

Science, Technology, Engineering, & Mathematics Endorsement

CAREER CLUSTER

PROGRAMS OF STUDY



**SCIENCE,
TECHNOLOGY,
ENGINEERING, &
MATHEMATICS**



- **CYBERSECURITY**
- **ENGINEERING**
- **PROGRAMMING
& SOFTWARE
DEVELOPMENT**



Science, Technology, Engineering, and Mathematics Career Cluster

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.

Cybersecurity Statewide Program of Study



The Cybersecurity program of study

Secondary Courses for High School Credit

Level 1

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

Level 2

- Computer Science I

Level 3

- Networking/Lab
- AP Computer Science A Math
- AP Computer Science B LOTE

Level 4

- Cybersecurity Capstone

Postsecondary Opportunities

Associates Degrees

- System Networking, and LAN/WAN Management
- Information Technology
- Computer and Information Sciences, General
- Computer Science

Bachelor's Degrees

- Computer Systems Networking and Telecommunications
- Computer Systems Networking and Telecommunications
- Computer and Information Sciences, General
- Computer Science

Master's, Doctoral, and Professional Degrees

- Computer Systems Analysis/Analyst
- Information Technology
- Computer Information Sciences, General
- Computer Science

Work-Based Learning and Expanded Learning Opportunities

Exploration Activities

- Participate in Skills USA competitions
- Job shadow a computer system analyst or information security analyst

Work-Based Learning Activities

- Obtain a cybersecurity IBC

Industry-Based Certifications

- Cisco 100-490 RSTech Supporting Cisco Routing and Switching Network Devices
- Cisco 200-201 CBROPS - Understanding Cisco Cybersecurity Operations Fundamentals
- Cisco CCNA (200-301) Implementing and Administering Cisco Solutions
- CodeHS Cybersecurity Level 1 Certification
- CompTIA A+ Certification
- CompTIA Network+
- CompTIA Security+
- Computer Networking Fundamentals – Job Ready
- ^Cybersecurity Fundamentals
- CyberSecurity Fundamentals: An ISACA Certificate
- Information Technology Specialist: Java
- Information Technology Specialist: JavaScript
- Information Technology Specialist: Networking
- Microsoft Security, Compliance, and Identity Fundamentals
- Microsoft 365 Fundamentals
- Oracle Certified Associate Java SE 8 Programmer

• Associate of (ISC)*

^Offered at Donna ISD *IBC sunsetting 8/31/24

Aligned Occupations

Occupations	Median Wage	Annual Openings	% Growth
Information Security Analysts	\$91,915	814	29%
Network and Computer System Administrators	\$82,597	2,814	19%
Computer System Analysts	\$87,568	5,937	29%

Successful completion of the Cybersecurity program of study will fulfill requirements of the STEM Endorsement. Revised – October 2022

Cybersecurity Course Information

Level 1

COURSE NAME	SERVICE ID	PREREQUISITES	COREQUISITES
Principles of Information Technology	1302700 (1 credit)	None	None
Fundamentals of Computer Science	03580140 (1 credit)	None	None
Foundations of Cybersecurity	03580850 (1 credit)	None	None

Level 2

COURSE NAME	SERVICE ID	PREREQUISITES	COREQUISITES
*Internetworking Technologies	N1302803 (1 credit)	None	None
Computer Science I	03580200 (1 credit)	Algebra I	None
*AP Computer Science Principles	A3580300 (1 credit)	None	None
*Computer Maintenance/Lab	13027300 (1 credit) 13027310 (2 credits)	Principles of Technology	None

