

General Information	
Academic subject	Agricultural zoology
Degree course	Agricultural Science and Technology (L25)
Curriculum	Plant production and protection
ECTS credits	3 ECTS (2 ECTS Lectures + 1 ECTS Laboratory)
Compulsory attendance	No
Language	Italian

Subject teacher	Name Surname	Mail address	SSD
	Giovanni Tamburini	giovanni.tamburini@uniba.it	AGR/11

ECTS credits details			ETCs
Basic teaching activities	Related teaching activity Plant Protection disciplines		3

Class schedule	
Period	First semester
Year	2021/2022
Type of class	Lecture - workshops

Time management	
Hours	75
In-class study hours	30
Out-of-class study hours	45

Academic calendar	
Class begins	-
Class ends	-

Syllabus	
Prerequisites/requirements	
Expected learning outcomes	<p><i>Knowledge and understanding</i></p> <ul style="list-style-type: none"> ○ Knowledge and understanding on the basic aspects concerning the biology of the animals <p><i>Applying knowledge and understanding</i></p> <ul style="list-style-type: none"> ○ Ability to distinguish the fauna composition which could be involved in the activities related to the crop productions <p><i>Making informed judgements and choices</i></p> <ul style="list-style-type: none"> ○ Ability of understanding biological, ethological and ecological phenomena which allow the success of the injurious animals in the considered context ○ Ability of application of treatments able to limit the development of injurious animals in the considered context <p><i>Communicating knowledge and understanding</i></p> <ul style="list-style-type: none"> ○ Ability of describing the animals and the biological, ethological and ecological phenomena involving the animals in the considered context <p><i>Capacities to continue learning</i></p> <ul style="list-style-type: none"> ○ Ability of updating the own knowledge on the animals and the biological, ethological and ecological phenomena involving the animals in the considered context <p>The results of the expected learning, in term of knowledge and</p>

	ability, are listed in the Annex A of the Didactic Regulation of the Bachelor Degree Course (expressed by the European descriptors of the study title).
<p>Contents</p>	<p>Organization of living matter – histology (epithelial and connective tissues). Structures involved in nutrition, food uptake and digestion. Respiration and gas exchange (by means of integument, tracheae, gills, lungs; respiratory pigments. Body fluid circulation and involved structures; blood and haemolymph. Excretion, osmoregulation and involved structures. Nervous tissue and system, sensorial organs and perception. Glands and secretion organs. Integument and its derived structures, skeleton; locomotion (muscular tissue). Reproduction and involved structures. Symmetry and metamerism.</p> <p>Reproduction and life strategies – Reproductive modalities and strategies: asexual (schizogony, gemmation, fragmentation, polyembryony) and sexual reproduction; gonochorism and hermaphroditism; gametogenesis, egg and spermatozoa morphology; amphigony, fecundation and parthenogenesis. Oviparous, ovoviviparous and viviparous organisms. Sex determination (progametic, syngamic, metagametic). Egg classification, embryonic and postembryonic (direct and indirect; continuous and discontinuous; allometry) development. Neoteny. Dimorphism, polymorphism.</p> <p>Evolutionary theory and adaptation. Concept of species.</p> <p>Ethology and ecology – Innate and acquired behaviour; taxis and tropism. Communication and social behaviour (mating, aggression, parenting). Mutualistic and antagonistic symbiosis. Trophic relationships (trophic levels, chain, pyramid and net). Animal adaptations: communications, mimicry, mimicry. Biological rhythms and clock. Dispersion mechanisms within the space (active, passive, migration) and time (diapause, quiescence, hibernation and aestivation). Zoogeographic areas. Biotope, biocoenosis, populations, population density and dynamics, biotic potential, natural ecosystems, agroecosystem.</p> <p>Phyla of potential pests in agriculture – Details of the main animal Phyla with details of a few phytophagous species: Nematoda (<i>Ditylenchus</i>, <i>Heterodera</i>, <i>Globodera</i>, <i>Meloidogyne</i>); Acarina (<i>Tetranychidae</i>, <i>Eriophyoidea</i>); Gasteropodes (<i>Helicidae</i>, <i>Arionidae</i>, <i>Limacidae</i>); Mammalia Rodentia (<i>Muridae</i>).</p> <p>Practical classes – Means, tools and instruments for investigations; methods of collecting and preserving zoological materials; basic principles of breeding certain animal groups in the laboratory; identification of the main animal taxa.</p>
<p>Course program</p>	
<p>Bibliography</p>	<ul style="list-style-type: none"> • Notes of the lectures • De Bernardi et al., 2012 – Zoologia (general part) – Idelson-Gnocchi (In alternative: Mitchell L.G., Mutchmor J.A., Dolphin W.D., 1992 – Zoologia. Zanichelli Ed., Bologna; or Dorit R.L., Walzer W.F., Barnes D., 1997 – Zoologia. Zanichelli Ed., Bologna) • Suss L., Locatelli D.P., 2001 - I parassiti delle derrate (Il Sole 24 ore Edagricole, Bologna) <p>Study schemes:</p> <ul style="list-style-type: none"> • presentations and other didactic material provided during the lessons <p>Additional readings:</p>

