

Engineering Program of Study

Engineering



A program of study serves as a guide, along with other career planning materials, as learners continue along a career path. Courses listed are only recommended coursework and should be individualized to meet each learner's educational and career goals.

Ultimately, a 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. Student Success Plans outlining career goals should be utilized through the advisement process.

Requires on-the-job training or industry-recognized credential

- Computer-Aided Design (CAD) Technician
- Computer Numerical Control (CNC) Programmer
- Machinist

Requires an associate degree

- Electrical Technician
- Maintenance Technician
- Mechatronic Technician

Requires a bachelor's degree

- Aerospace Engineering
- Civil Engineer
- Computer Engineer
- Design Engineer
- Electrical Engineer
- Engineering Technician/Technologist
- Manufacturing Engineer
- Mechanical Engineer
- Process Engineer
- Systems Engineer

Requires an advanced degree

- Engineering Manager
- Principal Engineer

Sample occupations



Course examples

Career Exploration (22151A001)

Career Exploration courses help students identify and evaluate personal goals, priorities, aptitudes, and interests with the goal of helping them make informed decisions about their careers. These courses expose students to various sources of information on career and training options and may also assist them in developing job search and employability skills.

Introduction to Technology and Engineering (Industrial) (21052A002)

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.

Introduction to Engineering Design (21006A001)

Engineering Design courses offer students experience in solving problems by applying a design development process. Often using solid modeling computer design software, students develop, analyze, and test product solutions models as well as communicate the features of those models.

Principles of Engineering (21004A001)

Principles of Engineering courses provide students with an understanding of the engineering /technology field. Students typically explore how engineers use various technology systems and manufacturing processes to solve problems; they may also gain an appreciation of the social and political consequences of technological change.

Emerging Technologies (21053A001)

Emerging Technologies courses emphasize students' exposure to and understanding of new and emerging technologies. The range of technological issues varies widely but typically include lasers, fiber optics, electronics, robotics, computer technologies (software engineering), Game Art and Design, CAD/CAM, communication modalities, and transportation technologies.

Engineering Workplace Experience (21048A001)

Engineering Workplace Experience courses provide students with work experience in an engineering-related field. Goals must be set cooperatively by the student, teacher, and employer (although students are not necessarily paid). These courses must include classroom instruction at least once per week, involving further study of the field, discussion of relevant topics that are responsive to the workplace experience and employability skill development. Workplace Experience courses must be taught by an approved WBL educator-coordinator. These courses should be aligned to a Career Development Experience that could include: Student-led Enterprises; School-based Enterprises; Immersion Supervised Agricultural Experiences; Clinical Experiences in Health Science and Technology programs; Internships; and Apprenticeship programs including Youth Apprenticeships, Pre-apprenticeships, and Registered Apprenticeships.

Full sequence

	Grade	English	Math	Science	Social Studies	Required Courses, Electives, and Learner Activities	Career and Technical Courses
Middle School	7	ELA 7	Math 7	Science 7	Social Studies 7		Career Exploration
	8	ELA 8	Math 8	Science 8	Social Studies 8		Introduction to Technology and Engineering
Secondary	9	ELA 9	Algebra I	NGSS Aligned Science 9	U.S. 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 Engineering Design
	10	ELA 10	Geometry	NGSS Aligned Science 10	World History or Economics		Principles of Engineering
	11	ELA 11	Algebra II	Chemistry*	U.S. Government*		Emerging Technologies
	12	Transitional English or English Composition*	TM STEAM or Calculus*	Physics*	*		Engineering Workplace Experience
Postsecondary	13	English Composition†	General Education**†	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.
	14	Oral Communication†	Mathematics for Elementary Teaching I & II†				
	15	Continue courses in learner's 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 Illinois Articulation Initiative Code

Additional opportunities

Early career opportunities learning about work

- Career Planning
- Career Fairs
- Industry Speakers
- Informational Interviews
- Career Presentations
- Worksite Tours
- Cooperative Education
- Job Shadow
- Simulated Skill Development
- Other

Credit Transfer and WBL opportunities

- Dual Enrollment/Dual Credit
- Advanced Placement
- Articulated Credit
- Career-Related Service Learning
- School-Based Enterprise
- Student-Led Enterprise
- Project-Based Learning
- Internships
- Apprenticeships (e.g., youth, pre-registered, non-registered, research)
- Other

Industry-recognized credentials

- Certification
- License
- Other

Student organizations

- Business Professionals of America
- Educators Rising
- Future Business Leaders of America
- Family, Career and Community Leaders of America
- National FFA Organization (Illinois Association FFA)
- Future Health Professionals
- Illinois Distributive Education Clubs of America
- Science Olympiad
- Skills USA Illinois
- Technology Student Association
- Other
- Team-Based Challenge