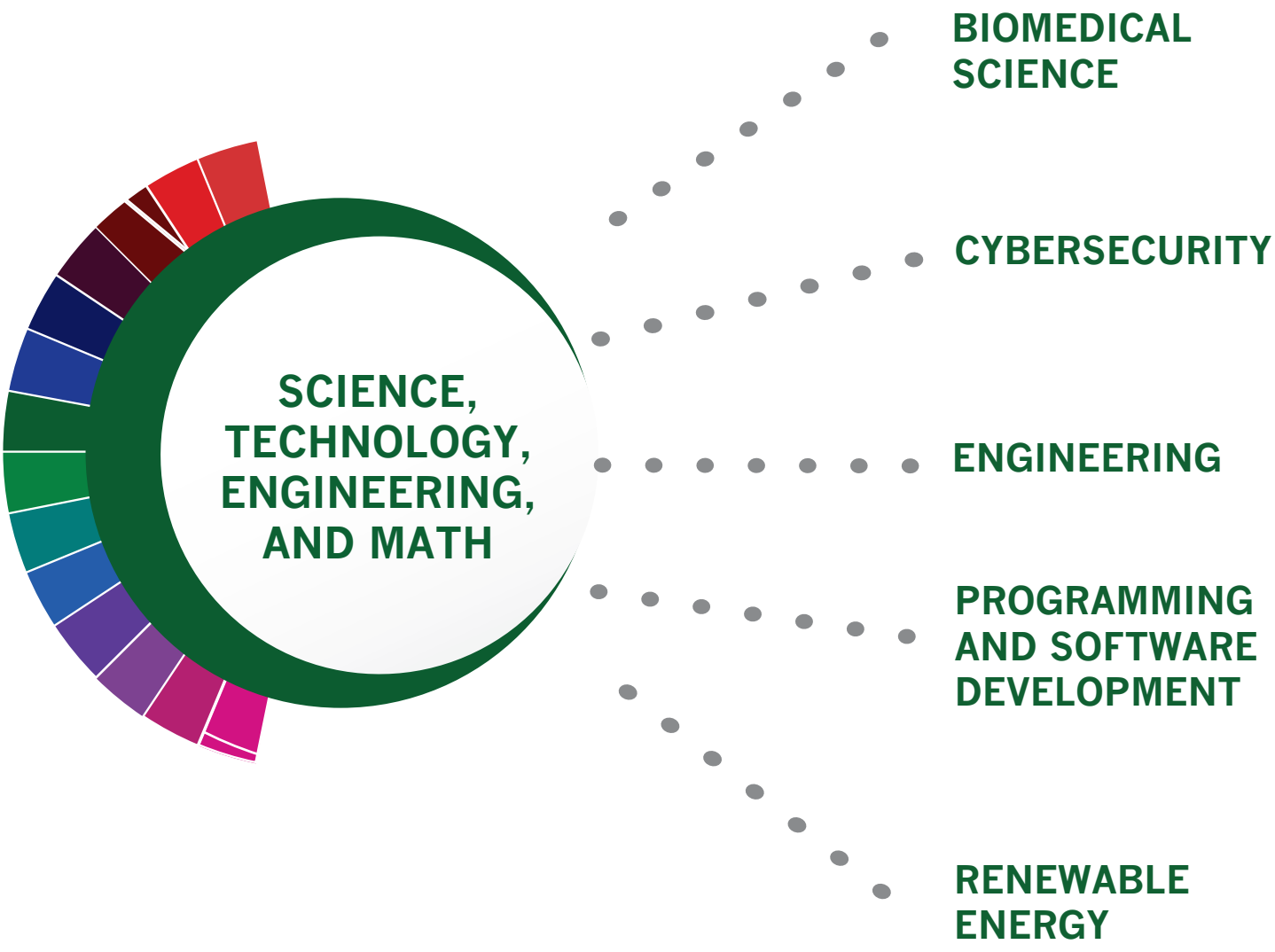
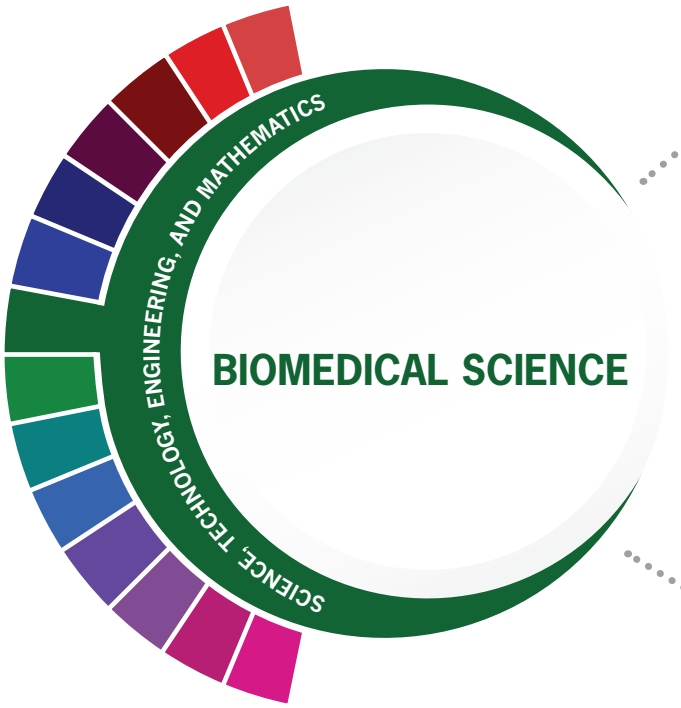


