

EE 105 Introduction to Electrical Engineering

Fall, 2021

Course Syllabus

4 October, 2021

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

Instructor

Armand R. Tanguay, Jr.
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Chemical Engineering and Materials Science,
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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 Saturday, October 23rd (Tentative)
Exact date, time, and location or format to be arranged

Final Examination Thursday, December 9th, 4:30 to 6:30 p.m.
Location or format to be arranged

EE 105 Introduction to Electrical Engineering

Graduate Teaching Fellow

Matin Barekatin

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

Office: VHE 418

Telephone: 323-449-8986

E-Mail: barekata@usc.edu

Office Hours: Mondays
5:00 p.m. to 7:00 p.m.
Other times by appointment

Undergraduate Teaching Fellows

Alexander (Xander) Morgan

(Homework Sets, Lecture Content)

E-Mail: xmorgan@usc.edu

Office Hours: Saturdays
12:00 p.m. to 2:00 p.m.
Other times by appointment

Jocelyn Liu

(Homework Sets, Lecture Content)

E-Mail: liujocel@usc.edu

Office Hours: Sundays
12:00 p.m. to 2:00 p.m.
Other times by appointment

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 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)
14 October – 15 October, 2021	Fall Recess
23 October, 2021 (Saturday)	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