

Technology and Engineering Department

1. Technology Communications, a term course, is a prerequisite to Communications Technology Cluster; this prerequisite may be waived under either one of the following conditions.
 - a.) Students having a 3.0 CGPA or better.
 - b.) With prior approval from the appropriate Technology and Engineering Instructor.
2. Intro to Power Mechanics is a prerequisite for all the courses in the Transportation cluster.
3. Be sure and check the Course Description Booklet for other prerequisites for listed courses.
4. Auto 1 is a one-period per day class for one term (1/2 credit). Auto 2 is a one period per day class for two terms for one credit.
5. PLTW courses are two term courses. Please check with instructor for further details.

NOTE: Some of the courses in Technology and Engineering have a required fee, and others have a basic materials cost. Please note the cost of courses that you are considering by checking the enclosed fee insert sheet.

“MATERIALS PROCESSING TECHNOLOGY”

400 ENGINEERING MATERIALS (Eng. Materials) - 9, 10, 11, 12 (1 Term -- .50 credit) Fee: Check the fee insert sheet. This is an exploratory course designed to familiarize the student with the proper procedures in the operation, care and safe usage of lab equipment along with an introduction to manufacturing equipment in wood technology and metal technology. The use of wood, plastic, metals, concrete and other materials is introduced to help students understand technology’s role in preparing a product.

401 WOODS TECHNOLOGY 1 - 9, 10, 11, 12 (1 Term -- .50 credit) Prerequisite: Engineering Materials. Fee: Check the fee insert sheet. This introductory level course applies modern technology to the efficient processing of our important renewable resource, wood. Students will explore careers, examine new techniques and methods, while safely constructing a project.

402 WOODS TECHNOLOGY 2 - 9,10, 11, 12 (1 Term -- .50 credit) Prerequisite: Woods 1 Fee: Check the fee insert sheet. This intermediate level course is designed to further enhance the level of skill development in Woods 1. Student will concentrate on developing safe work habits focusing primarily on portable and stationary power equipment. Student will have a list of competencies to complete which will prove abilities. Each student will be required to write a summary of set-up, safe operation and maintenance of a stationary power tool.

403 WOODS TECHNOLOGY 3 - 10, 11, 12 (1 Term -- .50 credit) Prerequisite: Woods 2, acceptance of application and interview. Fee: Check the fee insert sheet. This advanced course will challenge the student in the various areas of wood technology with specific emphasis on cabinet and furniture making. The student will design and produce a cabinet or furniture item using the various methods of construction. Students will have three project options to choose from and must understand this course will require substantial material cost in excess of \$80.

405	<p>Light Construction Methods - 10, 11 (1 Term -- .50 credit) Fee: Check the fee insert sheet. This course provides an opportunity for students to learn and apply the basic knowledge and skills of the wide and varied field of the building trades industry. The course will give the student the opportunity to do actual construction work as well as learn what experienced building trades people do. Students will be able to apply their knowledge and skills by constructing small buildings, such as tool sheds, play houses, etc. (50% classroom and 50% lab work.)</p>
406 407 413 414	<p>VOCATIONAL BUILDING TRADES - 12 (4 Terms)(.50 Credits per Term) Prerequisite: Building Trades 1/ Students must take for all 4 terms Students admitted to this program by application and selection process and by instructor approval only. See Vocational Building Trades instructor for application after successful completion of Light Construction Methods (Grade of C or better). Vocational Building Trades is designed for seniors who have expressed an interest in and an aptitude for entry into the many fields of the building trades/construction industry. The course will introduce the student to the many skills and potential careers associated with residential home construction. Each year students will be constructing an on-site building for someone from the community. Students will be required to pay for safety shoes and other required supplies.</p>
408	<p>Computer Integrated Manufacturing - 9, 10, 11, 12 (1 Term -- .50 credit) Prerequisite: Engineering Materials Fee: Check fee insert sheet. A course that applies principles of engineering design and drawings to create models using manufacturing applications. Students will apply engineering principals in both the creation and implementation of given projects, using various metal joining processes.</p>
409	<p>MACHINE TOOL TECHNOLOGY 1 - 9, 10, 11, 12 (1 Term -- .50 credit) Prerequisite: I.T. Materials Fee: Check fee insert sheet. Students will develop skill and knowledge in the operation of the lathe, milling machines, surface grinder, measuring instruments, and blue print reading.</p>
410	<p>MACHINE TOOL TECHNOLOGY 2 - 9, 10, 11, 12 (1 Term -- .50 credit) Prerequisite: Machine Tool 1 Fee: Check fee insert sheet. This course will allow students to work with advanced machine and tool processes. Advanced lathe and milling tool operations. Students will design and complete advanced machine projects.</p>
412	<p>WELDING TECHNOLOGY - 9, 10, 11, 12 (1 Term -- .50 credit) Prerequisite: I.T. Materials Fee: Check fee insert sheet. This is an introductory welding course that will help the student become skillful in doing AC-DC arc, TIG, MIG, plasma arc cutting and gas welding. The student will learn to control rod feed, weld simple joints, and weld metals.</p>

