

## 640-354 Sub-atomic Physics

<b>Credit Points:</b>	12.50
<b>Level:</b>	3 (Undergraduate)
<b>Dates &amp; Locations:</b>	2009, This subject commences in the following study period/s: Semester 2, - Taught on campus. Lectures and tutorials.
<b>Time Commitment:</b>	Contact Hours: 36 lectures and up to six 1-hour tutorials Total Time Commitment: 120 hours total time commitment.
<b>Prerequisites:</b>	Physics 640-223 or 640-243.
<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>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:  <ul style="list-style-type: none"> <li># explain the unified picture of quarks and leptons, hadrons, and atomic nuclei, and their basic properties and interactions; and</li> <li># solve and analyse problems in these areas by applying simple quantum mechanical reasoning.</li> </ul> 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>	Tests totalling up to 2 hours and assignments totalling up to an equivalent of 3000 words during the semester (20%); 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>	This subject potentially can be taken as a breadth subject component for the following courses: <ul style="list-style-type: none"> <li># <a href="https://handbook.unimelb.edu.au/view/2009/D09">Bachelor of Arts (https://handbook.unimelb.edu.au/view/2009/D09)</a></li> <li># <a href="https://handbook.unimelb.edu.au/view/2009/F04">Bachelor of Commerce (https://handbook.unimelb.edu.au/view/2009/F04)</a></li> </ul>

	<p># <a href="https://handbook.unimelb.edu.au/view/2009/A04"><b>Bachelor of Environments</b></a> (<a href="https://handbook.unimelb.edu.au/view/2009/A04">https://handbook.unimelb.edu.au/view/2009/A04</a>)</p> <p># <a href="https://handbook.unimelb.edu.au/view/2009/M05"><b>Bachelor of Music</b></a> (<a href="https://handbook.unimelb.edu.au/view/2009/M05">https://handbook.unimelb.edu.au/view/2009/M05</a>)</p> <p>You should visit <a href="http://breadth.unimelb.edu.au/breadth/info/index.html"><b>learn more about breadth subjects</b></a> (<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>	<p>This subject is available for science credit to students enrolled in the BSc (pre-2008 degree only), BASc or a combined BSc course.</p> <p>Previously known as 640-354 Nuclear and Particle Physics.</p>