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.

Proposed Indicator: Students finishing three or more courses for four or more credits with one course from a TEA recognized capstone course (in bold) within a program of study earn completer status for federal accountability reporting.
The Information Technology Support and Services program of study explores the occupations and educational opportunities associated with administering, testing, and implementing computer databases and applying knowledge of database management systems. This program of study may also include analyzing user requirements and problems to automate or improve existing systems and review computer system capabilities. This program of study may also include exploration into the research, design, or testing of computer or computer-related equipment for commercial, industrial, military, or scientific use.

For more information on postsecondary options for this program of study, visit TXCTE.org.
<table>
<thead>
<tr>
<th>COURSE NUMBER/ COURSE NAME</th>
<th>SERVICE ID/ CREDITS</th>
<th>PREREQUISITE (PREQ) RECOMMENDED PREREQUISITE (RPREQ)</th>
<th>GRADE</th>
</tr>
</thead>
<tbody>
<tr>
<td>8K100, 8K105 DC Principles of Information Technology</td>
<td>13027200 (1 credit)</td>
<td>None</td>
<td>9-10</td>
</tr>
<tr>
<td>8K300, 8K305 Geographic Information Systems</td>
<td>N1302805 (1 credit)</td>
<td>(PREQ) Principles of Information Technology</td>
<td>10-12</td>
</tr>
<tr>
<td>8K400, 8K405 Raster Based GIS</td>
<td>N1302806 (1 credit)</td>
<td>PREQ: Geographic Information Systems</td>
<td>10-12</td>
</tr>
<tr>
<td>8K210 Spatial Technology and Remote Sensing</td>
<td>N1302807 (1 credit)</td>
<td>(PREQ) Raster Based GIS</td>
<td>10-12</td>
</tr>
</tbody>
</table>
The Networking Systems program of study explores the occupations and educational opportunities associated with designing and implementing computer and information networks, such as local area networks (LAN), wide area networks (WAN), intranets, extranets, and other data communications networks. This program of study may also include exploration into analyzing science, engineering, and other data processing problems to implement and improve computer systems.

The Information Technology (IT) Career Cluster® focuses on building linkages in IT occupations for entry level, technical, and professional careers related to the design, development, support, and management of hardware, software, multimedia, and systems integration services.

Successful completion of the Networking Systems program of study will fulfill requirements of a Business and Industry Endorsement.

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

### GRCTC PATHWAY

#### LEVEL 1
- **8K100, 8K105** Principles of Information Technology and/or
  - **91822** AP Computer Science Principles

#### LEVEL 2
- **91820 (H)** Computer Science I

#### LEVEL 3
- **8K906, 8K907 DC** Computer Maintenance
- **8K930, 8K935 DC** Networking

#### LEVEL 4
- **8K960** Practicum in Information Technology

<table>
<thead>
<tr>
<th>HIGH SCHOOL/INDUSTRY CERTIFICATION</th>
<th>CERTIFICATE/LICENSE*</th>
<th>ASSOCIATE'S DEGREE</th>
<th>BACHELOR'S DEGREE</th>
<th>MASTER'S/DOCTORAL PROFESSIONAL DEGREE</th>
</tr>
</thead>
<tbody>
<tr>
<td>CompTIA A**</td>
<td>AEM 6 Business Practitioner</td>
<td>Computer and Information Sciences, General</td>
<td></td>
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</tr>
<tr>
<td>MTA: Network Fundamentals**</td>
<td>Intelligence Planner Certification Program</td>
<td>Computer Systems Networking and Telecommunications</td>
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<tr>
<td>MTA: Windows Server Admin, Fundamentals**</td>
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<td>Information Technology</td>
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<td></td>
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<tr>
<td>MTA: Windows Operating Systems Fundamentals**</td>
<td>Cisco Certified Entry Networking Technician</td>
<td>Information Technology</td>
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</tr>
<tr>
<td>Cisco Certified Network Associate (CCNA-Cyber Ops)**</td>
<td>Microsoft Networking Fundamentals</td>
<td>Network and System Administration/Administrator</td>
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</tr>
<tr>
<td></td>
<td></td>
<td>Computer Engineering, General</td>
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</tbody>
</table>

