EE 105 Introduction to Electrical Engineering

Fall, 2021

Course Syllabus

13 June, 2021

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)

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Office Hours  
Tuesday and Thursday, 6:00 p.m. to 7:30 p.m.,
OHE 230
Other times by appointment
For Fall, 2021, the schedule will be determined in
consultation with the class

Class Location  
OHE 230 (Olin Hall of Engineering)

Class Time  
Tuesday and Thursday, 4:00 to 5:50 p.m.

Discussion Sessions  
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 19th (Tentative)
Exact date, time, and location or format to be arranged

Final Examination  
Tuesday, December 9th, 4:30 to 6:30 p.m.
Location or format to be arranged
EE 105 Introduction to Electrical Engineering

Graduate Teaching Fellows

TBD
(Homework Sets, Lecture Demonstrations, Discussion Sections, Grading)
Office: TBD
Telephone: TBD
E-Mail: TBD
Office Hours: TBD
Other times by appointment

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Prerequisite or Corequisite

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

Required Textbooks


Excellent Recommended Texts


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
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 Logic
14. Digital Imaging
15. Introduction to Direct Current (DC) Linear Circuits
16. Circuit Parameters: Current, Voltage
17. Device Characteristics: Resistance, Capacitance, Inductance
18. Alternating Current (AC) Circuits
19. Semiconductor Devices: Diodes, Transistors
20. Semiconductor (VLSI Circuit) Fabrication; Cleanroom Tour

EE 105 Laboratory Experiments

Probability Simulations
(Simulations of the tossing of one or more dice in sequences)

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)
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Course Calendar

23 August, 2021 (Monday)  First Day of Fall Semester Classes
24 August, 2021 (Tuesday) First EE 105 Class
6 September, 2021 (Monday) Labor Day (University Holiday)
10 September, 2021 (Friday) Last Day to Register and Add Classes
10 September, 2021 (Friday) Last Day to Drop Without a “W”
10 September, 2021 (Friday) Last Day to Change Enrollment Option: (Pass/No Pass or Audit)
8 October, 2021 (Friday)  Last Day to Drop Without a “W” Appearing on the Transcript
8 October, 2021 (Friday)  Last Day to Change Enrollment Option: (Pass/No Pass to Letter Grade)
19 October, 2021 (Tuesday) Midterm Examination (Tentative)
12 November, 2021 (Friday) Last Day to Drop With a “W”
24 – 28 November, 2021 Thanksgiving Break
3 December, 2021 (Friday)  Fall Semester Classes End
4 – 7 December, 2021  Stop Period (Study Days)
8 – 15 December, 2021  Final Examination Period
9 December, 2021 (Tuesday) EE 105 Final Examination, 11:00 a.m. - 1:00 p.m. (2:00 p.m.)
16 December, 2021 – 9 January, 2022 Winter Recess