

Course title	Plant Pest Management				
Course code	GALA2304				
Course type	Lectures and practical application				
Level	Higher Diploma				
Year / Semester	2 nd Year / 3 rd Semester				
Teacher's name	Antonia Stelikou				
ECTS	6	Lectures / week	2	Laboratories / week	1
Course purpose and objectives	<p>The aim of the course is to equip students with the essential knowledge and practical skills to identify and effectively manage pests, diseases, and weeds relevant to gardening. The course explores both conventional and sustainable control methods (chemical, biological, mechanical, and physical) while introducing evaluation techniques for plant health, including destructive and non-destructive methods. Students are trained to apply integrated pest and disease management strategies that prioritise plant safety, environmental health, and regulatory compliance.</p>				
Learning outcomes	<p>Upon completion of the course, the students will be able to:</p> <p>Theoretical Learning Outcomes:</p> <ol style="list-style-type: none"> 1. Identify various types of weeds, pests, and pathogens affecting crops and ornamental plants. 2. Recognise the importance of beneficial organisms and their conservation. 3. Explain the characteristics, applications, and safe use of agricultural chemicals and biological treatments. 4. Understand the principles and practices of destructive and non-destructive evaluation methods for assessing plant health and stability—particularly in ornamentals. <p>Practical Learning Outcomes:</p> <ol style="list-style-type: none"> 5. Diagnose plant health problems using visual assessment and modern evaluation techniques. 6. Select and apply the most appropriate pest and disease control methods for different crop types, growth stages, and environments. 7. Operate safely and efficiently with plant protection tools and materials. 				
Prerequisites		Required			

Course content	<p>Week 1:</p> <p>Lecture</p> <p>Introduction to Entomology, Plant Pathology, and Weed Science – Basic Principles and Concepts</p> <ul style="list-style-type: none"> • Entomology basics: role of insects in horticulture (pests, pollinators, decomposers). • Plant pathology: definitions of disease, causal agents (fungi, bacteria, viruses), symptoms vs. signs. • Weed science: concept of weeds, their impact on crop competition, allelopathy, and ecosystem disruption. • Importance of integrated study (how insects, diseases, and weeds interact in horticultural systems). <p>Microscopy intro: Basic use of compound/stereo microscope</p> <p>Week 2:</p> <p>Lecture</p> <p>Various Orders of Insects, Mites, and Nematodes Relevant to Horticulture</p> <ul style="list-style-type: none"> • Major insect orders: Lepidoptera (moths/caterpillars), Coleoptera (beetles), Diptera (flies), Hemiptera (aphids, whiteflies), Thysanoptera (thrips). • Mites: spider mites, eriophyid mites – feeding habits and crop impact. • Nematodes: root-knot nematodes, cyst nematodes – soil-borne plant parasites. • Life cycles, host specificity, and economic impact on horticulture. <p>Microscopy (P): Observation and identification of major insect orders</p> <p>Week 3:</p> <p>Lecture</p> <p>Beneficial Insects</p> <ul style="list-style-type: none"> • Role in biological control (ladybirds, lacewings, parasitic wasps). • Pollinators: bees, butterflies, hoverflies – essential for fruit and seed set. • Soil engineers & decomposers: beetles, ants. • Practical examples of introducing/releasing beneficial insects in horticulture. <p>Microscopy (P): observation and identification of beneficial insects</p> <p>Week 4:</p> <p>Lecture</p> <p>Various Orders of Fungi and Bacteria</p> <ul style="list-style-type: none"> • Fungi: Ascomycota, Basidiomycota, Oomycetes – common horticultural pathogens (powdery mildew, rusts, downy mildew). • Bacteria: Gram-negative (<i>Pseudomonas</i>, <i>Xanthomonas</i>) and Gram-positive (<i>Clavibacter</i>) – symptoms like wilts, blights, cankers. • Distinction between biotic diseases and abiotic stress symptoms. • Life cycles, infection modes, survival in soil/plant residues. <p>Microscopy (P): observation of healthy vs. infected plant tissue.</p>
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Week 5:

Lecture

Various Orders of Viruses Relevant to Gardening

- Plant viruses: Potyviruses, Tobamoviruses, Geminiviruses.
- Transmission modes: insect vectors (aphids, whiteflies), mechanical, seed-borne.
- Symptoms: mosaics, leaf curling, stunting, color breaks.

