



UNIVERSITI TEKNOLOGI MARA

BIO510: ECOLOGY

Course Name (English)	ECOLOGY APPROVED
Course Code	BIO510
MQF Credit	4
Course Description	This course introduces the fundamental concepts of Ecology where the theme is to explain the factors that affect the Distribution and Abundance of Organisms in their natural environment; the functional relationship between Population, Community and Ecosystem with respect to the biotic and abiotic processes and functions within these ecological hierarchies; and the importance of Biodiversity.
Transferable Skills	Students will be able to grab the basic knowledge in ecology which includes population ecosystem and its relation to the surrounding environment. The laboratory and fieldwork session will enable students to appreciate the knowledge by experiencing the knowledge through a hands-on session.
Teaching Methodologies	Lectures, Lab Work, Field Trip, Discussion
CLO	CLO1 State factors affecting distribution and abundance of organisms, the principles of population dynamics, community interactions and structure, ecosystem components and biodiversity. CLO2 Describe the basic mathematical models in ecology. CLO3 Report on experimental finding in a scientific manner
Pre-Requisite Courses	No course recommendations
Topics	
1. Introduction to Ecology 1.1) 1.1 The Scientific Method in Ecology 1.2) 1.2 Natural Selection and Adaptation	
2. Distribution and Abundance 2.1) 2.1 Biogeography 2.2) 2.2 Factors affecting distribution and abundance 2.3) 2.3 Species Transplants 2.4) 2.4 Transplant Experiments	
3. Factors that Affect Distribution and Abundance: Dispersal 3.1) 3.1 Examples of dispersal 3.2) 3.2 Modes of dispersal 3.3) 3.3 Advantages of dispersal 3.4) 3.4 Fugitive species 3.5) 3.5 Dispersal Hypotheses	
4. Factors that Affect Distribution and Abundance: Habitat Selection 4.1) 4.1 Definition and approach to studying habitat selection 4.2) 4.2 Behavioural mechanisms of habitat selection 4.3) 4.3 Evolution of habitat preference 4.4) 4.4 Theory of habitat selection	
5. Factors that Affect Distribution and Abundance: Biotic Components 5.1) 5.1 Predation 5.2) 5.2 Disease and parasitism 5.3) 5.3 Allelopathy 5.4) 5.4 Competition	

<p>6. Factors that Affect Distribution and Abundance: Abiotic Component</p> <p>6.1) 6.1 Temperature and moisture 6.2) 6.2 Ecotypes 6.3) 6.3 Light 6.4) 6.4 Dissolved minerals</p>
<p>7. Relationship Between Distribution and Abundance</p> <p>7.1) 7.1 Spatial scale of geographic ranges 7.2) 7.2 Variations in geographic range size 7.3) 7.3 Range size and abundance</p>
<p>8. Population Ecology</p> <p>8.1) 8.1 Basic population parameters 8.2) 8.2 Population density and its measure 8.3) 8.3 Population dispersion 8.4) 8.4 Basic Demography 8.5) 8.5 Population dynamics 8.6) 8.6 Human population growth</p>
<p>9. Community Ecology – Competition</p> <p>9.1) 9.1 Modes of competition 9.2) 9.2 Intraspecific competition 9.3) 9.3 Niche concept 9.4) 9.4 Competition theory 9.5) 9.5 Competitive exclusion principle 9.6) 9.6 Resource partitioning</p>
<p>10. Community Ecology</p> <p>10.1) 10.1 Predation 10.2) 10.2 Mutualism 10.3) 10.3 Commensalism</p>
<p>11. Community Ecology – Abundance and Diversity</p> <p>11.1) 11.1 Species abundance 11.2) 11.2 Species diversity 11.3) 11.3 Environmental complexity – Heterogeneity 11.4) 11.4 Intermediate disturbance hypothesis</p>
<p>12. Community Ecology – Structure and Succession</p> <p>12.1) 12.1 Physical features of communities – stratification and zonation 12.2) 12.2 Features of communities 12.3) 12.3 Indicator species 12.4) 12.4 Keystone species 12.5) 12.5 Primary and secondary succession 12.6) 12.6 Successional models</p>
<p>13. Ecosystems Ecology</p> <p>13.1) 13.1 Basic components of ecosystems: basic processes 13.2) 13.2 Trophic relationships 13.3) 13.3 Primary and secondary production 13.4) 13.4 Production efficiency 13.5) 13.5 Biogeochemical cycling</p>
<p>14. Ecology and Biodiversity</p> <p>14.1) 14.1 Levels of Biodiversity 14.2) 14.2 Biodiversity crisis 14.3) 14.3 Extinction 14.4) 14.4 Value of Biodiversity 14.5) 14.5 Factors affecting biodiversity</p>

Assessment Breakdown	%
Continuous Assessment	50.00%
Final Assessment	50.00%

Details of Continuous Assessment	Assessment Type	Assessment Description	% of Total Mark	CLO
	Assignment	Video Assignment	20%	CLO3
	Test	Test 1	15%	CLO1
	Test	Test 2	15%	CLO2

Reading List	Reference Book Resources	<ul style="list-style-type: none"> • Molles C.J 2008, <i>Ecology; Concepts and Applications</i> • Engewood Clifs, Colinvax P. 1992, <i>Ecology 2</i>, New York: John Wiley • Slingsby, D and C. Cook 1986, <i>Practical Ecology. Dimensions of Science.</i>, Thompson, J.J (Ed). Macmillan Education Ltd, • Krebs, C.J 1994, <i>Ecology : Problems of Distribution and Abunda</i>, New York: John Wiley • Smith, R.L 1996, <i>Field and Applied Ecology</i>, Upper Saddle River, New Jersey : Benjamin/Cum
	Article/Paper List	This Course does not have any article/paper resources
Other References	This Course does not have any other resources	