**The University of Jordan**

**Faculty of Agriculture Dept. Horticulture & Crop Science**

**Program: B.Sc. in Hort. & Crop Science Year: 2013-2014/ Fall semester**

**Plant Genetics (**0631240**)**

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| **Credit hours** | **3** | **Level** | **2nd year** | **Pre-requisite** | **0304101** |
| **Lecturer** | **Dr. Muhanad Akash** | **Office number** | **290** | **Office phone** | **22340** |
| **Course website** | **http://elearning.ju.edu.jo/** | **E-mail** | **makash@ju.edu.jo** | **Place** |  |

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

Principles related to mendelian, population, and molecular genetics of plants including mitosis and meiosis, probability and statistics, linkage and mapping, molecular structure and organization of genetic material, chromosomal and molecular bases of inheritance for qualitative and quantitative traits, and introduction to plant biotechnology.

**Learning Objectives**

• To develop an appreciation of the importance of plant genetics.

• To develop an understanding of the basic principles of classical, evolutional, and molecular genetics.

**Intended Learning Outcomes (ILOs):**

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

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

**A1-** Examine a brief overview of the modern history of genetics

**A2-** Understand Mendel’s rules of inheritance: segregation and independent assortment

**A3**- Know how genes generally control the production of enzymes and thus the fate of biochemical pathways

**A4**- Understand the properties that a genetic material must have

**A5**- Understand the chromosomal bases of inheritance

**A6**- Understand the molecular bases of inheritance

**A7**- Examine genomics, biotechnology, and recombinant DNA

**A8**-Understand the patterns of inheritance of phenotypic traits

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

**B1**- Appreciate the role that plant genetic has played and continues to play in the world economy and culture

**B2**- Interpret results efficiently

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

**C1**- Understand the overall importance of plant genetics for our existence

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

**D1**- Emphasis on genetical research problems

**D2**- Improve and practice scientific analysis and interpretation

# ILOs: Learning and Evaluation Methods

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| **ILO/s** | **Learning Methods** | **Evaluation Methods** |
| A. Knowledge and Understanding (A1-A8) | Lectures and Discussions | Exam, assignments |
| B. Intellectual Analytical and Cognitive Skills (B1-B2) | Lectures, Homework and Assignments | Exam, assignments |
| C. Subject Specific Skills (C1) | Lectures, Homework | Exam , assignments |
| D.Transferable Key Skills (D1-D2) | Lectures, Assignments | Exam , assignments |

**Course Contents**

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| **Content** | **Reference** | **Week** | **ILO/s** |
| 1. An introduction to modern genetics | Tamarin (2004) | 1 | A1,B2,C1,D1 |
| 1. Mendel’s Principles | Tamarin (2004) | 2, 3 | A2 |
| 1. Mitosis and Meiosis | Tamarin (2004) | 3, 4 | A2 |
| 1. Probability and Statistics | Tamarin (2004) | 5 | A4,B2,D2 |
| 1. Linkage and Mapping in Eukaryotes | Tamarin (2004) | 6, 7 | A5,B2,D2 |
| 1. Cytogenetics | Tamarin (2004) | 7, 8 | A5 |
| 1. Chemistry of the Gene | Tamarin (2004),  Campbell Biology (2013) | 9 | A3,A6 |
| 1. Transcription & Translation | Tamarin (2004) , Campbell Biology (2013) | 10,11 | A6 |
| 1. DNA: Its Mutation, Repair, and Recombination | Tamarin (2004) , Campbell Biology (2013) | 12 | A6 |
| 1. Genomics, Biotechnology, and Recombinant DNA | Tamarin (2004) , Campbell Biology (2013) | 13-15 | A7,B2,C1,D1,D2 |
| 1. Non-Mendelian Inheritance | Tamarin (2004) | 15 | A8,D1 |
| 1. Quantitative Inheritance | Tamarin (2004) | 16 | A8 |

**Learning Methodology**

1. **Lectures**: 2 per week (including one Midterm exam)
2. **Duration:** 16 weeks, 48 hours in total
3. **Assignments:** to be notified

# Evaluation

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| **Evaluation** | **Point %** | **Date** |
| **Midterm Exam** | 30 |  |
| **Assignments** | 10 |  |
| **Homework** | 10 |  |
| **Final Exam** | 50 |  |

**Main Reference/s:**

* **Principles of Genetics**, 7th edition. 2004. Tamarin. R. H. McGraw Hill Companies

# References:

* Campbell Biology, 10th edition. 2013. Neil A. Campbell and Jane B. Reece. Benjamin Cumming's Publishing Company

**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>