

Name _____

Learner ID _____

School/College/University _____

For additional information contact:
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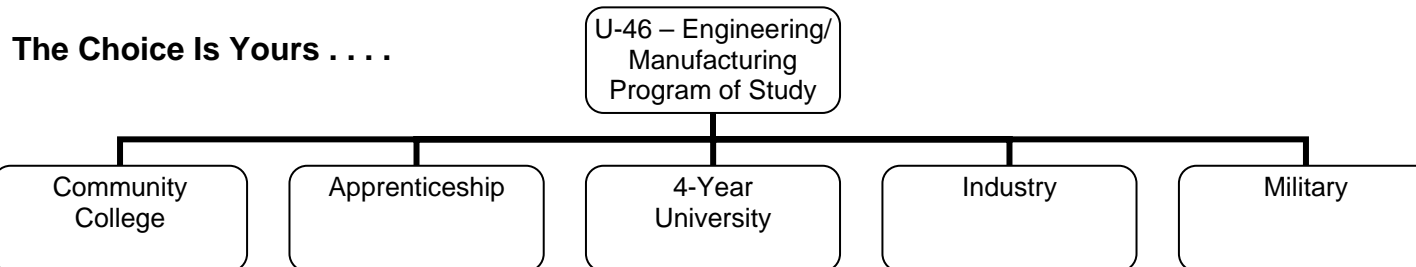
Engineering/Manufacturing

Career Cluster Plan of Study for ► Learners ► Parents ► Counselors ► Teachers/Faculty ► Manufacturers

This Career Cluster Plan of Study (based on Engineering/Manufacturing Career Cluster) can serve as a guide, along with other career planning materials, as learners continue on a career path.

Courses listed with this plan are only recommended coursework and should be individualized to meet each learner's educational and career goals. *This Plan of Study, used for learners at an educational institution, should be customized with course titles and appropriate high school graduation requirements as well as college entrance requirements.

EDUCATION LEVELS	GRADE	English/ Language Arts	Math	Science	Social Studies/ Sciences	PE	Other Required Courses Other Electives Recommended Electives Learner Activities	*Career and Technical Courses and/or Degree Major Courses for Manufacturing	SAMPLE Occupations Relating To This Career Cluster
Interest Inventory Administered and Plan of Study Initiated for All Learners									
SECONDARY	9	**Freshman Language Arts	**Algebra 1-2 **Geometry	**Biology		PE	All plans of study should meet local and state high school graduation requirements and college entrance requirements. Certain local student organization activities are also important including public speaking, record keeping and work-based experiences.	Production Technology/Communication Technology (or Keyboarding) IED – Introduction to Engineering Design (PLTW)	<ul style="list-style-type: none"> ► Business Entrepreneur ► Design Engineer ► Environmental Engineer ► Industrial Machinery Mechanic ► Inspector ► Labor Relations Manager ► Logistician ► Logistics Manager ► Machinist ► Mold Maker ► Manufacturing Technician ► Manufacturing Engineer ► Mechanical Engineer ► Pattern and Model Maker ► Production Manager ► Quality Control Technician ► Safety Engineer ► SPC Coordinator ► Tool and Die maker ► CNC Manufacturing
	10	**Sophomore Language Arts	**Geometry **Algebra 3-4	**Chemistry IPS		PE Health		IED – Introduction to Engineering Design (PLTW) Principles of Engineering Design (PLTW) Machine Tool 1-2	
	11	**Junior Language Arts	**Algebra 3-4 Pre Calc/Trig AP Calculus	**Physics ***Chemistry	***U.S. History	PE		Principles of Engineering Design (PLTW) Computer Integrated Manufacturing (PLTW) Machine Tool 1-2 or 3-4 *ECC Articulated Credit – IMT103 Industrial Manufacturing Tech 1...3 Credits (B or higher for machine Tool 3-4)	
	College Placement Assessments – Academic/Career Advisement Provided							Computer Integrated Design (PLTW) Engineering Design/Development (PLTW) Machine Tool 1-2, 3-4 or 5-6 *ECC Articulated Credit – IMT104 Industrial Manufacturing Tech II...3 credits (B or higher for Machine Tool 5-6)	
	12	**Senior Language Arts			**Economics **Civics	PE 1 Semester			
<p>*Articulation Credit – Elgin Community college credits will be awarded when student enrolls at ECC in the fall following graduation or within 27 months.</p> <p>** Honors Credit offered</p> <p>*** Honors and/or AP Credit offered</p> <p>May Earn National Career Readiness Certification (NCRC) and National Industry Manufacturing Certification (NIMS)</p>									



Engineering/Manufacturing

Course Descriptors

(Course content may be taught as concepts within other courses.)

- ✧ **Introduction to Engineering Design** – (Fall, 2009)
Using computer modeling software, students learn the process of product design. They solve design problems as they develop, create, and analyze product models.
- ✧ **Principles of Engineering** – (PLTW) TBD
Students explore technology systems and manufacturing processes to find out how math, science, and technology help people.
- ✧ **Computer Integrated Manufacturing** – (PLTW) TBD
Students learn concepts of robotics and automated manufacturing by creating three-dimensional designs with modeling software, and producing models of their designs.
- ✧ **Engineering Design & Development** – (PLTW) TBD
Teams of students, guided by community mentors, work together to research, design, and construct a solution to an engineering problem.
- ✧ **Machine Tool – 1-2**
Grade Level: 10, 11, 12
Prerequisite: Mechanical CAD 1-2 or IED (Introduction to Engineering Design, PLTW) 10 & 11 grade students wishing to pursue a sequence of courses in the machine shop area should be given preference in enrollment. Class offered at BHS, SEHS, & SHS – open to all U-46 students.
Content: This is a beginning course to provide the entry-level skills of the machine tool industry. Machines incorporated in this course include the lathe, vertical milling machine, radial drill press, pedestal grinder, surface grinders, and various measuring devices, precision and semi-precision measuring devices. Introduction to computers is also explored at this level. CNC programming is introduced.
Activities: Theory and practice of machining various metals using hand and machine tools of industry.
- ✧ **Machine Tool – 3-4**
Grade Level 11, 12
Prerequisite: Machine Tool Technology 1-2. Class offered at BHS, SEHS & SHS - open to all U-46 students. This class meets for two periods a day.
Content: This is a class in the machine tool field for students with a definite interest in the trade that has successfully passed Machine Tool Technology 1-2. Theory and application is more advanced with more math and blueprint reading.
Activities: Lab activities include: hand and machine layout, heat-treating, cutter grinding and cylindrical grinding, along with regular project work. Facility and machine maintenance will also be taught. CNC programming is also explored in this class. (National Certification/Articulation Credit)
- ✧ **Machine Tool – 5-6**
Grade Level: 12
Prerequisite: Machine Tool 1-2 and 3-4 or with consent of instructor. Class offered at BHS, SEHS, & SHS – open to all U-46 students.
Content: The class meets two periods each day. It is a career preparation class for students interested in careers in the machine tool industry. Students will develop entry-level skills in mathematics, blueprint reading, the use of measuring instruments, and the basic machine tools of the industry.
Activities: Discussions of the technical information in the design and construction of jigs, fixtures, dies, and molds. Work on the lathe, vertical mill, surface grinder, band saw, tool and cutter grinder. An in-depth CNC programming is done at this level with increased computer time. Students will be required to pay project costs. (National Certification/Articulation Credit)