



AN INITIATIVE OF  LDOE

STEM Renaissance Pathway Brief Pre-Engineering



Pre-Engineering

The Louisiana pre-engineering pathway provides a pre-engineering program for both TOPS University and TOPS Tech diploma-seeking high school students. Through hands-on projects and interaction with industry professionals, the curriculum prepares students to compete in the 21st century by engaging them in understanding the fundamentals of engineering in the classroom as well as in the workplace. Students will understand the careers available to them in the field of engineering as well as learn key skills such as teamwork, oral and written technical communication, and work ethic that will serve them well whether they pursue an advanced degree or immediately join the workforce.

College and Career Connections

Finding high-wage career opportunities directly out of high school can be challenging. It typically requires advanced capstone credentials accompanied by work experience and/or apprenticeships in the field of study.

| High School to Career | Community/ technical College to Career | University to Career |
|---|---|---|
| Automotive Technician Outboard Marine Technician Solar Panel Installer Wind Turbine Technician | Architectural and Civil Drafter Computer Integrated Manufacturing Computer Engineering Programmer Mechanical Drafter | Biomedical Engineering Chemical Engineering Civil/Construction Engineering Petroleum Engineering |

****This Louisiana STEM Pathway must be used for students entering grade 9 in the 2024-2025 school year and future cohorts. The “Archived Pathway” briefs must be followed for students that entered grade 9 prior to the 2024-2025 school year. Email STEM@la.gov with any questions.**

Universal Documents

[STEM Pathways](#) [CDF Eligible Courses](#) [Jump Start Funding](#) [Universal Course Codes](#)

Capstone Credentials

In order to graduate, Jump Start students must earn at least one credential from the options below.

*Please contact the individual providers to confirm if provider specific courses are structured to offer the credential.

INDUSTRY BASED CREDENTIALS: Depending on student course completion

| | | |
|-------------------------------------|--------------------------------|--|
| Autodesk Certified User AutoCAD | CIW Javascript Specialist | COMP TIA IT Fundamentals |
| Autodesk Inventor Certified User | CIW Perl Specialist | Fundamentals of Javascript, Functional Programming, and Web Development Level 1 |
| CIW Data Analyst | CIW Web Site Design Specialist | |

STEM Renaissance Digital Design & Emergent Media Pathway Structure

To earn the **Silver STEM Diploma Seal** students must pass one course from each of the four following concentration areas: an Introductory Engineering course, an Engineering Design course, a Principles of Engineering course, and a Silver Engineering Focal course. (These course options are listed on the following chart.)

To earn the **Gold STEM Diploma Seal** students must complete the requirements for the Silver STEM Diploma Seal, pass two Pre-Engineering courses, pass one Applied Computing and Technology course from the approved STEM Pathway listing, and pass an additional Math or Science course. (These course options are listed on the following chart.)

To complete the **TOPS Tech Diploma** students must complete the Gold STEM Diploma Seal requirements and one course from the approved Career Readiness Course list.

Universal Documents

[STEM Pathways](#)

[CDF Eligible Courses](#)

[Jump Start Funding](#)

[Universal Course Codes](#)

Pre-Engineering STEM Pathway Course Options

| Concentration Area | Course Code | Course Title | Carnegie Credits |
|--|-------------|--|------------------|
| To earn the Silver STEM Diploma Seal students <u>must</u> pass one course from each of the four following concentration areas: an Introductory Engineering course, an Engineering Design course, a Principles of Engineering course, and a Silver Engineering Focal course. | | | |
| Introductory Engineering Course (Select 1) | 110801 | Intro to Engineering (LSU Partnership) OR | 1 |
| | 110802 | PLTW Intro to Engineering Design | 1 |
| Engineering Design Course (Select 1) | 110861 | Engineering Design and Development (LSU Partnership) OR | 1 |
| | 110862 | PLTW Engineering Design and Development | 1 |
| Principles of Engineering Course (select 1) | 080109 | PLTW Principles of Engineering OR | 1 |
| | 110864 | Principles of Engineering (LSU Partnership) | 1 |
| Exploration Course for Pre-Engineering (Select 1) | 061177 | AP Computer Science Principles OR | 1 |
| | 110850 | Computer Integrated Manufacturing OR | 1 |
| | 150740 | First Robotics I OR | |
| | 061140 | Intro to Computational Thinking (LSU Partnership) OR | 1 |
| | 110841 | PLTW Civil Engineering and Architecture OR | 1 |
| | 150780 | Robotics (LSU Partnership) | 1 |

