Computer Servicing Technology
Mississippi Curriculum Framework

47.0104_Computer Installation and Repair Technology/Technician.

2022

Published by:
Mississippi Community College Board
Division of Workforce, Career, and Technical Education
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The Office of Curriculum and Instruction (OCI) was founded in 2013 under the Division of Workforce, Career, and Technical Education at the Mississippi Community College Board (MCCB). The office is funded through a partnership with The Mississippi Department of Education (MDE), who serves as Mississippi's fiscal agent for state and federal Career and Technical Education (CTE) Funds. The OCI is tasked with developing statewide CTE curriculum, programming, and professional development designed to meet the local and statewide economic demand.

Contents

FACULTY WRITING TEAM MEMBERS 2
ADMINISTRATOR WRITING TEAM MEMBERS 2
BUSINESS AND INDUSTRY CONTRIBUTING WRITING TEAM MEMBERS 2
OFFICE OF CURRICULUM AND INSTRUCTION TEAM MEMBERS 2
RESEARCH ABSTRACT 5
REVISION HISTORY 5
ADOPTION OF NATIONAL CERTIFICATION STANDARDS 6
ARTICULATION 6
Industry Job Projection Data 7
TECHNICAL SKILLS ASSESSMENT 8
PROGRAM DESCRIPTION 9
SUGGESTED COURSE SEQUENCE 10
COMPUTER SERVICING TECHNOLOGY COURSES 13
Appendix A: Recommended Tools and Equipment 36
RECOMMENDED INSTRUCTIONAL AIDS 38
SUGGESTED RESOURCES 39
STUDENT SUPPLIES 39
Appendix B: Curriculum Definitions and Terms 41
Appendix C: Course Crosswalk 42
Appendix D: Recommended Computer Servicing Technology Textbook List 44

Research Abstract

The curriculum framework in this document reflects the changes in the workplace and several other factors that impact local vocational–technical programs. Federal and state legislation calls for articulation between high school and community college programs, integration of academic and vocational skills, and the development of sequential courses of study that provide students with the optimum educational path for achieving successful employment. National skills standards, developed by industry groups and sponsored by the U.S. Department of Education and Labor, provide vocational educators with the expectations of employers across the United States. All of these factors are reflected in the framework found in this document.

Revision History

2010 - Research & Curriculum Unit, Mississippi State University
2016 - Office of Curriculum & Instruction, Mississippi Community College Board
2022 - Office of Curriculum & Instruction, Mississippi Community College Board

Adoption of National Certification Standards

CompTIA is a vendor neutral provider of IT certifications. At the time of this revision, CompTIA A+ (2022 edition) comprises CompTIA A+220-1101 and CompTIA A+ 220-1102. The following overview has been prepared based directly oninformation from the CompTIA A+ certification website at www.CompTIA.org.

The certification covers both hardware and software fundamentals that are needed by IT professionals in support and service technician roles. CompTIA A+ 220-1101 covers computer technology fundamentals, such as PC installation, configuration, mobile devices, and networking as well as safety procedures and prohibited content. CompTIA A+ 220-1102 covers installing and configuring PC and mobile operating systems, as well as common functions in networking, email and security.

In order to receive CompTIA A+ certification a candidate must pass two exams. The first exam is CompTIA A+ 220-1101 Certification Exam. The CompTIA A+ 220-1101 and CompTIA A+ 220-1102 examinations measures necessary competencies for an entry-level IT professional with the equivalent knowledge of at least 12 months of hands-on experience in the lab or field. Successful candidates will have the knowledge required to assemble components based on customer requirements, install, configure and maintain devices, PCs and software for end users, understand the basics of networking and security/forensics, properly and safely diagnose, resolve and document common hardware and software issues while applying troubleshooting skills. Successful candidates will also provide appropriate customer support; understand the basics of virtualization, desktop imaging, and deployment.

CompTIA A+ is accredited by ANSI to show compliance with the ISO 17024 Standard and, as such, undergoes regular reviews and updates to the exam objectives.

For more information related to CompTIA examinations, please visit www.CompTIA.org.

Articulation

During the consultation process with Computer Servicing Technology instructors, it was decided that the secondary Information Technology pathway curriculum lacked sufficient focus in particular topic matter to be able to articulate to the Computer Servicing Technology program. Therefore, no articulation agreement could be established for this program.

Industry Job Projection Data

A summary of occupational data is available from the Mississippi Department of Employment Security.

Computer Installation and Repair Technology occupations require an education level of a postsecondary career and technical certificate. A summary of occupational data from the Mississippi Occupational Employment Projections is displayed below:

Standard Occupational Classification (SOC)		2016 Employment	2026 Projected Employment	Projected Employment Growth 2016-2026		Total Projected Avg. Annual Job Openings
SOC Code	Occupation			Number	Percent	
15-1142	Network and Computer Systems Administrators	1,340	1,360	20	1.5%	95
15-1152	Computer Network Support Specialists	1,050	1,170	120	11.4%	100

Note. The data was retrieved April 26, 2022 from the Mississippi Occupational Employment Projection Standard Occupational Classification (SOC) data
https://mdes.ms.gov/information-center/labor-market-information/

TECHNICAL SKILLS ASSESSMENT

Colleges should report the following for students who complete the program with a career certificate, technical certificate, or an Associate of Applied Science Degrees for technical skills attainment. To use the approved Alternate Assessment for the following programs of study, colleges should provide a Letter of Notification to the Director of Career Technical Education at the MS Community College Board. Please see the following link for further instructions: http://www.mccb.edu/wkfEdu/CTDefault.aspx.

CIP Code	Program of Study
47.0104	Computer Installation and Repair Technology
Level	**Standard Assessment**
Accelerated /15 Hour	CompTIA A+ 220-1101
Level	**Standard Assessment**
Career	CompTIA A+ 220-1101
Level	**Standard Assessment**
Technical/AAS	CompTIA A+ 220-1102

Through successful coursework completion, students will acquire the foundational knowledge for taking several CompTIA certification examinations. Courses from the Computer Servicing Technology curriculum have been mapped to the objectives outlined for numerous CompTIA certifications. More details about each certificate can be found at http://certification.comptia.org/. The following chart highlights the course content areas, courses, and the corresponding certification possibilities. The course program sequence can be found on the following pages.

Content Areas	Course	Certificate
IT Support	CST 1123 Basic IT Hardware CST 1333 Operating Systems CST 2113 IT Servicing Lab I CST 2123 IT Servicing Lab II CST 2913 Special Projects CST 1913 Mobile Device Support I	CompTIA A+
Network Support	CST 1213 Networking I CST 2223 Networking II	CompTIA Network+
Server Administration Support	CST 1713 Server Administration I CST 1813 Server Administration II	CompTIA Server+
Cloud Computing Support	CST 2413 Cloud Essentials CST 2423 Cloud Computing	CompTIA Cloud Essentials
Networking Security	CST 1613 Security Fundamentals CST 2613 Security Fundamentals II	CompTIA Security+

PROGRAM DESCRIPTION

The Computer Servicing Technology program will provide students with the required skills and expertise to be employable as computer and IT support specialists to interface with IT hardware, communications, endpoint and mobile technology resources. The program prepares individuals to install, maintain, service, and diagnose operational problems in computing and endpoint devicesarising from software, network, or electrical malfunctions. In additionto PC and mobile support, further emphasis is placed on support of computer networks, server maintenance, and cloud technologies. Courses in the IT Specialist Technician program describe the skills, equipment, software, and hardware tools to properly support the information technology industry. This program will also emphasize oral and written communication skills and professional skills necessary for IT Support Specialists.

