New Curriculum or Curricular Change EFD Template

PURDUE UNIVERSITY | College of Engineering

Engineering Faculty Document
No.: 21-25
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:

Microelectronics and Nanotechnology (MN)

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 60600, Solid State Devices, 3 credits

6 additional credits from this list:

Course #	Title	Credits
ECE 50616	Physics and Manufacturing of Solar Cells	3
ECE 50631	Fundamentals of Current Flow	1
ECE 50632	Introduction to Quantum Transport	1
ECE 50633	Boltzmann Law: Physics to Machine Learning	1
ECE 52600	Fundamental of BioMEMS and Micro-Integrated Systems	3
ECE 55200	Introduction to Lasers	3
ECE 55700	Integrated Circuit/MEMS Fabrication Laboratory	3
ECE 59500	Advanced Lithography	1

ECE 59500	Application Oriented Computational Nanotechnology - Part 1	1
ECE 59500	Applied Quantum Computing I-Fundamentals	1
ECE 59500	Applied Quantum Computing II-Hardware	1
ECE 59500	Applied Quantum Computing III-Algorthm and Software	1
ECE 59500	Data Analysis, Design of Experiments and Machine Learning	1
ECE 59500	Fundamentals of Transistors	1
ECE 59500	Integrated Circuit/MEMS Fabrication Laboratory	3
ECE 59500	Introduction to Electronics Packaging and Heterogeneous Integration	3
ECE 59500	Introduction to Nanolithography	1
ECE 59500	MEMS I: Microfabrication and Materials for MEMS	1
ECE 59500	MEMS II: Fundamentals of MEMS Design	1
ECE 59500	MEMS III: Applications in MEMS	1
ECE 59500	Microfabrication Fundamentals	1
ECE 59500	Semiconductor Device Integration Through Simulation	3
ECE 59500	Semiconductor Fundamentals	1
ECE 59500	Semiconductor Manufacturing	1
ECE 59500	Theory and Practice of Solar Cells: A Cell to System Perspective	1
ECE 60420	Radio Frequency Integrated Circuits	3
ECE 60600	Solid State Devices I	3
ECE 60614	Reliability Physics of Nanoelectronic Transistors	3
ECE 60645	High-speed Semiconductor Devices	3
ECE 61200	Advanced VLSI Devices (Nanoscale Transistors)	3
ECE 65400	Solid-State Devices II	3
ECE 65600	Electronic Transport in Semiconductors	3
ECE 65800	Semiconductor Material and Device Characterization	3
ECE 69500	Flexible and Stretchable Electronics	3

RATIONALE:

Microelectronics and nanotechnology is one of the focus or research areas in ECE. Approximately 6% 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:28374/form