**The University of Jordan**

**Faculty: Agriculture**

**Department: Horticulture & Crop Sciences**

**Program: Horticulture & Crop Sciences**

**Academic Year/ Semester: Second Semester 2014/2015**

**Course Name: (Field Crops Science -601721)**

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| --- | --- | --- | --- | --- | --- |
| **Credit hours** | **3 hours weekly** | **Level** | **MSc** | **Pre-requisite** | **--** |
| **Coordinator/ Lecturer** | **Prof. Hani Saoub** | **Office number** | **213** | **Office phone** | **22343** |
| **Course website** | **--** | **E-mail** | **hanis@ju.edu.jo** | **Place** | **--** |

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| --- | --- | --- | --- | --- | --- |
| **Office hours** | | | | | |
| **Day/Time** | **Sunday** | **Monday** | **Tuesday** | **Wednesday** | **Thursday** |
|  | **--** | **--** | **--** | **--** | **--** |
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**Course Description**

Discussion of optimal management production to strategic crops starting from seed germination, plant growth, harvesting and seed treatment, influence of time and seedling emergence in botanical population on growth and development of crop, evaluation of botanical characteristics to improve production in semi-arid environment and long term influence of cultivation and fertilization.

**Learning Objectives**

1. Increase knowledge of crop production research and development.

2. Enhance student ability to critically analyze crop production issues.

3. Provide with knowledge about the basic foundation of the principles that underlie most of our crop management practices.

4. Improve student's ability to explain the underlying science for many of our crop production practices.

5. Provide with lessons on how the information students are learning explains or applies to what they have observed or experienced in various cropping situations, and how those cropping systems might be improved.

**Intended Learning Outcomes (ILOs):**

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

**A. Knowledge and Understanding:** Students are expected to

**A1-** Understand the relationship between different disciplines of crop production processes.

**A2-** Understand the basic principles of crop science.

**A3-** Know the biological basis for climatic and edaphic requirements of crops.

**B. Intellectual Analytical and Cognitive Skills:** Students are expected to

B1- Explain the underlying science for many of crop production practices.

B2- Evaluate different crop needs under various practices to satisfy those needs.

B3- Enhance their power of observation;

B4- Learn to think at higher levels of integration; and engage in discussion.

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

C1- Read review papers and book chapters to gain an appreciation of specific and broader issues in crop production.

C2- Learn and evaluate new research techniques and approaches.

C3- Prepare a case study of crop production with higher level of integration using scientific method studies to sharpen their powers of scientific observation and to develop new research ideas.

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

D1- Design and implement appropriate solutions and practices that optimize crop productivity.

D2- Develop a greater appreciation of crop production research and technology transfer.

# ILOs: Learning and Evaluation Methods

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| **ILO/s** | **Learning Methods** | **Evaluation Methods** |
| A. Knowledge and Understanding | Lectures and Discussions | Exam, Quiz, |
| B. Intellectual Analytical and Cognitive Skills | Lectures and Group discussions-- presentation | Exam, Quiz, Oral Exam |
| C. Subject- Specific Skills | Group discussions-- presentation | Exam, Quiz, Oral Exam |
| D. Transferable Key Skills: | Group discussions | Report +Exam |

