

Technology Education

Course Offerings by Grade

9th Grade	10th Grade	11th Grade	12th Grade
Wood Fundamentals and Design	Wood Fundamentals and Design	Wood Fundamentals and Design	Wood Fundamentals and Design
CAD 1: Computer Aided Design & Engineering	CAD 1: Computer Aided Design & Engineering	CAD 1: Computer Aided Design & Engineering	CAD 1: Computer Aided Design & Engineering
STEM Geometry	STEM Geometry	STEM Geometry	
Metal Fabrication and Machining	*CAD II	*CAD II	*CAD II
Intro To Technology	Wood Structures and Design	Wood Structures and Design	Wood Structures and Design
Robotics	*Construction Concepts	*Construction Concepts	*Construction Concepts
*Project G.R.I.L.L	*Engineering and Design	*Engineering and Design	*Engineering and Design
	Intro To Technology	Intro To Technology	Intro To Technology
	Metal Fabrication and Machining	Metal Fabrication and Machining	Metal Fabrication and Machining
	*Advanced Metal Fabrication and Machining	*Advanced Metal Fabrication and Machining	*Advanced Metal Fabrication and Machining
	Electricity and Electronics	Electricity and Electronics	Electricity and Electronics
	Robotics	Robotics	Robotics
	*Robotics II	*Robotics II	*Robotics II
	*Project G.R.I.L.L	*Project G.R.I.L.L	*Project G.R.I.L.L*

*Laude Courses

- *Advanced Metal Fabrication 1.0
- *Construction Concepts 1.0
- *CAD II 1.0
- *Engineering & Design .5
- *Project GRILL 1.0
- *Robotics II .5

Primary Career Clusters in Technology Education

- Manufacturing
- Architecture and Construction
- Science Technology Engineering and Mathematics

Manufacturing	Architecture and Construction	Science Technology Engineering and Mathematics
CAD 1: Computer Aided Design & Engineering	Wood Fundamentals and Design	STEM Geometry
STEM Geometry	CAD 1: Computer Aided Design & Engineering	*Engineering and Design
*CAD II	*CAD II	CAD 1: Computer Aided Design & Engineering
Intro To Technology	*Construction Concepts	*CAD II
Metal Fabrication and Machining	Wood Structures and Design	Intro To Technology
*Advanced Metal Fabrication and Machining	Electricity and Electronics	Metal Fabrication and Machining
Electricity and Electronics	Robotics	*Advanced Metal Fabrication and Machining
Robotics	*Robotics II	Electricity and Electronics
*Robotics II	*Project G.R.I.L.L	Robotics
*Project G.R.I.L.L		*Robotics II
		*Project G.R.I.L.L

TECHNOLOGY EDUCATION

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Introduction to Technology

Course Code: TEITE
Grade: 9-12
Prerequisite: None
Course Length: One semester
Course Credit: 0.5
Offered: Yearly

What you will learn in this course:

This course will study the past, present, and future of technology systems as well as their impact on society, and the environment. Students will develop knowledge and skills involved in communications, transportation, conventional/alternative energy systems and custom manufacturing. These areas will be taught in both a classroom settings and with numerous hands-on activities and experiences. Examples of units covered include: basic engine rebuilding, automobile systems and repair, electronics, alternative energy systems, precision measurement and custom manufacturing processes.

How you will learn in this course:

Through a combination of hands-on activities, demonstrations, field trips, and the overall group project.

Why is this course important:

Manufacturing is an important part of our local economy. Many people give very little thought to how products are designed and made. This course gives students insight to how manufacturing and the design process works and gives them the skills to enter into employment related to this project.

Electricity/Electronics

Course Code: TETEE
Grade: 10-12
Prerequisites: None
Course Length: One semester
Course Credit: 0.5
Offered: Yearly

What you will learn in this course:

This class will involve theory and hands on learning of modern AC and DC electrical circuits and systems. Students will work with various labs to understand concepts and safety in residential wiring, automotive systems and various modern electrical devices. All students will diagnose and test circuits and components with a digital multi-meter that they build from scratch to keep for personal use at home and in the shop. Alternative electrical energy-producing devices will be covered and constructed in great detail. Electrical motor construction and testing will also take place. Students will also be responsible for the purchase and construction of an individual electronics project. This class will challenge you to overcome your fear of electricity and its complicated stigma. Learn to understand and respect the technology that makes modern life possible.

