**The University of Jordan**

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

**Program: 2018-2019*/Fall semester***

**Course title:** Plant Ecology **(**0601923**)**

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| Credit hours | 3 | Level | PhD Course | Pre-requisite |  |
| 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 |  |

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

**Course Description**

 Topic of this course emphasizes basic concepts of plant ecology including the components of ecological systems, ecological analysis and ecological modeling, plant responses to ecology, population ecology and their variation as well as types of flora in relation to geographical location and energy distribution and ecological preservation of plants.

**Learning Objectives**

1. To know both branches of ecology (Autecology and Synecology).
2. To study the relationships between individual plants and environment = Autecology.
3. To study the relationships between communities and environment = Synecology.
4. To study the structure, nature , organization and development of plant communities.
5. To relate each environmental factor with some case studies.

**Intended Learning Outcomes (ILOs):**

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

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

A1- Define and distinguishAutecology from Synecology as ecosystems

A2- Understand the influence of various environmental factors on individual plants and communities.

A3- Describe the interactions between various environment factors.

A4- To develop the knowledge about physical and biological soil fertility and pests control.

A5- To develop knowledge about how to deal with possible changes in plant growth as consequence to environmental factors.

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

B1- Developing skills about real application of plant ecology context.

B2- Provide students with skills to undertake the whole ecosystem concepts and in particular Agro ecosystem.

B3**-** Describe the scientific principles upon which Agro ecosystem is based, including temperature, light, gases, wind, water and humidity and soil.

B4- Identify the main ecological principles governing cropping systems and their application to rotation design and poly cultures (intercropping), permculture, as well as weed, pest and disease control.

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

C1- To have deep knowledge about the effect of each environmental factors by relating it into some case studies.

C2- Using specific techniques to manage the light environment in Agro ecosystem.

*C3-* Understanding global warming effect on agriculture that resulted from the interaction of light x temperature x wind.

***C4-*** Discuss the role of certain cropping systems in determining the soil characteristics.

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

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

D2- Understanding the ecological significance of light on plants cultivation.

D3- Know how to adopt the microclimates in agricultural process.

*D4-* Employing the cropping systems in improving the soil characters (texture, structure, nutritional status,……)

D5- Understanding the role of Agro-ecosystems in protecting regional and global biodiversity.

D6- Utilization of sustainable Agro-ecosystems reaching to sustainable food systems

# ILOs: Learning and Evaluation Methods

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| **ILO/s** | **Learning Methods** | **Evaluation Methods** |
| **A**. Knowledge and Understanding (**A1-A6**) | Lectures and DiscussionsAssignment readings | Exam, Quiz,  |
| **B**. Intellectual Analytical and Cognitive Skills (**B1-B4**) |  Lectures and DiscussionsAssignment readings | Exam, Quiz, |
| **C**. Subject Specific Skills (**C1-C4**) | Lectures and DiscussionsAssignment readings | Exam, Quiz, |
| **D**.Transferable Key Skills (**D1-D5**) | Lectures and DiscussionsAssignment readings | Exam, Quiz, |

**Course Contents**

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| **No. of lecture (s) /Week** | **Subject** | **Sources** | **ILOs** |
| 1 , 2, 3(1stwk) | Introduction; The effect of both branches of ecosystem on sustainability of food. | Chapter 1, & 2 pp. 3-24. in Gliessman S.R. 1998 | *A1& A2& B1& B4* |
| 4, 5,6 (2nd wk) | Plant requirement of light & temperature. | Chapter 4, & 5 pp. 41-64. in Gliessman S.R. 1998 | *A2 & A3 B3 & C2 & C3& D2* |
| 7,8, 9(3rd wk) | Plant affect by humidity and wind | Chapter 6, &7pp. 71-90. Gliessman S.R. 1998 | *A2 & A3 & A5& B2& C2& C3 & D3* |
| 10, 11, 12(4th wk) | Soil characters and its water content and their interaction with ecosystem | Chapter 8, & 9 pp. 99-127. in Gliessman S.R. 1998 | *A4 & B3 & C4 & D4*  |
|  13, 14, 15(5thwk) | Biotic and environmental factors  | Chapter 11, & 12 pp. 149-172 in Gliessman S.R. 1998 | *A4 & B3 & C4 & D4* |
| 16, 17, 18(6th wk) | Presentations about the role of Conventional systems in ecosystem.  | http://dlc.dlib.indiana.edu/dlc/handle/10535/2424 | *A1& B1 &B2 & B3& D1& D5& D6* |
| 19, 20,21(7thwk) | Presentations about the role of Organic Farming system in ecosystem  | http://pubs.aic.ca/doi/abs/10.4141/CJPS08165 | *A1& B1 &B2 & B3& D1& D5& D6* |
| 22(8th wk) | Midterm Exam |  |  |
|  23, 24(8th wk) | Presentations about the role of Crop Rotation in ecosystem. | http://www.scielo.br/scielo.php?pid=S1517-83822004000300006&script=sci\_arttext | *A1& B1 &B2 & B3& D1& D5& D6* |
| 25, 26, 27(9th wk) | Presentations about the role of Good Agricultural Practices in ecosystem. | http://www.oecd-ilibrary.org/commonwealth/trade/a-guide-to-the-european-market-for-medicinal-plants-and-extracts/good-agricultural-practices\_9781848597389-7-en | *A1& B1 &B2 & B3& D1& D5& D6* |
| 28, 29, 30(10th wk) | Presentations about Sustainable Agricultural in ecosystem | http://link.springer.com/chapter/10.1007/978-1-4612-3252-0\_1 | *A1& B1 &B2 & B3& D1& D5& D6* |
| 31, 32, 33(11th wk) | Genetic resources and their role in adaptation to agro-ecosystems | Chapter 14 pp. 194-211. in Gliessman S.R. 1998 | *A2 & A5 & B1 & C1 & D3 & D5*  |
| 34, 35(12th wk) | Species interaction in Crop Communities  | Chapter 15 pp. 213-226. in Gliessman S.R. 1998 | *A2 & A5 & B1 & C1 & D3 & D5*  |
| 36, 37, 38(12th and 13th wk) | Agro-ecosystems diversity, sustainability and management | Chapter 16 & 17 pp. 227-266. in Gliessman S.R. 1998 | *A1 & A2 & B1 & B2 & B3& B4 &C4 & D1&D4 & D5& D6* |
| 39(13th wk) | Second - hr Exams |  |  |
| 40, 41, 42(14th wk) | The Energetics of Agro-ecosystem | Chapter 18, pp. 269-284. in Gliessman S.R. 1998 | *A1&A2&A5&B2&B3&C2&C3&D2&D3* |
| 43, 44, 45(15th wk) | Interaction between Agro-ecosystem and Natural Ecosystem | Chapter 19, pp. 285-298. in Gliessman S.R. 1998 | *A1 & A2 & B1 & B2 & B3& B4 &C4 & D1&D4 & D5& D6* |
| 46, 47, 48(16th wk) | Achieving sustainability in food supply  | Chapter 20 & 21 pp. 299-327. in Gliessman S.R. 1998 | *A1 & A2 & B1 & B2 & B3& B4 &C4 & D1&D4 & D5& D6* |

**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.

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| **Evaluation** | **Point %** | **Date** |
| Midterm Exam  | 30% |  |
| Presentations | 20% |  |
| Final Exam  | 50% |  |

**Reference:**

1. *Gliesseman S. R. 1998.Agroecology: Ecological Processes in Sustainable Agriculture. Ed. E. Engles. Sleeping Bear Press. USA.*

**Intended Grading Scale (Optional)**

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| --- | --- | --- | --- | --- |
| **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>