



MVTHS--CTE DEPARTMENT

Technology & Engineering Education Course Listings 2011 - 2012

2000A Orientation to Manufacturing I

IN200A 810

This introductory course is designed to allow students to develop a knowledge of concepts in manufacturing in a global society and its impact on our lives and our environment. This course will emphasize the laboratory approach. Class activities will include demonstrations and applications of manufacturing systems, materials, tools, and machines. Students will apply mathematics and technical knowledge to problem solving.

Length of course: 1 Semester
Credits per semester .5
Grade level: 9, 10 (Juniors and seniors will be allowed in the course only if enrollment numbers make this possible. (Juniors will have priority.)
Prerequisite: None

2000B Orientation to Manufacturing II

IN200B 811

This introductory course is designed to allow students to become aware of the role that welding and cutting of materials play in manufacturing technology. General knowledge and understanding will be developed in arc and wire feed welding, oxyacetylene welding and cutting, manual, semi-automatic, and plasma cutting, air-arc metal removal, T.I.G. welding, and the use of computers and robotics as they relate to these processes. The laboratory approach will be emphasized. Students will apply mathematics and technical knowledge to problem solving.

Length of course: 1 Semester
Credits per semester .5
Grade level: 9, 10 (Juniors and seniors will be allowed in the course only if enrollment numbers make this possible. (Juniors will have priority.)

2100 Communications Technology (Drafting)

IN210 814

Communications Technology is a course designed to foster an awareness and understanding of the technologies used to communicate in our modern society. Students will gain experience in the areas of design and drafting, radio and television broadcasting, computers in communication, photography, graphic arts, and telecommunications.

Length of course: 1 Semester
Credits per semester .5
Grade level: 9, 10 (Juniors and seniors will be allowed in the course only if enrollment numbers make this possible. (Juniors will have priority.)
Prerequisite: None

2200 Energy Utilization Technology (Electricity)

IN220 805

Energy Utilization Technology is a course designed to foster an awareness and understanding of how we use energy in our industrial technological society. Areas of study will include conversion of energy; electrical fundamentals; solar energy resources; alternate energy resources such as wind, water, and geothermal; fossil fuels; nuclear power; energy conservation; and computer uses in energy technology. Students will use laboratory experiences to become familiar with current energy technologies.

Length of course: 1 Semester
Credits per semester .5
Grade level: 9, 10 (Juniors and seniors will be allowed in the course only if enrollment numbers make this possible. (Juniors will have priority.)
Prerequisite: None

2300 Production Technology (Construction)

IN230 818

Production Technology is a course designed to foster an awareness and understanding of manufacturing and construction technology. Through a variety of learning activities, students are exposed to many career opportunities in the production field. Experiences in manufacturing include product design, materials and processes, tools and equipment, including computers, safety procedures, corporate structure, management, research and development, production planning, mass production, marketing and servicing. In construction, students will be exposed to site preparation, foundations, building structures, installing utilities, and finishing and servicing structures.

Length of course: 1 Semester
Credits per semester .5
Grade level: 9, 10 (Juniors and seniors will be allowed in the course only if enrollment numbers make this possible. (Juniors will have priority.)
Prerequisite: None

2400 Transportation Technology (Small Engines)

IN240 822

Transportation Technology is a course designed to foster an awareness and understanding of the various transportation customs that make up our mobile society. Through laboratory activities the student will be exposed to the technologies of and career opportunities involved in material handling, atmospheric and space transportation, marine transportation, terrestrial transportation, and computer uses in transportation technology.

Length of course: 1 Semester
Credits per semester .5
Grade level: 9, 10 (Juniors and seniors will be allowed in the course only if enrollment numbers make this possible. (Juniors will have priority.)
Prerequisite: None

Introduction to Engineering Design (IED)

AVC

This course is for students interested in Engineering and/or Architecture related fields. Units of study include sketching, Multi-Views, Pictorial and 3DDrawing, Sections, Dimensioning, Auxiliary, and Architectural drawings. Portfolios are developed by the students, containing different mediums, such as drawing, sketching, digital pictures, film clips, and computer files, to record and illustrate their design process. Concepts of careers, design, techniques, forms and shapes, geometry, graphing, adaptations, quality control, packaging, and cost analysis are taught in a logical fashion and applied in this hands-on curriculum. Students will be expected to use 2D and 3D CAD software to solve problems and present designs. Powerful Autodesk software such as AutoCAD and Inventor will be utilized. Technical reading and math skills are needed. This course is part of a nationally recognized program called Project Lead the Way. More information can be found at the web site www.PLTW.org