*Includes Level 1 and Level II Certificates
**Added, offered at GISD campus

### OCCUPATIONS

<table>
<thead>
<tr>
<th>OCCUPATIONS</th>
<th>MEDIAN WAGE</th>
<th>ANNUAL OPENINGS</th>
<th>% GROWTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Computer Network Architects</td>
<td>$111,633</td>
<td>1,082</td>
<td>23%</td>
</tr>
<tr>
<td>Computer Systems Analysts</td>
<td>$87,568</td>
<td>5,937</td>
<td>29%</td>
</tr>
<tr>
<td>Computer Network Support Specialists</td>
<td>$68,037</td>
<td>1,824</td>
<td>19%</td>
</tr>
</tbody>
</table>

### WORK BASED LEARNING AND EXPANDED LEARNING OPPORTUNITIES

**Exploration Activities:**
- Join TSA
- Job shadow a computer network architect or support specialist

**Work Based Learning:**
- Activities: Earn an industry-based certification.

For more information on postsecondary options for this program of study, visit TXCTE.org.
<table>
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<tbody>
<tr>
<td>8K100, 8K105 DC, 8K700 MST Principles of Information Technology</td>
<td>13027200 (1 credit)</td>
<td>None</td>
<td>9-10</td>
</tr>
<tr>
<td>91822 AP Computer Science Principles</td>
<td>A3580300 (1 credit)</td>
<td>PREQ: Algebra I</td>
<td>9-10</td>
</tr>
<tr>
<td>91820 (H) Computer Science I</td>
<td>03580200 (1 credit)</td>
<td>PREQ: Algebra I</td>
<td>9-10</td>
</tr>
<tr>
<td>8K730, 8K735 DC MST Internetworking Technologies I (CISCO 1)</td>
<td>N1302803 (1 credit)</td>
<td>RPREQ: Principles of Information Technology</td>
<td>10-12</td>
</tr>
<tr>
<td>8K710, 8K715 DC MST; 8K906, 8K907 DC GRCTC Computer Maintenance</td>
<td>13027300 (1 credit)</td>
<td>PREQ: Principles of Information Technology</td>
<td>10-12</td>
</tr>
<tr>
<td>8K740, 8K745 DC MST Internetworking Technologies II (CISCO II)</td>
<td>N1302804 (1 credit)</td>
<td>PREQ: Internetworking Technologies I</td>
<td>10-12</td>
</tr>
<tr>
<td>8K930, 8K935 DC GRCTC Networking</td>
<td>13027400 (1 credit)</td>
<td>RPREQ: Principles of Info. Technology, Comp. Maint., and/or Comp. Maint./Lab</td>
<td>11-12</td>
</tr>
<tr>
<td>8K750S, 8K755S DC MST Project Based Research (CISCO 3)</td>
<td>12701500 (1 credit)</td>
<td>PREQ: MST Internetworking II (CISCO 2)</td>
<td>11-12</td>
</tr>
<tr>
<td>8K760S, 8K765S DC MST Project Based Research</td>
<td>12701510 (1 credit)</td>
<td>PREQ: 8K750S, 8K755S MST Project Based Research</td>
<td>11-12</td>
</tr>
<tr>
<td>8K960 GRCTC Practicum in Info Technology</td>
<td>13028000 (2 credits)</td>
<td>RPREQ: Principles of Info. Technology, Comp. Maint., and/or Comp. Maint./Lab</td>
<td>11-12</td>
</tr>
</tbody>
</table>
The Web Development program of study explores the occupations and educational opportunities associated with designing, creating, and modifying websites. This program of study may also explore integrating websites with other computer applications, and converting written, graphic, audio, and video components to compatible web formats by using software designed to facilitate the creation of web and multimedia content.

