### Purdue University
Request for Addition, Expiration, or Revision of an Undergraduate Course
(10000-40000 Level)

**Department**: ECE  
**Effective Session**: 201710

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

- [x] New course with supporting documents
- [x] Change in course attributes (department head signature only)
- [ ] Add existing course offered at another campus
- [ ] Change in instructional hours
- [ ] Expiration of a course
- [ ] Change in course description
- [ ] Change in course number
- [ ] Change in course requisites
- [ ] Change in course title
- [ ] Change in semesters offered (department head signature only)
- [ ] Change in course credit type
- [ ] Transfer from one department to another

**Proposed**:  
**Subject Abbreviation**: ECE  
**Course Number**: 30411  
**Long Title**: Electric and Magnetic Fields

**Existing**:  
**Subject Abbreviation**: ECE  
**Course Number**: 31100  
**Long Title**: Electric and Magnetic Fields

**Terms Offered**: Check all that apply:
- [ ] Summer
- [x] Fall
- [x] Spring

**Campus(ES) Involved**:
- [ ] Calumet
- [ ] Cont Ed
- [ ] Ft. Wayne
- [ ] Tech Statewide
- [x] W. Lafayette
- [ ] Indianapolis

**Credit Type**

1. Fixed Credit: Cr. Hrs.
2. Variable Credit Range:  
   - Minimum Cr. Hrs: __________  
   - To: __________  
   - Or: __________  
   - Maximum Cr. Hrs: __________
3. Equivalent Credit: [x] Yes  
   - No

**Schedule Type**

- Lecture
- Recitation
- Presentation
- Laboratory
- Lab Prep
- Studio
- Distance
- Clinic
- Experiential
- Research
- Ind. Study
- PractIC/Excer

**Minutes Per Mg**

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<tr>
<th>Schedule Type</th>
<th>Weeks</th>
<th>% of Credit Allocated</th>
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**Course Attributes**: Check all that apply:

- [x] Pass/Not Pass Only
- [x] Satisfactory/Unsatisfactory Only
- [ ] Repeatable
- [ ] Maximum Repeatable Credit: __________
- [x] Credit by Examination
- [x] Fees
- [x] Coop
- [ ] Lab
- [ ] Rate Request
- [ ] Full Time Privilege
- [ ] Off Campus Experience

**COURSE DESCRIPTION**

Include requisites/restrictions:
- Undergraduate level ECE 20100 Minimum Grade of C
- Undergraduate level PHYS 21000 Minimum Grade of D or Undergraduate level PHYS 21000 Minimum Grade of D
- Undergraduate level MA 26100 Minimum Grade of D
- Undergraduate level MA 26200 Minimum Grade of D

Restrictions: Student must be enrolled in School of Electrical & Computer Engineering or School of Biomedical Engineering.

- Continuation of vector calculus, electrostatics, magnetostatics, and Maxwell's Equations. Introduction to electromagnetic waves, transmission lines.
- *COURSE LEARNING OUTCOMES*
  1. An ability to work with electric fields and to be able to find electric and potential fields from charge distributions including the presence of dielectric materials.
  2. An ability to work with magneto-static fields and to be able to find magnetic fields from current distributions including the presence of magnetic materials.
  3. An ability to work with time varying fields including wave propagation.
  4. An ability to work with transmission lines in the time and frequency domains.

**Cross-Listed Courses**

- [ ]

**Institutional Approval**

1. [ ] Department
2. [ ] Instructor
3. [ ] Other

- [ ] Department Approval Type

**Department Chair**

- [ ] Date

**School Dean**

- [ ] Date

**Offices of the Registrar**

- [ ] Date
To: The Faculty of the College of Engineering

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

RE: Changes to an existing course: ECE 31100 change in number and requisites.

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

FROM: ECE 31100 Electric and Magnetic Fields
Sem. 1, 2. Lecture 3, Credit 3
Requisites: Undergraduate level ECE 20100 Minimum Grade of D- and (Undergraduate level PHYS 27200 Minimum Grade of D- or Undergraduate level PHYS 24100 Minimum Grade of D- or Undergraduate level PHYS 25100 Minimum Grade of D- or Undergraduate level PHYS 26100 Minimum Grade of D-) and (Undergraduate level MA 26200 Minimum Grade of D- or Undergraduate level MA 26600 Minimum Grade of D- or Undergraduate level MA 36600 Minimum Grade of D-)
Restrictions: Student must be enrolled in School of Electrical & Computer Engineering or School of Biomedical Engineering.

Continued study of vector calculus, electrostatics, magnetostatics, and Maxwell's Equations. Introduction to electromagnetic waves, transmission lines, and radiation from antennas.

TO: ECE 30411 Electric and Magnetic Fields
Sem. 1, 2. Lecture 3, Credit 3
Requisites: Undergraduate level ECE 20100 Minimum Grade of C and (Undergraduate level PHYS 27200 Minimum Grade of D- or Undergraduate level PHYS 24100 Minimum Grade of D- or Undergraduate level PHYS 25100 Minimum Grade of D- or Undergraduate level PHYS 26100 Minimum Grade of D-) and (Undergraduate level MA 26200 Minimum Grade of D- or Undergraduate level MA 26600 Minimum Grade of D- or Undergraduate level MA 36600 Minimum Grade of D-).
Restrictions: Student must be enrolled in School of Electrical & Computer Engineering or School of Biomedical Engineering.

Continued study of vector calculus, electrostatics, magnetostatics, and Maxwell's Equations. Introduction to electromagnetic waves, and transmission lines.
REASON: This course is part of the Core Curriculum for the BSEE and degree. Subsets of Core Curriculum courses serve as prerequisites for most upper division ECE electives. In addition, a degree requirement for all ECE students is to achieve a GPA in all major-area (ECE) courses of at least a 2.0. Therefore, in order to ensure that ECE students are as well prepared as possible for upper division ECE courses, as well as to facilitate their achievement of the minimum major-area GPA of 2.0, a minimum grade requirement in the key ECE prerequisite course is being proposed. The change in number is proposed in order to update to the ECE five digit numbering scheme.

For V. Rang Balakrishnan, Head
School of Electrical and Computer Engineering
ECE 5-Digit Course Numbering

First Digit: Level
6 – Graduate only courses
5 – Dual level
4 – Senior Level
3 – Junior Level
2 – Sophomore Level
1 – First Year Level

2nd and 3rd Digits: ECE Area
00 – CNSIP
02 – Automatic Control
04 – Fields and Optics
06 – Microelectronics and Nanotechnology
08 – Computer Engineering
10 – Power and Energy Systems
12 – VLSI
14 – BIS

4th and 5th Digits:
Mostly arbitrary – keep in prereq order if possible within ECE area. When updating, use same last two digits, i.e. ECE 30500 → ECE 30605, etc.

Special Cases:
X9595 for all experimental courses.
X99XX for all seminar or similar courses
XXX99 for all professional practice courses
490XX for all Sr. Design courses