Engineering and Technology - Class Offerings			
Engineering	**Manufacturing**	**Graphics**	**Video Productions**
Introduction to Engineering	Welding/Metal Fabrication 1	Introduction to Digital Media / Graphics	Introduction to Multimedia / Graphics
3D Solid Modeling	Welding/Metal Fabrication 2	Graphics / Screen Printing	Video Production I
Principle of Engineering	Welding/Metal Fabrication 3	Graphics Productions	Video Production II
Architectural Design and Construction	Introduction to Engineering	Digital Photography and Editing	Tech & Eng Education Capstone
Architectural II	Design for Manufacturing	Web Graphics	
Advanced Architectural	Introduction to Woodworking	Advanced Photography	
Advanced Engineering	Cabinet and Furniture Design I	Tech & Eng Education Capstone	
Electronics	Cabinet and Furniture Design II		
Introduction to Robotics	Advanced Woodworking		
Robotics I	Tech & Eng Education Capstone		
Tech & Eng Education Capstone			

Engineering

Freshman	Sophomore	Junior	Senior
Introduction to Engineering	3D Solid Modeling	Principle of Engineering	Design for Manufacturing
Introduction to Robotics	Robotics I	Architectural II	Advanced Architectural
Electronics	Advanced Engineering		Tech & Eng Education Capstone

Manufacturing

Freshman	Sophomore	Junior	Senior
General Metals	Metal Fabrication	Machine Shop I	Tech & Eng Education Capstone
Introduction to Woodworking	Cabinet and Furniture Design I &II	Advanced Woodworking	

Graphics

Freshman	Sophomore	Junior	Senior
Introduction to Digital Media / Graphics	Graphics / Screen Printing	Graphics Productions	Advanced Photography
		Digital Photography and Editing	Tech & Eng Education Capstone

Video Productions

Freshman	Sophomore	Junior	Senior
Introduction to Multimedia / Graphics	Video Production I	Video Production II	Tech & Eng Education Capstone

ENGINEERING AND TECHNOLOGY EDUCATION

Engineering and Technology Education is an important part of any school curriculum in our modern industrial technical society. Engineering and Technology Education courses are "basic" for they offer an opportunity to put into practice the science, mathematics, and communication skills as students work in an industrial environment which is similar to that of industry. Students will gain career awareness in a wide variety of areas and will learn valuable consumer knowledge. As they build a base for further vocational education they will develop good work habits and positive attitudes. They will also gain valuable basic skills, which can be used all through their lives to make improvements and maintain a wide variety of consumer products.

ENGINEERING TECHNOLOGY - ARCHITECTURE

6567/6568 **INTRODUCTION TO ENGINEERING (ARCH I LEVEL I)**
Prerequisite: None
Grades: 9, 10, 11, 12
Year/ 1 credit Transcribed

Northeast Wisconsin Technical College

the STEM academy® establishing engineering habits of the mind

This STEM (Science, Technology, Engineering, and Mathematics) course is a basic introduction to engineering for all students. Students who complete this course will learn the concepts necessary in order to develop their ideas into solutions that will improve our lives. Exciting hands-on learning activities, rating consumer products, destructive testing and Solid Works 3D solid modeling apply math, science, history and English content from other courses in a STEM experience.

6523 **ARCHITECTURAL DESIGN AND CONSTRUCTION (ARCH I LEVEL II)**
Prerequisite: Introduction to Engineering
Grades: 10, 11, 12
Semester/.5 credit

the STEM academy® establishing engineering habits of the mind

Architecture is more than just walls around us. The form and function of the spaces we live and work in are at the heart of how any design comes to life. This STEM academy course will investigate how the structure is designed and built as well as the layout of spaces between walls. Students will be introduced to a variety of concepts including green building and sustainable design in architecture. Students will apply the concepts introduced, to a "dream home" that they design and model. These concepts will allow the students to judge the live-ability of homes and apartments that they may someday consider renting, buying, or building.
Students with vocational goals such as carpenters, design decorators, builders, architectural drafters, or engineers should take this course.