| Additional Course Options | Course Code | Course Title | Carnegie Credits |
|---|-------------|--|------------------|
| To earn the Gold STEM Diploma Seal students <u>must</u> complete the requirements for the Silver STEM Diploma Seal, pass two Pre-Engineering courses, pass one Applied Computing and Technology course from the approved STEM Pathway listing and pass an additional Math or Science course. | | | |
| Approved Pre-Engineering Course Options* (Select 2) *continued on the next page | 110830 | Aerospace Engineering OR | 1 |
| | 3130300 | Automotive Technician I OR | 1 |
| | 110560 | Basic Technical Drafting OR | 1 |
| | 080198 | CDF Qualifying CTE Internship I OR | 1 |
| | 080530 | Data Manipulation and Analysis (LSU Partnership) OR | 1 |
| | 144200 | Engineering Economy (LSU Partnership) OR | 1 |

| | | | |
|---|--------|--|---|
| Approved Pre-Engineering Course Options (Select 2) | 150740 | First Robotics I OR | 1 |
| | 150750 | First Robotics II OR | 1 |
| | 110795 | Introduction to Remote Controlled Vehicle Technologies OR | 1 |
| | 110020 | Marine Engineering OR | 1 |
| | 110831 | PLTW Aerospace Engineering OR | 1 |
| | 110841 | PLTW Civil Engineering and Architecture OR | 1 |
| | 110821 | PLTW Digital Electronics OR | 1 |
| | 110864 | Principles of Engineering (LSU Partnership) OR | 1 |
| | 110796 | Remote Controlled Vehicle Technologies OR | 1 |
| | 150780 | Robotics (LSU Partnership) OR | 1 |
| | 150730 | Robotics: Advanced (1 Credit) | 1 |

Approved Applied Computing and Technology course students should select **ONE** course option.

| | | | |
|---|--------|---|---|
| Approved Applied Computing and Technology Course Options* (Select 1) *continued on the next page | 061177 | AP Computer Science A OR | 1 |
| | 061175 | AP Computer Science Principles OR | 1 |
| | 080520 | Advanced Javascript, Programming, and Web Development OR | 1 |
| | 080505 | CIW Database Design OR | 1 |
| | 040519 | CIW E-Commerce Site design and Development OR | 1 |
| | 040517 | CIW Essentials of Web Design OR | 1 |
| | 040405 | CIW Internet Business OR | 1 |
| | 061125 | CIW Introduction to Javascript OR | 1 |
| | 061120 | CIW Networking Technology OR | 1 |
| | 061126 | CIW Perl Fundamentals OR | 1 |
| | 040415 | CIW Website Development OR | 1 |
| | 061130 | COMP TIA+ Fundamentals of Computer Installation and Configuration OR | 1 |
| | 061122 | COMP TIA+ Networking Fundamentals OR | 1 |
| | 061127 | COMP TIA+ Programming with PL/SQL OR | 1 |
| | 061138 | COMP TIA+ Security OR | 1 |
| | 110850 | Computer Integrated Manufacturing OR | 1 |

