**UNIVERSITY OF SARGODHA**

**DEPARTMENT OF PLANT PATHOLOGY**

COURSE OUTLINE Winter 2020-2021

Course Title: Introduction to Prokaryotes

Course Code: PP-305

Credit Hours: 3(2-1)

Instructor: Dr. Yasir Iftikhar

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DESCRIPTION AND OBJECTIVES

Objective:

To introduce basic and applied concepts of Plant associated bacteria and mollicutes, the student will acquaint with the knowledge of prokaryotic diversity, bacterial cell structure and metabolism, and microbial reproduction.

**Theory**:

Introduction, economic importance, general characteristics; morphology, reproduction and physiology; cultural characteristics; mode of infection and transmission of bacteria and mollicutes and their management; study of specific prokaryotic plant diseases in Pakistan.

**Practical**:

Isolation, purification, identification and preservation of plant pathogenic prokaryotes; hypersensitive reactions and pathogenicity tests; Inoculum preparation and testing with known concentration

INTENDED LEARNING OUTCOMES

Students will be able to understand the basic concept of plant prokaryotes. This course will also be helpful for the students in their higher studies.

COURSE CONTENTS

THEORY:

1. Introduction, History and Economic importance of Bacteria.
2. General characteristics of plant pathogenic bacteria
3. Classification of Bacteria
4. Morphology, Reproduction and Physiology
5. Genetics of Bacteria
6. Life cycles and dispersal of plant pathogenic prokaryotes
7. Infection and disease development and transmission of plant prokaryotes
8. Effect of environment on disease development
9. Diagnose of plant prokaryotes and management
10. Major Bacterial diseases in Pakistan

PRACTICAL:

1. Isolation and identification of Bacteria
2. Symptoms of Bacterial disease
3. Detection of Plant Pathogenic Bacteria
4. Serological and Molecular detection

READINGS

1. Agrios, G.N. 2005. Plant Pathology. 5th edition. Academic Press, New York, USA.
2. Dworkin, M., S. Falkow, E. Rosenberg and K.H. Schleifer. 2006. The Prokaryotes: A Handbook on the Biology of Bacteria: Symbiotic Associations, Biotechnology, Applied Microbiology. 3rd edition. Springer.
3. Elliott, C. 2008. Manual of Bacterial Plant Pathogens. The Williams & Wilkins Company.
4. Janse, J.D. 2008. Phytobacteriology: Principles and Practice. CABI Publishing.
5. Mishra, R.S. 2003. Bacterial Plant Diseases. Discovery Publication House, India.

 COURSE SCHEDULE

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| Week  | Topics and Readings | Books with Page No. |
| 1 | What is plant pathogenic prokaryotes  | Plant Pathology, Concepts and Laboratory Exercises 3rd Edition Pages 81-89 |
| 2 | Introduction and History of Plant Pathogenic bacteria and economic importance | Plant Pathology 5th editionChapter 12 |
| 3 | Classification of bacteria | Plant Pathology 5th editionChapter 12 |
| 4 | Morphology and composition of bacteria | Fundamentals of Bacterial Plant Pathology Pages 8-22 |
| 5 | Reproduction of Bacteria (Sexual and Asexual) | Handouts |
| 6 | Physiology and genetics of bacteria | Fundamentals of Bacterial Plant Pathology Pages 52-73, 104-126 |
| 7 | Physiology and genetics of bacteria  | Fundamentals of Bacterial Plant Pathology Pages 52-73, 104-126 |
| 8 | **Mid term** |  |
| 9 | Survival and Spread of bacteria  | Fundamentals of Bacterial Plant Pathology Pages 184-202 |
| 10 | Strategies of bacterial infection and disease development  | Fundamentals of Bacterial Plant Pathology Pages 204-223 |
| 11 | Strategies of bacterial infection and disease development | Fundamentals of Bacterial Plant Pathology Pages 204-223 |
| 12 | Effect of environment on bacterial infection | Fundamentals of Bacterial Plant Pathology Pages 225-234 |
| 13 | Diagnosis of Bacterial disease | Handouts |
| 14 | Major bacterial diseases and their management  | Handouts |
| 15 | Major bacterial diseases and their management | Handouts |
| 16 | **Final Term** |  |

RESEARCH PROJECT /PRACTICALS /LABS /ASSIGNMENTS

Lab assignments to the students will be assigned during the semester. Practical will be conducted during the week in respective classes according to the manual in the Department of Plant Pathology, College of Agriculture, UOS.

 ASSESSMENT CRITERIA

Sessional: 20% (Participation, Presentation, Assignment)

Project: -

Presentation: -

Participation: -

Mid Exam: 30%

Final Exam (including practical): 50%