

PURDUE

U N I V E R S I T Y

**SCHOOL OF ELECTRICAL
AND COMPUTER ENGINEERING
UNDERGRADUATE ADVISING OFFICE**

Engineering Faculty Document 50-20
February 27, 2020
Page 1 of 1

To: The Engineering Faculty
From: School of Electrical and Computer Engineering
Re: ECE 30417

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 30417 Engineering Optics Laboratory

Semesters offered: Spring

Non-repeatable

Credit 1

Pre-requisites:

ECE 20008 or ECE 20800

ECE 30100

ECE 30411 or ECE 31100

ECE 30416 (may be taken concurrently)

MA 26200 or (MA 26500 and (MA 26600 or MA 36600))

Course Description

A set of laboratory experiments dealing with fundamentals and basic applications of geometrical optics, beams, polarization optics, wave optics and Fourier optics.

Reason

This is a new courses in the ECE Optics path that complements ECE 30416 with hands-on experience.

History of Previous Offering

This is a new course.



Michael R. Melloch, Associate Department Head of ECE

ECE 30417- Engineering Optics Laboratory

Lab Hours: 3 Credits: 1

Professional Attributes

Upper Level Lab

Normally Offered: Each Spring

Course Prerequisites:

ECE 30100 and (ECE 20008 or ECE 20800) and (ECE 30411 or ECE 31100) and ECE 30416 [may be taken concurrently].

Prerequisites by topics: This class is designed for advanced undergraduate students.

Catalog Description:

A set of laboratory experiments dealing with fundamentals and basic applications of geometrical optics, beams, polarization optics, wave optics and Fourier optics.

Course Objectives:

This laboratory course is designed around three goals. First, the student should find confirmation and reinforcement of topics covered in EE 30412. Second, the student should be able to apply optical principals to the solution of problems, and to be able to define limitations to these applications. Third, the student should acquire "breadboarding" skills, i.e. be able to build an optical instrument by assembling a set of optical components.

Supplementary Information:

Will be offered spring only semesters effective fall 2016.

Required Text(s): *Fundamentals of Photonics*, E.A. Saleh & Malvin Carl Teich, Wiley-Interscience, 2 edition (March 9, 2007); Language: English; ISBN-10: 0471358320; ISBN-13: 978-0471358329. It is available as a hard copy through commercial booksellers, and through the Purdue Engineering library reserve desk, Dewey Decimal classification number 621.36 Sa32f 2007.

Supplementary Text(s): "Optics" by E. Hecht, 4th ed., 2002 ISBN No. 080-538-5665

Lab Outline:

Week	Experiment
1-2	Geometric Optics
3-4	Interferometer and Interference Effects
5	Power and beam spot measurement of laser beams
6	Spatial filtering and beam expanding
7	Transform, convolution and correlation of beams
8	Polarization Effects
9	Diffraction
10	Optical Fourier Transforms and Spatial Filtering
11-12	Holographic Recording and Reconstruction; Project/Design Introduction
13-14	Design Project
15	Coherence Effects