

<b>Program</b>	13IG – [Bachelor’s Degree in Forest Engineering]
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Course number and name	
<b>Number</b>	[135004105]
<b>Name</b>	Zoology
<b>Semester</b>	S2 [(February-June)]

Credits and contact hours	
<b>ECTS Credits</b>	6
<b>Contact hours</b>	60

<b>Coordinator's name</b>	Carlos Alonso (carlos.alonso@upm.es)
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Specific course information
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#### Description of course content

The goal of this course is to provide future Forest Engineers with a solid foundation on general principles of Zoology and insect morphology, physiology and systematics. This knowledge would allow undergraduate students understand advanced courses on ecology, biological assessment, game management and pest control; along with the principles of ecosystem based management of wild areas.

#### List of topics to be covered

1. Introduction to Zoology: general principles, zoogeography and systematics
2. Concepts of insect morphology and taxonomy
3. Insect anatomy and physiology
4. Apterygota and Palaeoptera
5. Orthopteroidea
6. Hemipteroidea
7. Endopterygota I: Neuroptera, Coleoptera, Mecoptera and Lepidoptera
8. Endopterygota II: Diptera, Trichoptera, Siphonaptera and Hymenoptera
9. Protozoa
10. Poriphera, Placozoa, Cnidaria and Ctenophora
11. Lophotrochozoa I: Acoelomorpha, Platyhelminthes, Mesozoa, Nemertea, Gnathostomulida, Micrognathozoa, Rotifera and Acanthocephala
12. Lophotrochozoa II: Cycliophora, Gastrotricha, Entoprocta, Bryozoa, Brachyopoda, Phoronida, Mollusca, Annelida, Echiura and Sipuncula
13. Minor ecdysozoans: Nematoda, Nematomorpha, Kinorhynchina, Priapulida, Loricifera, Onychophora and Tardigrada
14. Arthropoda I: Chelicerata and Myriapoda
15. Arthropoda II: Crustacea and Insecta (\*expanded in chapters 2 to 8)

16: Chaetognatha and Deuterostomia: Echinodermata, Hemichordata and Chordata	
17: Agnatha and Fishes	
18: Amphibians	
19: Reptiles	
20: Birds	
21: Mammals	
<b>Prerequisites or co-requisites</b>	
Biology	
<b>Course category in the program</b>	
<input type="checkbox"/> <b>R (required)</b>	<input checked="" type="checkbox"/> <b>E (elective)</b> <i>(elective courses may not be offered every year)</i>

<b>Specific goals for the course</b>
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<b>Specific outcomes of instruction</b>
<p>CB01 - Knowledge at the undergraduate level that, although supported by advanced textbooks, also includes some aspects that imply knowledge from the forefront of the field of study</p> <p>CE 01.08 - Knowledge of the biological bases and foundations of the plant and animal biology in engineering.</p> <p>CE 02.02 - Ability to know, understand and use the principles of: Forest Zoology and Entomology.</p> <p>CG01 - Ability to understand the foundations of biological, chemical, physical, mathematical, and representation systems necessary for the development of professional activity, as well as to identify the different biotic and physical elements of the forest environment and renewable natural resources capable of protection, conservation and uses in the forest field.</p> <p>CG03 - Knowledge of the degradation processes that affect forest systems and resources (pollution, pests and diseases, fires, etc.) and ability to use techniques for protecting the forest environment, forest hydrological restoration, and forest conservation. biodiversity.</p> <p>CT10 - Environmental awareness: It is the set of knowledge, abilities, skills and attitudes, useful for interacting with the environment, ethically, responsibly and sustainably, in order to avoid or lessen the negative effects produced by the inappropriate practices caused by human activities, and to promote the benefits that professional activity can generate in the environmental field, taking into account its economic and social implications.</p> <p>RA5 - RA1 - RA249 – Ability to transmit information, ideas, problems and solutions to both specialized and non-specialized audiences.</p>

<b>Bibliography and supplemental materials</b>
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<ul style="list-style-type: none"> <li>– Gullan, P. J., &amp; Cranston, P. S. (2014). The insects: an outline of entomology. John Wiley &amp; Sons.</li> <li>– Harris, C.L. 1996. Concepts in Zoology. HarperCollins College Publishers.</li> <li>– Hickman, C.P., Jr., Roberts, L.S., Keen, S.L., Larson, A., L'anson, H., Eisenhour,</li> </ul>
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POLITÉCNICA



D.J. 2009. Integral Principles of Zoology. McGraw-Hill. – Miller, S.A., Harley, J.P. 2009. Zoology, 8th edition. McGraw-Hill.
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Teaching methodology			
<input checked="" type="checkbox"/> lectures	<input type="checkbox"/> problem solving sessions	<input type="checkbox"/> collaborative actions	<input checked="" type="checkbox"/> laboratory sessions
<b>Other:</b>	Field trip		