640-351 Astrophysics & Optics III

Credit Points:	12.500
Level:	Undergraduate
Dates & Locations:	2008, This subject commences in the following study period/s: Semester 1, - Taught on campus.
Time Commitment:	Contact Hours: 36 lectures and up to six 1-hour tutorials Total Time Commitment: 120 hours.
Prerequisites:	Physics 640-225 or 640-245. Mathematics 620-231 or 620-233; and mathematics 620-232 or 620-234.For 2007, students who completed 640-237 but not 640-225 or 640-245 will also be permitted to enrol.
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:	Prof R Webster; Dr A Roberts
Subject Overview:	This subject develops the study of astrophysics and optics and introduces powerful mathematical tools of more general applicability in engineering and the physical sciences. In astrophysics this subject will concentrate on emission processes, high-energy astrophysics and cosmology, while the other section of the subject provides an introduction to Fourier optics, imaging and nonlinear optics. Students completing this subject will be able to: # explain the principles underlying emission processes in astrophysics, high energy astrophysics and cosmology; # demonstrate an understanding of radiation processes, degenerate stars, black holes, accretion processes and relativistic cosmology and solve problems relevant to these topics; # be able to apply the principles of Fourier, convolution and correlation to solving problems in diffraction and optical imaging; and # demonstrate an appreciation of the role of coherence in optical physics as well as an understanding of pulsed laser systems and nonlinear optical processes. In addition, students will enhance their ability to plan effective work schedules and manage their time to meet the deadlines for submission of assessable work and prepare for tests and examinations.
Assessment:	Written assignments totalling up to 3000 words due during the semester (20%); project work involving a 15-minute group presentation and written report up to 1000 words due during the semester (10%); a 3-hour written examination in the examination period (70%).
Prescribed Texts:	Optics (E Hecht), 4th edn, Addison-Wesley An Introduction to Modern Astrophysics (B Carol and D Ostlie), Addison-Wesley
Breadth Options:	This subject is a level 2 or level 3 subject and is not available to new generation degree students as a breadth option in 2008. This subject or an equivalent will be available as breadth in the future.

	Breadth subjects are currently being developed and these existing subject details can be used as guide to the type of options that might be available. 2009 subjects to be offered as breadth will be finalised before re-enrolment for 2009 starts in early October.
Fees Information:	Subject EFTSL, Level, Discipline & Census Date, http://enrolment.unimelb.edu.au/fees
Notes:	This subject is available for science credit to students enrolled in the BSc (pre-2008 degree only), BASc or a combined BSc course.