PHYC90013 Condensed Matter Physics

Credit Points:	12.5
Level:	9 (Graduate/Postgraduate)
Dates & Locations:	2015, Parkville This subject commences in the following study period/s: Semester 2, Parkville - Taught on campus.
Time Commitment:	Contact Hours: 36 hours comprising 3 one-hour lectures/week. Total Time Commitment: 170 hours
Prerequisites:	

Subject	Study Period Commencement:	Credit Points:
PHYC90007 Quantum Mechanics	Semester 1	12.50
PHYC90008 Quantum Field Theory	Semester 1	12.50

and a third-year subject in statistical physics equivalent to

Subject	Study Period Commencement:	Credit Points:
PHYC30017 Statistical Physics	Semester 2	12.50

Corequisites:	None
Recommended Background Knowledge:	None
Non Allowed Subjects:	None
Core Participation Requirements:	It is University policy to take all reasonable steps to minimise the impact of disability upon academic study and reasonable steps will be made to enhance a student's participation in the University's programs. Students who feel their disability may impact upon their active and safe participation in a subject are encouraged to discuss this with the relevant subject coordinator and the Disability Liaison Unit.
Coordinator:	Assoc Prof Jeffrey Mccallum
Contact:	Email: **msc@physics.unimelb.edu.au (mailto:msc@physics.unimelb.edu.au)**
Subject Overview:	This subject provides an advanced introduction to condensed matter physics. The general topics covered are (i) experimental and theoretical aspects of the characterisation of condensed matter using eletrons and x-rays and (ii) the quantum model of solids and its relevance to semiconductor and mesoscopic physics. Specific topics covered may include: (i) the imaging of condensed matter at the atomic level and (ii) the determination of how atoms are bonded; (iii) application of imaging beyond the nanoscale; (iv) magnetism; (v) superconductivity; (vi) the properties of semiconductor devices and (vii) mesoscopic systems.
Learning Outcomes:	The objectives of this subject are: # To challenge the students to expand their knowledge of condensed matter physics and provide a foundation for further advanced studies. # To broaden their appreciation of how condensed matter physics integrates into the discipline of physics overall. # To develop a deep understanding of how condensed matter is characterised on the atomic scale.

	# To understand the role of quantum effects in micro- and meso-scopic systems and acquire a fundamental understanding of a range of physical phenomena in condensed matter systems.
Assessment:	Two assignments totalling up to 36 pages of written work (20%), spaced equally during the semester. One four-hour end-of-semester written examination (80%).
Prescribed Texts:	None
Recommended Texts:	None
Breadth Options:	This subject is not available as a breadth subject.
Fees Information:	Subject EFTSL, Level, Discipline & Census Date, http://enrolment.unimelb.edu.au/fees
Generic Skills:	At the completion of this subject, students should have gained skills in: # analysing how to solve a problem by applying simple fundamental laws to more complicated situations; # applying abstract concepts to real-world situations; # solving relatively complicated problems using approximations; # participating as an effective member of a group in discussions and collaborative assignments; # managing time effectively in order to be prepared for group discussions and undertake the assignments and exam.
Related Course(s):	Master of Science (Physics)
Related Majors/Minors/ Specialisations:	Physics Physics