Computer Courses

Taught by Mr. John Murtha

Detailed information about each of these courses follows this introduction page.

I run all courses as self-directed courses where I will communicate with students via email, chat, or live video conference (e.g. Skype) when needed. There is no set class time as courses are self-paced. I provide students with detailed semester and linear timelines for each course.

Types of assignment include (dependent on the course): worksheets, lab work, chapter exams, skill exams, midterm and final exams.

Hardware/Software – See course details below for this information.

**ONLINE COURSES**

**List of online courses supplemented by me. These courses are 110 hours each.**

PC Repair courses:

**IT Essentials** (CompTIA A+ certification)

Networking Courses:

**Introduction to Networks** (Cisco CCNET certification)

**Routing and Switching Essentials** (Cisco CCNET certification)

**Scaling Networks** (Cisco CCNA certification)

**Connecting Networks** (Cisco CCNA certification)

Linux Operating System courses:

**Linux Essentials** (Pre-training before taking a Linux certification course)

**BOOK-BASED COURSES**

**List of book-based courses offered by me. Student will have to purchase the books.**

**These courses are 110 hours each.**

Video Game Design courses:

**Video Game Design - Fundamentals** (2 books)

**Video Game Design - Composition** (2 books)

**Course details provided below …………….**

**Cisco PC Repair Course**

**Course Name**: IT Essentials (PC Repair) - approximately 110 hours.

**Level**: Grade 10 and higher or a very strong grade 9 student.

**Lab Hardware/Software Student need**: Two computers: (1) a PC computer to take apart and rebuild (should be non-working) and (2) a working computer for configuring; a copy of one of the following Operating Systems: (Windows Vista, 7, 8, or 10).

Course Description

IT Essentials covers fundamental computer and career skills for entry-level IT jobs. The IT Essentials curriculum includes hands-on labs that provide practical experience. Virtual tools help you hone your troubleshooting skills and practice what you learn. The course also provides a learning pathway to Cisco CCNA.

Curriculum Objectives

The primary objective of this course is to help students prepare for entry-level IT positions in a variety of working environments. Students gain confidence with the components of desktop and laptop computers by learning the proper procedures for hardware and software installations, upgrades, and troubleshooting.

By the end of the course, students will be able to complete the following objectives:

* Define information technology (IT) and describe the components of a personal computer.
* Describe how to protect people and equipment from accidents, damage, and contamination.
* Perform a step-by-step assembly of a desktop computer.
* Explain the purpose of preventive maintenance and identify the elements of the troubleshooting process.
* Install and navigate an operating system.
* Configure computers to connect to an existing network.
* Upgrade or replace components of a laptop based on customer needs.
* Describe the features and characteristics of mobile devices.
* Install and share a printer.
* Implement basic physical and software security principles.
* Apply good communications skills and professional behavior while working with customers.
* Perform preventive maintenance and advanced troubleshooting.
* Assess customer needs and provide solutions or recommendations.

Career Pathways

IT Essentials is ideal for students seeking entry-level IT positions in companies, government agencies, educational institutions, or service providers, or to work for themselves.

Job titles include - Help Desk Technician, IT Support Technician, Field Service Technician, Support Engineer, Network Support Technician, Network Support Engineer, and more.

Industry certification

Helps prepare for CompTIA A+ certification exam(s).

**Cisco CCNA Networking Courses**

The CCNA Routing and Switching curriculum consists of four courses. IT Essentials is the prerequisite for the first CCNA course. Each course must be taken in sequence.

**Course Name: Introduction to Networks** (Cisco CCNET) - approximately 110 hours.

**Level**: Grade 10 or higher and taken IT Essentials.

**Lab Hardware/Software Student need**: All software supplied by the teacher, no extra hardware required.

Course Description

Introduction to Networks is the first course in the Cisco CCNA Routing and Switching curriculum, and it teaches students the architecture, structure, functions and components of the Internet and other computer networks. By the end of the course, students will be able to build simple LANs, perform basic configurations for routers and switches, and implement IP addressing schemes.

