**UNIVERSITI TEKNOLOGI MARA**

**EVT533: SOIL SCIENCE AND ANALYSIS**

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| **Course Name (English)** | SOIL SCIENCE AND ANALYSIS APPROVED |
| **Course Code** | EVT533 |
| **MQF Credit** | 4 |
| **Course Description** | The module provides the students with a basic understanding of the formation and development of soil and its properties. These properties which are used to determine its capacity to control the movement of industrial wastes and domestic sewage include basic geology of parent rocks, soil forming processes, and its physical, chemical and biological properties. Understanding of the inherent soil physical and chemical properties is essential to understand and assess the flow of toxic materials and soil pollutants through the soil and ground water which may affect human health and the environment. |
| **Transferable Skills** | 1. Able to measure soil physical and chemical properties parameters.<br>2. Able to identify causes of soil quality degradation.<br>3. Able to relate soil quality and the state of the surrounding environment. |
| **Teaching Methodologies** | Lectures, Lab Work, Discussion |
| **CLO** | CLO1 Describe the significance of the physical, chemical and biological properties of soil and how soil relates to the environmental stability.<br>CLO2 Relate the changes of soil characteristics as a result of human activities.<br>CLO3 Practice the physical, chemical and biological properties of soil in relation to the soil fertility and stability.<br>CLO4 Discuss the process that leads to soil degradation and the related environmental problem, including the pollutants mobility, reaction and fate within the soil environment. |
| **Pre-Requisite Courses** | No course recommendations |

| **Topics** |
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| **1. Introduction to Soil Science**<br>1.1) 1.1 Soil as a medium for plant growth.<br>1.2) 1.2 Origin and formation of soils.<br>1.3) 1.3 Rocks and minerals. |
| **2. Characteristics of Soil 1.**<br>2.1) 2.1 Physical characteristics and properties of soil.<br>2.2) 2.2 Soil bulk density, particle density and soil colour.<br>2.3) 2.3 Soil structure, consistency, aeration and soil temperature.<br>2.4) 2.4 Soil water and plant available water. |
| **3. Characteristics of Soils 2.**<br>3.1) 3.1 Soil chemical properties.<br>3.2) 3.2 Soil acidity and pH determination.<br>3.3) 3.3 Cations exchange in soil and its significance. |
| **4. Soil Biology.**<br>4.1) 4.1 Soil organisms.<br>4.2) 4.2 Soil organic matter and soil humus.<br>4.3) 4.3 Organic colloids. |
| **5. Introduction to Malaysian Soils.**<br>5.1) 5.1 Origin and classification of Malaysian soils.<br>5.2) 5.2 Distribution of Malaysian soils.<br>5.3) 5.3 Soil suitability classification. |

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| **6. Soil Erosion.**<br>6.1) 6.1 Current scenario in Malaysia.<br>6.2) 6.2 Impacts of soil erosion.<br>6.3) 6.3 Mechanics of soil erosion.<br>6.4) 6.4 Erosivity of rainfall reactant.<br>6.5) 6.5 Erodibility of soil. |
| **7. Soil and Environmental Quality I.**<br>7.1) 7.1 Definition and concept of soil pollution.<br>7.2) 7.2 Behaviour of organic and inorganic pollutants in soil.<br>7.3) 7.3 Environmental fate of agricultural waste in soil. |
| **8. Soil and Environmental Quality II.**<br>8.1) 8.1 Environmental fate of industrial waste in soil.<br>8.2) 8.2 Detoxification and bioremediation of soil pollutants.<br>8.3) 8.3 Soil degradation and soil quality measurement. |

| Assessment Breakdown | % |
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| Continuous Assessment | 60.00% |
| Final Assessment | 40.00% |

**Details of Continuous Assessment**

| Assessment Type | Assessment Description | % of Total Mark | CLO |
|---|---|---|---|
| Multiple Choice Questions | Quiz | 20% | CLO1 |
| Practical | Lab skills (10 marks), and lab reports (10 marks) | 20% | CLO3 |
| Test | Test | 20% | CLO4 |

**Reading List**

**Recommended Text**

- **Mark S. Coyne,James Allen Thompson 2006, *Fundamental Soil Science*, Delmar Pub [ISBN: 0-7668-4266-5]**
- **Edward J. Plaster 2003, *Soil Science and Management*, 4 th. Edition Ed., Delmar Pub New York, USA [ISBN: 0-7668-3935-4]**

**Reference Book Resources**

- **Brady, N. C. and R. R. Well 2008, *TheNature and Properties of soils*, 11 Ed., , Prentice and Hall [ISBN: ]**
- **Gulam Mohamad Hashim 2003, *Managing Soil Erosion and Nutrient Depletion*, Ed., , MARDI [ISBN: ]**
- **Morgan, R. P. C. 2007, *Soil Erosion and Conservation*, Ed., , Longman Group Ltd [ISBN: ]**
- **Tan, K.H 2000, *Environmental Soil Science*, Ed., , Elsievier [ISBN: ]**
- **White, R. E., 2006, *Principles and Practice of Soil Science*, 4th Ed., all, Blackwell UK [ISBN: 978-0-632-064]**

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

**Other References**: This Course does not have any other resources