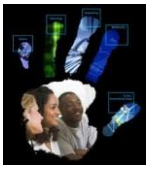
6524 **ARCHITECTURAL DESIGN AND CONSTRUCTION II (ARCH I LEVEL III)**
Prerequisite: Architectural Design and Construction (Level II)
Grades: 10, 11, 12
Semester/.5 credit

In this design course students will explore the styles and construction of homes and commercial buildings. Students will continue to use the ArchiCAD drawing program to design the draw floor plans, foundation plans, elevation plans, and detail drawings of windows, doors, stairways, and wall sections of homes. The room by room function and activity approach will again be used to design a residential home. Other topics discussed in this course include architectural styles, strength of materials, city codes, electrical plans and cost estimation.

6527/6528 **ADVANCED ARCHITECTURAL DESIGN AND CONSTRUCTION (ARCH I LEVEL IV)**
Prerequisite: Architectural Design and Construction II (Level III)
Grades: 11, 12
Year/ 1 credit

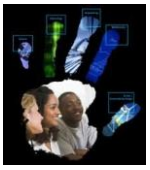
In this open ended design course students will have the opportunity to select appropriate residential, commercial, and public architecture projects to complete. Students will be expected to work independently on high end projects of their choosing. Advanced architectural concepts such as modern design (1950-present), materials, site considerations, green design, and structural engineering will be discussed and implemented. Students who have high interest and aptitude may take this course multiple times.

ENGINEERING TECHNOLOGY



6546/6547 **3D SOLID MODELING (ENGINEERING LEVEL II)**
Prerequisite: Introduction to Engineering
Grades: 10, 11, 12
Year/ 1 credit … Transcribed
Weighted Grading (5.0)

Learning 3D design is an interactive process. Students learn best when they can explore the practical applications of the concepts that they learn. This STEM course has many activities and exercises that enable students to put design concepts into practice. Students create their ideas such as drone designs, extreme sports equipment, hip replacement parts, robotic arm components, musical instruments and their parts as well as many others. Ideas become reality in this course. Students will also have the opportunity to become CSWA (Certified Solid Works Associate) certified at the completion of this course.
** Currently in the progress of a credit agreement with UWGB.
*** Availability of college credits is based on legislative action***



6573/6574 **PRINCIPLES OF ENGINEERING (ENGINEERING LEVEL III)**
Prerequisite: Introduction to Engineering
Grades: 10, 11, 12
Year/ 1 credit
(Semester 1-.5 credit Engineering and Technology)
(Semester 2-.5 credit Science)

This STEM course makes a contribution to the curriculum by providing opportunities for students and teachers to link content together and apply it to solve problems. More and more jobs demand advanced skills, requiring that people be able to learn, reason, think creatively, make decisions, and solve problems. An understanding of science, technology, engineering and math and their methods contribute in an essential way to these skills. Principles of Engineering is a team based advanced course designed for most students. The Principles of Engineering courses intention and purpose is to educate students in a "main line" method providing STEM education for everyone. While providing a STEM based education for all students, those interested in becoming practicing engineers clearly benefit from this course content. *The second semester counts as .5 credit Science elective.*
** Currently in the progress of a credit agreement with UWGB.
*** Availability of college credits is based on legislative action***

6531/6532 ADVANCED ENGINEERING (ENGINEERING LEVEL IV)

Prerequisite: Successful Completion of 3D Solid Modeling (Level II) and CSWA certified
Grades: 11, 12
Year/ 1 credit
Weighted Grading (5.0)

In this open ended engineering course students will have the opportunity to select appropriate activities, design concepts, and their own projects to complete. Students will be expected to work independently on these high end projects of their choosing. Advanced engineering concepts will be discussed and implemented throughout this course along with the opportunity to become CSWP certified. Students who have high interest and aptitude may take this course multiple times.
*** Availability of college credits is based on legislative action***

