

# High School to College and Career Pathway: Secondary

Career and Technical Education: Preparing Students for College and Career!



## Area of Study: Technology and Engineering Education

### Pathway: Pre-Engineering (Utah Pre-Engineering Program)

**Get the Facts**  
In Utah, an engineer, professional or structural, must be licensed.

**Workforce Trends**  
Due to the expansion of jobs in the technical fields and the increasing numbers of engineers who are retiring, the number of job openings in technology and engineering is increasing. There is a critical shortage of engineers and engineering technologists entering the field at a time when technology is reinventing itself every few years.

| CAREER AND TECHNICAL EDUCATION Recommended Pathway Courses   |  |        |
|--|--|--------|
| (Students may select individual courses for exploration, or a complete Pathway for an in-depth focus.) |  |        |
| CLASS AVAILABILITY MAY VARY AT YOUR HIGH SCHOOL  |  |        |
| Course #   | Foundation Courses: (required)                 | Credit |
| 21.0114  | Pre-Engineering (required)                     | 1.00   |
| 21.0115  | Engineering Design (required)                  | .50    |
|  | Choose one of the following courses:           |        |
| 21.0116  | Materials & Processes                          | .50    |
| 21.0117  | Automation & Robotics                          | .50    |
|  | <b>Elective Courses:</b>                       |        |
| 14.3101  | Material Science                               | 1.00   |
| 15.0614  | Introduction to Bio-Manufacturing              | 1.00   |
| 20.0112  | Advanced Technology                            | .50    |
| 21.0104  | Foundations of Technology                      | .50    |
| 21.0105  | Physics with Technology                        | 1.00   |
| 21.0200  | Energy Foundations                             | .50    |
| 47.0105  | Electronics                                    | 1.00   |
| 48.0101  | Drafting/CAD                                   | 1.00   |
| 32.0199  | Student Internship (Critical Workplace Skills) | .50    |

2.00 credits

1.00 credit

3.00 credits for completion

**Pre-Engineering is:**

- > High skill
- > High wage
- > High demand
- > Nontraditional for females

**Sample Career Occupations**

- > Civil Engineer
- > Civil Engineering Technician
- > Electrical Engineer
- > Technology and Engineering Education Teacher
- > Mechanical Engineer
- > Mechanical Engineering Technician

| Middle School           |                         | State Requirements |                        | High School Suggested Education Plan               |   |                          |   | College and Career  |
|-------------------------|-------------------------|--------------------|------------------------|--|---|--------------------------|---|---|
| 7th Grade               | 8th Grade               | Middle School      | High School            | 9th Grade Suggested                                | 10th Grade Suggested  | 11th Grade Suggested     | 12th Grade Suggested                    | Beyond High School  |
| Language Arts 7<br>1.00 | Language Arts 8<br>1.00 | 2.00               | Language Arts<br>4.00  | Language Arts 9<br>1.00                            | Language Arts 10<br>1.00  | Language Arts 11<br>1.00 | Language Arts 12<br>1.00                | There are a number of options for education and training beyond high school, depending on your career goals. <ul style="list-style-type: none"> <li>&gt; Certificate</li> <li>&gt; Associate degree</li> <li>&gt; Bachelor's degree</li> <li>&gt; Professional degree</li> <li>&gt; On-the-job training</li> <li>&gt; Apprenticeship</li> <li>&gt; Military training</li> </ul> For more information on salary projections, labor market demand, and training options, visit <a href="http://www.utahfutures.org">www.utahfutures.org</a> . |
| Math * 1.00             | Math * 1.00             | 2.00               | Math<br>3.00           | Math * 1.00  | Math * 1.00   | Math * 1.00              | Math * 1.00                             |   |
| Science<br>.50          | Science<br>1.00         | 1.50               | Science<br>3.00        | Earth Systems<br>1.00                              | Biology<br>1.00   | Chemistry<br>1.00        | Physics or Physics with Technology 1.00 |   |
| Utah Studies<br>.50     | U.S. History I<br>1.00  | 1.50               | Social Studies<br>3.00 | Geography for Life<br>.50                          | World Civilizations<br>.50  | U.S. History II<br>1.00  | U.S. Government and Citizenship .50     |   |
| P.E.<br>1.00            | Health<br>.50           | 1.50               | P.E./Health<br>2.00    | Participation Skills and Techniques .50            | Fitness for Life .50 / Health Education .50<br>Lifetime Activities or Sport .50 |                          |   |   |
| The Arts .50            | The Arts .50            | 1.00               | Fine Arts<br>1.50      | Fine Arts Courses 1.50                             |   |                          |   |   |
| Keyboarding .50         |                         |                    | Computer Tech.<br>.50  | Computer Technology .50                            |   |                          |   |   |
| CTE Intro 1.00          |                         | 1.00               | CTE<br>1.00            | Refer to Career and Technical Education box above. |   |                          |   |   |

