UCLouvain

lboe2111

2026

Advanced and applied evolutionary biology

3.00 credits	35.0 h + 30.0 h	Q1

Teacher(s)	Baeckens Simon ;
Language :	English
Place of the course	Louvain-la-Neuve
Prerequisites	The student has a basic knowledge and understanding of ecology, evolutionary biology and genetics
Main themes	Evolutionary theories, measuring natural and sexual selection and other evolutionary processes, phylogeny construction and interpretation, cultural evolution, evolutionary applications
Learning outcomes	**At the end of this learning unit, the student is able to :** 1 **Contribution of the teaching unit to the program's AA reference framework** In line with the BOE2M program's competency framework, this teaching unit contributes to the development and acquisition of the following skills: 1, 2, 3 (3.6), 7 2 **Course-specific learning outcomes :** The student masters a broad and deep overview of the different evolutionary theories dealing with both macro- and microevolution and with both genetic and cultural evolution. The student is able to apply evolutionary thinking in several applied fields that have been covered during the course, but can also apply their understanding to other fields in a critical, well-supported manner. The student is familiar with reading and synthesizing both historical and current scientific literature in the field of evolutionary biology in general and of evolutionary applications in particular.
Evaluation methods	A single integrated written exam (3 hrs) at the UCLouvain-campus that will cover all the material lectured by the 3 professors, as well as a question about the TP (critical reading exercise). The relative distribution of the theoretical course part of the final mark of the exam and the one of the TP part is fixed at 80 and 20%, respectively.
Teaching methods	Classroom lectures with discussions Some lectures will also include bioinformatic exercices Autonomous reading of an assigned book chapter
Content	The course will train the students' advanced and applied knowledge in biological evolution and in evolutionary thinking. After a recap of the basic principles and concepts of evolutionary theory, the course will address a range of timely topics in the field of advanced and applied evolutionary biology. There will be a focus on topics which are of particular relevance for ecologists, organismal biologists and conservation biologists. Students will be trained in advanced evolutionary thinking and understanding from genes to organismal phenotypes and how and why this matters not only for our basic understanding of living creatures but also for a range of applied fields including nature conservation, medicine, agriculture, fisheries, humanities, amongst others. The covered topics include: 1. Introduction to the course 2. Recap of concepts of basic courses in evolution (bachelor) 3. Natural selection & evolution in a human-modified world 4. Phylogenetics (building and interpreting phylogenies) 5. Genomic basis of evolution (including detection and interpretation) 6. Mitonuclear interactions 7. Rapid evolution & eco-evolutionary dynamics 8. Predictability of evolution & evolutionary biology of invasions 9. Evolutionary thinking and engineering The practical part of the cours (TP) concerns a largely autonomous exercise of critical reading of historical milestone publications in evolutionary biology (Book chapters). For this course, we combine and integrate expertise of both UNamur (Prof. Alice Dennis) and UCLouvain (Prof. Simon Baeckens and Hans Van Dyck). Lecturing occurs on both campuses. Check the timeschedule carefully on ADE.
Inline resources	Website Moodle LBOE2111

Faculty or entity in charge	BIOL

Programmes containing this learning unit (UE)

Program title	Acronym	Credits	Prerequisite	Learning outcomes
Master [120] in Biology of Organisms and Ecology	BOE2M	3		
Master [60] in Biology	BIOL2M1	5		
Master [120] of Education, Section 4 : Biology	BIOL2M4	3		