METROPOLITAN STATE UNIVERSITY OF DENVER
Office of Academic and Student Affairs

REGULAR COURSE SYLLABUS

School of: Professional Studies
Department: Engineering Technology
Prefix & Course Number: EET 3110 Crosslisted With*: 
Course Title: Transform Methods in Circuit Analysis
Banner course title (30 characters): Transform Methods Circuit Anal
Check All That Apply: Required for Major: X Required for Minor: Specified Elective: 
Required for Concentration: Elective: Service Course: 

To receive Title IV financial aid funds, all institutions of higher education must comply with the federal definition of a credit hour. The Higher Learning Commission requires institutions to maintain policies and procedures for verifying compliance with this definition.

Federal Credit Hour Definition: A credit hour is an amount of work represented in intended learning outcomes and verified by evidence of student achievement that is an institutionally-established equivalency that reasonably approximates not less than: (1) one hour of classroom or direct faculty instruction and a minimum of two hours of out-of-class student work each week for approximately fifteen weeks for one semester or trimester hour of credit, or ten to twelve weeks for one quarter hour of credit, or the equivalent amount of work over a different amount of time; or (2) at least an equivalent amount of work as required in paragraph (1) of this definition for other activities as established by an institution, including laboratory work, internships, practica, studio work, and other academic work leading toward the award of credit hours. 34CFR 600.2 (11/1/2010)

Credit Hours: 4 (4 + 0 )

Face-to-Face or Equivalent Hours per course:
Lecture 60 Lab Internship Practicum Other (please specify type and hours):

Additional Student Work Hours per course: 120

Schedule Type: L Grade Mode: L

Variable topics umbrella course: No X Yes If Yes, number of credit hours allowed

Specified repeatable course: No X Yes

APPROVED:

Date
Department Chair OR Program Director
Date
Dean OR Associate Dean
Date
Associate VP, Academic and Student Affairs

*If crosslisted, attach completed Course Crosslisting Agreement Form
Prefix and Course Number: EET 3110

Prerequisite(s): EET 1150 and MTH 2410, with a grade of “C” or better
Corequisite(s): _____
Prerequisite(s) or Corequisite(s): _____

Banner Enforced:
Prerequisite(s): EET 1150 and MTH 2410, with a grade of “C” or better
Corequisite(s): _____
Prerequisite(s) or Corequisite(s): _____

Registration restrictions: Level _____ Class _____ Program/Major _____ Student attribute _____

Catalog Course Description:
This is an advanced-level circuit analysis course introducing the use of classical ordinary differential equations combined with mathematical transforms to solve complex electronic networks. MATLAB, or equivalent, software is introduced and used as a tool for circuit analysis throughout the course.

Specific Variable Topics Course Description (if applicable, umbrella course description included above):

Required Reading and Other Materials will be equivalent to:

Specific, Measurable Student Behavioral Learning Objectives:
Upon completion of this course the student should be able to:
1. Perform analysis on complex circuits using classical ordinary differential equations and frequency space transformation.
2. Find the transfer function and determine steady state values of circuits and systems.
3. Use MATLAB, or equivalent, software to perform time and frequency based analysis of electronic systems.
4. Calculate the Fourier series or transform of common electrical engineering signals and apply the results to the analysis of electronic systems.

Detailed Outline of Course Content:

I. Review of Basic Circuits Analysis
   A. Nodal and Mesh Network Analysis
   B. Thevenin and Norton Equivalent Circuits
   C. Dependent Sources
   D. Inductance and Capacitance
      1. Stored Energy
      2. Resonance

II. Introduction to Matrix Laboratory (MATLAB) mathematical modeling, or equivalent, software.

III. Ordinary differential equations
   A. First order circuits
   B. Second order circuits
      1. Zero input solution
      2. Total solution
         a) Step response
         b) Steady state analysis
         c) Complex frequency and circuit response
IV. Laplace Transform:
   A. Definition
   B. Properties and Constraints
   C. Inverse Transforms
      1. Partial fraction expansion
      2. Table Look-up
   D. Initial and Final Value Theorems
   E. Application
      1. Ordinary differential equations
      2. Electric circuit analysis
      3. The Laplace transform function in MATLAB

V. Circuit Analysis via Laplace
   A. Nodal
   B. Thevenin
   C. Norton
   D. Superposition Theorem
   E. Voltage Divider

VI. Transfer Functions
   A. Concept
   B. Poles and Zeros
   C. Bode Plots
   D. Transfer function analysis using MATLAB

VII. Fourier Series
   A. Definition
   B. Properties and Constraints
   C. Computation and analysis of results

VIII. Fourier Transform
   A. Definition
   B. Properties and Constraints
   C. Computation by integration
   D. Parseval’s Theorem

Evaluation of Student Performance:
1. Written exams
2. Homework
3. Quizzes