

ITT Technical Institute
NT1110
Computer Structure and Logic

SYLLABUS

Credit hours: 4.5


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

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

None.

Course Description:

The organization of a computer is examined in a typical operating systems environment. Terminology and underlying principles related to major computer functions are discussed in the context of hardware and software environments.



COURSE SUMMARY

COURSE DESCRIPTION

The organization of a computer is examined in a typical operating systems environment. Terminology and underlying principles related to major computer functions are discussed in the context of hardware and software environments.

MAJOR INSTRUCTIONAL AREAS

1. Introduction to Computers
2. Number System and Units of Measurement
3. Input/output (I/O) Ports and Devices
4. Motherboards and Busses
5. The Central Processing Unit (CPU)
6. Memory and Storage
7. Computer Operation
8. Operating Systems
9. Basic Security
10. Basic Networking
11. Troubleshooting

COURSE LEARNING OBJECTIVES

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

1. Describe the purpose and function of an operating system.
2. Describe the physical components of a computer and various input and output devices.
3. Explain the role of the motherboard in the functioning of a computer.
4. Explain the purpose, functions, and characteristics of a CPU.
5. Convert numbers between binary, decimal, and hexadecimal number system.
6. Explain how a computer manages information using various memory and storage devices.
7. Differentiate between various file systems.
8. Explain the BIOS and start-up process of a computer.
9. Apply the basic computer security measures through authentication and access control.
10. Explain computer networking in the context of client–server and peer-to-peer network models.
11. Troubleshoot common computer problems using a structured approach.

COURSE OUTLINE

MODULE 1: OPERATING SYSTEMS

COURSE LEARNING OBJECTIVES COVERED

1. Describe the purpose and function of an operating system.

TOPICS COVERED

- Types of Operating Systems
- Different Versions of Windows operating system
- Windows Operating System Interfaces
- Disk Partitions, Files, and Folders Management
- System Management Tools

MODULE LEARNING ACTIVITIES	GRADED	OUT-OF-CLASS TIME
Reading: <i>Computer Structure and Logic</i> , Chapter 8, pp. 281–322	No	4.0 hrs.
Lesson Presentation: Study Lesson.	No	1.5 hrs.
Short Answer: Answer questions on the purpose and functions of an operating system.	Yes	1.0 hr.
Lab: Complete the lab titled “Identifying the Operating System.”	Yes	1.0 hr.

Total Out-Of-Class Activities: 7.5 Hours

MODULE 2: I/O PORTS AND DEVICES

COURSE LEARNING OBJECTIVES COVERED

- Describe the physical components of a computer and various input and output devices.

TOPICS COVERED

- I/O Ports
- Input Devices
- Types of Displays
- Types of Video Connectors
- Fundamentals of Printing
- Multimedia Devices

MODULE LEARNING ACTIVITIES	GRADE D	OUT-OF- CLASS TIME
Reading: <i>Computer Structure and Logic</i> , Chapter 3, pp. 61–105.	No	5.0 hrs.
Reading: <i>Computer Hardware Course</i> , Chapter 2, pp. 11–16, and Chapter 3, pp. 17–36.	No	2.0 hrs.
Lesson Presentation: Study Lesson.	No	2.5 hrs.
Preparation for Quiz: Prepare for Quiz 1.	No	2.0 hrs.
Short Answer: Answer questions on latest trends in input/output devices.	Yes	1.5 hrs.
Lab: Complete the lab titled “Identifying I/O Ports and Devices.”	Yes	1.5 hrs.
Quiz: Attempt Quiz 1.	Yes	N/A

Total Out-Of-Class Activities: 14.5 Hours

MODULE 3: COMPUTER COMPONENTS

COURSE LEARNING OBJECTIVES COVERED

3. Explain the role of the motherboard in the functioning of a computer.
4. Explain the purpose, functions, and characteristics of a CPU.

TOPICS COVERED

- Motherboards and its Components
- Installation, Upgrading, and Troubleshooting of Processors

MODULE LEARNING ACTIVITIES	GRADED	OUT-OF-CLASS TIME
Reading: <i>Computer Structure and Logic</i> , Chapter 4, pp. 115–152 and Chapter 5, pp. 161–186.	No	7.0 hrs.
Reading: <i>Computer Hardware Course</i> , Chapter 10, pp. 99–107 and 120–127.	No	1.5 hrs.
Lesson Presentation: Study Lesson.	No	2.5 hrs.
Discussion: Participate in the discussion titled “Processors and Their Characteristics.”	Yes	1.0 hr.
Short Answer: Answer questions on the motherboard and CPU.	Yes	2 hrs.
Lab: Complete the lab titled “Identify Motherboard Components and Form Factors.”	Yes	1.0 hr.
Preparation for Quiz: Prepare for Quiz 2.	No	2.0 hrs.

Total Out-Of-Class Activities: 17.0 Hours

MODULE 4: MEMORY, STORAGE, AND NUMBERING SYSTEM

COURSE LEARNING OBJECTIVES COVERED

5. Convert numbers between binary, decimal, and hexadecimal number system.
6. Explain how a computer manages information using various memory and storage devices.
7. Differentiate between various file systems.

