

Grades 9, 10, 11, 12

0338 IU: Broadcast Journalism B

Prerequisite: None

0339 IU: Broadcast Journalism C

See English / Language Arts section for details.

0340 Irish Update A

Grades 10, 11, 12

0341 Irish Update B

Prerequisite: None

0342 Irish Update C

See English / Language Arts section for details.

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.