EE151                 Communication Systems                 Summer 2018

## COURSE  SYLLABUS

### Course Description

An introduction to communication systems. Analysis and design of communication systems based on radio, transmission lines, and fiber optics. Topics include fundamentals of analog and digital signal transmission in the context of baseband communications, including concepts such as modulation and demodulation techniques, multiplexing and multiple access, pulse code modulation (PCM), distortion, and bandwidth. Digital communication concepts include an introduction to sampling and quantization and transmission coding. The effects of noise on the performance of analog and digital communication systems   (optional).

Prerequisite(s): courses 103, 101/L, and Computer Engineering 107 or Applied Math and Statistics 131 or probability theory and random variables background. Enrollment is restricted to School of Engineering and Physical and Biological Sciences majors

### Course Outline

- Amplitue Modulation: DSB-SC, SSB, DSB, QAM, VSB, receiver design, Chapter 3
- Angle Modulation: FM and PM relationship, FM narrowband and wideband modulation, FM demodulation and receiver, Chapter 4
- Pulse Modulation: PAM, PPM, PCM, Delta, DPCM, Line codes, Chapter 5
- Baseband Data Transmission: ISI, Nyquist channel, Raised-Cosine Pulse Spectrum, M-ary data transmission, Eye pattern, Chapter 6
- Digital Band-Pass Modulation: ASK, PSK, FSK, DPSK, non-coherent modulation, M-ary modulation, Chapter 7
- Analog and Digital communications in noise (optional)

Lecture: Monday and Wednesday 9 a.m.-12:30 p.m. Room J Baskin Engr 165.

Instructor: Hamid R. Sadjadpour, BE2-245B, Email: hamid@soe.ucsc.edu,

Phone: (831)459-1483.

Any question regarding the homeworks, should be directed to the TA or grader.

**Textbooks:**

Simon Haykin, Michael Moher, Introduction to Analog and Digital Communications, Second edition, John Wiley Publisher.

Homeworks (10%):

Problems will be given at the end of each chapter. Late homework will not be accepted.

Exams (Midterm 30%, Final 60% ):

No make-up exam under any circumstances. Exams most likely are closed book.

You must receive a passing grade on the Final exam to pass this course. Using phone during exam is considered cheating.

## Academic Dishonesty

Any confirmed academic dishonesty including but not limited to copying homeworks or cheating on exams, will result in a no-pass or failing grade. You are encouraged to read the campus policies regarding academic integrity. Examples of cheating include (but are not limited to):

- Sharing results or other information during an examination.
- Working on an exam before or after the official time allowed.
- Submitting homework that is not your own work.
- Reading another student's homework solution before it is due.
- Allowing someone else to read your homework solution before the assignment is due.
- If there is any question as to whether a given action might be construed as cheating, see me before you engage in any such actions