TOPICS COVERED

- Numbering Systems Used in Computers
- Basic Boolean Operations
- Measurement of Data Transfer and Frequency
- Random Access Memory (RAM)
- Dual Inline Memory Module (DIMM) and Direct Rambus Memory (RDRAM) Modules Installation
- Hard Disk, CD and DVD Optical Drives
- Windows File Systems

MODULE LEARNING ACTIVITIES	GRADE D	OUT-OF-CLASS TIME
Reading: <i>Computer Structure and Logic</i> , Chapter 2, pp. 35–52; Chapter 6, pp. 195–228; and Chapter 8, pp. 304–305.	No	5.0 hrs.
Reading: <i>Computer Hardware Course</i> , Chapter 5, pp. 49–56; Chapter 6, pp. 57–66; and Chapter 7, pp. 65–70.	No	2.0 hrs.
Reading: <i>Server Disk Management in a Windows Environment</i> , Chapter 2.	No	2.0 hrs.
Lesson Presentation: Study Lesson.	No	2.5 hrs.
Short Answer: Answer questions on different file systems.	Yes	1.5 hrs.
Lab: Complete the lab titled “Exploring RAM, Hard Disk Drives, and Optical Disk Drives.”	Yes	1.5 hrs.
Lab: Complete the lab titled “Converting Numbers to Various Numbering Systems.”	Yes	N/A
Quiz: Attempt Quiz 2.	Yes	N/A

Total Out-Of-Class Activities: 14.5 Hours

MODULE 5: COMPUTER OPERATION AND SECURITY

COURSE LEARNING OBJECTIVES COVERED

8. Explain the BIOS and start-up process of a computer.
9. Apply the basic computer security measures through authentication and access control.

TOPICS COVERED

- Basic Input/Output System (BIOS), Complementary Metal-Oxide-Semiconductor (CMOS), and Firmware
- How to Configure the System BIOS
- Power-On Self-Test (POST) and Error Reporting
- Fundamentals of Security
- Data and Physical Security
- Purposes and Principles of Access Control
- Installation, Configuration, and Troubleshoot Security Features
- Wireless Security

MODULE LEARNING ACTIVITIES	GRADE D	OUT-OF- CLASS TIME
Reading: <i>Computer Structure and Logic</i> , Chapter 7, pp. 237–271, and Chapter 9, pp. 331–360.	No	6.0 hrs.
Reading: <i>Computer Hardware Course</i> , Chapter 12, pp. 147–155.	No	1.0 hr.
Lesson Presentation: Study Lesson.	No	2.0 hrs.
Discussion: Participate in the discussion titled “Security Basics.”	Yes	2.0 hrs.
Short Answer: Answer questions on BIOS.	Yes	2.0 hr.
Lab: Complete the lab titled “Understanding BIOS and POST.”	Yes	1.5 hrs.

Total Out-Of-Class Activities: 14.5 Hours

MODULE 6: TROUBLESHOOTING AND NETWORKS

COURSE LEARNING OBJECTIVES COVERED

10. Explain computer networking in the context of client–server and peer-to-peer network models.
11. Troubleshoot common computer problems using a structured approach.

TOPICS COVERED

- PC Tools
- Hardware or Software Problem Identification
- Windows Troubleshoot
- Network Models
- Internet Connectivity Technologies
- Transport Control Protocol/Internet Protocol (TCP/IP) Applications and Technologies
- Types of Cables and Connectors
- Network Devices
- TCP/IP Configuration
- Network Command-Line Tools

MODULE LEARNING ACTIVITIES	GRADE D	OUT-OF-CLASS TIME
Reading: <i>Computer Structure and Logic</i> , Chapter 10, pp. 369–403, and Chapter 11, pp. 413–452.	No	7.5 hrs.
Lesson Presentation: Study Lesson.	No	2.0 hrs.
Lab: Complete the lab titled “Troubleshooting Networking Issues.”	Yes	N/A
Preparation for Final Exam: Prepare for the Final Exam.	No	5.0 hrs.
Final Exam: Attempt the Final Exam.	Yes	N/A

Total Out-Of-Class Activities: 14.5 Hours

EVALUATION AND GRADING

EVALUATION CRITERIA

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

Category	Weight
Short Answer	20%
Discussion	10%
Lab	30%
Quiz	15%
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

- Antonakos, J. L. (2011). *Lab manual to accompany computer structure and logic*. Indianapolis, IN: Prentice Hall.
- Pearson Certification Team. (2011). *Computer structure and logic*. Indianapolis, IN: Prentice Hall.
- Smith, E. H. (2011). *Video mentor DVD*. Indianapolis, IN: Prentice Hall.
Retrieved from http://media.pearsoncmg.com/pcp/itt_media/1256386782/index.html
- Smith, E. H. (2011). *Windows simulator DVD*. Indianapolis, IN: Prentice Hall.
Retrieved from http://media.pearsoncmg.com/pcp/itt_media/1256386472/windows_sim_unzip_and_click_setupexe.zip

RECOMMENDED RESOURCES

- Books and Professional Journal
 - 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>)
 - Browse > Browse by Format > Books > Books24x7
 - 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
 - Tutorial Links:
 - Computer Science Tutorials
 - TechTutorials–Free Computer References
- 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 August 29, 2013)

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 videos, hands-on labs, and group discussions. Your progress will be regularly assessed through a variety of assessment tools including labs, discussions, short answers, quizzes, and 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)