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| **The University of Jordan** |
| **Faculty of Agriculture** | **Department of Horticulture and Crop Science** |
| **Course title** | **Forestry Science (3 credit hrs 2 lec. + 3 practice)** |
| **Course code & Level** | **631313 , Third year** |
| **Pre-requisite** | **Principle of Plant Production (661101)** |

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| **Coordinator/ Lecturer** | **Office number** | **Office phone** |
| Prof.Dr.Mohammad Omari | 249 | 22334 |

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| **Course website** | **E-mail** | **Place** |
| On UJ E. Learning portal @ Moodle LCM . | momari@ju.edu.jo  | Classroom no. (61181) |

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| **Office hours** |
| **Day/Time** | **Sunday** | **Monday** | **Tuesday** | **Wednesday** | **Thursday** |
| **Day** | **\*** |  | **\*** | **\*** | **\*** |
| **Time** | **(8-9) & ( 9-16)** | **(8-15)** | **(8-9) &(10-12)** | **(816)** | **(816)** |

**COURSE DESCRIPTION**

Introduction, influences of forestry science, dendrology and forest trees classification. Forest ecology, ecological factors and their influences on forest growth and development. Afforestation and Forest management. Role of forestry in sustainable development. Agro-forestry systems. Windbreak and shelter belt plantings. Forest protection, measurement and harvesting. Forests and afforestation in Jordan.

**Learning Objectives**

1. Awareness of students with the various products, benefits and services of the forest.

2. To develop a knowledge and understanding of proper silvicultural treatment/s of the forest stands

 to improve the composition and quality of the products.

3. Sensitize students to understand the role and contribution of forestry in sustainable development

 of dry land regions.

4. Sensitize students to understand the establishment, management techniques and functions of the

 Windbreak and shelterbelts in improving lively hood and socioeconomic conditions of rural

 communities in dry land regions.

**Intended Learning Outcomes (ILOs): يقصد بها نتائج التعلم**

**Intended Learning Outcomes (ILOs):**

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

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

**A1-**Gain information for an internet sources related to forestry*.*

**A2**Gain information on Forest ecology.

**A3-** Demonstrate basic knowledge on forest tree nurseries & Afforestation methods .

**A4-** Demonstrate basic knowledge on silvicultural systems and treatments.

* **A5**- Understand the establishment and management of fuel wood plantations.
* **A6**- Demonstrate basic knowledge on different terms and applications of agroforestry systems
* Practiced in arid land regions.

**A7**- Understand the establishment, management techniques and functions of the windbreak

 and shelterbelts in improving lively hood and socioeconomic conditions of rural

 communities in dry land regions.

**A8**- Understand the basic information’s and objectives of forest mensuration and inventory and

 harvesting.

**A9**- Gain information on forestry sector in Jordan.

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

**B1**- Know how to prepare sites selected for afforestation ,site preparation methods and

 techniques .

**B2**-Be able to match between tree species and site conditions for better survival, growth rate

 and production.

**B3**- Be able to advise and conduct the proper silvicultural treatment/s of forest stands.

**B4-** Develop strategies to counteract forest tree enemies and reduce risk of damage from these

 enemies.

**ILOs: Learning and Evaluation Methods**

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

**D1**- Gain basic forest establishment and management to maintain a long term production of

 forest products, benefits and services.

**D2**- Improve agricultural level in dry land regions through using forest trees and shrubs.

**D3**- Know the right time and right techniques to harvest and handle forest crops.

**D4**- Know the field in which wood of different forest species can be used.

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

**C1**- Apply and analyze methods of seed harvesting and seedling production in the nursery.

**C2**- Select and prepare of afforestation site.

**C3**-Establish and manage of wind breaks and shelterbelts to protect agricultural fields.

**C4**- Select the appropriate agroforestry system/s to maximize the profit from the land.

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| **ILO/s** | **Learning Methods** | **Evaluation Methods** |
| **A**. Knowledge and Understanding (**A1-A6**) | Lectures and Discussions | Exam, Quiz,  |
| **B**. Intellectual Analytical and Cognitive Skills (**B1-B4**) |  Lectures and Discussions | Exam, Quiz, |
| **C**. Subject Specific Skills (**C1-C4**) | Lectures and Discussions | Exam, Quiz, |
| **T**ransferable Key Skills (**D1-D4**) | Project & presentation | Project & presentation evaluation. |

