**The University of Jordan**

**Faculty of Agriculture Department of Horticulture and Crop Science**

**Program: *2015-2016/Fall semester***

**Course title:** Irrigated Field Crops **(601421)**

**-----------------------------------------------------------------------------------------------------------**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Credit hours | 3 | Level | PhD Course | Pre-requisite | 304101 |
| Coordinator/ Lecturer | Prof. R. Sharaiha | Office number | 248 | Office phone | 22351 |
| Course website | [Faculty](http://blackboard.ju.edu.jo/webapps/login/) Member Website | E-mail | ramzik@ju.edu.jo | Place |  |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Office hours** | | | | | |
| **Day/Time** | **Sunday** | **Monday** | **Tuesday** | **Wednesday** | **Thursday** |
| **Time** | 10: -11:00 |  | 10: -11:00 |  | 10: -11:00 |

**Course Description**

The course introduces the students to the: -

Basic principle of soil and water as they relate to yield production.

Plant nutrients and water requirement under different regions.

Plant varieties, densities and crop rotation under irrigated conditions.

**Learning Objectives**

1. Clarify the interaction between soil water and plants for optimum yield production.
2. Discuss the importance of crop varieties, plant densities, crop rotation, water and nutrient requirements under irrigated condition.
3. Illustrate different methods of calculating amount of water needed for field crops at different growth stages.
4. Analyze case studies for different irrigated crops in different regions.

**Intended Learning Outcomes (ILOs):**

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

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

A1. Discuss the soil water relation

A2. Discuss the relative production of various crops in response to irrigation

A3. Know the factors affecting plant water consumptive use

A4. Understand plant densities, crop rotation, and nutrient requirement in relation to irrigation.

A5. Calculate the water balances for field crops,

A6. Calculate the amount of water needed by field crops in different stages.

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

B1. Use the proper irrigation system for each cultivated crop

B2. Optimize the water application according to soil characters.

B3. Manipulate the program of irrigation in accordance with the dominated environmental conditions.

B4. Establish the Fertigation system .

B5. Understand the critical stage of water shortage for each crop

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

C1. Apply the water with specific quantities in relation to plant growth stage.

C2. Minimize the draining quantity of water in each type of soil .

C3. Run the fertigation system in automatic manner

C4. Calculate the water use efficiency.

1. **Transferable Key Skills:** Student is expected to

D1- Improving use of water resources for sustainability (water harvest).

D2- Integrate the irrigation with other management practices

D3- Effectuate the aeration and drainage

D4- Adaptation of new technology

D5- Familiarize the irrigation regime for certain crops

# ILOs: Learning and Evaluation Methods

|  |  |  |
| --- | --- | --- |
| **ILO/s** | **Learning Methods** | **Evaluation Methods** |
| **A**. Knowledge and Understanding (**A1-A5**) | Lectures and Discussions  Assignment readings | Exam, Quiz, |
| **B**. Intellectual Analytical and Cognitive Skills (**B1-B3**) | Lectures and Discussions  Assignment readings | Exam, Quiz, |
| **C**. Subject Specific Skills (**C1-C3**) | Lectures and Discussions  Assignment readings | Exam, Quiz, |
| **D**.Transferable Key Skills (**D1-D4**) | Lectures and Discussions  Assignment readings | Exam, Quiz, |

