



UNIVERSITI TEKNOLOGI MARA

AGR571: SOIL CONSERVATION AND MANAGEMENT

Course Name (English)	SOIL CONSERVATION AND MANAGEMENT APPROVED
Course Code	AGR571
MQF Credit	4
Course Description	An advanced soil science course focused mainly on soil management and conservation with a particular reference to Malaysian soils. Aspects of managing soil fertility and conserving soil against its deterioration such as soil erosion, depletion of nutrients in soil and stress occurring in soil that affect plant growth are covered. In addition, important features of soil with inherent problems are studied and techniques of managing and minimizing these problems are also discussed. The course will also cover the different types of soil survey carry out in Malaysia, interpreting soils maps and how to utilise soil survey in soil management.
Transferable Skills	knowledge, life long learning, teamwork, leadership
Teaching Methodologies	Lectures, Lab Work, Field Trip, Discussion, Presentation
CLO	<p>CLO1 Identify and explain the properties, distribution and types of Malaysian soils and able to manage these soils for optimum crop productivity.</p> <p>CLO2 Describe and understand the process that lead to soil erosion and degradation and how they affect crop performance and the environment</p> <p>CLO3 Understand and interpret important soil chemical, physical and biological data and suggest appropriate agronomic and management practices for optimum crop performance.</p> <p>CLO4 Analyse and prescribe appropriate conservation measure for soil exposed to different type of problems.</p> <p>CLO5 Elaborate on agricultural practices that lead to soil deterioration, degradation and carbon release and practices that enhanced soil chemical, physical and biological properties while encouraging carbon sequestration.</p>
Pre-Requisite Courses	No course recommendations
Topics	
1. INTRODUCTION TO MALAYSIAN SOIL 1.1) 1. classification of Malaysian soils 1.2) 2. distribution and properties of Malaysian soil 1.3) 3. Erosion studies on Malaysian soils 1.4) 4. Conservation practices in Malaysia agriculture	
2. SOIL SURVEY SYSTEM IN MALAYSIA 2.1) 1. purpose and importance of soil survey in plantation management 2.2) 2. type of soil survey 2.3) 3. interpretation of soil map, soil terrain map and soil suitability map 2.4) 4. soil survey report: their use and interpretation	
3. WATER AND WIND EROSION 3.1) 1. type water and wind erosion 3.2) 2. rainfall and runoff erosivity 3.3) 3. soil properties affecting erodibility 3.4) 4. management of water erosion 3.5) 5. wind erosivity 3.6) 6. management of wind erosion 3.7) 7. modelling water and wind erosion	

4. BIOLOGICAL MEASURES OF SOIL EROSION

- 4.1) 1. roles and function of canopy cover
- 4.2) 2. cover crops
- 4.3) 3. crop residue harvesting
- 4.4) 4. manuring and soil erosion
- 4.5) 5. soil conditioners and erosion control
- 4.6) 6. cropping system and erosion
- 4.7) 7. crop intensity
- 4.8) 8. organic farming and erosion

5. NUTRIENT EROSION AND AQUATIC ECOSYSTEM

- 5.1) 1. eutrophication
- 5.2) 2. factors affecting transport of pollutants
- 5.3) 3. common pollutants and their sources
- 5.4) 4. wetland and pollution
- 5.5) 5. conservation and management of non-point source pollution

6. RESTORATION OF ERODED AND DEGRADED SOILS

- 6.1) 1. methods of restoration of degraded and marginal soils
- 6.2) 2. restoration of saline soil
- 6.3) 3. restoration of mined soil
- 6.4) 4. restoration of compacted soil
- 6.5) 5. indicators of soil restoration
- 6.6) 6. physical and chemical properties of restored soils

7. EROSION AND SOIL QUALITY

- 7.1) 1. indicators of soil quality
- 7.2) 2. soil quality index
- 7.3) 3. soil quality assessment
- 7.4) 4. soil quality and erosion relationships
- 7.5) 5. management of soil quality
- 7.6) 6. strategies for soil and water conservation

8. SEMINAR AND TALK BY STUDENT (one day)

- 8.1) n/a

Assessment Breakdown	%
Continuous Assessment	50.00%
Final Assessment	50.00%

Details of Continuous Assessment	Assessment Type	Assessment Description	% of Total Mark	CLO
	Lab Exercise	n/a	15%	CLO1 , CLO2 , CLO3 , CLO4 , CLO5
	Quiz	n/a	5%	CLO2
	Test	test 1	10%	CLO1 , CLO2
	Test	test 2	10%	CLO2 , CLO3
	Test	test 3	10%	CLO4 , CLO5

Reading List	Recommended Text	<ul style="list-style-type: none"> • Humberto Blanco and Rattan Lal 2008, <i>Principle of Soil Conservation and Management</i>, Springer • Morgan, P. R. C 2007, <i>Soil Erosion and Conservation</i>, Longman Group Ltd • Gulam, M. H. 2003, <i>Managing soil Erosion and Nutrient Depletion</i>, MARDI • Shamsuddin, J. 2006, <i>Acid Sulphate Soils</i>
	Reference Book Resources	<ul style="list-style-type: none"> • Brady, N.C. and Well, R.R. 2008, <i>The Nature and Properties of Soil</i>, 11th Ed., Prentice and Hall • Dinahue, R. L., Follet, R.H. and Tulloch, R.W. 1983, <i>Our Soils and Their Management</i>, 5th Ed., The Interstate Printers and Publishers Inc Danville Illinois
Article/Paper List	This Course does not have any article/paper resources	
Other References	This Course does not have any other resources	