Local Implementation Considerations:

Students completing two or more courses for two or more credits within a program of study earn concentrator status for Perkins V federal accountability reporting.

Students finishing three or more courses for four or more credits with one course from level 3 or 4 within a program of study earn completer status for federal accountability reporting.

Texas Education Agency



COURSES

LEVEL 1
Principles of Biosciences
Principles of Biomedical Science (PLTW)

LEVEL 2
Human Body Systems (PLTW)
Biotechnology I

LEVEL 3
Biotechnology II
Medical Microbiology
Medical Interventions (PLTW)

LEVEL 4
Pathophysiology
Biomedical Innovations (PLTW)
Practicum in Science, Technology, Engineering, and Mathematics
Scientific Research and Design

HIGH SCHOOL/ INDUSTRY CERTIFICATION	CERTIFICATE/ LICENSE*	ASSOCIATE'S DEGREE	BACHELOR'S DEGREE	MASTER'S/ DOCTORAL PROFESSIONAL DEGREE
Medical Laboratory Assistant	Medical and Clinical Laboratory Technologists	Histologic Technician	Molecular Biology	Genetic Counseling
Medical Laboratory Technician			Biomedical Engineers	Medical Scientist
		Clinical Laboratory Science/ Medical Technology/ Technologist	Clinical Laboratory Science/ Medical Technology/ Technologist	Epidemiology

Additional industry based certification information is available from the TEA CTE website.

For more information on postsecondary options for this program of study, visit TXCTE.org.

OCCUPATIONS	MEDIAN WAGE	ANNUAL OPENINGS	% GROWTH
Medical and Laboratory Technicians	$37,981	1,159	28%
Biological Technicians	$42,931	452	17%
Forensic Science Technicians	$48,152	171	35%
Chemical Technicians	$49,733	672	10%
Medical and Clinical Laboratory Technologists	$58,760	1,166	25%

WORK BASED LEARNING AND EXPANDED LEARNING OPPORTUNITIES

Exploration Activities:	Work Based Learning Activities:
Health Occupations Students of America (HOSA)	Lab internship or shadow a healthcare or medical professional

The Biomedical Science program of study focuses on the study of biology and medicine in order to introduce students to the knowledge and skills necessary to be successful in the healthcare field, such as researching and diagnosing dieases, pre-existing conditions, or other determinants of health. Students may also practice patient care and communication.

The Science, Technology, Engineering, and Mathematics (STEM) Career Cluster focuses on planning, managing, and providing, scientific research and professional and technical services, including laboratory and testing services, and research and development services.

Successful completion of the Biomedical Science program of study will fulfill requirements of the Public Service Endorsement or STEM Endorsement, dependent upon courses chosen.

