**The University of Jordan**

**Faculty: Agriculture Department: Horticulture & Crop Sciences**

**Program: Horticulture & Crop Sciences Academic Year/ Semester:---**

**Course Name (Forage Crops -0631231)**

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| --- | --- | --- | --- | --- | --- |
| **Credit hours** | **Sunday, Tuesday, Thursday 11-12 am** | **Level** | **--** | **Pre-requisite** | **--** |
| **Coordinator/ Lecturer** | **Dr. Hani Saoub** | **Office number** | **Vice Dean** | **Office phone** | **22310** |
| **Course website** | **--** | **E-mail** | **hanis@ju.edu.jo** | **Place** | **--** |

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| **Office hours** | | | | | |
| **Day/Time** | **Sunday** | **Monday** | **Tuesday** | **Wednesday** | **Thursday** |
|  | **10-11** |  | **10-11** |  | **10-11** |
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**Course Description**

This course assesses the role of forages in a productive, sustainable agriculture, identify the major forage crops, and develop an understanding of the principle of sound forage crop management, including harvesting and utilization. Also explains how management affects growth, stand persistence, and physiological changes of forage crops.

**Learning Objectives**

1. To develop an understanding of the principles of sound forage crop management, including harvesting and utilization.

2. To assess the role of forages in a productive, sustainable agriculture.

3. To know and identify the major forage crops, in particular those grown in Jordan.

4. To understand how management affects growth, stand persistence, and physiological changes of forage crops.

**Intended Learning Outcomes (ILOs):**

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

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

**A1- Understand the principles of forage crop management.**

**A2- Understand the role of forage crops in a productive sustainable agriculture.**

**A3- knows the major forage crops.**

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

B1- Identify forage crops using morphological characterstics.

B2- Develop ways to utilize forage management practices in an integrated sustainable systems.

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

C1- Be able to manage a field for forage crop production

C2- Be able to give recommendations for forage production.

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

D1- To use the most advanced technology for forage production

D2- Develop plans to improve forage production in Jordan

D3- Searching for new and highly productive forage plants

# 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 Discussions | Exam, Quiz, |
| **C. Subject- Specific Skills** | Lectures and Discussions | Exam, Quiz, |
| **D. Transferable Key Skills:** | Discussions | Exam |

