**UNIVERSITY OF SARGODHA**

**DEPARTMENT OF PLANT PATHOLOGY COLLEGE OF AGRICULTURE**

COURSE OUTLINE **Fall 2020**

Course Title: Introduction to Plant Parasitic Nematodes

Course Code: PP-303

Credit Hours: 3(2-1)

Instructor: Dr. Muhammad Imran Hamid

Email: imran.hamid@uos.edu.pk

|  |
| --- |
| **DESCRIPTION AND OBJECTIVES** |

1. Introduction and history of plant parasitic nematodes
2. Morphology and identification of plant parasitic nematodes
3. Nomenclature and classification of plant pathogenic nematodes
4. Effect of pathogenic nematodes on plant health
5. Diagnosis and management of important plant parasitic nematode diseases prevalent in the country

|  |
| --- |
| **INTENDED LEARNING OUTCOMES** |

This course will enable the students to learn about the plant parasitic nematodes at species level and their loses in economically important crops. Moreover, the conventional and biological based management practices will be reviewed for plant parasitic nematodes.

|  |
| --- |
| **COURSE CONTENTS** |

**Theory:**

1. Introduction to plant nematology
2. The history and importance of nematodes in agriculture
3. Nematode morphology and anatomy and their various systems including digestive, reproductive and nervous taxonomy of plant parasitic nematodes
4. Nematode feeding habits
5. Types of plant parasitic nematodes according to feeding habits
6. Cellular changes brought in plant during feeding
7. Impact of important nematodes on plant health and their management

**Practical:**

1. Soil sampling methods and equipments
2. Extraction procedures for nematodes and materials requirements
3. Staining and identification of nematodes from soil and infested plant materials
4. Preparation of temporary and permanent slides to study morphological features of nematodes
5. Staining of nematodes and their egg masses in roots
6. Demonstration of nematode inflicted foliage and root symptoms

|  |
| --- |
| **READINGS** |

1. Agrios, G. N. 2005. Plant Pathology. 5th. Academic Press London.
2. Bridge, J. and J. L. Starr. 2007. Plant Nematodes of agriculture importance: A color hand book. Manson Publishing.
3. Dropkin, H. Victor. 1980. Introduction to Plant Nematology. A Wiley-Interscience Publication. New York.
4. Jenkins, W. R., and D. P. Taylor. 1967. Plant Nematology. Reinhold Publishing Corporation, New York.
5. Lee, D. L., and H. J. Atkinson. 1977. Physiology of Nematodes. Columbia University Press, New York.
6. Mansoor,S.1990. Development of Phytonematology in Pakistan. pp 515-525. In: Progress in Plant Nematology. S. K. Saxena, A. Rashid, and R. M. Khan. (Eds.). CBS Publications Pvt. Ltd. Delhi.
7. Noe, P. J. 2003. Pathogencity and Isolation of Plant-parasitic Nematodes. pp 69-73. In: Plant Pathology: Concepts and Laboratory Exercises. R. N. Trigiano, M. T. Windham, and A. S. Windham. (Eds.). CRC Press, USA.
8. Noe, P. J. 2003. Plant-parasitic Nematodes. pp 61-67. In: Plant Pathology: Concepts and Laboratory Exercises. R. N. Trigiano, M. T. Windham, and A. S. Windham. (Eds.). CRC Laboratory Press, USA.
9. Thorne, G. 1961. Principles of Nematology.Mc Graw -Hill Book Co., New York.

|  |
| --- |
| **COURSE SCHEDULE** |
| **Week** | **Topics and Readings** | **Books with Page No.** |
| **1** | Introduction to Plant NematologyHistory and importance of nematodes in agriculture | Nematology, 331; Plant-parasitic Nematodes. pp 61-67 |
| **2** | Nematode morphology and anatomyDigestive system of nematode | Nematology, 337; Plant-parasitic Nematodes. pp 61-67 |
| **3** | Reproductive system of nematodeNervous system of nematode | Nematology, 338 |
| **4** | Circulatory and respiratory systems of nematodeTaxonomy of plant parasitic nematode | Nematology, 339 |
| **5** | Symptoms produced by nematodesNutrition of nematode | Nematology, 340 |
| **6** | Feeding habit of plant parasitic nematodeTypes of plant parasitic nematode according to feeding habit | Nematology, 469-477 |
| **7** | Cellular changes during feedingImpact of plant parasitic nematode on plant health | Nematology, 480 |
| **8** | Revision and mid-term examination |  |
| **9** | Classification of Plant Parasitic NematodesUse of Molecular tools in classification of nematodes | Agrios 2005: 830 |
| **10** | Major nematode diseases and their taxonomic statusSlow decline of citrus | Agrios 2005: 826-854; Plant-parasitic Nematodes. pp 61-67 |
| **11** | Potato cyst nematodeNematodes of Sugarcane | Agrios 2005: 826-854 |
| **12** | Nematodes of CottonNematodes of Vegetables | Agrios 2005: 835-836 |
| **13** | Nematodes of riceNematodes of cereals | Agrios 2005:830 |
| **14** | Nematodes of BananaNematodes of Peanut | Agrios 2005:838-874 |
| **15** | Nematodes as entomopathogenic agentsManagement of plant parasitic nematode | Agrios 2005:838-874; Plant-parasitic Nematodes. pp 61-67 |
| **16** | Final Examination |  |

|  |
| --- |
| **RESEARCH PROJECT/PRACTICAL/LABS/ASSIGNMENTS** |

1. Collection of soil samples for the extraction of various nematodes
2. Identification of nematodes and their organs
3. Draw sketches of different nematodes with their organs

|  |
| --- |
| **ASSESSMENT CRITERIA** |

Sessional: 20%

Project:

Midterm: 30%

Participation: