

MAST30029 Partial Differential Equations

Credit Points:	12.50												
Level:	3 (Undergraduate)												
Dates & Locations:	2012, Parkville This subject commences in the following study period/s: Semester 2, Parkville - Taught on campus. Lectures and practice classes.												
Time Commitment:	Contact Hours: 3 x one hour lectures per week, 1 x one hour practice class per week Total Time Commitment: Estimated total time commitment of 120 hours												
Prerequisites:	<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>MAST20009 Vector Calculus</td> <td>Semester 1, Semester 2</td> <td>12.50</td> </tr> </tbody> </table> <p># 620-296 Multivariable and Vector Calculus (prior to 2010) # 620-233 Vector Analysis Advanced (prior to 2009)</p> <p>and 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>MAST30021 Complex Analysis</td> <td>Semester 1, Semester 2</td> <td>12.50</td> </tr> </tbody> </table> <p># 620-221 Real and Complex Analysis (prior to 2009) # 620-252 Analysis (prior to 2010)</p>	Subject	Study Period Commencement:	Credit Points:	MAST20009 Vector Calculus	Semester 1, Semester 2	12.50	Subject	Study Period Commencement:	Credit Points:	MAST30021 Complex Analysis	Semester 1, Semester 2	12.50
Subject	Study Period Commencement:	Credit Points:											
MAST20009 Vector Calculus	Semester 1, Semester 2	12.50											
Subject	Study Period Commencement:	Credit Points:											
MAST30021 Complex Analysis	Semester 1, Semester 2	12.50											
Corequisites:	None												
Recommended Background Knowledge:	None												
Non Allowed Subjects:	<p>Students may only gain credit for one of</p> <ul style="list-style-type: none"> # MAST30029 Partial Differential Equations # MAST30023 Differential Equations for Engineers (prior to 2012) <p>Students who have completed MAST30007 Applied Partial Differential Equations may not enrol in this subject for credit.</p>												
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/												
Coordinator:	Assoc Prof Antoinette Tordesillas												
Contact:	Third Year Coordinator Email: tycoord@ms.unimelb.edu.au (mailto:tycoord@ms.unimelb.edu.au)												
Subject Overview:	Partial differential equations (PDEs) are fundamental in all physical and mathematical, as well as biological and engineering sciences. This subject provides a solid introduction to the concepts and methods of solving PDEs, and balances basic theory and concrete applications.												

	<p>It covers how PDEs arise in modelling various phenomena and introduces the most common classes of PDEs and the most important methods that are used to solve them.</p> <p>Topics covered include: quasilinear first-order PDEs: modelling contexts, characteristics, shocks and fan solutions; second-order linear PDEs: heat, wave and Laplace equations, maximum principles, eigenfunction expansions and Fourier series, Fourier and Laplace transform methods, applications of complex analysis.</p>
Objectives:	<p>On completion of this subject, students should:</p> <ul style="list-style-type: none"> # know contexts in which partial differential equations provide relevant models; # understand distinctive features of several important classes of partial differential equations and general properties of the solutions; # be able to find exact solutions of simple first and second-order partial differential equations in two variables; # know how eigenfunction, transform and complex variable methods arise naturally and can be applied in partial differential equation problems.
Assessment:	A 45-minute written test held mid-semester (20%), and a 3-hour written examination in the examination period (80%).
Prescribed Texts:	None
Breadth Options:	<p>This subject potentially can be taken as a breadth subject component for the following courses:</p> <ul style="list-style-type: none"> # Bachelor of Commerce (https://handbook.unimelb.edu.au/view/2012/B-COM) # Bachelor of Environments (https://handbook.unimelb.edu.au/view/2012/B-ENVS) # Bachelor of Music (https://handbook.unimelb.edu.au/view/2012/B-MUS) <p>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.</p>
Fees Information:	Subject EFTSL, Level, Discipline & Census Date, http://enrolment.unimelb.edu.au/fees
Generic Skills:	<p>In addition to learning specific skills that will assist students in their future careers in science, they will have the opportunity to develop generic skills that will assist them in any future career path. These include:</p> <ul style="list-style-type: none"> # problem-solving skills: the ability to engage with unfamiliar problems and identify relevant solution strategies; # analytical skills: the ability to construct and express logical arguments and to work in abstract or general terms to increase the clarity and efficiency of analysis.
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:	<p>Applied Mathematics (specialisation of Mathematics and Statistics major) Mathematical Physics Science credit subjects* for pre-2008 BSc, BASc and combined degree science courses Science-credited subjects - new generation B-SCI and B-ENG. Core selective subjects for B-BMED.</p>