MAST30029 Partial Differential Equations

Credit Points:	12.50
Level:	3 (Undergraduate)
Dates & Locations:	2010, 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:	One of # **620-231 Vector Calculus (/view/2010/620-231)** # 620-296 Multivariable and Vector Calculus (prior to 2010) # 620-233 Vector Analysis Advanced (prior to 2009) and one of # **620-324 Complex Analysis (/view/2010/620-324)** # 620-221 Real and Complex Analysis (prior to 2009) # 620-252 Analysis (prior to 2010)
Corequisites:	None
Recommended Background Knowledge:	None
Non Allowed Subjects:	Students may only gain credit for one of # 620-334 Partial Differential Equations # **620-326 Differential Equations for Engineers (/view/2010/620-326)** Students who have completed **620-331 Applied Partial Differential Equations (/view/2010/620-331)** may not enrol in this subject for credit.
Core Participation Requirements:	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.
Coordinator:	Prof Omar Foda
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. 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. 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.
Objectives:	On completion of this subject, students should:

	# 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:	This subject potentially can be taken as a breadth subject component for the following courses: # **Bachelor of Commerce (https://handbook.unimelb.edu.au/view/2010/B-COM)** # **Bachelor of Environments (https://handbook.unimelb.edu.au/view/2010/B-ENVS)** # **Bachelor of Music (https://handbook.unimelb.edu.au/view/2010/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
Generic Skills:	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: # 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 Course(s):	Bachelor of Science
Related Majors/Minors/ Specialisations:	Applied Mathematics