Curriculum Objectives

Students who complete Introduction to Networks will be able to perform the following functions:

* Understand and describe the devices and services used to support communications in data networks and

the Internet

* Understand and describe the role of protocol layers in data networks
* Understand and describe the importance of addressing and naming schemes at various layers of data

networks in IPv4 and IPv6 environments

* Design, calculate, and apply subnet masks and addresses to fulfill given requirements in IPv4 and IPv6

networks

* Explain fundamental Ethernet concepts, such as media, services, and operations
* Build a simple Ethernet network using routers and switches
* Use Cisco command-line interface (CLI) commands to perform basic router and switch configurations
* Utilize common network utilities to verify small network operations and analyze data traffic

Career Pathways

CCNA Routing and Switching curriculum builds the skills you need to get hired and succeed in jobs related to networking computers, devices, and things. Whether you go for that first job or specialize with more study, CCNA is a great foundation.

[Career pathways](https://www.netacad.com/careers/pathways/) include: network technician, support engineer, network administrator, network designer, network engineer, and more.

Industry certification

Helps prepare for Cisco CCNA certification exam(s).

**Course Name: Routing and Switching Essentials** (Cisco CCNET) - approximately 110 hours.

**Level**: Grade 11 or higher and taken Introduction to Networks (Cisco CCNA).

**Lab Hardware/Software Student need**: All software supplied by the teacher, no extra hardware required.

Course Description

Routing and Switching Essentials is the second course in the CCNA Routing and Switching curriculum teaching students 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.

Curriculum Objectives

Students who complete the Routing and Switching Essentials course will be able to perform the following functions:

* Understand and describe basic switching concepts and the operation of Cisco switches
* Understand and describe the purpose, nature, and operations of a router, routing tables, and the route lookup process
* Understand and describe how VLANs create logically separate networks and how routing occurs between them
* Understand and describe dynamic routing protocols, distance vector routing protocols, and link-state routing protocols
* Configure and troubleshoot static routing and default routing (RIP and RIPng)
* Configure and troubleshoot an Open Shortest Path First (OSPF) network
* Understand, configure, and troubleshoot access control lists (ACLs) for IPv4 and IPv6 networks
* Understand, configure, and troubleshoot Dynamic Host Configuration Protocol (DHCP) for IPv4 and IPv6 networks
* Understand, configure, and troubleshoot Network Address Translation (NAT) operations

Career Pathways

CCNA Routing and Switching curriculum builds the skills you need to get hired and succeed in jobs related to networking computers, devices, and things. Whether you go for that first job or specialize with more study, CCNA is a great foundation.

[Career pathways](https://www.netacad.com/careers/pathways/) include: network technician, support engineer, network administrator, network designer, network engineer, and more.

Industry certification

Helps prepare for Cisco CCNA certification exam(s).

**Course Name: Scaling Networks** (Cisco CCNA) - approximately 110 hours.

**Level**: Grade 11 or higher and taken Routing and Switching Essentials (Cisco CCNA).

**Lab Hardware/Software Student need**: All software supplied by the teacher, no extra hardware required.

Course Description

Scaling Networks is the third course in the CCNA Routing and Switching curriculum teaching students 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.

Curriculum Objectives

Students who complete the Scaling Networks course will be able to perform the following functions:

* Understand, configure and troubleshoot enhanced switching technologies such as VLANs, Rapid Spanning Tree Protocol (RSTP), Per VLAN Spanning Tree Plus Protocol (PVST+), and EtherChannel
* Understand, configure, and troubleshoot first hop redundancy protocols (HSRP) in a switched network
* Understand, configure, and troubleshoot wireless routers and wireless clients
* Configure and troubleshoot routers in a complex routed IPv4 or IPv6 network using single-area OSPF, multiarea OSPF, and Enhanced Interior Gateway Routing Protocol (EIGRP)
* Manage Cisco IOS® Software licensing and configuration files

Career Pathways

CCNA Routing and Switching curriculum builds the skills you need to get hired and succeed in jobs related to networking computers, devices, and things. Whether you go for that first job or specialize with more study, CCNA is a great foundation.

[Career pathways](https://www.netacad.com/careers/pathways/) include: network technician, support engineer, network administrator, network designer, network engineer, and more.

Industry certification

Helps prepare for Cisco CCNA certification exam(s).

