


This biannual learning is being organized in 2024-2025

Teacher(s)	Page Melissa ;
Language :	English
Place of the course	Louvain-la-Neuve
Learning outcomes	<p>At the end of this learning unit, the student is able to :</p> <p>Currently, system biology is widely used in environmental sciences. This class is a theoretical course of genomics and proteomics.</p> <p>1 It aims at teaching the students the scientific and informatics skills in order to be able to determine DNA sequences of organisms and fine-scale genetic mapping of genomic data.</p> <p>In addition, it gives the students scientific and technical skills in order to deeply understand scientific articles relating to environmental proteomics, and to help them to fit in research teams developing this approach.</p>
Evaluation methods	<p>For Prof. Melissa Page (transcriptomic part) evaluation is an exam made up of open and written questions. For the part of Prof Alice Dennis (genomic part) evaluation is via an oral presentation and question session For both parts of the practical work, a detailed report of the practical work must be submitted. It is necessary to participate in all the practical work sessions to obtain a TP rating.</p> <p><i>Please note :</i> <i>Due to the two modules that compris this course (transcriptomics: theoretical and practical, and genomics: theoretical and practical), the score obtained for each module mediates the calculation of the final score of the evaluation.</i></p>
Teaching methods	Lectures in the classroom ; practical work with assistants in the computer room. Support ppt files on moodle UCL and UNamur platform.
Content	<p>This course is given by two lecturers in two parts. This course has 30 hours of volume 1 and 18 hours of volume 2 : - 18 hours volume 1 + 12 hours volume 2 by Prof. Alice Dennis at UNamur - 12 hours of volume 1 + 6 hours of volume 2 by Prof. Melissa Page at UCLouvain This course is partially linked to the LBOE2124 Molecular Ecology course.</p> <p>Transcriptomics part (Melissa Page, UCLouvain) :</p> <p>Theory : History: Transcriptomics as one tool in the toolkit box- Why is transcriptomics such a huge success in Evolution and Ecology? Methodology : Experimental procedure - Differences between genomics and transcriptomics - Technological limitations and perspectives of transcriptomics; Another tool in the toolkit box: (e) Quantitative Trait Loci; Case studies using transcriptomics in Evolutionary Ecology with a focus on studies done with data obtained from the wild : Transcriptomics for understanding the Anthropocene, Stickleback fishes <i>Gasterosteus aculeatus</i> case study, Transcriptomics in butterflies, General conceptual conclusions from these case studies; Conclusions at the methodological level.</p> <p>Part practical work : analysis of an published transcriptome and identification of candidate genes involved in tissue regeneration of the African turquoise killifish (<i>Nothobranchius furzeri</i>).</p> <p>Genomics part (Prof. Alice Dennis, UNamur) :</p> <p>Theory : - History of genomics - Evolution of genomes - High throughput sequencing methods - Principles of genome assembly - Comparative genomics, functional genomics - applications to questions in ecology and evolution</p> <p>Part practical work :</p> <p>1/ Introduction to the bioinformatics for biologists 2/ Genome alignment, annotation and summary 3/ Comparison among genomes and application to ongoing research</p>
Inline resources	Access UCLouvain's online moodle platform for course content and information on the practical organization of the course

Bibliography	• Fichiers ppt des cours; livres et documents de référence sur la plateforme en ligne moodle
Other infos	Prerequisites : - basic knowledge in genetics and biochemistry are necessary - the slides seen during the course serve as teaching support - scientific articles will be analyzed during the course.
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	4		
Master [60] in Biology	BIOL2M1	4		