San Jose State University
Electrical Engineering Department

EE283-01 Broadband Communication Networks Spring 2019

Course and Contact Information

Instructor: Nader F. Mir
Office Location: Department of Electrical Engineering, College of Engineering, E251
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E-mail Address: nader.mir@sjsu.edu (preferred contact method: in person - office hours)
Office Hours: M/W: 11:45am-1:00pm
Instructor’s Web-site: http://www.sjsu.edu/people/nader.mir/
Class Days/Time: Mon/Wed, 4:30pm - 5:45pm
Classroom: E343
Prerequisites: EE281 or equivalent (may be taken concurrently)

Course Description and Outcomes

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. Credit Hours: 3

Course Learning Outcomes (CLOs). Upon successful completion of this course, students will be able to:

1. Understand the Fundamentals of Broadband Networks
2. Design of Advanced Routers and Switches
3. Learn Quality of Service (QoS) in Advanced Networking Devices
4. Analyze Tunneling Technique and MPLS Networks
5. Learn All-Optical Switches and Networks
6. Understand Network Virtualization Analysis
7. Understand Software Defined Networking (SDN)
8. Understand Cloud Computing and Data Centers
9. Learn Packet Queues and Delay Analysis and Simulation
Required Textbook/Readings

Required Textbook


Note 1: The textbook is only available in online stores (and not campus stores) such as Amazon.

Note 2: The textbook is now under the preparation for its 3rd edition, and thus therefore the hardcopies of its 2nd edition may be sold out in some stores. However, the electronic version such as PDF version is still available for purchase.

Note 3: Some updates for the 3rd edition may be become available during the instructions.

Other Periodical Readings

1. IEEE Communications Magazine
2. IEEE Communications Standards Magazine
3. IEEE Network Magazine

Course Requirements and Assignments

Class Participation: The class attendance is required and is an important factor to achieve the leaning objectives of this course.

Homework Assignments: Normally bi-weekly, hardcopies of assignments are required to be turned in class. Working on assignments is an important factor to achieve the leaning objectives of this course. Answers to homework will be given in class before each exam.

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

Exams:

- Final Exam: Friday, May 17th, 2:45pm (location: TBA).

Evaluation and Grading Information

Assignments/Project: 20%

Midterm Exam: 40%

Final Exam: 40%
Standard Grading Percentage Breakdown (after possible normalizations):

<table>
<thead>
<tr>
<th>Percentage Range</th>
<th>Grade</th>
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<tbody>
<tr>
<td>94% and above</td>
<td>A</td>
</tr>
<tr>
<td>90% - 93%</td>
<td>A-</td>
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<tr>
<td>87% - 89%</td>
<td>B+</td>
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<tr>
<td>84% - 86%</td>
<td>B</td>
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<tr>
<td>80% - 83%</td>
<td>B-</td>
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<tr>
<td>77% - 79%</td>
<td>C+</td>
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<tr>
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<td>D+</td>
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<tr>
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<td>D</td>
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<tr>
<td>60% - 63%</td>
<td>D-</td>
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<tr>
<td>below 60%</td>
<td>F</td>
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**Tentative Course Schedule**

1. Overview of Broadband Networks  
   Week 1

2. Architecture of Routers for Broadband Networking (Chapter 12)  
   Week 2, 3

3. Quality of Service in Broadband Network Routers (Chapter 13)  
   Weeks 4

4. Tunneling, VPNs, and Multi-Protocol Label Switching (MPLS) Networks (Chapter 14)  
   Weeks 5, 6

5. Optical Networks and Switches (Chapter 15)  
   Week 7

   *Quick Review, HW answers, and Midterm Exam*  
   Week 8

6. Network Virtualization (Chapter 16)  
   Week 9

7. Software Defined Networking (SDN) (Chapter 17)  
   Week 10
8. Cloud Computing and Network Virtualization (Chapter 16)  
   Week 11, 12

9. Packet Delay Models, Network of Queues, (Foundation of Simulation Tools) (Chapter 11)  
   Weeks 13, 14

*Quick Review, HW answers, and Final Exam*  
Weeks 15 and 16

**University Policies**

Per University Policy S16-9, university-wide policy information relevant to all courses, such as academic integrity, accommodations, etc. will be available on Office of Graduate and Undergraduate Programs’ Syllabus Information web page at [http://www.sjsu.edu/gup/syllabusinfo/](http://www.sjsu.edu/gup/syllabusinfo/)

**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.