

ITT Technical Institute
NT2715
**Advanced Computer Maintenance,
Troubleshooting, and Repair**
Onsite and Online Course

SYLLABUS

Credit hours: 4.5

Contact/Instructional hours: 56 (34 Theory Hours, 22 Lab Hours)

Prerequisite(s) and/or Corequisite(s):

Prerequisite: NT1110 Computer Structure and Logic or equivalent or IT1115

Introduction to Information Technology or equivalent

Course Description:

This course is an intensive study of PC hardware and software including physical devices, BIOS, operating systems, and applications. Instruction will include installation, configuration, troubleshooting, and repairing software and hardware implementations.

This course examines the concepts found in the CompTIA A+ certification exam.



COURSE SUMMARY

COURSE DESCRIPTION

This course is an intensive study of PC hardware and software including physical devices, BIOS, operating systems, and applications. Instruction will include installation, configuration, troubleshooting, and repairing software and hardware implementations. This course examines the concepts found in the CompTIA A+ certification exam.

MAJOR INSTRUCTIONAL AREAS

1. Basic Computer Terms
2. Computer Repair
3. Motherboard Components
4. Configuration Changes
5. Computer Upgrades
6. Troubleshooting
7. Memory Installation
8. Multimedia Devices
9. Printers
10. Operating Systems
11. Modems
12. Computer Security

COURSE LEARNING OBJECTIVES

By the end of this course, you should be able to:

1. Identify hardware parts that connect to different ports of a computer.
2. Explain the various motherboard technologies and identify important motherboard parts.
3. Make configuration changes to a computer.
4. Assemble and disassemble a computer, make basic voltage and continuity checks, and replace a power supply.
5. Perform basic troubleshooting.
6. Plan for a memory installation or upgrade.

7. Install, configure, and troubleshoot optical drives, sound, scanners, and digital cameras.
8. Explain how various printer types operate and solve common printer problems.
9. Select components best suited for a particular computing task.
10. Install, configure, and troubleshoot Windows, Android, and iOS operating systems.
11. Set up wired and wireless networks.
12. Use appropriate prevention methods for data protection.
13. Explain the impacts and purpose of environmental control best suited for a computing task.

COURSE OUTLINE

MODULE 1: PC AND LAPTOP ANATOMY

COURSE LEARNING OBJECTIVES COVERED

- Identify hardware parts that connect to different ports of a computer and laptop.
- Explain the various motherboard technologies and identify important motherboard parts.

TOPICS COVERED

- The Essentials of a Computer
- Computer and Its Components
- Laptop Expansion Options

MODULE LEARNING ACTIVITIES	GRADED	OUT-OF-CLASS TIME
Reading: Review Soper & Prowse, Chapters 1, 2, and 9.	No	6 hr
Lesson: Study the lesson for this module.	No	2 hr
Multimedia: Watch the videos titled “Ports, Connectors, and Components” and “Input Devices” available with the lab simulator.	No	1 hr
Lab 1: Complete the lab titled “Identifying the Peripherals.”	Yes	N/A
Lab 2: Complete the lab titled “Managing External Devices.”	Yes	N/A
Quiz: Prepare for Quiz 1.	No	2 hr

Total Out-Of-Class Activities: 11 Hours

MODULE 2: MOTHERBOARDS AND STORAGE DEVICES

COURSE LEARNING OBJECTIVES COVERED

- Identify hardware parts that connect to different ports of a computer and laptop.
- Explain the various motherboard technologies and identify important motherboard parts.
- Make configuration changes to a computer.
- Plan for a memory installation or upgrade.
- Install, configure, and troubleshoot optical drives, sound, scanners, and digital cameras.
- Explain how various printer types operate and solve common printer problems.
- Select components best suited for a particular computing task.

TOPICS COVERED

- Understanding BIOS and RAM
- Printer Basics
- Video Cards and Display Settings
- Troubleshooting Optical Drives

MODULE LEARNING ACTIVITIES	GRADED	OUT-OF-CLASS TIME
Reading: Review Soper & Prowse, Chapters 3, 5, 7, 11, and 12.	No	15 hr
Lesson: Study the lesson for this module.	No	2 hr
Multimedia: Watch the videos titled “Hardware: Firmware-BIOS”, “Hardware: Firmware-CMOS,” “Printer Hardware,” and “Configuration Devices and Printers in Windows 7” available with the lab simulator.	No	1.5 hr
Quiz: Take Quiz 1.	Yes	N/A
Lab 1: Complete the lab titled “Printer Maintenance and RAID Configuration.”	Yes	N/A
Lab 2: Complete the lab titled “Memory and CMOS Settings.”	Yes	N/A
Lab 3: Complete the lab titled “Visual Display Settings.”	Yes	N/A
Quiz: Prepare for Quiz 2.	No	2 hr

Total Out-Of-Class Activities: 20.5 Hours

MODULE 3: OPERATING SYSTEMS

COURSE LEARNING OBJECTIVES COVERED

- Make configuration changes to a computer.
- Perform basic troubleshooting.
- Install, configure, and troubleshoot Windows, Android, and iOS operating systems.
- Explain the impacts and purpose of environmental control best suited for a computing task.

