Information Technology Career Cluster

The Information Technology (IT) career cluster focuses on the design, development, support, and management of hardware, software, multimedia, and systems integration services. This career cluster includes occupations ranging from Software Developer and Programmer to Cybersecurity Specialists and Network Analysts.

Statewide Program of Study: *Programming and Software Development*

The Programming and Software Development program of study focuses on occupational and educational opportunities associated with researching, designing, developing, testing, and 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 includes creating, modifying, and testing the codes, forms, and script that allow computer applications to run.

Secondary Courses for High School Credit

Level 1	• Principles of Information Technology • Fundamentals of Computer Science
Level 2	• Computer Science I • Game Programming and Design • AP Computer Science Principles • Entrepreneurship I
Level 3	• Computer Science II • Introduction to C# Programming Applications • Discrete Mathematics for Computer Science • Mobile Application Development • Advanced Cloud Computing • AP Computer Science A • IB Computer Science Standard Level • IB Computer Science Higher Level
Level 4	• Computer Science III • Independent Study In Technology Applications • Independent Study in Evolving/Emerging Technologies • Practicum in Entrepreneurship • Practicum in Audio/Video Production • Practicum in Audio/Video Production + Extended Practicum in Audio/Video Production • Practicum in Information Technology • Practicum in Information Technology + Extended Practicum in Information Technology • Practicum in Science, Technology, Engineering, and Mathematics • Practicum in Science, Technology, Engineering, and Mathematics + Extended Practicum in Science, Technology, Engineering, and Mathematics • Career Preparation for Programs of Study • Career Preparation for Programs of Study + Extended Career Preparation • Scientific Research and Design • Career and Technical Education Project-Based Capstone

Aligned Advanced Academic Courses

AP or IB	AP Calculus AB AP Statistics IB Mathematics Applications and Interpretation SL
Dual Credit	Dual credit offerings will vary by Local Education Agency.

Students should be advised to consider these course opportunities to enrich their preparation. AP or IB courses not listed under the Secondary Courses for High School Credit section of this framework document do not count towards Concentrator/Completer status for this program of study.

Work-Based Learning and Expanded Learning Opportunities

Work-Based Learning Activities	• Intern at a local IT company to develop skills in programming and coding • Shadow a software developer to learn how they create and improve software to support efficient processes at their company
Expanded Learning Opportunities	• Program and create a game • Participate in TSA or SkillsUSA

Aligned Industry-Based Certifications

- Apple App Development with Swift
- C++ Certified Associate Programmer
- Certified Entry-Level Python Programmer (PCEP)
- Certified Professional Programmer
- Certified User: Programmer
- CodeHS Python Level 1 Certification
- CompTIA IT Fundamentals+
- CompTIA Linux+
- 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
- CompTIA A+ Certification
- CompTIA Server+

Example Postsecondary Opportunities

Apprenticeships
- Computer Programmer Apprenticeship

Associate Degrees
- Computer Programming
- Web Page, Digital/Multimedia and Information Resources Design

Bachelor's Degrees
- Data Science
- Computer Engineering

Master's, Doctoral, and Professional Degrees
- Management Science
- Computer Software Engineering

Additional Stackable IBCs/Licensures
- AWS Certified Developer Associate

Example Aligned Occupations

Computer User Support Specialists
Median Wage: $51,411
Annual Openings: 5,757
10-Year Growth: 21%

Software Developers
Median Wage: $111,705
Annual Openings: 15,324
10-Year Growth: 36%

Computer Programmers
Median Wage: $87,997
Annual Openings: 1,176
10-Year Growth: 4%

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

Texas Education Agency

Programming and Software Development

Information Technology Career Cluster

Statewide Program of Study: Programming and Software Development

Course Information

Level 1

Course	Prerequisites | Corequisites	Career Clusters
Principles of Information Technology* 13027200 (1 credit)	**Prerequisites:** None **Corequisites:** None **Recommended Prerequisites:** None **Recommended Corequisites:** None	
Fundamentals of Computer Science* 03580140 (1 credit)	**Prerequisites:** None **Corequisites:** None **Recommended Prerequisites:** None **Recommended Corequisites:** None	