**Course Contents**

|  |  |  |  |
| --- | --- | --- | --- |
| **No. of lecture (s) /Week** | **Subject** | **Sources** | **ILOs** |
| 1,2  (1st wk) | Introduction | Chapter 1, 1-24. in [B. A. Stewart](http://www.amazon.com/s/ref=dp_byline_sr_book_1?ie=UTF8&text=B.+A.+Stewart&search-alias=books&field-author=B.+A.+Stewart&sort=relevancerank). 1993. | *A1& A2& A3& A6* |
| 4, 5,6  (2nd wk) | Soil Water and Monitoring Technology  a-soil moisture storage  b-soil infiltration | Chapter 2, pp. 25-84 in [B. A. Stewart](http://www.amazon.com/s/ref=dp_byline_sr_book_1?ie=UTF8&text=B.+A.+Stewart&search-alias=books&field-author=B.+A.+Stewart&sort=relevancerank). 1993. | *A1& A5 & B2& C1& C2& D2& D3* |
| 7,8  (3rd wk) | Soil Water–plant system and Monitoring Technology | Chapter 3, pp. 85-115. in [B. A. Stewart](http://www.amazon.com/s/ref=dp_byline_sr_book_1?ie=UTF8&text=B.+A.+Stewart&search-alias=books&field-author=B.+A.+Stewart&sort=relevancerank). 1993. | *A1 & A2 & A3& A4& A5& A6& B1& B2& B3& B5 C1& C2& C4 & D2& D3 & D5* |
| 9, 10  (3rd and 4th wk) | Irrigation efficiency and Uniformity | Chapter 4, pp. 119-132 in [B. A. Stewart](http://www.amazon.com/s/ref=dp_byline_sr_book_1?ie=UTF8&text=B.+A.+Stewart&search-alias=books&field-author=B.+A.+Stewart&sort=relevancerank). 1993. | *A1 & A3 & A5& A6 & B1 & B2& B3& C1& C2& C4& D2& D3* |
| 11,12, 13  (4thwk) | On farm system design, operation and land management | Chapter 5, pp. 133-179. in [B. A. Stewart](http://www.amazon.com/s/ref=dp_byline_sr_book_1?ie=UTF8&text=B.+A.+Stewart&search-alias=books&field-author=B.+A.+Stewart&sort=relevancerank). 1993. | *A1 & A3& A4& A6& B1& B2& B3& B4& B5 C1& C2& C4 &D1& D2& D3 & D4* |
| 14,15  (5thwk) | Irrigation system automation | Chapter 6, pp. 181-193. in [B. A. Stewart](http://www.amazon.com/s/ref=dp_byline_sr_book_1?ie=UTF8&text=B.+A.+Stewart&search-alias=books&field-author=B.+A.+Stewart&sort=relevancerank). 1993. | *A3& A5& A6& B1& B2& B3& B4& B5& C1& C3& C4 & D2& D3 & D4* |
| 16, 17, 18, 19, 20  (6th & 7th wks) | Aeration, drainage and erosion | Chapter 7, 8 pp. 195-275. in [B. A. Stewart](http://www.amazon.com/s/ref=dp_byline_sr_book_1?ie=UTF8&text=B.+A.+Stewart&search-alias=books&field-author=B.+A.+Stewart&sort=relevancerank). 1993. | *A1 & A3& A4& A5& B1& B2& B3& B5& C1& C2& C4 & D1& D2 & D3* |
| 21  (7th wk) | Midterm Exam |  |  |
| 22, 23, 24  (8thwk) | Irrigation of Sugar, Oil and Fiber crops | Chapter 9, pp. 279-335. in [B. A. Stewart](http://www.amazon.com/s/ref=dp_byline_sr_book_1?ie=UTF8&text=B.+A.+Stewart&search-alias=books&field-author=B.+A.+Stewart&sort=relevancerank). 1993. | *A2 & A3& A4 & A5& A6 & B1 & B4& B5 & C1 & C3 & D2 & D4 & D5* |
| 25, 26  (9thwk) | Landscape irrigation | Chapter 10, pp. 337-361. in [B. A. Stewart](http://www.amazon.com/s/ref=dp_byline_sr_book_1?ie=UTF8&text=B.+A.+Stewart&search-alias=books&field-author=B.+A.+Stewart&sort=relevancerank). 1993. | *A2 & A3& A4 & A5& A6 & B1 & B4& B5 & C1 & C3 & D2 & D4 & D5* |
| 27, 28, 29  (9th & 10th wks) | Irrigation of Forages | Chapter 11, pp. 363-393. in [B. A. Stewart](http://www.amazon.com/s/ref=dp_byline_sr_book_1?ie=UTF8&text=B.+A.+Stewart&search-alias=books&field-author=B.+A.+Stewart&sort=relevancerank). 1993. | *A2 & A3& A4 & A5& A6 & B1 & B4& B5 & C1 & C3 & D2 & D4 & D5* |
| 30, 31, 32, 33, 34  (10th ,11th & 12th wks) | Irrigation of Nurseries | Chapter 12, pp. 395-422. in [B. A. Stewart](http://www.amazon.com/s/ref=dp_byline_sr_book_1?ie=UTF8&text=B.+A.+Stewart&search-alias=books&field-author=B.+A.+Stewart&sort=relevancerank). 1993. | *A2 & A3& A4 & A5& A6 & B1 & B4& B5 & C1 & C3 & D2 & D4 & D5* |
| 35  (12th wk) | Second - hr Exams |  |  |
| 36, 37, 38, 39  (12th & 13th wks) | Irrigation of small Grains | Chapter 13, pp. 423-476. in [B. A. Stewart](http://www.amazon.com/s/ref=dp_byline_sr_book_1?ie=UTF8&text=B.+A.+Stewart&search-alias=books&field-author=B.+A.+Stewart&sort=relevancerank). 1993. | *A2 & A3& A4 & A5& A6 & B1 & B4& B5 & C1 & C3 & D2 & D4 & D5* |
| 40, 41, 42  (14th wk) | Irrigation of Soybean and Corn | Chapter 14, pp. 477-533. in [B. A. Stewart](http://www.amazon.com/s/ref=dp_byline_sr_book_1?ie=UTF8&text=B.+A.+Stewart&search-alias=books&field-author=B.+A.+Stewart&sort=relevancerank). 1993. | *A2 & A3& A4 & A5& A6 & B1 & B4& B5 & C1 & C3 & D2 & D4 & D5* |
| 43, 44, 45, 46  (15th & 16th wks) | Irrigation of Vegetables | Chapter 15, pp. 535-606. in [B. A. Stewart](http://www.amazon.com/s/ref=dp_byline_sr_book_1?ie=UTF8&text=B.+A.+Stewart&search-alias=books&field-author=B.+A.+Stewart&sort=relevancerank). 1993. | *A2 & A3& A4 & A5& A6 & B1 & B4& B5 & C1 & C3 & D2 & D4 & D5* |
| 47, 48  (16thwk) | New and Future Technology of irrigation | Chapter 16, pp. 609-626. in [B. A. Stewart](http://www.amazon.com/s/ref=dp_byline_sr_book_1?ie=UTF8&text=B.+A.+Stewart&search-alias=books&field-author=B.+A.+Stewart&sort=relevancerank). 1993. | *A3 & A5 & B2 & B3 & B4 &C1& C2 & C3& C4& D1& D2& D3& D4* |