Week 6:

Field Work

Exercise in Identifying Pests and Diseases relevant to gardening

- Practical observation in local greenhouse, orchard, or nursery.
- Students record symptoms

Week 7:

Lecture: Weed Families & Identification

- Key weed families: Poaceae (grasses), Asteraceae (thistles, daisies), Fabaceae (clovers), Solanaceae (nightshades).
- Morphological traits for identification (leaves, flowers, growth habit).
- Competitive strategies: seed dormancy, vegetative propagation, rapid growth.

Field Work

Exercise in Identifying Pests and Diseases in Gardens and nurseries

Survey plots for **weed presence, density, and associated pest issues.**

Week 8:

Lecture: Weeds, Pests, Diseases & Plant Stability

- Impact of weeds on ornamental plants (nutrient/water competition, allelopathy, pest/disease reservoirs).
- Factors affecting ornamental plant stability (physical stress, biotic/abiotic influences).
- Control methods: destructive vs. non-destructive for pests and diseases.

Week 9:

Field Work

Exercise in Identifying Pests and Diseases in gardens and nurseries

Advanced identification and diagnosis:

- Mixed infections (e.g., insect damage + fungal infection).
- Abiotic stresses misdiagnosed as diseases.

Week 10:

Lecture

Characteristics of Agricultural Chemicals, Categories, and Their Origins

- Categories: insecticides, fungicides, herbicides, nematocides, bactericides.
- Chemical origins: synthetic vs. botanical (neem, pyrethrum, essential oils).
- Mode of action (contact, systemic, selective vs. non-selective).
- Environmental and health concerns (residues, resistance, toxicity).

Week 11:

Lecture

Methods for Controlling Pests and Diseases (Chemical, Physical, Mechanical, or Biological)

- Chemical: correct application, rotation to prevent resistance.
- Physical: barriers, heat/solarization, light traps.
- Mechanical: hand weeding, pruning, removal of infected material.
- Biological: predators, parasitoids, beneficial fungi/bacteria.
- Integrated Pest Management (IPM) as a holistic framework.

Week 12: Field work: application of appropriate pest control methods in nursery and garden settings

Course Breakdown

Week	Teaching Content	Teaching Process
Week 1	Introduction to Entomology, Plant Pathology, and Weed Science – Basic Principles and Concepts Basic use of compound/stereo microscope;	Lecture and Microscopy Intro (P)
Week 2	Various Orders of Insects, Mites, and Nematodes Relevant to Horticulture Observation and identification of major insect orders	Lecture and Microscopy (P)
Week 3	Beneficial Insects observation and identification of beneficial insects	Lecture and Microscopy (P)
Week 4	Various Orders of Fungi and Bacteria Relevant to Horticulture	Lecture and Microscopy (P)

		observation of healthy vs. infected plant tissue.	
	Week 5	Various Orders of Viruses Relevant to Horticulture	Lecture
	Week 6	Exercise in Identifying Pests and Diseases relevant to gardening	Field Work
	Week 7	Lecture: Weed Families & Identification Exercise in Identifying Pests and Diseases in Gardens and nurseries Survey plots for weed presence, density, and associated pest issues.	Lecture + Field work
	Week 8	Lecture: Weeds, Pests, Diseases & Plant Stability	Lecture
	Week 9	Exercise in Identifying Pests and Diseases in gardens and nurseries Advanced identification and diagnosis	Field Work
	Week 10	Characteristics of Agricultural Chemicals, Categories, and Their Origins	Lecture
	Week 11	Methods for Controlling Pests and Diseases (Chemical, Physical, Mechanical, or Biological)	Lecture
	Week 12	Ornamental Plant Protection: Stability and Evaluation	Lecture
Teaching methodology	<p>Theoretical Instruction: The theoretical part of the course is delivered through structured lectures focusing on foundational knowledge of entomology, plant pathology, weed science, pest and disease management, and ornamental plant protection. The methodology emphasises the gradual build-up of concepts, classification systems, and control strategies, using real-world examples and case studies relevant to horticulture. Visual aids, specimen images, and short case discussions are incorporated to strengthen students' theoretical understanding and prepare them for field observations.</p>		

