

METROPOLITAN STATE COLLEGE of DENVER
Office of Academic Affairs

REGULAR COURSE SYLLABUS

School of: Professional Studies

Department: Engineering Technology

CIP Code: 15.0303

Prefix & Course Number: EET 3630

Crosslisted With*: _____

Course Title: Electromagnetic Fields

Check All That Apply: Required for Major: Required for Minor: _____ Specified Elective:

Required for Concentration: _____ Elective: _____ Service Course: _____

Credit Hours: 3 (3+0)

Total Contact Hours per semester (assuming 15-16 week semester):

Lecture 45 Lab 0 Internship _____ Practicum _____ Other (please specify type and hours): _____

Schedule Type(s): L Grading Mode(s): L

Variable Topics Courses (list restrictions, including the maximum number of hours that can be earned**):

** NOTE: This information must be included in the course description.

Restrictions (Variable Topics Course): _____

Prerequisite(s): EET 3110 and EET 3620 and MTH 2410, with grades of "C" or better

Corequisite(s): _____

Prerequisite(s) or Corequisite(s): _____

Banner Enforced:

Prerequisite(s): EET 3110 and EET 3620, and MTH 2410, with grades of "C" or better

Corequisite(s): _____

Prerequisite(s) or Corequisite(s): _____

Catalog Course Description:

This course covers mathematical concepts of static and dynamic electromagnetic fields. Topics include: planewave propagation in lossless and lossy media, waveguide propagation, and radiation principles.

APPROVED: Richard Pozzi 3/1/2011
 Department Chair OR Program Director 3-1-11
 Date
B. J. Morgaweg 6/2/11
 Dean OR Associate Dean 6/2/11
 Date
Heidi A. Johnson
 Associate VP, Academic Affairs 6/2/11
 Date

*If crosslisted, attach completed Course Crosslisting Agreement Form

Required Reading and Other Materials will be equivalent to:

Schwarz (1989), *Electromagnetics for Engineers*, Oxford, England: Oxford University Press

Specific, Measurable Student Behavioral Learning Objectives:

Upon completion of this course the student should be able to:

1. Explain the fundamental concepts of electromagnetic wave propagation.
2. Use many kinds of waveguides and antennas.
3. Apply electromagnetic field theory to the solution of radio communications problems.

Detailed Outline of Course Content (Major Topics and Subtopics) or Outline of Field Experience/Internship (experience, responsibilities and supervision):

- | | |
|---|---|
| I. Fundamentals of Transmission Lines (review): | IV. Electrodynamics and Maxwell's Equations |
| A. Lumped Circuit Theorem | V. Plane Waves: |
| B. Characteristic Impedance | A. Reflection |
| C. Attenuation | B. Refraction |
| D. Dispersion | C. Transmission |
| E. Reflection | D. Lossy Media |
| F. Transmission | VI. Guided Waves: |
| G. Impedance Matching | A. Transmission Lines |
| H. Standing Wave Ratio | B. Hollow Metal Waveguides |
| I. Measurements | C. Optical Filters |
| II. Mathematics of Fields: | VII. Antennas: |
| A. Vector Analysis | A. Sources |
| B. Line and Surface Integrals | B. Dipoles |
| C. Scalar and Vector Fields | C. Arrays |
| III. Statics: | |
| A. Electric Fields | |
| B. Magnetic Fields | |

Evaluation of Student Performance:

1. Written exams
2. Written lab reports
3. Computer simulations