Level 3

COURSE NAME	SERVICE ID	PREREQUISITES	COREQUISITES
*Engineering Application of Computer Science Principles	N1303772 (1 credit)	None	None
Networking/Lab	13027400 (1 credit) 13027410 (2 credits)	None	None
*Digital Forensics	03580360 (1 credit)	None	None
*Internetworking Technologies II	N1302804 (1 credit)	Internetworking Technologies I	None
AP Computer Science A - Math	A3580110 (1 credit)	None	None
AP Computer Science B - LOTE	A3580120 (1 credit)	None	None
*IB Computer Science Standard Level	I3580200 (1 credit)	None	None
*Discrete Mathematics for Computer Science	03580370	Algebra II	None

Level 4

COURSE NAME	SERVICE ID	PREREQUISITES	COREQUISITES
Cybersecurity Capstone	03580855 (1 credit)	None	None
*Practicum in Information Technology	13028000 (2 credits) 13028005 (3 credits)	2 high school Info. Tech. courses	None
Practicum in STEM	13037400 (2 credits) 13037405 (3 credits)	Algebra I and Geometry	None
*Project-Based Research	1270100 (1 credit)	None	None
*Independent Study in Technology Applications	03580900 (1 credit)	None	None
*Independent Study in Evolving/Emerging Technologies	03581500 (1 credit)	None	None
*IB Computer Science Higher Level - Math	I3580310 (1 credit)	None	None
*IB Computer Science Higher Level - LOTE	13580320 (1 credit)	None	None

*Not Currently Offered at Donna ISD

FOR ADDITIONAL INFORMATION ON THE SCIENCE, TECHNOLOGY, ENGINEERING & MATHEMATICS, CONTACT CTE@tea.texas.gov

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Science, Technology, Engineering, and Mathematics Career Cluster

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.

Engineering Statewide Program of Study



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

Secondary Courses for High School Credit

Level 1

- Principles of Applied Engineering

Level 2

- Manufacturing Engineering Technology I

Level 3

- Digital Electronics

Level 4

- Engineering Design and Problem Solving

Work-Based Learning and Expanded Learning Opportunities

Exploration Activities

- Participate in Skills USA competitions

Work-Based Learning Activities

- Intern at an engineering firm
- Shadow a machinist

Industry-Based Certifications

- Autodesk Associate (Certified User) AutoCAD
- Autodesk Associate (Certified User) & Professional Fusion 360
- Autodesk Associate (Certified User) & Professional Inventor for Mechanical Design
- Autodesk Associate (Certified User) & Professional Revit Architecture
- Autodesk Associate (Certified User) & Professional Revit for Electrical
- Autodesk Associate (Certified User) & Professional Revit for Structural Design
- Autodesk Certified Professional in AutoCAD-Design & Drafting
- Autodesk Certified Professional in Civil 3D-Infrastructure Design
- Autodesk Certified Professional in Revit for Architectural Design
- Autodesk Certified User & Professional in Inventor
- C-103 Certified Industry 4.0 Associate - Robot System Operations
- Engineering Technology Foundations
- Lean Six Sigma Green Belt Certification
- Pre-Engineering/Engineering Technology - Job Ready
- Certified SOLIDWORKS Associate (CSWA) - Electrical
- Certified SOLIDWORKS Associate (CSWA) - Academic
- Certified SOLIDWORKS Associate (CSWA) - Mechanical Design
- Certified SOLIDWORKS Associate (CSWA) - Simulation
- Certified SOLIDWORKS Associate (CSWA) - Sustainability
- Certified SOLIDWORKS Professional (CSWP) - Model Based Definition
- Certified SOLIDWORKS Professional (CSWP) - Academic
- Certified SOLIDWORKS Professional (CSWP) - Simulation
- Certified SOLIDWORKS Professional (CSWP) - Mechanical Design
- Certified SOLIDWORKS Associate Professional (CSWP) -- Drawing Tools

Postsecondary Opportunities

Associates Degrees

- Electrical and Electronics Engineering
- Drafting and Design Technology/ Technician, General
- Engineering Technology

Bachelor's Degrees

- Electrical and Electronics Engineering
- CAD/CADD Drafting and/or Design Technology/ Technician
- Bioengineering and Biomedical Engineering
- Construction Engineering Technology/ Technician

