Computer Repair & Networking

Organization **Washburn Institute of Technology**

Program Number **11.0901**

Instructional Level **Certificate**

Target Population

Grades 11 & 12

Post-secondary

Description

This program prepares students to become proficient computer service professionals and network technicians and pass the following exams: A+ Certification Exams, Microsoft Certified Professional (MCP), CompTIA Network +, CompTIA Security+ and Cisco Certified Network Associate (CCNA).

First year instruction includes micro-computer hardware, Microsoft operating systems, Networking, Linux, Microsoft network operating systems, network security.

Second year instruction incorporates first year topics and prepares students to install, configure, and operate local, wide-area, and multi-layer switched networks.

Entry Requirements

WorkKeys®	Applied Math	Level 5
WorkKeys®	Reading for Information	Level 5

Assessment Plan

Assessment is an integral part of the educational process at Washburn Tech and accurate feedback is an important tool in continuously improving the institution's technical programs. Students can expect to participate in assessment activities prior to entry into programs, within specific courses and following program completion for specific fields of study.

Student Learning Outcomes

A. Communicate effectively.
B. Integrate technology.
C. Learn effectively - use academics effectively.
D. Demonstrate cooperative/teamwork skills.
E. Apply safety.
F. Think critically and creatively.

G. Demonstrate responsible work ethics.

Program Outcomes

A. Identify basic procedures for adding and removing field replaceable modules for both desktop and portable systems.

B. Identify available IRQs, DMAs, and I/O addresses and procedures for device installation and configuration.

C. Identify common peripheral ports, associated cabling, and their connectors.

D. Identify proper procedures for installing and configuring IDE/EIDE devices, proper procedures for installing and configuring SCSI devices, and proper procedures for installing and configuring peripheral devices.

E. Identify hardware methods of upgrading system performance, procedures for replacing basic subsystem components, unique components and when to use them. The student must be able to identify common symptoms and problems associated with each module and how to troubleshoot and isolate the problems.

F. Identify basic troubleshooting procedures and how to elicit problem symptoms from customers and know the various types of preventive maintenance products and procedures and when to use them.

G. Identify issues, procedures, and devices for protection within the computing environment. This includes people, hardware, and the surrounding workspace. Must be able to distinguish between the popular CPU chips in terms of their basic characteristics.

H. Identify the categories of RAM (Random Access Memory) terminology, their locations and physical characteristics. Student must know what the most popular type of motherboards are and their components and architecture (bus structures and power supplies).

I. Identify the purpose of CMOS (Complementary Metal-Oxide Semiconductor), what it contains, and how to change its basic parameters. Be able to identify basic concepts, printer operations, and printer components.

J. Identify care and service techniques and common problems with primary printer types. Student must also be able to identify basic networking concepts, including how a network works and the ramifications of repairs on the network.

K. Identify the major desktop components and interfaces, and their functions. Differentiate the characteristics of Windows XP/Vista/7 and Linux. Identify the names, locations, purposes, and contents of major system files.

L. Demonstrate the ability to use command-line functions and utilities to manage the operating system, including the proper syntax and switches. Identify basic concepts and procedures for creating, viewing, and managing disks, directories, and files. This includes procedures for changing file attributes.

M. Plan and install a small wired and wireless network connecting to the Internet.

N. Recognize and mitigate security threats to a computer network.

O. Install, configure, and troubleshoot Cisco IOS devices.

P. Configure a server to provide common Web services.

Q. Configure a switch with VLANs and multi-layer switch communication.

R. Implement WAN links.

S. Using the OSI model, perform LAN, WAN, and VLAN troubleshooting.

T. Design an IP addressing scheme to meet LAN requirements.

U. Write and present in a technical manner.

V. Perform customer service in a professional and courteous manner.

W. Identify professional resources and levels of professional certification.

Course #	Course Title	Credit Hours	Required
CRN115	PC Hardware Fundamentals	4	Yes
CRN125	PC Troubleshooting & Maintenance	4	Yes
CRN135	PC Software Fundamentals	4	Yes
CRN170	Fundamentals of Computer Networking	3	Yes
CRN155	Network Operating Systems I	3	Yes
CRN165	Network Operating Systems II	3	Yes
CRN150	Fundamentals of Network Security	3	Yes
CRN220	CCNA I	2	Yes
CRN225	CCNA I Lab	3	Yes
CRN230	CCNA II	2	Yes
CRN235	CCNA II Lab	3	Yes
CRN240	Workplace Skills I	2	Yes
CRN243	Enterprise Networking	2	Yes
CRN248	Enterprise Networking Lab	3	Yes
CRN253	Network Technology Application	2	Yes
CRN258	Network Technology Application Lab	3	Yes
CRN265	Workplace Skills II	2	Yes
CRN270	Computer Repair OJT (optional)	3	No

