General Information	
Academic subject	**Entomology (Module of I.C. Zoology and Entomology)**
Degree course	**Agri-Forestry Environment and Landscape Sciences and Technologies**
Curriculum	
ECTS credits	6
Compulsory attendance	No
Language	Italiano

Subject teacher	Name Surname	Mail address	SSD
	Eustachio Tarasco	eustachio.tarasco@uniba.it	AGR/11

ECTS credits details			
Basic teaching activities			

Class schedule	
Period	Second semester
Year	Second year
Type of class	Lectures, 4 ECTS (32 hours) Laboratory and field classroom and workshops, 2 ECTS (28 hours)

Time management	
Hours	150
In-class study hours	60
Out-of-class study hours	90

Academic calendar	
Class begins	
Class ends	

Syllabus	
Prerequisites/requirements	Know the main aspects of Entomology, inherent the structure, biology and ecology of the insects and their control
Expected learning outcomes	*Knowledge and understanding* Knowledge of the basic elements of Entomology Knowledge of insect interaction with the environment and forestry *Applying knowledge and understanding* Ability to assess insect biodiversity in agroforestry ecosystems Ability to analyze the relationships between insects and territory *Making informed judgements and choices* Ability to analyze useful and noxious entomofauna and environmental contexts in the light of the reports between human activities and the natural environment. Ability to evaluate the most suitable solution to eco-friendly management and sustainable use of entomofauna *Communicating knowledge and understanding* Ability to present the results of projects and develop jobs by themselves or in group activities, through the preparation of technical reports and oral exposure, using an appropriate technical language *Capacities to continue learning* Ability to ensure the continuous updating of knowledge in the specific field, even with tools that make use of new communications technologies and information technology Ability to deal with the typical problems of agro-forestry land entomofauna, including through innovative technical solutions

Contents	•
Course program	Phylogeny and classification of insects – general part; Recognition and classification techniques. External morphology and anatomy. Seed Coat, Head, Chest, Abdomen. Muscular, nervous, sensory systems, digestive, respiratory, circulatory, excretory, reproductive, endocrine, secretor. Reproductive behavior. Embryonic development and parthenogenesis. Post embryonic development. Adult insect: emergence, secondary sexual characteristics, sexual dimorphism. Ethology and ecology: distribution of species, diapause, population dynamics. Means and methods of controlling pests: biological control, integrated. Endo-therapy. Characteristics and properties of biocidal products: natural and synthetic products. Mode of action in relation to the effects on plants, insects and other organisms. Insects of agroforestry ecosystem-General information on the major Orders and families of the class Insecta: Protura, Collembola, Diplura, Thysanura, Ephemeroptera, Odonata, Orthoptera, Isoptera. Top saving Thrips (*Frankliniella occidentalis*): piercing-sucking insects; Rynchota Tingidae (*Corythuca ciliata*), Pentatomidae (*Nezara viridula*, *Halyomorpha halys*) Cercopidae (*Haematoloma dorsata*), Cicadellidae, Aphrophoridae (*Philenus spumarius*), Cercopidae (*Haematoloma dorsata*), Whitefly (*Aleyrodes* spp.), Lachnidae (*Cynara cupressi*), Aphididae (*Myzus cerasi*) Adelgidae (*Sacchiphantes viridis, s. abietis*), Phylloxeridae (*Phylloxera quercus*) Margarodidae (*Matsucoccus feytaudi*, *M. pini, Icerya purchasi*), Diaspididae, Psillidae (*Glicaspis brimblecombei*), Triozidae (*Lauritrioza alacris*) Flatidae (*Metcalfa pruinosa*), Coreidae (Western conifer seed bug). Top saving: Lepidoptera Tortricidae (*Tortrix viridana, Ryacionia buoliana*), geometer moth (*Operopthera brumata*), Thaumetopoeidae (*Thaumetopoea pityocampa, T. processionea*), Lymantriidae (gypsy moth, *Euproctis chrysorrhoea, Leucoma salicis*), Lasiocampidae (*Malacosoma neustria*); Coleoptera Scarabeidae (*Melolontha melolontha, Anoxia matutinalis, Polyphylla fullo*), Chrysomelidae (*Melasoma populi, Xantogaleruca luteola*), Weevil (*Otiorhynchus* sp.); Elateridae . Hymenoptera Pamphilidae (*Cephalcia arvensis*), Diprionidae (*Neodiprion sertifer, Diprion pini*), Tenthredinidae. Bloodsucking Diptera and vectors of disease: Diptera Mosquito (*Culex pipiens, Aedes albopictus*), Psychodidae, Muscidae. Root insects: Rhyncota Cicadidae (*Cicada orni, Tibicen plebejus*); Orthoptera (*Gryllotalpa gryllotalpa*); Coleoptera Scarabeidae, Click Beetle. Galligen insects: Homoptera Pemphigidae (*Pemphigus bursarius, Baizongia pistaciae, Utricularia, dichanthelium, Eriosoma geoica*); Diptera Cecidomyiidae (*Mikiola fagi*); Hymenoptera Cynipidae (*Cynips* spp.). Xylophagus insects: Termite (*Reticulitermes lucifugus*, *Kalotermes flavicollis*, *Cryptotermes brevis*); Lepidoptera Sesiidae (*Sesia apiformis, Synanthedon Thrip adult, Paranthrene tabaniformis*), Cossidae (*Cossus cossus, Zeuzera pyrina, Parahypopta caestrum*); Coleoptera Buprestidae (*Coroebus florentinus*, *Cerambyx cerdo*), stag beetle (*Lucanus cervus*), Longhorn Beetle (*Saperda carcharias, Phoracantha semipunctata, P. populnea, Cerambix cerdo, Anoplophora* sp.*, Monochamus* sp.), Curculionidae (*Pissodes notatus, Rhynchophorus ferrugineus*), Scolytidae (*Ips typographus, Phloeosinus aubei, Phloeosinus, Tomicus destruens*); Hymenoptera: Siricidae (*Urocerus gigas*, *Sirex noctilio*). Beneficial insects (pollinators, predators and parasitoids): Neuroptera Chrisopidae; Diptera Sirphidae, Tachinidae; Coleoptera Coccinellidae, ground beetle (*Calosoma sycophanta*); Hymenoptera Apidae (*Apis mellifera*, *Bombus terrestris*) Ant (Formica group "rufa"). Vespoidea (European