How you will learn in this course:

This course will be taught from a modern electronics text. Students will use Algebra and basic math skills to apply electrical theory and application on a variety of projects, labs, and self discovery experiments. Guest speakers, field trips, and video presentations will be used when applicable.

Why this course is important:

Electricity is the backbone of what makes modern life possible. With the proper knowledge and safety techniques students will be able to use the skills learned in this class throughout their personal and professional lives.

Metal Fabrication and Machining—Welding I

Course Code: TEMFM
Grade: 9-12
Prerequisites: None
Course Length: One semester
Course Credit: 0.5
Offered: Yearly

What you will learn in this course:

Metal is the primary resource and building block in our manufacturing economy. This is an exploratory course into the world of metal fabrication and machining. Students will build skills and knowledge in sheet metal, welding (gas-OFW, arc-SMAW, MIG-GMAW, TIG-GTAW), and machining skills on both manual and mills. Within these areas, the student will learn proper safety and use of machines and hand tools used in metalworking. Students will learn techniques in precision measuring, plan reading, problem solving, design and careers available in metalworking. A number and variety of projects will be constructed as a platform for the students to learn the skills taught in this class.

How you will learn in this course:

Students will learn by listening, seeing, and doing. The approach to learning in this class is that of the Journeymen and Apprentice. Students will learn through trial and error on a variety of projects. Quality and accuracy is highly emphasized all finished products.

Why this course is important:

The metal working industry is a very important part of our local and national economies. Try to go through the day without touching a metal object or something that was created in a metal die. Students need to become familiar with what the industry has to offer in our area and to explore opportunities. **Articulated-Advanced credit standing (2 credits) through LTC for Welding Intro with a grade of B for high school course. Valid through 2016-2017 school year.**

*Advanced Metal Fabrication and Machining —Welding II

Course Code: TEAMA
Grade: 10-12
Prerequisites: Metal Fabrication and Machining
Course Length: One year
Course Credit: 1.0
Offered: Single Period One year or Double Period One Semester

*Laude Course—Class of 2019 and beyond

What you will learn in this course:

Students who wish to continue on with more advanced level projects in metal fabrication and machining will be able to refine their skills in this class. Students will complete a variety of machining projects on both manual and CNC machines. Students will learn advanced welding techniques and complete large scale individual or partner projects in a self-paced setting. Students will also work jointly with other Tech Ed classes to complete advanced metal fabrication on Project Grill. Examples of student designed projects have been engine hoists, choppers, log splitters, weight equipment, trailers, go carts, tree stands, etc. If you are a self-driven learner and need an open shop setting that allows you to express your building skills, this class is for you.

How you will learn in this course:

Students will learn by listening, seeing, and doing. The approach to learning in this class is that of the Journeymen and Apprentice. Students will learn through trial and error on a variety of projects. Quality and accuracy is highly emphasized all finished products.

Why this course is important:

Students with aptitude for metal working will be able to have their skills and further the depth of study. The course will lay the foundation for success in post-graduate pursuits, tech school, or employment.

Articulated-Advanced credit standing (2 credits) through LTC Welding Maintenance Intro with a grade of B for high school course. Valid through 2016-2017 school year.

Wood Fundamentals and Design

Course Code: TEWHT
Grade: 9-12
Prerequisites: None
Course Length: One semester
Course Credit: 0.5
Offered: Yearly

What you will learn in this course:

Students will be introduced to the basics of working with wood. Students will design and create their own projects while gaining an understanding of properties of different wood species and learning safe operation of hand and power tools.

How you will learn in this course:

Through instructor-selected activities, you will participate in needed processes to complete project construction.

Why this course is important:

Wood is a basic component in our lives. Through this course you will be able to make better selections and uses of wood while learning to use and maintain common equipment. You will use creativity and problem-solving skills to design and create your own projects.

Wood Structures and Design

Course Code: TEWPT
Grade: 10-12
Prerequisites: Wood Fundamentals and Design
Course Length: One semester
Course Credit: 0.5
Offered: Yearly

What you will learn in this course:

Students will build on what they've learned in Wood Fundamentals and Design to design and create a piece of cabinet furniture including doors and/or drawers. A further study of wood qualities as well

How you will learn in this course:

Through instructor-selected activities, you will participate in needed processes to complete project construction.

Why this course is important:

Wood is a basic component in our lives. Through this course you will be able to make better selections and uses of wood while learning to use and maintain common equipment. You will use creativity and problem-solving skills to design and create your own projects.

