

Engineering Faculty Document No. EFD 71-22
February 18, 2022

Memorandum

To: The College of Engineering Faculty**From:** The Elmore Family School of Electrical and Computer Engineering**Re:** new Wireless & Optical 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.

Description: The Wireless & Optical Engineering Concentration introduces students to the fundamental concepts and engineering challenges associated with semiconductor manufacturing, renewable energy, military and defense needs. It prepares students for employment in both private industry and the government sector, fiber optics communications, imaging, display and virtual reality technologies, sensors, laser, and LIDAR, and RF security and wireless systems. In addition, completing this minor will provide students with a firm foundation to pursue a graduate education focused on fields and/or optics that may include theoretical, simulation, and experimentally-based research projects.

Reasons: Fields and optics are both rooted in the same fundamental force of nature - electromagnetism. A tremendous number of advances have occurred since the discovery of this phenomenon, taking it from an intellectual curiosity to a fundamental building block of today's world. This includes underpinning the internet, both wireless communications and long-haul fiber optic networks, as well as global sensing technologies, renewable energy generation, and many more applications. To continue to advance these exciting fields & optics technologies, and to apply them in practically useful ways, it is necessary for more engineers to be well acquainted with this field.



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Associate Head of Teaching and Learning
Professor of Electrical and Computer Engineering

Fields and Optics Concentration

The Fields and Optics Concentration requires a minimum of 10 credits and completion of the three required components below.

Core: (3 credits)

ECE 30412 Electromagnetics II

Electives: (6 credits)

Students must complete a minimum of 6 credits from the below list. VIP (Vertically Integrated Projects) and ECE 49600 Undergraduate Projects may be taken for a maximum of 3 credits toward the concentration upon approval of the Associate Head of Undergraduate Programs or Associate Head of Teaching and Learning.

ECE 30414 Elements Of Fiber Optics, Lasers And Optoelectronics

ECE 30416 Basics Of Engineering Optics

ECE 30500 Semiconductor Devices

ECE 44100 Distributed Parameter Systems

ECE 49600 Electrical And Computer Engineering Projects

ECE 50616 Physics And Manufacturing Of Solar Cells

ECE 55200 Introduction To Lasers

ECE 59500 Selected Topics In Electrical Engineering

[Right] Qualifying Title: Magnetic Resonance Imaging Theory (3 credits)

VIP 37920 Junior Participation In Vertically Integrated Projects (VIP)

VIP 47920 Senior Participation In Vertically Integrated Projects (VIP)

Elective Lab: (1 credit)

Students must complete a minimum of 1 lab from the below list:

ECE 30415 Fiber Optics And Lasers Laboratory

ECE 30417 Engineering Optics Laboratory

ECE 30700 Electromagnetic Fields And Waves Laboratory