**Course content**

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| **No. of lecture (s) /Week** | **Subject** | **Sources** | **ILOs** |
| **2** **(lst wk)** | **Unit 1: History , influences , and uses of the forest** * Forestry science, divisions and forest defined.
* Importance of forests throughout history.
* Forest products, benefits and services.

Aspects to trees as modifiers of the environment. | Chapter 1 in Sharpe et al.1995 | **A-1** |
| 15**(2nd- 10 th  wk)** | **Unit 2: Dendrology and forest trees classification**  * Identification of trees.
* A " Forest defined "
* Forest plant classification. Forest trees in Jordan ......( **Lab** )
 | Part 3 in Stoddard,C.H. and G.M.Stoddard,1987Each student will prepare a plant collection of tree species. | **C-3** |
| 4**(3th&4th wk)**    | **Unit 3: Forest ecology and ecological factors and their**  **influences on forest growth and development** * The science of ecology and forest ecology.
* The forest environment.
* Classification of site factors:

**1-Forest trees and the climatical factors:** * Temperature, light, water, wind.
* Classification of forest trees according to:
* Temperature, Light requirements.
* Effects of snow and wind on forest tree's growth and wood quality.

**2- Forest trees and the edaphic factors:** * Concepts of forest soil, forest litter, tree roots,
* Importance of soil to forest trees .Effects of soil

 physical properties on forest trees.* Classification of forest trees with respect to soil type.
* Soil water content and factors affecting the

 Distribution of rainfall within a forest.**3-Topographic factors and forest trees:** * Topographic position, slope, altitude, exposure.
* Classification of forestlands according to slope degrees.

 **4-Forest trees and the biological factors**: * Interrelations between forest trees and plants, animals and human.
 |  Chapter 1 in  Sharpe et al.1995 | **A2** |
| 3**(5th&6th wk)** | Unit 4:Role of Forestry in Sustainable Development of Dry land Regions* Function of Trees and Shrubs: Fuel wood, Fodder,

Improvement in Agricultural Production* Place of Trees and Shrubs in Rural landscapes
 | Part 1,6, in Ffolliott et al.1995 | **D2** |
| 2**(6th&7th wk)** | Unit 5:Nursery management in dry land regions* Choice of the site for the nursery
* Planning and preparation of the nursery
* Layout of the nursery
* Procurement and storage of the seed
 | Chapter 10 in Smith,D.M.,1982&Part 11 in Ffolliott et al.1995& | **A3, C1** |

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| 5**(8th&9th wk)** | Unit 6:Afforestation and Management of Forest Plantations in Dry land Regions* Selection and Preparation of the Planting Site

-Species Selection-Timing of Planting-Spacing and Arrangement of Plantings* Reforestation methods:

 1-Direct seeding method. 2-Planting nursery-grown seedlings. * Major types of forest tree plantations:

