

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

Print Form

EFD 6/1/07

DEPARTMENT Electrical and Computer Engineering

EFFECTIVE SESSION Fall 2009

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

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

PROPOSED:

EXISTING:

TERMS OFFERED
Check All That Apply:

Subject Abbreviation ECE

Subject Abbreviation ECE

Summer Fall Spring

Course Number 47700

Course Number 47700

CAMPUS(ES) INVOLVED

Long Title Digital Systems Senior Project

Short Title Digital Systems Sr Project

- | | |
|---------------------------------------|--|
| <input type="checkbox"/> Calumet | <input type="checkbox"/> N. Central |
| <input type="checkbox"/> Cont Ed | <input type="checkbox"/> Tech Statewide |
| <input type="checkbox"/> Ft. Wayne | <input checked="" type="checkbox"/> W. Lafayette |
| <input type="checkbox"/> Indianapolis | |

Abbreviated title will be entered by the Office of the Registrar if omitted. (30 CHARACTERS ONLY)

CREDIT TYPE

COURSE ATTRIBUTES: Check All That Apply

1. Fixed Credit: Cr. Hrs. 4
2. Variable Credit Range:
Minimum Cr. Hrs
(Check One) To Or
Maximum Cr. Hrs.
3. Equivalent Credit: Yes No

1. Pass/Not Pass Only
2. Satisfactory/Unsatisfactory Only
3. Repeatable
- Maximum Repeatable Credit:
4. Credit by Examination
5. Special Fees

6. Registration Approval Type
Department Instructor
7. Variable Title
8. Honors
9. Full Time Privilege
10. Off Campus Experience

Schedule Type	Minutes Per Mtg	Meetings Per Week	Weeks Offered	% of Credit Allocated
Lecture	<u>100</u> <u>50</u>	2	15	50
Recitation				
resentation				
Laboratory	<u>200</u> <u>100</u>	2	15	50
Lab Prep				
Studio				
Distance				
Clinic				
Experiential				
Research				
Ind. Study				
Pract/Observ				

Cross-Listed Courses

COURSE DESCRIPTION (INCLUDE REQUISITES/RESTRICTIONS):

A structured approach to the development and integration of embedded microcontroller hardware and software that provides senior-level students with significant design experience applying microcontrollers to a wide range of embedded systems (e.g., instrumentation, process control, telecommunications, and intelligent devices). The primary objective is to provide practical experience developing integrated hardware and software for embedded microcontroller systems in an environment that models one which students will most likely encounter in industry.
Prerequisites: [(ECE 20100, 20200, 20700, 20800, 25500, 27000, 30100, 30200, 31100, 36200) or (ECE 20100, 20200, 20700, 20800, 25500, 26400, 27000, 30100, 30200, 33700, 36200, 36400, 36800)]

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 _____

Sandra Schaffer
West Lafayette Registrar 3/8/09

OFFICE OF THE REGISTRAR

3/16/09
jm

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EFD 61-07

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 Cont Ed Tech Statewide
 Ft. Wayne W. Lafayette
 Indianapolis

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North Central Department Head _____ Date _____	North Central Chancellor _____ Date _____
West Lafayette Department Head <i>W. R. Mellich</i> 3/5/09 _____ Date _____	West Lafayette College/School Dean <i>Michael Yeaman</i> 3/5/09 _____ Date _____

West Lafayette Registrar _____ Date _____

2009 MAY 28 AM 10:40
RECEIVED
OFFICE OF THE REGISTRAR

TO: The Faculty of the College of Engineering
FROM: The Faculty of the School of Electrical and Computer Engineering
RE: ECE 477, Changes in Credit, Description, Content, and Requisites

The faculty of the School of Electrical and Computer Engineering has approved the following changes to the undergraduate level course, ECE 477. This action is now submitted to the Engineering Faculty with a recommendation for approval.

From: **ECE 477 Digital Systems Senior Project**
Sem. 1 and 2. Class 2, Lab 2. Cr. 3.
Prerequisite: ECE 362. Authorized equivalent courses or consent of instructor may be used in satisfying course pre- and co-requisites.

A structured approach to the development and integration of embedded microcontroller hardware and software that provides senior-level students with significant design experience applying microcontrollers to a wide range of embedded systems (e.g., instrumentation, process control, telecommunications, intelligent devices, etc.). The primary objective is to provide practical experience developing integrated hardware and software for embedded microcontroller systems in an environment that models one which students will most likely encounter in industry.

To: **ECE 477 Digital Systems Senior Project**
Sem. 1 and 2. Class 2, Lab 4, Cr. 4.
Prerequisite: [(ECE 201, 202, 207, 208, 255, 270, 301, 302, 311, 362) or (ECE 201, 202, 207, 208, 255, 264, 270, 301, 302, 337, 362, 364, 368)] and consent of instructor.

A structured approach to the development and integration of embedded microcontroller hardware and software that provides senior-level students with significant design experience applying microcontrollers to a wide range of embedded systems (e.g., instrumentation, process control, telecommunications, and intelligent devices). The primary objective is to provide practical experience developing integrated hardware and software for embedded microcontroller systems in an environment that models one which students will most likely encounter in industry.

Reason: The course description, content, credit hours, and requisites have been changed to reflect the updated content of the course. The course has been offered in this form as ECE 495C since Fall 2007.

M. J. T. Smith, Head
School of Electrical and Computer Engineering

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

ECC Minutes # 11

Date 11-12-08

Chairman ECC R. Cipra

ECE 477 – Digital Systems Senior Project

Required Text(s): *None*

Course Outline

Lectures

Principal Topics

1	project proposal guidelines and documentation requirements
1	digital system design considerations
2	printed circuit board layout basics
1	embedded system design constraints
1	product packaging considerations
1	survey of alternative microcontrollers for embedded applications
3	embedded system interfacing: switching D.C. loads, optical isolation, keypads, RPGs, PWM, position control, steppers, A.C. loads
2	power supply design
2	passive component selection guidelines
1	patent infringement liability
2	design for reliability, maintainability, and safety; failure mode and risk analysis
2	board assembly, soldering techniques, and debugging
1	embedded software development
1	ethical/social/political/environmental product lifecycle impact analysis
2	formal design reviews
1	project success criteria demos

Lab Outline

<i>Weeks</i>	<i>Activity</i>
2	Learning how to use various CAD/CAE tools: schematic capture and PCB layout software.
3	Learning how to use various hardware/software development tools: target microcontroller assembler, compiler, linker; target microcontroller debug monitor; target microcontroller evaluation board; logic analyzer (timing and state analysis); in-circuit flash programmer.
3	Designing and testing target microcontroller system hardware and interface circuitry.
3	Designing and testing application software for target microcontroller system hardware.
3	Integrating system hardware and software along with packaging the final product.
1	Demonstrating the final product.

Course Outcomes: The BSEE and BSCmpE Program Attributes and Objectives are listed on-line at the URL:

<https://engineering.purdue.edu/ECE/Academics/Undergraduates/ProgramObjectivesandOutcomes>

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 and test a microcontroller-based digital system [1,2,3,4,5; a,b,c,e,i,j,k]
- ii) an understanding of the engineering design process [4,6,7; b,c,e,f,h]
- iii) an ability to function on a multidisciplinary team [6,7; d,h,j]
- iv) an awareness of professional and ethical responsibility [[6,7; f,h,j]
- v) an ability to communicate effectively, in both oral and written form [6; g]