6563 ELECTRONICS

Prerequisite: None
Grades: 10, 11, 12
Semester/.5 credit

In this course, students will learn about the generation of electricity, electrical circuits, and measurement of electricity. Through class work and experiments, students will examine how series and parallel circuits work in a residential house. Beyond electricity in a home, the student may choose several paths that lead to the understanding of how resistors, transistors, and diodes are used to make modern electronic devices as well as how an electric motor operates and various types of electromechanical devices. Labs will include hands-on to wire simple circuits, 3-way switches and 240V devices in a home. Students will also learn about the various careers in the field of electricity and electronics. A calculator is required for this course.

6648 INTRODUCTION TO ROBOTICS – ENGINEERING EMPHASIS

Prerequisite: None
Grades: 9, 10, 11, 12
Semester/.5 credit

This STEM course with an emphasis on engineering and design has been designed for students who enjoy thinking critically and creatively. You will develop collaborate teams that will practice effective communication. After you have identify your strengths this will enable you to make positive contributions to your group and class. Students will learn to use easyC for programing and SolidWorks for drawing; with these tools you will make ideas become reality.

6649 ROBOTICS I – AUTOMATION AND ENGINEERING

Prerequisite: Introduction to Robotics
Grades: 10, 11, 12
Semester/.5 credit

This STEM course will be a continuation and an expansion of Introduction to Robotics. You with explore the world of automation while you engineer a machine that will improve your chosen task. You will use easyC programing to control various sensors. These are some of the sensors that will be used ultrasonic, light, limit, rotational, potentiometer, and others. You will also have the ability to use SoildWorks as a tool to help your ideas become reality.

GRAPHIC AND MEDIA TECHNOLOGY

006752 INTRODUCTION TO DIGITAL MEDIA

Prerequisite: None
Grades: 9, 10, 11, 12
Semester/.5 credit

If you have a MacBook Air this course is for you! Learn the Mac OS and create slideshow, radio shows, stop motion videos and podcasts. This course serves as an introduction to the video/graphics courses taught at Bay Port or as a stand-alone course to the student just wanting to explore various multimedia technologies. The semester course will cover the current Macintosh operating system as well as introduction to several software programs used in Photography, Graphics Screen Print, Video Production, and Web Design. Software programs include Photoshop, iPhoto, iTunes, Garage Band, iMovie. **This course is not available for students who have already taken Graphics or Video Production courses.**

6570 DIGITAL PHOTOGRAPHY AND EDITING

Prerequisite: None
Grades: 11, 12
Semester/.5 credit

Northeast Wisconsin Technical College

This photography course covers the use of cameras, composing and taking pictures, plus digital editing. This course will also teach the advanced functions of any digital camera. It is best if all students have their own digital camera for class (does not have to be expensive). We will also produce a web portfolio of work. We will use Apple computers with IPhoto, IWeb and Adobe Photoshop to work with our images. This serves as an introduction to a possible life time hobby or as a good introduction to a career in photography. This course is articulated through NWTC and counts for 3 credits of Digital Photography for students planning on attending NWTC.
Picture taking assignments require time outside of school be spent taking pictures.

6575 ADVANCED PHOTOGRAPHY

Prerequisite: Must have a B or higher in Digital Photography and Editing
Grades: 12
Semester/.5 credit

Students will become proficient in Adobe Photoshop and DSLR cameras and lenses. Students will also have the opportunity to work on projects of their choosing along with project for other people.

6595 GRAPHICS SCREEN PRINT

Prerequisite: None
Grades: 10, 11, 12
Semester/.5 credit

The technique of screen printing is simple, and satisfying to those who learn it. This course introduces a variety of methods from the simplest, one color screen print method to vinyl stickers and Dye Sublimation on glass. Be prepared to be creative and get ink on your fingers. This course would be beneficial and enjoyed by art and graphics students. Screen printing process is used by many groups to produce team shirts, posters, and banners.