TOPICS COVERED

- Understanding and Configuring Mobile Operating Systems
- Understanding and Configuring Windows Operating Systems
- Configuring Mobile WiFi and Windows Networks

MODULE LEARNING ACTIVITIES	GRADED	OUT-OF-CLASS TIME
Reading: Review Soper & Prowse, Chapters 13, 14, and 16.	No	14 hr
Reading: Read Soper & Prowse, Chapter 10.	No	3 hr
Lesson: Study the lesson for this module.	No	2.5 hr
Multimedia: Watch all the videos listed under the heading “Windows 7” available with the lab simulator.	No	2.5 hr
Quiz: Take Quiz 2.	Yes	N/A
Lab 1: Complete the lab titled “Installing an Operating System on a PC.”	Yes	N/A
Lab 2: Complete the lab titled “Working with a Mobile Operating System.”	Yes	N/A
Quiz: Prepare for Quiz 3.	No	2 hr

Total Out-Of-Class Activities: 24 Hours

MODULE 4: NETWORKING CONCEPTS AND OPERATIONAL PROCEDURES

COURSE LEARNING OBJECTIVES COVERED

- Identify hardware parts that connect to different ports of a computer and laptop.
- Make configuration changes to a computer.
- Perform basic troubleshooting.
- Select components best suited for a particular computing task.
- Install, configure, and troubleshoot Windows, Android, and iOS operating systems.
- Set up wired and wireless networks.

TOPICS COVERED

- Understanding Networking and Wireless Fundamentals
- Network Cabling and Connectors
- Understanding Operational Procedures and Communication Methods

MODULE LEARNING ACTIVITIES	GRADED	OUT-OF-CLASS TIME
Reading: Review Soper & Prowse, Chapter 16.	No	7 hr
Reading: Read Soper & Prowse, Chapter 18.	No	9 hr
Lesson: Study the lesson for this module.	No	2.5 hr
Quiz: Take Quiz 3.	Yes	N/A
Lab 1: Complete the lab titled “Working with Network Cables.”	Yes	N/A
Lab 2: Complete the lab titled “Operational Procedures.”	Yes	N/A
Exam: Prepare for Exam 1.	No	5 hr
Exam: Take Exam 1.	Yes	N/A
Quiz: Prepare for Quiz 4.	No	2 hr

Total Out-Of-Class Activities: 25.5 Hours

MODULE 5: PREVENTIVE MAINTENANCE AND SECURITY

COURSE LEARNING OBJECTIVES COVERED

- Assemble and disassemble a computer, make basic voltage and continuity checks, and replace a power supply.
- Perform basic troubleshooting.
- Explain how various printer types operate and solve common printer problems.
- Explain the impacts and purpose of environmental control best suited for a computing task.

TOPICS COVERED

- Power and Computer Cooling Systems
- Computer Security Basics
- Computer and System Troubleshooting

MODULE LEARNING ACTIVITIES	GRADED	OUT-OF-CLASS TIME
Reading: Review Soper & Prowse, Chapters 4, 15, and 17.	No	17 hr
Lesson: Study the lesson for this module.	No	2.5 hr
Quiz: Take Quiz 4.	Yes	N/A
Lab 1: Complete the lab titled “Checking Power Supply Voltages.”	Yes	N/A
Lab 2: Complete the lab titled “Security Settings.”	Yes	N/A
Exam: Prepare for Exam 2.	No	5 hr

Total Out-Of-Class Activities: 24.5 Hours

MODULE 6: REVISION AND FINAL EXAM

COURSE LEARNING OBJECTIVES COVERED

- Identify hardware parts that connect to different ports of a computer and laptop.
- Explain the various motherboard technologies and identify important motherboard parts.
- Make configuration changes to a computer.
- Assemble and disassemble a computer, make basic voltage and continuity checks, and replace a power supply.
- Perform basic troubleshooting.
- Plan for a memory installation or upgrade.
- Install, configure, and troubleshoot optical drives, sound, scanners, and digital cameras.
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- Select components best suited for a particular computing task.
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- Explain the impacts and purpose of environmental control best suited for a computing task.