 1-Production plantations. 2-Plantations for environmental improvement. 3-Soil stabilization plantations.4-Amenity plantations.* Introduction of forest trees to arid-zones.
 | Chapter 8, 11 in Smith,D.M.,1982& Part 12 in Ffolliott et al.1995& Part 5 in Stoddard,C.H.and G.M.Stoddard,1987. | **A3****B1****B2****C2****D1** |
| 3**(10th&11th wk)** | Unit 7: The practice of Silviculture* Forest stands classification
* Objectives of silvicultural treatments
* Types of silvicultural treatments
* Reproduction of forests
 | Chapter 1,2,4,6, in Smith,D.M.,1982& Part 4 in Stoddard,C.H.and G.M.Stoddard,1987. | **A4** |
| 2**(12th wk)** | Unit 8:Fuel wood plantations and management.* Role of fuel wood in energy requirements
* Advantages of wood as a source of energy
* Management of fuel wood resources
 | Part 15 in Ffolliott et al.1995 | **A5** |
| **3** **(13th wk)** | Unit 9:Agroforestry Practices -Agricultural Production Systems-Livestock Production Systems-Wildlife Production Systems-Woody Production Systems-Combined Production Systems-Classification of Agroforestry Systems-Agroforestry Systems in Dryland Regions | Part 16 in Ffolliott et al.1995 | **A6****C4** |
| 3**(14th wk)** | **Unit 10:Windbreak and Shelterbelt Plantings** * Objectives of Windbreak and Shelterbelt Plantings
* Design, Selection of Trees and Shrub species
* Planting Techniques
 | Part 17 in Ffolliott et al.1995 | **A6****C3** |
| 2**(15th wk)** | **Unit 11: Forest protection**   | Part 9 in Stoddard,C.H.and G.M.Stoddard,1987. | **B4** |
| 1**(16th wk)** | **Unit 12: Forest mensuration and harvesting**   | Part 12 in Ffolliott et al.1995& A list of internet sites on forest harvesting | **A8****D3****D4** |
| 1 **(16 th wk)** |  **Unit 13: Forests and afforestation in Jordan**   | Forest dept. annual reports | **A8** |

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| **Learning Methodology*** + Lectures (including 1 mid-term exam)
	+ Laboratory: (including field trips, collection of plant specimens, mensuration of single logs and timbered areas using different instruments, slide show, and identification of trees and shrubs. Techniques followed in site preparation and planting of seedlings. Operations followed in forest tree nurseries.
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**Grading**

Grading in the course of forestry science (631313) will be as follows:

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| **Activity** | **% of grade** |
| **Lectures** | **Laboratory** |
| **Midterm exam**  Tuesday 3/12/2013 | 20 | 10 |
| Quizzes ,reports,…….  | 15 | - |
| Plant collection | - | 5 |
| Final exam. | **40** | **10** |
| **TOTAL** | **75** | **25** |

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| **References** |
| **Selected References:*** **Sharpe,G.W.,C.W.,Hendee ,W.F.Sharpe and J.C.Hendee,1995."Introduction To Forest and Renewable Resources, McGraw-Hill Book Company,New York.St.Louis.**

* Ffolliott ,P. F.,K.N.Brooks ,H.M.Gregersen and A.L.Lundgren,1995.”Dryland Forestry Planning and Management”,John Wiley & Sons,Inc.New York.

 **Other** **References** * Collins,B.M.and F.M.White,1981."Elementary forestry",Reston publishing

Company Inc.,Reston Virajina.* Goor,A.Y.and C.W.Barney,1988."Forest Tree Planting in Arid Zones",

The Ronald Press Company. New York. * Hall,N.et al.,1972.The use of Trees and Shrubs in the Dry Country of Australia.

 A.G.P.S. Canberra.* Hamilton,G.J.,1975."Forest Mensuration Handbook",Her Majesty's Stationery

Office, London.* Smith,D.M.,1982"The Practice of Silviculture", John Wiley and Sons Inc., New York.
* Spurr,S.H.and B.V.Barnes,1980."Forest Ecology",John Wiley and Sons,

New York, Chichester Brisbane Toronto.* Stoddard,C.H.and G.M.Stoddard,1987."Essentials of Forestry Practice",

 John Wiley and Sons, New York. Chichester. |

**Class participation:**

Students are expected to attend classes on time, and fully participate in class work and discussions. Your attendance is crucial, as each class builds upon the previous class session. Actual participation in class work is a very important part of your learning experience in this course, so you are expected to come and to be prepared to do the work, ask questions, and fully engage with the course.