6590/6592 GRAPHIC PRODUCTION

Prerequisite: B or better in Graphics /Screen Print or Instructor Approval
Grades: 11, 12
Year: 1 Credit

Independent studies based course in which student's sign up for the course and assist the instructor with projects which may need to be produced. This course is designed to take those students interested in the world of graphic communications to the next level. Jobs may consist of print media to screen printing. The screen printing side will stress the use of photo emulsion, while the print side will allow students to become more proficient on programs such as Photoshop, Illustrator, and InDesign. Some examples of projects which may be completed by students enrolled in this course are, coffee mugs, full color stickers, static clings, desktop publishing projects of any proportion, district wide printing of banners, t-shirts, sports team t-shirts, club t-shirts, and special event t-shirts. A student interested in the course will be able to register for it more than once.

6664 VIDEO and GOPRO PRODUCTION I

Prerequisite: Grade 10 students must have taken Multimedia as a Freshman
Grades: 10, 11, 12
Semester/.5 credit

This course is designed to introduce students to the world of television and the use of video as a communications media. An understanding of equipment uses and the various types available to us both in and out of our environment will be discussed. Students will learn the various phases of video production from filming, editing, adding graphics and text and lighting to sound and voice. Students will also have access to GoPro cameras for a number of projects.

6673 VIDEO PRODUCTION II – ANIMATION AND SPECIAL EFFECTS

Prerequisite: Grade of "B" or better in Video Production I or instructor approval
Grades: 10, 11, 12
Semester/.5 credit

This course continues building upon the foundations established in Video Production I. Students are allowed greater flexibility and creativity on each assignment. A more in depth study of the editing programs and their capabilities will be stressed. Lighting a set, graphic production and sound will be stressed. Basic animation and special effects will be added to your video to make them look more professional.

6683 ADVANCED VIDEO PRODUCTION

Prerequisite: Video Production I and II with a grade of "B" or better and instructor approval
Grades: 11, 12
Semester/.5 credit

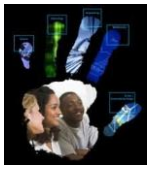
This is an independent studies based course in which students sign up for the course and assist the instructor with projects which may need to be produced. Students will be involved with the bi-weekly broadcast of Pirate Vision, which is the taping, editing, broadcasting, and script development for the show. **A student interested in the course will be able to register for it more than once.**

09006A WEB GRAPHICS

Prerequisite: None
Grades: 9,10, 11, 12
Semester/.5 credit

This class is for designers who want to create impactful graphics for use online. In this class you will discover the steps to creating web graphics using Adobe Photoshop, Adobe Animate, and Adobe Spark. Learn about file formats, color tables, animations, and the creation of interesting special effects, such as rollovers and tweening. Design for your favorite websites like Instagram and Twitter.

METAL TECHNOLOGY



6613/6614 DESIGN FOR MANUFACTURING
Prerequisite: Introduction to Engineering
Grades: 11, 12
Year/ 1 credit

Design for Manufacturing teaches general manufacturing techniques. Calculations and analysis tools are used to design and redesign student's concepts. This course applies and integrates ideas that have been generated in other courses and generates life size models and prototypes. Industry standard software and machinery are used to manufacture student's ideas with verification programs to determine the ability for a plan to be mass produced. Certification will advance students toward continuing education and career opportunities in the fields of engineering, design and machine operation.
UNITS: Introduction to Manufacturing, Reading Technical Drawings, Introduction to Machining, Mills and Milling Operations, Math in Manufacturing, Conversion Measurements and Tools, Simple Metallurgy, Cutting Tools, Cutting Feeds, Speeds and RPM, Chip Formation, Load and MRR, Cutting Tools Geometry, The Science and Skill of Measuring, Introduction to Computer Numerical Control, Coordinates, Axis and Motion, Introduction to Geometrics, Before and After the Machine, Advanced Technology Section , Beyond Chip Making (Laser, Water Jet EDM)

6600A WELDING/METAL FABRICATION 1
Prerequisite: None
Grades: 9, 10, 11, 12
Semester/.5 credit

Welding/Metal Fabrication 1 is an introduction course highlighting the welding and metal fabrication trades. Students will be introduced to SMAW, MIG, and TIG welding processes. Students will also fabricate their own "Mini Grill" using sheet metal that is designed and cut using the PlasmaCam and fasteners and hand tools as identified. Safety glasses are requires.

