ECE 792-047
Wide Bandgap Semiconductor Device Fabrication and Technology

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Graduate Students!

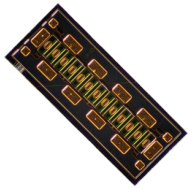
Spring 2019
MW 8:30 AM - 9:45 AM Lectures (EB2)
~3Hr Lab/Activity each week (EB2/MRC)

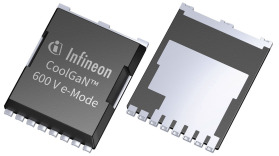
Prerequisite: ECE 538 or equivalent
(non-ECE students are welcome)
Sister Class *(recommended, but not required)*:
ECE-792-003 "Wide Bandgap Semiconductor Power Devices"

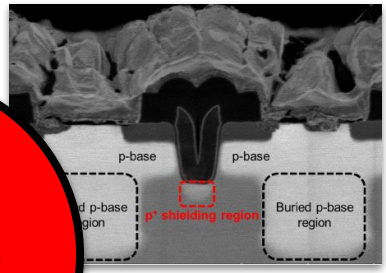
Design, fabricate and characterize your own GaN HEMT!

Description: Wide bandgap (WBG) semiconductor devices offer performance advantages over conventional silicon technology in a variety of applications, including power conversion, telecommunications and optoelectronics. This hands-on class will unveil how high-power WBG devices are fabricated and tested. We will focus on the two most prominent materials in this class: **silicon carbide (SiC) and gallium nitride (GaN)**. By the end of the semester, each student will have fabricated their own GaN high electron mobility transistors (HEMTs) in our very own NC State Nanofabrication Facility (NNF)!

This is a project- and laboratory-based class. The beginning of the semester will have a mixture of lectures and labs to introduce you to SiC and GaN fabrication concepts, applied to both **lateral and vertical devices**. In the middle of the semester, students will spend their time fabricating their own lateral GaN HEMTs. At the end of the semester, lectures will resume, accompanied by both GaN and SiC device testing labs.







Power Electronics

Wide Bandgap Devices

Wireless Electronics

The focus of the class is on advanced semiconductor device fabrication, specifically with wide bandgap semiconductors. Though prior knowledge of power device physics and design techniques are helpful, they are not required.