Level 2

Course	Prerequisites | Corequisites	Career Clusters
Computer Science I* 03580200 (1 credit)	**Prerequisites:** Algebra I *or* **Corequisites:** Algebra I **Recommended Prerequisites:** None **Recommended Corequisites:** None	
Game Programming and Design 03580380 (1 credit)	**Prerequisites:** Algebra **Corequisites:** None **Recommended Prerequisites:** None **Recommended Corequisites:** None	
AP Computer Science Principles* A3580300 (1 credit)	**Prerequisites:** None **Corequisites:** None **Recommended Prerequisites:** Algebra I **Recommended Corequisites:** None	
Entrepreneurship I 13011101 (1 credit)	**Prerequisites:** None **Corequisites:** None **Recommended Prerequisites:** Principles of Business, Marketing and Finance **Recommended Corequisites:** None	

Level 3

Course	Prerequisites | Corequisites	Career Clusters
Computer Science II 03580300 (1 credit)	**Prerequisites:** Algebra I and either Computer Science I or Fundamentals of Computer Science **Corequisites:** None **Recommended Prerequisites:** None **Recommended Corequisites:** None	
Introduction to C# Programming Applications N1302812 (1 credit)	**Prerequisites:** None **Corequisites:** None **Recommended Prerequisites:** At least one credit in a Level 2 or higher course in programming or software development **Recommended Corequisites:** None	
Discrete Mathematics for Computer Science* 03580370 (1 credit)	**Prerequisites:** Algebra II **Corequisites:** None **Recommended Prerequisites:** None **Recommended Corequisites:** None	
Mobile Application Development 03580390 (1 credit)	**Prerequisites:** Algebra I **Corequisites:** None **Recommended Prerequisites:** Algebra I **Recommended Corequisites:** None	
Advanced Cloud Computing* N1302813 (1 credit)	**Prerequisites:** None **Corequisites:** None **Recommended Prerequisites:** At least one credit in a Level 2 or higher course in computer science, programming, software development, or networking systems. **Recommended Corequisites:** None	
AP Computer Science A* A3580110 (1 math credit) A3580120 (1 LOTE credit) ***Continued on next page***	**Prerequisites:** None **Corequisites:** None **Recommended Prerequisites:** Algebra I or a student should be comfortable with functions and the concepts found in the uses of functional notation such as $f(x) = x + 2$ and $f(x) = g(h(x))$ **Recommended Corequisites:** None	

* Indicates course is included in more than one program of study.

For additional information on the **Information Technology** career cluster, contact cte@tea.texas.gov or visit https://tea.texas.gov/cte

Programming and Software Development

Information Technology Career Cluster

Statewide Program of Study: Programming and Software Development

Course Information

Course	Prerequisites | Corequisites	Career Clusters
IB Computer Science Standard Level* I3580200 (2 credits)	**Prerequisites:** None **Corequisites:** None **Recommended Prerequisites:** Computer Science I, Algebra II **Recommended Corequisites:** None	
IB Computer Science Higher Level* I3580310 (1 math credit) I3580320 (1 LOTE credit)	**Prerequisites:** None **Corequisites:** None **Recommended Prerequisites:** Computer Science I, Algebra II Recommended Corequisites: None	

Course	Prerequisites | Corequisites	Career Clusters
Computer Science III* 03580350 (1 credit)	**Prerequisites:** Computer Science II, Advanced Placement (AP) Computer Science A, or International Baccalaureate (IB) Computer Science Standard Level or IB Computer Science Higher Level. **Corequisites:** None **Recommended Prerequisites:** None Recommended Corequisites: None	
Independent Study In Technology Applications First Time Taken: 03580900 (1 credit) Second Time Taken: 03581000 (1 credit)	**Prerequisites:** None **Corequisites:** None **Recommended Prerequisites:** minimum of one credit from the courses in the Information Technology Career Cluster Recommended Corequisites: None	
Independent Study in Evolving/Emerging Technologies First Time Taken: 03581500 (1 credit) Second Time Taken: 03581600 (1 credit)	**Prerequisites:** None **Corequisites:** None **Recommended Prerequisites:** a minimum of one credit from the courses in the Information Technology Career Cluster **Recommended Corequisites:** None	

