

MACHINING PROGRAM OF STUDY MATRIX: MIDDLE -HIGH SCHOOL-POSTSECONDARY (FULL SEQUENCE)

This Career Program of Study can serve as a guide, along with other career planning materials, as learners continue along a career path. Courses listed within this plan are only recommended coursework and should be individualized to meet each learner's educational and career goals. The program of study should be customized with course titles and appropriate high school graduation requirements as well as college entrance requirements. Additional career exploration opportunities should also be offered at upper elementary grade levels to promote higher engagement and learner focus in subsequent years.

	Grade	English	Math	Science	Social Studies	Required Courses, Electives, and Learner Activities	Career and Technical Courses	Sample Occupations	
Student Success Plans outlining career goals should be utilized through the advisement process.								Requiring on-the-job training or Industry-Recognized Credential <ul style="list-style-type: none"> • CNC Machine Operator • CNC Machine Programmer • Automotive Machinist • Die Maker • Industrial Machinery Mechanics • Machine Tool Setter • Maintenance Machinist • Millwrights • Mold Maker • Pattern Maker • Precision Machinist • Tool room Machinists • Toolmakers 	
Middle School	7	ELA 7	Math 7	Science 7	Social Studies 7		Career Exploration		
	8	ELA 8	Math 8	Science 8	Social Studies 8		Employability Skills		
Courses with an asterisk () indicate the potential for exploring credit transfer opportunities with local community colleges*									
Secondary	9	ELA 9	Algebra I	NGSS Aligned Science 9	United States History	All programs of study should meet local and state high school graduation requirements and college entrance requirements. Participations in a CTSO are also important for developing appropriate skills and competencies.	Introduction to Technology and Engineering	Requiring an Associate's Degree: <ul style="list-style-type: none"> • Industrial Engineering Technicians • Mechanical Engineering Technicians 	
	10	ELA 10	Geometry	NGSS Aligned Science 10	American Government		Foundations of Technology		
	11	ELA 11	Algebra II	Chemistry*	World History or Economics		Machine Shop Technology I*		Computer Integrated Manufacturing*
	12	Transitional English or English Composition*†	TM Technical Math, TM STEM, College Algebra*, Calculus*†	Physics*	Psychology*		Machine Shop Technology II*		Machine Tool Technology Workplace Experience
Courses with a double asterisk () indicate courses that might have already been met with an appropriate dual credit agreement**									
Postsecondary	13	English Composition. †	Technical Math	General Physics**†	Social Science†	All programs of study should meet learners' career goals with regards to required degrees, licenses, certifications or journey worker status. Participations in appropriate student organizations are also important for developing appropriate skills and competencies.	Continue required courses in learners' chosen area of specialization to complete the desired certification and/or credential.		Occupations Requiring a Bachelor's Degree: <ul style="list-style-type: none"> • Industrial Engineering • Industrial Maintenance Manager • Maintenance Project Engineer • Manufacturing Operations Manager • Manufacturing Engineering
	14	Oral Communication†	College Algebra**	General Chemistry**†					
	15	Continue courses in learners' chosen area of specialization							
	16								

*AP Dual Credit Opportunities

**Skip to next course in sequence if accomplished through credit transfer opportunity

†Postsecondary Course Affiliated with IAI Code

CTE Course Codes, Titles, Definitions

State Codes	Course Title	Course Definitions
22151A001	Production Technology	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 are exposed to site preparation, foundations, building structures, installing utilities, and finishing and servicing structures.
21052A002	Introduction to Technology and Engineering (Industrial)*	Introduction to Technology & Engineering is comprised of the following areas: Production, Transportation, Communication, Energy Utilization and Engineering Design but is not limited to these areas only. This course will cover the resources, technical processes, industrial applications, material sciences, technological impact and occupations encompassed by that system.
13203A007	Beginning Machining	Beginning Machining course enable students to create metal parts using various machine tools and equipment. Course content may include interpreting specifications for machines using blueprints, sketches, or descriptions of parts; preparing and using lathes, milling machines, shapers, and grinders with skill, safety, and precision.
13203A005	Machine Shop Technology I	This course introduces students to the basic mechanical and technical skills common to most fields in the fabrication of metal parts in support of other manufacturing activities. Topics include shop safety, hand and power tool use, the operation and maintenance of precision metal working equipment, precision measurement, quality control, exploring the manufacturing process, instrumentation and blueprint reading.
21010A001	Computer Integrated Manufacturing	Computer Integrated Manufacturing courses involve the study of robotics and automation. Building on computer solid modeling skills, students may use computer numerical control (CNC) equipment to produce actual models of their three-dimensional designs. Course topics may also include fundamental concepts of robotics, automated manufacturing, and design analysis.
13203A006	Machine Shop Technology II	This course builds on the skills and concepts introduced in Machine Shop Technology I. Additional skill -building activities include automated manufacturing, the use of end mills, surface grinders, drill presses, and basic welding procedures.
13148A001	Machine Tool Technology Workplace Experience	Machine Tool Technology Workplace Experience courses provide students with work experience in fields related to manufacturing systems and/or research. Goals are typically set cooperatively by the student, teacher, and employer (although students are not necessarily paid). These courses may include classroom activities as well, involving further study of the field or discussion regarding experiences that students encounter in the workplace.

Additional Learning Opportunities Continuum			
Early Career Opportunities Learning about work	Credit Transfer & WBL Opportunities	Industry Recognized Credentials	Student Organization
<input type="checkbox"/> Career Planning	<input type="checkbox"/> Dual Enrollment / Dual Credit	<input type="checkbox"/> Certification / License	<input type="checkbox"/> Business Professionals of America (BPA)
<input type="checkbox"/> Career Fairs	<input type="checkbox"/> Advanced Placement	<input type="checkbox"/> Certification / License	<input type="checkbox"/> Future Business Leaders of America (FBLA)
<input type="checkbox"/> Industry Speakers	<input type="checkbox"/> Articulated Credit	<input type="checkbox"/> Other	<input type="checkbox"/> Family, Career and Community Leaders of America (FCCLA)
<input type="checkbox"/> Informational Interviews	<input type="checkbox"/> Career-Related Service Learning		<input type="checkbox"/> Future Farmers of America - Illinois (FFA)
<input type="checkbox"/> Career Presentations	<input type="checkbox"/> School-Based Enterprise		<input type="checkbox"/> Future Health Professionals (HOSA)
<input type="checkbox"/> Worksite Tours	<input type="checkbox"/> Student-Led Enterprise		<input type="checkbox"/> Illinois DECA
<input type="checkbox"/> Cooperative Education	<input type="checkbox"/> Project-Based Learning		<input type="checkbox"/> Science Olympiad
<input type="checkbox"/> Job Shadow	<input type="checkbox"/> Internships		<input type="checkbox"/> Skills USA Illinois
<input type="checkbox"/> Simulated Skill Development	<input type="checkbox"/> Apprenticeships (i.e., youth, pre-registered, non-registered, research)		<input type="checkbox"/> Technology Student Association (TSA)
<input type="checkbox"/> Other	<input type="checkbox"/> Other		<input type="checkbox"/> Other
List Other:	List Other:		List Other:
			<input type="checkbox"/> Team-Based Challenge
			List Challenge:

Feeder Middle School(s):	
LEA Additional Graduation Requirements	