	<p>Practical Instruction: Practical learning is based on guided fieldwork sessions where students apply theoretical knowledge to real horticultural environments. Under instructor supervision, students practice identifying pests, diseases, and weeds on live plants. Emphasis is placed on observational skills, correct diagnosis, and the application of appropriate field techniques. Field exercises are designed to reinforce classroom learning and develop hands-on experience critical for professional practice in plant protection and horticultural management.</p>						
<p>Bibliography</p>	<p>Greek Bibliography</p> <ul style="list-style-type: none"> • Καιλίδης, Δημήτριος Σ. (2016), Ασθένειες των δέντρων, δασών και πάρκων, Αφοί Κυριακίδη Εκδόσεις Α.Ε., ISBN 978-960-602-090-2. • Συλλογικό έργο (2012), Φυσιολογία καταπονήσεων των φυτών: Οι λειτουργίες των φυτών κάτω από αντίξοες συνθήκες περιβάλλοντος, 3η έκδ., Αθήνα, Έμβρυο, ISBN 978-960-8002-63-0 • Μπορούφας, Γ., και Παππά, Μ. (2023). Εχθροί λαχανικών και φυτών μεγάλης καλλιέργειας. ISBN 978-618-5667-95-5 Kallipos Repository • Ελευθεροχωρινός, Η. Γ. (2009), Ζιζανιολογία: Ζιζάνια, ζιζανιοκτόνα, περιβάλλον, αρχές και μέθοδοι διαχείρισης, 3η έκδ., Αθήνα, ΑγροΤύπος ΑΕ, ISBN 978-960-7667-34-2 <p>English Bibliography</p> <ul style="list-style-type: none"> • Donald D Bills, Shain-dow Kung (2014). Biotechnology And Plant Protection: Viral Pathogenesis And Disease Resistance - Proceedings Of The Fifth International Symposium. Singapore : World Scientific. ISBN: 9789810222741 EBSCO Host • Sachin Tyagi (2021). Plant Protection and Stress Management: Vol.04: Hi Tech Horticulture. ISBN: 9789387973435. EBSCO Host • PT Bailey (2007). Pests of Field Crops and Pastures : Identification and Control. Collingwood, VIC : CSIRO PUBLISHING. ISBN: 9780643067585. EBSCO Host • Vacante, Vincenzo, Gerson, Uri (2012). Integrated Control of Citrus Pests in the Mediterranean Region. Sharjah : Bentham Science Publishers. ISBN: 9781608056804. EBSCO Host 						
<p>Assessment</p>	<table border="0"> <tr> <td>• Attendance and course participation:</td> <td>10%</td> </tr> <tr> <td>• Individual practical assignments/reports related to the nature of the field work:</td> <td>40%</td> </tr> <tr> <td>• Final Written Examination:</td> <td>50%</td> </tr> </table> <p>Student performance in this course will be evaluated through a combination of continuous and summative assessments. Attendance and active participation in class will contribute 10% to the final grade, reflecting the importance of consistent engagement. A portfolio of individual lab reports compiled from the various practical sessions will account for 40%, assessing students' ability to document their work systematically, demonstrate applied skills, and reflect on their learning throughout the semester. The final written examination, weighted at 50%, will include both closed-ended questions (e.g., multiple-choice, matching, true/false) and open-ended questions (e.g., short-answer, essay-type, case studies). The examination will have a duration of two academic periods and will evaluate students' overall understanding of the course content, their ability to synthesize theoretical and practical knowledge, and their critical thinking skills.</p> <p>Student performance is evaluated on a scale of 0 to 100, with a minimum overall passing grade of 60. The final grade is calculated as a weighted average of the assessment components described above.</p>	• Attendance and course participation:	10%	• Individual practical assignments/reports related to the nature of the field work:	40%	• Final Written Examination:	50%
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<p>Language</p>	<p>Greek or English</p>						