UNIVERSITI TEKNOLOGI MARA

AGR411: INTRODUCTORY SOIL SCIENCE

Course Name (English)	INTRODUCTORY SOIL SCIENCE APPROVED
Course Code	AGR411
MQF Credit	3
Course Description	This course will introduce students to the understanding of soils and its properties that affect crops growth and performance. Students will see and experience first hand observation of soil in the field and recognize important soil physical features that play important roles on the growth of plantation crops. Basic terms and fundamental concepts used for the description, study and management of soil will be introduced and the relationship of soil characteristics to plant growth and productivity will be demonstrated. On Completion of the course students should be able to make simple soil description, measure some important soil parameters such as drainage class, slope class, soil depth, soil texture and able to predict the site suitability for plantation crops.
Transferable Skills	Knowledge, Communication, leadership, teamwork, life long learning
Teaching Methodologies	Lectures, Lab Work, Field Trip, Discussion
CLO	CLO1 Represent and relate the basic principles, concept and theories of soil science. CLO2 Able to recognize and describe selected soil properties in the field and relate to plantation crop performance. CLO3 Understand, able to interpret and relates soil reports to field operation in plantation.
Pre-Requisite Courses	No course recommendations

Topics
1. INTRODUCTION 1.1) 1. Definition of soil, pedon, soil profile and soil horizons. 1.2) 2. The roles and function of soils 1.3) 3. History of soil sciences4. Phase and components of soil 1.4) 4. Field related to soil science; physics, chemistry, biology and soil conservation
2. SOIL FORMATION 2.1) 1. Soil parent materials 2.2) types of rocks and minerals 2.3) importance of rocks and minerals in supplying nutrients to soils 2.4) weathering and soil formation 2.5) 2. Major factors affecting soil type 2.6) role of climate 2.7) role of topography 2.8) role of drainage
3. SOIL GEOMORPHOLOGY 3.1) 1. general relief of Malaysian topography 3.2) 2. major topographical formation and soil type 3.3) 3. major land use and topographic setting 3.4) 4. soil on flood plain 3.5) 5. soil on river terraces and alluvial fan 3.6) 6. soil on coastal plains
4. PHYSICAL PROPERTIES 4.1) 1. color and texture 4.2) 2. structure and consistency 4.3) 3. particle and bulk density of soil 4.4) 4. Soil air and porosity

5. MALAYSIAN SOILS 5.1) 1. Geology of Malaysia and type of soils 5.2) 2. Distribution and properties of major Malaysian soils 5.3) 3. Land use and Malaysian soils 5.4) 4. General management Of Malaysian soils under Plantation crops 5.5) 5. Marginal soils in Malaysia and their land use and management
6. CHEMICAL PROPERTIES OF SOIL 6.1) 1. soil colloidal and chemistry 6.2) 2. cation exchange capacity (CEC) 6.3) 3. Soil pH 6.4) 4. Lime requirements 6.5) 5. Soil nutrients
7. SOIL ORGANIC MATTER 7.1) 1. SOM and litter decomposition 7.2) 2. SOM and soil physical properties 7.3) 3. SOM and Chemical properties 7.4) 4. Addition of SOM
8. SOIL WATER 8.1) 1. properties of water 8.2) 2. soil water content 8.3) 3. plant available water 8.4) 4. water infiltration and percolation 8.5) 5. soil drainage system
9. SOIL BIOLOGICAL PROPERTIES 9.1) 1. soil macro and micro organisms 9.2) 2. role of organism in decomposition and nutrient cycling 9.3) 3. practices that improves soil organisms activity 9.4) 4. factors affecting soil biological properties

Assessment Breakdown	%
Continuous Assessment	60.00%
Final Assessment	40.00%

Details of Continuous Assessment

Assessment Type	Assessment Description	% of Total Mark	CLO
Assignment	Written Assignment	20%	CLO2
Presentation	Video Presentation	20%	CLO3
Test	Online Test	20%	CLO1

Reading List

Recommended Text

- **Plaster, E.J 1997, *Soil Science and Management*, 3 Ed., Delmar Publishers Inc New York**

Reference Book Resources

- **Brady, N.C and Weil, R.R. 2010, *The Nature and properties of Soils*, 14 Ed., Prentice Hall New Jersey**
- **Richard Bardgett 2005, *The Biology of Soil*, Oxford University Press**
- **Gerrard A. J 1992, *Soil Geomorphology*, Chapman and Hall**
- **Ashman, M. R. and Puri, G. 2001, *Essential Soil Science*, Blackwell Publishing**
- **Carter, M. R. 1993, *Soil Sampling and Methods of Analysis*, Lewis Publisher Boca Raton, Florida**
- **Coyne, M. S. and Thompson, J. A. 2006, *Fundamental Soil Science*, Thompson Corporation New York**
- **Forth, H. D. 1994, *Dasar-Dasar Ilmu Tanah*, Penerbit Erlengga Jakarta**
- **Jones, B. J 2001, *Laboratory Guide Conducting Soil Tests and Plant Analysis*, CRC Press Ltd.**
- **Miller, R.W and Donahue, R. L. 1995, *Soils in our Environment*, 7th Ed., Prentice Hall New Jersey**
- **Plaster, E.J. 1997, *Soil Science and Management*, 3rd Ed., Delmar Publishers Inc New York**

Article/Paper List: This Course does not have any article/paper resources

Other References: This Course does not have any other resources