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<tbody>
<tr>
<td>8K100, 8K105 Principles of Information Technology</td>
<td>13027200 (1 credit)</td>
<td>None</td>
<td>9-10</td>
</tr>
<tr>
<td>8K110 Web Technologies</td>
<td>13027900 (1 credit)</td>
<td>RPREQ: Principles of Information Technology</td>
<td>10-12</td>
</tr>
<tr>
<td>8K920S GRCTC Computer Programming I</td>
<td>13027600 (1 credit)</td>
<td>RPREQ: Principles of Information Technology and Algebra I</td>
<td>11-12</td>
</tr>
<tr>
<td>9K930S GRCTC Web Design</td>
<td>03580820 (1 credit)</td>
<td>RPREQ: Principles of Information Technology</td>
<td>11-12</td>
</tr>
<tr>
<td>8K980 (2) GRCTC Practicum in Information Technology - Web Design</td>
<td>13028000 (2 credits)</td>
<td>(PREQ): A minimum of two high school information technology (IT) courses</td>
<td>12</td>
</tr>
</tbody>
</table>
Geographic Information Systems

Principles of Information Technology
8K100, 8K105 DC
TSDS PEIMS Code: 13027200 (PRINIT)
Grade Placement: 9–10, Credit: 1
Prerequisites: None
In Principles of Information Technology, students will develop computer literacy skills to adapt to emerging technologies used in the global marketplace. Students will implement personal and interpersonal skills to prepare for a rapidly evolving workplace environment. Students will enhance reading, writing, computing, communication, and reasoning skills and apply them to the information technology environment.

Geographic Information Systems
8K300, 8K305
TSDS PEIMS Code: N1302805 (GIS)
Grade Placement: 10-12, Credit: 1
Prerequisites: None
Geographic Information Systems (GIS) is a course designed to introduce students to Geographic Information Systems and Remote Sensing (RS) technology through academic study and applied instruction. Students will be introduced to terminology and concepts relating to GIS/RS technology and will apply these concepts through the use of GIS software programs.

Raster-Based Geographic Information Systems
8K400, 8K405
TSDS PEIMS Code: N1302806 (RBGIS)
Grade Placement: 10-12, Credit: 1
Prerequisites: None
Geographic Information Systems (GIS) is a course designed to introduce students to Geographic Information Systems and Remote Sensing (RS) technology through academic study and applied instruction. Students will be introduced to terminology and concepts relating to GIS/RS technology and will apply these concepts through the use of GIS software programs. This course introduces the principles of Geographic Information Systems (GIS) data sets including raster-based information such as images or photographs. Students will study local problems and acquire information, including images or aerial photographs, process the data they acquire, and merge the acquired data with vector data. Students will plan, conduct, and present solutions for locally-based problems.

Spatial Technology and Remote Sensing
8K210
TSDS PEIMS Code: N1302807 (SPATECRS)
Grade Placement: 10-12, Credit: 1
Prerequisites: None
This course is designed to provide students with instruction in GIS and RS technology. Students will receive instruction in standard geospatial extension software and geospatial tools, including global positioning systems (GPS), and continued training in GIS project management and problem solving. Each student will participate in applied learning activities with emphasis placed on planning, conducting, and presenting special projects dealing with the use of GIS/RS tools and data.
Networking Systems

**Principles of Information Technology**  
8K100, 8K105, 8K700 MST  
TSDS PEIMS Code: 13027200 (PRINIT)  
Grade Placement: 9-10, Credit: 1 Prerequisites: None  
In Principles of Information Technology, students will develop computer literacy skills to adapt to emerging technologies used in the global marketplace. Students will implement personal and interpersonal skills to prepare for a rapidly evolving workplace environment. Students will enhance reading, writing, computing, communication, and reasoning skills and apply them to the information technology environment.