Master's, Doctoral, and Professional Degrees

- Electrical and Electronics Engineering
- Mechanical Engineering
- Bioengineering and Biomedical Engineering

- Certified SOLIDWORKS Associate*

Offered at Donna ISD *IBC sunsetting 8/31/24

Aligned Occupations

Occupations	Median Wage	Annual Openings	% Growth
Aerospace Engineers	\$110,843	481	9%
Industrial Engineers	\$97,074	1,263	10%
Mechanical Engineers	\$91,107	1,535	11%
Chemical Engineers	\$112,819	474	9%
Electrical Engineers	\$98,405	1,137	105%

Successful completion of the Engineering program of study will fulfill requirements of the Business and Industry or STEM endorsement if the math and science requirements are met. Revised – August 2022

Engineering Course Information

Level 1

COURSE NAME	SERVICE ID	PREREQUISITES	COREQUISITES
Principles of Applied Engineering	13036200 (1 credit)	None	None
*Introduction to Engineering Design (PLTW)	N1303742 (1 credit)	None	None
*Engineering Essentials (PLTW)	N1303760 (1 credit)	None	None

Level 2

COURSE NAME	SERVICE ID	PREREQUISITES	COREQUISITES
*Manufacturing Engineering Technology I	13032900 (1 credit)	None	None
Digital Electronics	13037600 (1 credit)	Algebra I and Geometry	None
*Engineering Science	13037500 (1 credit)	Algebra I, Biology, Chemistry and either Integrated Physics (IPC) or Physics	None

Level 3

COURSE NAME	SERVICE ID	PREREQUISITES	COREQUISITES
Engineering Design and Development (PLTW)	N1303749 (1 credit)	None	None
*Engineering Design and Presentation I	13036500 (1 credit)	Algebra I	None
*Computer Integrated Manufacturing (PLTW)	N1303748 (1 credit)	None	None
*Aerospace Engineering (PLTW)	N1303745 (1 credit)	None	None
*Civil Engineering & Architecture (PLTW)	N1303747 (1 credit)	None	None
*Environmental Sustainability (PLTW)	N1303746 (1 credit)	None	None

Level 4

COURSE NAME	SERVICE ID	PREREQUISITES	COREQUISITES
Engineering Design & Problem Solving	13037300 (1 credit)	Algebra I and Geometry	None
*Engineering Design and Presentation II	13036600 (2 credits)	Algebra I and Geometry	None
*Practicum in Science, Technology, Engineering, and Mathematics	13037400 (2 credits) 13037405 (3 credits) 13037410 (2 credits) 13037415 (2 credits)	Algebra I and Geometry	None
Scientific Research & Design	13037200 (1 credit)	Biology, Chemistry and either Integrated Physics (IPC) or Physics	None

*Not Currently Offered at Donna ISD

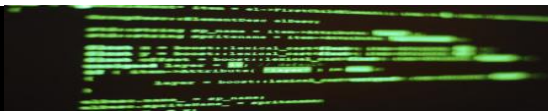
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Science, Technology, Engineering, and Mathematics Career Cluster

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.

Programming and Software Development Statewide Program of Study



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.

Secondary Courses for High School Credit

Level 1

- Fundamentals of Computer Science

Level 2

- Computer Science I

Level 3

- AP Computer Science A, MATH
- AP Computer Science A, LOTE
- Computer Science II

Level 4

- Computer Science III
- Practicum in Information Technology
- Practicum in Science, Technology, Engineering, and Mathematics

