PHYC30011 Sub-atomic Physics

Credit Points: 12.5

Level: 3 (Undergraduate)

Dates & Locations:

2015, Parkville

This subject commences in the following study period/s:
Semester 2, Parkville - Taught on campus.

Time Commitment: Contact Hours: 2 to 4 hours per week, 36 in total, lectures and problem-solving classes Total Time Commitment: Estimated total time commitment of 170 hours

Prerequisites:

Either

Subject	Study Period Commencement:	Credit Points:
PHYC30018 Quantum Physics	Semester 1	12.50

(PHYC30018 alone, satisfies the prerequisite)

Or

Subject	Study Period Commencement:	Credit Points:
PHYC20010 Quantum Mechanics and Special Relativity	Semester 1	12.50

plus one of

Subject	Study Period Commencement:	Credit Points:
PHYC20009 Thermal and Classical Physics	Semester 1	12.50
PHYC20011 Electromagnetism and Optics	Semester 2	12.50

Corequisites: None

Recommended Background Knowledge: None

Non Allowed Subjects: None

Core Participation Requirements: For the purposes of considering request 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 of 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/

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Subject Overview: The subject provides an introduction to the unified picture of elementary particles and atomic nuclei - how the elementary quarks combine to form strongly interacting particles, and how two of these, the proton and neutron combine to form atomic nuclei; how quarks and their composites interact with the leptons and with each other; how we study these systems experimentally; and the exciting unanswered questions in this field of physics.

	Topics covered will be selected from: quarks and leptons; strong, electromagnetic and weak interactions; symmetries and conservation laws; structure, models and properties of hadrons; structure, models and properties of nuclei; scattering and decay processes; accelerators; detectors; fission and fusion reactors; applications of nuclear and particle physics techniques; and other topics in sub-atomic physics of contemporary interest.
Learning Outcomes:	Students completing this subject should be able to: # explain the unified picture of quarks and leptons, hadrons, and atomic nuclei, and their basic properties and interactions; and # solve and analyse problems in these areas by applying simple quantum mechanical reasoning. In addition, students should 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:	Test of 1 hour (5%) and two assignments equivalent to 1500 words each during the semester (7.5% each); a 3-hour written examination in the examination period (80%).
Prescribed Texts:	B R Martin, Nuclear and Particle Physics: An Introduction, Wiley.
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/2015/B-ARTS)** # **Bachelor of Commerce (https://handbook.unimelb.edu.au/view/2015/B-COM)** # **Bachelor of Environments (https://handbook.unimelb.edu.au/view/2015/B-ENVS)** # **Bachelor of Music (https://handbook.unimelb.edu.au/view/2015/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
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:	Physics Physics Physics Physics Physics (specialisation of Physics major) Science-credited subjects - new generation B-SCI and B-ENG.