### PURDUE UNIVERSITY
REQUEST FOR ADDITION, EXPIRATION, OR REVISION OF A GRADUATE COURSE
(50000-60000 LEVEL)

#### DEPARTMENT
ENGINEERING

#### EFFECTIVE SESSION
FALL 2011

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

- [ ] 1. New course with supporting documents (complete proposal form)
- [ ] 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
- [ ] 8. Change in instructional hours
- [ ] 9. Change in course description
- [ ] 10. Change in course requisites
- [ ] 11. Change in semesters offered
- [ ] 12. Transfer from one department to another

#### PROPOSED:
- Subject Abbreviation: Electromagnetics
- Course Number: 60400
- Long Title: Electromagnetics Field Theory
- Short Title: Electromagnetics Field Theory

#### EXISTING:
- Subject Abbreviation: ECE
- Course Number: 60400
- Long Title: Electromagnetics Field Theory
- Short Title: Electromagnetics Field Theory

#### TERMS OFFERED
- [ ] Summer
- [x] Fall
- [x] Spring

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

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

#### CREDIT TYPE

<table>
<thead>
<tr>
<th>Credit Type</th>
<th>1. Fixed Credit: Cr. Hrs.</th>
<th>2. Variable Credit Range: Minimum Cr. Hrs. (Check One)</th>
<th>To</th>
<th>Or</th>
<th>3. Equivalent Credit: Yes</th>
<th>No</th>
<th>4. Thesis Credit: Yes</th>
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<td>Maximum Cr. Hrs.</td>
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#### CREDIT TYPE

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<tr>
<th>Type</th>
<th>Minutes Per Min</th>
<th>Meetings Per Week</th>
<th>Weeks Offered</th>
<th>% of Credit Allocated</th>
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<tbody>
<tr>
<td>Lecture</td>
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<td>Recitation</td>
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<td>Presentation</td>
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<td>Ind. Study</td>
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<td>Pract/Observ</td>
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#### COURSE ATTRIBUTES:

- [ ] 1. Pass/Not Pass Only
- [ ] 2. Satisfactory/Unsatisfactory Only
- [ ] 3. Repeatable
- [ ] 4. Credit by Examination
- [ ] 5. Maximum Repeatable Credit:
- [ ] 6. Special Fees
- [ ] 7. Variable Title
- [ ] 8. Honors
- [ ] 9. Full Time Privilege
- [ ] 10. Off-Campus Experience

#### COURSE DESCRIPTION (INCLUDE REQUISITES/RESTRICTIONS):

Prerequisites: Graduate Standing. Review of general concepts (Maxwell's equations, materials interaction, boundary conditions, energy flow); statics (Laplace's equation, Poisson's equation); distributed parameter systems (classification of solutions, transmission lines, and waveguides); radiation and antennas (arrays, reciprocity, Huygens' principle); a selected special topic (e.g., magnetostatics, waves in anisotropic media and optical fibers).

### Signature Page

- Cabinet Department Head: [Signature] Date: 12/14/11
- Calumet School Dean: [Signature] Date: 2-68-11
- Fort Wayne Department Head: Date
- Fort Wayne School Dean: [Signature] Date
- Indianapolis Department Head: Date
- Indianapolis School Dean: [Signature] Date
- Undergrad Curriculum Committee: Date
- Vice Chancellor for Academic Affairs: [Signature] Date
- West Lafayette Department Head: [Signature] Date
- West Lafayette College/School Dean: Date
- Graduate Council Secretary: Date
- West Lafayette Registrar: Date

### OFFICE OF THE REGISTRAR
ECE 604 Electromagnetic Field Theory

Credits: 3.

Graduate Area(s):
   Fields and Optics

Normally Offered: Each Fall, Spring

Prerequisites: Graduate Standing

Corequisites: None.

Catalog Description: Review of general concepts (Maxwell's equations, materials interaction, boundary conditions, energy flow); statics (Laplace's equation, Poisson's equation); distributed parameter systems (classification of solutions, transmission lines, and waveguides); radiation and antennas (arrays, reciprocity, Huygen's principle); a selected special topic (e.g. magnetostatics, waves in anisotropic media and optical fibers).

Required Text(s):


Recommended Reference(s): None.

Lecture Outline:

<table>
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<tr>
<th>Weeks</th>
<th>Topic</th>
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<tbody>
<tr>
<td>1/3</td>
<td>Electrostatics and dielectric materials</td>
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<tr>
<td>1/3</td>
<td>Magnetostatics and magnetic materials</td>
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<tr>
<td>1</td>
<td>Maxwell's equations</td>
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<td>1</td>
<td>Propagation and reflection of plane waves</td>
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<td>2/3</td>
<td>Numerical methods, and product-solution method</td>
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<td>2</td>
<td>TE and TM mode, transmission lines and wave guides</td>
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<td>1</td>
<td>Resonant cavities</td>
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<td>2</td>
<td>Antennas</td>
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<td>1</td>
<td>Fresnel and Fraunhofer diffraction</td>
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<td>2/3</td>
<td>Gaussian beams</td>
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<td>Special topic selected by the instructor</td>
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<tr>
<td>1</td>
<td>Review and Exams</td>
</tr>
</tbody>
</table>


Synergistic Activities

Editorial Board Member

- Journal of Communications and Network
- Word Academy of Science, Engineering, and Technology
- Recent Patents on Electrical Engineering, Bentham Science Publishers

- Technical Referee for Journals
  - IEEE Transactions on Antennas and Propagation
  - IEEE Transactions on Geoscience and Remote Sensing
  - IEEE Transactions on Magnetics
  - IEE Microwaves, Antennas, and Propagation
  - IEE Science, Measurement, and Technology
  - International Journal on Circuit Theory

Professional Membership:

- Institute of Electrical and Electronics Engineers (IEEE)
- American Society for Engineering Education (ASEE)