Program Course Descriptions

CRN115 PC Hardware Fundamentals (4 credits)

PC Hardware Fundamentals provides an introduction to the computer hardware skills needed to help meet the requirement for entry-level information and communication technology professionals. The curriculum covers the fundamentals of PC hardware technology, networking, laptop, and printer, operational procedures, and also provides an introduction to advanced concepts in ever growing Computer Technology. Students who complete this course will be able to describe the internal components of a computer, assemble a computer system, install an operating system, and troubleshoot using system tools and diagnostic software. Hands-on labs help students develop critical thinking and complex problem-solving skills.

CRN125 PC Troubleshooting & Maintenance (4 credits)

PC Troubleshooting & Maintenance provides an introduction to the computer hardware skills needed to help meet the requirement for entry-level information and communication technology professionals. The curriculum covers the fundamentals of PC hardware and software troubleshooting and maintenance.

Students who complete this course will be able to describe the internal components of a computer, assemble a computer system, install an operating system, and troubleshoot using system tools and diagnostic software. Hands-on labs help students develop critical thinking and complex problem-solving skills.

CRN135 PC Software Fundamentals (4 credits)

PC Software provides a comprehensive overview of the computer operating system and introduction to advanced concepts. Students who complete this course will be able to install and trouble shoot an operating system using system tools and diagnostic software. Practical application will include connecting computers to the Internet and share resources in a networked environment.

CRN170 Fundamentals of Computer Networking (3 credits)

This course first introduces the fundamental building blocks that form a modern network, such as protocols, topologies, hardware, and network operating systems. It then provides in-depth coverage of the most important concepts in contemporary networking, such as TCP/IP, Ethernet, wireless transmission, and security. The course will prepare you to select the best network design, hardware, and software for your environment. You will also have the skills to build a network from scratch and maintain, upgrade, and troubleshoot an existing network.

CRN155 Network Operating Systems I (3 credits)

This course introduces students to a broad range of Network Operating System (NOS) concepts, including installation and maintenance. The course focus is on Microsoft Windows 2008/2012 operating system concepts, management, maintenance, and the required resources.

CRN165 Network Operating Systems II (3 credits)

This course introduces students to a broad range of Network Operating System (NOS) concepts, including installation and maintenance. The course focus is on Linux Network Operating System concepts, management, maintenance, and the required resources.

CRN150 Fundamentals of Network Security (3 credits)

This course is targeted toward an Information Technology (IT) professional who has networking and administrative skills in Windows-based TCP/IP networks and familiarity with operating systems and who wants to further a career in IT by acquiring a foundational knowledge of security topics.

CRN220 CCNA I (2 credits)

These concurrent courses introduce the architecture, structure, functions, components, and models of the Internet and other computer networks. The principles and structure of IP addressing and the fundamentals of Ethernet concepts, media, and operations are introduced to provide a foundation for the curriculum. By the end of these courses, students will be able to build simple LANs, perform basic configurations for routers and switches, and implement IP addressing schemes.
Prerequisite: Successful complete of Year 1, Comptia A+ and Microsoft Technology Associate certification, or instructor consent.

CRN225 CCNA I Lab (3 credits)

These concurrent courses introduce the architecture, structure, functions, components, and models of the Internet and other computer networks. The principles and structure of IP addressing and the fundamentals of Ethernet concepts, media, and operations are introduced to provide a foundation for the curriculum. By

the end of these courses, students will be able to build simple LANs, perform basic configurations for routers and switches, and implement IP addressing schemes.
Prerequisite: Successful complete of Year 1, Comptia A+ and Microsoft Technology Associate certification, or instructor consent.