Approved Statewide Program of Study - September 2019

Texas Education Agency

COURSE INFORMATION

COURSE NAME	SERVICE ID	PREREQUISITES (PREQ) COREQUISITES (CREQ)	GRADE
Principles of Biosciences	13036300 (1 credit)	None	9-10
Principles of Biomedical Science (PLTW)	N1302092 (1 credit)	None	11-12
Human Body Systems (PLTW)	N1302093 (1 credit)	None	10-12
Biotechnology I	13036400 (1 credit)	PREQ: Biology	11-12
Biotechnology II	13036450 (1 credit)	PREQ: Biotechnology I and Chemistry and Biology	11-12
Medical Microbiology	13020700 (1 credit)	PREQ: Biology and Chemistry	10-12
Medical Interventions (PLTW)	N1302094 (1 credit)	None	10-12
Pathophysiology	13020800 (1 credit)	PREQ: Biology and Chemistry	11-12
Biomedical Innovation (PLTW)	N1302095 (1 credit)	None	11-12
Practicum in Science, Technology, Engineering, and Mathematics	13037400 (2 credits) 13037405 (3 credits) 13037410 (2 credits) 13037415 (3 credits)	PREQ: Algebra I and Geometry	12
Scientific Research and Design	13037200 (1 credit)	PREQ: Biology, Chemistry, Integrated Physics and Chemistry (IPC), or Physics	11-12

FOR ADDITIONAL INFORMATION ON THE SCIENCE, TECHNOLOGY, ENGINEERING AND MATHEMATICS CAREER CLUSTER, PLEASE CONTACT:

https://tea.texas.gov/cte

COURSES

LEVEL 1
- Principles of Information Technology
- Fundamentals of Computer Science
- Foundations of Cybersecurity

LEVEL 2
- Internetworking Technologies I
- Computer Programming I
- Computer Science I
- AP Computer Science Principles
- Computer Maintenance/Lab

LEVEL 3
- Internetworking Technologies II
- Engineering Applications of Computer Science Principles
- Networking/Lab
- Digital Forensics
- AP Computer Science A

LEVEL 4
- Cybersecurity Capstone
- Practicum in Information Technology
- Practicum in STEM
- Project-Based Research

HIGH SCHOOL/ INDUSTRY CERTIFICATION	CERTIFICATE/ LICENSE*	ASSOCIATE'S DEGREE	BACHELOR'S DEGREE	MASTER'S/ DOCTORAL PROFESSIONAL DEGREE
Oracle Certified Associate Java SE 8	GIAC Reverse Engineering Malware	System Networking, and LAN/WAN Management	Computer Systems Networking and Telecommunications	Computer Systems Analysis/Analyst
Oracle Certified Database Associate	Certified Advanced Windows Forensic Examiner	Information Technology	Computer Systems Networking and Telecommunications	Information Technology
Cisco Certified Entry Networking Technician (CCENT)	SAP Certified Technology Professional System Security Architect	Computer and Information Sciences, General		
CompTIA A+, Network+, Security+, and IT Fundamentals	Cisco Certified Network Professional Security Certification	Computer Science		

Additional industry based certification information is available from the TEA CTE Website

For more information on postsecondary options for this program of study, visit TXCTE.org.

OCCUPATIONS	MEDIAN WAGE	ANNUAL OPENINGS	% GROWTH
Information Security Analysts	$91,915	814	29%
Network and Computer System Administrators	$82,597	2,814	19%
Computer Systems Analyst	$87,568	5,937	29%

WORK BASED LEARNING AND EXPANDED LEARNING OPPORTUNITIES

Exploration Activities:

Join TSA
Job shadow a computer system analyst or information security analyst.

Work Based Learning Activities:

Obtain an industry based certification.

The Cybersecurity program of study includes the occupations and educational opportunities related to planning, implementing, upgrading, or monitoring security measure for the protection of computer networks and information. This program of study may also include exploration into responding to computer security breaches and virus and administering network security measures.

The Science, Technology, Engineering, and Mathematics (STEM) Career Cluster focuses on planning, managing, and providing, scientific research and professional and technical services, including laboratory and testing services, and research and development services.

