PHYSICS 6243 Syllabus
Fall Semester, 1999

Instructor:  Dr. R. J. Hauenstein
Office:     PS-217 (744-5812)
Hours:      MWF (10:00–11:00 a.m. or by appointment.)
E-Mail:     rjh@hyper.phy.okstate.edu

Lectures:   PS-112, MWF, 11:30 a.m.–12:20 p.m.

Text:       No single text adequately covers all of the material of this course. However, a general survey is given by Yu and Cardona, Fundamentals of Semiconductors (Springer, 1996). This will serve as our reference. Other references will be suggested, as appropriate. Finally, additional materials will be placed on reserve at the Edmon Low Library.

Prerequisites: PHYS 5663 (Solid State I), PHYS 5113 (Stat. Thermodynamics), PHYS 5613 (Quantum Mech. I), or their equivalents.

Course Description: This is the first of a two-semester sequence on semiconductors, offered nominally every alternate year, designed to give in-depth coverage of the major topics in the physics of semiconductors and semiconductor devices. PHYS 6243 includes:

- Physics of electrons and holes
- The lattice: phonons, strain, scattering
- Non-equilibrium statistics
- Generation, recombination, trapping
- Optical material properties
- Bandstructure theories and models
- Doping and equilibrium statistics
- Transport theory and phenomena
- Electrical material properties
- Semiconductor devices: the $p$-$n$ junction

Course Grade: There will be no formal exams. Instead, course grade will be based entirely on assigned homework (see below).

Scale: No stricter than 90%/80%/70%/60% for minimum A/B/C/D.

NOTE: Habitual unexcused absence will result automatically in a course grade of “F” (see “Excused absences” section).

Attendance and Absences: Attendance of all lectures is required and expected. Attendance is particularly important since lectures will only loosely follow the book (Yu and Cardona), often including or emphasizing materials not covered there, and vice versa.

Excused absences: A written note, documenting a valid reason for the absence (such as personal illness or emergency), must be presented to Dr. Hauenstein for the absence to be considered “excused”; otherwise, the absence will be considered “unexcused”. NOTE: Students are responsible for all material covered in class or through out-of-class assignments including any classes which are missed due to excused absence. Unexcused absence $>20\%$ of the time will be regarded as habitual.

Homework: Assigned roughly every two weeks, with due dates indicated. No late homework will be accepted! All problems will be graded and returned. Selected solutions may be posted. All problems will carry equal “point value” (10 pts. per problem) except where otherwise indicated by the instructor.

Withdrawals: The University Withdrawal Policy will be followed strictly. Students are responsible for knowing all relevant dates and rules.

Academic Dishonesty/Misconduct: Neither academic dishonesty nor academic misconduct will be tolerated and will be dealt with in strict accordance with OSU policies. Any instances whatsoever may result in a course grade of “F”. Students are responsible for knowing and conforming to all OSU policies concerning academic dishonesty and academic misconduct for this course.