**The University of Jordan**

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

**Program: 2009-2010/First Semester**

**Course title: Farm Irrigation Management (644312)**

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| **Credit hours** | **3** | **Level** | **BSc** | **Pre-requisite** | **Principles of Irrigation (604103)** |
| **Coordinator/ Lecturer** | **Prof. Ahmad M. Abu-Awwad** | **Office number** | **114** | **Office phone** | **22464** |
| **Course website** | **On UJ E Learning portal** | **E-mail** | **abuawwad@ju.edu.jo** | **Place** | **LWE Seminar Room** |

|  |
| --- |
| **Office hours** |
| **Day/Time** | **Sunday** | **Monday** | **Tuesday** | **Wednesday** | **Thursday** |
| **Day** | **\*** | **\*** | **\*** | **\*** | **\*** |
| **Time** | **10-12** | **11-2** | **10-12** | **11-2** | **10-12** |

**Course Description**

The course covers plant-soil-atmosphere (climatic) relationships, farm irrigation system and system design fundamentals, and water for irrigation.

**Learning Objectives**

Students will:

1. Develop a complete understanding of plant-soil-water-atmosphere, consumptive use, and evapotranspiration.
2. Develop a working understanding of direct and indirect determination of crop water requirement.
3. Develop a working understanding of functions of farm irrigation systems, type of farm irrigation systems, application method, flow measurement and application method.
4. Develop the ability to evaluate farm irrigation performance, management and cost
5. Develop a working understanding of water for irrigation, sources, quantities, qualities, and water law.

**Intended Learning Outcomes (ILOs):**

Successful completion of the course should lead to the following outcomes:

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

**A1-** Understanding of plant-soil-water-atmosphere relationships.

**A2-** Understanding of farm irrigation systems and system design fundamentals.

**A3-** Understanding of water for irrigation, sources, quality, and quantity

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

B1- Demonstrate the ability to determine crop evapotranspiration and water requirement.

B2-Be able to collect and analyses data requirements for design, water sources evaluation, determining the design daily water requirement.

B3-Demonstrate the ability to evaluate farm irrigation systems.

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

C1- Be able to answer the following questions: when to irrigate? How much water to apply, and How (application system)?

C2-Be able to classify irrigation water and its suitability for crops and soil.

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

D1- Be able to synthesize the above skills into farm irrigation management.

# ILOs: Learning and EvaluationMethods

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

**Course Contents**

|  |  |  |  |
| --- | --- | --- | --- |
| **Content** | **Reference**  | **Week** | **ILO/s** |
| Introduction | Chapter 1.Principle of Farm Irrigation system Design (1988). Larry G. G. James. Publisher: John Wiley& Sons. | 1st week | A1 |
| Plant-Soil-Atmosphere (Climatic) RelationshipsPlant, Soil and Atmosphere | = | 2nd week | A1 |
| Consumptive Use and Evapotranspiration | = | 3rd week | B1 |
| Determining EvapotranspirationDirect Measurement of EvapotranspirationLysimeters, Field Water Balances, Evapotranspiration ChambersCalculating EvapotranspirationAerodynamic MethodsEnergy Balance MethodsCombination (Penman) MethodsEmpirical Methods | = | 4th week | B1, B2 |
| Irrigation RequirementsIrrigation SchedulingScheduling StrategiesFull IrrigationDeficit IrrigationWhen to IrrigatePlant IndicatorsSoil IndicatorsWater Budget TechniqueAmount to Apply per Irrigation | = | 5th week | B1,B2,C1, D1 |
| Farm irrigation systems and system design fundamentals.Introduction | Chapter 2.Principle of Farm Irrigation system Design (1988). Larry G. G. James. Publisher: John Wiley & Sons. | 6th week | C2 |
| Functions of Farm Irrigation SystemsCrop and Soil CoolingFrost ProtectionDelaying Fruit and Bud DevelopmentControlling Wind ErosionGerminating SeedsChemical ApplicationLand Application of Wastes | = | 7th week | A1, D1 |
| Types of Farm Irrigation SystemsApplication MethodsFlow Measurement and Regulation Methods | = | 8th week | C2,B3,D1 |
| Designing Farm Irrigation SystemsData Requirements for DesignWater Source EvaluationDetermining the Design Daily Irrigation RequirementAlternative DesignsPerformance of Farm Irrigation SystemsFarm Irrigation System CostsSelecting the Most Suitable System Design  | = | 9th week | B2,B3,D1 |
| Water for Irrigationintroduction | Chapter 3.Principle of Farm Irrigation system Design (1988). Larry G. G. James. Publisher: John Wiley & Sons. | 10th week | A3,B2,C2 |
| Sources of water | = | 11th week | A3,B2,C2 |
| Water quality | = | 12th week | A3,B2,C2 |
| Water quantity | = | 13th week | A3,B2,C2 |
| Water law | = | 14th week | A3,B2,C2 |
| Flow measurement | Chapter 8.Principle of Farm Irrigation system Design (1988). Larry G. G. James. Publisher: John Wiley & Sons. | 15th week | A3,B2,D1 |
| = | = | 16th week  | = |

**Learning Methodology**

## The course will be structures mainly in Lectures; and discussions, exercise, demonstration, and applications.

# Evaluation

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| --- | --- | --- |
| **Evaluation** | **Point %** | **Date** |
| **Midterm Exam**  | 30 | 8-12 / 11 / 2014 |
| **2nd Exam** | 15 | 5-10 / 12 /2014 |
| **Homework an Quizzes** | 5 |  |
| **Final Exam**  | 50 | 4-8 / 1 / 2015 |

**Main Reference/s:**

# Principle of Farm Irrigation system Design (1988). Larry G. G. James. Publisher: John Wiley& Sons.

# References:

* Lectures
* Internet

**Intended Grading Scale (Optional)**

0-35 **F**

36-39 **D**-

40-47 **D**

48-51 **D+**

52-55 **C**-

56-63 **C**

64-67 **C+**

68-71 **B**-

72-79 **B**

80-83 **B+**

84-87 **A**-

88-100 **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>