Successful completion of the Cybersecurity program of study will fulfill requirements of a Business and Industry or STEM Endorsement.
Approved Statewide Program of Study - September 2019

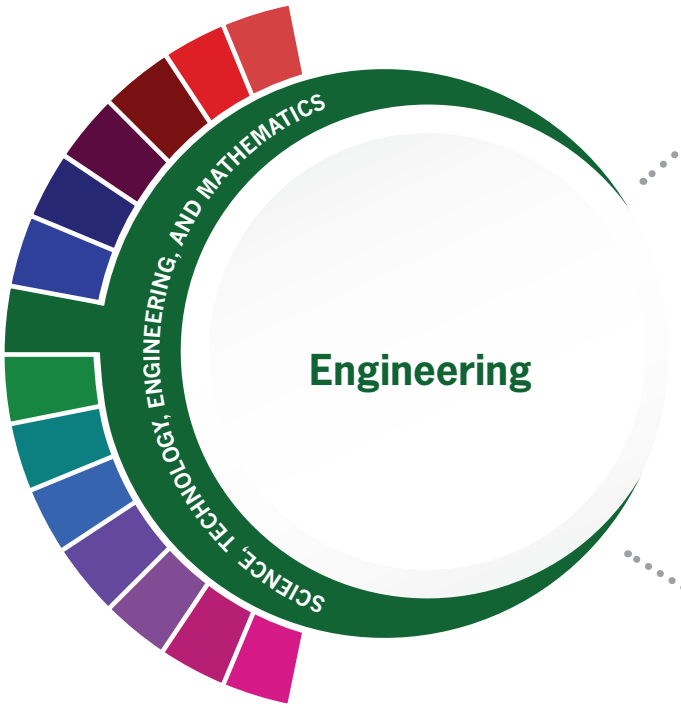
Texas Education Agency

COURSE INFORMATION

COURSE NAME	SERVICE ID	PREREQUISITES (PREQ) COREQUISITES (CREQ)	GRADE
Principles of Information Technology	13027200 (1 credit)	None	9-10
Fundamentals of Computer Science	03580140 (.5 to 1 credit)	None	9-12
Foundations of Cybersecurity	03580850 (1 credit)	None	9-12
Internetworking Technologies I	N1302803 (1 credit)	None	10-12
Computer Programming I	13027600 (1 credit)	None	10-12
Computer Science I	03580200 (.5 to 1 credits)	PREQ: Algebra I	9-12
AP Computer Science Principles	A3580300 (1 credit)	None	9-12
Computer Maintenance	13027300 (1 credit) 13027310 (2 credits)	None	10-12
Internetworking Technologies II	N1302804 (1 credit)	PREQ: Internetworking Technologies I	11-12
Engineering Applications of Computer Science Principles	N1303772 (1 credit)	None	10-12
Networking/Lab	13027400 (1 credit) 13027410 (2 credits)	None	10-12
Digital Forensics	03580360 (.5 to 1 credit)	None	9-12
AP Computer Science A	A3580110 (1 credit) A3580120 (1 credit)	None	9-12
Cybersecurity Capstone	03580855 (1credit)	None	11-12
Practicum in Information Technology	13028000 (2 credit) 13028005 (3 credit) 13028010 (2 credit) 13028015 (3 credit)	PREQ: Two high school Information Technology courses	12
Practicum in STEM	13037400 (2 credits) 13037405 (3 credits) 13037410 (2 credits) 13037415 (3 credits)	PREQ: Algebra I and Geometry	12
Project-Based Research	12701500 (1 credit)	None	11-12

FOR ADDITIONAL INFORMATION ON THE SCIENCE, TECHNOLOGY, ENGINEERING AND MATHEMATICS CAREER CLUSTER, PLEASE CONTACT:

https://tea.texas.gov/cte



COURSES

LEVEL 1

Principles of Applied Engineering
Computer Aided Drafting for Manufacturing (TBD)
Introduction to Engineering Design (PLTW)

