**The University of Jordan**

**Faculty: of Agriculture Department: Land, Water and Environment**

**Program: Academic Year/ Semester 2nd semester 2013**

**Course Name (Course Number)**

**Soil Genesis and Classification 634320**

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| --- | --- | --- | --- | --- | --- |
| Credit hours | 3 | Level | Third year | Pre-requisite |  |
| Coordinator/ Lecturer | Prof. Awni Taimeh | Office number |  | Office phone | 22445 |
| Course website |  | E-mail | ataimeh@ju.edu.jo | Place | 181 |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Office hours | | | | | |
| Day/Time | Sunday | Monday | Tuesday | Wednesday | Thursday |
|  |  |  |  |  |  |
|  | 8-11,12-2 | 8-12.30 | 8-11,12-2 | 8-12.30 | 8-11,12-2 |

**Course Description**

Understanding how soils are formed and formed, soil forming factors including parent material, Living organisms, climate, relief, and time. Soil forming processes, concepts of soil classification diagnostic horizons and features used to classify soil, soil moisture and temperature regime, Soil taxonomy, classification of soils in Jordan

**Course Objectives:** Students will:

* Understand how the soil area formed under different soil forming factors
* Know how the different soil forming factors control soil forming processes under different condition.
* Understand why the different soils are different and the role of soil forming process.
* Have the background to understand the concept used to classify soils.
* Understand soil variation in the field and principle behind soil sampling.
* Have knowledge how to conduct soil survey and land use planning.

**Intended Learning Outcomes (ILOs):**

**A. Knowledge and Understanding:** Student is expected to

**A1-** Should be able to understand how soils are formed under different conditions, and explain why they vary.

**A2-** Attain knowledge about the geographic distribution of different soils in Jordan, their properties, classification and their potential use.

**B. Intellectual Analytical and Cognitive Skills:** Student is expected to

B1- Ability to understand factor behind some important phenomena such as climatic change and desertification

B2- Ability to conduct necessary analyses for the preparation of land use plan

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**C. Subject- Specific Skills:** Students is expected to

C1- Be able to understand soil variation in the field and apply such capability in designing any sampling scheme necessary for various investigations.

C2- Understand the real causes and mechanisms of soil degradation process and desertification.

C3: Should be able to collect necessary data for planning land use

C4: Have necessary skill to map soils in the field and understand their variation.

**D. Transferable Key Skills:** Students is expected to

D1- Design sampling program for collecting field information for various studies.

D2- Design soil survey program at various scales.

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# ILOs: Learning and Evaluation Methods

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| ILO/s | Learning Methods | Evaluation Methods |
| A. Knowledge and Understanding | Lectures and Discussions, | Exam, and Quiz .. |
| B. Intellectual Analytical and Cognitive Skills | : Homework and Assignments, | Reports |
| C. Subject- Specific Skills | Homework and Assignments | Quiz and Exams |
| D. Transferable Key skills | Lectures and Discussions, | Quiz and Exams |

**Course Contents**

|  |  |  |  |
| --- | --- | --- | --- |
| **Content** | **Reference** | **Week** | **ILO/s** |
| Introduction: --What is soil, non-soil,-Relationship between Pedology and other sciences, Pedology as an independent science | Chapter 1:McCracken, R.J. Soil Genesis and Classification | 1st week | A1-A2 |
| Physical and chemical weathering:, processes of weathering, weathering of rock, mineral stability, application to local conditions | Chapter 13: Nile C. Brady, 1974. The Nature and Properties of Soils | **2nd week** | ***A1-A2*** |
| Soil forming factors: -Parent materials, Climate,  -Living organisms,- Time, -Relief, | Chapter 6-11 Peter W, Kirkland, 1974, Pedology, Weathering, and Gemorphological Research | 3th -5h week | A1-A2 |
| Soil properties and features -used in studying the genesis of soils, Indications of each property | Chapter:2 McCracken, R.J. Soil Genesis and Classification | 6th week | A1-A2 |
| Soil forming processes responsible for soil formation, Intensity,-Variation, -Magnitudes, -Effects of soil forming factors on different processes. | Chapter 6:McCracken, R.J. Soil Genesis and Classification | 6th week | A1-A2,B1-B2 |
| Soil horizons development, differentiation, effects of soil forming processes on the development of different types of horizons. | Chapter 6:McCracken, R.J. Soil Genesis and Classification | 7th-8th week | A1-A2 |
| Paleosols, -Definition, Recognition of paleosols, -Criteria used in studying paleosols, -Paleosols in Jordan | Chapter 6:McCracken, R.J. Soil Genesis and Classification | 9h week | B1-B2 |
| Soil classification: Modern soil taxonomy, objectives features, comparison with other systems,-Soil orders, diagnostic horizons: formation of different diagnostic horizons , Epipedons, Subsurface horizons. complete classification | Chapter 14:McCracken, R.J. Soil Genesis and Classification  Chapter:2-4,USDA Soil Classification, 2013 | **10th – 13th week** | **C1-C2. D1,D2** |
| Soils of Jordan:-Important soils in Jordan, factors responsible for formation of important soils, classification, distribution, -Utilization | Soils of Jordan Application | 14th week | A1-A2 |
| Soil mapping: field mapping of soils, soil interpretation | Chapter 25-26:McCracken, R.J. Soil Genesis and Classification | 15th week | C-D |

**Learning Methodology**

## The course is structured to include lectures, discussion, exercise, demonstration homework and application to local conditions.

# Evaluation

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| --- | --- | --- |
| **Evaluation** | **Point %** | **Date** |
| **Midterm Exam** | 30 | According to semester |
| **2nd Midterm Exam** | 20 | This course is offered during fall and spring semesters. |
| **Homework** | 10 |  |
| **Final Exam** | 50 |  |

**Main Reference/s:**

1. McCracken, R.J. Soil Genesis and Classification (Text Book)
2. Peter W, Kirkland, 1974, Pedology, Weathering, and Gemorphological Research.
3. USDA Soil Taxonomy, 2013

# References:

1. Soil Survey Staff, 1952. Soil Survey Manual.
2. Selected Papers in Soil Formation.
3. Charles, B. Hunt, 1972. Geology of Soils; Their Evolution, Classification and Uses.
4. Nile C. Brady, 1974. The |Nature and Properties of Soils.
5. Handouts
6. Nile C. Brady, 1974. The Nature and Properties of Soils.

**Intended Grading Scale (Optional)**

0-39 **F**

40-49 **D**-

50-54 **D**

55-59 **D+**

60-64 **C**-

65-69 **C**

70-73 **C+**

74-76 **B**-

77-80 **B**

81-84 **B+**

85-89 **A**-

90-100 **A**

**Notes:**

* Concerns or complaints should be expressed in the first instance to the module lecturer; if no resolution is forthcoming, then the issue should be brought to the attention of the module coordinator (for multiple sections) who will take the concerns to the module representative meeting. Thereafter, problems are dealt with by the Department Chair and if still unresolved the Dean and then ultimately the Vice President. For final complaints, there will be a committee to review grading the final exam.
* For more details on University regulations please visit:

<http://www.ju.edu.jo/rules/index.htm>