This program is mapped to CompTIA's A+ certification objectives and supports student certification for A+. The industry standards are taken from the Computing Technology Industry Association, CompTIA A+ Core 1 (Exam Number: 220-1101) objectives, and the CompTIA A+ Core 2 (Exam Number: 220-1102) objectives. CompTIA A+ Certification Exam Objectives can be downloaded from https://partners.comptia.org/docs/default-source/resources/comptia-a-220-1101-exam-objectives-(3-0) and https://partners.comptia.org/docs/default-source/resources/comptia-a-220-1102-exam-objectives-(3-0)

Computer Servicing Technology is a two-year program of study that requires courses in the career–technical core, designated areas of concentration, and the academic core. Students who successfully complete a minimum of 30 semester hours in computer servicing technology courses may earn a career certificate. Students who successfully complete a minimum of 45 semester hours in computer servicing technology courses may earn a technical certificate. Successful completion of a minimum of 60 semester credit hours of course work in a two-year program leads to an Associate in Applied Science degree.

SUGGESTED COURSE SEQUENCE

Accelerated Pathway Credential

			SCH Breakdown			Contact Hour Breakdown		Certification Information
Course Number	Course Name	Semester Credit Hours	Lecture	Lab	Total Contact Hours	Lecture	Lab	Certification Name
CST 1123	Basic IT Hardware	3	2	4	75	30	45	
CST 1213	Networking I	3	2	2	60	30	30	
CST 1333	Operating Systems	3	2	2	60	30	30	
	Instructor Approved Technical Electives	6						
	TOTAL	**15**						

Career Certificate Required Courses

			SCH Breakdown			Contact Hour Breakdown		Certification Information
Course Number	Course Name	Semester Credit Hours	Lecture	Lab	Total Contact Hours	Lecture	Lab	Certification Name
CST 1123	*Basic IT Hardware	3	2	2	60	30	30	CompTIA A+ or equivalent CompTIA exam
CST 1213	*Networking I	3	2	2	60	30	30	
CST 1333	*Operating Systems	3	2	2	60	30	30	
CST 1713	Server Administration I	3	2	2	60	30	30	
CST 1913	*Mobile Device Support I	3	2	2	60	30	30	
CST 2113	IT Servicing Lab I	3	2	2	60	30	30	
CST 2123	IT Servicing Lab II	3	2	2	60	30	30	
CST 2713	IoT Fundamentals	3	2	2	60	30	30	
CST 2413	Cloud Essentials	3	2	2	60	30	30	
CST 1613	*Security Fundamentals	3	2	2	60	30	30	
	TOTAL	**30**						

Technical Certificate Required Courses

			SCH Breakdown			Contact Hour Breakdown		Certification Information
Course Number	Course Name	Semester Credit Hours	Lecture	Lab	Total Contact Hours	Lecture	Lab	Certification Name
CST 1813	Server Admin II	3	2	2	60			CompTIA A+ or equivalent CompTIA exam
CST 2223	Networking II	3	2	2	60			
CST 2613	Security Fundamentals II	3	2	2	60	30	30	
CST 2913	Special Projects	3	2	2				
	Instructor Approved Electives	3	2	2	60	30	30	
	TOTAL	**15**						

Technical Electives

			SCH Breakdown			Contact Hour Breakdown		Certification Information
Course Number		Semester Credit Hours	Lecture	Lab	Total Contact Hours	Lecture	Lab	Certification Name
TCT 2314	Digital Communications I	4						
TCT 2324	Digital Communications II	4						
TCT 1114	Fundamentals of Telecommunications	4						
IST 1154	Web and Programming Concepts	4						
BOT 1173	Introduction to Microsoft Office	3						
CST 2134	IT Diagnostics & Troubleshooting	4						
CST 2423	*Cloud Computing II	3						
CST 2623	Computer Forensics	3						
CST 292(1-6)	Supervised Work Experience	1-6						
CST 291(1-3)	Special Projects	1-3						
WBL 191(1-3) WBL 192(1-3) WBL 193(1-3) WBL 291(1-3) WBL 292(1-3) WBL 293(1-3)	Work-Based Learning	1-6						

General Education Core Courses

To receive the Associate of Applied Science degree, a student must complete all of the required coursework found in the Career Certificate option, Technical certificate option, and a minimum of 15 semester hours of General Education core. The courses in the General Education Core may be spaced out over the entire length of the program so that students complete some academic and Career Technical courses each semester or provided primarily within the last semester. Each community college will specify the actual courses that are required to meet the General Education Core Requirements for the Associate of Applied Science degree at their college. The Southern Association of Colleges and Schools Commission on Colleges (SACSCOC) Section 9 Standard 3 of the *Principles of Accreditation: Foundations for Quality Enhancement*[1] describes the general education core.

Section 9 Standard 3:

3. The institution requires the successful completion of a general education component at the undergraduate level that

   a) is based on a coherent rationale.

   b) is a substantial component of each undergraduate degree program. For degree completion in associate programs, the component constitutes a minimum of 15 semester hours of the equivalent; for baccalaureate programs, a minimum of 30 semester hours or the equivalent.

   c) ensures breadth of knowledge. These credit hours include at least one course from each of the following areas: humanities/fine arts, social/behavioral sciences, and natural science/mathematics. These courses do not narrowly focus on those skills, techniques, and procedures specific to a particular occupation or profession.

General Education Courses

			SCH Breakdown			Contact Hour Breakdown		Certification Information
Course Number	Course Name	Semester Credit Hours	Lecture	Lab	Total Contact Hours	Lecture	Lab	Certification Name
	Humanities/Fine Arts	3						
	Social/Behavioral Sciences	3						
	Math/Science	3						
	Academic electives	6						
	TOTAL	**15**						

[1] Southern Association of Colleges and Schools Commission on Colleges. (2017). *The Principles of Accreditation: Foundations for Quality Enhancement*. Retrieved from http://www.sacscoc.org/2017ProposedPrinc/Proposed%20Principles%20Adopted%20by%20BOT.pdf

COMPUTER SERVICING TECHNOLOGY COURSES

Course Number and Name: **CST 1123 Basic IT Hardware**

Description: A survey of computer hardware components. Topics include hardware compatibility, system architecture, input devices, video displays and adapters, disk drives, and other related peripherals.

Hour Breakdown:

Semester Credit Hours	Lecture	Lab	Contact Hours
3	2	2	60

Prerequisite: Instructor Approved

Student Learning Outcomes:

1. Demonstrate and practice general safety procedures in the school and work-site environments. CompTIA Core 2, 1102 – Domain 4.4
2. Discuss aspects related to mobile device hardware. CompTIA Core 1, 1101 – Domain 1.0
3. Perform system disassembly/inspection. CompTIA Core 1, 1101 – Domain 3.0
    a. Explain the importance of motherboard components, their purpose, and properties.
    b. Compare and contrast various RAM types and their features.
    c. Install and configure PC expansion cards.
    d. Install and configure storage devices and use appropriate media.
    e. Install various types of CPUs and apply the appropriate cooling methods.
    f. Compare and contrast various PC connection interfaces, their characteristics and purpose.
    g. Identify common PC connector types and associated cables.
4. Install a power supply based on given specifications. CompTIA Core 1, 1101 – Domain 3.0
5. Select the appropriate components for a custom PC configuration, to meet customer specifications or needs. CompTIA Core 1, 1101 – Domain 3.0 & 5.0
6. Compare and contrast types of display devices and their features. CompTIA Core 1, 1101 – Domain 1.2 and 3.1
7. Install and configure common peripheral devices CompTIA Core 1, 1101 – Domain 3.0

Standards
CompTIA A+ 1101

CompTIA Core 1, 1101 – Domain 1.0 Mobile Devices
CompTIA Core 1, 1101 – Domain 3.0 Hardware
CompTIA Core 1, 1101 – Domain 5.0 Hardware and Network Troubleshooting

Course Number and Name: **CST 1213 Networking I**

Description: Concepts of telephony, local area networks, wide area networks, data transmission, and topology methods.

