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

DEPARTMENT: School of Electrical and Computer Engineering (EFD 66-10) EFFECTIVE SESSION Fall 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: 40020
Long Title: Sound Reinforcement System Design
Short Title: Sound Reinforcement Sys Design

EXISTING:
Subject Abbreviation
Course Number
Long Title
Short Title

TEAMS OFFERED
Check All That Apply:

SUMMER
FAI
SPRING

CAMPUS(ES) INVOLVED
Calumet
Cont Ed
Fl. Wayne
Indianapolis
N. Central
Tech Statewide
W. Lafayette

Abbr. title will be entered by the Office of the Registrar if omitted. (30 characters only)

CREDIT TYPE
1. Fixed Credit: Cr. Hrs: 3
2. Variable Credit Range: Minimum Cr. Hrs (Check One)
   -- To
   -- Or
   -- Yes
   -- No
3. Equivalent Credit: Yes

COURSE ATTRIBUTES: Check All That Apply
6. Registration Approval Type
   -- Department
   -- Instructor

7. Variable Title
8. Honors
9. Full Time Privilege
10. Off Campus Experience

Schedule Type: Lecture
Minutes Per Mfg: 50
Meetings Per Week: 3
Weeks Offered: 16
% of Credit Allocated: 100

Cross-Listed Courses: 2011 Aug

COURSE DESCRIPTION (INCLUDE REQUISITES/RESTRICTIONS):
See attachment.

*COURSE LEARNING OUTCOMES:
See attachment.

Calumet Department Head
Date
Calumet School Dean
Date

Fort Wayne Department Head
Date
Fort 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
West Lafayette Registrar
Date

OFFICE OF THE REGISTRAR
TO: The Faculty of the College of Engineering

FROM: The Faculty of the School of Electrical and Computer Engineering

RE: New Undergraduate Course: ECE 40020 Sound Reinforcement System Design

The faculty of the School of Electrical and Computer Engineering has approved the following new course. This action is now submitted to the Engineering Faculty with a recommendation for approval.

ECE 40020 Sound Reinforcement System Design
Sem. Fall, Cr. 3, Lecture 3.

Prerequisites: ECE 25500 and (ECE 30100 [may be taken concurrently])

Restrictions: Must be enrolled in one of the following Majors: Electrical Engineering, Interdisciplinary Engineering

Description: An introduction to computational tools used in the measurement and analysis of electro-acoustic systems, and their application to sound reinforcement system engineering. Service learning based projects, serving the needs of community clients, provides the context for application of sound reinforcement system design principles and practices.

Reason: This course has been offered as ECE 49500 in Fall 2006 (6 students), Fall 2007 (6), Fall 2008 (9), Fall 2009 (12), Fall 2010 (12), and will be offered in Fall 2011. This course is for students with an interest in sound system design and provides them with the opportunity to gain first-hand experience with industry standard computer-based tools.

[Signature]
on behalf of V. Balakrishnan, Head
School of Electrical and Computer Engineering

APPROVED FOR THE FACULTY OF THE SCHOOLS OF ENGINEERING BY THE ENGINEERING CURRICULUM COMMITTEE

ECC Minutes #17
Date 4-20-11
Chairman ECC R. Capra
ECE 40020 - Sound Reinforcement System Design

Lecture Hours: 3.0 Credits: 3.0

Requisites: ECE 25500 and (ECE 30100 [may be taken concurrently])

Requisites by Topic: Basic electronic components and circuit design principles Concurrent Prerequisites: Basic understanding of signals and systems

Catalog Description:
An introduction to computational tools used in the measurement and analysis of electro-acoustic systems, and their application to sound reinforcement system engineering. Service learning based projects, serving the needs of community clients, provide the context for application of sound reinforcement system design principles and practices.

Required Text(s):


Recommended Text(s):


Course Outcomes:

A student who successfully fulfills the course requirements will have demonstrated:

i. an ability to apply knowledge obtained in earlier coursework and to obtain new knowledge necessary to design a sound reinforcement system. [1,2,3,4,5; a,b,c,e,i,j,k]
ii. an understanding of the engineering design process. [4; b,c,e,f,h]
iii. an ability to function on a multidisciplinary team. [6; d,h,j]
iv. an awareness of professional and ethical responsibility. [6; f,h,j]
v. an ability to communicate effectively, in both oral and written form. [6; g]

Assessment Method for Course Outcomes: Outcome Evaluation Instruments Used (i) Sound System Design and EASE Simulation for Assigned Venue (ii) Concept Questions on Midterm and Final Exams (iii) Service Learning Report for Community Client (iv) Essay Questions on Midterm and Final Exams (v) Written Project Report and Presentation Students must demonstrate basic competency in all the course outcomes, listed above, in order to receive a passing grade. Demonstration of Outcome (i) will be based on successful completion of a sound reinforcement design for an assigned venue (e.g., 2000-seat general-purpose auditorium with balcony), for which a minimum score of 60% will be required to establish basic competency (based on technical content and design constraint satisfaction
scores on project report). Demonstration of Outcome (ii) will be based on successful completion of concept questions on the midterm and final exams, for which a minimum score of 60% will be required to establish basic competency. Demonstration of Outcome (iii) will be based on successful completion of an audio-related service learning project for a community client and submission of a written report detailing the work completed, for which a minimum score of 60% will be required to establish basic competency. Demonstration of Outcome (iv) will be based on successful completion of essay questions on the midterm and final exams (that address economic, environmental, ethical, safety, reliability, and social issues associated with sound system design), for which a minimum score of 60% will be required to establish basic competency. Demonstration of Outcome (v) will be based on the written project report (technical writing style score) and oral presentation, for which a minimum score of 60% on each will be required to establish basic competency.

Lecture Outline:

<table>
<thead>
<tr>
<th>Week(s)</th>
<th>Topics</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Physics: radiation of sound</td>
</tr>
<tr>
<td>3</td>
<td>Sound: transmission, summation, and reception</td>
</tr>
<tr>
<td>3</td>
<td>Design: evaluation, prediction, variation, and specification</td>
</tr>
<tr>
<td>3</td>
<td>Optimization: examination, verification, and calibration</td>
</tr>
<tr>
<td>3</td>
<td>Component selection: loudspeakers, power amplifiers, signal processors, mixing consoles, microphones, racks, wiring</td>
</tr>
<tr>
<td>1</td>
<td>Project presentations</td>
</tr>
<tr>
<td>1</td>
<td>Demos, design project overview, midterm exam</td>
</tr>
</tbody>
</table>

Engineering Design Content:

Establishment of Objectives and Criteria
Synthesis
Analysis
Testing
Evaluation

Engineering Design Consideration(s):

Economic
Environmental
Ethical
Health/Safety
Social
School of Electrical and Computer Engineering (EFD 66-10)

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Restrictions: Must be enrolled in one of the following Majors: Electrical Engineering, Interdisciplinary Engineering

Learning Outcomes:

A student who successfully fulfills the course requirements will have demonstrated:

i. an ability to apply knowledge obtained in earlier coursework and to obtain new knowledge necessary to design a sound reinforcement system.

ii. an understanding of the engineering design process.

iii. an ability to function on a multidisciplinary team.

iv. an awareness of professional and ethical responsibility.

v. an ability to communicate effectively, in both oral and written form.