	<ul style="list-style-type: none"> • Baccetti B., Barbagallo S., Suss L., Tremblay E., 2000 – Manuale di Zoologia agraria. A. Delfino Ed., Roma. • Chapman J.L., Reiss M.J., 1994 – Ecologia. Principi e applicazioni. (chapters 2.1÷2.3, 4.1÷4.6, 5.1÷5.28, 13.8, 18.1÷18.2, 19) Zanichelli Ed., Bologna. • Pellizzari Scaltriti G., 2002 – Parassitologia animale dei vegetali. CLEUP Editore. <p>For foreign students (LLP-Erasmus, Tempus, etc.): Integrated principle of Zoology (Cleveland et al., 2005, McGraw-Hill).</p>
Notes	Students will be provided with a copy of all presentations utilized for lectures, including also those eventually needed for the practical activities.
Teaching methods	The subjects will be provided with several examples and illustrations by means of Power Point presentations, movies, practical drills in the classroom and laboratory.
Assessment methods	<p>Only the students enrolled in the academic year during which this module is offered, can have an intermediary exam during the teaching period of module. The result of this intermediary exam remains valid for the whole academic year and concurs to the final evaluation of the student.</p> <p>The intermediary exam will be given on the subjects treated during the lessons and the practical activities as reported in the Didactic Regulation in Agricultural Science and Technology (art. 9) and syllabus (annex A) and which is correlated to the actual teaching period. The evaluation of the intermediary exam is expressed in thirtieths.</p> <p>At the end of the module teaching period, the students, who passed positively the intermediary exam, can give the final exam concerning on the subjects treated during the lessons and the practical activities since the intermediary exam, as reported in the Didactic Regulation in Agricultural Science and Technology (art. 9) and syllabus (annex A) and which is correlated to the actual teaching period.</p> <p>Students who did not pass or give the intermediary exam will be examined on the whole subjects treated during the lessons and the practical activities as reported in the Didactic Regulation in Agricultural Science and Technology (art. 9) and syllabus (annex A) and which is correlated to the actual teaching period.</p> <p>The intermediary and the final exams consist of an oral examination (written if necessary). The evaluation of the student is based on criteria previously fixed such as reported in the Annex A of the Didactic Regulation in Agricultural Science and Technology.</p> <p>The exam for foreign students can be given in English according to the above reported modalities.</p>
Evaluation criteria (Explain for each expected learning outcome what a student has to know, or is able to do, and how many levels of achievement there are.	<ul style="list-style-type: none"> • <i>Knowledge and comprehension ability</i> <ul style="list-style-type: none"> ○ Description of the basic morphological, biological, ecological and ethological characteristics of the animals and interpretation of their functional correlations • <i>Knowledge and applied comprehension ability</i> <ul style="list-style-type: none"> ○ Description of the factors favouring the success of the different ecological classes of the animals in the crop production • <i>Autonomy of judgement</i> <ul style="list-style-type: none"> ○ Formulation of potential treatments on the factors favouring the success of injurious animals within the crop production sector • <i>Communication skills</i>

	<ul style="list-style-type: none"> ○ Exhaustive description and illustration, with appropriateness of term, richness of examples and correlation of the basic aspects which favour the success of the animals • <i>Learning ability</i> <ul style="list-style-type: none"> ○ Adaptation of the basic cognitive tools acquired during the module in order to explain and solve numerous applied problems and diversified case of study
Further information	<p>Visiting hours Wednesday, from 11.30 am to 1.30 pm, after a request of appointment.</p>