Hour Breakdown:

Semester Credit Hours	Lecture	Lab	Contact Hours
3	2	2	60

Prerequisite: Instructor Approved

Student Learning Outcomes:

1. Introduce safety concerns.
2. Investigate career opportunities.
3. Analyze hardware, media, and software. CompTIA Network+ 008, Domain 1.0
    a. Review basic network principles.
    b. Describe network topologies.
    c. Discuss, operate, and troubleshoot wiring.
    d. Discuss basic communications.
    e. Discuss the future of communications.
4. Describe ISO/OSI model. CompTIA Network+ 008, Domain 1.0
5. List and describe protocols. CompTIA Network+ 008, Domain 1.0
6. Discuss Internetworking devices. CompTIA Network+ 008, Domain 2.0
7. Examine LAN/WAN testing and analysis procedures. CompTIA Network+ 008, Domain 3.0

Standards

CompTIA Network+

1.0 Networking Fundamentals

2.0 Network Implementations

Course Number and Name: **CST 1333 Operating Systems**

Description: Study of operating systems. Emphasis will be placed on support personnel interaction with operating systems and related software applications.

Hour Breakdown:

Semester Credit Hours	Lecture	Lab	Contact Hours
3	2	2	60

Prerequisite: Instructor Approved

Student Learning Outcomes:

1. Use operating systems to perform basic system tasks. CompTIA Core 2, 1102, Domain 1.0
2. Understand software and applications in relation to different operating systems. CompTIA Core 2, 1102, Domain 1.0
3. Explain the function of utilities with in different operating systems. CompTIA Core 2, 1102, Domain 1.0 & CompTIA Linux+ 004 2.2
4. Use advanced features of operating systems. CompTIA Core 2, 1102, Domain 1.0 & Linux+ 004, 2.0
5. Differentiate between types of operating systems. CompTIA Core 2, 1102, Domain 1.0 & Linux+ 004, 2.0
6. Compare and contrast various features and requirements of Microsoft Operating Systems. CompTIA Core 2, 1102, Domain 1.0
   A. Install Windows PC operating systems using appropriate methods.
   B. Operate Windows Control Panel utilities.

Identify common features and functionality of the Mac OS and Linux operating systems. CompTIA Core 2, 1102, Domain 1.0

Standards
CompTIA Core 2 1102 Domain 1.0 Operating Systems

CompTIA Linux+ 004 Domain 2.0 System Operations and Maintenance

Course Number and Name: **CST 1613 Security Fundamentals**

Description: Fundamentals of IT security. Topics include identifying risks and participating in risk mitigation activities; providing infrastructure, application, operational, and information security; applying security controls to maintain confidentiality, integrity, and availability; identifying appropriate technologies and products; troubleshooting security events and incidents; and operating with an awareness of applicable policies, laws, and regulations.

Hour Breakdown:

Semester Credit Hours	Lecture	Lab	Contact Hours
3	2	2	60

Prerequisite: Instructor Approved

Student Learning Outcomes:

1. Define and describe information security. CompTIA Security+ 601, Domain 1.0
2. Compare and contrast different social engineering techniques. Security+ 601 1.1
3. Explain the security concerns associated with various types of vulnerabilities. Security+ 601 1.6
4. Discuss threat actors, vectors and intelligence sources. Security+ 601, 1.3
5. Evaluate techniques used in security assessments. Security + 601, 1.7
6. Discuss penetration testing. Security+ 601, 1.7
7. Recognize threats and security concerns related to endpoint devices and applications.
8. Analyze potential indicators to determine attack types. Security+ 601, 1.2 & 1.3
9. Discuss threats to mobile communications
10. Discuss security issues and concerns with mobile devices and connections. Security+ 601, 3.5
11. Explain the security concerns for embedded or specialized systems. Security+ 601 2.6
12. Identify physical attacks on storage media or peripherals. Security+ 601, 1.2
13. Characterize basic aspects of cryptography
14. Summarize the basics of cryptographic concepts. Security+ 601, 2.8
15. Summarize public key infrastructure and cryptography protocols
16. Discuss public key infrastructure and certificates. Security+ 601, 3.9

Standards

CompTIA Security+ Certification Exam Objectives
1.1 Compare and contrast the different types of social engineering techniques.
1.2 Given a scenario, analyze potential indicators to determine the type of attack.
1.3 Given a scenario, analyze potential indicators associated with application attacks.
1.6 Explain the security concerns associated with various types of vulnerabilities
1.7 Summarize the techniques used in security assessments.
2.6 Explain the security implications of embedded and specialized systems.
2.8 Summarize the basics of cryptographic concepts
3.5 Given a scenario, implement secure mobile solutions.
3.9 Given a scenario, implement public key infrastructure

Course Number and Name: **CST 1713 Server Administration I**

Description: Fundamentals of server support. Topics include support of server hardware, installation and configuration server operating systems, and asset management.

Hour Breakdown:

Semester Credit Hours	Lecture	Lab	Contact Hours
3	2	2	60

Prerequisite: Instructor Approved

Student Learning Outcomes:

1. Explain the purpose and function of server chassis types. CompTIA Server+ 005, 1.1
2. Install, configure, and maintain server components. CompTIA Server+ 005, 1.1
3. Install cables and implement proper cable management procedures. CompTIA Server+ 005, 1.1
4. Configure RAID using best practices. CompTIA Server+ 005, 1.2
5. Summarize hardware and features of various storage technologies. CompTIA Server+ 005, 1.2
6. Install and deploy primary storage devices based on given specifications and interfaces. CompTIA Server+ 005, 1.2
7. Calculate appropriate storage capacity and plan for future growth. CompTIA Server+ 005, 4.3
8. Install and configure server operating systems. CompTIA Server+ 005, 2.1
9. Compare and contrast server roles and requirements for each. CompTIA Server+ 005, 2.3
10. Use access and control methods to administer a server. CompTIA Server+ 005, 1.3
11. Compare and contrast various ports and protocols. CompTIA Server+ 005, 1.1
12. Configure servers to use IP addressing and network infrastructure services. CompTIA Server+ 005, 1.2
13. Explain the importance of asset management and documentation. CompTIA Server+ 005, 3.6

Standards
CompTIA Server+ Certification Objectives

1.1Given a scenario, install physical hardware
1.2 Given a scenario, deploy and manage storage.
1.3 Given a scenario, perform server hardware maintenance.
2.1 Given a scenario, install server operating systems.
3.6 Summarize proper server decommissioning concepts.
4.3 Given a scenario, troubleshoot storage problems.

Course Number and Name: **CST 1813 Server Administration II**

Description: Fundamentals of server support. Topics include support of server hardware, installation and configuration server operating systems, and asset management.

Hour Breakdown:

Semester Credit Hours	Lecture	Lab	Contact Hours
3	2	2	60

Prerequisite: Instructor Approved

Student Learning Outcomes:

1. Explain basic data security concepts. CompTIA Server+ 005, 3.1
2. Compare and contrast physical security methods and concepts. CompTIA Server+ 005, 3.2
3. Apply server hardening techniques. CompTIA Server+ 005, 3.5
4. Implement logical access control methods based on company policy. CompTIA Server+ 005, 3.3
5. Implement proper environmental controls and techniques. CompTIA Server+ 005, 3.2
6. Explain troubleshooting theory and methodologies. CompTIA Server+ 005, 4.1
7. Troubleshoot hardware problems, selecting the appropriate tools and methods. CompTIA Server+ 005, 4.2
8. Troubleshoot software problems, selecting the appropriate tools and methods. CompTIA Server+ 005, 4.4
9. Diagnose network problems, selecting the appropriate tools and methods. CompTIA Server+ 005, 4.5
10. Troubleshoot storage problems, selecting the appropriate tools and methods. CompTIA Server+ 005, 4.3
11. Diagnose security issues, selecting the appropriate tools and methods. CompTIA Server+ 005, 4.6
12. Perform proper server maintenance techniques. CompTIA Server+ 005, 1.3
13. Implement data security methods and secure storage disposal techniques. CompTIA Server+ 005, 3.6
14. Implement appropriate backup techniques. CompTIA Server+ 005, 3.7
15. Explain the importance of disaster recovery principles. CompTIA Server+ 005, 3.8
16. Explain the purpose and operation of virtualization components. CompTIA Server+ 005, 2.5

Standards

CompTIA Server+ Certification Objectives
3.1 Summarize data security concepts.
3.2 Summarize physical security concepts.
3.3 Explain important concepts pertaining to identity and access management for server administration.
3.5 Given a scenario, apply server hardening methods.
3.6 Summarize proper server decommissioning concepts.
3.7 Explain the importance of backups and restores.