“TRANSPORTATION CLUSTER”

• **Articulated courses are classes taken at the high school level, which can be applied toward a degree program at a technical college. For further information contact your guidance counselor.**

416 Power Mechanics 1 - 9, 10, 11, 12 (1 Term -- .50 credit) *Fee: Check fee insert sheet. Intro to Power Mechanics* is an introductory course into the small engines and auto mechanics area. It involves an introduction to the principles of operation of four stroke cycle engines, with emphasis on basic systems and parts. The students will need an aluminum frame 4-stroke engine. A Briggs and Stratton lawn mower engine, under 5 h.p. is preferred, which will be rebuilt during the class. Students will provide their own engine to work on and will be responsible for purchasing their own parts.

417 Power Mechanics 2 - 10, 11, 12 (1 Term -- .50 credit) *FEE: Check fee insert sheet. Prerequisite: Power Mechanics 1* A course in practical application to develop skills and knowledge for maintenance and repair of 2 and 4 cycle engines. The course will give the student the opportunity to do actual work on all types of small engines. Students will pay for all repair parts used. Motorcycle, snowmobile, chainsaw, and outboard motors will be the main type of small engines the course will concentrate on. Students will provide engines to work on.

418 AUTO MECHANICS 1 - 11, 12 (1 Term) *Prerequisite: Small Engines 1 & 2* See Fee insert. This is a consumer oriented course designed to teach the basic concepts of automotive technology. In this course, the student will be exposed to basic concepts of design, service, maintenance and repair of automobiles with a focus on entry level service operations and procedures. This course will provide a foundation for continued study of automotive technology. Students are required to have a valid driver’s license, proof of insurance and a vehicle for use during lab activities.

447 AUTO MECHANICS 2 - 11, 12 (2 Terms)(.50 credit per term) *Prerequisite: Auto Mechanics 1 (#418)* This is an intermediate level course designed to provide an in-depth look at the concepts and technologies covered in 418. In this course, the student will be exposed to intermediate level concepts of design, service, maintenance and repair of automobiles with a focus on unit diagnosis, unit repair, service operations and procedures. Students are required to have a valid driver’s license, proof of insurance and a vehicle for use during lab activities.

444 VOCATIONAL AUTO - 12 (4 Terms)(.50 credit per term) *Prerequisite: All Power Mechanics and Auto classes. See Fee insert.* This course is intended for automotive career directed students. The course is designed to provide students with exposure to advanced concepts in automotive technology, diagnosis, repair and maintenance. In addition, the students will gain in-depth knowledge and experience with the global automotive industry. Students in this class must have a vehicle on which to perform service operations as part of the class. Students are required to have a valid driver’s license, proof of insurance and a vehicle for use during lab activities.

