

# Engineering Career Cluster

The Engineering career cluster focuses on planning, designing, testing, building, and maintaining of machines, structures, materials, systems, and processes using empirical evidence and science, technology, and math principles. This career cluster includes occupations ranging from mechanical engineer and electrical engineer and mapping technician.

## Statewide Program of Study Mechanical and Aerospace Engineering

The Mechanical and Aerospace Engineering program of study focuses on occupational and educational opportunities associated with design, development, maintenance, and testing of engines, machines, and structures related to aircraft and space. Students will design, test, and evaluate projects related to aerodynamics, structural, and mechanical design. This program of study includes applying scientific, mathematical, and empirical evidence to solve problems related to navigation, mechanics, propulsion, and combustion.

### Secondary Courses for High School Credit

Level 1	<ul style="list-style-type: none"> <li>‡ Principles of Applied Engineering</li> <li>‡ Principles of Technology</li> <li>‡ Introduction to Aerospace and Aviation</li> <li>‡ Introduction to Computer-Aided Design and Drafting</li> <li>‡ Introduction to Engineering Design (PLTW)</li> <li>‡ Engineering Essentials (PLTW)</li> </ul>
Level 2	<ul style="list-style-type: none"> <li>‡ Intermediate Computer-Aided Design and Drafting</li> </ul>
Level 3	<ul style="list-style-type: none"> <li>‡ Engineering Design and Presentation I</li> <li>‡ Engineering Mathematics</li> <li>‡ Engineering Science</li> <li>‡ Aerospace Engineering (PLTW)</li> <li>‡ Engineering Design and Development (PLTW)</li> <li>‡ Aerospace Design I (TBD)</li> <li>‡ Mechanical Design I (TBD)</li> </ul>
Level 4	<ul style="list-style-type: none"> <li>‡ Engineering Design and Problem Solving</li> <li>‡ Engineering Design and Presentation II</li> <li>‡ Aerospace Design II (TBD)</li> <li>‡ Mechanical Design II (TBD)</li> <li>‡ Career and Technical Education Project-Based Capstone</li> <li>‡ Practicum in Science, Technology, Engineering, and Mathematics</li> <li>‡ Practicum in Science, Technology, Engineering, and Mathematics + Extended</li> <li>‡ Practicum in Science, Technology, Engineering, and Mathematics</li> <li>‡ Practicum in Engineering (TBD)</li> <li>‡ Career Preparation for Programs of Study</li> <li>‡ Career Preparation for Programs of Study + Extended Career Preparation</li> <li>‡ Scientific Research and Design</li> </ul>

### Example Postsecondary Opportunities

Apprenticeships  
 ‡ Mechanical Engineering Technician Apprenticeship

Associate Degree

### Aligned Advanced Academic Courses

AP or IB	<ul style="list-style-type: none"> <li>AP Calculus AB</li> <li>AP Calculus BC</li> <li>AP Physics 1</li> </ul>	<ul style="list-style-type: none"> <li>AP Physics 2</li> <li>AP Statistics</li> </ul>	<ul style="list-style-type: none"> <li>IB Physics SL</li> <li>IB Physics HL</li> </ul>
Dual Credit	Dual credit offerings will vary by local education agency.		

Students should be advised to consider these course opportunities to enrich their preparation. AP or IB courses not listed under the Secondary Courses for High School Credit section of this framework document do not count towards concentrator/completer status for this program of study.

### Work-Based Learning and Expanded Learning Opportunities

Work-Based Learning Activities	<ul style="list-style-type: none"> <li>‡ Intern at an aviation or aerospace company</li> <li>‡ Shadow a mechanical engineer to understand design and testing processes</li> <li>‡ Complete a project to test and evaluate a new product design for a local company</li> </ul>
Expanded Learning Opportunities	<ul style="list-style-type: none"> <li>‡ Tour an aerospace facility</li> <li>‡ Participate in SkillsUSA or TSA</li> </ul>

### Aligned Industry-Based Certifications

- ‡ Engineering Technology Foundations
- ‡ PreEngineering/Engineering Technology Job Ready
- ‡ Lean Six Sigma Green Belt Certification
- ‡ Aerospace Manufacturing Certification
- ‡ Autodesk Associate (Certified User) AutoCAD
- ‡ Autodesk Associate (Certified User) Fusion 360
- ‡ Autodesk Associate (Certified User) Inventor for Mechanical Design
- ‡ Autodesk Associate (Certified User) Revit Architecture
- ‡ Autodesk Associate (Certified User) Revit for Electrical
- ‡ Autodesk Associate (Certified User) Revit for Structural Design
- ‡ Autodesk Certified Professional Fusion 360
- ‡ Autodesk Certified Professional in AutoCAD for Design and Drafting
- ‡ Autodesk Certified Professional in Civil 3D for Infrastructure Design
- ‡ Autodesk Certified Professional in Inventor for Mechanical Design
- ‡ Autodesk Certified Professional in Revit for Architectural Design
- ‡ Autodesk Certified Professional in Revit for Electrical Design
- ‡ Autodesk Certified Professional in Revit for Structural Design
- ‡ Certified SOLIDWORKS Associate (CSWA) Academic
- ‡ Certified SOLIDWORKS Associate (CSWA) Architectural
- ‡ Certified SOLIDWORKS Associate (CSWA) Mechanical Design
- ‡ Certified SOLIDWORKS Associate (CSWA) Simulation
- ‡ Certified SOLIDWORKS Associate (CSWA) Sustainability
- ‡ Certified SOLIDWORKS Professional (CSWP) Academic
- ‡ Certified SOLIDWORKS Professional (CSWP) Mechanical Design
- ‡ Certified SOLIDWORKS Professional (CSWP) Model Based Definition
- ‡ Certified SOLIDWORKS (CSWP) Simulation
- ‡ Certified SOLIDWORKS (CSWP) Drawing Tools