**Course Contents**

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| **Content** | **Reference** | **Week** | **ILO/s** |
| Introduction: | Forage Crops. A working manual. | 1 | A1 |
| Terminology  - Definitions | Forage Crops. A working manual. | 1 | A1 |
| - Forages in a changing world  - importance of forage crops | Forage Crops. A working manual. | 2 | A1+A2 |
| Forage characteristics | Forage Crops. A working manual.  Heath, M.E., Barnes, R.F. and D.S. Metcalfe.1985. Forages: The Science of Grassland Agriculture. 4`th ed. Iowa State University press, Iowa, U.S.A. | 2 | A2+A3+B1 |
| Identification of forage crops | Heath, M.E., Barnes, R.F. and D.S. Metcalfe.1985. Forages: The Science of Grassland Agriculture. 4`th ed. Iowa State University press, Iowa, U.S.A. Fo | 3 | A3+B1 |
| Classification of forage crops | Forage Crops. A working manual. | 3 | **B1** |
| Forage legumes & nitrogen fixation | Heath, M.E., Barnes, R.F. and D.S. Metcalfe.1985. Forages: The Science of Grassland Agriculture. 4`th ed. Iowa State University press, Iowa, U.S.A.  Barnes, R.F., D.A. Miller, and C.J. Nelson. 1995. Forages- Vol.1- An introduction to Grassland Agriculture. (5th edition). Iowa State University press, Iowa, U.S.A. | 4 | A1+A2 |
| Forage mixtures | Forage Crops. A working manual. | 4 | A1+A2+B2 |
| Establishment & weed management: selection of cultivars, planting requirements, etc. | Heath, M.E., Barnes, R.F. and D.S. Metcalfe.1985. Forages: The Science of Grassland Agriculture. 4`th ed. Iowa State University press, Iowa, U.S.A.  Barnes, R.F., D.A. Miller, and C.J. Nelson. 1995. Forages- Vol.1- An introduction to Grassland Agriculture. (5th edition). Iowa State University press, Iowa, U.S.A. | 5 | B2+C1 |
| Soil fertility & fertilization | Heath, M.E., Barnes, R.F. and D.S. Metcalfe.1985. Forages: The Science of Grassland Agriculture. 4`th ed. Iowa State University press, Iowa, U.S.A. | 6 | A1+A2+B2 |
| Nutrient cycling in pasture ecosystems | Heath, M.E., Barnes, R.F. and D.S. Metcalfe.1985. Forages: The Science of Grassland Agriculture. 4`th ed. Iowa State University press, Iowa, U.S.A. | 6 | A1+A2+B2 |
| Physiological aspects and management | Forage Crops. A working manual. | 7 | B2+C1 |
| Forage utilization: when, why, how?  -Hay making,  -Silage | Forage Crops. A working manual. | 8-9 | B2+C1+C2 |
| Forage legumes (alfalfa, berseem, other clovers, medics, vetches). Conditions required, cultural practices, etc. | Forage Crops. A working manual.  Langer, R.H.M. 1990. Pastures: their ecology and management. Oxford University Press. New Zealand. | 10-11- 12 | A3+B2+C1+C2+D1+D2+D3 |
| Forage in livestock systems | Forage Crops. A working manual. | 12-13 | B2+C1+C2 |
| Forage grasses (fodder corn, sudangrass, ryegrass, others). Conditions required, cultural practices, etc. | Forage Crops. A working manual.  Heath, M.E., Barnes, R.F. and D.S. Metcalfe.1985. Forages: The Science of Grassland Agriculture. 4`th ed. Iowa State University press, Iowa, U.S.A. | 13-14 | A3+B2+C1+C2+D1+D2+D3 |
| Animal disorders as related to forage crops | Heath, M.E., Barnes, R.F. and D.S. Metcalfe.1985. Forages: The Science of Grassland Agriculture. 4`th ed. Iowa State University press, Iowa, U.S.A. | 15 | B2+C1+C2+D1 |
| Forage evaluation | Heath, M.E., Barnes, R.F. and D.S. Metcalfe.1985. Forages: The Science of Grassland Agriculture. 4`th ed. Iowa State University press, Iowa, U.S.A.  Barnes, R.F., D.A. Miller, and C.J. Nelson. 1995. Forages- Vol.1- An introduction to Grassland Agriculture. (5th edition). Iowa State University press, Iowa, U.S.A. | 15-16 | B2+C1+C2+D1+D2+D3 |

# Evaluation

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| **Evaluation** | **Point %** | **Date** |
| **Midterm Exam** | 30 | 10-11-2013 |
| **Second Exam** | 20 | 8-12-2013 |
| **Final Exam** | 50 | As scheduled by the University calendar |

**Main Reference/s:**

Forage Crops. A working manual.

# References:

1. Heath, M.E., Barnes, R.F. and D.S. Metcalfe.1985. Forages: The Science of Grassland Agriculture. 4`th ed. Iowa State University press, Iowa, U.S.A.
2. Barnes, R.F., D.A. Miller, and C.J. Nelson. 1995. Forages- Vol.1- An introduction to Grassland Agriculture. (5th edition). Iowa State University press, Iowa, U.S.A.
3. Barnes, R.F., D.A. Miller, and C.J. Nelson. 1995. Forages- Vol. II - The Science of Grassland Agriculture. (5th edition). Iowa State University press, Iowa, U.S.A.
4. Langer, R.H.M.1990.Pastures: their ecology and management. Oxford University Press. New Zealand.
5. Horrocks, R.D. and J.F. Valentine. 1999. Harvested Forages. Academic Press.
6. Barnes, R.F., C.J. Nelson, M. Collins, and K.J. Moore. 2003. Forages- Vol.1- An Introduction to Grassland Agriculture. (6th edition). Wiley-Blackwell.
7. Barnes, R.F., C.J. Nelson, K.J. Moore, and M. Collins. 2007. Forages- Vol. II - The Science of Grassland Agriculture. (6th edition). Wiley-Blackwell.

**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>