<p>446 452</p>	<p>AUTOMOTIVE TECHNICIAN YOUTH APPRENTICESHIP - 11,12 <i>Prerequisite: Power Mechanics; concurrent courses Auto I & II (11th grade); Vocational Auto (12th grade) (2 Terms -credit per Term)</i> The Automotive Technician Youth Apprenticeship program is for juniors and seniors who have a strong interest in pursuing a career in the automotive service industry. The program combines classroom instruction with 450 hours of work experience in the automotive industry. Students are required to take Small Engines 1 prior to entering this program. As juniors, students will take Auto Mechanics 1 and 2 and as seniors they will take Vocational Auto. Students who successfully complete the program gain the following benefits: 1) Certification by the state of Wisconsin as an Automotive Technician Youth Apprentice. 2) Recognition of the Youth Apprenticeship certificate by the automotive industry, which will give students a competitive edge when applying for work. 3) Advanced standing credits at Nicolet Technical College in the Automotive Technician technical diploma program.</p>
<p>“COMMUNICATIONS CLUSTER”</p>	
<p>426</p>	<p>MECHANICAL CAD DESIGN 1 - 9, 10, 11, 12 (1 Term --.50 credit) This course is designed to acquaint the student with Mechanical drafting principles and techniques. This course will allow students to acquire skills and knowledge in sketching, proper computer usage, multi-view drawings, dimensioning, section views, pictorials and drawings, and manufacturing processes. The basics of Computer-Aided Drafting (CAD) will be introduced to students in this class. Drafting related career opportunities are also explored.</p>
<p>427 428</p>	<p>PROJECT LEAD THE WAY: INTRODUCTION TO ENGINEERING DESIGN - 10, 11, 12 (2 Terms -- 1.00 credit) <i>Prerequisite: Mechanical CAD Design 1</i> An applied pre-engineering course that teaches problem-solving skills using a design development process. Models of product solutions are created, analyzed and communicated using solid modeling computer design software. CAD drawings such as section views, orthographic and isometric views, as well as partial and complete assembly drawings and working drawings are derived from the models.</p>
<p>429</p>	<p>ARCHITECTURAL CAD DESIGN 1 - 9, 10, 11, 12 (1 Term -- .50 credit) . This course is designed to allow students to explore the design and layout of residential structures, as well as the creation and use of CAD drawings in home design and construction. Drawings and related projects are assigned in area planning for homes, cost analysis, floor plan design, foundations, roof styles, section views, elevations, perspective renderings, and land descriptions. Related career opportunities are also explored. The basics of computer-aided Drafting (CAD) will be reinforced in this class using Chief Architect and AutoCAD Architectural Desktop software packages.</p>
<p>430</p>	<p>ARCHITECTURAL CAD DESIGN 2 - 10, 11, 12 (1 Term -- .50 credit) <i>Prerequisite: Architectural CAD Design 1</i> This course is designed to allow the student to learn about more advanced architectural design as well as residential building technology. CAD drawing subjects will include building planning, floor plan design, pictorial drawings, sectional plans, framing plans, electrical plans, climate control systems, and basic plumbing diagrams. Alternate energy sources for housing are explored and evaluated. Architectural design problems will be created, modeled, analyzed and communicated using CAD software including Architectural Desktop and Chief Architect. Complete sets of drawings and plans will be assembled into an electronic portfolio and presented to the class. Course also includes units on careers in Architecture as well as frequent field trips to the Vocational Building Trades project house to view the application of architectural design elements to an actual residential structure.</p>

