Engineering Faculty Document No. 53-06
May 10, 2007

TO: The Faculty of the College of Engineering
FROM: The Faculty of the School of Electrical and Computer Engineering
RE: ECE 658 Changes in Course Description and Content

The faculty of the School of Electrical and Computer Engineering has approved the following changes in ECE 658. This action is now submitted to the Engineering Faculty with a recommendation for approval.

From: **ECE 658 – Semiconductor Material and Device Characterization**
Sem. 2. Class 3, cr. 3 (Offered in alternate years.)
Prerequisite: ECE 606. Authorized equivalent courses or consent of instructor may be used in satisfying course pre- and co-requisites.

A comprehensive survey of modern characterization techniques routinely used to determine solid-state material and device parameters. Concepts and theory underlying the techniques are examined, and sample experimental results are presented. The coverage includes electrical, optical, chemical, and physical characterization methods.

To: **ECE 658 – Semiconductor Material and Device Characterization**
Sem.2, even years. Class 3, cr. 3.
Prerequisite: ECE 606.

An examination of modern characterization techniques routinely employed to determine semiconductor material and device parameters. Concepts and theory underlying the techniques are reviewed, and sample experimental results are presented. Emphasis is on techniques employing electrical measurements.

Reason: The course description and content have been changed to reflect the increased emphasis on techniques employing electrical measurements.

Mark Smith, Head
School of Electrical & Computer Engineering

ECE 658 – Semiconductor Material and Device Characterization

Required Text: D. K. Schroder, *Semiconductor Material and Device Characterization*, 3rd edition, John Wiley & Sons, © 2006; ISBN-13: 978-0-471-73906-7 and ISBN-10: 0-471-73906-5.

Weeks	***Principal Topics***
1	Resistivity and type measurements
2	Semiconductor doping measurements and profiling
1 2/3	Barrier height and contact resistance measurements
1	Series resistance and related measurements
1 1/3	Deep-level parameter measurements
1 1/3	Measurement of oxide and interface parameters in MOS devices
1 1/3	Measurement of MOSFET channel parameters
2 1/3	Carrier lifetime measurements
1	Carrier mobility measurements
2	Demonstrations and midterm exam