***Construction Concepts**

Course Code: TECNC
Grade: 10-12
Prerequisites: Wood Fundamentals & Wood Structures and/or Instructor approval
Course Length: One semester
Course Credit: 1.0 (2 class periods/day)
Offered: Yearly
**Laude Course—Class of 2019 and beyond*

What you will learn in this course:

This class provides students with up-to-date information on building materials and construction methods along with practical hands-on learning. Some of the areas covered include **building site layout, foundations, masonry work, wall and roof framing, plumbing, heating, ventilating and air conditioning, and electrical installation, and interior and exterior finishes.** This course is designed to expose students to the many career opportunities in the construction industry.

How you will learn in this course:

Students will learn through demonstrations, class discussions, and hands-on activities. Guest presenters and field trips to construction sites will complement classroom instruction.

Why this course is important:

The demand for skilled trades people is increasing with an aging workforce. Job opportunities are, and will continue to be abundant. Many are unaware of the outstanding wages and benefits earned by these occupations.

CAD I—Computer Aided Design & Engineering

Course Code: TEC1
 Grade: 9-12
 Prerequisites: None
 Course Length: One semester
 Course Credit: 0.5
 Offered: Yearly

What you will learn in this course:

In this course you will learn basic 2D and 3D computer aided design and modeling techniques that can be used to solve engineering problems. The design and engineering software used will be AutoCad and Solidworks. Students will gain an understanding on how an engineer, architect, and other technical professionals use technology to solve problems. Students will learn the engineering and design process and they will apply that process within a team environment to solve a given engineering challenge. Students will be exposed to the Design and Innovation lab where they will build and test their designs

How you will learn in this course:

Through demonstrations, practical exercises, CAD training guides, videos, and guest speakers.

Why this course is important:

This course is a must for students interested in drafting, design, and engineering. This course is a prerequisite for CAD II courses.

***CAD II**

Course Code: TEC2A/TEC2B
 Grade: 10-12
 Prerequisites: CAD I or STEM Geometry
 Course Length: Year
 Course Credit: 1.0
 Offered: Yearly

**Laude Course—Class of 2019 and beyond*

What you will learn in this course:

This course is a continuation of CAD I with an emphasis on mechanical and architectural drafting/design. You will learn the principles, procedures, and materials used in designing and constructing a single family residence along with developing mechanical drawings. A strong emphasis will be placed on large project work that includes engineering drawings of mechanical components along with a complete set of residential building drawings.

How you will learn in this course:

The course will be taught from a standard architectural and mechanical design text, lectures, demonstrations, and CAD exercises including design challenges. The software you will learn is Solidworks, REVIT and AutoCAD.

Why this course is important:

Any student considering a career in engineering, industrial design or residential design will need the basic knowledge and skills learned in this course. Experience gained in computer use is essential in today's society.

***Engineering and Design**

Course Code: TEEAD
 Grade: 10-12
 Prerequisites: CAD I or Algebra 2 or Instructor approval
 Course Length: One semester
 Course Credit: 1.0 (2 class periods/day)
 Offered: Yearly

**Laude Course—Class of 2019 and beyond*

What you will learn in this course:

This course is for the student wishing to further his/her knowledge and preparation for a career in engineering, mechanical design, computer aided machining or tool and die. Students will be exposed to the new Design and Innovation Lab where they will work with computer aided drafting (CAD), computer aided machining (CAM) and computer numerical control (CNC) equipment. Some of the topics include blueprint reading, geometric tolerancing, engineering design process and rapid prototyping. The curriculum is project based so bring your ideas and enthusiasm to make this class one of your most memorable high school experiences!

How you will learn in this course:

The course will be taught from current CAD/CAM text and tutorials, demonstrations, CAD/CAM exercises, videos and field trips. Students will also learn problem-solving procedures used by the industry to create new products.

Why this course is important:

Any student considering a career in Industrial Design, Machine Trades, or Engineering will need the knowledge and skills covered in the course.

STEM Geometry

Course Code: MASGA/MASGB
 Grade: 9-12
 Prerequisite: Algebra I or Alg/Geo II
 Course Length: One year
 Course Credit: 1.0 math credit & 0.5 tech education credit
 Offered: Yearly

See page 36 for a description of this course.

Robotics

Course Code: TEROB
 Grade: 9-12
 Prerequisites: None
 Course Length: November - March
 Credits: 0.5
 Offered: Yearly

Primarily completed outside of the school day.

