

<b>Module code</b>	SM-2301		
<b>Module Title</b>	Combinatorics and graph theory		
<b>Degree/Diploma</b>	Bachelor of Science (Mathematics)		
<b>Type of Module</b>	Major Option		
<b>Modular Credits</b>	4	<b>Total student Workload</b>	10 hours/week
		<b>Contact hours</b>	4 hours/week
<b>Prerequisite</b>	SM-1201 Mathematical Methods for the Sciences		
<b>Anti-requisite</b>	None		
<b>Aims</b>			
The aim of this module is to introduce students to some of the most important ideas in discrete mathematics. They will be able learn key combinatorial techniques and apply important combinatorial proof techniques and problem solving skills to unfamiliar problem.			
<b>Learning Outcomes</b>			
<i>On successful completion of this module, a student will be expected to be able to:</i>			
Lower order :	30%	- apply elementary techniques to simple combinatorial problems	
Middle order :	60%	- find recurrence relations for some sequences	
		- apply generating-function methods to some combinatorial questions, including (in some cases) the problem of finding a formula for a sequence when given a recurrence relation.	
		- Understand some elements of graph theory	
		- apply the principle of Inclusion-Exclusion to a variety of problems	
Higher order:	10%	- advance his/her facility in learning abstract mathematics	
		- advance his/her facility in reading and constructing proofs	
<b>Module Contents</b>			
- Introduction to Counting Techniques. Permutations and Combinations. Binomial Coefficients.			
- The Principle of inclusion and exclusion.			
- Recurrence Relations.			
- Generating Functions.			
- Graph theory.			
<b>Assessment</b>	Formative assessment	Tutorial and feedback.	
	Summative assessment	Examination: 60%	
		Coursework: 40%	
		- 2 class tests (20%)	
		- 2 assignments (20%)	