Course Syllabus

ELCT 566 – Semiconductor Optoelectronics

<table>
<thead>
<tr>
<th>Course Coordinator:</th>
<th>Dr. Asif Khan</th>
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<tr>
<td>Catalog Description:</td>
<td>Basic semiconductor material optical properties. Principles and structures of semiconductor lasers, Light Emitting Diodes, and photodetectors.</td>
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<td>Credit Hours</td>
<td>3</td>
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<td>Prerequisite(s) by course</td>
<td>ELCT 363 or equivalent</td>
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<tr>
<td>Prerequisite by topics</td>
<td>Intro to Microelectronics</td>
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Course Outcomes:
Students who successfully complete this course will be able to:

- Solve problems on basic semiconductor optoelectronics devices
- Gain fundamental knowledge of basic semiconductor optoelectronic devices
- Relate impacts of semiconductor material properties into the optical properties of semiconductor devices
- Describe impacts of semiconductor material properties into the fabrications of semiconductor optoelectronic devices

Course Topics:

- Basic properties for semiconductors
- Optical processes in semiconductors
- P-N junctions, Schottky and Ohmic contacts
- Light emitting diodes (including double-heterojunction LED and multi quantum well LED)
- Introduction to lasers
- Photodetectors (photoconductors, junction p-i-n photodiodes, and Schottky photodiodes)
- Fast optical communication components (fiber optic, optoelectronic modulation, integrated and external optic modulators)
- Solar cells

Course Contribution to Program Outcomes:
ELCT 566 contributes to an achievement of:

- Outcome A – an ability to apply knowledge of mathematics, science and engineering
- Outcome B – an ability to design and conduct experiments, as well as to analyze and interpret data
- Outcome C – an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability
- Outcome D – an ability to function on multidisciplinary teams
- Outcome E -- an ability to identify, formulate, and solve engineering problems
- Outcome I – a recognition of the need for, and ability to engage in life-long learning
- Outcome J – a knowledge of contemporary issues
• Outcome K – an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice

General Course Policies

Academic Integrity
Unless otherwise stated, assignments and examination work are expected to be the sole effort of the student submitting the work. Students are expected to follow the University of South Carolina Honor Code and they should expect that every instance of a suspected violation will be reported. Students found responsible for violations of the Code will be subject to academic penalties under the Code in addition to whatever disciplinary sanctions are applied.

Accommodating Disabilities
Reasonable accommodations are available for students with a documented disability. If you have a disability and may need accommodations to fully participate in this class, contact the Office of Student Disability Services: 777-6142, TDD 777-6744, email sasds@mailbox.sc.edu, or stop by LeConte College Room 112A. All accommodations must be approved through the Office of Student Disability Services.

Diversity
When scheduling exams, I have attempted to avoid conflicts with major religious holidays. If, however, I have inadvertently scheduled an exam or major deadline that creates a conflict with your religious observances, please let me know as soon as possible so that we can make other arrangements.

Recommended Study Habits
• Read the assigned material before class.
• Bring thoughtful questions to class for discussion.
• Prepare for the exams in study groups.
• Take notes during class discussions and while completing reading assignments.

Deviations
Minor deviations from the syllabus are a normal part of any adaptive teaching and learning process.