6611A/6612B WELDING/METAL FABRICATION 2
Prerequisite: Welding/Metal Fabrication 1
Grades: 10, 11, 12
Year/ 1 credit

Welding/Metal Fabrication 2 allows students to continue exploring various processes in welding and metal fabrication. Careers associated with welding and fabrication will be explored and presented by various local businesses. Students will continue to gain knowledge of SMAW, MIG, and TIG welding processes along with being introduced to Flux Core welding and Oxy/Fuel Cutting. Students will begin to explore welding with Stainless Steel and Aluminum in various applications. Students will use their welding skills to aid them in fabricating their own projects out of various metals. Students will also explore different fastening options commonly used in the industrial trades like pipe fitting and mechanical fasteners. Students may use CNC equipment to PlasmaCut or CNC machine their projects. Safety glasses required.

6623A/6624B WELDING/METAL FABRICATION 3

Prerequisite: Completion of Welding/Metal Fabrication 2 with a grade of "C" or better or approval Of the instructor.
Grades: 11, 12
Year/ 1 credit

Welding/Metal Fabrication 3 is designed for the student with a serious interest in pursuing a career in the trade of welding or fabrication. This course is designed to build upon existing skills learned in Welding/Fabrication and apply it towards skills required to obtain entry level work in the trade that they choose. Classroom study will include advanced level welding instruction, CNC Machining, CNC cutting (PlasmaCam) and other "high-tech" areas. Students will be engaged in mandatory lab assignments as well as being allowed to design/build their own projects throughout the year. All students shall be required to perform maintenance on lab equipment.
Safety glasses required.

WOOD TECHNOLOGY

6703 INTRODUCTION TO WOODWORKING

Prerequisite: None
Grades: 9, 10, 11, 12
Semester/.5 credit

This class is a hands-on woodworking course where students will gain experience reading and sketching drawings, measuring, cutting, joining, and finishing wood while constructing woodworking projects. Students will learn to use many tools and safe work habits.
Safety glasses are required.

6713 FURNITURE AND CABINETRY

Prerequisite: Introduction to Woodworking.
Grades: 10, 11, 12
Semester/.5 credit

Furniture and cabinetry will stress the safe and proper use of hand and machine tools commonly used to shape and form wood. Students will learn to read blue prints and be required to draw plans and compute the cost of their projects. Common fasteners and various methods of finishing will also be discussed.

6716 FURNITURE AND CABINETRY II

Prerequisite: Introduction to Woodworking.
Grades: 10, 11, 12
Semester/.5 credit

Furniture and cabinetry will stress the safe and proper use of hand and machine tools commonly used to shape and form wood. Students will learn to read blue prints and be required to draw plans and compute the cost of their projects. Common fasteners and various methods of finishing will also be discussed.

6723 ADVANCED WOOD TECHNOLOGY

Prerequisite: 1 Semester of Furniture and Cabinetry
Grades: 11, 12
Semester/.5 credit

This course deals with modern and conventional technologies of working with wood. Included is design, programming and machining on a CNC router and lathe using Mastercam software. Mastercam is professional software used in manufacturing with automated machines. The course is designed for those students who have a great deal of interest in these areas. Students in this course are required, either as a group or as individuals to plan their own lab work under one of the topic areas. COURSE FEE, plus project cost.

