

**San Jose State University  
Electrical Engineering Department**

**EE283**

**Broadband Communication Networks**

**Spring 2017**

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**Course and Contact Information**

<b>Instructor:</b>	Nader F. Mir
<b>Office Location:</b>	Department of Electrical Engineering, College of Engineering, E251
<b>Telephone:</b>	(408) 924-3986
<b>E-mail Address:</b>	<a href="mailto:nader.mir@sjsu.edu">nader.mir@sjsu.edu</a> (preferred contact method: in person - office hours)
<b>Office Hours:</b>	M/W: 11:45am-1:00pm
<b>Instructor's Web-site:</b>	<a href="http://www.sjsu.edu/people/nader.mir/">http://www.sjsu.edu/people/nader.mir/</a>
<b>Class Days/Time:</b>	Section 1: Mon/Wed, 4:30-5:45pm, Section 2: Mon/Wed, 1:30-2:45pm
<b>Classroom:</b>	Engineering Building 345
<b>Prerequisites:</b>	EE281 or EE181, or equivalent course taken during undergrad studies

**Course Format**

**Course:** EE283, **Section:** 01/02, **Course Title:** Broadband Communication Networks, **Credit Hours:** 3

**Course Description:** Broadband Networks Overview, Tunneling, VPNs, and Multi-Protocol Label Switching (MPLS); All-Optical Networks, Architecture of High-Speed Switches and Routers, Data Center Networks, Network Virtualization, Software-Defined Networking (SDN), Packet Delay and Network Queueing Models, and Quality of Service.

**Course Learning Outcomes (CLOs)**

Upon successful completion of this course, students will be able to:

1. Understand the Fundamentals of Broadband Networks
2. Analyze VPNs, Tunneling, and Overlay Networks
3. Analyze MPLS Networks for Broadband Communications
4. Understand Cloud Centers and Network Virtualization Analysis
5. Design of Advanced Routers and Switches
6. Understand Software Defined Networking (SDN)

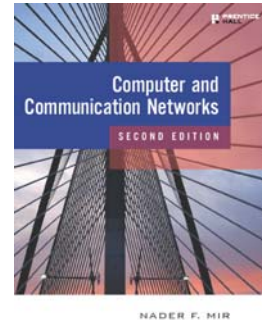
7. Learn Packet Queues and Delay Analysis and Simulation
8. Learn Quality of Service (QoS) in Advanced Networking Devices

### **Required Textbook/Readings**

#### **Required Textbook**

Computer and Communication Networks,” By Nader F. Mir, 2<sup>nd</sup> Edition, ISBN: 0133814742 published by Pearson Prentice-Hall in 2015.

(The text book is available at SJSU campus bookstore and at most online stores such as Amazon or Barnes & Noble.)



#### **Other Periodical Readings**

1. IEEE Communications Magazine
2. IEEE Network Magazine

### **Course Requirements and Assignments**

**Class Participation:** Class participation is a course requirement. Please be aware that there may be a number of random attendance checks throughout the semester.

**Homework Assignments:** Hard copies to be turned in class.

**Project:** A hard copy to be turned in class, and a softcopy to be uploaded to Canvas.

#### **Exams:**

- Midterm Exam: Friday, March, 24<sup>th</sup>, 12:30pm (location: TBA).
- Final Exam: Saturday, May 13<sup>th</sup> (still tentative), 9:00am (location: TBA).

### **Grading Information**

**Assignments/Project(s):** 20% (Note: answers to homework will be given in class before each exam.)

**Exam 1 (Midterm Exam):** 40%

**Exam 2 (Final Exam):** 40%

Standard Grading Percentage Breakdown (after possible normalizations):

94% and above	A
90% - 93%	A-
87% - 89%	B+
84% - 86%	B
80% - 83%	B-
77% - 79%	C+
74% - 76%	C
70% - 73%	C-
67% - 69%	D+
64% - 66%	D
60% - 63%	D-
below 60%	F

### **Tentative Course Schedule**

1. Overview of Broadband Networks  
Week 1
2. Tunneling, VPNs, and Multi-Protocol Label Switching (MPLS) Networks (Chapter 14)  
Weeks 2, 3
3. Optical Networks and GMPLS (Chapter 15)  
Week 4
4. Cloud Computing and Network Virtualization (Chapter 16)  
Week 5
5. Architecture of Advanced Routers (Chapter 12)  
Week 6, 7
- Review/Mid-term Exam*  
Week 7
6. Software Defined Networking (SDN) (Chapter 17)  
Week 8
7. Packet Delay Models, Network of Queues, and Foundation of Simulation Tools (Chapter 11)  
Weeks 9, 10, 11
8. Quality of Service in Routers for Broadband Networks (Chapter 13)  
Weeks 12, 13