**AP Computer Science Principles**  
91822  
TSDS PEIMS Code: A3580300  
Grade Placement: 9-10, Credit: 1  
Prerequisites: Algebra I  
AP Computer Science Principles introduces students to the central ideas of computer science, instilling the ideas and practices of computational thinking and inviting students to understand how computing changes the world. The rigorous course promotes deep learning of computational content, develops computational thinking skills, and engages students in the creative aspects of the field. The course is unique in its focus on fostering students’ creativity. Students are encouraged to apply creative processes when developing computational artifacts and to think creatively while using simulations to explore questions that interest them. Rather than teaching a particular programming language or tool, the course focuses on using technology and programming as a means to solve computational problems and create exciting and personally relevant artifacts. Students design and implement innovative solutions using an iterative process similar to what artists, writers, computer scientists, and engineers use to bring ideas to life.

**Computer Maintenance**  
8K710, 8K715 DC MST, 8K906, 8K907 DC (1) GRCTC  
TSDS PEIMS Code: 13027300 (COMPMTN)  
Grade Placement: 10–12, Credit: 1  
Prerequisite: None.  
Recommended Prerequisite: Principles of Information Technology.  
In Computer Maintenance, students will acquire knowledge of computer maintenance and creating appropriate documentation. Students will analyze the social responsibility of business and industry regarding the significant issues relating to the environment, ethics, health, safety, and diversity in society and in the workplace as related to computer maintenance. Students will apply technical skills to address the IT industry and emerging technologies.

**MST Internetworking Technologies I (CISCO 1)**  
8K730, 8K735 DC MST  
TSDS PEIMS Code: N1302803 (INTNET1)  
Grade Placement: 10–12, Credit: 1  
Prerequisite: None.  
The Internetworking Technologies I course is normally comprised of the courses called Cisco CCNA R&S: Introduction to Networks (CCNA 1) and Cisco CCNA R&S: Routing and Switching Essentials (CCNA 2). The Introduction to Networks course introduces the concept of networking, using various analogies to help the student understand the movement of packets throughout the Internet, and the protocol standards used. The Routing and Switching course moves the student into the theory of "moving packets." The concepts of routing and switching "packets" to the correct destination is covered, and how a network administrator can direct and/or streamline this process through device configuration and deployment.
Networking Systems

MST Internetworking Technologies II (CISCO 2)
8K740, 8K745 DC MST
TSDS PEIMS Code: N1302804 (INTNET2)
Grade Placement: 10–12, Credit: 1
Prerequisite: None.
The Internetworking Technologies II course is normally comprised of the courses called Cisco CCNA R&S: Scaling Networks (CCNA 3) and Cisco CCNA R&S: Connecting Networks (CCNA 4). The CCNA 3 course covers the architecture, components, and operations of routers and switches in larger and more complex networks. Students learn how to configure routers and switches for advanced functionality. The CCNA 4 course discusses the Wide Area Network (WAN) technologies and network services required by converged applications in a complex network. The course enables students to understand the selection criteria of network devices and WAN technologies to meet network requirements.

Networking
8K930, 8K935 DC GRCTC
TSDS PEIMS Code: 13027400 (NETWRK)
Grade Placement: 10–12, Credit: 1
Prerequisite: None.
Recommended Prerequisites: Principles of Information Technology, Computer Maintenance, and Computer Maintenance Lab.
Recommended Corequisite: Networking Lab.
In Networking, students will develop knowledge of the concepts and skills related to data networking technologies and practices to apply them to personal or career development. To prepare for success, students will have opportunities to reinforce, apply, and transfer knowledge and skills to a variety of settings and problems.

MST Project-Based Research (CISCO 3)
8K750S, 8K755S DC (Fall)
TSDS PEIMS Code: 12701500 (First Time Taken) (PROBS1) (CISCO III)
Grade Placement: 11–12, Credit: 1
Prerequisite: 8K740, 8K745 DC MST Internetworking II (CISCO 2)
Project-Based Research is a course for students to research a real-world problem. Students are matched with a mentor from the business or professional community to develop an original project on a topic related to career interests. Students use scientific methods of investigation to conduct in-depth research, compile findings, and present their findings to an audience that includes experts in the field. To attain academic success, students must have opportunities to learn, reinforce, apply, and transfer their knowledge and skills in a variety of settings.