3.8 Explain the importance of disaster recovery.
4.1 Explain the troubleshooting theory and methodology
4.2 Given a scenario, troubleshoot common hardware failures.
4.3 Given a scenario, troubleshoot storage problems
4.4 Given a scenario, troubleshoot common OS and software problems
4.5 Given a scenario, troubleshoot network connectivity issues

Course Number and Name: **CST 1913 Mobile Device Support I**

Description: Fundamentals of mobile device support. Topics include an overview of mobile computing history, modern mobile operating systems and related software, types of devices and accessories, common networking protocols, standards-based wireless networking, cellular technology, and wireless network planning design concepts.

Hour Breakdown:

Semester Credit Hours	Lecture	Lab	Contact Hours
3	2	2	60

Prerequisite: Instructor Approved

Student Learning Outcomes:

1. Discuss physical hardware used in mobile devices
    a. Battery, HID, Storage, Network CompTIA Core 1, 1101, Domain 1.1
    b. Display types – LCD, OLED CompTIA Core 1, 1101, Domain 1.2
    c. Touch screens/Digitizers CompTIA Core 1, 1101, Domain 1.2
    d. Bluetooth, NFC, WiFI, Hotspots CompTIA Core 1, 1101, Domain 1.3

2. Explain the characteristics of various types of mobile devices. CompTIA Core 1, Domain 1.0

3. Compare and contrast accessories & ports of mobile devices. CompTIA Core 1, 1.3

4. Compare and contrast common network ports and protocols for mobile devices. CompTIA Network+, 1.1

5. Describe and explain Computer Network Types, Topologies, and the OSI Model. CompTIA Network+ 2.3

6. Compare and contrast wireless standards and technologies
a. Identify and define cellular technologies. CompTIA Network+, 2.4
b. Identify and define aspects related to access points. CompTIA Network+, 2.1
c. Identify and define antenna types. CompTIA Network+ 2.4

7. Compare and contrast IEEE 802.11 Terminology and Technology
a. Identify and define 802.11 a/b/g/n/ac/ax. CompTIA Network+ 2.4
b. Identify and define frequencies and range. CompTIA Network+ 2.4

8. Discuss and demonstrate the Interpretation of Site Survey, Capacity Planning, and Wireless Design. CompTIA Network+ 3.2

9. Define and classify Computer Network Infrastructure Devices. CompTIA Network+ 2.1

10. Explain and define Network Traffic Flow, Control, and Security. CompTIA Network+ 1.7

Standards
CompTIA Core 2 1101 Domain 1.0 Operating System

1.1 Given a scenario, install and configure laptop hardware and components.
1.2 Compare and contrast the display components of mobile devices.
1.3 Given a scenario, set up and configure accessories and ports of mobile devices.
1.4 Given a scenario, configure basic mobile-device network connectivity and application support

CompTIA Network+ 008

1.1 Compare and contrast the Open Systems Interconnection (OSI) model layers and encapsulation concepts.
1.7 Explain basic corporate and datacenter network architecture.
2.1 Compare and contrast various devices, their features, and their appropriate placement on the network
2.3 Given a scenario, configure and deploy common Ethernet switching features.
2.4 Given a scenario, install and configure the appropriate wireless standards and technologies
3.2 Explain the purpose of organizational documents and policies

Course Number and Name: **CST 2113 IT Servicing Lab I**

Description: Fundamentals of IT servicing. Includes configuration, test equipment and software usage, basic disassembly and assembly methods, preliminary tests and diagnostics, and schematic interpretation. Additional emphasis will be placed on troubleshooting methodology implementation on various hardware and software systems.

Hour Breakdown:

Semester Credit Hours	Lecture	Lab	Contact Hours
3	2	2	60

Prerequisite: Instructor Approved

Student Learning Outcomes:

1. Demonstrate and practice general safety procedures in relation to school and work site environments. CompTIA Core 2, 1102 – 4.4
2. Identify and utilize hand tools and test equipment needed for basic IT servicing. CompTIA Core 1, 1101 – 2.8
3. Identify and use various software tools needed for basic IT servicing equipment. CompTIA Core 2 1102 – 1.3
4. Complete maintenance documentation. CompTIA Core 2, 1102 – 1.2
5. Demonstrate repair procedures for disassembly and reassembly of various components. CompTIA Core 1, 1101 – 3.4
6. Discuss and perform preventive printer maintenance using best practices. CompTIA Core 1, 1101 – 3.7
7. Troubleshoot common problems related to PC components such as:CompTIA Core 1, 1101 – 5.0
   a. Motherboards
   b. RAM
   c. CPU
   d. Power with appropriate tools.
   e. Hard drives and RAID arrays
   f. Common video, projector and display issues.
8. Properly install and support a Microsoft Windows operating system. CompTIA Core 2, 1102 – 1.9
9. Recognize and interpret the meaning of common error codes and startup messages from the boot sequence, and identify steps to correct the problems. CompTIA Core 1, 1101 – 3.4
10. Given a scenario, apply appropriate Microsoft command line tools. CompTIA Core 1, 1101 – 1.2,
11. Given a scenario, use appropriate Microsoft operating system features and tools. CompTIA Core 2, 1.3
12. Given a scenario, use appropriate data destruction and disposal methods. CompTIA Core 2, 1102 - 2.8
13. Demonstrate effective behaviors that contribute to the achievement and maintenance of customer satisfaction. CompTIA Core 2, - 4.7
14. Given a scenario, explain the troubleshooting theory. CompTIA Core 1, 1101 – 5.1
15. Identify basic troubleshooting procedures and good practices for eliciting problem symptoms from customers. CompTIA Core 2, 1102 – 4.1
16. Identify concepts relating to malware, their dangers, their symptoms, their sources, how they infect, how to protect against them, and how to remove or quarantine them. CompTIA Core 2, 1102 – 3.3

Standards

CompTIA Core 1, 1101

1.2 Compare and contrast the display components of mobile devices.
2.8 Given a scenario, use networking tools.
3.4 Given a scenario, install and configure motherboards, central processing units (CPUs), and add-on cards.
3.7 Given a scenario, install and replace printer consumables.
5.0 Hardware and Network Troubleshooting
5.1 Given a scenario, apply the best practice methodology to resolve problems.

CompTIA Core 2, 1102

1.2 Given a scenario, use the appropriate Microsoft command-line tool.
1.3 Given a scenario, use features and tools of the Microsoft Windows 10 operating system (OS).
1.9 Given a scenario, perform OS installations and upgrades in a diverse OS environment.
3.3 Given a scenario, use best practice procedures for malware removal.
4.1 Given a scenario, implement best practices associated with documentation and support systems information management
4.4 Given a scenario, use common safety procedures.
4.7 Given a scenario, use proper communication techniques and professionalism.

Course Number and Name: **CST 2123 IT Servicing Lab II**

Description: Continuation of IT Servicing Lab I with an increased emphasis on system analysis and diagnosis of PC component and software failures. Additional emphasis will be placed on the diagnosis of hardware and software issues pertaining to mobile devices such as smart phones, tablets, and portable computers, as well as printer and network technology concerns.

