

## PHYC30011 Sub-atomic Physics

<b>Credit Points:</b>	12.50
<b>Level:</b>	3 (Undergraduate)
<b>Dates &amp; Locations:</b>	2010, Parkville This subject commences in the following study period/s: Semester 2, Parkville - Taught on campus. Lectures
<b>Time Commitment:</b>	Contact Hours: 2 to 4 hours per week, 36 in total, lectures and problem-solving classes Total Time Commitment: Estimated total time commitment of 120 hours
<b>Prerequisites:</b>	One of # <b>640-214 Quantum Mechanics and Special Relativity (/view/2010/640-214)</b> # 640-223 Quantum Mechanics and Thermal Physics Advanced (prior to 2009) # 640-243 Quantum Mechanics and Thermal Physics (prior to 2009)
<b>Corequisites:</b>	None
<b>Recommended Background Knowledge:</b>	None
<b>Non Allowed Subjects:</b>	None
<b>Core Participation Requirements:</b>	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.
<b>Coordinator:</b>	Assoc Prof Elisabetta Barberio
<b>Contact:</b>	<b>Email: <a href="mailto:c640354@physics.unimelb.edu.au">c640354@physics.unimelb.edu.au</a> (mailto:c640354@physics.unimelb.edu.au)</b>
<b>Subject Overview:</b>	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.
<b>Objectives:</b>	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.
<b>Assessment:</b>	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%).

<b>Prescribed Texts:</b>	B R Martin, Nuclear and Particle Physics: An Introduction, Wiley.
<b>Breadth Options:</b>	<p>This subject potentially can be taken as a breadth subject component for the following courses:</p> <ul style="list-style-type: none"> <li># <b><u>Bachelor of Arts</u></b> (<a href="https://handbook.unimelb.edu.au/view/2010/B-ARTS">https://handbook.unimelb.edu.au/view/2010/B-ARTS</a>)</li> <li># <b><u>Bachelor of Commerce</u></b> (<a href="https://handbook.unimelb.edu.au/view/2010/B-COM">https://handbook.unimelb.edu.au/view/2010/B-COM</a>)</li> <li># <b><u>Bachelor of Environments</u></b> (<a href="https://handbook.unimelb.edu.au/view/2010/B-ENVS">https://handbook.unimelb.edu.au/view/2010/B-ENVS</a>)</li> <li># <b><u>Bachelor of Music</u></b> (<a href="https://handbook.unimelb.edu.au/view/2010/B-MUS">https://handbook.unimelb.edu.au/view/2010/B-MUS</a>)</li> </ul> <p>You should visit <b>learn more about breadth subjects</b> (<a href="http://breadth.unimelb.edu.au/breadth/info/index.html">http://breadth.unimelb.edu.au/breadth/info/index.html</a>) and read the breadth requirements for your degree, and should discuss your choice with your student adviser, before deciding on your subjects.</p>
<b>Fees Information:</b>	Subject EFTSL, Level, Discipline & Census Date, <a href="http://enrolment.unimelb.edu.au/fees">http://enrolment.unimelb.edu.au/fees</a>
<b>Notes:</b>	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.
<b>Related Course(s):</b>	Bachelor of Science
<b>Related Majors/Minors/ Specialisations:</b>	Physics Physics