# CSIT 186: NETWORKING II

## 1. Course Information

**Subject**
CSIT - Computer Science/ Information Technology

**Course Number**
186

**School**
Science, Technology, Engineering, Mathematics

**Course Title**
Networking II

## 2. Hours

**Semester Hours**
3.00000

**Lecture**
3

**Lab**
0

**Practicum**
0

## 3. Catalog Description

**For display in the online catalog**
This course continues the exploration of the fundamental concepts of computer networks. Topics to be covered include the Network Layer, Linked Layer, Local Area Network, Network Management, Wireless and Mobile Networks, and Multimedia Networking. Network Security will be introduced. Lab activities will provide students with practical experiences in computer networking. It will be centered on implementation, configuration and troubleshooting of a LAN. Open lab time required.

## 4. Requisites

**Prerequisites**
CSIT 185

**Corequisites**
None

## 5. Course Type

**Course Fee Code**
3

**Course Type for Perkins Reporting**
vocational (approved for Perkins funding)

## 6. Justification

**Describe the need for this course**
This course will provide students with an in-depth understanding of applicable networking concepts by preparing students for various professional certification exams accepted in the IT industry. CSIT 186 is a continuation of Networking I and provides a more in-depth understanding of networking concepts by continuing to focus on most frequently used internet protocols at application, transport, network and link layers.

## 7. General Education

**Will the college submit this course to the statewide General Education Coordinating Committee for approval as a course, which satisfies a general education requirement?**

No

**If the course does not satisfy a general education requirement, which of the following does it satisfy:**

Elective

## 8. Consistency with the Vision and Mission Statements, the Academic Master Plan, and the strategic initiatives of the College

**Please describe how this course is consistent with Ocean County College's current Vision Statement, Mission Statement, Academic Master Plan, and the strategic initiatives of the College:**

| | Add item |
|---|---|
| 1 | Offer comprehensive educational programs that develop intentional learners of all ages and ensure the full assessment of student learning in these programs. (Mission Statement) |
| 2 | Foster educational innovation through effective teaching-learning strategies, designed to develop and nurture intentional learners who are informed and empowered. (Vision Statement) |
| 3 | Employ technology and learning outcomes assessment to ensure student success in an increasingly diverse and complex world. (Vision Statement) |
| 4 | Prepare students for entrance into the workforce and/or for successful transfer to other educational institutions. (Academic Master Plan) |
| 5 | Seek to empower students through the mastery of intellectual and Practical Skills. (Academic Master Plan) |
| 6 | Challenge students to transfer information into knowledge and knowledge into action. (Academic Master Plan) |

**9. Related Courses at Other Institutions**

## Comparable Courses at NJ Community Colleges

**Institution**

Atlantic Cape CC

**Course Title**

INTERNET SERVER ADMINISTRATION

**Course Number**

CISM243

**Number of Credits**

3

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**Institution**

Bergen CC

**Course Title**

NETWORKING FUNDAMENTALS II

**Course Number**

INF264

**Number of Credits**

3

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**Institution**

Brookdale CC

**Course Title**

LOCAL AREA NETWORKS

**Course Number**
COMP261

**Number of Credits**
3

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**Institution**
Hudson County CC

**Course Title**
INTRODUCTION TO NETWORKS AND NETWORKING CONCEPTS

**Course Number**
CSC240

**Number of Credits**
3

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**Institution**
Mercer County CC

**Course Title**
ADVANCED NETWORK TOPICS

**Course Number**
NET278

**Number of Credits**
3

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## Transferability of Course

**Georgian Court University**

| Course Code, Title, and Credits | Transfer Catagory | If non-transferable; select status |
|---|---|---|
| ELECTIVE CREDIT (3) | ELECTIVE | |

**Kean University**

| Course Code, Title, and Credits | Transfer Catagory | If non-transferable; select status |
|---|---|---|
| TECH1500 INTRO TO TELECOMMUNICATIONS (3) | Elective | |

**Monmouth University**

| Course Code, Title, and Credits | Transfer Catagory | If non-transferable; select status |
|---|---|---|
| Computer Science Elective | 100 Level Computer Science Elective | |

**Rowan University**

| Course Code, Title, and Credits | Transfer Catagory | If non-transferable; select status |
|---|---|---|
| Computer Science Elective | GenEd COMPUTER SCIENCE ELECTIVE | |

**Rutgers - New Brunswick, Mason Gross School of the Arts**

| Course Code, Title, and Credits | Transfer Catagory | If non-transferable; select status |
|---|---|---|
| | | Will not transfer |

**Stockton University**

| Course Code, Title, and Credits | Transfer Catagory | If non-transferable; select status |
|---|---|---|
| COMP SCIENCE & INFO SYS ELECTIVE | Elective Computer Science | |

## 10. Course Learning Outcomes

**Learning Outcomes**

| | Students who successfully complete this course will be able to: |
|---|---|
| CLO1 | Identify and explain Internet architecture. Describe Internet Protocol stack and ISO/OSI network reference model and functions of each layer. |
| CLO2 | Construct models of current wireline and wireless networking technology. |
| CLO3 | Identify and explain common Application layer protocols: HTTP, FTP, SMTP/POP3/IMAP, DNS, DHCP, TLS/SSL, SNMP, etc. |
| CLO4 | Identify and explain common Transport layer TCP and UDP, protocols' segment structure, reliable data transfer, flow control, and congestion control as well as connection management |
| CLO5 | Identify and explain Network layer operations, concepts of IPv4 and IPv6, network layer data plane and control plane, and functions of DHCP, ICMP, RIP, OSPF, and BGP protocols. |
| CLO6 | Familiarize with Link layer protocols and knowledge of network trouble shooting using network diagnosis commands; obtain hands-on knowledge of LAN installation and management and explain the concept of error detection and error correction. |
| CLO7 | Assess wireless technologies and understand the 2G/3G/LTE wireless technology and IEEE 802.11 family of wireless technologies (Wi-Fi) as well as routing for mobile users. |
| CLO8 | Explain multi-media networking application, the concepts and technology of network support for multimedia contents, and learn the various types of video and audio streaming and the protocols such as RTP and SIP. |
| CLO9 | Explain network security, cryptography, authentication and data security. Familiarize with TLS/SSL, IPsec, firewalls, and IDS. |
| CLO10 | Identify new trends in networking technology, such as SDN (Software Defined Network) and NFV (Network Function Virtualization). |