Hour Breakdown:

Semester Credit Hours	Lecture	Lab	Contact Hours
3	2	2	60

Prerequisite: Instructor Approved

Student Learning Outcomes:

1. Demonstrate and practice general safety procedures in the school and work site environment. CompTIA Core 2, 1102 – 4.4
2. Maintain a service log on individual pieces of equipment. CompTIA Core 2, 1102 – 4.1
3. Given a scenario, troubleshoot PC operating system problems with appropriate tools. CompTIA Core 2, 1102 – 1.3
4. Given a scenario, troubleshoot common PC security issues with appropriate tools and best practices. CompTIA Core 2, 1101 2.5
5. Install and configure laptop hardware and components. CompTIA Core 1, 1101 – 1.1
6. Explain the function of components within the display of a laptop. CompTIA Core 1, 1101 1.2
7. Given a scenario, use appropriate laptop features. CompTIA Core 1, 1101 1.3
   a. Special function keys
   b. Docking station
   c. Rotating / removable screens
8. Troubleshoot printers with appropriate tools. CompTIA Core 1, 1101 – 3.6
9. Given a scenario, troubleshoot and repair common mobile device issues while adhering to the appropriate procedures. CompTIA Core 1, 1101 -5.5
10. Execute best practice for data backup, data recovery and data segregation. CompTIA Core 2, 1121 -4.3

    Identify common remote access technologies and initiate connections CompTIA Core 1, 1102 – 4.9
11. Execute best practices with interpretation of networking technologies and related services. CompTIA Core 1, 1102 – 1.6
12. Identify common symptoms and problems associated with components and devices and how to troubleshoot and isolate the problems. CompTIA Core 1, 1101 – 5.6
13. Discuss potential issues from printing from mobile devices and PC equivalents. CompTIA Core 1, 1101 -5.6

Standards

CompTIA Core 1, 1101

1.1 Given a scenario, install and configure laptop hardware and components.
1.2 Compare and contrast the display components of mobile devices.
1.3 Given a scenario, set up and configure accessories and ports of mobile devices.
3.6 Given a scenario, deploy and configure multifunction devices/printers and settings.
5.5 Given a scenario, troubleshoot common issues with mobile devices.

5.6 Given a scenario, troubleshoot and resolve printer issues.

CompTIA Core 2, 1102

1.3 Given a scenario, use features and tools of the Microsoft Windows 10 operating system (OS).
1.6 Given a scenario, configure Microsoft Windows networking features on a client/desktop.
2.5 Given a scenario, manage and configure basic security settings in the Microsoft Windows OS.
4.1 Given a scenario, implement best practices associated with documentation and support systems information management.
4.3 Given a scenario, implement workstation backup and recovery methods.
4.4 Given a scenario, use common safety procedures
4.9 Given a scenario, use remote access technologies

Course Number and Name: **CST 2134 IT Diagnostics and Troubleshooting**

Description: Diagnostic techniques and troubleshooting methodologies of operating systems, common hardware problems, and system malfunctions, including peripherals.

Hour Breakdown:

Semester Credit Hours	Lecture	Lab	Contact Hours
4	2	4	90

Prerequisite: Instructor Approved

Student Learning Outcomes:

1. Demonstrate and practice general safety procedures in the school and work-site environments. CompTIA Core 2, 1102 - 4.4
    a. Apply relevant and appropriate safety techniques.
    b. Demonstrate an understanding of and comply with relevant OSHA safety standards.

2. Identify basic troubleshooting procedures and good practices for eliciting problem symptoms from customers. CompTIA Core 2, 1102 - 3.1
    a. Identify basic troubleshooting procedures.
    b. Explain accepted practices of eliciting problem symptoms in dealing with customers.
    c. Identify whether the problem is in the hardware or software.

3. Recognize common hardware and software problems, and determine how to resolve them. CompTIA Core 2, 1102 – 3.1
    a. Identify common hardware and software problems.
    b. Identify the general protection faults.
    c. Determine the procedures for resolving a system lockup and stop errors ("blue screen of death").
    d. Identify and utilize third-party and Windows-based utilities to resolve hardware and software problems.
    e. Identify and resolve problems associated with the Device Manager.

4. Identify common symptoms and problems associated with each component and device and how to troubleshoot and isolate the problems. CompTIA Core 1, 1101 – 5.2
    a. Interpret POST codes.
    b. Identify and isolate processor/memory symptoms.
    b. Identify and troubleshoot problems with the monitor/video.
    c. Identify common problems associated with motherboards.
    d. Identify and isolate problems associated with hard drives.
    e. Identify and isolate problems with expansion cards.

5. Recognize and interpret the meaning of common error codes and startup messages from the boot sequence, and identify steps to correct the problems. CompTIA Core 2, 1102 – 3.1
    a. Identify the Safe Mode.
    b. Identify what a "No operating system found" message means and steps to correct the problem.
    c. Identify and correct bad, corrupted or missing system files.

6. Recognize Windows-specific printing problems, and identify the procedures for correcting them. CompTIA Core 1, 1101 – 3.6 & 5.6
    a. Demonstrate how to set up and install a local and networked printer.
    b. Identify and correct when the print spool is stalled.
    c. Identify and correct when the incorrect/incompatible driver for print problems occur.

7. Identify concepts relating to malware, their dangers, their symptoms, their sources, how they infect, how to protect

against them, and how to remove or quarantine them. CompTIA Core 2, 1102 – 3.3

a. Explain preventative measures and techniques.

b. Examine the propagation of malware.

c. Identify where various malware files or programs are located within the operating system or other sources.

d. Identify the various sources for malware.

e. Identify the procedures of how to determine the presence of various malware.

Standards

CompTIA Core 1, 1101

Domain 3.0 - Hardware

Domain 5.0 – Hardware and Network Troubleshooting

Core 2 – Core 2, 1102

Domain 3.0 – Software Troubleshooting

Domain 4.0 - Operational Procedures

ourse Number and Name: **CST 2223 Networking II**

Description: Continuation of Networking I. Topics include further analysis of WAN technologies, in-depth TCP/IP terminology, virtual private and remote access concepts, overview of network security, integrity, and management concepts are also introduced.

Hour Breakdown:

Semester Credit Hours	Lecture	Lab	Contact Hours
3	2	2	60

Prerequisite: Instructor Approved

Student Learning Outcomes:

1 Categorize network devices and their placement on the network. CompTIA Network+, 008 – 2.1

2. Compare and contrast different wireless standards CompTIA Network+, 008 – 2.4

3. Obtain an in-depth understanding of IP addressing schemes. CompTIA Network+, 008 1.4

4. Properly identify virtual network and remote access concepts. CompTIA Network+, 008 – 4.4

5. Understand the concepts of network security. CompTIA Network+, 008 - Domain 1.0

6. Understand the concepts of voice and video over Internet Protocol CompTIA Network+, 008 - Domain 2.1

7. Properly troubleshoot a variety of network related problems. CompTIA Network+, 008 - Domain 5.0

8. Obtain the knowledge necessary to ensure network integrity and availability. CompTIA Network+, 008 – 4.1

9. Explain basic concepts related to network management. CompTIA Network+, 008 – 2.2

Standards

CompTIA Network+ 008

2.0 Networking Fundamentals

3.0 Network Operations

4.0 Network Security

5.0 Network Troubleshooting

Course Number and Name: **CST 2413 Cloud Essentials**

Description: Fundamentals of Cloud computing. Topics include an understanding of terms and characteristics associated with Cloud technologies, an overview of history, virtualization and scalability, and foundational knowledge of the Cloud computing industry.

Hour Breakdown:

Semester Credit Hours	Lecture	Lab	Contact Hours
3	2	2	60

Prerequisite: Instructor Approved

Student Learning Outcomes:

1. Understand basic cloud characteristics
   a. Explanation of cloud principles and characteristics. Cloud Essentials 002 – 1.1
   b. Identification of cloud storage technologies Cloud Essentials 002 – 1.3
   c. Identify cloud networking concepts. Cloud Essentials 002 – 1.2

2. Describe and define principles of cloud environments
   a. Appropriate cloud assessments Cloud Essentials 002 – 2.1
   b. Vendor relations and cloud adoptions Cloud Essentials 002 – 2.3
   c. Benefits of cloud services and migration approaches Cloud Essentials 002 – 2.5

3. Describe and define management and technical operations
   a. Cloud Operations Cloud Essentials 002 – 2.1
   b. Orchestration and automation Cloud Essentials 002 – 2.1

4. Define and implement virtualization technologies utilizing type 2 hypervisors to install network and workstation operating systems. Cloud Essentials, 002 – 3.0

5. Define and describe cloud elements of risk management, security, policy, and procedure
   a. Standard operating procedures Cloud Essentials, 002 – 4.1
   b. Change management Cloud Essentials, 002 - 4.2
   c. Security policies. Cloud Essentials, 002 - 4.3

Standards
Cloud Essentials 002

1.0 Cloud Concepts
2.0 Business Principles of Cloud Environments
3.0 Management and Technical Operations
4.0 Governance, Risk, Compliance, and Security for the Cloud

Course Number and Name: **CST 2423 Cloud Computing**

Description: Continuation of Cloud Computing I. Emphasis is placed on the installation, configuration, and management of Cloud-based systems.

