

Eagan High School
**TECHNOLOGY, ENGINEERING,
 & MANUFACTURING DEPT.**
Experience the Human-Made World.

CONSTRUCTION

MN Career Field

0503 Intro to Woods

0505 Intro to Const/Home Repair

0538 Cabinetmaking

0542 Sports Equipment

MANUFACTURING

MN Career Field

0550 Intro to Metals

0551 Welding & Machining

COMMUNICATIONS

MN Career Field

0504 Intro to Graphics/Video

0548 Website Development

ARCHITECTURE

MN Career Field

0501 Intro to Drafting

*0558 Architecture &
 Landscape Design*

TRANSPORTATION

MN Career Field

0502 Intro to Transportation

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0561 Aviation Exploration

STEM

MN Career Field

0531 Intro to 3D Modeling

0563 Intro to Engineering

CAREER DEVELOPMENT

Full-Year Courses for Those Considering their Future Career

7780 Construction Careers A-B-C

7710 Aviation Careers A-B-C

TECHNOLOGY, ENGINEERING, & MANUFACTURING DEPARTMENT

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.

CONSTRUCTION COURSES

0503 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 many of the production machines in the classroom while learning industry terminology. In addition, activities will include squaring stock, basic joinery, gluing techniques and finishing.

Projects: Hardwood mantel clock.

0505 Problem Solving Home Repair (Intro to Construction)

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.

Projects: Construction of a residential house wall; Students will learn framing, electrical, plumbing, drywall, painting, tiling, and caulking in addition to numerous troubleshooting and repair skills.

0538 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.

Projects: End table with drawer or dorm-room furniture.

0542 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.

Projects: Choice of canoe paddle, baseball bat, lacrosse stick, or ping-pong paddle.

MANUFACTURING COURSES0550 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.

Projects: Fabricated sheet metal toolbox.

0551 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.

Projects: Milled nameplate, drill thread index, and numerous welding exercises.

COMMUNICATIONS COURSES0504 Intro to Graphics and Video**(Meets MN Arts Standard Requirement)**

Grades 9, 10,11,12

Prerequisite: None

This survey course introduces the basics of graphic communications. Students learn to meet the client's needs through use of computer illustration, digital photography, animation, video, and multimedia presentations. Projects provide students with valuable computer, artistic and communication skills. These skills can be applied immediately to personal projects in and out of high school.

Projects: Letterform logo, magazine cover, daydream video, DVD portfolio.

0548 Web Development

Grades 10,11,12

Prerequisite: Intro to Graphics and Video

This course is an introduction to web page coding, structure and design. Laboratory activities will emphasize the use of the web authoring software Adobe Dreamweaver. Students will explore the structure of the design and build process of web authoring by learning to read and write function HTML and CSS code, both in a text editor and Dreamweaver. Emphasis will be placed on root folder organization and the sketching of site structure. JavaScript and jQuery will also be explored and discussed.

Projects: On-line web publication designed by the student.

ARCHITECTURE COURSES0501 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.

Projects: Lake cabin design with walk-through animation.

0558 Architecture and Landscaping Design**(Meets MN Arts Standard Requirement)**

Grades 10,11,12

Prerequisite: Intro to Drafting

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

Projects: Basic residential architectural drawings (floor plans, elevation, perspective and plot plans).

TRANSPORTATION COURSES**0502 Intro to Transportation**

Grades 9,10,11,12
Prerequisite: None

This survey course introduces the student to land, air and water transportation systems through the construction of functional scale model vehicles. Students will demonstrate understanding of propulsion, guidance, control, suspension, and support systems through the construction and testing of these vehicles. Basic construction, fabrication, and electrical concepts will be presented.

Projects: Glider, hovercraft, and boat molding.

0544 Small Engines

Grades 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.

Projects: Small engine teardown and rebuild.

0561 Aviation Exploration

Grades 10,11,12
Prerequisite: Intro to Transportation

This is an exploratory course that introduces the student to the world of aviation. Concepts covered include aircraft design, systems and operation, airline management and career opportunities.

Projects: Radio controlled helicopter, flight simulation, and aircraft design and construction.

STEM COURSES**0531 3D Modeling**

Grades 10,11,12
Prerequisite: None

Students will master the fundamentals of drafting to create their own projects. Students will output their designs to 3D printers, to create an actual prototype of their work. Standard projection methods, dimensioning, 3D modeling norms and an introduction to CAM (Computer-aided manufacturing) will be covered.

Projects: Detail, assembly, sectional, and pictorial drawings as well as virtual prototyping and 3D printing.

0563 Intro to Engineering

Grades 10,11,12
Prerequisite: None

This course is an introduction to 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.

Projects: Bridge design-build (With 3d printing), Wind Turbine Pump, & Circuit Board Strobe Light.

CAREER DEVELOPMENT COURSES7710 Aviation Careers & Ground School A

Grades 11 & 12

7711 Aviation Careers & Ground School B

Prerequisite: None

7712 Aviation Careers & Ground School C

Length: Two Periods, Full Year Course Recommended

LEARN TO FLY HERE! Students will pilot single-engine airplanes, gliders, partner with NASA to engineer scale aircraft, and participate in numerous field trips to experience the world of aviation. During this course, students will develop the skill and knowledge required to pass the FAA written exam for a private pilot's license and explore some of the various careers in aviation, such as: Commercial & Military Pilot, Aircraft Maintenance Technician, Aerospace Engineering, Aircraft Manufacturing, Airport Operations, and Air Traffic Control.

College credit available: Contact the instructor for more information regarding articulated credits.

7780 Construction Careers & Building Trades A

Grades 11 & 12

7781 Construction Careers & Building Trades B

Prerequisite: None

7782 Construction Careers & Building Trades C

Length: Two Periods, Full Year Course Recommended

This course will provide students with an overview of professional building trades through the National Building Trades Union's Multi-Craft Core Curriculum. Students will explore Minnesota apprenticeship programs, post-secondary training programs and the world of work. By the end of the course students will be able to make an educated decision about which trade, if any, would best fit their future career interests and goals. Additionally, students will be prepared to either go straight to work, apply to a post-secondary program, or enroll in an apprenticeship program.

This program will deliver numerous field trips to industry training facilities and the construction of a shed and tiny house.

NOTE: Aviation & Ground School as well as Construction & Building Trades meet on the Eagan High School campus. For Career Development courses that take place at other District sites, consult the District published Career Development catalog for more details and course numbers.