| | | | |
|--|--------|--|---|
| Approved Applied Computing and Technology Course Options (Select 1) | 040221 | Cyber Literacy I (NICERC Partnership) OR | 1 |
| | 040224 | Cybersecurity (Cyber.org Partnership) OR | 1 |
| | 040217 | Cybersecurity (LSU Partnership) OR | 1 |
| | 040218 | Cyber Society (NICERC Partnership) OR | 1 |
| | 080523 | Fundamentals of HTML, CSS, and Javascript OR | 1 |
| | 061180 | Interactive Computing (LSU Partnership) OR | 1 |
| | 061140 | Introduction to Computational Thinking (LSU Partnership) OR | 1 |
| | 144300 | Programming for Engineers (LSU Partnership) OR | 1 |
| | 061179 | Survey of Computer Science (LSU Partnership) | 1 |

Math OR Science course students should select ONE course option.

| | | | |
|--|--------|---|---|
| Math OR Science Course (Select 1) *continued on next page | 160347 | Advanced Math- Functions and Statistics OR | 1 |
| | 160346 | Advanced Math- Pre-Calculus OR | 1 |
| | 160501 | Advanced Math-Pre-Calculus: DE-CMAT 1223 Trigonometry OR | 1 |
| | 150307 | Biology II: AP Biology OR | 1 |
| | 160327 | AP Calculus AB OR | 1 |
| | 160328 | AP Calculus BC OR | 1 |
| | 150410 | AP Chemistry OR | 1 |
| | 150311 | AP Environmental Science OR | 1 |
| | 150794 | AP Physics C: Electricity and Magnetism OR | 1 |
| | 150795 | AP Physics C: Mechanics OR | 1 |
| | 150724 | Physics I: AP Physics I- Algebra Based OR | 1 |
| | 150725 | Physics: AP Physics II- Calculus Based OR | 1 |
| | 222004 | AP Psychology OR | 1 |
| | 160352 | AP Statistics OR | 1 |
| | 150321 | Biology: DE CBIO 1013 General Biology I OR | 1 |
| | 150322 | Biology I: DE CBIO 1033 General Biology I (Science Majors) OR | 1 |
| | 150302 | Biology II OR | 1 |
| | 150324 | Biology II: DE CBIO 1033 General Biology I (Science Majors) OR | 1 |

| | | | |
|--|--------|--|---|
| Math OR Science Course (Select 1) | 150326 | Biology II: DE CBIO 1043 General Biology II (Science Majors) OR | 1 |
| | 149995 | Biology II: DE CBIO 2103 Microbiology OR | 1 |
| | 160506 | Calculus DE CMAT 2113-5 Calculus I OR | 1 |
| | 160507 | Calculus DE CMAT 2123-5 Calculus II OR | 1 |
| | 150414 | Chemistry I: DE CCEM 1103 Chemistry I OR | 1 |
| | 150322 | Chemistry I: DE CCEM 1123 General Chemistry I (Science Majors) OR | 1 |
| | 150402 | Chemistry II OR | 1 |
| | 150420 | Chemistry II: DE CCEM 1123 General Chemistry II (Science Majors) OR | 1 |
| | 150422 | Chemistry II: DE CCEM 1133 General Chemistry II (Science Majors) OR | 1 |
| | 150914 | Environmental Science DE- CEVS 1103 OR | 1 |
| | 225011 | Introduction to Psychology CPSY 2013 OR | 1 |
| | 150726 | Physics I: DE CPHY 2113 Physics I (Algebra/Trig Based) OR | 1 |
| | 150728 | Physics I: DE CPHY 2113 Physics I (Calculus Based) OR | 1 |
| | 150701 | Physics II OR | 1 |
| | 160348 | Pre-Calculus OR | 1 |
| | 160349 | Probability and Statistics OR | 1 |
| | 160356 | Probability and Statistics: DE CMAT 1303 OR | 1 |
| | 222001 | Psychology | 1 |

Universal Documents

[STEM Pathways](#)

[CDF Eligible Courses](#)

[Jump Start Funding](#)

[Universal Course Codes](#)