Hour Breakdown:

Semester Credit Hours	Lecture	Lab	Contact Hours
3	2	2	60

Prerequisite: Instructor Approved

Student Learning Outcomes:

1. Discuss Cloud Architecture and Designs. CompTIA Cloud+ 003, Domain 1.0
   a. Analyze factors that contribute to capacity planning. CompTIA Cloud+ 003, 1.2
   b. Explain the importance of high availability and scaling in cloud environments. CompTIA Cloud+ 003,1.3
   c. Analyze the solution designs in support of business requirements. CompTIA Cloud+ 003, 1.4

2. Define security as it relates to cloud environments. CompTIA Cloud+ 003, Domain 2.0
   a. Discuss security in a cloud network environment. CompTIA Cloud+ 003, 2.2
   b. Describe identity and access management. CompTIA Cloud+ 003, 2.1
   c. Define the important of incident response procedures. CompTIA Cloud+ 003, 2.6

3. Discuss deployment and provision of cloud solutions or environments. CompTIA Cloud+ 003, Domain 3.0
   a. Analyze components of a cloud solution. CompTIA Cloud+ 003, 3.1
   b. Discuss storage provision strategies in cloud environment. CompTIA Cloud+ 003, 3.2
   c. Introduce cloud migration methods. CompTIA Cloud+ 003, 3.5

4. Evaluate operation and support methods. CompTIA Cloud+ 003, Domain 4.0
   a. Define methods to configure logging, monitoring and altering to maintain operational status. CompTIA Cloud+ 003, 4.1
   b. Discuss ways to maintain and efficient operation of a cloud environment. CompTIA Cloud+ 003, 4.2
   c. Analyze how to properly implement proper automation and orchestration techniques. CompTIA Cloud+ 003, 4.4

Course Number and Name: **CST 2613 Introduction to Cyber-Crime**

Description: This course introduces and explains the various types of offenses that qualify as cyber-crime activity. Emphasis is placed on identifying cyber-crime activity and the response to these problems from both the private and public domains. Upon completion, students should be able to accurately describe and define cyber-crime activities and select an appropriate response to deal with the problem.

Hour Breakdown:

Semester Credit Hours	Lecture	Lab	Contact Hours
3	2	2	60

Prerequisite: Instructor Approved

Student Learning Outcomes:

1. Define information security and key terms describing physical and logical attacks.
2. Define information security and key terms describing physical and logical attacks.

1. Analyze appropriate tools for organizational security. CompTIA Security+, 601 - 4.1
2. Remember secure protocols vs insecure protocols. CompTIA Security+, 601 - 3.1
3. Discuss the importance of physical security controls. CompTIA Security+, 601 - 2.7
4. Discuss the implementation of security within network designs
5. Explain appliance devices and technologies. CompTIA Security+, 601 - 3.3
6. Compare firewalls types and configurations methods. CompTIA Security+, 601 - 3.3
7. Describe ways to monitor and conduct analysis of network traffic. CompTIA Security+, 601 - 4.1
    a. Introduce cloud computing and associated security concerns.
8. Discuss security solutions and controls for cloud environments. CompTIA Security+, 601 - 3.6
    a. Characterize threats to wireless networks and security controls. CompTIA Security+, 601 – Domain 2.0
9. Configure security settings on wireless devices
10. Describe attacks associated with wireless networks.
11. Evaluate authentication methods and credentials
12. Discuss authentication management and authentication types. CompTIA Security+, 601 - 3.8
13. Define authentication usage within applications and hosts. CompTIA Security+, 601 - 3.2
14. Define risk management, risk identification, and data privacy.
15. Analyze policies related to security accounts and endpoints. CompTIA Security+, 601 - 3.7
16. Discuss policies, processes, and procedures for incident response. CompTIA Security+, 601 - 4.2
17. Define methods for applying mitigation techniques or controls to secure environments. CompTIA Security+, 601 - 4.4

Standards

CompTIA Security+
Domain 2.0 Architecture and Design
Domain 3.0 Implementation
Domain 4.0 Operations and Incident Response

Course Number and Name: **CST 2623 Introduction to Computer Forensics**

Description: This introductory course focuses on computer forensics principles and an exposure to computer technology concepts from operating systems and file types to data transmission and PDA's. Students are introduced to the foundation of electronic evidence collection and handling; as well as the role of evidence in detecting and prosecuting computer crimes, incident response, civil cases, fraud and information security verification. Demonstrations and hands-on investigations familiarize students with a number of relevant investigative techniques

Hour Breakdown:

Semester Credit Hours	Lecture	Lab	Contact Hours
3	2	2	60

Prerequisite: Instructor Approved

Student Learning Outcomes:

1. Formulate and implement organizational computer forensics preparedness policies, as well as determine the necessity for forensic procedures. CompTIA Security+ 4.2, 4.3
2. Identify key aspects related to digital forensics for documentation and acquisition. CompTIA Security+ - 4.5
3. Classify various forms of computer crime/abuse and the relevant evidence. CompTIA Security+ - 5.2
4. Explain laws and risk analysis to computer forensics. CompTIA Security+ 5.4
5. Retrieve and seize digital evidence from computer systems without contamination. CompTIA Security+ 4.1
6. Explain how data can be hidden. CompTIA Security+ 3.2
7. Apply and justify the use of particular forensics tools. CompTIA Security+ 4.1

Standards
CompTIA Security+ 601

Domain 4.0 Operations and Incident Response

Domain 5.0 Governance, Risk and Compliance

Course Number and Name: **CST 2713 IoT Fundamentals**

Description: This course provides an overview of Internet of Things (IoT) technologies. Students will learn how IoT devices are utilized in commercial and residential settings to monitor events, collect data, and automate tasks. Areas of emphasis will include conducting site surveys, reading blueprint drawings, understanding infrastructure requirements, device setup, and maintenance.

Hour Breakdown:

Semester Credit Hours	Lecture	Lab	Contact Hours
3	2	2	60

Prerequisite: Instructor Approved

Student Learning Outcomes

1. Explore Construction Blueprints.
   a. Read and interpret typical blueprints required in the IoT industry.
   b. Read and interpret drawing line types, symbols, and legends used in blueprints.

2. Summarize the properties of a project. CompTIA Project+

3. Explain the purpose of site surveys and gathering customer information. Infocomm Certified Technology Specialist Domain A

4. Draft scope of work documents detailing work procedures Infocomm Certified Technology Specialist Domain A

5. Install and configure IoT devices (security cameras, sensors, and other technology). CompTIA A+, 1101 – Domain 2.3

6. Explain the security implications of embedded and specialized systems. CompTIA Security+, 601 – Domain 2.6

Standards

CompTIA Core 1, 1101 – Domain 2 Networking
CompTIA Security+, 601 – Domain 2 Architecture and Design
CompTIA Project+ 004 – Project Basics
Infocomm Certified Technology Specialist

Course Number and Name: **CST 291(1–3) Special Projects**

Description: Practical application of skills and knowledge gained in computer servicing and technical-related courses. The instructor works closely with the student to ensure that the selection of a project will enhance the student's learning experience.

Hour Breakdown:

Semester Credit Hours	Lecture	Lab	Contact Hours
1		2	30
2		4	60
3		6	90

Prerequisite: Instructor Approved

Student Learning Outcomes:

1. Improve career prospects in the digital-age workplace utilizing effective communication skills.
2. Properly satisfy customer needs while adhering to workplace policy and procedures.
3. Discuss job roles, responsibilities, and showcase character traits required of successful IT Technicians in the workplace.
4. Obtain and utilize professionalism skills (business etiquette, ethics, teamwork, etc.) while in the workplace.
5. Prepare a professional resume and use online job resources to aid in searching for and obtaining a desired employment opportunity.
6. Utilize proper soft-skills to perform well in employment interviews and use proper methods of follow-up to assist in securing a desired occupation.
7. Use technical skills obtained through academic career to perform real world scenarios in relation to IT Technician servicing to further prepare for the world of work

Course Number and Name: **CST 292(1–6) Supervised Work Experience**

Description: Cooperative program between industry and education designed to integrate the student's technical studies with industrial experience.

