

IS311T

Internetworking Infrastructure and Operations [Onsite]

Course Description:

This course involves the fundamentals of networking concepts. It includes various concepts used in a TCP/IP network. The course highlights how information flows in a network through various hardware devices and protocols and how these impact network security. The course offers an overview of security issues that are typically considered when managing the infrastructure, internetworking and operations in a network.

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

Prerequisites: TB143T Introduction to Personal Computers or equivalent or TB145T Introduction to Computing or equivalent

Credit hours: 4

Contact hours: 60 (36 Theory Hours, 24 Lab Hours)

SYLLABUS: Internetworking Infrastructure and Operations

Instructor: _____

Office hours: _____

Class hours: _____

MAJOR INSTRUCTIONAL AREAS

1. Fundamentals of networking
2. Concepts used in a TCP/IP network
3. Information flow in a network
4. Network devices and protocols
5. Network security
6. Managing network infrastructure and operations

COURSE OBJECTIVES

After successful completion of this course, the student will have the opportunity to:

1. Explain the key concepts of modern communications systems.
2. Using the ITT Tech Virtual Library, describe the different types of Database Management Systems (DBMS) models.
3. Install a network adapter and configure Domain Name Server (DNS) and Windows Internet Naming System (WINS) settings in a Local Area Network (LAN).
4. Explain the Open System Interconnect (OSI) model in computer networks.
5. Explain the purpose of four layers of the Transmission Control Protocol/Internet Protocol (TCP/IP) model in computer networks.
6. Perform sub- and super-netting in a network.
7. Identify the role of protocols and port numbers in a network.

8. Explain the various components of Network Security.
9. Troubleshoot select problems related to common network systems.

Related SCANS Objectives

1. Evaluate the concept of network in a communication system.
2. Maintain the flow of information in the network in a systematic fashion.
3. Analyze the security needs of a network and present the inference to the management.
4. Use computers to manage network infrastructure and operations.
5. Demonstrate the understanding of a network system and the flow of information in it.
6. Apply the use IP configuration to troubleshoot a network.
7. Evaluate security related data for the purpose of implementing risk management and intrusion detection for an organization.
8. Troubleshoot the problems related to the network connectivity for an organization.

TEACHING STRATEGIES

The curriculum is designed to promote a variety of teaching strategies that support the outcomes described in the course objectives and that foster higher cognitive skills. Delivery makes use of various media and delivery tools in the classroom.

COURSE RESOURCES

Student Textbook Package

- Beasley, Jeffrey S. *Networking*. Upper Saddle River, NJ: Pearson Prentice Hall, 2008.
- DVD: "Network+" (exam N10-003, Version 2.6). TestOut LabSim software.
- CD-ROM: "Information Security Shorts" (date 05/05, version 1.2). U.S. Dept. of Defense Information Assurance Training and Awareness Products.
- CD-ROM: "Information Operations (IO) Fundamentals" (date 02/01, version 1.0). U.S. Dept. of Defense Information Assurance Training and Awareness Products.

References and Resources

ITT Tech Virtual Library

Log in to the ITT Tech Virtual Library (<http://www.library.itt-tech.edu/>) to access online books, journals, and other reference resources selected to support ITT Tech curricula.

■ General References

• Books

The following books are related to this course and are available through the ITT Tech Virtual Library.

- Books> Ebrary>
Cole, Eric *Network Security Bible*, John Wiley & Sons, Inc., 2005, pp. 3-8, pp. 417-434 and pp. 613-623.
Dean, Tamara, *Network+ 2005 In Depth*, Course Technology, Inc., 2005, pp. 594-600.
Oppel, Andrew J. *Databases Demystified*. The McGraw-Hill Companies, 2004, pp. xix-19.
- Books> Library Catalog> Harold F. Tipton, Information Security Management Handbook, InfoSecurityNetBase Collection, Boca Raton, FL: CRC Press, 2003.

All links to web references outside of the ITT Tech Virtual Library are always subject to change without prior notice.

EVALUATION & GRADING

COURSE REQUIREMENTS

1. Attendance and Participation

Regular attendance and participation are essential for satisfactory progress in this course.

2. Completed Assignments

Each student is responsible for completing all assignments on time.

3. Team Participation (if applicable)

Each student is responsible for participating in team assignments and for completing the delegated task. Each team member must honestly evaluate the contributions by all members of their respective teams.