**Course Name: Connecting Networks** (Cisco CCNA) - approximately 110 hours.

**Level**: Grade 11 or higher and taken Scaling Networks (Cisco CCNA).

**Lab Hardware/Software Student need**: All software supplied by the teacher, no extra hardware required.

Course Description

Connecting Networks is the fourth and final course in the CCNA Routing and Switching curriculum covering the WAN technologies and network services employed by converged applications in a complex network.  By the end of this course, students will be able to configure and troubleshoot network devices and resolve common issues with data link protocols.

Curriculum Objectives

Students who complete the Connecting Networks course will be able to perform the following functions:

* Understand and describe different WAN technologies and their benefits
* Understand and describe the operations and benefits of virtual private networks (VPNs) and tunneling
* Understand, configure, and troubleshoot serial connections
* Understand, configure, and troubleshoot broadband connections
* Understand, configure, and troubleshoot tunneling operations
* Understand, configure, and troubleshoot Network Address Translation (NAT) operations
* Monitor and troubleshoot network operations using syslog, SNMP, and NetFlow
* Understand and describe network architectures:
  + Borderless networks
  + Data centers and virtualization
  + Collaboration technology and solutions

Career Pathways

CCNA Routing and Switching curriculum builds the skills you need to get hired and succeed in jobs related to networking computers, devices, and things. Whether you go for that first job or specialize with more study, CCNA is a great foundation.

[Career pathways](https://www.netacad.com/careers/pathways/) include: network technician, support engineer, network administrator, network designer, network engineer, and more.

Industry certification

Helps prepare for Cisco CCNA certification exam(s).

**Linux Operating System Course**

**Course Name: Linux Essentials** - approximately 110 hours.

**Level**: Grade 10 or higher and taken IT Essentials.

**Lab Hardware/Software Student need**: All software supplied by the teacher, no extra hardware required.

Course Description

Knowledge of Linux is a helpful skill for a wide variety of careers in business and Information Technology fields. Many emerging and growing career opportunities including big data, cloud computing, cyber security, information systems, networking, programming and software development (to name a few) require basic to advanced knowledge of the Linux command line.

Curriculum Objectives

This course covers the fundamentals of the Linux operating system and command line. The goal of this course is to provide students a “starting place” for learning the Linux operating system. By the end of the course, students will be able to complete the following objectives:

* Understand Linux as an operating system
* Explain some of the considerations for choosing an operating system
* Understand some of the basics of open source software and licensing
* Acquire basic knowledge of working with Linux
* Learn basic Linux command line skills
* Learn how to use help commands and navigate help systems when using Linux
* Basics of how to work with Linux files and directories
* Searching and extracting data from Linux files
* Basic understanding of the concept of scripting
* Familiarity with the components of desktop and server computers
* Knowing where data is stored on a Linux system
* Querying vital network settings for a Linux computer on a Local Area Network
* Identifying various types of users on a Linux system
* Creating users and groups on a Linux system
* Managing Linux file permissions and ownership
* Understanding special Linux directories and files

Career Pathways

Knowledge of Linux is an important differentiator for business and IT professionals interested in big data, cloud computing, cybersecurity, information systems, networking, programming, software development, and more.

[Career pathways](https://www.netacad.com/careers/pathways/) include: network engineer, software developer, and Linux administrator

Industry certification

Not associated with any certification exams.

**Video Game Design Courses**

**Course Name: Video Game Design – Fundamentals** - approximately 110 hours.

**Level**: Grade 9 or higher.

**Lab Hardware/Software Student need**: All software supplied by the teacher, no extra hardware required.

Course Description

Lessons provide a top-level overview of the video game design process, from the beginning of the game build to the sales and marketing of the final product. This course takes any student from novice to advanced skills and knowledge.

Curriculum Objectives

Students who complete the Video Game Design – Fundamentals course will be able to perform the following functions:

* Describe the roles and responsibilities of team members on a video game design team
* Describe, classify, and categorize the different gaming genres
* Discuss how video games affect behavior, cognitive development, and motor skills
* Compare and contrast perspective, scene design, and basic animation
* Build applied mathematics logic statements
* Understand, configure, and troubleshoot Network Address Translation (NAT) operations
* Describe the techniques used in industry to evaluate games
* Describe and create a development plan for a video game design
* Describe how video games are marketed and sold
* Data centers and virtualization

Career Pathways

Video Game Design - Fundamentals curriculum builds the skills you need to be a member of the production team that make up the video game design profession. When you go for more study, this course is a great foundation.