Length of course:	1 2 Semester(s)
Credits per semester	1 .5
Grade level:	11, 12 (Mt. Vernon Township H.S. Freshman and sophomores are permitted to take course)
Prerequisite:	A grade of B or above in Algebra 1A or concurrent enrollment in Algebra 1A or higher level math EXPLORE (Math/Science) Score: 17+ PLAN (Math/Science) Score: 19+
Application:	Yes
Class size:	25

Principles of Engineering (POE)

AVC

This course helps students understand the field of engineering/engineering technology by exploring various technology systems and manufacturing processes help students learn how engineers and technicians use math, science and technology in an engineering problem solving process to benefit people. Topics include the design process, CAD usage, material strength testing, structural analysis, and other engineering topics. Furthermore, the course includes concerns about social and political consequences of technological change. Unit topics include defining types of engineering, communication and documentation, engineering systems, statics and strength of materials, materials and materials testing, engineering for reliability, and dynamic/kinematics. This course is part of a nationally recognized program called Project Lead the Way. More information can be found at the web site www.PLTW.org

Length of course:	1 2 Semester(s)
Credits per semester	1 .5
Grade level:	11, 12 (Mt. Vernon Township H.S. Sophomores are permitted to take course) AVC Out-of-District – 11, 12
Prerequisite:	Completion of Introduction to Engineering Design (IED); A grade of B or above in Geometry or Concurrent enrollment in Geometry or higher level math EXPLORE (Math/Science) Score: 17+ PLAN (Math/Science) Score: 20+
Application:	Yes
Class size:	25

3100 Vehicle Maintenance & Repair I

IN310A/B

855

AVC

This course provides experiences related to maintenance, repair and servicing of a variety of transportation and maintenance equipment. Planned learning activities will allow students to become knowledgeable of fundamental principles and methods and to develop technical skills related to auto mechanics, diesel mechanics, motorboat mechanics and gasoline engine/mower repair. Instruction should include safety principles and practices; combustion engine principles; maintaining, servicing and repairing different types of transportation vehicles, as well as maintenance equipment such as lawn mowers, chainsaws and rotary tillers.

Length of course:	2 Semesters
Credits per semester	1
Grade level:	11, 12
Prerequisite:	Communication/Energy/Production/Transportation
Dual Credit:	Rend Lake College: AUTO 1231—Introduction to Automotive Technology (2 credit hours)—Junior/Senior only
Application:	Yes

3200 Drafting/CAD I**IN320A/B 830 AVC**

This course is for students who are interested in careers in drafting, design, architecture, construction management, interior design, graphic arts, engineering and other related professions. Students will learn to make drawings and read blueprints in the same manner as professionals in the careers listed above. Students will learn to use drafting tools to make drawings by hand. They will also learn to use computer aided drafting (CAD) to make drawings by computer. The classroom is equipped with professional CAD systems which include some of the latest and most powerful software. No previous experience with computers or drafting is needed. The main requirement for enrollment in the course is a sincere desire to learn the "language of industry"....drafting. Success in college (technology, architecture, and engineering) or technical school and success on industrial jobs can be improved by completion of this course. College credit can be received by students who complete this course and achieve a minimum score on a Proficiency Test.

Length of course:	2 Semesters
Credits per semester	1
Grade level:	11 and 12
Prerequisite:	Communication/Energy/Production/Transportation
Dual Credit:	Rend Lake College: CAD 1201—Introduction to Computer Aided Drafting (2 credit hours)—Junior/Senior only
Application:	Yes

3300 Electronics I– Analog**IN330A/B 840 AVC**

A lab based course that utilizes hands-on activities to provide learning experiences in basic electronics. Students will learn the fundamental theories, formulas and concepts of modern electronics. An emphasis is placed on electronic components as they pertain to industrial and commercial circuits. Topics include power supplies, relays, transistor switching, motor controls, robotics and sensors, alarm systems and computer interfacing. Students will design, construct and troubleshoot projects and printed circuit boards throughout the course. This course would provide excellent background for future technicians, electrical engineers, or anyone interested in the field of electronics and computers.

