BRAWIJAYA UNIVERSITY

FACULTY OF AGRICULTURE

DEPARTMENT OF PLANT PESTS AND DISEASES / MASTER OF AGRICULTURAL ENTOMOLOGY

SEMESTER COURSE PLAN

COURSES	CODE	CLUSTERS OF COURSES	CREDIT (SKS)	SEMESTER	Date of Preparation
Research Methodology and Data Interpretation	PTH81103	Master of Agricultural Entomology	3 SKS 3.51 ECTS	Even	June 8, 2021

AUTHORIZATION	Course Developer Lecturer	Course Coordinator	Head of Study Program
Department of Plant Pests and Diseases	Dr. Akhmad Rizali, SP, MSi Dr. Agr.Sc. Hagus Tarno SP, MP Prof.Dr.Ir. Abdul Latief Abadi, MS	Name Signature	Akhmad Rizali, SP, M.Si, Ph.D Signature

Learning Outcomes	ILO STUDY PROGRAM	
	1	Able to work together and have social sensitivity and high concern for society and the environment.
	2	Mastering concepts, theories and methods in the field of agricultural entomology
	3	Mastering the theory of biotechnology in controlling plant pests and managing plant resistance

	4	Have the skills to manage research in the field of inter/multidisciplinary agricultural entomology
	5	Have skills in contributing to solving problems in society through research design in the field of agricultural entomology
	6	Have skills in developing innovations and proven applications for solving problems in society in the field of agricultural entomology in an inter/multidisciplinary manner within the framework of sustainable agriculture
	Course Learning Outcome	
	1	Students are able to understand the scientific method and the urgency of its use and master how to formulate problems, conduct research and scientific publications
	2	Students are able to master how to write a thesis including aspects of authorship, literature, data presentation and data interpretation
	3	Students are able to understand how to interpret data based on the results of statistical analysis
	4	Students are able to write article manuscripts from research results for scientific publications
Brief Description of Course	This course discusses scientific methods and data interpretation for the preparation of research reports (theses). Aspects discussed include thesis writing format, language, writing style, principles of scientific research, searching and writing bibliography, preparing tables and supporting images of scientific writing. In addition, it also discusses the writing of research proposals, research reports, publication articles, oral presentations and posters of scientific papers.	
Learning Material / Subject	1) Introduction 2) Scientific Method 3) Research Problem Formulation 4) Scientific Reports and the Urgency of Scientific Publications 5) Thesis Writing Guidelines	

6) Authorship and Literature
7) Presentation and Interpretation of Data
8) Publication of Research Results
9) Research Design and Sampling Methods
10) Hypothesis Testing
11) Interpretation of Analysis Results: Basic Statistics
12) Interpretation of Analysis Results: Diversity Analysis (Anova)
13) Interpretation of Analysis Results: Correlation and Regression
14) Interpretation of Analysis Results: Non-Parametric Statistics

ILO and CLO Relationship

	A1	K1	K2	K3	S1	S2	S3
CLO 1	0.5	0.5	0	0	0	0	0
CLO 2	0	0	0	0.25	0.25	0.5	0
CLO 3	0	0.25	0	0.25	0.25	0.25	0
CLO 4	0	0	0	0	0.25	0.5	0.5

Book

Main

1) Ruxton G.D. & Colegrave N. 2016. Experimental Design for the Life Sciences. 4th Edition
2) Quinn GP & Keough, MJ. 2002. Experimental Design and Data Analysis for Biologists
3) Ra, GN. 2007. Statistics for Agricultural Sciences
4) Ford ED. 2004. Scientific Method for Ecological Research
5) Oshima A &; Hogue A. 1999. Writing Academic English

Supporting References

	1) Rahardjo BT, Muhammad FN, Setiawan Y, Febryadi A, Ihsan M, Wibowo D, Fernando I. 2023. Ant preference for different types of bait at sugarcane plantations in East Java, Indonesia. Biodiversity Journal of Biological Diversity 24(4). 2) Wibowo D, Rahardjo BT, Karindah S, Muhammad FN. 2023. The diversity and abundance of weeds in sugarcane (Saccharum officinarum) plantations and its relationships with Hymenoptera parasitoids diversity. Biodiversity Journal of Biological Diversity 24(4). 3) Sama'Iradat T, Gatot M, Latief AA, Toto H. 2020. Demographic Analysis Armoured Scale (Diaspididae Family) on Apple Plant in Junggo, Tulungrejo Village, Bumiaji District, Batu City. Proceedings of the 13th International Interdisciplinary Studies Seminar, IISS 2019, 30-31 October 2019, Malang, Indonesia (p. 306). European Alliance for Innovation.	
Learning Media	**Software:**	**Hardware:**
		Computer, LCD
Team Teaching	Dr. Akhmad Rizali, SP, MSi Dr. Agr.Sc. Hagus Tarno SP, MP Prof.Dr.Ir. Abdul Latief Abadi, MS	
Required Courses	-	

Week	Sub-CLO (as expected final capability)	Indicators	Criteria & Forms of Assessment	Learning Methods (Lectures / Assignments / other forms of learning)	Time (Duration)	Learning Materials / [References]	Proportion (%)