Hour Breakdown:

Semester Credit Hours	Lecture	Lab	Contact Hours
1		2	30
2		4	60
3		6	90
4		8	120
5		10	150
6		12	180

Prerequisite: Instructor Approved

Student Learning Outcomes:

1. Apply technical skills needed to be a viable member of the workforce.
   a. Prepare a description of technical skills to be developed in the supervised work experience program.
   b. Develop technical skills needed to be a viable member of the workforce.

2. Apply skills developed in other program area courses.
   a. Perform skills developed in other program area courses in the supervised work experience program.

3. Apply human relationship skills.
   a. Practice human relationship skills in the supervised work experience program.

4. Apply and practice positive work habits and responsibilities.
   a. Perform assignments to develop positive work habits and responsibilities.

5. Work with the instructor and employer to develop written occupational objectives to be accomplished.
   a. Perform written occupational objectives in the supervised occupational experience program.

6. Assess accomplishment of objectives.
   a. Prepare daily written assessment of accomplishment of objectives.
   b. Present weekly written reports of activities performed and objectives accomplished to the instructor.

7. Utilize a set of written guidelines for the supervised work experience.
   a. Develop and follow a set of written guidelines for the supervised work experience.
   b. Write and present/report project updates utilizing common formatting guidelines (i.e., APA, MLA, etc).

Appendix A: Recommended Tools and Equipment

CAPITALIZED ITEMS

1. Blade servers for Operating Systems, Server Administration I and II, , and SecurityFundamentals.
    a. Network operating system
    b. Servers
    c. Switches/Routers
    d. Color printer
2. Fault insertion troubleshooting computer w/ monitor, printer, and complete documentation including diagnostic software, schematics, and manufacturer's specifications (1 to 3 students)
3. Analog fault insertion troubleshooting trainer and complete documentation including schematics and manufacturer's specifications (1)
4. Laser printer trainers (1 to 3 students)
5. Apple/Mac trainers (1 to 3 students)
6. Lab for Operating Systems, Networking I, and other related technical electives.
    a. Mobile devices
    b. Laser printer (1 per class with Jet Direct connection)
    c. Color printer (1 per class)
    d. Cabling and connecting equipment for each network
    e. Internet capability
    f. Switch (48 and 96 port), router, rack, and panels (wired and/or wireless)
    g. Console cable
    h. SOHO router/switch
    i. Access point
    j. VoIP phone
    k. Network cable termination equipment for fiber and copper
    l. Multiple termination ends and cable (1 per student)
    m. WiFi analyzer
    n. Cable testers
    o. Cable stripper
    p. Punchdown tool
    q. Wire cutters
    r. Endpoint devices for network connectivity
    s. A/V switches
    t. A/V converters
    u. Video converters/adapters
    v. Webcams
    w. Speakers
    x. Microphones
    y. Soldering Station
    z.
7. Lab for maintenance, tear down, and reassembly
    a. Mobile devices
    b. Multimedia computers with CD-ROM, speakers, sound card. Option to purchase internal modem per need to local lab (30 units per class, 10 to be used as servers)
    c. Laser printer (1 per class with Jet Direct connection)
    d. Color printer (1 per class)
    e. 3-D printer
    f. Thermal printer
    g. Scanner, color page (1 per class)
    h. Cabling and connecting equipment for each network
    i. Internet capability
    j. Switch (48 port and 96 port), router, rack, and panels (wired and/or wireless)
    k. Network hubs

l. Uninterruptible power supply

8. Mobile Trainers
   a. Wireless access points
   b. Security cameras and other devices
   c. Operating systems and applications
9. Computer crime and computer forensics trainers
   a. Monitoring software
   b. Database software
   c. Bio-metric specialized equipment

NON-CAPITALIZED ITEMS

1. Digital multi-meter (1 per student)
2. Fiber switches 48 ports or higher
3. Single mode fiber optic cable
4. Multi-mode fiber optic cable
5. Patch panel
6. Racks, rack mounts
7. Network interface cards (wired and/or wireless) (1 per student)
8. Multi-handset cordless phone system
9. Media devices
10. Logic clip sets, including 14, 16, 18, 24, and 40 pin (1)
11. Integrated circuit puller and inserter (1)
12. Nut driver set (1 per 3 students)

13. Allen wrenches (English and metric) (1 set each)
14. Solder station including iron, holder, and solder sucker (1 per 2 students)
15. Student tool kit:
    A. Screwdriver set
    B. Current probe
    C. IC puller
    D. 3/16-in., 1/4-in. nut driver
    E. Three-claw part holder
    F. T10, T15 rev. torque driver
    G. 1/8-in., 3/16-in., 1/4-in. flat screwdriver
    H. #2, #4 reversible screwdriver
    I. IC inserter, IC extractor
    J. #0, #1 Phillips screwdriver
    K. Solder reel, soldering iron
    L. 4 1/2-in. side cutter
    M. 6-in. adjustable wrench
    N. 5-in. needle-nose pliers
    O. 8-in. wire cutter
    P. Reverse action tweezers
    Q. Spare parts tube
    R. Logic probe
    S. Wire side cutter
    T. Needle-nose pliers
    U. Adjustable wrench (6-in.)
    V. Network tool kits (4)
16. Network testing, monitoring and measurement equipment
17. Safety goggles (1)
18. Wrist strap and static mat (1 per student)
19. Lab work benches (1 per 4 students)
20. Lab work stool (1 per student)
21. High-intensity lamp w/magnifying lens (1 per student)

22. Circuit board vise (1 per work bench)

RECOMMENDED INSTRUCTIONAL AIDS

It is recommended that instructors have access to the following items:

1. Color data/video projector (1 per lab)
2. Interactive board (e.g., SmartBoard, Promethean, Mimio, etc.)
3. SVGA to NTSC video output scan connecter (1 per television)
4. System maintenance/repair tool kit (2 per lab)
5. Multimedia capable laptop (1 per department)
6. 75”, or larger, TV screens (7)
7. DVD player
8. Mobile devices (1 per instructor)
9. CompTIA Instructor Network Account

CompTIA Certmaster Materials

10. Cyber-crime/cyber terrorism handbooks (2)

SUGGESTED RESOURCES

1. Network operating system software – client licenses for Microsoft Windows Server,
2. Linux (no license required)
3. Network-compatible backup software
4. Imaging software (i.e., Symantec Ghost, etc.)
5. Virtual system software (i.e., Virtual PC, VMWare Player, Virtual Box, etc.)
6. Virus Protection software (i.e., Security Essentials, Norton, etc.)
7. Malware protection software (i.e., Super Anti-Spyware, UBCD4Win, Ad-Aware, etc.)
8. Network-compatible word processing software (1 per lab)
9. Network-compatible database management software (1 per lab)
10. Network-compatible spreadsheet software (1 per lab)
11. Network-compatible presentation software (1 per lab)
12. Network-compatible operating system software – MSDNAA is preferred source [More than one operating system will be required for Operating Systems (CST 1333).] (1 per lab)
13. Microcomputer programming languages software (1 per lab)
14. Additional clip art software (1 per lab)
15. Apple iOS software
16. Mac OS X or latest software
17. VMware software
18. Mobile devices (tablet, phone, iPad, iPod)

STUDENT SUPPLIES

1. Cables
2. Connectors
3. Network interface cards
4. RJ45 Crimping Tool
5. RJ45 Plugs
6. Thermal Paste
7. USB Drive
8. Latex gloves (1 box per student)
9. Wrist band and anti-static mat
10. Soldering kit
11. Student tool kit:
    A. Screwdriver set
    B. Current probe
    C. IC puller
    D. 3/16-in., 1/4-in. nut driver
    E. Three-claw part holder
    F. T10, T15 rev. torque driver
    G. 1/8-in., 3/16-in., 1/4-in. flat screwdriver
    H. #2, #4 reversible screwdriver
    I. IC inserter, IC extractor
    J. #0, #1 Phillips screwdriver
    K. Solder reel, Soldering iron
    L. 4 1/2-in. side cutter
    M. 6-in. adjustable wrench
    N. 5-in. needle-nose pliers
    O. 8-in. wire cutter
    P. Reverse-action tweezers
    Q. Spare parts tube
    R. Logic probe
    S. Wire side cutter
    T. Needle-nose pliers
    U. Adjustable wrench (6-in.)

