Module code	SB-4342		
Module Title	Advanced Genetic Analysis		
Degree/Diploma	Bachelor of Science (Biology)		
Type of Module	Major Option		
Modular Credits	4	**Total student workload**	8 hours/week
		Contact hours	6 hours/week
Prerequisite	SB-2211 Genetics		
Anti-requisite	None		

Aims

This module is designed for students to apply the combined power of classical and molecular genetics in investigating a wide range of biological questions. The students will also engage in discussion based on the primary literature to conceptualise a plan for studying key biological questions at the molecular level.

Learning Outcomes:

On successful completion of this module, a student will be expected to be able to:

Lower order :	40%	- Describe the definition of a gene - Describe gene organisation and chromosome structure - Describe the advantages and potential limitations of various model organism. - Understand the general principles of mutant analysis. - Identify mutation. - Discuss the various tools in reverse genetics. - Explain the concept and purpose of genome-wide mutant screens.
Middle order :	40%	- Characterise the phenotype of a mutation. - Associate mutant phenotype to DNA sequence. - Classify mutation defects on the basis of its effect on the function. - Determine functionally related genes on the basis of their interaction and/or infer a logical order in which genes function in a pathway.
Higher order:	20%	- Conduct a presentation on non-conventional model organisms used in research and discuss their limitations. - Work effectively in groups to develop a plan for investigating a key biological question.

Module Contents

- The basis for genetic analysis
- Genomes, chromosomes and epigenetics
- Model organisms and their genomes
- Identifying and classifying mutants
- Connecting phenotypes with DNA sequences
- Mutant phenotypes and gene activity
- Reverse genetics
- Genome editing
- Genome-wide mutant screens
- Gene interactions: suppressors and enhancers
- Epistasis and genetic pathways

Assessment	Formative assessment	Tutorials and feedback
	Summative assessment	Examination: 60%
		Coursework: 40% - Two (2) individual assignments (10%) - One (1) individual presentation (10%) - One (1) individual laboratory report (10%) - One (1) class test (10%)