ADVANCED SOLID STATE
PHYSICS PHYS 6371

COURSE OUTLINE

Fall 2007

INSTRUCTOR: Robert Glosser - Office, FO2.724C, 972 883-2876
e-mail: <glosser@utdallas.edu>
Office hours: 4:00 to 5:00pm, Monday and Wednesday or by appointment

SESSIONS: Tuesdays and Thursdays in CB1.122 from 7:00 to 8:15pm

TEXTS: REQUIRED: Kittel, *INTRODUCTION TO SOLID STATE PHYSICS*, 8th ed.

ADDITIONAL RECOMMENDED TEXTS: Burns, *SOLID STATE PHYSICS*, Goodstein, *STATES OF MATTER* (Dover)

SUPPLEMENTARY TEXTS: (either on reserve at the UTD Library or necessary excerpts will be made available.)
Ashcroft & Mermin, *SOLID STATE PHYSICS*
Ibach and Luth, *SOLID STATE PHYSICS*
Ziman, *PRINCIPLES OF THE THEORY OF SOLIDS* (2nd ed.) paperback
Blakemore, *SOLID STATE PHYSICS* (2nd ed.) paperback
Dekker, *SOLID STATE PHYSICS*
Kittel, *QUANTUM THEORY OF SOLIDS*, paperback
Levy, *PRINCIPLES OF SOLID STATE PHYSICS*
Ziman, *ELECTRONICS AND PHONONS*

GRADING: There are no exams. Grade will be determined by attendance, homework and one term paper or talk.

PREREQUISITES: PHYS 5371, Introduction to Solid State Physics or equivalent

TOPICS COVERED:

1. Superconductivity
2. Diamagnetism and paramagnetism
3. Ferromagnetism
4. Dielectrics and ferroelectrics
5. Fermi Surfaces and Metals
6. Thermoelectricity

PURPOSE OF THIS COURSE: A person with an advanced degree in Physics should have at least a basic knowledge of important topics in condensed matter physics. The topics mentioned above are representative of areas that have been and continue to be subjects of great basic research as well as of applied interest.

OBJECTIVES: At the completion of the course, a student is expected to be able to discuss, in basic conceptual terms, the mechanisms of superconductivity, ferromagnetism and ferroelectricity. From these or closely related topics, a working familiarity with one of these topics will be demonstrated in either a term paper or a class presentation. This will contain, not only the basic concepts of the particular topic, but also the extension of these concepts to a current research topic that is agreed upon by the student and the instructor.