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ELEN350 16

Course Summary

Course : ELEN350 **Title :**
Length of Course : 16 **Faculty :**
Prerequisites : N/A **Credit Hours :**

Description

Course Description:

Course Scope:

At the end of this course you will have an understanding of electrical and magnetic materials and forces, their characteristics and uses, and methods used to characterize conditions.

Objectives

After completing the course, the student should be able to accomplish these Learning Objectives (LO):

1. Describe the specific characteristics of electrical and magnetic fields.
 2. Analyze the transmission and reflection of electromagnetic waves through various media and interfaces.
 3. Develop Maxwell's Equations.
 4. Solve circuit problems using vector analysis.
 5. Describe the various applications of static fields.
 6. Distinguish the different types of plane wave propagation and the commensurate properties for each.
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Outline

Week 1: Introductions, Electrostatic Field in Fre

Learning Outcomes

(LO-1, LO-5)

Required Readings

Chapter 1

Assignments

Assignment for Week 1 due end of week

Week 2: Electrostatic Field in Free Space (cont.), Dielectrics, Capacitance, and Electric Energy

Learning Outcomes

(LO-1, LO-5)

Required Readings

Chapter 1 (cont.)

Chapter 2

Assignments

Assignment for Week 2 due end of week

Week 3: Dielectrics, Capacitance, and Electric Energy (cont.), Steady Electric Currents

Learning Outcomes

(LO-1, LO-5)

Required Readings

Chapter 2 (cont.)

Chapter 3

Assignments

Assignment for Week 3 due end of week

Week 4: Magnetostatic Field in Free Space

Learning Outcomes

(LO-1, LO-5)

Required Readings

Chapter 4

Assignments

Assignment for Week 4 due end of week

Week 5: Magnetostatic Field in Material Media

Learning Outcomes

(LO-1, LO-5)

Required Readings

Chapter 5

Assignments

Assignment for Week 5 due end of week

Week 6: Slowly Time-Varying Electromagnetic Field

Learning Outcomes

(LO-2, LO-3)

Required Readings

Chapter 6

Assignments

Assignment for Week 6 due end of week

Week 7: Inductance and Magnetic Energy

Learning Outcomes

(LO-2, LO-3)

Required Readings

Chapter 7

Assignments

Assignment for Week 7 due end of week

Midterm Exam

Week 8: Rapidly Time-Varying Electromagnetic Field

Learning Outcomes

(LO-1, LO-2, LO-3)

Required Readings

Chapter 8

Assignments

Assignment for Week 8 due end of week

Week 9: Uniform Plane Electromagnetic Waves

Learning Outcomes

(LO-1, LO-2, LO-3)

Required Readings

Chapter 9

Assignments

Assignment for Week 9 due end of week

Week 10: Reflection and Transmission of Plane Waves

Learning Outcomes

(LO-1, LO-2, LO-3, LO-6)

Required Readings

Chapter 10

Assignments

Assignment for Week 10 due end of week

Week 11: Field Analysis of Transmission Lines

Learning Outcomes

(LO-1, LO-2, LO-3, LO-6)

Required Readings

Chapter 11

Assignments

Assignment for Week 11 due end of week

Week 12: Circuit Analysis of Transmission Lines

Learning Outcomes

(LO-1, LO-2, LO-3, LO-4, LO-6)

Required Readings

Chapter 12

Assignments

Assignment for Week 12 due end of week

Week 13: Waveguides and Cavity Resonators

Learning Outcomes

(LO-1, LO-2, LO-3, LO-4, LO-6)

Required Readings

Chapter 13

Assignments

Assignment for Week 13 due end of week

Week 14: Waveguides and Cavity Resonators (cont.)

Learning Outcomes

(LO-1, LO-2, LO-3, LO-4, LO-6)

Required Readings

Chapter 13

Assignments

Assignment for Week 14 due end of week

Week 15: Antennas and Wireless Communication Systems (cont.)

Learning Outcomes

(LO-1, LO-2, LO-3, LO-4, LO-6)

Required Readings

Chapter 14

Assignments

Assignment for Week 15 due end of week

Week 16: Antennas and Wireless Communication Systems (cont.)