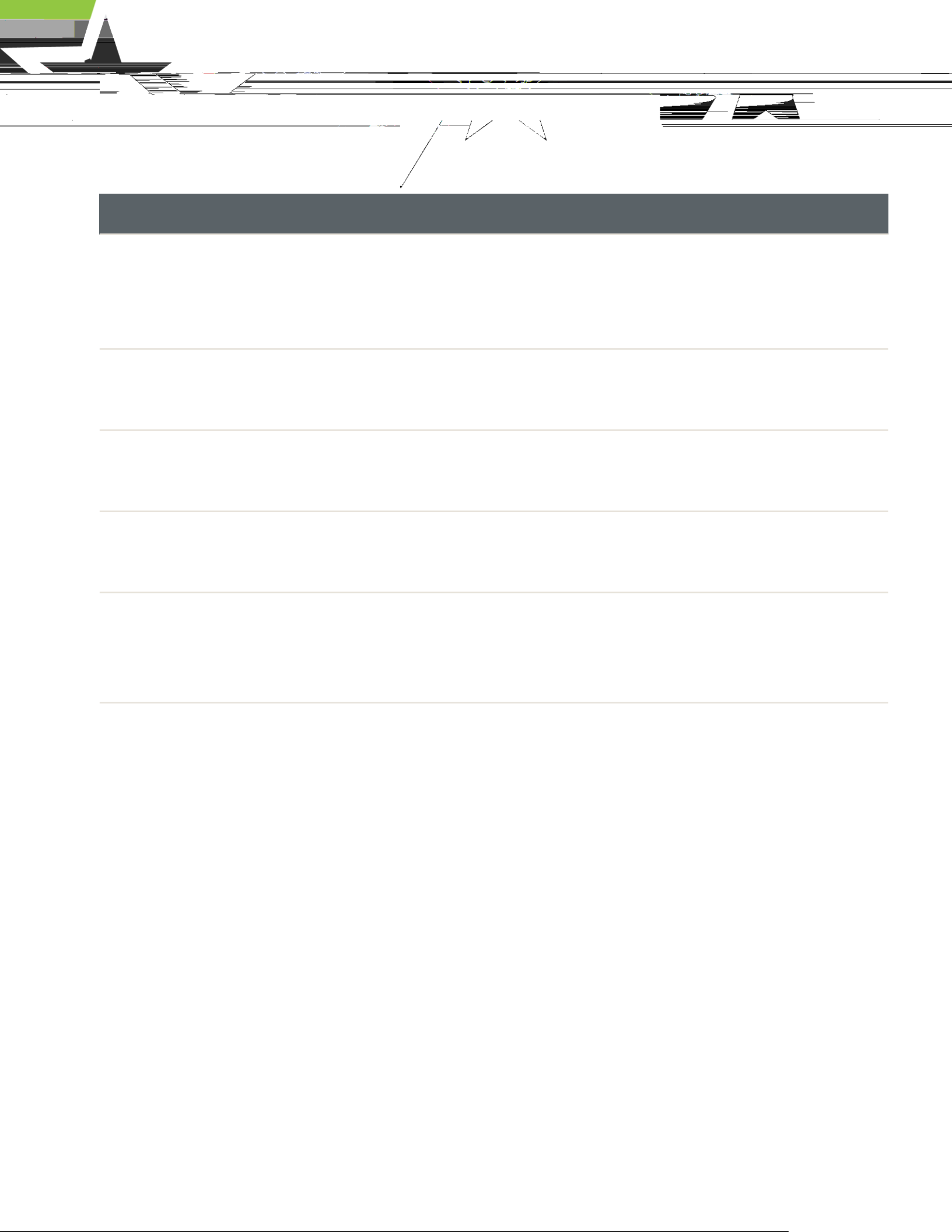
# Engineering Career Cluster

## Statewide Program of Study Mechanical and Aerospace Engineering

### Course Information

Level 3

Course	Prerequisites   Corequisites	Career Clusters
Engineering Design and Presentation I* 13036500 (1 credit)	Prerequisites Algebra I Corequisites None Recommended Prerequisite Principles of Applied Engineering Prerequisites Algebra I, Corequisite Recommended Prerequisite:	 
Engineering Mathematics 13036507 (1 credit)		



# Engineering Career Cluster

## Statewide Program of Study Mechanical and Aerospace Engineering

### Course Information

Level 4

Course	Prerequisites   Corequisites	Career Clusters
Practicum in Engineering* TBD (TBD credit)	Prerequisites:TBD Corequisites:TBD Recommended Prerequisite:TBD Recommen(s):10.3 0.396 rg 19.0(s:)10 rg 19.098(A)15.00Cor3(e)-28(r)22.99qrg 19.0(i)-19.003(s)6.0	