V. Precision tool kits
W. Pry and removal tools
X. Apple iPhone, iPad, iPod, and tablet tool kits
Y. Power testers

Appendix B: Curriculum Definitions and Terms

- Course Name – A common name that will be used by all community colleges in reporting students

- Course Abbreviation – A common abbreviation that will be used by all community and junior colleges in reporting students

- Classification – Courses may be classified as the following:
  - Career Certificate Required Course – A required course for all students completing a career certificate.
  - Technical Certificate Required Course – A required course for all students completing a technical certificate.
  - Technical Elective – Elective courses that are available for colleges to offer to students.

- Description – A short narrative that includes the major purpose(s) of the course

- Prerequisites – A listing of any courses that must be taken prior to or on enrollment in the course

- Corequisites – A listing of courses that may be taken while enrolled in the course

- Student Learning Outcomes – A listing of the student outcomes (major concepts and performances) that will enable students to demonstrate mastery of these competencies

The following guidelines were used in developing the program(s) in this document and should be considered in compiling and revising course syllabi and daily lesson plans at the local level:

- The content of the courses in this document reflects approximately 75% of the time allocated to each course. The remaining 25% of each course should be developed at the local district level and may reflect the following:
  - Additional competencies and objectives within the course related to topics not found in the state framework, including activities related to specific needs of industries in the community college district
  - Activities that develop a higher level of mastery on the existing competencies and suggested objectives
  - Activities and instruction related to new technologies and concepts that were not prevalent at the time the current framework was developed or revised
  - Activities that include integration of academic and career–technical skills and course work, school-to-work transition activities, and articulation of secondary and postsecondary career–technical programs
  - Individualized learning activities, including work-site learning activities, to better prepare individuals in the courses for their chosen occupational areas

- Sequencing of the course within a program is left to the discretion of the local college. Naturally, foundation courses related to topics such as safety, tool and equipment usage, and other fundamental skills should be taught first. Other courses related to specific skill areas and related academics, however, may be sequenced to take advantage of seasonal and climatic conditions, resources located outside of the school, and other factors. Programs that offer an Associate of Applied Science Degree must include all of the required Career Certificate courses, Technical Certificate courses AND a minimum of 15 semester hours of General Education Core Courses. The courses in the General Education Core may be spaced out over the entire length of the program so that students complete some academic and Career Technical courses each semester. Each community college specifies the actual courses that are required to meet the General Education Core Requirements for the Associate of Applied Science Degree at their college.

- In order to provide flexibility within the districts, individual courses within a framework may be customized by doing the following:

  - Adding new student learning outcomes to complement the existing competencies and suggested objectives in the program framework
  - Revising or extending the student learning outcomes
  - Adjusting the semester credit hours of a course to be up 1 hour or down 1 hour (after informing the Mississippi Community College Board [MCCB] of the change)

Appendix C: Course Crosswalk

Course Crosswalk Computer Servicing Technology					
Note: Courses that have been added or changed in the 2015 curriculum are highlighted.					
Existing			**Revised**		
2010 Curriculum			**2015 Curriculum**		
Course Number	**Course Title**	**Hours**	**Course Number**	**Course Title**	**Hours**
CST 1114	Basic Electronics	4	CST 1114	Basic Electronics	4
CST 1123	Basic Computer Hardware	3	CST 1123	Basic IT Hardware	3
CST 1214	Networking I	4	CST 1214	Networking I	4
			CST 1323	Digital Electronics	4
CST 1333	Operating Systems	3	CST 1333	Operating Systems	3
CST 2113	Computer Servicing Lab I	3	CST 2113	IT Servicing Lab I	3
CST 2123	Computer Servicing Lab II	3	CST 2123	IT Servicing Lab II	3
CST 2134	PC Diagnostics and Troubleshooting	4	CST 2134	IT Diagnostics and Troubleshooting	4
CST 2223	Networking II	3	CST 2223	Networking II	3
			CST 1154	Web and Programming Concepts	4
			CST 1713	Server Administration I	3
			CST 1613	Security Fundamentals	3
			CST 1813	Server Administration II	3
			CST 1913	Mobile Device Support I	3
			CST 1923	Mobile Device Support II	3
			CST 2413	Cloud Computing I	3
			CST 2423	Cloud Computing II	3
			CST 2613	Computer Security Threats	3
			CST 2463	Computer Forensics	3
			CST 2913	Special Projects	3

Course Crosswalk
Computer Servicing Technology

Note: Courses that have been added or changed in the 2015 curriculum are highlighted.

Existing			Revised		
2015 Curriculum			2022		
Course Number	**Course Title**	**Hours**	**Course Number**	**Course Title**	**Hours**
CST 1114	Basic Electronics	4	CST 1123	IT Basic Hardware	3
CST 1123	Basic IT Hardware	3	CST 1214	Networking 1	4
CST 1214	Networking I	4	CST 1333	Operating Systems	3
CST 1323	Digital Electronics	4	CST 2113	IT Servicing Lab I	3
CST 1333	Operating Systems	3	CST 2123	IT Servicing lab II	3
CST 2113	IT Servicing Lab I	3	CST 2134	IT Diagnostics and Troubleshooting	4
CST 2123	IT Servicing Lab II	3	CST 2223	Networking II	3
CST 2134	IT Diagnostics and Troubleshooting	4	CST 1713	Server Administration I	3
CST 2223	Networking II	3	CST 1613	Security Fundamentals	3
CST 1154	Web and Programming Concepts	4	CST 1813	Server Administration II	3
CST 1713	Server Administration I	3	CST 1913	Mobile Devices	3
CST 1613	Security Fundamentals	3	CST 2413	Cloud Essentials	3
CST 1813	Server Administration II	3	CST 2423	Cloud Computing	
CST 1913	Mobile Device Support I	3	CST 2613	Security Fundamentals II	3
CST 1923	Mobile Device Support II	3	CST 2463	Computer Forensics	3
CST 2413	Cloud Computing I	3	CST 2913	Special Projects	3
CST 2423	Cloud Computing II	3	CST 2713	IoT Fundamentals	
CST 2613	Computer Security Threats	3			
CST 2463	Computer Forensics	3			
CST 2913	Special Projects	3			

Appendix D: Recommended Computer Servicing Technology Textbook List

Recommended Computer Servicing Technology Text Book List **CIP 47.0108 – Computer Servicing Technology**		
Book Title	**Author (s)**	**ISBN**
The Official CompTIA A+ Core 1 Student Guide (Exam 220-1001) eBook	James Pengelly & Pam Taylor	978-1-64274-220-6
The Official CompTIA A+ Core 2 Student Guide (Exam 220-1002) eBook	James Pengelly & Pam Taylor	978-1-64274-224-4
The Official CompTIA Cloud Essentials+ Student Guide (Exam CLO-002) eBook	Damon Garn	978-1-64274-268-8
The Official CompTIA Cloud+ Student Guide (Exam CV0-003) eBook	Damon Garn	978-1-64274-346-3
The Official CompTIA Network+ Student Guide (Exam N10-008) eBook	James Pengelly	978-1-64274-358-6
The Official CompTIA Security+ Student Guide (Exam SY0-601) eBook	James Pengelly	978-1-64274-328-9
The Official CompTIA Server+ Student Guide (Exam SK0-005) eBook	Damon Garn	978-1-64274-340-1