MST Project-Based Research
8K760S, 8K765S DC (Spring)
12701510 (Second Time Taken) (PROBS2)
Grade Placement: 11–12, Credit: 1
Prerequisite: 8K750, 8K755 DC MST Project-Based Research.
Project-Based Research is a course for students to research a real-world problem. Students are matched with a mentor from the business or professional community to develop an original project on a topic related to career interests. Students use scientific methods of investigation to conduct in-depth research, compile findings, and present their findings to an audience that includes experts in the field. To attain academic success, students must have opportunities to learn, reinforce, apply, and transfer their knowledge and skills in a variety of settings.

Practicum in Information Technology
8K960 GRCTC
TSDS PEIMS Code: 13028000 (First Time Taken) (PRACIT1)
Grade Placement: 12, Credit: 2
Prerequisite: A minimum of two high school information technology (IT) courses.
In the Practicum in Information Technology, students will gain advanced knowledge and skills in the application, design, production, implementation, maintenance, evaluation, and assessment of products, services, and systems. Knowledge and skills in the proper use of analytical skills and application of IT concepts and standards are essential to prepare students for success in a technology-driven society. Critical thinking, IT experience, and product development may be conducted in a classroom setting with an industry mentor, as an unpaid or paid internship, as part of a capstone project, or as career preparation.
Web Development

Principles of Information Technology
8K100, 8K105, 8K700 MST
TSDS PEIMS Code: 13027200 (PRINIT)
Grade Placement: 9–10, Credit: 1
Prerequisites: None
In Principles of Information Technology, students will develop computer literacy skills to adapt to emerging technologies used in the global marketplace. Students will implement personal and interpersonal skills to prepare for a rapidly evolving workplace environment. Students will enhance reading, writing, computing, communication, and reasoning skills and apply them to the information technology environment.

Web Technologies
8K110
TSDS PEIMS Code: 13027900 (WEBTECH)
Grade Placement: 10–12, Credit: 1
Prerequisite: None.
Recommended Prerequisite: Principles of Information Technology
In Web Technologies, students will learn to make informed decisions and apply the decisions to the field of IT. Students will implement personal and interpersonal skills to prepare for a rapidly evolving workplace environment. The knowledge and skills acquired and practiced will enable students to successfully perform and interact in a technology-driven society. Students will enhance reading, writing, computing, communication, and critical thinking and apply them to the IT environment.

Computer Programming I
8K920S (Fall) GRCTC
TSDS PEIMS Code: 13027600 (COMPPRO1)
Grade Placement: 11–12, Credit: 1
Prerequisite: None.
Recommended Prerequisites: Principles of Information Technology and Algebra I.
In Computer Programming I, students will acquire knowledge of structured programming techniques and concepts appropriate to developing executable programs and creating appropriate documentation. Students will analyze the social responsibility of business and industry regarding the significant issues relating to the environment, ethics, health, safety, and diversity in society and in the workplace as related to computer programming. Students will apply technical skills to address business applications of emerging technologies.

Web Design
9K930S (Spring)
TSDS PEIMS Code: 03580820 (TAWEBDN)
Grade Placement: 11-12, Credit: 1
Prerequisite: None.
The technology applications curriculum has six strands based on the National Educational Technology Standards for Students (NETS•S) and performance indicators developed by the International Society for Technology in Education (ISTE): creativity and innovation; communication and collaboration; research and information fluency; critical thinking, problem solving, and decision making; digital citizenship; and technology operations and concepts. This is an introductory course in web design.
Web Development

Practicum in Information Technology – Web Design
8K980 GRRTC
TSDS PEIMS Code: 13028000 (PRACIT1)
Grade Placement: 12, Credit: 2
Prerequisite: A minimum of two high school information technology (IT) courses.
In the Practicum in Information Technology, students will gain advanced knowledge and skills in the application, design, production, implementation, maintenance, evaluation, and assessment of products, services, and systems. Knowledge and skills in the proper use of analytical skills and application of IT concepts and standards are essential to prepare students for success in a technology-driven society. Critical thinking, IT experience, and product development may be conducted in a classroom setting with an industry mentor, as an unpaid or paid internship, as part of a capstone project, or as career preparation.