Industry certification

NA

*Prerequisite: None*

**Course Name: Video Game Design – Composition** - approximately 110 hours.

**Level**: Grade 9 or higher and taken Video Game Design - Fundamentals.

**Lab Hardware/Software Student need**: All software supplied by the teacher, no extra hardware required.

Course Description

Delivers in-depth instruction, including theory and application, on the details of video game design. Each chapter acts as a building block that supports the next skill learned. This allows students to learn the objective of each lesson, practice the corresponding skill, and lay the foundation on which to acquire the next skill set.

Curriculum Objectives

Students who complete the Video Game Design – Composition course will be able to perform the following functions:

* Explain what is meant by the scope, or life cycle, of a video game
* Develop character descriptions
* Develop a comprehensive story outline for a video game
* Design a basic HUD for a video game
* Detail the elements needed to create audience-appropriate engagement
* Evaluate the five key mechanics of a strategy game
* Develop game programming using qualifiers
* Incorporate sounds into a video game
* Apply various artistic techniques to create the perception of depth in artwork
* Compare and contrast raster images and vector images
* Create pose-to-pose animations for game assets
* Summarize the ways in which physics applies to video games
* Describe the components and identify the classifications of a simulation

Career Pathways

Video Game Design – Composition curriculum builds the skills you need to be a member of the production team that make up the video game design profession. It is the first step in being hired and succeeding in jobs related to video game design.

Industry certification

NA

*Prerequisite: Video Game Design Fundamentals*

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How each course is bundled with 4 or 5 CTS Modules:

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| CTS Bundles |
| [IT Essentials](#ITEssentialsB) |
| NET2020 - Workstation Technology and Operations |
| NET2030 - Network Structures |
| NET2080 - Laptops and Peripherals |
| NET2110 - Telecommunications |
| NET1910 - Project A for Cap Stone Project OR INF3010 Hardware and Software Analysis |
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| [CCNA Intro to Networking](#CCNADics1) |
| NET2040 - Network Media and Devices |
| NET2050 - Open System Interconnection |
| NET2060 - Network Protocols |
| NET3100 - Network Media & Device Security |
| NET2920 – Project B for Cap Stone Project |
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| [CCNA Routing and Switching Essentials](#CCNARoutSwitch) |
| |  | | --- | | NET2070 - Local Area Networks | |
| |  | | --- | | NET3060 - Wide Area Networks | |
| NET2920 - Project C to help cover course content |
| |  | | --- | | NET2930 - Project D to help cover course content | |
| NET - Project for Cap Stone Project |
|  |
| [Scaling Networks](#CCNAScalingNetworks) |
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| NET3070 - Routing Fundamentals |
| NET3090 - Network Management |
| NET3910 - Project D to help cover course content |
| NET3920 - Project E to help cover course content |
| NET Project for Cap Stone Project |
|  |
| [Connecting Networks](#CCNAConnectingNetworks) |
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| NET3080 - Internet Processes |
| NET3110 - Telecommunications 2 |
| NET Project to help cover course content |
| NET Project to help cover course content |
| NET Project for Cap Stone Project |
|  |
| [Introduction to Video Game Design](#FundamentalsVideoGameDesign) |
|  |
| COM1005 - Visual Composition |
| COM1015 - Media |
| COM1145 - Animation 1 |
| COM2145 - Animation 2 |
| COM1910 - COM Project A in place of INF1070 Digital Presentation |
|  |
| [Composition of a Video Game Design](#CompositionVideoGameDesign) |
|  |
| COM1035 - Graphic Tools |
| COM2035 - Raster Graphics 1 |
| COM3145 - Animation 3 |
| DES1020 - The Design Process |
| DES1030 - 2-D Design |
|  |
| [Linux - Network Operating Systems](#LinuxNOS) |
| NET3050 - Network Operating Systems |
| NET Project to help cover course content |
| NET Project to help cover course content |
| NET Project for Cap Stone Project |