MAST30012 Discrete Mathematics

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 # **620-295 Real Analysis with Applications (/view/2010/620-295)** # **620-158 Accelerated Mathematics 2 (/view/2010/620-158)** and any other second year level subject from the Department of Mathematics and Statistics
Corequisites:	None
Recommended Background Knowledge:	None
Non Allowed Subjects:	None
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:	Dr Richard Brak
Contact:	Third Year Coordinator **Email: tycoord@ms.unimelb.edu.au (mailto:tycoord@ms.unimelb.edu.au)**
Subject Overview:	This subject is concerned with the study of objects, which are finite in number and typically computable. At a computational level one seeks efficient algorithms and formulas for the listing, construction and counting of the objects. The main topics to be covered are: enumeration and listings; permutations; designs, codes and finite geometry; words, patterns and Ramsey theory; and physical combinatorics. Designs are relevant to statistics, codes to communication engineering, patterns and Ramsey theory to computer science, and physical combinatorics to mathematical physics. Words are useful for representing and constructing objects and relating combinatorial objects to algebraic structures.
Objectives:	On completion of this subject, the student should: # comprehend the features characterizing problems in discrete combinatorial mathematics; # develop skills required to analyze and solve problems in discrete combinatorial mathematics; # appreciate the overlap between discrete mathematics and other areas of applied and pure mathematics.
Assessment:	Three written assignments due at regular intervals during semester amounting to a total of up to 50 pages (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 Arts (https://handbook.unimelb.edu.au/view/2010/B-ARTS)** # **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; # collaborative skills: the ability to work in a team; # time management skills: the ability to meet regular deadlines while balancing competing commitments.
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 Mathematics and Statistics (Applied Mathematics specialisation) Mathematics and Statistics (Discrete Mathematics specialisation) Mathematics and Statistics (Mathematical Physics specialisation) Mathematics and Statistics (Pure Mathematics specialisation) Operations Research / Discrete Mathematics Pure Mathematics