New Curriculum or Curricular Change EFD Template

PURDUE UNIVERSITY | College of Engineering

Engineering Faculty Document
No.: 20-25
May 1, 2024

TO: The Engineering Faculty

FROM: The Faculty of the Elmore Family School of Electrical and Computer Engineering

RE: New Engineering Concentration

The Faculty of the Elmore Family School of Electrical and Computer Engineering has approved the following new Concentration from the College of Engineering. This action is now submitted to the Engineering Faculty with a recommendation for approval.

TITLE:

Fields and Optics (FO)

DESCRIPTION:

This concentration applies to these programs/major:

Programs:

- ECE-MSECE-OL
- ECE-MSECE

Major:

- ECEN (Electrical & Computer Engr)

To earn this concentration, students will complete the following coursework:

Required: ECE 60400, Electromagnetic Field Theory, 3 credits

6 additional credits from this list:

Course #	Title	Credits
ECE 51300	Diffraction, Fourier Optics and Imaging	3
ECE 55200	Introduction to Lasers	3
ECE 59500	Advanced Lithography	1
ECE 59500	Applied Quantum Computing I-Fundamentals	1
ECE 59500	Applied Quantum Computing II-Hardware	1
ECE 59500	Applied Quantum Computing III-Algorithm and Software	1
ECE 59500	Food and Energy Farms: Challenges to Sustainable Production on a Crowded Planet	3

ECE 59500	Introduction to Quantum Science and Technology	3
ECE 59500	MRI Theory	3
ECE 59500	Microfabrication Fundamentals	1
ECE 59500	Optical Imaging System Design	3
ECE 59500	Plasmas and Electric Discharges	3
ECE 59500	Semiconductor Manufacturing	1
ECE 60400	Electromagnetic Field Theory	3
ECE 60421	Nanophotonics and Metamaterials	3
ECE 60422	Primer on RF Circuit Design	1
ECE 60423	RF System Design	1
ECE 60424	RF Design: Passive/Active Components	1
ECE 60431	Fiber Optic Communications	1
ECE 60432	Nanophotonic Modeling	1
ECE 61500	Nonlinear Optics	3
ECE 61600	Ultrafast Optics	3
ECE 61700	Antennas: Design and Application	3
ECE 61800	Numerical Electromagnetics	3
ECE 69500	Computational Bioelectromagnetics	3
ECE 69500	Quantum Detectors	1
ECE 69500	Quantum Detectors and Sensors	3
ECE 69500	Quantum Networks	1
ECE 69500	Quantum Optics & Quantum Information	3
ECE 69500	Topological Electrodynamics	3

RATIONALE:

Fields and optics is one of the focus or research areas in ECE. Approximately 8% of our ECE graduate students have this as their primary area of interest. This concentration allows students to fine-tune their MSECE credential.

Head/Director of the Elmore Family School of Electrical and Computer Engineering

Link to Curriculog entry: https://purdue.curriculog.com/proposal:28373/form