10752-713(8) Solid State Physics (1½l, 1½p)

2015

Course summary:

Diffraction by crystals and the reciprocal lattice. Periodic crystal potentials, the tight-binding model, semi-conductors. Magnetism: para-, dia-, ferro- and antiferromagnetism. Superconductivity.

Outcomes of course:

The course is intended as introduction to various aspects of solid state physics. Students who complete the course will be familiar with the basic physical principles underlying a variety of fundamental phenomena in the solid state.

Lecturer:

Dr F Cinti
Telephone number: (021) 808-3864
E-mail address: cinti@sun.ac.za
Office: Room Wallenberg Centre, STIAS, STELLENBOSCH.

Course content:

Crystal structures and their systematics; scattering from crystals; heat capacity. The free electron model for conduction; energy bands in solids. Some current questions of interest.

Practical (Tutorials):

Weekly tutorials (as per honours course schedule)

Study material:

Prescribed textbook: D.L. Sidebottom “Fundamentals of condensed matter and crystalline physics”, Cambridge University Press, 2012

Assessment:

Methods of Assessments
Assessment shall occur by means of continuous assessment, comprising the following: One final oral examination, various in-class assignments testing advanced calculation skills and at least one group presentation. Significant emphasis will be placed on the conceptual content.

Venue and time of assessment opportunities
See timetable

Availability of marks:
Immediately following assessment or assignment.

Calculation of final mark for the module:
Oral examination 1/3, group lecture presentations 1/6, in-class tests/assignments 1/2