**Course Contents**

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| --- | --- | --- | --- |
| **Content** | **Reference** | **Week** | **ILO/s** |
| 1-Introduction:   * Economic role of field crops * Green revolution in agriculture | 1+6+7+11 | 1 | A1 |
| 2-Crop productivity: |  |  |  |
| * The basis of all crop yield | 1+6+7+13 | 2 | A2 |
| * The botany of crop yield | 1+4+9 | 3 | A3 |
| * Yield progress, problems, and prospects | 2+10+11+12 | 4 | A2 |
| * Leaf area and plant architecture | 9+13 | 5 | A2+A3 |
| * Economic yield, biological yield, and harvest index | 1+4+7+11+13 | 6 | A2+B1+B2 |
| * Cropping programs, soil productivity and cropping practices in agro ecosystem | 1+2+4+5+10+11+13 | 7 | B1+B2+B3+C1 |
| * Cultural energy and crop production | 1+2+5+10+11+13 | 8 | B1+B2+B3+B4+C1 |
| * Crop mixtures, monocultures, and yield. | 1+4+10+11+13 | 9 | B1+B2+B3+B4+C1 |
| 3-Biological nitrogen fixation:   * The role of legumes in the farming systems | 6+7+8+10 | 10 | A2+B1+B2+C1 |
| 4- Crop physiology and efficient water use: |  |  |  |
| * Yield and photosynthesis | 1+7+10+13 | 11 | A2+A3+B1+B2 |
| * Efficient water use in crop production | 1+4+13+14 | 11 | A2+B1+B2 |
| * Management practices for efficient water use | 1+3+4+14 | 12 | A2+B1+B2+C1+D1+D2 |
| * Actual and potential yields of field crops in moisture-limited environments | 1+3+4+10+14 | 13 | B2+B3+B4 |
| * Plant breeding strategies for rainfed areas | 1+3+4+10+14 | 14 | B2+B3+B4 |
| 5-Sustainable field crops production |  |  |  |
| * needs and determinants of crop production and related areas | 5+11+13+15+16+17 | 15 | C1+C2+D1+D2 |
| * Sustainable use of non conventional water resources in crop production | 5+11+13+15+16+17 | 15 | C1+C2+D1+D2 |
| 6- Group discussion of case studies | All available ref. | 16 | C3 |

# Evaluation

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| **Evaluation** | **Point %** | **Date** |
| First Exam | 20 | 15/3/2015 |
| In class presentation | 20 | - |
| Case Study | 20 | - |
| Final Exam | 40 | - |

# References:

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| --- | --- |
| 1 | Acquaah, G. 2001. Principles of Crop Production: theory, techniques, and technology. First edition. Prentice Hall Publisher. |
| 2 | Brady, N.C. 1989-1991. Advances in Agronomy. Volumes: 42-44. Academic Press, Inc. Harcourt Brace Jovanovich, Publishers. San Diego. |
| 3 | Dregne, H.E. and Willis, W.O. 1983. Dryland Agriculture. American Society of Agronomy, Inc. Madison, Wisconsin, USA. |
| 4 | Fageria, N. K, Baligar, V. C. and Jones, C.A.1997. Growth and mineral nutrition of field crops. Marcel Dekker. |
| 5 | FAO. Food and Agricultural Organization. 1989. Sustainable agricultural production, implications for international agricultural research. FAO, Rome. |
| 6 | Martin, J.H., Leonard, W.H. and Stamp, D.L.1976. Principles of Field Crop Production, 3 rd Edition, MacMillan/McGraw-Hill. |
| 7 | Martin, J.H., Leonard, W.H., Stamp, D.L. and Waldren, R.P. 2005. Principles of Field Crop Production, 4th Edition, MacMillan/McGraw-Hill. |
| 8 | Osman, A.E., M.A. Ibrahim, and M.A. Jones. 1990. The role of legumes in the farming systems of the Mediterranean areas. ICARDA, Aleppo, Syria. |
| 9 | Parker, R.O.1998. Introduction to Plant Science, Delmar Publishers. |
| 10 | Russel, E. M. 1995. Crop Science principles and practices, Burgess Intl Group. |
| 11 | Smith, C. W. 1995. Crop Production: Evolution, History, and Technology, John Wiley & Sons Inc. |
| 12 | Sparks, D. L. Advances in Agronomy. Volumes: 46 & 53. Academic Press, Inc. Harcourt Brace Jovanovich, Publishers. San Diego. |
| 13 | Stoskopf, N.C. 1981. Understanding crop production. Reston Publishing Company, Inc., Reston, Virginia. USA. |
| 14 | Taylor, H.M, W.R. Jordan, and T.R. Sinclair. 1983. Limitations to efficient water use in crop production. American Society of Agronomy, Inc. Madison, Wisconsin, USA. |
|  | Journals |
| 15 | Agronomy Journal (http://agron.scijournals.org/). The American Society of Agronomy. |
| 16 | Crop Science (http://crop.scijournals.org/). Crop Science Society of America. |
| 17 | Other related journals. |

**Intended Grading Scale (Optional)**

**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>