

**San Jose State University
Electrical Engineering Department**

EE284

Convergent Voice and Data Networks

Fall 2009

Instructor

Instructor: Nader F. Mir
Department: Electrical Engineering, **College:** Engineering
Office Location: E251
Instructor's Web-site: <http://www.engr.sjsu.edu/nmir>
Office Hours: M/W: 11:45-1:30, and 3:30-4:30pm
Preferred Contact: During Office Hours

Course Information

Course Code: EE284
Section: 01
Course Title: Convergent Voice and Data Networks, 3 credit hours
Class Hours & Location: *Hours:* Mon.-Wed. 4:30-5:45pm, *Location:* ENGR339

Course Description:

This course introduces the convergence of voice and data networks into a single packet network, specifically an Internet Protocol (IP) network. Networked multimedia is introduced using an in-depth treatment of Voice over IP (VoIP) requirements, protocols and related technologies. Standards currently in use for VoIP are discussed, as are the practical aspects and deployment challenges surrounding VoIP.

Prerequisites: EE281 (or graduate standing)

Text-Book:

“Carrier Grade Voice Over IP,” 2nd Ed., 2003, Daniel Collins, ISBN 0-07-140634-4, McGraw-Hill Networking Professional.

Other References:

1. “IP Telephony - The Integration of Robust VoIP Services,” By Bill Douskalis, Prentice-Hall., ISBN: 0130141186.
2. “SIP: Understanding the Session Initiation Protocol,” by Alan B. Johnston, Artech House, second edition, 2004. ISBN 1-58053-655-7
3. Selected IETF RFCs, and instructor provided handouts.

Other Periodical Reading Materials:

IEEE Communications Magazine
IEEE Network Magazine

Student Learning Objectives for the Course:

1. LO1 Analyze Overview of VoIP and Multimedia Networks
2. LO2 Specify and qualify Fundamentals of PSTN and SS7 Protocol
3. LO3 Identify, formulate and solve Voice Preparation for IP Networking and Codec
4. LO4 Analyze Signaling in VoIP Networks: H.323 Protocols
5. LO5 Analyze Signaling in VoIP Networks: SIP and MGCP
6. LO6 Analyze Integration of VoIP and SS7 Networks
7. LO7 Identify, formulate and solve Media Packet Compression and Codecs
8. LO8 Analyze Real Time and Streaming Protocols
9. LO9 Analyze Voice/Video Over IP and Multimedia Networks, SCTP Protocol

Course Requirements

Homework Assignments

Homework Project

Exams: Mid-Term Exam and Final Exam

Class Participation: Class Participation is a course requirement

Tentative Course Schedule

1. Overview of VoIP and Multimedia Networks
Weeks 1
2. Fundamentals of PSTN and SS7 Protocol Signaling Networks
Weeks 1 and 2
3. Voice Preparation for IP Networking and Codecs
Weeks 3 and 4
4. Signaling in VoIP Networks: H.323 Protocols
Weeks 5, 6 and 7

Mid-term Exam and Review
Week 8
5. Signaling in VoIP Networks: SIP and MGCP
Weeks 9
6. Integration of VoIP and SS7 Networks
Week 10
7. Media Packet Compression and Codecs
Week 11
8. Real Time and Streaming Protocols
Week 12

9. Voice/Video Over IP and Multimedia Networks, SCTP Protocol
Week 13

10. Advanced Topics in VoIP and Media Networking
Weeks 14 and 15

Review/ Final Exam
Weeks 16

Note: Be aware of Furlough days (non-working days for faculty due to state budget cut) mandated by the state of California and SJSU

Grading

Assignments/Project: 20%

Midterm Exam: 40% (Wed. October 21st)

Final Exam: 40%

Total: 100%

Problem Solving Sessions:

Homework problem solving sessions will be conducted before each exam.

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. 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).