LEVEL 2

Manufacturing Engineering Technology I

LEVEL 3

Engineering Design and Development (PLTW)
Engineering Design and Presentation I
Computer Integrated Manufacturing (PLTW)
Aerospace Engineering (PLTW)
Digital Electronics
Civil Engineering and Architecture (PLTW)
Engineering Science
Environmental Sustainability (PLTW)

LEVEL 4

Engineering Design and Problem Solving
Engineering Design and Presentation II
Practicum in STEM
Scientific Research and Design

HIGH SCHOOL/ INDUSTRY CERTIFICATION	CERTIFICATE/ LICENSE*	ASSOCIATE'S DEGREE	BACHELOR'S DEGREE	MASTER'S/ DOCTORAL PROFESSIONAL DEGREE
Autodesk Certified Professional or User (ACU) - Inventor	Engineer, Professional	Electrical and Electronics Engineering	Electrical and Electronics Engineering	Electrical and Electronics Engineering
Certified SolidWorks Associate (CSWA)	Fluid Power Systems Designer	Drafting and Design Technology/ Technician, General	CAD/CADD Drafting and/or Design Technology/ Technician	Mechanical Engineering
Certified Engineering Technician - Audio Systems	Certified Biomedical Auditor	Engineering Technology	Bioengineering and Biomedical Engineering	Bioengineering and Biomedical Engineering
	Certified Cost Estimator/ Analyst		Construction Engineering Technology/ Technician	

Additional industry based certification information is available from the TEA CTE website.

For more information on postsecondary options for this program of study, visit TXCTE.org.

OCCUPATIONS	MEDIAN WAGE	ANNUAL OPENINGS	% GROWTH
Aerospage Engineers	$110,843	481	9%
Industrial Engineers	$97,074	1,263	10%
Mechanical Engineers	$91,707	1,535	11%
Chemical Engineers	$112,819	474	9%
Electrical Engineers	$98,405	1,137	10%

WORK BASED LEARNING AND EXPANDED LEARNING OPPORTUNITIES

Exploration Activities:
Participate in competitions like Skills USA

Career Preparation Activities:
Engineering internship
Job shadow a machinist

The Engineering program of study focuses on the design, development, and use of engines, machines, and structures. Students will learn how to apply science, mathematical methods, and empirical evidence to the innovation, design, construction, operation, and maintenance of different manufacturing systems.

The Science, Technology, Engineering, and Mathematics (STEM) Career Cluster® focuses on planning, managing, and providing scientific research and professional and technical services, including laboratory and testing services, and research and development services.

Successful completion of the Engineering program of study will fulfill requirements of the Business and Industry or STEM Endorsement.