Length of course:	2 Semesters
Credits per semester	.5
Grade level:	11 and 12
Prerequisite:	Communication/Energy/Production/Transportation

3400 Manufacturing I**IN340A/B 845 AVC**

This course offers a planned sequence of learning experiences which provide students with the opportunities to develop competencies needed for employment in a variety of manufacturing-related occupations. Course content will emphasize competencies common to many occupations such as applying safety practices, selecting materials, metal fabrication, performing benchwork operations, performing precision measurement, performing layouts, performing housekeeping activities and setting and operating a variety of tools used for separating, machining, forming and combining materials, blueprint reading and related math.

Length of course:	2 Semesters
Credits per semester	1
Grade level:	11 and 12
Prerequisite:	Communication/Energy/Production/Transportation
Dual Credit:	Rend Lake College: MACH 1201—Machining Technology I (4 credit hours)—Junior/Senior only Rend Lake College: WELD 1270—Introduction to Welding Processes (4 credit hours)—Junior/Senior only
Application:	Yes

3500 3-D Drawing and Animation**IN350A/B 852 AVC**

The 3-D computer drawing and animation course is designed to provide students with the skills needed for a career in the fields of advertising, commercial art, graphic design, web site development, and graphic illustrator. Students will learn to apply artistic, design, and layout principles, along with text, graphics, drawing, rendering, sound, video, and 2D/3D animation integration to develop various print, video and digital products. Students will use hardware and software programs to create, manipulate, color, paint and layer scanned images, computer graphics, and original artwork. Students will use hardware and software to capture, edit, create, and compress audio and video clips. Students will use animation and 2D/3D hardware and software to create animated text, graphics and images. Students will apply artistic techniques to design and create advertisements, displays, publications, technical illustrations, marketing brochures, logos, trademarks, packaging, video graphics, and computer-generated media.

Length of course:	2 Semesters
Credits per semester	.5
Grade level:	11 and 12
Prerequisite:	Communication/Energy/Production/Transportation
Application:	Yes

4100 Vehicle Maintenance & Repair II**IN410A/B 895 AVC**

This course provides learning experiences related to maintenance, repair and servicing of a variety of transportation and maintenance equipment. Planned learning activities should emphasize the development of more advanced knowledge and skill than those provided in Vehicle Maintenance & Repair I. Student technical skill experiences should include instruction and activities in safety principles and practices, as well as continued development of skills associated with aircraft mechanics, auto mechanics, diesel mechanics, motorboat mechanics, and gasoline engine/mower repair. All learning experiences are designed to allow the student to acquire job-entry skills and knowledge.

Length of course:	2 Semesters
Credits per semester	1
Grade level:	12
Prerequisite:	Vehicle Maintenance & Repair I
Application:	Yes

4200 Drafting/CAD II**IN420A/B 875 AVC**

This course builds on the skills developed in Drafting/CAD I and allows the student to begin learning to perform tasks in a selected specialty. Students who like architecture will learn the skills necessary to draw a set of house plans. Students who like machines will learn skills necessary to complete drawings for manufactured parts for automobiles and other consumer products. Students will learn to plan, research materials, determine requirements, and organize activities to complete a drawing. Students will continue to develop skills and complete drawings with professional computer aided drafting (CAD) systems. Students who successfully complete this course will be prepared for beginning employment and (or) greater success in college or technical school programs.

Length of course:	2 Semesters
Credits per semester	1
Grade level:	12
Prerequisite:	Drafting/CAD I
Application:	Yes

4300 Electronics II – Digital**IN430A/B 885 AVC**

Designed to meet the needs of students primarily interested in computer electronics and interfacing. Students will design, construct, and evaluate digital circuits and projects. Techniques for computer interfacing and controls will be explored through hands-on activities and programming projects. Students will learn the basics of programming and interfacing single-chip microcontrollers. Topics include digital schematics, truth tables, logic gates, circuit simplification, analog interfacing, digital interfacing, computer number systems, and Boolean Algebra. This course would provide excellent background for future technicians, electrical engineers, or anyone interested in the field of electronics and computers.

