# ENGINEERING PHYSICS (EPHY)

## EPHY 535 ANALOG ELECTRONICS (4)

Covers the design, analysis, simulation, construction, and evaluation of electronic circuits with circuit elements including resistors, capacitors, inductors, diodes, transistors, and operational amplifiers. Kirchhoff's laws, Thevenin and Norton equivalent circuits, DC and AC (frequency dependent) circuit analysis is covered. Three lecture hours and one three-hour laboratory period. Students who successfully completed PHYS 535 will not receive additional credit for EPHY 535. Prerequisite: PHYS 212 or PHYS 242 or consent of instructor.

## EPHY 537 DIGITAL ELECTRONICS (4)

Subjects covered will be basic concepts of digital electronics such as: gates, logic modules, truth tables, digital codes, sequential systems, semiconductor memories, decade counters, etc. The laboratory program is designed to give students firsthand experience on the material covered in lecture using integrated circuits and LED display systems. Three lecture hours and one three-hour laboratory period. Prerequisite: PHYS 242 or PHYS 212 or consent of instructor.

## EPHY 542 MATERIALS CHARACTERIZATION AND INSTRUMENTATION LABORATORY (3)

Several advanced experiments exploring methods currently used in research and industry. Familiarization with machine shop procedures, vacuum, low temperature, and other experimental techniques. Six laboratory hours. Prerequisite: PHYS 341 or consent of instructor.

## EPHY 581 OPTICAL SYSTEMS DESIGN (4)

Addresses key principles/ideas within optical systems design, including advanced geometrical optics, tracing, ZemaxTM training, aberration theory, zoom systems design, sequential and non-sequential systems, with emphasis on real-world application and design problems and solutions. Three lecture hours and one three-hour laboratory each week. Not open to students who completed EPHY 381. Prerequisites: PHYS 243, PHYS 541 (may be taken concurrently) or consent of the instructor.

## EPHY 623 FLUID DYNAMICS (3)

An in-depth introduction to the physics of fluid flows, which governs physical phenomena as diverse as the drainage of water from a kitchen sink and the development of tropical cyclones. Some experience with computer programming will be required. Not open to students who have successfully completed EPHY 423. Prerequisites: MATH 374, PHYS 243, PHYS 307, or consent of instructor.