

# MAST90031 Enumerative Combinatorics

<b>Credit Points:</b>	12.50						
<b>Level:</b>	9 (Graduate/Postgraduate)						
<b>Dates &amp; Locations:</b>	This subject is not offered in 2014. On-campus.						
<b>Time Commitment:</b>	Contact Hours: 36 hours comprising three 1-hour lectures per week. Total Time Commitment: 3 contact hours and 7 hours private study per week.						
<b>Prerequisites:</b>	<p>The following, or equivalent.</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>	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					
<b>Corequisites:</b>	None						
<b>Recommended Background Knowledge:</b>	Use of mathematical symbolic computation packages such as Mathematica and Maple is encouraged.						
<b>Non Allowed Subjects:</b>	None						
<b>Core Participation Requirements:</b>	For the purposes of considering requests 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 for 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>Contact:</b>	<p>Prof. Tony Guttmann                      Email: <a href="mailto:guttmann@unimelb.edu.au">guttmann@unimelb.edu.au</a> (<a href="mailto:guttmann@unimelb.edu.au">mailto:guttmann@unimelb.edu.au</a>)</p> <p>Dr Richard Brak                      Email: <a href="mailto:rb1@unimelb.edu.au">rb1@unimelb.edu.au</a> (<a href="mailto:rb1@unimelb.edu.au">mailto:rb1@unimelb.edu.au</a>)</p>						
<b>Subject Overview:</b>	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.						
<b>Learning Outcomes:</b>	<p>After completing this subject, students should</p> <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>						
<b>Assessment:</b>	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>	Master of Philosophy - Engineering Master of Science (Mathematics and Statistics) Ph.D.- Engineering
<b>Related Majors/Minors/ Specialisations:</b>	Mathematics and Statistics