# .- Agricultural Entomology

## Prof. Emanuele Mazzoni

COURSE AIMS AND INTENDED LEARNING OUTCOMES

The course aims to provide students with the basic elements and notions of general and agricultural entomology, and examines the relationships between insects, humans and their productions so as to allow, through morphological and bio-ethological awareness of the most common harmful species and of the symptomatology of their damage, an understanding and knowledge of crop protection strategies within the context of sustainable agriculture.

At the end of the course, students will know the bio-ethological aspects of the most important insect species of phytosanitary significance, including in the light of the most recent findings reported by the international scientific literature. Students will be able to apply their acquired knowledge to identifying the aforementioned insect species of agricultural interest, and recognising the symptoms of their damage. Students will be able to collect and manage the data needed to evaluate monitoring and defence strategies, with a view to a sustainable production (integrated and organic) of crops. Students will know how to deal with other players in the production chain by demonstrating/displaying their acquired knowledge in an independent fashion, holding critical discussions with them in light of the more recent findings.

COURSE CONTENT

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|  | ECTS |
| Systematic classification of insects in the Arthropod taxon and their morphology. Anatomy and physiology of the tegumental, digestive and excretory, circulatory, and respiratory systems. | 0.5 |
| Anatomical organisation and physiology of the nervous and endocrine systems. Peripheral nervous system and communication. Reproduction and embryonic development. Postembryonic development and metamorphosis. | 1.0 |
| Intraspecific and interspecific relationships. Semiochemicals. Factors that govern the development of populations. Relationships between insects and plants: phytophagy, pollination. | 0.5 |
| Means of combatting insects. Insecticides: mechanisms of action, selectivity, toxicity, resistance. Principles of organic and integrated defence. | 0.5 |
| Insect classification. Morphological and biological characteristics of Orders. Morphological and biological characteristics of the main species harmful to agricultural crops.  Mites: notes on the morphology and biology of the main groups of agricultural interest. | 3.5 |
| Tutorials. Observation of morphological structures and of the main species for recognition purposes. | 1.0 |

READING LIST

Texts adopted

PJ Gullan, PS Cranston, *Lineamenti di entomologia,* Zanichelli Editore, Bologna, 2006.

Suggested texts

F. Pennacchio (Ed.), *Gli insetti e il loro controllo,* Liguori Editore, Naples, 2014.

L. Masutti, S. Zangheri, *Entomologia generale e applicata,* Cedam, 2001.

A. Pollini, *Entomologia applicata,* Edagricole, Bologna, 2013.

TEACHING METHOD

1. Theoretical frontal and dialogue-based lectures in which the topics and key concepts of the discipline will be presented and discussed; PowerPoint presentations will be used as a lecture aid and, together with other teaching material, will be made available to students enrolled in the course through the Blackboard platform at the end of the corresponding lectures.
2. Students will participate in practical tutorials in the laboratory to learn the techniques for recognising the main insect species of phytosanitary interest.

ASSESSMENT METHOD AND CRITERIA

A final exam comprising:

a) a recognition test of 10 species of insects of agricultural interest (30 marks overall) and an assessment of the quality of the entomological box prepared by the student (1 mark; preparation is compulsory). Passing the recognition test/entomological drawer assessment (a minimum mark of 18/30) is obligatory for passing the exam;

b) an oral examination. During the oral exam, which lasts at least 20 minutes, students will be assessed through 2 questions on the first part of the programme (general entomology) and 2 questions on the second part (special entomology). The assessment will consider the student's understanding of the question and adherence of their answer to the question, the organisation of their answer, their command and mastery of the scientific language and terminology, their confidence and level of subject knowledge, and their ability to process the acquired knowledge.

The average of the marks obtained in the individual tests will constitute the final mark out of thirty.

NOTES AND PREREQUISITES

Students are invited to register for the course on the Blackboard platform and to visit it regularly for any alerts or updates.

Students are required to have basic knowledge in the fields of biology and zoology (concepts of species, systematics of the animal kingdom, organisation and function of animal cells).

Should the health situation relating to the Covid-19 pandemic not allow face-to-face teaching, remote teaching in synchronous or asynchronous mode will be guaranteed; this will be communicated in good time to students.

Information on office hours available on the teacher's personal page at http://docenti.unicatt.it/.