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
- Advanced Placement (AP) Computer Science Principles
- Entrepreneurship I

Level 3
- Introduction to C# Programming Applications
- Computer Science II
- Advanced Cloud Computing
- Discrete Mathematics for Computer Science
- Mobile Application Development
- Advanced Placement (AP) Computer Science A
- International Baccalaureate (IB) Computer Science Standard Level
- International Baccalaureate (IB) Computer Science Higher Level

Level 4
- Computer Science III
- Independent Study in Technology Applications
- Independent Study in Evolving/Emerging Technologies
- Career and Technical Education Project-Based Capstone
- 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 Engineering
- Practicum in Engineering + Extended Practicum in Engineering
- Practicum in Entrepreneurship
- Practicum in Entrepreneurship + Extended Practicum in Entrepreneurship
- Career Preparation for Programs of Study
- Career Preparation for Programs of Study + Extended Career Preparation
- Scientific Research and Design

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 SkillsUSA or TSA

Aligned Industry-Based Certifications

- Apple App Development with Swift Associate
- AWS Certified Cloud Practitioner
- AWS Certified DevOps Engineer - Professional
- AWS Certified Solutions Architect - Associate
- AWS Certified SysOps Administrator - Associate
- C++ Certified Associate Programmer
- C++ Certified Entry-Level Programmer
- Certified Associate Data Analyst with Python
- Certified Associate JavaScript Programmer
- Certified Associate Python Programmer
- Certified Associate Tester with Python
- Certified Entry-Level Data Analyst with Python
- Certified Entry-Level JavaScript Programmer
- Certified Entry-Level Python Programmer (PCEP)
- Certified Entry-Level Tester with Python
- Certified Entry-Level Web Developer
- Certified Professional: Programmer
- Certified User: Programmer
- CLA: C Programming Language Certified Associate
- CLE: C Certified Entry-Level Programmer
- CompTIA A+ Certification
- CompTIA Linux+
- CompTIA Server+
- CompTIA Tech+
- CPE: C++ Certified Entry-Level Programmer
- Information Technology Specialist Cloud Computing
- Information Technology Specialist Computational Thinking
- Information Technology Specialist Python
- Information Technology Specialist Software Development
- Information Technology Specialist: Java
- Information Technology Specialist: JavaScript
- Java SE Java Certified Foundations Associate
- Knowledge Pillars: AI Business Implementation Specialist (AIBIP)
- Knowledge Pillars: C# Coding Specialist (CSCS)
- Knowledge Pillars: Coding in AI Specialist (CiAIS)
- Knowledge Pillars: JavaScript Coding Specialist (JSCS)
- Knowledge Pillars: Python Coding Apprentice (PCA)
- Knowledge Pillars: Python Coding Specialist (PCS)
- Microsoft Certified: Azure Data Fundamentals
- Microsoft Certified: Azure Fundamentals
- Microsoft Certified: Azure Solutions Architect Expert
- Oracle Certified Associate Java SE 8 Programmer
- Oracle Database SQL Certified Associate
- Tosa JavaScript (Advanced or Expert)
- Tosa Python (Advanced or Expert)

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.

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/License
- AWS Certified Developer Associate

Example Aligned Occupations

Computer User Support Specialists
Median Wage: $51,823
Annual Openings: 6,387
10-Year Growth: 21%

Software Developers
Median Wage: $127,000
Annual Openings: 12,350
10-Year Growth: 36%

Computer Programmers
Median Wage: $99,177
Annual Openings: 657
10-Year Growth: 4%

Data Source: TexasWages, Texas Workforce Commission. Retrieved 3/8/2024.

For more information visit: https://tea.texas.gov/academics/college-career-and-military-prep/career-and-technical-education/it-programming-and-software-development-extendedpptx.pdf

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 **Corequisites:** Algebra I **Recommended Prerequisites:** None **Recommended Corequisites:** None	
Game Programming and Design 03580380 (1 credit)	**Prerequisites:** Algebra I **Corequisites:** None **Recommended Prerequisites:** None **Recommended Corequisites:** None	
Advanced Placement (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
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	
Computer Science II 03580300 (1 credit)	**Prerequisites:** Algebra I and Computer Science I or AP Computer Science Principles **Corequisites:** None **Recommended Prerequisites:** None **Recommended Corequisites:** None	