Evaluation Criteria Table

The final grade will be based on the following weighted categories:

GRADE CATEGORIES	WEIGHT
Participation	10%
Lab Assignments	30%
Quizzes	15%
Research Assignments	10%
Writing Assignments	10%
Final Exam	25%
Total	100%

Grade Conversion Table

Final grades will be calculated from the percentages earned in class as follows:

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

COURSE OUTLINE

Readings:

- **For all units except unit 1:** It is recommended that students complete the relevant readings before attending class.
- **Unit 1:** All concepts will be covered in the class; as a result, the specified readings are only for student reference.

Unit #	Activities for the unit
1	<ul style="list-style-type: none"> • Read the following: <ul style="list-style-type: none"> ○ Textbook: <ul style="list-style-type: none"> ▪ Chapter 1, pp. 3-8 • Writing Assignment

<p style="text-align: center;">2</p>	<ul style="list-style-type: none"> • Read the following: <ul style="list-style-type: none"> ○ Textbook: <ul style="list-style-type: none"> ▪ Chapter 1, pp. 9-19 • Lab Assignment
<p style="text-align: center;">3</p>	<ul style="list-style-type: none"> • Read the following: <ul style="list-style-type: none"> ○ Textbook: <ul style="list-style-type: none"> ▪ Chapter 4, pp. 85-93 and 100-105 ▪ Chapter 6, pp. 151-159 ○ ITT Tech Virtual Library> Library Catalog> Search: Information Security Management Handbook> 2.1 Communications and Network Security> An Introduction to LAN/WAN Security ○ DoD CD: Information Security Shorts, "Wireless" • Research Assignment • Lab Assignment
<p style="text-align: center;">4</p>	<ul style="list-style-type: none"> • Read the following: <ul style="list-style-type: none"> ○ Textbook: <ul style="list-style-type: none"> ▪ Chapter 8, pp. 233-237, 242-243, 249-250, 257-272, and 276-280 • Writing Assignment • Lab Assignment

<p>5</p>	<ul style="list-style-type: none"> • Read the following: <ul style="list-style-type: none"> ○ Textbook: <ul style="list-style-type: none"> ▪ Chapter 5, pp. 113-142 ○ DoD CD: Information Operations Fundamentals, "Global Connectivity" • Research Assignment • Lab Assignment
<p>6</p>	<ul style="list-style-type: none"> • Read the following: <ul style="list-style-type: none"> ○ ITT Tech Virtual Library> Books> Ebrary> Network+ 2005 In Depth: Chapter 13, pp. 594-600 • Writing Assignment • Un-graded Lab Assignment
<p>7</p>	<ul style="list-style-type: none"> • Read the following: <ul style="list-style-type: none"> ○ Textbook: <ul style="list-style-type: none"> ▪ Chapter 14, pp. 427-431, 441-458, and 465- 468 ○ DoD CD: Information Security Shorts, "Peer to Peer" • Writing Assignment 1 • Research Assignment 2 • Lab Assignment

<p style="text-align: center;">8</p>	<ul style="list-style-type: none"> • Read the following: <ul style="list-style-type: none"> ○ ITT Tech Virtual Library> Books> Ebrary> Databases Demystified: Chapter 1, pp. xix-19 • Research Assignment
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<p>9</p>	<ul style="list-style-type: none"> • Read the following: <ul style="list-style-type: none"> ○ Textbook: <ul style="list-style-type: none"> ▪ Chapter 9, pp. 297-313 • Writing Assignment 1 • Research Assignment 2 • Lab Assignment
<p>10</p>	<ul style="list-style-type: none"> • Read the following: <ul style="list-style-type: none"> ○ Textbook: <ul style="list-style-type: none"> ▪ Chapter 10: Network Security, pp. 317-338 ○ ITT Tech Virtual Library: <ul style="list-style-type: none"> ▪ Books> Ebrary> Network Security Bible: <ul style="list-style-type: none"> • Chapter 1 (Information System Security Principles), pp. 3-8 • Chapter 13 (Network Architecture Fundamentals), pp. 417-434 • Chapter 19 (Putting Everything Together), pp. 613-623 ▪ Library Catalog> Search: Information Security Management Handbook> 3.1 Security Management Concepts and Principles> Security Management ○ DoD CDs: <ul style="list-style-type: none"> ▪ Information Operations Fundamentals, "Actual Incidents" and "Revolution in Military Affairs"

	<ul style="list-style-type: none"> ▪ Information Security Shorts, "Passwords" and "IA Roles and Responsibilities" • Writing Assignment
<p style="text-align: center;">11</p>	<p style="text-align: center;">Final Exam</p>