

Insect Pathology

Obligatory module or Selective module	Insect Pathology	PNH 2211
Semester	IV	
Module level	Undergraduate	
Module Coordinator	Dr. Tri Harjaka, S.P., M.P.	
Lecturer(s)	Dr.Ir. Arman Wijonarko, M.Sc. Dr. Tri Harjaka, S.P., M.P.	
Type of Module	Lecture: 1 hour and 40 minutes Practical	
Status	C (Compulsory courses)	
Exam	Written	
Number of participants	64	
Credit Points:	2/1 (5.02 ECTS)	
Description:	<p>This course will make students participating in learning able to understand the causes of diseases in pest insects, the development of insect populations due to insect pathogen disorders, microbial classification of insect pathogens, techniques for developing insect pathogens and their implementation in plant protection programs. The course material provides theories and real examples of insect diseases in the field. The material is given in the form of lectures, discussions, and direct observations both in the laboratory and in the field. In the middle and end of the lecture students are tested in writing, among others by answering questions, assigning lectures at least three times a semester, and compiling reports from laboratory / field observations (practicum). Assessment is also done through oral presentations that are done individually or in groups.</p>	
Academic goal (competency):	<p>The course of Insect Pathology aims to provide professional competence / supplies to the learning participants as a prospective graduate of the Plant Protection Study Program in the development of insect pathogens to overcome pest problems in the field, especially insects.</p>	
Course outcomes:		
<ol style="list-style-type: none"> 1. Understand the principles of epizootiology 2. Understand the character and bio-ecology of microbes that are pathogenic to insects 3. Able to distinguish and analyze infections due to biotic and abiotic factors 4. Understand the insect immune system 5. Understand the advantages and disadvantages of microbes as biological agents and their prospects 		

Contents:

1. Limitation / understanding of Insect Pathology and the history of its development
2. Interaction of insects with microbes, the relationship of mutualism, amensalism and parasitism
3. Biotic and abiotic diseases in insects
4. Terms in insect pathology (infection, virulence, pathogenicity)
5. Pathogenic fungi in insects (entomopathogenic fungi)
6. Pathogenic bacteria in insects (entomopathogenic bacteria)
7. Pathogenic virus in insects (entomopathogenic virus)
8. Nematodes as parasites and insect pathogens (entomopathogenic nematode)
9. Microsporidia and insect pathogenic protozoa
10. Epizootiology
11. Development of insect pathogenic strains
12. Techniques in insect pathology (isolation, propagation, bioassay, application and evaluation)
13. Implementation of insect pathogens in IPM (Integrated Pest Management)
14. Status of the latest development of Insect Pathology

Which previous course required?**Literature:**

1. Vega, E.F., and Kaya, H.K. 2012. Insect Pathology. Second Edition. Academic Press. 490 p.
2. Tanada. Y. and Kaya, H.K. 1993. Insect Pathology. Academic Press. 666 p
3. Boucias, D.G. and Pendland, J.C. 1998. Principles of Insect Pathology. Kluwer Academic. 537 p
4. Rolf, J and Reynolds, S.E (edt.) 2009. Insect Infection and Immunity. Oxford Biology. 254 p
5. Hajek, A. E., Glare, T.R., and O'Callaghan, M. 2010. Use of Microbes for Control and eradication of Invasive arthropods. Springer. 366 p
6. Miller, L.K. (edt.) 1997. The Baculovirus. Plenum. 447 p
7. Lacey, L.A., and Kaya, H.K. (edt). 2000. Manual of Techniques in Invertebrate Pathology. Kluwer Academic. 911.p

Materials provided: Hand out of powerpoint**Requirements for exam:**75% attendance set by the Faculty of Agriculture**Teaching method(s)**

Lectures, Discussion, Presentation/Assignment

Workload (hrs).

1. Theoretical of course:14 times
2. Lab work:10 times
3. Home studies: related to the chapter discussed in the class