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

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

Information Technology Career Cluster

Statewide Program of Study: Programming and Software Development

Course Information

Level 3

Course	Prerequisites | Corequisites	Career Clusters
Advanced Cloud Computing* 13027520 (1 credit)	**Prerequisites:** At least one credit from a course in computer science, programming, software development, or networking systems **Corequisites:** None **Recommended Prerequisites:** None **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:** None **Recommended Corequisites:** None	
Advanced Placement (AP) Computer Science A* A3580110 (1 math credit) A3580120 (1 LOTE credit)	**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	
International Baccalaureate (IB) Computer Science Standard Level* I3580200 (2 credits)	**Prerequisites:** None **Corequisites:** None **Recommended Prerequisites:** Computer Science I, Algebra II **Recommended Corequisites:** None	
International Baccalaureate (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	

Level 4

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	

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Information Technology Career Cluster

Statewide Program of Study: Programming and Software Development

Course Information

Level 4

Course	Prerequisites | Corequisites	Career Clusters
Independent Study in Technology Applications* First Time Taken: 03580900 (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	
Independent Study in Evolving/Emerging Technologies* First Time Taken: 03581500 (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	
Career and Technical Education Project-Based Capstone* First Time Taken: 12701101 (1 credit)	**Prerequisites:** None **Corequisites:** None **Recommended Prerequisites:** None **Recommended Corequisites:** None	
Practicum in Audio/Video Production First Time Taken: 13008700 (2 credits) Second Time Taken: 13008710 (2 credits)	**Prerequisites:** Audio/Video Production II and Audio/Video Production II 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 II and Audio/Video Production II Lab **Corequisites:** None **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	

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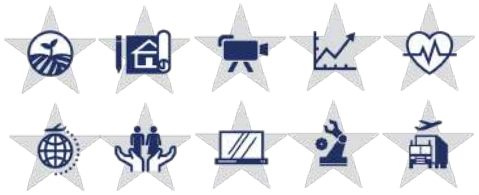
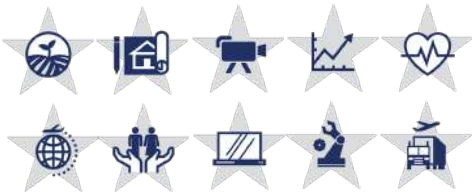
Information Technology Career Cluster

Statewide Program of Study: Programming and Software Development

Course Information

Level 4

Course	Prerequisites | Corequisites	Career Clusters
Practicum in Information Technology + Extended Practicum in Information Technology* First Time Taken: 13028005 (3 credits) Second Time Taken: 13028015 (3 credits)	**Prerequisites:** A minimum of two high school information technology (IT) courses **Corequisites:** None **Recommended Prerequisites:** None **Recommended Corequisites:** None	
Practicum in Engineering* First Time Taken: 12756080 (2 credits) Second Time Taken: 12756090 (2 credits)	**Prerequisites:** Algebra I and Geometry and a minimum of two credits with at least one course in a Level 2 or higher course from the Engineering career cluster **Corequisites:** None **Recommended Prerequisites:** None **Recommended Corequisites:** None	
Practicum in Engineering + Extended Practicum in Engineering* First Time Taken: 12756085 (3 credits) Second Time Taken: 12756095 (3 credits)	**Prerequisites:** Algebra I and Geometry and a minimum of two credits with at least one course in a Level 2 or higher course from the Engineering career cluster **Corequisites:** None **Recommended Prerequisites:** None **Recommended Corequisites:** None	
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 CTE program of study **Recommended Corequisites:** None	
Practicum in Entrepreneurship + Extended Practicum in Entrepreneurship* First Time Taken: 13011121 (3 credits)	**Prerequisites:** None **Corequisites:** None **Recommended Prerequisites:** Entrepreneurship I and Entrepreneurship II, or successful completion of at least two courses in a CTE program of study **Recommended Corequisites:** None	

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Statewide Program of Study: Programming and Software Development

Course Information

Level 4

Course	Prerequisites | Corequisites	Career Clusters
Career Preparation for Programs of Study* First Time Taken: 12701121 (2 credits)	**Prerequisites:** At least one Level 2 or higher CTE 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 CTE course **Corequisites:** None **Recommended Prerequisites:** None **Recommended Corequisites:** None	
Scientific Research and Design 13037200 (1 credit)	**Prerequisites:** Biology, and one credit of the following: Physics for Engineering, chemistry, Integrated Physics and Chemistry (IPC), or physics **Corequisites:** None **Recommended Prerequisites:** None **Recommended Corequisites:** None	

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