APPROVED

HLST S8001: Conservation Genetics

Module Details

Module Code:	HLST S8001
Full Title:	Conservation Genetics APPROVED
Valid From::	Semester 1 - 2018/19 (September 2018)
Language of Instruction:	English
Duration:	1 Semester
Credits::	7.5
Module Owner::	Sergio Moreira
Departments:	Unknown
Module Description:	This module aims to provide the conceptual basis for understanding the genetics of biological problems in conservation. This module will provide an introduction to key concepts and tools of conservation genetics. By the end of this module students should be able to make informed decisions on the management of endangered species.

Module Learning Outcome	
On successful completion of this module the learner will be able to:	
#	**Module Learning Outcome Description**
MLO1	Demonstrate a clear appreciation of the principles of conservation genetics
MLO2	Apraise the application of population genetics to analyse complex ecological issues and identify solutions relating to conservation
MLO3	Design, apply and interpret molecular data in relation to conservation genetics

Pre-requisite learning		
Module Recommendations *This is prior learning (or a practical skill) that is strongly recommended before enrolment in this module. You may enrol in this module if you have not acquired the recommended learning but you will have considerable difficulty in passing (i.e. achieving the learning outcomes of) the module. While the prior learning is expressed as named DkIT module(s) it also allows for learning (in another module or modules) which is equivalent to the learning specified in the named module(s).*		
52347	SCIAS7Z01	Molecular Bioscience
53597	53597	Habitat and Wildlife Ecology

Module Indicative Content
Review of relevant genetic principles Phenotypes and genotypes, allelic frequencies, understanding molecular markers, genetic variation in natural populations
Random mating populations: Hardy-Weinberg principle Hardy-Weinberg proportions, testing for Hardy-Weinberg proportions, estimation of Hardy-Weinberg
Small populations and genetic drift Genetic drift, changes in allelic frequencies, the inbreeding effect of small populations, loss of allelic diversity, founder effect and bottlenecks
Population subdivision F-statistics, gene flow and genetic drift, gene flow and natural selection, limitations of Fst and other measures of subdivision, estimation of gene flow, population subdivision and conservation
Genetics and Conservation Inbreeding depression, demography and extinction, estimation of population size, inbreeding depression and extinction
Conservation Strategies Conservation units, systematics and taxonomy, phylogeny and reconstruction, hybridisation, conservation breeding and restoration
Practical Exercises Practicals will be delivered through laboratory and computer-based sessions. During laboratory sessions students will acquire expertise in general molecular biology techniques. These include: DNA extraction, PCR, the role of molecular markers in differentiating cryptic species and its applications in phylogenetics. Computer-based practicals will allow the student to become familiar with different types of genetic data sets and the use of various open source software for genetic analyses. By completing these practicals, students will strengthen their understanding of basic population genetics theory in a conservation context. All sessions will emphasize the use of molecular data to inform management of endangered species.
Learning and Teaching Resources n/a
Students will receive feedback in the following ways: • Discussions with the lecturer will provide feedback throughout the module • Academic feedback will be provided on continuous assessment • Feedback on final examination will be given in line with the Institute's policy
Students will be supported in their learning in the following ways: • Formal lectures • IT based tutorials • Small group investigation • MOODLE site with tutor directed materials (e.g. links to literature, e-learning materials and contemporary scientific related topics) • Independent study

Module Assessment

Assessment Breakdown	%
Course Work	10.00%
Project	15.00%
Practical	25.00%
Final Examination	50.00%

Module Special Regulation

Assessments

Full Time On Campus

Course Work

Assessment Type	Class Test	**% of Total Mark**	10
Marks Out Of	0	**Pass Mark**	0
Timing	n/a	**Learning Outcome**	1,2
Duration in minutes	0		

Assessment Description
In class test on the evaluation and interpretation of genetic data.

Project

Assessment Type	Project	**% of Total Mark**	15
Marks Out Of	0	**Pass Mark**	0
Timing	n/a	**Learning Outcome**	1,2
Duration in minutes	0		

Assessment Description
This assessment will be shared with Environmental Monitoring and GIS module. Students will conduct research in a current conservation related topic. During this project students will analyse complex ecological issues and identify and develop solutions relating to conservation.

Practical

Assessment Type	Practical/Skills Evaluation	**% of Total Mark**	25
Marks Out Of	0	**Pass Mark**	0
Timing	n/a	**Learning Outcome**	1,2,3
Duration in minutes	0		

Assessment Description
Students will participate in weekly laboratory and computer-based practicals. During laboratory sessions, students will evaluate and appraise different molecular techniques pertinent to conservation genetics. The students will use specialised techniques, skills and modern computer-based population genetics tools necessary for making informed decisions relating to conservation issues.

Final Examination

Assessment Type	Formal Exam	**% of Total Mark**	50
Marks Out Of	0	**Pass Mark**	0
Timing	End-of-Semester	**Learning Outcome**	1,2
Duration in minutes	0		

Assessment Description
End of semester final examination will assess the application and understanding of all taught material. This would typically include critical thinking style questions and essay style section.

Reassessment Requirement

A repeat examination
Reassessment of this module will consist of a repeat examination. It is possible that there will also be a requirement to be reassessed in a coursework element.

Module Workload

Workload: Full Time On Campus					
Workload Type	*Contact Type*	*Workload Description*	*Frequency*	*Average Weekly Learner Workload*	*Hours*
Lecture	Contact	No Description	Every Week	3.00	3
Practical	Contact	No Description	Every Week	3.00	3
Independent Study	Non Contact	No Description	Every Week	4.00	4
Directed Reading	Non Contact	No Description	Every Week	2.00	2
				Total Weekly Learner Workload	12.00
				Total Weekly Contact Hours	6.00

This module has no Part Time On Campus workload.

Module Resources

Recommended Book Resources

Frankham, R., Ballou, J.D., Briscoe, D.A.,. (2002), Introduction to Conservation Genetics, Cambridge University Press, Cambridge, UK, [ISBN: 9780521639859].

Allendorf, F.W., Luikart, G.. (2008), Conservation and the Genetics of Populations, Wiley-Blackwell, USA, [ISBN: 9781405121453].

Supplementary Book Resources

Freeland, J.R.. (2005), Molecular Ecology, John Wiley and Sons, England, UK, [ISBN: 9780470090626].

Felsenstein, F.. (2004), Inferring Phylogenies, Sinauer Associates Inc., Massachusetts, USA, [ISBN: 9780878931774].

This module does not have any article/paper resources

Other Resources

Journal, Molecular Ecology,
http://onlinelibrary.wiley.com/journal/1 0.1111/(ISSN)1365-294X

Journal, Conservation Genetics,
https://link.springer.com/journal/10592