UNIVERSITI TEKNOLOGI MARA

AGR161: INTRODUCTION TO SOIL SCIENCE

Course Name (English)	INTRODUCTION TO SOIL SCIENCE APPROVED
Course Code	AGR161
MQF Credit	4
Course Description	This course will interactively engage students cognitively and scientifically in areas of soil physical, chemical and biological properties. Students will define concepts, explain theories verbally and in writing, be able to perform tests in the laboratory and discuss the results. the outcome shall be assessed through a variety of tools which include the traditional paper examination, tests, assignment, classroom discussion and laboratory engagement.
Transferable Skills	Knowledge, Communication, leadership, teamwork, life long learning
Teaching Methodologies	Lectures, Lab Work, Tutorial
CLO	CLO1 Represent and relate the basic principles of soil science and its relation to plant growth and environment. CLO2 Explain the physical, chemical, and biological properties of soils. CLO3 Identify and apply the concepts, principles and theories of soil science.
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 role of soil 1.3) 3. history of soil 1.4) 4. phase and components of soil.
2. Minerals and Rocks 2.1) 1. mineral in soils 2.2) 2. rocks
3. Physical Properties of Soil 3.1) 1. colour and texture 3.2) 2. structure and consistency 3.3) 3. particle and bulk density 3.4) 4. soil air: porosity
4. Factors and Processes of Soil Formation 4.1) 1. factor of soil formation (parent materials, climate, topography, time and biota) 4.2) 2. process of soil formation (dissolution, hydrolysis,, hydration, carbonation, oxidation, reduction, eluviation illuviation, podzolization, leaching, salination, decompostion)
5. Soil Water 5.1) 1. functions of soil water 5.2) 2. water holding capacity 5.3) 3. soil water condition 5.4) 4. measuring soil water content 5.5) 5. water movements in soils
6. Soil Temperature 6.1) 1. importance of temperature on soils 6.2) 2. source of temperature 6.3) 3. temperature and its relation to plant growth and soil organism 6.4) 4. control of soil temperature

7. Chemical Properties of Soil 7.1) 1. soil colloidal chemistry 7.2) 2. cation exchange capacity 7.3) 3. soil pH 7.4) 4. Lime requirements 7.5) 5. plant nutrients
8. Soil Biological Characteristics 8.1) 1. soil micro and macro organisms 8.2) 2. role of organisms in enhancing soil fertility 8.3) 3. factors affecting soil organisms 8.4) 4. Practices that improves soil organisms activity 8.5) 5. Humus and soil organic matter

Assessment Breakdown	%
Continuous Assessment	60.00%
Final Assessment	40.00%

Details of Continuous Assessment

Assessment Type	Assessment Description	% of Total Mark	CLO
Assignment	Individual project	10%	CLO3
Lab Exercise	Lab/Final Reports	20%	CLO2
Test	Test 1	15%	CLO1
Test	Test 2	15%	CLO2

Reading List

Recommended Text

- **Brady, N.C. and R.R. Weil., *The Nature and Properties of Soils.*, 14 Ed., , ed. Prentice Hall, New Jersey. [ISBN:]**

Reference Book Resources

- **Plaster, E.J 1997, *Soil Science and Management*, 3 Ed., , Delmar Publishers Inc., New York [ISBN:]**
- **Ashman, M.R., and Puri, G 2001, *Essential Soil Science*, Ed., , Blackwell Publishing. [ISBN:]**
- **Carter, M.R 1993, *Lewis, Soil Sampling and Methods of Analysis*, Ed., , Boca Raton, Florida [ISBN:]**
- **Coyne, M.S. and Thompson, J. A 2006, *Fundamental Soil Science*, Ed., , Thomson Corporation. New York [ISBN:]**
- **Jones, B.J 2001, *Laboratory Guide Conducting Soil Tests and Pl*, Ed., , Analysis. CRC Press Ltd [ISBN:]**
- **Forth, H.D 1994, *Dasar-Dasar Ilmu Tanah. (Alih Bahasa:Soernart*, Ed., , Penerbit Erlengga, Jakarta [ISBN:]**
- **Miller, R.W. and R.L. Donahue 1995, *Soils in our Environment*, 7 Ed., , Prentice Hall, New Jersey**

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

Other References: This Course does not have any other resources