

San Jose State University
Electrical Engineering Department

EE284

Convergent Voice, Video, and Data Networks

Fall 2017

Instructor

Instructor: Dr. Balaji Venkatraman

Department: Electrical Engineering, College: Engineering

Class Location & Hours:

Section 1 – 40607 - Meeting Information			
Days & Times	Room	Instructor	Meeting Dates
MoWe 7:30PM - 8:45PM	Engineering Building 345	Balaji Venkatraman	08/23/2017 - 12/11/2017

Preferred Contact: During Office Hours
Monday, Wednesday: 6:30 – 7:30 PM

Course Information

- **Course Code:** EE284, **Section: 01** (40607)
- **Course Title:** Convergent Voice and Data Networks, 3 credit hours
- **Course Description:** Public-Switched Telephone Network and SS7 Protocol, Voice over IP (VoIP) Signaling Protocols, H.323, Session Initiation Protocol (SIP), Internetworking VoIP, Regular, and Wireless Cellular Networks, Media Gateways, Media Preparation and Compression, Codecs, Multimedia Networks, IPTV, VoD, Content Delivery Networks (CDNs)
- **Prerequisites:** EE281 or UG Equivalent
- **Text-Book:**
 - “Carrier Grade Voice Over IP,” 2nd Ed., 2003, Daniel Collins, ISBN 0-07-140634-4, McGraw-Hill Networking Professional. (2nd edition or later)
- **Lecture Notes:** All lecture notes will be posted on Canvass
- **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:**
 1. IEEE Communications Magazine
 2. IEEE Network Magazine
- **Student Learning Objectives (LOs) for the Course:** Upon successful completion of this course, students will be able to:
 1. Analyze Overview of VoIP and Multimedia Networks
 2. Specify and qualify Fundamentals of PSTN and SS7 Protocol
 3. Identify, formulate and solve Voice Preparation for IP Networking and Codec
 4. Analyze Signaling in VoIP Networks: H.323 Protocols
 5. Analyze Signaling in VoIP Networks: SIP and MGCP
 6. Analyze Integration of VoIP and SS7 Networks
 7. Identify, formulate and solve Media Packet Compression and Codecs
 8. Analyze Real Time and Streaming Protocols
 9. Analyze Voice/Video Over IP and Multimedia Networks, SCTP Protocol

Course Requirements

- **Homework Assignments**
- **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 (Week 1)
2. Fundamentals of PSTN and SS7 Protocol Signaling Networks (Weeks 1 and 2)
3. Signaling in VoIP Networks: H.323 Protocols (Weeks 3 and 4)
4. Signaling in VoIP Networks: SIP and MGCP (Weeks 5, 6)
- Mid-term Exam and Review (Week 7)*
5. Integration of VoIP and SS7, and Wireless LTE Networks (Week 8)
6. Voice Preparation for IP Networking and Codecs (Weeks 9 and 10)
7. Media Compression and Packetization for IP Networking (Weeks 11 and 12)
8. Real Time and Streaming Protocols (Week 13)
9. Voice/Video Over IP and Multimedia Networks, SCTP Protocol (Week 14)
10. Selected Topics: IPTV, Video on Demand, Content Delivery Networks (CDNs) (Week 15)

Review/ Final Exam (Weeks 15 and 16)

Grading

- **Assignments:** 10%
- **Project:** 20%
- **Midterm Exam:** 30%
- **Final Exam:** 40%

Total: 100%

Exams may be administered online using Canvas. Students should ensure that they have a laptop capable of installing and running the requisite software to take online quizzes and tests.

Pop up quizzes may be administered in class.

Standard Grading Percentage Breakdown (after possible normalizations):

Current grading scheme for this assignment		
Name:	Range:	
A	100 %	to 90.0%
A-	< 90.0 %	to 85.0%
B+	< 85.0 %	to 80.0%
B	< 80.0 %	to 75.0%
B-	< 75.0 %	to 70.0%
C+	< 70.0 %	to 65.0%
C	< 65.0 %	to 60.0%
C-	< 60.0 %	to 55.0%
D+	< 55.0 %	to 50.0%
D	< 50.0 %	to 45.0%
D-	< 45.0 %	to 40.0%
F	< 40.0 %	to 0.0%

- **Problem Solving Sessions:** Homework and quizzes can be reviewed and discussed with the ISA/TA or in class
- **Attendance:** Please be aware that there will be a number of random attendance checks throughout the semester

Policy Information

University Academic Integrity:

Students should know that the University's Academic Integrity Policy is available at <http://www.sjsu.edu/senate/docs/S04-12.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](http://www.sa.sjsu.edu/judicial_affairs/index.html) is available at 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.

Quizzes and Exams will be administered online using Canvas. Students should ensure that they have a laptop capable of installing and running the requisite software to take online quizzes and tests.

Pop up quizzes may be administered in class.

* **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).