TO: The Engineering Faculty
FROM: The Faculty of the School of Electrical Engineering
RE: Change in EE 552

The Faculty of the School of Electrical Engineering has approved the following course changes in EE 552. This action is now submitted to the Engineering Faculty with a recommendation for approval.

FROM:

EE 552. INTRODUCTION TO LASERS
Sem. 2, class 3, credits 3.
Prerequisite: EE 311

An introduction to lasers and laser applications which does not require a knowledge of quantum mechanics as a prerequisite. Topics include: the theory of laser operation, some specific laser systems, non-linear optics, optical detection, and applications to optical communications, holography, laser-driven fusion, and integrated optics.

Text: J. Verckyen, Laser Electronics, Prentice-Hall, 1989. (0-13-523630-4)

Outline:	Weeks
Introduction: Review of Some Aspects of Classical Optics Elementary Optical Cavity Analysis. Gaussian Beams.	4
Interactions of Radiation with Matter. Review of Atomic and Molecular Properties. Absorption, Emission, Scattering, Line Broadening. Radioactive Transport. Laser Media.	4
Introduction to Laser Theory. Rate Theory. Gain Saturation: Homogeneous and Inhomogeneous Broadening. Gain Narrowing. Rigrod Analysis. Output Coupling. Optimization. Hole Burning. Threshold Behavior. Pulse Generation. Laser Systems.	2
Reacting Gas Flows. Physical Gasdynamics. Elementary Processes. Chemical Kinetics and Relaxation Phenomena. Conservation Equations.	1
Gasdynamic Lasers. General Attributes. C02 Molecule. Relaxation Kinetics. Mixture Composition. Stagnation Conditions. Gasdynamic Expansion Process. Optical Considerations and Other Factors.	2
Chemical Lasers. Survey. Elementary Analyses. Gasdynamic Phenomena. Performance.	2
Design Problems Peculiar to High-Power, C.W. Lasers. Aerodynamic Windows. Parasitic Losses. Beam Propagation. Applications.	1

TO:

EE 552. INTRODUCTION TO LASERS
Sem. 2, class 3, credits 3.
Prerequisite: EE 311

An introduction to lasers and laser applications which does not require a knowledge of quantum mechanics as a prerequisite. Topics include: The theory of optical cavities and laser operation, and applications of this theory to several specific laser systems.

Text: J. Verdeyen, Laser Electronics, Prentice-Hall, 1995. (0-13-706666-X)

Outline:	Weeks
Introduction: Review of Some Aspects of Classical Optics. Elementary Optical Cavity Analysis. Gaussian Beams. Laser Cavity Modes.	3
Interactions of Radiation with Matter. Absorption, Emission, Scattering, Line Broadening. Laser Media.	2
Introduction to Laser Theory. Rate Theory. Gain Saturation. Homogeneous and Inhomogeneous Broadening. Gain Narrowing. Output Coupling. Optimization. Hole Burning. Threshold Behavior. Pulse Generation.	4
Specific Laser Systems: Solid State lasers. Tunable Lasers. Gas Lasers. Semiconductor Lasers.	4
Special Topics (Detectors, Coherence, etc. ...)	1
Exams	1

REASON: The outline and course description have been changed to reflect the current content of the course.

Richard J. Schwartz
Professor and Head