Work-Based Learning and Expanded Learning Opportunities

Exploration Activities

- Join TSA
- Participate in a coding club at school

Work-Based Learning Activities

- Obtain a programming IBC

Industry-Based Certifications

- Apple App Development with Swift
- C++ Certified Associate Programmer
- Certified Entry-Level Python Programmer (PCEP)
- Certified Professional Programmer
- Certified User Programmer
- CompTIA Unix+
- CodeHS Python Level 1 Certification
- Information Technology Specialist: Java
- Information Technology Specialist: JavaScript
- Microsoft Azure AI Fundamentals
- Microsoft Azure Data Fundamentals
- Oracle Certified Associate Java SE 8 Programmer
- Oracle Database SQL Certified Associate



Postsecondary Opportunities

Associates Degrees

- Computer Programming/Programmer General
- Computer Software Engineer
- Computer Science
- Certified Software Analyst

Bachelor's Degrees

- Management Information Systems, General
- Computer Software Engineer
- Computer Science
- Information Science/ Studies

Master's, Doctoral, and Professional Degrees

- Computer Software Engineer
- Computer Science
- Information Science/ Studies

Aligned Occupations

Occupations	Median Wage	Annual Openings	% Growth
Software Developer, Systems Software	\$103,334	2,985	25%
Software Developers, Application	\$104,499	6,311	30%
Computer Programmers	\$79,893	1,454	9%

Successful completion of the Programming and Software Development program of study will fulfill requirements of the Business and Industry endorsement and STEM endorsement if the math and science requirements are met. Revised – August 2022

Programming and Software Development Course Information

Level 1

COURSE NAME	SERVICE ID	PREREQUISITES	COREQUISITES
Fundamentals of Computer Science	03580140 (1 credit)	None	None

Level 2

COURSE NAME	SERVICE ID	PREREQUISITES	COREQUISITES
*Advanced Cloud Computing	N1302813 (1 credit)	None	None
*AP Computer Science Principles	A3580300 (1 credit)	None	None
*Computer Science I	03580200 (1 credit)	None	Algebra I
*Game Programming and Design	03580380 (1 credit)	Algebra I	None

Level 3

COURSE NAME	SERVICE ID	PREREQUISITES	COREQUISITES
*Introduction to C# Programming Applications	N1302812 (1 credit)	None	None
AP Computer Science A, MATH, LOTE	A3580110 (1 credit) A3580120 (1 credit)	None	None
*Mobile Application Development	03580390 (1 credit)	Algebra I	None
*Computer Science II	03580300 (1 credit)	Algebra I, Computer Science I, or Fundamentals of Computer Science	None
*IB Computer Science Standard Level	I3580200 (2 credits)	None	None
*Discrete Mathematics for Computer Science	03580370 (1 credit)	Algebra I	None
*Advanced Cloud Computing	N1302813 (1 credit)	None	None

Level 4

Course Name	Service ID	PREREQUISITES	COREQUISITES
*Computer Science III	03580350 (1 credit)	Computer Science II, AP Computer Science A	None
*IB Computer Science Higher Level, MATH, LOTE	I3580320 (1 credit) I3580310 (1 credit)	None	None
*Practicum in Information Technology	13028000 (2 credits) 13028005 (3 credits) 13028010 (2 credits) 13028015 (3 credits)	Two high school Information Technology courses	None

See next page for additional Level 4 courses

Programming and Software Development Course Information

Level 4 Continued

Course Name	Service ID	PREREQUISITES	COREQUISITES
*Practicum in Audio/Video Production	13008700 (2 credits) 13008705 (3 credits) 13008710 (2 credits) 13008715 (3 credits)	Audio/Video Production II Lab	None
*Practicum in Science, Technology, Engineering, and Mathematics	13037400 (2 credits) 13037405 (3 credits) 13037410 (2 credits) 13037415 (3 credits)	Algebra I and Geometry	None
*Practicum in Entrepreneurship	N1303425 (2 credits)	None	None
*Career Preparation I	12701300 (2 credits) 12701305 (3 credits)	None	None
*Independent Study in Technology Applications	03580900 (1 credit)	None	None
*Independent Study in Evolving/Emerging Technologies	03581500 (1 credit)	None	None

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