Approved Statewide Program of Study - September 2019

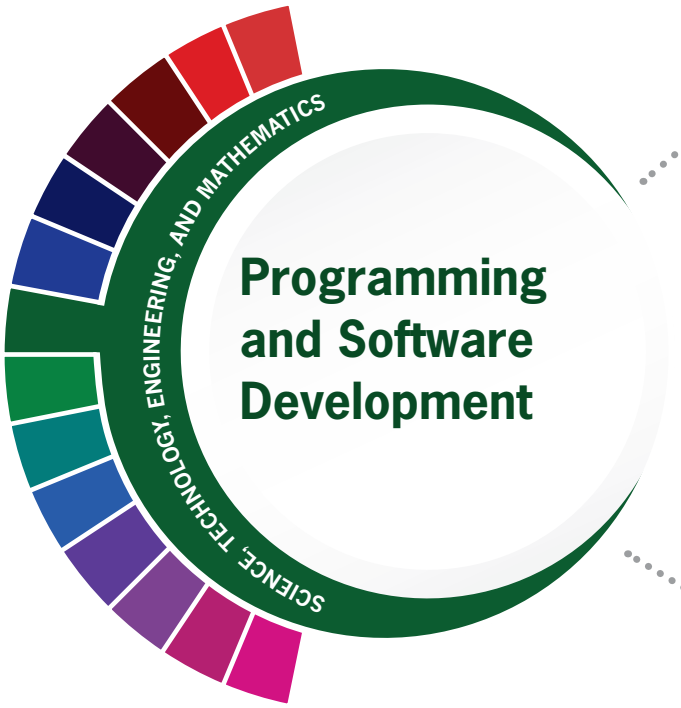
Texas Education Agency

COURSE INFORMATION

COURSE NAME	SERVICE ID	PREREQUISITES (PREQ) COREQUISITES (CREQ)	GRADE
Principles of Applied Engineering	13036200 (1 credit)	None	9-10
Computer Aided Drafting for Manufacturing (TBD)	TBD	TBD	TBD
Introduction to Engineering Design (PLTW)	N1303742 (1 credit)	None	9-12
Manufacturing Engineering Technology I	13032900	None	10-12
Engineering Design & Development (PLTW)	N1303749 (1 credit)	None	9-12
Engineering Design & Presentation I	13036500 (1 credit)	PREQ: Algebra I	10-12
Computer Integrated Manufacturing (PLTW)	N1303748 (1 credit)	None	9-12
Aerospace Engineering (PLTW)	N1303745 (1 credit)	None	9-12
Digital Electronics	13037600 (1 credit)	PREQ: Algebra I and Geometry	10-12
Civil Engineering & Architecture (PLTW)	N1303747 (1 credit)	None	9-12
Engineering Science	13037500 (1 credit)	PREQ: Algebra I and Biology Chemistry, Integrated Physics, and Chemistry (IPC), or Physics	10-12
Environmental Sustainability (PLTW)	N1303746 (1 credit)	None	9-12
Engineering Design & Problem Solving	13037300 (1 credit)	PREQ: Algebra I and Geometry	11-12
Engineering Design and Presentation II	13036600 (2 credits)	PREQ: Algebra I and Geometry	11-12
Practicum in Science, Technology, Engineering, and Mathematics	13037400 (2 credits) 13037405 (2 credits) 13037410 (3 credits) 13037415 (3 credits)	PREQ: Algebra I and Geometry	12
Scientific Research & Design	13037200 (1 credit)	PREQ: Biology, Chemistry, Integrated Physics, and Chemistry (IPC), or Physics	11-12

FOR ADDITIONAL INFORMATION ON THE SCIENCE, TECHNOLOGY, ENGINEERING AND MATHEMATICS CAREER CLUSTER, PLEASE CONTACT:

https://tea.texas.gov/cte



COURSES

LEVEL 1

Fundamentals of Computer Science

LEVEL 2

Computer Programming I
AP Computer Science Principles
Computer Science I

LEVEL 3

Introduction to C# Programming Applications
AP Computer Science A
Mobile App Development
Computer Programming II
Computer Science II

LEVEL 4

Computer Science III
Practicum in Information Technology
Practicum of A/V Production
Practicum in STEM
Career Preparation I

HIGH SCHOOL/ INDUSTRY CERTIFICATION	CERTIFICATE/ LICENSE*	ASSOCIATE'S DEGREE	BACHELOR'S DEGREE	MASTER'S/ DOCTORAL PROFESSIONAL DEGREE
Oracle Certified Association JAVA SE 8 Programmer	Certified Computing Professional	Computer Programming/Programmer General	Mangement Information Systems, General	
Oracle Certified Database Associate	Cloud Technology Associate Certification	Computer Software Engineer		
Microsoft Technology Associate, Introduction to Programming Using Python, HTML or CSS	AEM 6 Developer	Computer Science		
Microsoft Technology Associate, Introduction to Programming Using Java or Java Script	Certifed Software Analyst	Information Science/Studies		

*Includes Level I and Level II Certificates

For more information on postsecondary options for this programs of study, visit TXCTE.org

OCCUPATIONS	MEDIAN WAGE	ANNUAL OPENINGS	% GROWTH
Software Developer, Systems Software	$103,334	2,985	25%
Software Developers, Applications	$104,499	6,311	30%
Computer Programmers	$79,893	1,454	9%

WORK BASED LEARNING AND EXPANDED LEARNING OPPORTUNITIES

Exploration Activities:

Join TSA
Participate in a coding club at school.

Work Based Learning Activities:

Obtain an industry based certification.

