

# MAST90031 Enumerative Combinatorics

Credit Points:	12.5								
Level:	9 (Graduate/Postgraduate)								
Dates & Locations:	This subject is not offered in 2016.								
Time Commitment:	Contact Hours: 36 hours comprising three 1-hour lectures per week. Total Time Commitment: 170 hours								
Prerequisites:	The following, or equivalent. <table><tr><td>Subject</td><td>Study Period Commencement:</td><td>Credit Points:</td></tr><tr><td>MAST30021 Complex Analysis</td><td>Semester 1, Semester 2</td><td>12.50</td></tr></table>			Subject	Study Period Commencement:	Credit Points:	MAST30021 Complex Analysis	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:	Use of mathematical symbolic computation packages such as Mathematica and Maple is encouraged.								
Non Allowed Subjects:	None								
Core Participation Requirements:	<p>&lt;p&gt;For the purposes of considering request for Reasonable Adjustments under the Disability Standards for Education (Cwth 2005), and Student Support and Engagement Policy, academic requirements for this subject are articulated in the Subject Overview, Learning Outcomes, Assessment and Generic Skills sections of this entry.&lt;/p&gt; &lt;p&gt;It is University policy to take all reasonable steps to minimise the impact of disability upon academic study, and reasonable adjustments will be made to enhance a student's participation in the University's programs. Students who feel their disability may impact on meeting the requirements of this subject are encouraged to discuss this matter with a Faculty Student Adviser and Student Equity and Disability Support: &lt;a href="http://services.unimelb.edu.au/disability"&gt;http://services.unimelb.edu.au/disability&lt;/a&gt;&lt;/p&gt;</p>								
Contact:	Nathan Clisby Email: <a href="mailto:nclisby@unimelb.edu.au">nclisby@unimelb.edu.au</a> (mailto:nclisby@unimelb.edu.au) Dr Richard Brak Email: <a href="mailto:rb1@unimelb.edu.au">rb1@unimelb.edu.au</a> (mailto:rb1@unimelb.edu.au)								
Subject Overview:	The subject is about the use of generating functions for enumeration of combinatorial structures, including partitions of numbers, partitions of sets, permutations with restricted cycle structure, connected graphs, and other types of graph. The subject covers the solution of recurrence relations, methods of asymptotic enumeration, and some applications in statistical mechanics. The methods covered have widespread applicability, including in areas of pure and applied mathematics and computer science.								
Learning Outcomes:	After completing this subject, students should <ul style="list-style-type: none"><li># have learned about the use of generating functions for enumeration of combinatorial structures, including partitions of numbers and of sets, permutations with restricted cycle structure, connected graphs and other types of graph;</li><li># have studied the solution of recurrence relations; methods of asymptotic enumeration;</li><li># have considered some applications in statistical mechanics;</li><li># gain the ability to pursue further studies in this and related areas.</li></ul>								
Assessment:	Up to 50 pages of written assignments (40%: two assignments worth 20% each, due mid and late in semester), a 3 hour written examination (60%, in the examination period).								

<b>Prescribed Texts:</b>	"Analytic Combinatorics" by Philippe Flajolet and Robert Sedgewick, Cambridge University Press, 2009
<b>Recommended Texts:</b>	None
<b>Breadth Options:</b>	This subject is not available as a breadth subject.
<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>	<p>Upon completion of this subject, students should gain the following generic skills:</p> <ul style="list-style-type: none"><li># Problem-solving skills including the ability to engage with unfamiliar problems and identify relevant solution strategies;</li><li># Analytical skills through the ability to construct and express logical arguments and to work in abstract or general terms to increase the clarity and efficiency of analysis; and</li><li># Time management skills: the ability to meet regular deadlines while balancing competing commitments.</li></ul>
<b>Related Course(s):</b>	Doctor of Philosophy - Engineering Master of Philosophy - Engineering Master of Science (Mathematics and Statistics)
<b>Related Majors/Minors/ Specialisations:</b>	Mathematics and Statistics