**The University of Jordan**

**Faculty of Agriculture Department: Plant Protection**

**Program: Academic Year 2015/2016 First Semester**

Identification of Phytopathogenic Bacteria(0606725)

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| **Credit hours** | **3** | **Level** | **M.sc** | **Pre-requisite** |  |
| **Coordinator/ Lecturer** | **Prof. Hamed Khlaif** | **Office number** | 227 | **Office phone** | **22524** |
| **Course website** |  | **E-mail** |  H-khlaif@ju.edu.jo | **Place** |  |

|  |
| --- |
| **Office hours** |
| **Day/Time** | **Sunday** | **Monday** | **Tuesday** | **Wednesday** | **Thursday** |
|  | (10-11) | (10-11) | (10-11) | (10-11) | (10-11) |
|  |  |  |  |  |  |

**Course Description**

-To Give the student an idea about the different phytopathogenic bacterial genera.

-Give the student an idea about the recent updating nomenclature of phytopathogenic bacterial genera, diseases they cause, isolation on common and selective media, characteristics, their taxonomy, different techniques for their detection, survival, epedimic and genetics.

**Learning Objectives**

To give the students an idea about

1. different phytopathogenic bacterial genera.
2. different techniques for isolation, identification, preservation and inoculation methods.
3. Most recent methods for detection, identification, taxonomy, nomenclature according to international rules.

**Intended Learning Outcomes (ILOs):**

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

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

**A1-** different phytopathogenic bacterial genera.

**A2- their isolation and detection and identification with most recent techniques.**

**A3- their taxonomy, nomenclature, following the most recent updating lists of naming bacteria**

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

B1- classification, taxonomy, nomenclature according to international rules.

B2- characteristics of phytopathogenic bacteria

B3- examples of bacterial diseases

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

C1-techniques for classification

C2-biochemical tests for identification
C3- chemosystematic taxonomy

**C4: type collection preservation**

**D. Transferable Key Skills:** Students is expected to have an idea

D1- numerical taxonomy

D2- DNA and protein analysis, serology

D3- fatty acids and enzymes

**ILOs: Learning and Evaluation Methods**

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| --- | --- | --- |
| **ILO/s** | **Learning Methods** | **Evaluation Methods** |
| A. Knowledge and Understanding(A1-A3) | Lectures and Discussions | **Exam, Quiz and presentation** |
| B. Intellectual Analytical and Cognitive Skills(B1-B3) | : Lectures and Discussions | **Exam, Quiz,**  |
| C. Subject- Specific Skills(C1-C4) | Lectures and Discussions | **Exam, Quiz,**  |
| D. Transferable Key Skills (D1-D3) | Assignment and presentation | **Exam, Quiz,**  |

**Course Contents**

|  |  |  |  |
| --- | --- | --- | --- |
| **Content** | **Reference**  | **Week** | **ILO/s** |
| Introduction, definitions of concepts related to the course.  | 1,4,7 | 1 | A1-A3 |
| Classification of prokaryotes: an overview of taxonomic ranks, sp, subsp, intraspecific ranks, higher taxa and phylogenetic classification. | 1,3,4,6,7 | **2,3** | A1-A3 |
| Numerical taxonomy, similarity and resemblance, steps in classification, strain collection, type strain, list of culture collection, test selection, data coding, calculation of resemblance and distance coeffecient. | 1,3,4,6,7 | 4,5 | B1-B3 |
| Chemosystematic and molecularbiology, nuclic acid properties, contribution of nucleic acid to bacterial taxonomy , chromosome DNA, analysis of protein, serology of protein, electrophoresis pattern, enzymes, cell wall envelop, peptidoglycan and lipids | 3,6,7,8 | 6 | C1-C4 |
| The genera of phytopathogenic bacteria:1. Pseudomonas taxonomy, identification, and host specificity.
2. Fluorescent pseudomonas groups, LOPAT tests
 | 1,2,3,4,5,6,7,8 | 7 | D1-D3 |
| Xanthomonas: taxonomy and habitat  | 1,2,3,4,5,6,7,8 | 8,9 | D1-D3 |
| Erwinia groups, soft rot, yellow pigmented Erwinia, Erwinia amylovora group and Atypical Erwinia. | 1,2,3,4,5,6,7,8 | **10,11** | D1-D3 |
| Agrobacterium: identification, isolation, urase and esculin tests,infection process and Ti plasmid. | 1,2,3,4,5,6,7,8 | 12,13 | D1-D3 |
| Corynebacterium: taxonomy,, isolation and identification  | 1,2,3,4,5,6,7,8 | 14,15 | D1-D3 |
| Other phytopathogenic bacterial genera and Streptomyces. | 1,2,3,4,5,6,7,8 | 16 | D1-D3 |

**Learning Methodology**

Power point theoretical Lectures, discussion and presentation

**Evaluation**

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| --- | --- | --- |
| **Evaluation** | **Point %** | **Date** |
| **Midterm Exam**  | 30 |  |
| **Presentation and term papers** | 30 |  |
| **Final exam** | 40 |  |

**References:**

1. Fahy, P. C. and Persley, G. J. 1983. Plant Bacterial Diseases. Academic Press.
2. Gnanamoickum, S.S 2006. Plant Associated Bacteria, springer, Netherland.
3. Goszczyhska, T, Serfonitein, J,J and Serfonitein, S. 2000. Introduction to practical phytopathogenic Bacteria, A manual for phytobacteriology: ARC, plant protection research in science, Pretoria, South Africa.
4. Mount, S. M. 1982. Phytopathogenic prokaryote. Academic Press. New York.
5. Noel, R. and Krieg, et al. 1984. Bergey’s Manual of Systematic Bacteriology. Vol. 1. Williams and Wilkins. London.
6. Priest, F, and Austin, P. 1996, Modern Bacterial Taxonomy, second edition. Department of Biology and Science, Heriot,Watt University, Edirinburg, UK.
7. Schaad, N. W; Jones, J. B. and W-Chun. 2001. Laboratory Guide for Identification of Plant Pathogenic Bacteria, 3rd ed. APS St Paul, Minnesota.
8. Star, P. Mortiner. 1983. Phytopathogenic Bacteria Springer Verlag.

**Intended Grading Scale (Optional)**

**According to the university graduate scales**

**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>