## **Policy Information**

### **University Academic Integrity**

Students should know that the University's [Academic Integrity Policy is available at http://www.sa.sjsu.edu/download/judicial\\_affairs/Academic\\_Integrity\\_Policy\\_S07-2.pdf](http://www.sa.sjsu.edu/download/judicial_affairs/Academic_Integrity_Policy_S07-2.pdf). Your own commitment to learning, as evidenced by your enrollment at San Jose State University and the University's integrity policy, require you to be honest in all your academic course work. Faculty members are required to report all infractions to the office of Student Conduct and Ethical Development. The website for [Student Conduct and Ethical Development is available at http://www.sa.sjsu.edu/judicial\\_affairs/index.html](http://www.sa.sjsu.edu/judicial_affairs/index.html).

Instances of academic dishonesty will not be tolerated. Cheating on exams or plagiarism (presenting the work of another as your own, or the use of another person's ideas without giving proper credit) will result in a failing grade and sanctions by the University. For this class, all assignments are to be completed by the individual student unless otherwise specified. If you would like to include in your assignment any material you have submitted, or plan to submit for another class, please note that SJSU's Academic Policy F06-1 requires approval of instructors.

### **Campus Policy in Compliance with the American Disabilities Act**

If you need course adaptations or accommodations because of a disability, or if you need to make special arrangements in case the building must be evacuated, please make an appointment with me as soon as possible, or see me during office hours. Presidential Directive 97-03 requires that students with disabilities requesting accommodations must register with the DRC (Disability Resource Center) to establish a record of their disability.

### **Dropping and Adding**

Students are responsible for understanding the policies and procedures about add/drops, academic renewal, etc. [Information on add/drops are available at http://info.sjsu.edu/web-dbgen/narr/soc-fall/rec-298.html](http://info.sjsu.edu/web-dbgen/narr/soc-fall/rec-298.html). [Information about late drop is available at http://www.sjsu.edu/sac/advising/latedrops/policy/](http://www.sjsu.edu/sac/advising/latedrops/policy/). Students should be aware of the current deadlines and penalties for adding and dropping classes.

### **Classroom Protocol**

\* **Exams:** All exams including the final exam will be closed book and closed notes. Except for extraordinary, documented situations, make-up exams will not be allowed. Therefore, at the beginning of the semester, make sure that you have no exam or work conflicts with the schedule of this course.

\* **Cell Phones:** Students will turn their cell phones off or put them on vibrate mode while in class or exams. Students should not answer their phones in class. Students whose phones disrupt the course and do not stop when requested by the instructor will be referred to the Judicial Affairs Officer of the University.

\* **Computer Use:** In the classroom, students are allowed to use computers only for class-related activities. These include activities such as taking notes on the lecture underway, following the lecture on Web-based PowerPoint slides that the instructor has posted, and finding Web sites to which the instructor directs students at the time of the lecture. Students who use their computers for other activities or who abuse the equipment in any way, at a minimum, will be asked to leave the class, and, at a maximum, will be referred to the Judicial Affairs Officer of the University for disrupting the course. (Such referral can lead to suspension from the University.) Students are urged to report to their instructors computer use that they regard as inappropriate (i.e., used for activities that are not class related).

### **EE Department Honor Code**

The Electrical Engineering Department will enforce the following Honor Code that must be read and accepted by all students.

“I have read the Honor Code and agree with its provisions. My continued enrollment in this course constitutes full acceptance of this code. I will NOT:

- Take an exam in place of someone else, or have someone take an exam in my place
- Give information or receive information from another person during an exam
- Use more reference material during an exam than is allowed by the instructor
- Obtain a copy of an exam prior to the time it is given
- Alter an exam after it has been graded and then return it to the instructor for re-grading
- Leave the exam room without returning the exam to the instructor.”

### **Measures Dealing with Occurrences of Cheating**

- Department policy mandates that the student or students involved in cheating will receive an “F” on that evaluation instrument (paper, exam, project, homework, etc.) and will be reported to the Department and the University.
- A student’s second offense in any course will result in a Department recommendation of suspension from the University.