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Programming and Software Development

Information Technology Career Cluster

Statewide Program of Study: Programming and Software Development

Course Information

Course	Prerequisites	Corequisites	Career Clusters
Practicum in Entrepreneurship First Time Taken: 13011111 (2 credits)	**Prerequisites:** None **Corequisites:** None **Recommended Prerequisites:** Entrepreneurship I and Entrepreneurship II or successful completion of at least two courses in a career and technical education (CTE) program of study. **Recommended Corequisites:** None	
Practicum in Audio/Video Production First Time Taken: 13008700 (2 credits) Second Time Taken: 13008710 (2 credits)	**Prerequisites:** Audio/Video Production ll and Audio/Video Production ll Lab **Corequisites:** None **Recommended Prerequisites:** None **Recommended Corequisites:** None	
Practicum in Audio/Video Production + Extended Practicum in Audio/Video Production First Time Taken: 13008705 (3 credits) Second Time Taken: 13008715 (3 credits)	**Prerequisites:** Audio/Video Production ll and Audio/Video Production ll Lab **Corequisites:** Practicum in Audio/Video Production **Recommended Prerequisites:** None **Recommended Corequisites:** None	
Practicum in Information Technology* First Time Taken: 13028000 (2 credits) Second Time Taken: 13028010 (2 credits)	**Prerequisites:** A minimum of two high school information technology (IT) courses **Corequisites:** None **Recommended Prerequisites:** None **Recommended Corequisites:** None	
Practicum in Information Technology + Extended Practicum in Information Technology* First Time Taken: 13028005 (3 credits) Second Time Taken: 13028015 (3 credits)	**Prerequisites:** Minimum of two high school information technology (IT) courses **Corequisites:** None **Recommended Prerequisites:** None **Recommended Corequisites:** None	

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Programming and Software Development

Information Technology Career Cluster
Statewide Program of Study: Programming and Software Development

Course Information

Course	Prerequisites | Corequisites	Career Clusters
Level 4		
Practicum in Science, Technology, Engineering, and Mathematics First Time Taken: 13037400 (2 credits) Second Time Taken: 13037410 (2 credits)	**Prerequisites:** Algebra l and Geometry **Corequisites:** None **Recommended Prerequisites:** None **Recommended Corequisites:** None	
Practicum in Science, Technology, Engineering, and Mathematics + Extended Practicum in Science, Technology, Engineering, and Mathematics First Time Taken: 13037405 (3 credits) Second Time Taken: 13037415 (3 credits)	**Prerequisites:** Algebra l and Geometry **Corequisites:** None **Recommended Prerequisites:** None **Recommended Corequisites:** None	
Career Preparation for Programs of Study First Time Taken: 12701141 (3 credits)	**Prerequisites:** at least one Level 2 or higher Career and Technical Education course **Corequisites:** None **Recommended Prerequisites:** None **Recommended Corequisites:** None	
Career Preparation for Programs of Study + Extended Career Preparation First Time Taken: 12701141 (3 credits)	**Prerequisites:** at least one Level 2 or higher Career and Technical Education course **Corequisites:** None **Recommended Prerequisites:** None **Recommended Corequisites:** None	
Scientific Research and Design 13037200 (1 credit)	**Prerequisites:** Biology, Chemistry, Integrated Physics and Chemistry (IPC), or Physics. **Corequisites:** None **Recommended Prerequisites:** None Recommended Corequisites: None	
Career and Technical Education Project-Based Capstone First Time Taken: 12701101 (1 credit)	**Prerequisites:** None **Corequisites:** None **Recommended Prerequisites:** None **Recommended Corequisites:** None	

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Programming and Software Development