Learning Outcomes

(LO-1, LO-2, LO-3, LO-4, LO-6)

Required Readings

Chapter 14

Assignments

Assignment for Week 16 due end of week

Final Exam

Evaluation

Instructor announcements: Weekly announcements will appear on Monday of each week in the online classroom. This announcement will also be e-mailed to each student. The announcement will discuss the assignments for the week along with any other pertinent information for the week.

This is an upper level course; all students' work is to be presented as such in terms of quality and content. The grading system will be based on your participation in the discussions (30% of your total grade), weekly assignments (30% of your grade), and midterm and final exams (40% of your grade).

Reading Assignments: Please refer to the Course Outline section of this syllabus for the weekly reading assignments.

Week 1 Introductions: Within 10 days of course start, each student must log into the classroom and introduce yourself to the class. This is a required assignment and your introduction is due by Sunday of Week 1. Your response must be 250-300 words (a requirement) and include the following information.

- a. Your name
- b. Your university major or program
- c. Where you are in the program of study
- d. Your academic goals, to include why you are taking this class
- e. Information that you would like to share about yourself

Weekly Discussions: The weekly discussion is for students to post their questions on course content for that week. This discussion should not be used to discuss specific test questions prior to receiving feedback from the instructor (after the test is graded). If there is a question on a specific question, find a similar problem in the book and ask a question on that problem or concept. Asking specific questions on test questions creates an unfair advantage and defeats the purpose of the assessment tool. Specific topics will occur throughout the course and will require critical thought/research for your input – be sure to keep up with ongoing discussions! Discussion Board posting are graded at the end of the session and will constitute 30% of your final grade,

Weekly Assignments: There will be weekly assignments during the course worth a total of 30% of your total grade. Each weekly assignment will cover one or more chapters in the book used in this course. For all problems requiring mathematical calculations, all work must be shown.

Exams: There will be three exams worth 40% of your final grade. Exams will be open book, open note tests. Exams will be administered without a proctor. Students must complete the numbered exam by the end of the week indicated in the schedule.

Grading:

Name	Grade %
Discussions	30.00 %
Introduce Yourself	1.88 %
Week 1: What causes sunburn?	1.88 %
Week 2: Charles Augustin de Coulomb (1736-1806)	1.88 %
Week 3: Michael Farady (1791-1867)	1.88 %
Week 4: Heinrich Friedrich Emil Lenz (1804-1865)	1.88 %
Week 5: Communication at great distances.....	1.88 %
Week 6: Joseph Henry (1797-1878)	1.88 %
Week 7: Faraday's Law of Electromagnetic Induction	1.88 %
Week 8: sources of electromagnetic radiation.....	1.88 %
Week 9: Application of mutual inductance	1.88 %
Week 10: Wavelength of light	1.88 %
Week 11: James Clark Maxwell (1831-1879)	1.88 %
Week 12: Alexander Graham Bell (1847-1922)	1.88 %
Week 13: Willebrood van Royen Snell (1580-1626)	1.88 %

Week 14: Oliver Heaviside (1850-1925)	1.88 %
Week 15: Heinrich Rudolf Hertz (1857-1894)	1.88 %
Assignments	30.00 %
Week 1 Assignment	3.00 %
Week 2 Assignment	1.80 %
Week 3 Assignment	1.80 %
Week 4 Assignment	1.80 %
Week 5 Assignment	1.80 %
Week 6 Assignment	1.80 %
Week 7 Assignment	1.80 %
Week 8 Assignment	1.80 %
Week 9 Assignment	1.80 %
Week 10 Assignment	1.80 %
Week 11 Assignment	1.80 %
Week 12 Assignment	1.80 %
Week 13 Assignment	1.80 %
Week 14 Assignment	1.80 %
Week 15 Assignment	1.80 %
Week 16 Assignment	1.80 %
Midterm Exam	20.00 %
Week 7 Midterm	20.00 %
Final Exam	20.00 %
Week 16 Final	20.00 %

Materials

Course Guidelines

LATE POLICY

The University encourages all work to be completed according to the course schedule. The University Late Work Policy can be found in the Student Handbook here - <https://www.apus.edu/student-handbook/your-academic-success/before-your-course-begins/general-course-requirements.html>

University Policies

[Student Handbook](#)

- [Drop/Withdrawal policy](#)
- [Extension Requests](#)
- [Academic Probation](#)
- [Appeals](#)
- [Disability Accommodations](#)

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