New course to be offered Fall 2018

Fall 2018

Essentials of MOSFETs

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ECE Purdue University

- ECE 69500
- CRN 21519 for Distance Learning
- CRN 21517 for On Campus
- Offered 9/24-10/30/2018

- This course develops a simple framework for understanding the essential physics of modern nanotransistors and briefly discusses important technology considerations and applications of MOSFETs. The approach is broadly accessible to students with only a very basic knowledge of semiconductor physics and electronic circuits. The course is designed for anyone seeking a sound, physical, but simple understanding of how transistors, specifically MOSFETS, work. Students will gain an understanding of the operation of MOSFETs with channel lengths from the micrometer scale of the 1960's to the nanometer scale of today. The course is accessible to advanced undergraduates, beginning graduate students, as well as practicing engineers and scientists.

- Topics include device metrics for digital and analog circuits, traditional MOSFET theory, the virtual source model, 1D and 2D electrostatics, Landauer/transmission approach to nanotransistors, the limits of MOSFETs, as well as a quick look at HEMTs, bipolar transistors, and compact circuit models.

- **Prerequisites**: A basic understanding of semiconductor fundamentals.

- This course is part of a Purdue initiative that aims to complement the expertise that students develop with the ***breadth at the edges*** needed to work effectively in today's multidisciplinary environment. These serious short courses require few prerequisites and provide a general framework that can be filled in with self-study when needed.