MAST90015 Phase Transitions and Critical Phenomena

Credit Points:	12.50
Level:	9 (Graduate/Postgraduate)
Dates & Locations:	This subject is not offered in 2012. On-campus
Time Commitment:	Contact Hours: 36 hours comprising two 1-hour lectures per week and one 1-hour practice class per week. Total Time Commitment: Three contact hours and and hours private study per week.
Prerequisites:	None
Corequisites:	None
Recommended Background Knowledge:	It is recommended that students have completed a third year subject equivalent to

Subject	Study Period Commencement:	Credit Points:
MAST30012 Discrete Mathematics	Semester 2	12.50

Non Allowed Subjects:	None
Core Participation Requirements:	For the purposes of considering requests for Reasonable Adjustments under the Disability Standards for Education (Cwth 2005), and Students Experiencing Academic Disadvantage Policy, academic requirements for this subject are articulated in the Subject Description, Subject Objectives, Generic Skills and Assessment Requirements for this entry. The University is dedicated to provide support to those with special requirements. Further details on the disability support scheme can be found at the Disability Liaison Unit website: http://www.services.unimelb.edu.au/disability/
Contact:	Prof Paul Pearce Email: **papearce@unimelb.edu.au (mailto:papearce@unimelb.edu.au)**
Subject Overview:	The subject introduces the Gibbs ensembles of classical statistical mechanics, the relations to thermodynamics and the modern theory of phase transitions and critical phenomena including the concepts of critical exponents, universality and scaling. Applications include the ideal gas, mean field theories of fluids and ferromagnets and Ising lattice spin models.
Objectives:	After completing this subject students should: # understand the formulation of statistical mechanics; # know how to calculate equilibrium thermodynamic properties of physical interest in statistical systems; # have the ability to pursue further studies in this and related areas.
Assessment:	Up to 50 pages of written assignments (50%: two assignments worth 25% each, due mid and late in semester), a 3-hour written examination (50%, in the examination period).
Prescribed Texts:	None - lecture notes are provided.
Recommended Texts:	C.J. Thompson, Classical Equilibrium Statistical Mechanics, Oxford 1988
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:	Upon completion of the subject, students should develop the following generic skills:

	# problem-solving skills including engaging with unfamiliar problems and identifying relevant strategies; # analytical skills including the ability to construct and express logical arguments and to work in abstract or general terms to increase the clarity and efficiency of an analysis; # time management skills: the ability to meet regular deadlines while balancing competing commitments.