



STEM Renaissance Pathway Brief

Pre-Engineering



AN INITIATIVE OF  **LDOE**

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

****The STEM Renaissance Pathways must be used for students entering grade 9 in the 2024-2025 school year and future cohorts. The archived Louisiana STEM Pathway briefs must be followed for students in grades 10, 11, and 12 in the 2024-2025 school year. Email STEM@la.gov with any questions.**

Universal Documents

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[CDF Eligible Courses](#)

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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 Computer Science 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.

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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 Computer Science course from the approved STEM Pathway listing and pass an additional Math or Science course.			
Approved Pre-Engineering Course Options (Select 2)	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
	150740	First Robotics I OR	1
	150750	First Robotics II 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
	150780	Robotics (LSU Partnership) OR	1
150730	Robotics: Advanced (1 Credit)	1	

Additional Course Options	Course Code	Course Title	Carnegie Credits
Approved Computer Science 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

Additional Course Options	Course Code	Course Title	Carnegie Credits
Approved Computer Science Course Options (Select 1)	061126	CIW Pearl 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
	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.

Additional Course Options	Course Code	Course Title	Carnegie Credits
Math <u>OR</u> 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

Math OR Science course* (select 1)	Math OR Science course options continued.	
	150311	AP Environmental Science OR
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
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

Math <u>OR</u> Science course* (select 1)	Math OR Science course students should select <u>ONE</u> course option.		
	160349	Probability and Statistics OR	1
	160356	Probability and Statistics: DE CMAT 1303 OR	1
	222001	Psychology	1

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