**Learning Methodology:**

The course will be structured in lectures, discussions, assignments and reports. The course comprises overviews, from general understanding to expert knowledge on key topics, and learning is based mainly on lectures as well as independent learning through assignments.

|  |  |  |
| --- | --- | --- |
| **Evaluation** | **Point %** | **Date** |
| First Midterm Exam | 20% |  |
| Second term Exam | 20% |  |
| Discussion reports | 10% |  |
| Final Exam | 50% |  |

**References:**

### 1. [B. A. Stewart](http://www.amazon.com/s/ref=dp_byline_sr_book_1?ie=UTF8&text=B.+A.+Stewart&search-alias=books&field-author=B.+A.+Stewart&sort=relevancerank).  (1993). Irrigation of Agricultural Crops. (Agronomy Monograph No. 30.) Edited by B. A. Stewart and D. R. Nielsen. Wisconsin: American Society of Agronomy, Crop Sciences Society of America and the Soil Science Society of America. pp. 1246. ISBN 0-89118-102-4.

### 2. Scientific papers

**Intended Grading Scale (Optional)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **From (%)** | **To (%)** | **Scale** | **Mark** | **Result** |
| 0 | 44 | 0 | H | Fail |
| 45 | 47 | 0.75 | D- | Fail |
| 48 | 54 | 1 | D | Accepted |
| 55 | 60 | 1.5 | D+ | Accepted |
| 61 | 63 | 1.75 | C- | Good |
| 64 | 66 | 2 | C | Good |
| 67 | 72 | 2.5 | C+ | Good |
| 73 | 75 | 2.75 | B- | Very Good |
| 76 | 78 | 3 | B | Very Good |
| 79 | 84 | 3.5 | B+ | Very Good |
| 85 | 87 | 3.75 | A¯ | Excellent |
| 88 | 100 | 4 | A | Excellent |

**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.

**Important Regulations:**

* 1. Attendance and departure of students on time to have full 50 minute lecture.
  2. check the frequency of students regularly and at the beginning of the lecture, if number of absent lectures for any student comes close to max. then the is reminded.
  3. Not allowed for students to speak together during the running of lecture but to ask the instructor.
  4. Close of the Mobile
  5. The instructor is ready to answer any question out of office hours if presented in the office.
  6. Reminding of Exams dates one week before.
* For more details on University regulations please visit:

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