**The University of Jordan**

**Faculty of Agriculture Department of Plant Protection**

**Program: B.Sc. in Plant Protection 2016-2017/First Semester**

**Beneficial fungi (**[**0646423**](https://agriculture.ju.edu.jo/Lists/Courses/Disp_Course.aspx?ID=154&dept=Plant%20Protection&deptName=Plant%20Protection&prog=)**)**

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| --- | --- | --- | --- | --- | --- |
| **Credit hours** | **2** | **Level** | **B.Sc.** | **Pre-requisite** |  |
| **Coordinator/ Lecturer** | **Dr. Kholoud M. Alananbeh** | **Office number** | **131** | **Office phone** | **22424** |
| **Course website** | **UJ E-learning Portal** [**https://elearning.ju.edu.jo/**](https://elearning.ju.edu.jo/) | **E-mail** | **k.alananbeh@ju.edu.jo** | **Place** |  |

|  |
| --- |
| **Office hours** |
| **Day/Time** | **Sunday** | **Monday** | **Tuesday** | **Wednesday** | **Thursday** |
| **Day** | **\*** | **-** | **\*** | **-** | **-** |
| **Time** | **11-12** | **12-1** | **-** | **12-1** | **11-12** |

**\*\* Or by appointment**

**Course Description**

This course aims to provide students a basic knowledge about beneficial fungi and their role in different disciplines. Students will be introduced to importance of fungi in food, medicine, ecology, biocontrol, recycling, decomposing, bioremediation, biofuel, industry, and genetic studies.

**Learning Objectives**

At the end of the course, students will be familiar with the characteristics of the different phyla of fungi that have benefits to human, plants, and animals; and the different beneficial aspects that fungi provide to ecology, human, and industry.

**Intended Learning Outcomes (ILOs):**

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

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

A1- Know the eumycota phyla that includes the beneficial fungi.

A2- Discuss the importance of fungi in many disciplines mainly to human, plants, and

 animals.

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

B1- Be able to correlate the mycology and the beneficial fungi courses, where the student can differentiate the different phyla of fungi that are of benefit to human, plants, and animals.

B2. Recognize, identify and explain the different beneficial roles of the different fungal genera and species.

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

C1- Identify the different important roles fungi for human and ecology

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

D1- Recognize the importance of fungi to human, plant, and animal.

D2- Know the different disciplines that the fungi have role in.

# ILOs: Learning and Evaluation Methods

|  |  |  |
| --- | --- | --- |
| **ILO/s** | **Learning****Methods** | **Evaluation Methods** |
| Knowledge and Understanding(A1-A2) | Lectures and Discussions | Exam, Quiz |
| Intellectual Analytical and Cognitive Skills(B1-B2) | Lectures and Discussions, articles  | Exam, Quiz |
| Subject- Specific Skills (C1) | Lectures and Discussions, articles | Exam, Quiz |
| Transferable Key Skills (D1-D2) | Presentation | Presentation evaluation |

**Course Contents**

|  |  |  |  |
| --- | --- | --- | --- |
| **Content** | **Reference** **(Text Book)** | **Week** | **ILO/s** |
| General introduction about fungi | 1 | 1 | A1-2 |
| [Fungi](http://www.mycolog.com/CHAP1.htm) as food | 1,7 | 2-3 | A1-2,B1-2,C1,D1-2 |
| Mycorrhizae - mutualistic plant-fungus symbioses | 3,4,7 | 4-5 | A1-2,B1-2,C1 ,D1-2 |
| Mutualistic symbioses between fungi and animals | 3,4,7 | 6 | A1-2,B1-2,C1,D1-2 |
| Fungi as agents of biocontrol | 7 | 7-8 | A1-2,B1-2,C1,D1-2 |
| Midterm Exam |  |  |  |
| Fungi in industry and food processing | 7 | 9 | A1-2,B1-2,C1,D1-2 |
| Fungi in medicines | 6,7 | 10 | A1-2,B1-2,C1,D1-2 |
| [Bioremediation](http://www.mycolog.com/chapter7.htm)   | 5,7 | 11 | A1-2,B1-2,C1,D1-2 |
| Endophytes and rhizospheres | 1,2,7 | 12 | A1-2,B1-2,C1,D1-2 |
| Fungi in decomposition and recycling  | 7 | 14 | A1-2,B1-2,C1,D1-2 |
| Fungi for waste treatment | 7 | 14 | A1-2,B1-2,C1,D1-2 |
| Fungi as biofuel | 7 | 15 | A1-2,B1-2,C1,D1-2 |
| Fungi as model organisms for biochemical and genetic studies | 7 | 16 | A1-2,B1-2,C1,D1-2 |
| Fungi in recombinant DNA technology | 7 | 16 | A1-2,B1-2,C1,D1-2 |

**Learning Methodology**

Power point presentations and lectures handouts will be provided. These will be distributed during the previous lectures; it is important that students read the handouts before coming to lecture and lab.

**Evaluation**

|  |  |  |
| --- | --- | --- |
| **Evaluation** | **Point %** | **Date** |
| Midterm Exam | 30% |  |
| In - Class Quizzes | 5% | At the end of each topic |
| Activities, articles, and presentations   | 15% | Will be assigned |
| Class Final Exam | 50% | Will be announced from register |

**References**

1. Webster, J. and Weber, R. 2007. Introduction to fungi. 3rd Ed. Cambridge University Press.
2. Kavanagh, K. 2011. Fungi biology and applications. 2nd ed. John Wiley & Sons, Hoboken, N.J.
3. Paracer, Surindar. 2000. Symbiosis an introduction to biological associations. 2nd ed. Oxford University Press, New York.
4. Sally E. Smith, FAA, and David Read, FRS. 2008. Mycorrhizal Symbiosis. 3rd ed. Elsevier Ltd.
5. Gadd, G.M. 2001. Fungi in bioremediation. Cambridge University Press.
6. Moore, D. 2001. Fungi in medicine-antibiotics and other pharmaceuticals. *In*: Slayers, Saviors, Servants, and sex: an expose of kingdom fungi. Springer-Verlag, NewYork.
7. Articles published in different international journals

**Intended Grading Scale (Optional)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **From (%)** | **To (%)** | **Scale** | **Mark** | **Result** |
| 0 | 40 | 0 | H | Fail |
| 41 | 44 | 0.75 | D- | Fail |
| 45 | 51 | 1 | D | Accepted |
| 52 | 55 | 1.5 | D+ | Accepted |
| 56 | 59 | 1.75 | C- | Good |
| 60 | 66 | 2 | C | Good |
| 67 | 70 | 2.5 | C+ | Good |
| 71 | 74 | 2.75 | B- | Very Good |
| 75 | 81 | 3 | B | Very Good |
| 82 | 85 | 3.5 | B+ | Very Good |
| 86 | 89 | 3.75 | A¯ | Excellent |
| 90 | 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.
* For more details on University regulations please visit:

 <http://www.ju.edu.jo/rules/index.htm>