## 11. Topical Outline

**(include as many themes/skills as needed)**

| | Major Themes/ Skills | Assignments (Recommended but not limited to) | Assessments (Recommended but not limited to) | Course Learning Outcome(s) |
|---|---|---|---|---|
| TO1 | Network architecture, layering, and protocols<br>a. Network topology<br>b. Internet Protocol stack and ISO/OSI network reference models | Reading of textbook<br>Homework<br>Internet research<br>Class discussion | Exam | CLO1, 2 |
| TO2 | Application Layer<br>a. Principles of Network Applications<br>b. Internet protocols: HTTP, FTP, SMTP/POP3/IMAP, DNS, DHCP, TLS/SSL, SNMP, etc. | Reading of textbook<br>Homework<br>Internet research<br>Class discussion | Exam | CLO3 |
| TO3 | Transport Layer<br>a. TCP and UDP protocols<br>b. Connection vs connectionless: Reliable Data Transfer<br>c. Flow control, congestion control, and connection management | Reading of textbook<br>Homework<br>Internet research<br>Class discussion | Exam | CLO4 |

| | | | | |
|---|---|---|---|---|
| TO4 | Network Layer (Control Plane and Data Plane)<br>a. IPv4 and IPv4: IP addressing and network routing.<br>b. Intranet and internet routing. RIP, BGP, and OSPF protocols<br>c. Router functions and routing tables | Reading of textbook<br>Homework<br>Internet research<br>Class discussion | Exam | CLO5 |
| TO5 | Link Layer<br>a. LAN and VLAN<br>b. Error-Detection and -Correction Techniques<br>c. Network trouble shooting and diagnostics | Reading of textbook<br>Homework<br>Internet research<br>Class discussion<br>Projects | Exam<br>Project presentation | CLO6 |
| TO6 | Wireless and Mobile Networks<br>a. Wireless Links and Network Characteristics<br>b. CDMA, TDMA, 2G/3G/LTE wireless network<br>c. IEEE 802.11 family networks (Wi-Fi, Bluetooth, etc.) | Reading of textbook<br>Homework<br>Internet research<br>Class discussion<br>Projects | Exam<br>Project presentation | CLO7 |
| TO7 | Multimedia Networking<br>a. Streaming video, Voice-over-IP, and RTP and SIP protocols<br>b. Network requirements and implementation for multimedia | Reading of textbook<br>Homework<br>Internet research<br>Class discussion | Exam | CLO8 |
| TO8 | Security in Computer Networks<br>a. Principles of cryptography and end-point authentication<br>b. Operational Security: IPsec, TLS/SSL, Firewalls and Intrusion Detection Systems | Reading of textbook<br>Homework<br>Internet research<br>Class discussion | Exam | CLO9 |
| TO9 | Network for the future<br>a. Introduction to Cloud Networking, and application of Software Defined Network (SDN) and Network Function Virtualization (NFV) | Internet research<br>Class discussion | Exam | CLO10 |

## 12. Methods of Instruction

**In the structuring of this course, what major methods of instruction will be utilized?**

Lecture, homework, case studies, labs, a minimum of three examinations.

## 13. General Education Goals Addressed by this Course (this section is to fulfill state requirements)

Information

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**Technological Competency**

Yes

**Related Course Learning Outcome**

All

**Related Outline Component**

All

**Assessment of General Education Goal (Recommended but not limited to)**

Exam & Project presentation

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**Independent/Critical Thinking**
Yes

**Related Course Learning Outcome**
All

**Related Outline Component**
All

**Assessment of General Education Goal (Recommended but not limited to)**
Exam & Project presentation

## 14. Needs

**Instructional Materials (text etc.):**
Appropriate textbook and/or open educational resource will be selected. Contact the department for current adoptions. Class notes, presentations, software and online materials.

**Technology Needs:**
College Portal and/or College Distance Learning Platform and/or Textbook or Instructor Website.

**Human Resource Needs (Presently Employed vs. New Faculty):**
One (1) presently employed full-time faculty plus additional Adjunct Professors as needed.

**Facility Needs:**
Laboratory classrooms equipped with computer workstations, each configured to support networking. Podium computer similarly equipped plus the ability to present audio-video presentations to the class.

## 15. Grade Determinants

**The final grade in the course will be the cumulative grade based on the following letter grades or their numerical equivalents for the course assignments and examinations**

**A: Excellent**

**B+: Very Good**

**B: Good**

**C+: Above Average**

**C: Average**

**D: Below Average**

**F: Failure**

**I: Incomplete**

**R: Audit**

**For more detailed information on the Ocean County College grading system, please see Policy #5154.**

## 16. Board Approval

**History of Board approval dates**

Board of Trustees Approval Date: February 23, 2015
Approval of Form: September 2017
Board of Trustees Approval Date: March 26, 2020