

TO: The Faculty of the College of Engineering

FROM: School of Electrical and Computer Engineering of the College of Engineering

RE: ECE 51300 Changes in Terms Offered, Description, Text and Content

The faculty of the School of Electrical and Computer Engineering has approved the following changes in ECE 51300. This action is now submitted to the Engineering Faculty with a recommendation for approval.

From: **ECE 51300 – Diffraction, Fourier Optics, and Imaging**
Sem. 1 and 2. Class 3, cr. 3. Offered every third semester.
Prerequisite: EE 30100, 31100. Authorized equivalent courses or consent of instructor may be used in satisfying course pre- and co-requisites. Departmental approval is required.

Modern theories of diffraction and Fourier optics for imaging, optical communications, and networking. Imaging techniques involving diffraction and/or Fourier analysis with application to tomography, magnetic resonance imaging, synthetic aperture radar, and confocal microscopy. Additional topics in optical communications and networking, including wave propagation in free space, fiber, integrated optics, and related design issues. Simulation studies, using Matlab and other software packages for analysis and design. Offered every third semester.

To: **ECE 51300 – Diffraction, Fourier Optics and Imaging**
Sem. 1 of odd years. Class 3, cr. 3.
Prerequisite: EE 30100, EE 31100, or equivalent standing

Modern theories of diffraction and Fourier optics for imaging, optical communications and networking, micro/nano technologies and related devices and systems. Imaging techniques involving diffraction and/or Fourier analysis such as tomography, magnetic resonance imaging, synthetic aperture radar and confocal microscopy. Topics in optical communications and networking including wave propagation in free space, fiber, and integrated optics, and related design issues. Micro/nano technologies involving diffraction and/or Fourier analysis. Simulation studies using Matlab and other professional software packages for analysis and design.

Reason: The course content, description and text have been changed to reflect the updated content of the course.

Weeks	Principle Topics
1	Foundations of Diffraction Theory
2	Angular Spectrum Method
3	Fresnel and Fraunhofer Diffraction
4	Fourier Analysis of Optical Systems and Image Formation
5	Spatial Filtering and Optical Information Processing
6	Tomography and Synthetic Aperture Radar
7	Magnetic Resonance Imaging
8	Optimization Techniques
9	Wavefront Reconstructions (Holography)
10	Diffraction Optical Elements
11	Diffraction Gratings and Zone Plates I
12	Micro/Nano Devices and Rigorous Diffraction Theory
13	Numerical Methods
14	Wavelength Division Multiplexing and Demultiplexing
15	Exams



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