PHYC10001 Physics 1: Advanced

Credit Points:	12.5
Level:	1 (Undergraduate)
Dates & Locations:	2016, Parkville This subject commences in the following study period/s: Semester 1, Parkville - Taught on campus.
Time Commitment:	Contact Hours: 3 x one hour lectures per week; 1 x one hour tutorial per week; 28 hours of practical work (8 x three hour laboratory sessions and up to 30 minutes of pre-laboratory activity) and 10 weekly assignments of 30 minutes each during the semester. Total Time Commitment: Estimated total time commitment of 170 hours
Prerequisites:	Physics and Mathematics prerequisites exist for this subject. Physics One of # Excellent results in VCE Units 3/4 Physics (normally an unscaled score of at least 35) or equivalent.

Subject	Study Period Commencement:	Credit Points:
PHYC10002 Physics 2: Advanced	Semester 2	12.50

Mathematics

One of

Excellent results in VCE Units 3/4 Specialist Mathematics (normally an unscaled score of at least 35) or equivalent.

Subject	Study Period Commencement:	Credit Points:
MAST10006 Calculus 2	Semester 1, Semester 2	12.50
MAST10007 Linear Algebra	Summer Term, Semester 1, Semester 2	12.50
MAST10008 Accelerated Mathematics 1	Semester 1	12.50
MAST10009 Accelerated Mathematics 2	Semester 2	12.50

Corequisites:	None
Recommended Background Knowledge:	None
Non Allowed Subjects:	Students may only gain credit for one of

Subject	Study Period Commencement:	Credit Points:
PHYC10001 Physics 1: Advanced	Semester 1	12.50
PHYC10003 Physics 1	Semester 1	12.50
PHYC10005 Physics 1: Fundamentals	Semester 1	12.50

Core Participation Requirements:	For the purposes of considering request for Reasonable Adjustments under the Disability Standards for Education (Cwth 2005), and Student Support and Engagement Policy, academic requirements for this subject are articulated in the Subject Overview, Learning Outcomes, Assessment and Generic Skills sections of this entry. It is University policy to

	take all reasonable steps to minimise the impact of disability upon academic study, and reasonable adjustments will be made to enhance a student's participation in the University's programs. Students who feel their disability may impact on meeting the requirements of this subject are encouraged to discuss this matter with a Faculty Student Adviser and Student Equity and Disability Support: http://services.unimelb.edu.au/disability</p>
Coordinator:	Assoc Prof Roger Rassool
Contact:	Director of First Year Studies **Email: dfys@physics.unimelb.edu.au (mailto:dfys@physics.unimelb.edu.au)**
Subject Overview:	This subject is designed for students with a strong interest and background in physics, and aims to provide a deep understanding of a broad range of physics principles and applications. Topics include: Mechanics: describing and explaining translational and rotational motion, for example in the contexts of human and animal movement and transport (Newton's laws of motion, both translational and rotational; energy transfer and transformation; momentum and impulse; simple harmonic motion, equilibrium). Waves and sound: water waves; seismic waves; production and detection of sound, eg. musical instruments, hearing; ultrasound (reflection and refraction, superposition, resonance, energy transport, absorption, Doppler effect). Optics: optical imaging, sensors and optical instruments, human vision, crystallography (dispersion, lenses and mirrors, interference, diffraction, polarisation). Gravitation: weightlessness, planetary and satellite orbits, escape velocity (universal gravity, Kepler's laws). Special relativity: particle accelerators, the 'twin paradox' (Einstein's modification of Newtonian physics, relativity of time and space, equivalence of mass and energy). Vector notation, and differential and integral calculus, are used wherever appropriate.
Learning Outcomes:	To challenge students to develop further their understanding of the importance of physics principles and develop their capacity to: # understand and explain the physics principles of translational and rotational mechanics, waves, optics and special relativity; # apply these principles using logical reasoning, together with appropriate mathematical reasoning, to a variety of familiar and novel situations and problems; and # acquire experimental data using a range of measurement instruments and interpret these data.
Assessment:	Ongoing assessment of practical work during the semester (25%); ten weekly assignments (10 x 1.5% = 15%); a 3-hour written examination in the examination period (60%). Satisfactory completion of practical work is necessary to pass the subject (i.e. attendance and submission of work for at least 80% of workshop sessions together with a result for assessed work of at least 50%).
Prescribed Texts:	Fundamentals of Physics, 10th Edition Value Pack (incl. Companion and Etext) ISBN: 978 1 118 71837 7
Breadth Options:	This subject potentially can be taken as a breadth subject component for the following courses: # **Bachelor of Arts (https://handbook.unimelb.edu.au/view/2016/B-ARTS)** # **Bachelor of Commerce (https://handbook.unimelb.edu.au/view/2016/B-COM)** # **Bachelor of Environments (https://handbook.unimelb.edu.au/view/2016/B-ENVS)** # **Bachelor of Music (https://handbook.unimelb.edu.au/view/2016/B-MUS)** You should visit **learn more about breadth subjects (http://breadth.unimelb.edu.au/breadth/info/index.html)** and read the breadth requirements for your degree, and should discuss your choice with your student adviser, before deciding on your subjects.
Fees Information:	Subject EFTSL, Level, Discipline & Census Date, http://enrolment.unimelb.edu.au/fees

Generic Skills:	A student who completes this subject should be able to: # explain their understanding of physics principles and applications lucidly, both in writing and orally; # acquire and interpret experimental data and design experimental investigations; # participate as an effective member of a group in tutorial discussions, laboratory and study groups; # think independently and analytically, and direct his or her own learning; and # manage time effectively in order to be prepared for regular practical and tutorial classes, tests and the examination.
Notes:	This subject is available for science credit to students enrolled in the BSc (both pre-2008 and new degrees), BASc or a combined BSc course.
Related Majors/Minors/ Specialisations:	Science-credited subjects - new generation B-SCI and B-ENG. Selective subjects for B-BMED