1	Students are able to develop thinking about research methodology and data interpretation	Ability to respond to learning material, follow learning activities and skills to develop research methodology thinking and data interpretation and carry out duties	Criteria: The accuracy of students in developing thoughts related to research methodology and data interpretation Form of Assessment: Participatory Activities	Discussion	100 minutes Quiz and Task 1 (2x60 minutes):	Introduction to research methodology and data interpretation Book: 3,4	5 %
2	Students are able to develop thoughts, and master theories about the Scientific method including methods and techniques in research	Ability to respond to learning material, follow learning activities Scientific methods include methods and techniques in research and carry out duties	Criteria: The ability of students to develop scientific method thinking includes methods and techniques in research Form of Assessment: Participatory Activities	Discussion	100 minutes Self-study (2x60 minutes)	1. Philosophy of the scientific method 2. Techniques in research Book: 1,2	5 %

3	Students are able to develop thoughts and make research problem formulations	Ability to respond to learning materials, follow learning activities and skills in formulating research problems and carrying out tasks	Criteria: Students are able to develop research problem formulation thinking Form of assessment: Task: Review scientific articles related to current research topics in the field of plant pathology	Discussion	100 minutes Self-study (2x60 minutes):	Formulation of the research problem Mapping the theme of research topics that have the potential to be published in reputable journals / Current topics Book: 1,2,3	5 %
4	Students are able to develop thoughts, master theories related to scientific reports and the urgency of scientific publications	Ability to respond to learning materials, follow learning activities Scientific Reports and the Urgency of Scientific Publications and carry out duties	Criteria: Developing Scientific report thinking and the Urgency of Scientific Publications Form of assessment: Assignment: Participatory Activities	Discussion	100 minutes Self-study (2x60 minutes): soil formation process	Scientific Reports The Urgency of Scientific Publication Book: 1,2,3	5 %

5	Students are able to apply Thesis Writing guidelines	Ability to respond to learning material, follow learning activities and apply Thesis Writing guidelines and carry out duties	Able to apply Writing guidelines Form of assessment: Assignment: Practice of writing a thesis based on the format of Post FP UB	Discussion	100 minutes Self-study (2x60 minutes):	Thesis Writing Guidelines based on the format of Post FP UB Book: 1,2,3,4	5 %
6	Students are able to master application theory about authorship and literature thinking	Ability to respond to learning materials, participate in authorship and literature learning activities and carry out duties	Able to master the theory of application of authorship and literature thinking Form of assessment: Task: Apply library preparation using bibliograpy, zootero, mendeley	Discussion	100 minutes Self-study (2x60 minutes):	Ethics of authorship Library management Book: 1,2,3,4	5 %
7	Students are able to develop thinking Presentation and interpretation of table data	Ability to respond to learning materials, follow learning activities of presentation and interpretation of table data	Presentation and interpretation of table data Form of assessment:	Discussion	100 minutes Self-study (2x60 minutes):	Presentation of research data Interpretation of data in the form of tables and figures	5 %

		and carry out duties	Participatory Activities			Book: 1,2,3,4	
8	***Mid-term Exam (UTS)***						
9	Students are able to develop thoughts about the Publication of Research Results	Ability to respond to learning materials, participate in learning activities Publication of Research Results and carry out tasks	Able to compile Research Results Publications Shape valuation: Task: Make a scientific article manuscript	Discussion	560 minutes	Publication of Research Results in scientific journals or at scientific meetings Book: 1,2,3,4	5 %
10	Students are able to solve problems related to determining Research Design and Sampling Methods	Ability to respond to learning materials, follow learning activities Research Design and Sampling Methods and carry out duties	Able to determine Research Design and Sampling Methods Form of assessment: Research design case study	Discussion	100 minutes	Determination of research design Sampling Method Book: 1,2,3,4	5 %
11	Students are able to test hypotheses correctly	Ability to respond to learning materials, participate in learning activities and skills in	Able to perform hypothesis testing Form of assessment:	Discussion	100 minutes	Research hypothesis testing Book: 1,2,3,4	5 %

		testing hypotheses and carrying out tasks	Participatory Activities				
12	Students are able to master application theory on how to interpret analysis results: Basic Statistics	Ability to respond to learning material, follow learning activities and interpret analysis results: basic statistics and carry out tasks	Able to interpret the results of the analysis: basic statistics Form of assessment: Task: Find examples of Analysis Results: Basic Statistics and interpret them	Discussion	100 minutes	Case study Interpretation of Analysis Results: Basic Statistics Book: 1,2,3,4	5 %
13	Students are able to master application theory on how to interpret the results of diversity analysis (Anova)	Ability to respond to learning material, follow learning activities and interpret analysis results: variety (Anova) and carry out duties	Able to interpret the results of the analysis: variety (Anova) Form of assessment: Task: Search for examples of Analysis: variety (Anova) and interpret them	Discussion	100 minutes	Study Interpretation of Analysis Results: variety (Anova) Book: 1,2,3,4	5 %

14	Students are able to master application theory on how to interpret analysis results: correlation and regression	Ability to respond to learning material, follow learning activities and interpret analysis results: correlation and regression and carry out duties	Able to interpret the results of the analysis: correlation and regression Form of assessment: Task: Looking for examples Analysis: Correlation and Regression and interpret it	Discussion	100 minutes	Study of Interpretation of Analysis Results: Correlation and Regression Book: 1,2,3,4	5 %
15	Students are able to interpret the results of Analysis: Non-Parametric Statistics	Ability to respond to learning material in interpreting the results of Analysis: Non-Parametric Statistics and carry out duties	Able to interpret the results of Analysis: Non-Parametric Statistics Form of assessment: Task: Find examples of Analysis Results: Non-Parametric Statistics and interpret them	Discussion	100 minutes	Study of Interpretation of Analysis Results: Non-Parametric Statistics Book: 1,2,3,4	5 %
16	***Final Semester Exam (UAS)***						