6726 ADVANCED WOOD TECHNOLOGY II

Prerequisite: 1 Semester of Furniture and Cabinetry
Grades: 11, 12
Semester/.5 credit

This course deals with modern and conventional technologies of working with wood. Included is design, programming and machining on a CNC router and lathe using MasterCam software. Mastercam is professional software used in manufacturing with automated machines. The course is designed for those students who have a great deal of interest in these areas. Students in this course are required, either as a group or as individuals to plan their own lab work under one of the topic areas.

CO-OP TECHNOLOGY

6731/6732 TECHNOLOGY EDUCATION/AG CO-OP CLASS

Prerequisite: Must have earned 18 credits by the end of the 11th grade school year.
Must have acquired a G.P.A. of C or better in Technology Education courses
Must have earned a minimum of 2 credits in Technology Education area
Must have an attendance record of not more than 18 partial or full days absences for 11th grade. (Absence rate of not more than 10%)
Consent of teacher/coordinator and an application is required
Grade: 12
Year/ 1 credit

This course is a required course for students enrolled in the Tech Ed Co-op program. The course will focus on employment seeking skills, worker relations, verbal and written communications, career advancement, planning, and organizing, as well as other skills which enable success in the work place. Classroom activities will be in correlation with the experiences the student will be having on the work site.

6741/6742 TECHNOLOGY EDUCATION/AG CO-OP WORK SITE

Prerequisite: Technology Education/Ag Co-op Class
Consent of teacher/coordinator and an application is required
Grade: 12
Semester or Year/.5 to 2 credits

This course is to be taken concurrently with TECHNOLOGY EDUCATION/AG CO-OP CLASS. Students must meet all the prerequisites of that class in order to participate in this class. Experience is said to be the best teacher and this course gives the student the opportunity to experience on-the-job training at a work site of their choice. Students are responsible for securing a work site over the summer in a related field to Tech Ed. Related Tech areas are Auto, Metals, Graphics, Woods, Electrical, Drafting, and Graph Communications. Students are released to their work site during the afternoon. Hourly wages and high school credit are earned. The student needs to acquire a minimum of 15 work hours per week to qualify for credit. Students may select one of the following credit options.

- 2 credits Work release 3 periods all year
- 1 credit Work release 2 periods all year
- 1 credit Work release 3 periods one semester
- .5 credit Work release 2 periods one semester

OTHER OFFERINGS

6743/6744 TECHNOLOGY AND ENGINEERING EDUCATION CAPSTONE

Prerequisites: Advanced Engineering or Advanced Wood Technology II or Machine Shop I or Graphic Production or Advanced Video Production or Advanced Architecture
Grade: 12
Year / 1 Credit

This class is for students that have successfully completed their Technology Education and Engineering strand in the above mentioned prerequisites by the end of their junior year. In place of a student signing up for an independent study class they would enroll in this course. The students taking this class can expect to work in group and individual settings, in order to enhance their learning and prepare them to be Career and College ready. During the course of this class the students will be preparing for and competing against peers from around the state at the Skills USA competition along with other personalized learning opportunities.

YOUTH APPRENTICESHIP IN CONSTRUCTION OR MANUFACTURING RELATED FIELDS

The Wisconsin Youth Apprenticeship program integrates school-based and work-based learning. Students accepted into an approved Youth Apprenticeship program will continue taking classes at their high school while working as an apprentice at a participating business. Students will be enrolled in a technical class related to their youth apprenticeship program. These courses may be offered at either their high school or off campus.

Level One:	**Level Two:**
Junior OR Senior Year of High School	**Junior AND Senior year of High School**
450 hours of work-based learning MINIMUM	**900 hours of work-based learning MINIMUM**
2 semesters of related classroom instruction	**4 semesters of related classroom instruction**

Key elements of the youth apprenticeship program are:

- **Industry-developed skill standard**
- **Exposure to multiple aspects of the industry**
- **Skilled Mentors assigned to train students**
- **Paid on-the-job work experience**
- **Related classroom instruction concurrent with work-based learning**
- **Curriculum guidelines for all programs**
- **Performance evaluation of demonstrated competencies**
- **State-issued skill certificate.**