What you will learn:

Robotics I is an introductory course in the design and control of a tele-operated and autonomous robot. Students will select one of the following core areas of study: Programming, Electrical, Computer Aided Design, Business, Fabrication/ Machining and Analysis. The students must attend a minimum of 90 hours training during the pre-season and build season to receive credit. The class is organized around a team "Robo Riot 3418" that uses the First Robotics design challenge to achieve the curricular goals. First Robotics is a varsity sport for the mind it combines the excitement of sport

with the rigor of science and technology. The class typically starts in November and will end at the end of March.

How you will learn:

The core areas of study are taught by practicing engineers, technicians, teachers, and business mentors from local industry which includes Kohler, Curt Joa, Sargento, Panel Tech, and Sheboygan Chevrolet. The meeting times will vary based on the schedules of the mentors. The students will attend pre-season meeting before the official kickoff of the design challenge which occurs the first Saturday of January. After the kickoff this time is referred to as the build season. The build season is 6 weeks of intense design/build of the competition robot. Students are expected to attend a minimum of 10 hrs per week during the build season.

Why is this course important:

Robots are used in every technological industry, including automotive, aerospace, electronics and computer, chemical, manufacturing, telecommunications, consumer products, medicine and health, optics, agriculture, nuclear, mining, space, and textile. While technology continues to bring cyber and physical worlds together, the demand for robotics engineers and designers will continue to increase. *“The FIRST® Robotics Competition (FRC®) combines the excitement of sport with science and technology to create a unique varsity Sport for the Mind™. FRC helps high-school-aged young people discover the rewarding and engaging world of innovation and engineering.”*

***Robotics II**

Course Code:

Grade: 11-12

Prerequisites: Prior 2 Years of Robotics

Course Length: November - March

Credits: 0.5

Offered: Yearly

Primarily completed outside of the school day.

*Laude Course—Class of 2019 and beyond

What you will learn:

Robotics II is an advanced course in the design and control of a tele-operated and autonomous robot. To be enrolled in this course you must be a student captain in one of the following core areas of study: Programming, Electrical, Computer Aided Design, Business, Fabrication/Machining and Analysis. Guidelines and Expectations:

1. To be considered, all potential student captains must complete an application during the application time period.
2. After submitting an application, all applicants will take part in an interview with advisors and mentors on the leadership committee.
3. All student captains must be available for at least 30 minutes before and after every meeting to meet as a committee and prepare for team meetings.
4. All student captains must have reliable methods for communication with each other and in their subgroups.
5. All student captains must be available to attend every competition, demonstration, and outreach event the team participates in.
6. The captains must attend a minimum of 90 hours training during the pre-season and build season to receive credit.

7. Manages and organizes the leadership team
8. Acts as the “voice of the team” and is a spokesperson for the team
9. Maintains team unity and ensures proper year-round communication
10. Coordinates Robo Riot Robotics Team programs and scheduling with team advisors and mentors
11. Organizes workshops and ensures team members are adequately prepared for technical tasks
12. Communicates technical needs with machine shops and other in-kind sponsors
13. Manages and organizes the team during FRC build
14. Leads technical portions of the FRC Program
15. Organizes design reviews during build season
16. Ensures a daily task list is made at the lab
17. Ensures proper organization and productivity amongst students at the lab
18. Ensures build schedule (Gantt chart) is created and deadlines are met
19. Ensures lab is cleaned and organized
20. Manages parts to manufacture list during build season and works with Business Director to oversee the parts to order list

***Project G.R.I.L.L.**

Course Code:

TEPG1/TEPG2

Grade:

9-12

Prerequisite:

None

Course Length:

One year

Course Credit:

1.0, advance standing credit is available

through

LTC for their welding & maintenance program or machining program for first and second year participants.

Offered:

Single period one year, participation will be required outside of school hours as well.

*Laude Course—Class of 2019 and beyond

What you will learn in this course:

This course’s focus is on the Sheboygan County Project G.R.I.L.L. program, “Growing Readiness in Learning & Leading.” Throughout the year, students will learn how to design and manufacture a grill while highlighting how the manufacturing process works. Content to be covered involves measurement, design, engineering, management, advertising and marketing, finance, fabrication, teamwork, and proper documentation of the work completed. These skills are crucial to today’s manufacturing industries. Students will be given numerous opportunities to develop connections with people in manufacturing and technical college programs.

How you will learn in this course:

Through a combination of hands-on activities, demonstrations, field trips, and the overall group project.

Why is this course important:

Manufacturing is an important part of our local economy. Many people give very little thought to how products are designed and made. This course gives students in-sight to how manufacturing and the design process works and gives them the skills to enter into employment related to this project.