431	<p>ARCHITECTURAL CAD DESIGN 3 - 10, 11, 12 (1 Term -- .50 credit) Prerequisite: Architectural CAD Design 2. <i>Fee: See fee insert sheet.</i> Students will design, model and develop a complete set of plans for a residential structure using Chief Architect or AutoCAD Architectural Desktop. Students will then complete a physical 3d scale model using balsa wood, foam-core board, and other materials, and present their entire project to a group of their peers. Course also includes units on careers in Architecture as well as frequent field trips to the Vocational Building Trades project house to view the application of architectural design elements to an actual residential structure.</p>
435	<p>EXPLORING GRAPHIC ARTS - 9, 10, 11, 12 (1 Term -- .50 credit) Prerequisite: None Fee: Check fee insert Sheet. This course specializes in the field of offset printing. Study units will consist of line photography, half-tone photography, film developing, layout, stripping, plate making, offset presswork, and silk screening.</p>
436	<p>GRAPHIC ARTS TECHNOLOGY - 10, 11, 12 (1 Term -- .50 credit) Prerequisite: Exploring Graphic Arts. Fee: Check fee insert sheet. This course provides a concentrated study in a more specialized area including advanced camera work, special effects, video reproduction, digital photography, offset press operation, and computer typesetting. Students work on job orders as they would in a printing shop students can make personalized stationary, note pads, shopping lists, announcements, etc..</p>
439	<p>EXPLORING PHOTOGRAPHY - 9, 10, 11, 12 (1 Term -- .50 credit) <i>Fee - Check fee insert sheet.</i> This course provides the beginning photographer with the necessary skills, techniques, and knowledge of photography in order to express their own ideas on film. Units of instruction will include care and operation of camera, film development, making and enlarging prints. A complete basic photo course from how to take better pictures to mounting your own prints.</p>
440	<p>PHOTOGRAPHY TECHNOLOGY - 10, 11, 12 (1 Term -- .50 credit) Prerequisite: Exploring Photography <i>Fee - Check fee insert sheet</i> This course provides for advanced study in the more specialized areas of photography. Fundamentals of color photography will also be introduced. Study units will include: special treatment of negatives and prints, making colored prints from slides or color negatives. Quality in photographs is stressed along with the introduction and use of digital photography.</p>

“NON-CLUSTER COURSES” -- The courses listed in this group do not require prerequisites.	
422	SENIOR AUTO - 12 (1 Term -- .50 credit) <i>Only students who have not had any Power Mechanics or Autos courses. Fee: Check fee insert sheet</i> A comprehensive consumer oriented class for students who want to learn basic skills and information related to automobiles. Basic maintenance is stressed. Approximately 50% lab and 50% classroom. Students must have a car to work on and a valid drivers license.
“ELECTRONICS CLUSTER”	
432	INTRODUCTION TO ELECTRONICS - 9, 10, 11, 12 (1 Term -- .50 credit) <i>Fee: Check fee insert sheet</i> This course is designed to give students a good foundation in the basic principles of electronics. Students will study electron behavior in direct current (DC) and alternating current (AC) circuits. Students will have the opportunity to build and experiment with many interesting circuits using components such as resistors, capacitors, transistors, diodes, integrated circuits, etc. Students will also be able to construct at least one electronic project of their choice to keep.
433	ELECTRONICS COMMUNICATION - 9, 10, 11, 12 (1 Term -- .50 credit) <i>Prerequisite: Introduction To Electronics Fee: Check fee insert sheet</i> The course will provide students with an opportunity to study transmitter and receiver theory and applications for AM, FM, television, and other broadcast bands. Laboratory activities and circuit analysis will allow the student to understand oscillators, amplifiers, digital processing, fiber optics, laser transmission, and antennas. Students will have opportunities to make printed circuit boards and construct interesting projects of their choice to keep.
434	Project Lead the Way DIGITAL ELECTRONICS - 9, 10, 11, 12 (2 Terms -- 1 credit) <i>Prerequisite: Introduction To Electronics, Algebra TWO, or Instructor Recommendation. Fee: Check fee insert sheet.</i> This course is a PLTW Course which will provide students with an opportunity to study generation and processing of pulses used in electronic control systems and basic operations of a microprocessor. Students can elect to take 434 and receive college credit at a PLTW affiliated post secondary school. Students will build and work with circuits to reinforce learning in the area of logic circuits, robotics, flip-flops, counters, and control circuits.