

# PHYC30019 Astrophysics

<b>Credit Points:</b>	12.50																								
<b>Level:</b>	3 (Undergraduate)																								
<b>Dates &amp; Locations:</b>	2011, Parkville This subject commences in the following study period/s: Semester 1, Parkville - Taught on campus. Lectures and problem solving classes																								
<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>	<p>Physics</p> <p>One of</p> <table border="1"> <thead> <tr> <th>Subject</th> <th>Study Period Commencement:</th> <th>Credit Points:</th> </tr> </thead> <tbody> <tr> <td>PHYC20010 Quantum Mechanics and Special Relativity</td> <td>Semester 1</td> <td>12.50</td> </tr> <tr> <td>PHYC20011 Electromagnetism and Optics</td> <td>Semester 2</td> <td>12.50</td> </tr> <tr> <td>PHYC20009 Thermal and Classical Physics</td> <td>Semester 1</td> <td>12.50</td> </tr> <tr> <td>PHYC20005 Quantum Mechanics &amp; Thermal Physics</td> <td>Semester 1</td> <td>12.50</td> </tr> </tbody> </table> <p># 640-225 Electromagnetism &amp; Special Relativity (Advanced) (prior to 2009)                      # 640-245 Electromagnetism &amp; Special Relativity (prior to 2009)                      # 640-237 Astrophysics &amp; Optics (prior to 2009)                      # 640-234 Further Classical &amp; Quantum Mechanics (prior to 2009)                      # 640-223 Quantum Mechanics &amp; Thermal Physics (Advanced) (prior to 2009)                      (PHYC20005 Thermal and Classical Physics may be taken concurrently)</p> <p>And Mathematics</p> <p>Either both of</p> <table border="1"> <thead> <tr> <th>Subject</th> <th>Study Period Commencement:</th> <th>Credit Points:</th> </tr> </thead> <tbody> <tr> <td>MAST20009 Vector Calculus</td> <td>Semester 1, Semester 2</td> <td>12.50</td> </tr> <tr> <td>MAST20026 Real Analysis with Applications</td> <td>Semester 1, Semester 2</td> <td>12.50</td> </tr> </tbody> </table> <p>Or</p> <p># 620-296 Multivariable &amp; Vector Calculus (prior to 2010)</p> <p>For students who commenced second year level mathematics prior to 2009:</p> <p>One of</p> <p># 620-231 Vector Analysis (prior to 2009)                      # 620-233 Vector Analysis Advanced (prior to 2009)                      # MAST20009 Vector Calculus</p> <p>And one of</p> <p># 620-232 Mathematical Methods (prior to 2010)                      # 620-234 Mathematical Methods Advanced (prior to 2009).</p>	Subject	Study Period Commencement:	Credit Points:	PHYC20010 Quantum Mechanics and Special Relativity	Semester 1	12.50	PHYC20011 Electromagnetism and Optics	Semester 2	12.50	PHYC20009 Thermal and Classical Physics	Semester 1	12.50	PHYC20005 Quantum Mechanics & Thermal Physics	Semester 1	12.50	Subject	Study Period Commencement:	Credit Points:	MAST20009 Vector Calculus	Semester 1, Semester 2	12.50	MAST20026 Real Analysis with Applications	Semester 1, Semester 2	12.50
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<b>Corequisites:</b>	None																								

<b>Recommended Background Knowledge:</b>	None
<b>Non Allowed Subjects:</b>	Students cannot gain for this subject and either of the following <ul style="list-style-type: none"> <li># 640-237 Astrophysics &amp; Optics II (prior to 2009)</li> <li># 640-351 Astrophysics &amp; Optics III (prior to 2010)</li> </ul>
<b>Core Participation Requirements:</b>	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: <a href="http://www.services.unimelb.edu.au/disability/">http://www.services.unimelb.edu.au/disability/</a>
<b>Coordinator:</b>	Prof Rachel Webster
<b>Contact:</b>	<b>Email: <a href="mailto:PHYC30019@physics.unimelb.edu.au">PHYC30019@physics.unimelb.edu.au</a></b> ( <a href="mailto:PHYC30019@physics.unimelb.edu.au">mailto:PHYC30019@physics.unimelb.edu.au</a> )
<b>Subject Overview:</b>	This subject provides an introduction to astrophysics discussing the basic structure of stars, our galaxy, and the universe and introducing the most recent research questions. Topics covered include: <ul style="list-style-type: none"> <li># structure and evolution of stars, degenerate stars, black holes, the structure of the Milky Way and other cosmic objects, emission processes in astrophysics, high energy astrophysics, relativistic cosmology and cosmological models</li> </ul>
<b>Objectives:</b>	To challenge students to expand their knowledge of fundamental astrophysical principles and develop their capacity to: <ul style="list-style-type: none"> <li># explain the structure and evolution of stars, the Milky Way and other cosmic objects and cosmological models;</li> <li># explain the physics underlying emission processes in astrophysics, high energy astrophysics and cosmology, and</li> <li># demonstrate an understanding of emission processes, degenerate stars, black holes, accretion processes and relativistic cosmology;</li> <li># solve problems relevant to these topics.</li> </ul>
<b>Assessment:</b>	Two written assignments each totalling up to an equivalent of 1500 words due during semester (10% each); project work involving 15-minute group presentation and written report up to 1000 words due during semester (10%); a 3-hour written examination in the examination period (70%).
<b>Prescribed Texts:</b>	Dan Maoz, Astrophysics in a Nutshell, Princeton University Press, 2007
<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># <b>Bachelor of Commerce</b> (<a href="https://handbook.unimelb.edu.au/view/2011/B-COM">https://handbook.unimelb.edu.au/view/2011/B-COM</a>)</li> <li># <b>Bachelor of Environments</b> (<a href="https://handbook.unimelb.edu.au/view/2011/B-ENVS">https://handbook.unimelb.edu.au/view/2011/B-ENVS</a>)</li> <li># <b>Bachelor of Music</b> (<a href="https://handbook.unimelb.edu.au/view/2011/B-MUS">https://handbook.unimelb.edu.au/view/2011/B-MUS</a>)</li> </ul> <p>You should visit <b><a href="http://breadth.unimelb.edu.au/breadth/info/index.html">learn more about breadth subjects (http://breadth.unimelb.edu.au/breadth/info/index.html)</a></b> 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>Generic Skills:</b>	A student who completes this subject should be able to: <ul style="list-style-type: none"> <li># analyse how to solve a problem by applying simple fundamental laws to more complicated situations;</li> </ul>

	<ul style="list-style-type: none"> <li># apply abstract concepts to real-world situations;</li> <li># solve relatively complicated problems using approximations;</li> <li># participate as an effective member of a group in tutorial discussions;</li> <li># manage time effectively in order to be prepared for tutorial classes, undertake written assignments and the examination, and prepare and give a group presentation.</li> </ul>
<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 (specialisation of Physics major) Science credit subjects* for pre-2008 BSc, BAsC and combined degree science courses