



THE FEDERAL UNIVERSITY OF TECHNOLOGY, AKURE

Department of Crop, Soil and Pest Management

CSP 314 - CROP NEMATOTOLOGY AND VIROLOGY

COURSE PARTICULARS

Course Code: CSP 314

Course Title: Crop Nematology and Virology

No. of Units: 2

Course Duration: One hour of theory and two hours of practical per week for 15 weeks.

Status: Compulsory

Prerequisite: NIL

COURSE INSTRUCTORS

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COURSE DESCRIPTION

This course is a core departmental course that introduces students to the importance of nematodes and viruses as disease-causing agents in plants. It is a practical-oriented course. The course is handled by lecturers with vast knowledge and experience in the field of nematology

and virology. The course covers everything from the understanding of the basic features, isolation and identification of plant nematodes and viruses to pathogenesis and procedures for plant disease diagnosis, specifically those incited by nematodes and viruses. Plant virus replication and nematode development/life cycle and plant infection will be discussed as well. The course concludes with a look at ways diseases caused by nematodes and viruses can be more effectively *managed* to maximize crop productivity.

COURSE OBJECTIVES

The objectives of this course are to:

- introduce students to the wonderful world of nematodes and viruses and to stimulate their interests in nematology and virology as two critical areas in plant protection; and
- provide a foundation for advanced nematology and virology courses as well as for courses in allied fields such as entomology, plant pathology, parasitology, or zoology.

COURSE LEARNING OUTCOMES / COMPETENCIES

Upon successful completion of this course, the student will be able to:

(Knowledge based)

- give an overview of what nematodes are, their habitats and their effects on plants, human and other animals;
- explain the fact that not *all* nematodes are the *bad guys* – some *good guys* do exist among them as well;
- discuss the mode of infection of plants by viral pathogens
- discuss how nematode and viral pathogens of crops can be efficiently managed.

(Skills)

- sample for nematodes using some basic sampling techniques employed in nematology;
- extract nematodes from soil and plant materials using the basic extraction methods;
- identify some nematodes using the compound microscope;
- culture nematodes on both tomato plants and carrot discs;
- learn how to design a *poster* using Microsoft Power-point, as part of the continuous assessment;
- identify the common symptoms associated with viral diseases in crops and recommend effective control measures for the vectors of such diseases.

GRADING SYSTEM FOR THE COURSE

This course will be graded as follows:

Class Attendance	10%
Assignments	10%
Test(s)	20%
Practicals	20%
<u>Final Examination</u>	<u>40%</u>
<u>TOTAL</u>	<u>100%</u>

GENERAL INSTRUCTIONS

Attendance: It is expected that every student will be in class for lectures and also participate in all practical exercises as well as group projects. Attendance records will be kept and used to determine each person's qualification to sit for the final examination. In case of illness or other unavoidable cause of absence, the student must communicate as soon as possible with any of the instructors, indicating the reason for the absence.

Academic Integrity: Violations of academic integrity, including dishonesty in assignments, examinations, or other academic performances are prohibited. You are not allowed to make copies of another person's work and submit it as your own; that is plagiarism. All cases of academic dishonesty will be reported to the University Management for appropriate sanctions in accordance with the guidelines for handling students' misconduct as spelt out in the Students' Handbook.

Assignments and Group Work: Students are expected to submit assignments as scheduled. Failure to submit an assignment as at when due will earn you zero for that assignment. Only under extenuating circumstances, for which a student has notified any of the instructors in advance, will late submission of assignments be permitted.

Code of Conduct in Lecture Rooms and Laboratories: Students are expected to turn off their cell phones during lectures. Food and drinks are not permitted in the laboratories.

READING LIST

Adesiyon, S. O., Caveness, F.E., Fawole, B. and Adeniji, M. O. (2000). *Nematode pests of tropical Crops*. Petroleum (special) trust Fund. Heinemann Educational Books (Nigeria) Plc.

Luc, M., Sikora, R. A. & Bridge, J. (2005). Plant parasitic nematodes in subtropical and tropical agriculture. In: Michel Luc, Richard A. Sikora, John Bridge (Eds). *Plant parasitic*

nematodes in subtropical and tropical agriculture. Wallingford, UK, CABI Publishing - 2nd Ed.

Maurice, M. & Perry, R.N. (2006). Plant Nematology. In: Perry, R. N., Moens, M (Eds). *Plant Nematology*. Wallingford, UK, CABI Publishing.

Green, S. K. Guidelines for Diagnostic Work in Plant Virology. Technical Bulletin No. 15. The Asian Vegetable Research and Development Center.39p.

COURSE OUTLINE

Week	Topic	Remarks
1	Introduction and Course Overview Historical perspective on Nematology as a science Nematode biology and reproduction	In this first week of lectures, the students' interests in the course will be stimulated, preparing their minds for the remainder of the course.
2 & 3	Structure, Biology and Reproduction in nematodes	Practical exercise will involve surveys for plant-parasitic nematodes (PPNs), extraction and identification of the nematodes in the soil and plant materials collected
4 & 5	Plant-parasitic Nematodes Nematodes adaptation to plant parasitism Feeding Habits in PPN How PPN Nematodes Cause Disease	Students will be requested to prepare a <i>poster</i> of a nematode of their choice as assignment.
6	Specific Examples of Plant-parasitic Nematodes	Emphasis will be placed of the following nematodes: Root-knot Nematodes Lesion nematode Burrowing nematodes Yam nematodes Rice nematodes Practical exercise will also involve nematode identification and culturing on tomato plants.
7	Principles and Methods of Nematode Control	Effective, efficient and economically viable ways to manage plant-parasitic nematodes in the tropics
		MID-SEMESTER TEST
8&9	(i)Importance of Viruses as Disease Causing Agents in Crops (ii)Structure and Classification of viruses (iii)Isolation and Identification of Plant Pathogenic Viruses	The Mystery that surrounds viral diseases in the early history of phytopathology is brought to the fore. .

10&11	(i)Viral Particle Host Plant Interaction (ii)Symptoms of Viral Diseases in Crops	The process of viral replication and the path of the virions within the host tissue are clearly traced out
12&13	(i)Transmission of Plant Viruses (ii)Control of Viral Diseases of Crops REVISION	The place of insects and nematodes in the transmission of viral diseases is stressed.
14&15	EXAMINATION	ASSESSMENT AND EVALUATION OF THE STUDENTS