\* Talk to your school counselor about math requirements in the new common core curriculum. Core curriculum and elective requirements may vary district to district.

Concurrent enrollment course offerings vary by school and district. Many Utah postsecondary programs accept high school courses toward a two- or four-year degree through concurrent enrollment. Check regional postsecondary Pathways for details.

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## Area of Study: Technology and Engineering Education

### Pathway: Project Lead the Way (National Pre-Engineering Program)

#### Get the Facts

Project Lead the Way is offered in over 45 states and the District of Columbia.

In Utah, an engineer, professional or structural, must be licensed.

#### Workforce Trends

Nationally, engineering is the second largest of all professions. In Utah, it is one of the fastest-growing industries, having a projected growth rate of 2.2 percent through the year 2018, creating 17,200 jobs.



#### CAREER AND TECHNICAL EDUCATION

##### Recommended Pathway Courses

(Students may select individual courses for exploration, or a complete Pathway for an in-depth focus.)

CLASS AVAILABILITY MAY VARY AT YOUR HIGH SCHOOL

| Course #                             | Foundation Courses: (required)                 | Credit |
|--------------------------------------|--|--------|
| 21.0120                              | Engineering Design, Introduction (required)    | 1.00   |
| 21.0122                              | Principles of Engineering (required)           | 1.00   |
| Choose one of the following courses: |  |        |
| 14.0201                              | Aerospace Engineering                          | 1.00   |
| 21.0121                              | Digital Electronics                            | 1.00   |
| 21.0123                              | Computer Integrated Manufacturing              | 1.00   |
| 21.0124                              | Engineering Design & Development *             | 1.00   |
| 21.0125                              | Civil Engineering & Architecture               | 1.00   |
| Elective Courses:                    |  |        |
| 21.0105                              | Physics with Technology                        | 1.00   |
| 32.0199                              | Student Internship (Critical Workplace Skills) | .50    |

3.00 credits

Additional credits

3.00 credits for completion

\* Recommended capstone course. However, Pathway may be completed by taking 1.00 credit from elective courses.

#### Pre-Engineering is:

- > High skill
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#### Sample Career Occupations

- > Civil Engineer
- > Complex Analysis
- > Complex Design
- > Development Manufacturing Research
- > Electrical Engineer
- > Mechanical Engineer
- > Technology and Engineering Education Teacher

| Middle School           |                         | State Requirements |                        | High School Suggested Education Plan               |   |                          |   | College and Career  |
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| The Arts .50            | The Arts .50            | 1.00               | Fine Arts<br>1.50      | Fine Arts Courses 1.50                             |   |                          |   |   |
| Keyboarding .50         |                         |                    | Computer Tech.<br>.50  | Computer Technology .50                            |   |                          |   |   |
| CTE Intro 1.00          |                         | 1.00               | CTE<br>1.00            | Refer to Career and Technical Education box above. |   |                          |   |   |

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