Length of course:	2 Semesters
Credits per semester	.5
Grade level:	11 and 12
Prerequisite:	None

4400 Manufacturing II**IN440A/B 890 AVC**

This second training level course should offer experiences, which expand upon competencies achieved during Manufacturing Occupations I. This course will begin to offer students the opportunity to specialize in specific areas of manufacturing such as machine tool set-up and operation, welding, quality control, automated machine set-up and operation and sheet metal fabrication. Course content might include the following areas: metallurgy and heat treatment of metal, advanced machine set-up and operation, numerical control/computer, numerical control machining, performing supervisory functions and installation, and maintenance and repair of machinery, blueprint reading and related math.

Length of course:	2 Semesters
Credits per semester	1
Grade level:	12
Prerequisite:	Manufacturing I
Application:	Yes

5000 Interrelated Cooperative Education

BU500A/B 900 Skill_AVC

This course is designed for senior students interested in pursuing careers in occupations related to industrial technology. Students are released from school for their paid cooperative education work experience and participate in 200 minutes per week of related classroom instruction. Classroom instruction focuses on providing students with job survival skills, career exploration skills related to the job, as well as improving students' abilities to interact positively with others. For skills related to the job, refer to the skill development course outlines and the task list of the desired occupational program.

A qualified, certified CTE instructor is responsible for supervision. Written training agreements and individual student training plans are developed and agreed upon by the employer, student and coordinator. The coordinator, student and employer assume compliance with federal, state and local laws and regulations.

The course content includes the following broad areas of emphasis: further career education opportunities, planning for the future, job-seeking skills, personal development, human relationships, legal protection and responsibilities, economics and the job, organizations, and job termination. Classroom and worksite instruction is based on the tasks in an occupation.

- Length of course: 2 Semesters
- Credits per semester 1.5
- Grade level: 12
- Prerequisite: Completion of one credit of skill-specific training in an approved CTE program recommended.
- Application: Yes

CAREER PROGRAMS IN INDUSTRIAL OCCUPATIONS												
10.0104 Radio and Television Broadcasting 10.0202 (2000 CIP)	15.1100 (1990 CIP) Technology & Pre-Engineering 21.0201 (2000 CIP)	43.0107 Criminal Justice/Police Science	43.0203 Fire Science / Firefighting	46.1000 Construction Trade (Illinois specific CIP)	47.0100 Electrical / Electronics Maintenance and Repair Technology	47.0104 Computer Installation and Repair Technology / Technician	47.0600 Vehicle Maintenance and Repair Technologies	47.0603 Autobody / Collision and Repair Technology/ Technician	48.0101 Drafting and Design Technology/ Technician General 15.1301 (2000 CIP)	48.0200 Graphic Communications 10.0300 (2000 CIP)	48.0500 Precision Metal Working	50.0402 Commercial and Advertising Art
ORIENTATION LEVEL COURSES (9TH & 10TH GRADE)												
Illinois Plan Production Comm. Transport. Energy	Illinois Plan Production Comm. Transport. Energy	Illinois Plan Production Comm. Transport. Energy	Illinois Plan Production Comm. Transport. Energy	Illinois Plan Production Comm. Transport. Energy	Illinois Plan Production Comm. Transport. Energy	Illinois Plan Production Comm. Transport. Energy	Illinois Plan Production Comm. Transport. Energy	Illinois Plan Production Comm. Transport. Energy	Illinois Plan Production Comm. Transport. Energy	Illinois Plan Production Comm. Transport. Energy	Illinois Plan Production Comm. Transport. Energy	Illinois Plan Production Comm. Transport. Energy
PREPARATION LEVEL COURSES (11TH & 12TH GRADE)												
Radio & TV Broadcast Tech I	Engineering Technology I	Criminal Justice I	Fire Science I	Construction I	Electronic I	Computer Repair I	Vehicle Maintenance I	Autobody I	Drafting & Design I	Graphic Communication I	Manufacturing I	Commercial Arts I
Radio & TV Broadcast Tech II	Engineering Technology II	Criminal Justice II	Fire Science II	Construction II	Electronic II	Computer Repair II	Vehicle Maintenance II	Autobody II	Drafting & Design II	Graphic Communication II	Manufacturing II	Commercial Arts II
Cooperative Education	Cooperative Education	Cooperative Education	Cooperative Education	Cooperative Education	Cooperative Education	Cooperative Education	Coop Education	Coop Education	Cooperative Education	Cooperative Education	Coop Education	Cooperative Education