

**BOROUGH OF MANHATTAN COMMUNITY COLLEGE**

City University of New York

**Department of Computer Information Systems**

Office S150/Phone: 212-220-1476

**Telecommunication Networks I**

**CIS 345**

**Spring 2012**

**Credits: 4**

**Class hours: 3**

**Lab hours: 2**

**Course Description:**

This course is an introductory course to **Telecommunication and Networks**. It will cover the fundamentals of **Data Communications, Networking** and will introduce the **Open System Interface (OSI)** model.

**Prerequisites:** Basic skills- ENG 095; ESL 0095; ACR 095; MAT 012/ 051  
CIS 155 Computer Hardware or department approval

**Student Learning Outcomes and Assessment:**

- **Outcome:** Identify the different types of telecommunication networks and OSI seven-layer standards.  
**Assessment:** Homework assignments and exams
- **Outcome:** Describe network building blocks and their functions.  
**Assessment:** Homework assignments and exams
- **Outcome:** Interpret the design and management methods of networks.  
**Assessment:** Projects and exams
- **Outcome:** Analyze the different types of transmission media and their impairments.  
**Assessment:** Lab Projects, homework and exams
- **Outcome:** Write research projects on different topics related to telecommunication networks.  
**Assessment:** Research projects and papers
- **Outcome:** Justify the choice of topologies, protocols and transmission media for appropriate networks.  
**Assessment:** Homework assignments and exams

**General Education Outcomes and Assessment**

- **Communication Skills** – Students will write, read, listen and speak critically and effectively.  
**Assessment:** Students will write research projects/papers on different topics related to telecommunication networks critically and effectively.
- **Quantitative Skills** – Students will use quantitative skills and the concepts and methods of mathematics to solve problems  
**Assessment:** Students will use quantitative skills to interpret the design and management methods of network.
- **Information and Technology Literacy** – Students will collect, evaluate and interpret information and effectively use information technologies  
**Assessment:** Students will evaluate and interpret the OSI Reference Model, network topologies, protocols and transmission media.

**Required Text & Readings:**

Text: **Telecommunication Essentials: The Complete Global Source for Communications Fundamentals, Data Networking and the Internet and the Next Generation Networks, 2<sup>nd</sup> Edition**

Author: **Goleniewski, Lillian**

Pub: **Addison Wesley**

ISBN: **0-321-42761-0**

ISBN-13: **9780321427618**

**Other Resources:**

**Use of Technology (if applicable):** Flash drives are recommended.

## Evaluation & Requirements of Students:

Grades: Quiz/home work	15%
First Exam	20%
Second Exam	20%
Final Exam	20%
Written Project	25%
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	100%

## Outline of Topics:

### Part I Communications Fundamentals

- Chapter 1: Telecommunications Technology Fundamentals**  
Transmission Lines, Types of Network Connections, The Electromagnetic Spectrum and Bandwidth, Analog and Digital Transmission, Multiplexing, Political and Regulatory Forces in Telecommunications
- Chapter 2: Transmission Media: Characteristics and Applications**  
Twisted-pair, Coaxial Cable, Microwave, Satellite, Fiber Optics
- Chapter 3: Establishing Communications Channels**  
Establishing Connections, The PSTN Versus the Internet
- Chapter 4: The PSTN**  
The PSTN Infrastructure, The Transport Network Infrastructure, Signaling Systems, Intelligent Networks, SS7 and Next-Generation Networks

### Part II Data Networking and the Internet

- Chapter 5: Data Communications Basics**  
The Evolution of Data Communications, Data Flow, The OSI Reference Model and the TCP/IP Reference Model
- Chapter 6: Local Area Networking**  
LAN Basics, LAN Characteristics, LAN Interconnection and Internetworking
- Chapter 7: Wide Area Networking**  
Circuit-Switched Networks, Packet-Switched Networks
- Chapter 8: The Internet and IP Infrastructure Structures**  
Internet Basics, Internet Addressing and Address Resolution, The Organization of the Internet, IP QoS, What's Next on the Internet

### Part III New-Generation of Networks

- Chapter 9: IP Services**  
The Evolution to IP Services, IPT, IPTV, VPNs
- Chapter 10: Next-Generation Networks**  
The Broadband Evolution, Multimedia Networking Requirements, The Broadband Infrastructure, Next-Generation Networks and Convergence, The Next-Generation Network Infrastructure
- Chapter 11: Optical Networking**  
Optical Networking Today and Tomorrow, End-to-End Optical Networking, The Optical Edge, The Optical Core: Overlay Versus Peer-to-Peer Networking Models, The IP + Optical Control Plane, Migration to Optical Networking
- Chapter 12: Broadband Access Alternatives**  
Drivers of Broadband Access, DSL Technology, Cable TV Networks, Fiber Solutions, Wireless Broadband, Broadband PLT, HANs

### Part IV Wireless Communications

- Chapter 13: Wireless Communications Basics**  
A Brief History of Wireless Communications, Wireless Communications Regulations Issues, Wireless Impairments, Antennas, Wireless Bandwidth, Wireless Signal Modulation, Spectrum Utilization
- Chapter 14: Wireless WANS**  
1G: Analog Transmission, 2G: Digital Cellular Radio, 2.5G: Enhanced Data Services, 3G: Moving Toward Broadband Wireless, Beyond 3G, 4G: Wireless Broadband, 5G: Intelligent Technologies
- Chapter 15: WMANs, WLANs, and WPANs**
- Chapter 16: Emerging Wireless Applications**  
The Handset Revolution, Mobile IP, The IP Multimedia Subsystem, Mobile Gaming, Mobile Video, Mobile TV, Mobile Content

**College Attendance Policy:**

At BMCC, the maximum number of absences is limited to one more hour than the number of hours a class meets in one week. For example, you may be enrolled in a three-hour class. In that class, you would be allowed 4 hours of absence (not 4 days). In the case of excessive absences, the instructor has the option to lower the grade or assign an F or WU grade.

**Academic Adjustments for Students with Disabilities:**

Students with disabilities who require reasonable accommodations or academic adjustments for this course must contact the Office of Services for Students with Disabilities. BMCC is committed to providing equal access to all programs and curricula to all students.

**BMCC Policy on Plagiarism and Academic Integrity Statement:**

Plagiarism is the presentation of someone else's ideas, words or artistic, scientific, or technical work as one's own creation. Using the idea or work of another is permissible only when the original author is identified. Paraphrasing and summarizing, as well as direct quotations, require citations to the original source. Plagiarism may be intentional or unintentional. Lack of dishonest intent does not necessarily absolve a student of responsibility for plagiarism.

Students who are unsure how and when to provide documentation are advised to consult with their instructors. The library has guides designed to help students to appropriately identify a cited work. The full policy can be found on BMCC's website, [www.bmcc.cuny.edu](http://www.bmcc.cuny.edu). For further information on integrity and behavior, please consult the college bulletin (also available online).