TOPICS COVERED

- Review
- Certification Exam Tips and Tricks
- Final Exam Preparation

MODULE LEARNING ACTIVITIES	GRADED	OUT-OF-CLASS TIME
Lesson: Study the lesson for this module.	No	3 hr
Exam: Take Exam 2.	Yes	N/A
Final Exam: Prepare for the final exam.	No	5 hr
Final Exam: Take the final exam.	Yes	N/A

Total Out-Of-Class Activities: 8 Hours

EVALUATION AND GRADING

EVALUATION CRITERIA

The graded assignments will be evaluated using the following weighted categories:

CATEGORY	WEIGHT
Quiz	20%
Lab	30%
Exam	25%
Final Exam	25%
TOTAL	100%

GRADE CONVERSION

The final grades will be calculated from the percentages earned in the course, as follows:

GRADE	PERCENTAGE
A (4.0)	90–100%
B+ (3.5)	85–89%
B (3.0)	80–84%
C+ (2.5)	75–79%
C (2.0)	70–74%
D+ (1.5)	65–69%
D (1.0)	60–64%
F (0.0)	<60%

LEARNING MATERIALS AND REFERENCES

REQUIRED RESOURCES

COMPLETE TEXTBOOK PACKAGE

Soper, E. M., & Prowse, L. D. (2013). *CompTIA A+ 220-801 and 220-802 approved cert guide, Deluxe Edition (3rd ed.)*. Pearson Education, Inc.

RECOMMENDED RESOURCES

- Books and Professional Journals
 - Mueller, S. (2010). *Upgrading and repairing PCs (19th ed.)*. Pearson Education, Inc.
- ITT Tech Virtual Library (accessed via Student Portal | <https://studentportal.itt-tech.edu>)
 - Basic Search>
 - Robb, D. (2004). *Server disk management in a windows environment*. Florida: Auerbach Publications.
 - Singh, V. P. (2009). *Computer Hardware Course*. Delhi: Global Media.
 - School of Information Technology>
 - Computer Science Tutorials
 - TechTutorials
- Professional Association
 - Association of Information Technology Professionals
www.aitp.org/ (accessed October 21, 2013)
- Recommended Links
 - CompTIA Certifications
<http://certification.comptia.org/home.aspx> (accessed August 29, 2013)
 - IEEE Computer Society
<http://www.computer.org/portal/web/guest/home> (accessed March 16, 2015)

INSTRUCTIONAL METHODS AND TEACHING STRATEGIES

The curriculum employs a variety of instructional methods that support the course objectives while fostering higher cognitive skills. These methods are designed to encourage and engage you in the learning process in order to maximize learning opportunities. The instructional methods include but are not limited to lectures, collaborative learning options, use of technology, and hands-on activities.

To implement the above-mentioned instructional methods, this course uses several teaching strategies, such as hands-on labs and practice quizzes. Your progress will be regularly assessed through a variety of assessment tools including quizzes, labs, exams, and a final exam.

OUT-OF-CLASS WORK

For purposes of defining an academic credit hour for Title IV funding purposes, ITT Technical Institute considers a quarter credit hour to be the equivalent of: (a) at least 10 clock hours of classroom activities and at least 20 clock hours of outside preparation; (b) at least 20 clock hours of laboratory activities; or (c) at least 30 clock hours of externship, practicum or clinical activities. ITT Technical Institute utilizes a “time-based option” for establishing out-of-class activities which would equate to two hours of out-of-class activities for every one hour of classroom time. The procedure for determining credit hours for Title IV funding purposes is to divide the total number of classroom, laboratory, externship, practicum and clinical hours by the conversion ratios specified above. A clock hour is 50 minutes.

A credit hour is an artificial measurement of the amount of learning that can occur in a program course based on a specified amount of time spent on class activities and student preparation during the program course. In conformity with commonly accepted practice in higher education, ITT Technical Institute has institutionally established and determined that credit hours awarded for coursework in this program course (including out-of-class assignments and learning activities described in the “Course Outline” section of this syllabus) are in accordance with the time-based option for awarding academic credit described in the immediately preceding paragraph.

ACADEMIC INTEGRITY

All students must comply with the policies that regulate all forms of academic dishonesty or academic misconduct. For more information on the academic honesty policies, refer to the Student Handbook and the School Catalog.

INSTRUCTOR DETAILS

Instructor Name	
Office Hours	
Contact Details	

(End of Syllabus)