	Hornet, *Polistes gallicus, Vespula germanica*), Ichneumonidae, Braconidae, Chalcidoidea. Wood and food insects
Bibliography	• Tremblay – Entomologia applicata (Liguori Ed.). Masutti L. Zangheri S. - Entomologia generale e applicata (CEDAM Ed); Davies R.G. - Lineamenti di entomologia (Zanichelli Ed.); Chinery M. - Guida agli Insetti d'Europa (Muzio Ed.); lectures notes *For foreign students (LLP-Erasmus, Tempus, ecc.)* the book is: The Insects: An Outline of Entomology. P. J. Gullan & Peter Cranston
Notes	Students could get a copy of all presentations utilized for lectures, including also those eventually needed for the practical activities, downloading them through the repository. There is not a text in Italian language which treats all topics of the present discipline. Information can be fragmented or too specialistic on Italian and International Journals and books. Therefore, students are strongly invited to follow the lessons in order to have simplified and updated information
Teaching methods	Topics will be treated with the help of Power Point presentations, classroom exercises relating to case studies, analysis of scientific publications. All material will be shared through the electronic platform.
Assessment methods (indicate at least the type written, oral, other)	The exam consists of an oral or written test with questions related to the programme. The professor might assign also an ongoing test i.e. a practical exercise (project, research theme, review, etc.). The exam of foreign students can be done in English according to the procedures described above the exam consists in an oral examination about the arguments developed during school hours theoretical and theoretical and practical classroom and laboratory The evaluation of the student's preparation is based on established criteria, as detailed in Annex A of the study regulations of the graduate program
Evaluation criteria	Correctly describe entomofaunal relationships with the environment and possess sufficient knowledge about basic elements of applied entomology Ability to identify tools of governance of insects in agroforestry land. Ability to critically describe the relationships that different insect groups have with the various components of agroforestry ecosystems Ability to describe entomofauna and environmental contexts in the light of the reports between human activities and the natural environment. Ability to identify the policy instruments best suited to eco-friendly management and sustainable control of noxious insects Knowing how to present clearly and exhaustively the results of projects and develop jobs by themselves or in group activities, through the preparation of technical reports, presentations, oral exposure, using an appropriate technical language Be able to retrieve bibliographic and statistical sources themselves to continuously update their skills.

Further information	**Visiting hours**: Wednesday, Thursday and Friday (10:00-12:00). All afternoons by previous agreement.