PUROE UNIVERSITY
REQUEST FOR ADDITION, EXPIRATION,
OR REVISION OF AN UNDERGRADUATE COURSE
(10000-40000 LEVEL)

DEPARTMENT: Engineering  EFFECTIVE SESSION: Spring 2010

INSTRUCTIONS: Please check the items below which describe the purpose of this request.

☐ 1. New course with supporting documents
☐ 2. Add existing course offered at another campus
☐ 3. Expiration of a course
☐ 4. Change in course number
☐ 5. Change in course title
☐ 6. Change in course credit/type
☐ 7. Change in course attributes (department head signature only)
☐ 8. Change in instructional hours
☐ 9. Change in course description
☐ 10. Change in course requisites
☐ 11. Change in semesters offered (department head signature only)
☐ 12. Transfer from one department to another

PROPOSED:

Subject Abbreviation: ECE
Course Number: 474
Long Title: Introduction to Radio Frequency Circuit Design
Short Title: Int RF Circuit Des

EXISTING:
Subject Abbreviation:
Course Number:

TERMS OFFERED:
Check all that apply:
☐ Summer
☐ Fall
☐ Spring

CAMPUS(ES) INVOLVED:
☐ Calumet
☐ Cont Ed
☐ Ft. Wayne
☐ Indianapolis
☐ N. Central
☐ Tech State/Sd
☐ W. Lafayette

ABBREVIATED TITLE will be entered by the Office of the Registrar if admitted. (50 CHARACTERS ONLY)

CREDIT TYPE

1. Fixed Credit: Cr. Hrs. 3
2. Variable Credit Range:
   Minimum Cr. Hrs. To
   Maximum Cr. Hrs. 3
3. Equivalent Credit: Yes No

SCHEDULE TYPE

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% of Credit Allocated: 15

COURSE ATTRIBUTES: Check All That Apply

☐ academics
☐ 6 Registration Approval Type
   Department
   Instructor

☐ 7 Variable Title

☐ 8 Honors

☐ 9 Full Time Privilege

☐ 10 Off Campus Experience

COURSE DESCRIPTION (INCLUDE REQUIREMENTS/RESTRICTIONS):

An introductory course for the analysis, design and simulation of radio frequency (RF) circuits and components for communication systems and industrial applications. It concentrates on such topics as fundamental concepts of transmission line theory, high frequency circuit behavior, designing tuning and matching networks, filter networks, power amplifiers, smith chart, two port networks and S-parameters.

Pre-requisites: ECE 311 Electric and Magnetic Field, ECE 255 Introduction to Electronic Analysis and Design

Calumet Department Head: Date
Calumet School Dean: Date

Ft. Wayne Department Head: Date
Ft. Wayne School Dean: Date

Indianapolis Department Head: Date
Indianapolis School Dean: Date

North Central Department Head: Date
North Central Chancellor: Date

West Lafayette Department Head: Date
West Lafayette College/School Dean: Date

W. Lafayette Registrar: Date
Required Course
ECE 474 – Introduction to RF Circuit Design
Offered in the Fall or Spring semester

2009 Catalog Data
Class: 3. Lab: 0. Credits: 3.
Development of the basic principles and knowledge in the design of radio frequency (RF) circuits. Use of CAD tools in the RF circuit design.

Prerequisites
ECE 311 – Electric and Magnetic Fields
ECE 255 – Introduction to Electronic Analysis and Design

Prerequisite by Topic
Familiarity with the characteristics of semiconductor components such as diodes, BJTs, and FETs and the operation of electronic circuits. Basic knowledge of electromagnetic waves and transmission lines.

Required Textbook

References


Coordinator
Abdullah Eroglu, Assistant Professor of Electrical Engineering

Course Objectives
This is an introductory course for the analysis, design and simulation of radio frequency (RF) circuits and components for communication systems and industrial applications. It concentrates topics such as fundamental concepts of transmission line theory, high frequency circuit behavior, designing tuning and matching networks, filter networks, power amplifiers, smith chart, two port networks and S-parameters.

Schedule
Two 75-minute lectures per week

Lecture Topics
1. Introduction to RF Circuits  1 classes
2. RF characteristics of RF components  1 classes
3. Resonant circuits  2 classes
4. RF inductor and transformer design  1 classes
5. Filter Design  2 classes
6. Smith chart and its applications  2 classes
7. Transmission Lines  2 classes
8. Matching Networks  3 classes
9. Two-port networks  2 classes
10. Scattering parameters  2 classes
11. RF power amplifier design  3 classes
12. Use of CAD tool in RF circuit design 2 classes
13. Reviews 2 classes
14. Exams 2 classes

Course Outcomes

1. a basic knowledge of general RF circuits, components and systems [e,2]
2. an understanding of resonant circuits [a,e,k,1,2,6]
3. an ability to use Smith Chart in RF applications [a,c,k,1,4,6]
4. an ability to design impedance matching networks and passive RF filters [a,c,g, k,1,4,8,6]
5. an understanding of two port networks and S-parameters [a,e,k,1,2,6]
6. an understanding of RF power amplifiers [a,k,1,6]
7. an ability to use CAD tools in RF circuit design [a,c,k,1,4,6]

ABET category: Engineering science: 2 credits or 75%
Engineering design: 1 credit or 25%

Prepared by: Abdullah Eroglu Date: April 2, 2009