CRN230 CCNA II (2 credits)

These concurrent courses describe the architecture, components, and operations of routers and switches in a small network. Students learn how to configure a router and a switch for basic functionality. By the end of this course, students will be able to configure and troubleshoot routers and switches and resolve common issues with RIPv1, RIPng, single-area and multi-area OSPF, virtual LANs, and inter-VLAN routing in both IPv4 and IPv6 networks. Prerequisite: Successful completion of CCNA I and CCNA I Lab.

CRN235 CCNA II Lab (3 credits)

These concurrent courses describe the architecture, components, and operations of routers and switches in a small network. Students learn how to configure a router and a switch for basic functionality. By the end of this course, students will be able to configure and troubleshoot routers and switches and resolve common issues with RIPv1, RIPng, single-area and multi-area OSPF, virtual LANs, and inter-VLAN routing in both IPv4 and IPv6 networks. Prerequisite: Successful completion of CCNA I and CCNA I Lab.

CRN240 Workplace Skills I (2 credits)

This course prepares students to write and present documents often found in technical settings. Students will create technical summary documents, sets of instructions, technical illustrations, and technical presentations. Students will develop and enhance appropriate workplace appearance and behavior. Prerequisite: Concurrent enrollment in CCNA I and CCNA II.

CRN243 Enterprise Networking (2 credits)

These concurrent courses describe 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. By the end of this course, students will be able to configure and troubleshoot routers and switches and resolve common issues with OSPF, EIGRP, and STP in both IPv4 and IPv6 networks. Students will also develop the knowledge and skills needed to implement a WLAN in a small-to-medium network. Prerequisite: Successful completion of CCNA II and CCNA II Lab, or CCENT certification.

CRN248 Enterprise Networking Lab (3 credits)

These concurrent courses describe 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. By the end of this course, students will be able to configure and troubleshoot routers and switches and resolve common issues with OSPF, EIGRP, and STP in both IPv4 and IPv6 networks. Students will also develop the knowledge and skills needed to implement a WLAN in a small-to-medium network. Prerequisite: Successful completion of CCNA II and CCNA II Lab, or CCENT certification.

CRN253 Network Technology Application (2 credits)

These concurrent courses discuss the WAN technologies and network services required by converged applications in a complex network. The courses enable students to understand the selection criteria of network devices and WAN technologies to meet network requirements. Students learn how to configure and troubleshoot network devices and resolve common issues with data link protocols. Students will also develop the knowledge and skills needed to implement virtual private network (VPN) operations in a complex network. Prerequisite: Successful completion of Enterprise Networking and Enterprise Networking Lab.

CRN258 Network Technology Application (3 credits)

These concurrent courses discuss the WAN technologies and network services required by converged applications in a complex network. The courses enable students to understand the selection criteria of network devices and WAN technologies to meet network requirements. Students learn how to configure and troubleshoot network devices and resolve common issues with data link protocols. Students will also develop the knowledge and skills needed to implement virtual private network (VPN) operations in a complex network. Prerequisite: Successful completion of Enterprise Networking and Enterprise Networking Lab.

CRN265 Workplace Skills II (2 credits)

This course prepares students for the documents and skills needed to enter the competitive technical field job market. Students will create and enhance their cover letter and résumé. Interview techniques and job application skills will be developed. Students will learn to identify available professional resources and levels of professional certification. Students will develop and enhance appropriate workplace appearance and behavior. Prerequisite: Concurrent enrollment in CCNA III and CCNA IV.

CRN270 Computer Repair OJT (optional) (3 credits)

TBD

ADA Notification Statement and Disability Services:

The Testing/ADA Coordinator office is responsible for assisting in arranging accommodations and for identifying resources at Washburn Tech for persons with disabilities. Qualified students with disabilities MUST register and provide documentation with the office to be eligible for services. New requests for accommodations should be submitted two months or more prior to the date services should begin by contacting the Testing/ADA Coordinator's office as soon as a need may arise. Depending on the accommodation request, four to eight weeks lead time may be needed for timely and effective provision of services. Testing/ADA Coordinator coordinates and assists in arranging services it deems appropriate for eligible students on a case-by-case basis. If you are a student with a disability that may substantially limit your ability to participate in this class and believe you will need accommodations, it is your responsibility to contact:

Gloria Christian
Testing/ADA Coordinator
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