

EE 105 Introduction to Electrical Engineering

Fall, 2015

Course Syllabus

23 July, 2015

EE 105 Course Web Site: <https://blackboard.usc.edu/>

Instructor

Armand R. Tanguay, Jr.
Professor of Electrical Engineering–Electrophysics,
Chemical Engineering and Materials Science,
Biomedical Engineering, Ophthalmology,
and Physics and Astronomy;
Neuroscience Graduate Program

Office SSC 520 (Seaver Science Center)

Telephone 213-740-4403

E-Mail atanguay@usc.edu

Office Hours Monday and Wednesday, 5:30 to 7:00 p.m.
Other times by appointment

Class Location OHE 230 (Olin Hall of Engineering)

Class Time Tuesday and Thursday, 4:00 to 5:20 p.m.

Discussion Sections Tuesday, 8:00 p.m. to 9:00 p.m. (Tentative)
Wednesday, 8:00 p.m. to 9:00 p.m. (Tentative)

Grading Policy

Homework:	25%
Midterm Examination:	30%
Final Examination:	45%

Midterm Examination Tuesday, October 27th (Tentative)
Exact date, time, and location to be arranged

Final Examination Thursday, December 10th, 4:30 to 6:30 p.m. (Tentative)
Exact date, time, and location to be arranged

EE 105 Introduction to Electrical Engineering

Graduate Teaching Fellows

To Be Arranged

(Homework Sets, Lecture Demonstrations, Discussion Sections, Grading)

Office:

Telephone:

E-Mail:

Office Hours:

To Be Arranged

(Homework Sets, Lecture Demonstrations, Discussion Sections, Grading)

Office:

Telephone:

E-Mail:

Office Hours:

Prerequisite or Corequisite

Math 125 Calculus I; can be waived if calculus studied elsewhere

Required Textbooks

Roman Kuc, *The Digital Information Age: An Introduction to Electrical Engineering*, Second Edition, Cengage Learning, Stamford, Connecticut, (2015).

Dick White and Roger Doering, *Electrical Engineering Uncovered*, Second Edition, Prentice Hall, Englewood Cliffs, New Jersey, (2001).

Excellent Recommended Texts

David Cyganski and John A. Orr, with Richard F. Vaz, *Information Technology: Inside and Outside*, Prentice Hall, Upper Saddle River, New Jersey, (2001).

J. David Irwin and David V. Kerns, Jr., *Introduction to Electrical Engineering*, Prentice Hall, Englewood Cliffs, New Jersey, (1995).

John G. Truxal, *The Age of Electronic Messages*, MIT Press, Cambridge, Massachusetts, (1990).

EE 105 Introduction to Electrical Engineering

EE 105 Course Outline (Topics)

1. Overview of Electrical Engineering (EE as a Discipline)
2. Information and Communication
3. Information Representations (Language)
4. Encryption and Decryption
5. Signals in the Time Domain: Analog and Digital
6. Signals in the Frequency Domain: Tones, Spectrum Analyzer
7. Signal Modulation; AM and FM Radio, TV
8. Communications Example: HDTV
9. Introduction to Computation: Computing and Computing Architectures
10. The Computer as a Communications Network
11. Key Computational Parameters: Throughput, Bandwidth, Storage Capacity
12. Main and Peripheral Device Buses; Data Storage; CPUs
13. Digital Imaging
14. Introduction to Direct Current (DC) Linear Circuits
15. Circuit Parameters: Current, Voltage
16. Device Characteristics: Resistance, Capacitance, Inductance
17. Alternating Current (AC) Circuits
18. Semiconductor Devices: Diodes, Transistors
19. Semiconductor (VLSI Circuit) Fabrication; Cleanroom Tour

EE 105 Laboratory Experiments

Pre-Laboratory for Experiment 1: Free Space Optical Communications
(Introduction to laboratory instrumentation, including power supplies, signal generators, and digital storage oscilloscopes)

Experiment 1: Free Space Optical Communications
(Exploration of the design, fabrication, and operation of a free space optical communications system, consisting of a transmitter and receiver, the basis of modern fiber optics and space based communications systems)

Experiment 2: Musical Tone Synthesizer
(Construction, analysis, and operation of a simple circuit that allows for the generation of multiple musical tones, the basis for an electronic synthesizer)