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.

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: 30412
Long Title: Introduction to Engineering Optics

EXISTING:

Subject Abbreviation: ECE
Course Number: 41200

TERMS OFFERED:

- [ ] Summer
- [ ] Fall
- [x] Spring

CAMPUS(ES) INVOLVED:

- Calumet
- Cont Ed
- Ft. Wayne
- Tech Statewide
- W. Lafayette
- Indianapolis

Abbreviated title will be entered by the Office of the Registrar if omitted. (Max Characters Only)

CREDIT TYPE:

1. Fixed Credit: [ ] Credits
2. Variable Credit Range:
   Minimum Cr. Hrs:
   (Check One):
   To
   Or
   Or

COURSE ATTRIBUTES:

- [ ] Pass/Not Pass Only
- [ ] Satisfactory/Unsatisfactory Only
- [ ] Department
- [ ] Instructor
- [ ] 7 Variable Title
- [ ] 8 Honors
- [ ] 9 Full Time Privilege
- [ ] 10 Off-Campus Experience

Schedule Type

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

Weeks Offered

- % of Credit Allotted

Cross-Listed Courses

The control and characteristics of optical radiation are covered. Applications to optical instrumentation, thin films, holography and polarizing optics are discussed. Major topics: Geometrical Optics: Lenses, prisms; Huygens' principle, Fermat principle; Rays; Incoherent light. Physical Optics: Gratings, interferometers, diffraction elements, polarizers; Huygens-Fresnel principle, Maxwell's equations; Waves; Field vectors; Amplitude and phase, Coherent light. Law of reflection and refraction. Students are also suggested to consider taking experimental lab course 30413 together with 30412.

COURSE LEARNING OUTCOMES:

i. An ability to analyze simple optical systems (dielectric slabs, thin lenses, reflectors). [a,k]
ii. An ability to model Gaussian beams and the transformation of beams. [a,k]
iii. An ability to analyze and design polarization systems, including polarizers and wave plates. [a,c,k]
iv. A knowledge of optical interferometers and the operations of interferometers such as the Michelson, Fabry-Perot and double-slit . [a,k]
v. An ability to analyze diffraction patterns. [a,k]

OFICE OF THE REGISTRAR
To: The Faculty of the College of Engineering

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

RE: Changes to ECE 41200

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 41200 Introduction to Engineering Optics
Sem. 1. Lecture 3, Credit 3
Requisites: Undergraduate level ECE 31100 Minimum Grade of D- and Undergraduate level ECE 30100 Minimum Grade of D- [may be taken concurrently]
Course Description: Basic concepts of electromagnetism such as Maxwell's equations, uniform plane waves and reflection and refraction of plane waves.

TO: ECE 30412 Introduction to Engineering Optics
Sem. 2. Lecture 3, Credit 3
Requisites: Undergraduate Level ECE 30100 Minimum Grade of D- and Undergraduate level ECE 31100 Minimum Grade of D- [all may be taken concurrently] Students are also suggested to consider taking experimental lab course 30413 together with 30412
Course Description: The control and characteristics of optical radiation are covered. Applications to optical instrumentation, thin films, holography and polarizing optics are discussed. Major topics: Geometrical Optics: Lenses, prisms; Huygens' principle, Fermat principle; Rays; Incoherent light. Physical Optics: Gratings, interferometers, diffraction elements, polarizers; Huygens-Fresnel principle, Maxwell's equations; Waves; Field vectors; Amplitude and phase, Coherent light. Law of reflection and refraction.

REASON: The change is intended to improve the progression of courses from the 200 level to 300 and 400 level courses, for students who wish to focus their studies more precisely in the optics area.

For V. Raghu Balakrishnan, Head
School of Electrical and Computer Engineering

Approved for the faculty of the Schools of Engineering by the Engineering Curriculum Committee

ECG Minutes: 14 Date: 3-1-16
Chairman ECG: [Signature]