The programming and Software Development program of study explores the occupations and education opportunities associated with researching, designing, developing, and testing operating systems-level software, compilers, and network distribution software for medical, industrial, military, communications, aerospace, business, scientific, and general computer applications. This program of study may also include exploration into creating, modifying, and testing the codes, forms, and script that allow computer applications to run

The Science, Technology, Engineering, and Mathematics (STEM) Career Cluster focuses on planning, managing, and providing, scientific research and professional and technical services, including laboratory and testing services, and research and development services.

Successful completion of the Programming and Software Development program of study will fulfill requirements of a Business and Industry or STEM Endorsement.

Approved Statewide Program of Study - September 2019

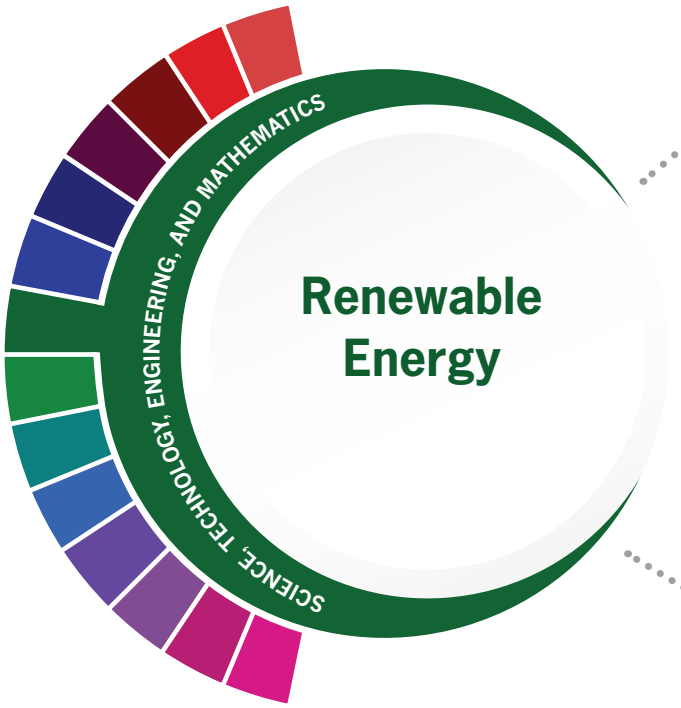
Texas Education Agency

COURSE INFORMATION

COURSE NAME	SERVICE ID	PREREQUISITES (PREQ) COREQUISITES (CREQ)	GRADE
Fundamentals of Computer Science	03580140 (.5 to 1 credit)	None	9-12
Computer Programming I	13027600 (1 credit)	None	10-12
AP Computer Science Principles	A3580300 (1 credit)	None	9-12
Computer Science I	03580200 (.5 to 1 credit)	PREQ: Algebra I	9-12
Introduction to C# Programming Applications	N1302812 (1 credit)	None	11-12
AP Computer Science A	A3580110 (1 credit) A3580120 (1 credit)	None	9-12
Mobile App Development	03580390 (.5 to 1 credit)	PREQ: Algebra I	11-12
Computer Programming II	13027700 (1 credit)	None	11-12
Computer Science II	03580300 (1 credit)	PREQ: Algebra I, Computer Science I, or Fundamentals of Computer Science	11-12
Computer Science III	03580350 (1 credit)	PREQ: Computer Science II, AP Computer Science A	12
Practicum in Information Technology	13028000 (2 credit) 13028005 (3 credit) 13028010 (2 credit) 13028015 (3 credit)	PREQ: Two high school information technology courses	12
Practicum in A/V Production	13008700 (2 credit) 13008705 (3 credit) 13008710 (2 credit) 13008715 (3 credit)	PREQ: Audio/Video Production II Lab	11-12
Practicum in STEM	13037400 (2 credit) 13037405 (3 credit) 13037410 (2 credit) 13037415 (3 credit)	PREQ: Algebra I and Geometry	12
Career Preparation I	12701300 (2 credit) 12701305 (3 credit)	None	11-12

