Office of the Registrar
FORM 40 REV. 5/11

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

DEPARTMENT: ECE

EFFECTIVE SESSION: Fall 2016

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

- [x] 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:		EXISTING:	
Subject Abbreviation	ECE	Subject Abbreviation	
Course Number	49022	Course Number	
Long Title	Electrical Engineering Senior Design Projects		
Short Title	Elec Engr Sr Design Proj		

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

TERMS OFFERED (Check All That Apply):
- [ ] Summer
- [x] Fall
- [x] Spring

CAMPUS(ES) INVOLVED:
- [ ] Calumet
- [ ] Cont Ed
- [ ] Ft. Wayne
- [ ] Indianapolis
- [ ] N. Central
- [ ] Tech Statewide
- [x] W. Lafayette

CREDIT TYPE
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 [ ]

COURSE ATTRIBUTES: Check All That Apply
1. Pass/Not Pass Only [ ]
2. Satisfactory/Unsatisfactory Only [ ]
3. Repeatable [ ]
   Maximum Repeatable Credit: [ ]
4. Credit by Examination [ ]
5. Fees [ ] Coop [ ] Lab [ ] Rate Request
   Include comment to explain fee
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	50	2	15	50
Recitation				
Presentation				
Laboratory	170	2	15	50
Lab Prep				
Studio				
Distance				
Clinic				
Experiential				
Research				
Ind. Study				
Pract/Observ				

Cross-Listed Courses

COURSE DESCRIPTION (INCLUDE REQUISITES/RESTRICTIONS):

Lecture sessions provide the student with background information on the design and management of projects. Formal lectures cover, for example, design for manufacturability, design for quality, test and evaluation, reliability and ethics, patents and copyrights, plus case studies. During the laboratory sessions, the students work in teams on a challenging open-ended electrical engineering project that draws on previous coursework. Projects routinely involve standard design facets (such as consideration of alternative solutions, feasibility considerations, and detailed system descriptions) and include a number of realistic constraints (such as cost, safety, reliability, and aesthetics). Lectures require use of the I-Clicker system.

*COURSE 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 and test a system, component, or process to meet desired needs.
ii. an understanding of the engineering design process.
iii. an ability to function on an interdisciplinary team.
iv. an awareness of professional and ethical responsibility.
v. effective communication skills, both oral and written.

	Date		Date
Calumet Department Head		Calumet School Dean	
Fort Wayne Department Head		Fort Wayne School Dean	
Indianapolis Department Head		Indianapolis School Dean	
North Central Faculty Senate Chair		Vice Chancellor for Academic Affairs	
West Lafayette Department Head	3/7/16	West Lafayette College/School Dean	3/11/16

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
SUBJECT: New Course numbered ECE 49022.

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 49022 Electrical Engineering Senior Design Projects
Sem. 1, 2; Lecture 2, Lab 6; Credit 4.
Prerequisites: (ECE 20100, ECE 20200, ECE 20700, ECE 20800, ECE25500, ECE 27000, ECE 30100, ECE 30200, ECE 31100) OR (ECE 20100, ECE 20200, ECE 20700, ECE 20800, ECE 25500, ECE 26400, ECE 27000, ECE 30100, ECE 30200, ECE 33700, ECE 36200, ECE 36400, ECE 36800)

Must be enrolled in one of the following Colleges: School of Electrical & Computer Engineering

Course Description:
Lecture sessions provide the student with background information on the design and management of projects. Formal lectures cover, for example, design for manufacturability, design for quality, test and evaluation, reliability and ethics, patents and copyrights, plus case studies. During the laboratory sessions, the students work in teams on a challenging open-ended electrical engineering project that draws on previous coursework. Projects routinely involve standard design facets (such as consideration of alternative solutions, feasibility considerations, and detailed system descriptions) and include a number of realistic constraints (such as cost, safety, reliability, and aesthetics).

REASON:

The School of Electrical and Computer Engineering seeks to provide Electrical Engineering majors with a capstone experience allowing students to work on collaborative projects. Two weekly lectures allow the introduction of pertinent technical background information and professional development topics (see the attached supplemental information). The two three-hour laboratory sessions are intended to allow students to gain hands-on experience working on team based projects using the accumulated skills of their chosen course of study. The proposed course is meant to complement ECE 47700 which is taken mainly by students in the Computer Engineering major. This course gives Electrical Engineering majors a four credit hour option to fulfill the requirements of senior design and is being offered as ECE 49595 during the Fall 2015 semester.

for V. Ragu Balakrishnan, Head
School of Electrical and Computer Engineering

Approved for the faculty of the Schools of Engineering by the Engineering Curriculum Committee
ECC Minutes 14 Date 3-15-16
Chairman ECC

ECE 49022 Electrical Engineering Senior Design Projects
Sem. 1, 2; Lecture 2, Lab 6; Credit 4.
Prerequisites: Must be enrolled in the School of Electrical and Computer Engineering. Complete Computer Engineering or Electrical Engineering core courses.

Course Description:
Lecture sessions provide the student with background information on the design and management of projects. Formal lectures cover, for example, design for manufacturability, design for quality, test and evaluation, reliability and ethics, patents and copyrights, plus case studies. During the laboratory sessions, the students work in teams on a challenging open-ended electrical engineering project that draws on previous coursework. Projects routinely involve standard design facets (such as consideration of alternative solutions, feasibility considerations, and detailed system descriptions) and include a number of realistic constraints (such as cost, safety, reliability, and aesthetics).

Learning Objectives:
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 system, component, or process to meet desired needs.
ii. an understanding of the engineering design process.
iii. an ability to function on an interdisciplinary team.
iv. an awareness of professional and ethical responsibility.
v. effective communication skills, both oral and written.

Required Text(s):

1. *Fundamentals of Engineering Design*, 2nd Edition, Barry Hyman, Prentice Hall, 2002, ISBN No. 978-0130467126.
2. *I-Clicker*, ISBN No. 9780716779391.

Proposed Lecture Outline for
ECE 40922 Electrical Engineering Design Projects

	LECTURE 1	LECTURE 2
Week 1	Ground Rules, Define Project	Prototype Construction Techniques and Static/Dynamic Evidence Capture
Week 2	Course Project and Housekeeping	Schematic Capture for Simulation and PCB Design
Week 3	Labor Day Holiday No	Design Strategies from ECE 207/208/270 & 362
Week 4	OPR1 grading and diagrams,	Analog Design Strategies: Linear/Non-linear
Week 5	Communications (JL) Overhead presentation technique	Digital Design Strategies: FSMs/Combinatorial
Week 6	PDR Preparation, etc. Safety	Mixed Signal – Crossing the Analog/Digital Divide
Week 7	Feedback from Review Design Constraints, Dr. Carla	Advanced Oscilloscope Techniques
Week 8	October Break Wed., Thu., Fri. labs	Passive Selection: Resistors and Inductors
Week 9	Quality	Passive Selection: Capacitors
Week 10	Discuss FDR, Orals	PCBs – the hidden component
Week 11	Troubleshooting & TRIZ	Practical Power Supplies (Switching and Linear)
Week 12	Assembly and Soldering	Practical Power Supplies, Batteries
Week 13	Q&A regarding Oral Progress Report 3	"*Design as a Life Style*" Jim Eaton, HP Design Engineer (ret.)
Week 14	Packaging	Reliability and Ethics
Week 15	Case Studies Discuss written report	Thanksgiving Vacation
Week 16	Patents and Copyrights John McNett, IP lawyer and senior partner.	EE Design Showcase