FOR ADDITIONAL INFORMATION ON THE SCIENCE, TECHNOLOGY, ENGINEERING AND MATHEMATICS CAREER CLUSTER, PLEASE CONTACT:

https://tea.texas.gov/cte



COURSES

LEVEL 1
Principles of Applied Engineering
Foundations of Energy

LEVEL 2
AC/DC Electronics
Energy and Natural Resources Technology
Introduction to Renewable Energy (TBD)

LEVEL 3
Environmental Sustainability (PLTW)
Solid State Electronics
Scientific Research and Design

LEVEL 4
Digital Electronics
Engineering Design and Problem Solving
Project-Based Research
Applied Mathematics for Technical Professionals
Practicum in STEM
Practicum in Energy (TBD)

HIGH SCHOOL/ INDUSTRY CERTIFICATION	CERTIFICATE/ LICENSE*	ASSOCIATE'S DEGREE	BACHELOR'S DEGREE	MASTER'S/ DOCTORAL PROFESSIONAL DEGREE
	Photovoltaic Installer-Level 1 Professional	Industrial Mechanics and Maintenance Technology	Surveying Engineering	
	Solar Photovoltaic Certiifciation	Solar Energy Technology/	Systems Engineering	
	Small Wind Installer-Level 1	Engineering, Mechanics		Manufacturing Engineering
		Engineering, General		

*Includes Level I and Level II Certificates

For more information on postsecondary options for this program of study, visit TXCTE.org

OCCUPATIONS	MEDIAN WAGE	ANNUAL OPENINGS	% GROWTH
Wind Turbine Services Technician	$51,334	387	108%
Solar Photovoltaic Installer	$43,957	47	81%

WORK BASED LEARNING AND EXPANDED LEARNING OPPORTUNITIES

Exploration Activities:	Work Based Learning Activities:
SkillsUSA Science Club	Research four renewable energy companies and compare them.

The Renewable Energy program of study helps students discover to assemble, inspect, maintain, and repair different equipment required for renewable energy. It introduces students to solar photovoltaic equipment and wind turbines, the systems and processes used to maintain and manage these types of equipment, and helps students develop the skills needed to do so.

The Science, Technology, Engineering, and Mathematics (STEM) Career Cluster focuses on planning, managing, and providing, scientific research and professional and technical services, including laboratory and testing services, and research and development services.

Successful completion of the Renewable Energy program of study will fulfill requirements of the Business and Industry or STEM endorsement.

Texas Education Agency

COURSE INFORMATION

COURSE NAME	SERVICE ID	PREREQUISITES (PREQ) COREQUISITES (CREQ)	GRADE
Principles of Applied Engineering	13036200 (1 credit)	None	9-12
Foundations of Energy	N1300263 (1 credit)	None	9-12
AC/DC Electronics	13036800 (1 credit)	PREQ: Principles of Applied Engineering	10-12
Energy and Natural Resources Technology	13001100 (1 credit)	PREQ: At least 1 credit from courses in the Agriculture, Food, and Natural Resources Cluster	10-12
Introduction to Renewable Energy	TBD	TBD	TBD
Environmental Sustainability	N13003746 (1 credit)	None	9-12
Solid State Electronics	13036900 (1 credit)	PREQ: AC/DC Electronics	11-12
Scientific Research and Design	13037200 (1 credit)	PREQ: Biology, Chemistry, Integrated Physics and Chemistry (IPC), or Physics	11-12
Digital Electronics	13037600 (1 credit)	PREQ: Algebra 1 and Geometry	10-12
Engineering Design and Problem Solving	13037300 (1 credit)	PREQ: Algebra 1 and Geometry	11-12
Project Based Research	12701500 (1 credit)	None	11-12
Applied Mathematics for Technical Professionals	1270410 (1 credit)	None	11-12
Practicum in STEM	13037400 (2 credits) 13037405 (2 credits) 13037410 (3 credits) 13037415 (3 credits)	PREQ: Algebra I and Geometry	12
Practicum in Energy (TBD)	TBD	TBD	TBD

FOR ADDITIONAL INFORMATION ON THE SCIENCE, TECHNOLOGY, ENGINEERING AND MATHEMATICS CAREER CLUSTER, PLEASE CONTACT:

https://tea.texas.gov/cte