UCLouvain

lbrte2102

2026

Integrated exercises in environmental science and technology

5.00 credits	45.0 h	Q1 and Q2

Teacher(s)	Gerin Patrick (coordinator) ;Javaux Mathieu ;Vanclooster Marnik ;
Language :	French > English-friendly
Place of the course	Louvain-la-Neuve
Prerequisites	Knowledge and skills acquired throughout the whole science and engineering courses of the BIRE programme.
Main themes	The integrated exercise require the students to synthesize the scientific and technological state of the art of a multidisciplinary subject relevant to environmental bio-engineering on the basis bibliographical research. These exercises involve the use of bibliographic search methods, the identification of the relevant sources of information, the collection of the documents and of the relevant data, their understanding, their analysis, their structuring and their synthesis. The result of this synthesis is communicated as a written report and as an oral presentation, which must be understandable by a reader with a general scientific background, but not a specialised one. These exercises require the students to organize themselves as a team to be able to handle in a sufficiently complete way the various aspects of their subject. Wherever possible, the subjects are offered in various areas related to the fields of the students program options. The learning activity is based on putting into practice the principles of project management, team management and peer review
Learning outcomes	**At the end of this learning unit, the student is able to :** a. Contribution de l'activité au référentiel AA (AA du programme) 1.1, 1.4, 1.5 2.1, 2.4 3.1., 3.2, 3.6, 3.7, 3.8 5.3 6.1, 6.2, 6.4, 6.5, 6.6, 6.7, 6.8 b. Formulation spécifique pour cette activité des AA du programme (maximum 10) At the end of this activity, the student is able to synthesize the state of scientific and technological knowledge available on a complex issue related to environmental bioengineering, i.e: - Collect relevant bibliographic information by using bibliographical research tools; - Cite and refer to this information in a scientific text according to the bibliographic citation rules accepted in the scientific community; - Understand scientific articles and critically use their content; - Identify, acquire and integrate the new knowledge needed to complete the project; - Distinguish the key elements of a complex problem, reformulate objectives and define the limits of the project; - Communicate in a structured, rigorous and synthetic way, orally and in writing; - Formulate recommendations and argue; - Orally defend his claims. At the end of this activity, the student is also able to contribute adequately (attitude and productions) to the success of the functioning of a team, to carry out a long-term project.

Evaluation methods	Final written report of each the student team, that has to define the initial questions in their context, and build and argue answers to these questions. Final oral presentation and answer to questions (defence). A peer assessment is taken into account to weight individually the grade of the team work. Penalties are applied to the final grade for activities carried out after the deadline or not carried out (details on Moodle) Assessment criteria: - Respect of the bibliographic citation rules - Relevance and rigour in the presentation and structuring of the subject - Relevance and extent of information search - Clarity and completeness of the communication, quality of writing - Critical analysis of scientific and technological aspects - Synthetic communication of theubject - Mastery of the subject (capacity to answer questions) - Contribution to the success of the team (Moodle Dynamo). Integration of assessments: Final_mark= [grade_written_team_report *0.50 + grade_oral_team_presentation_*0.25]*[individual_relative_involvement_Dynamo - 1)*0.7+1] + [grade_individual_defense*0.25] - penalties *Persistent cases of dysfunction within a team or serious behavioural problems on the part of a student, which would be contrary to the educational objective of contributing adequately to the successful functioning of a team and its mission, may result in a change in the individual mark of the student concerned, at the discretion of the teachers.*
Teaching methods	To help students to efficiently achieve the course objectives, learning is based on 1) an introduction to the course (in classroom) ; 2) an introduction to bibliographic search tools (in computer room) ; 3)an introduction to project and team management (in classroom); 4) alternating personal work (bibliographic research and writing) and team work ; and 5) common oral presentations of the project progress. The composition of the students teams is organised by the course coordinator. The organization of team work and the frequency of their meetings are managed by the students themselves. The students' work is completed under the weekly guidance of one teacher who can advice them with respect to the scientific content and communication skills. The students teams are coached by voluntary scientists who can give advices on the team management aspects. At one third and two thirds of the work , joint sessions allow each team of students to present orally its progress, to hear the work of other teams and get comments and suggestions (feedback) from all the teachers, on both the content and the form of their presentation. Peer assessment of the contribution of each member to the success of the team is organized several times during the work progress
Content	The students have to synthesize the scientific and technological state of the art on multidisciplinary subjects (questions) related to environmental bioengineering. Topics are proposed by teachers in the form of concrete and open questions, on diverse themes depending on their areas of interest and expertise, and current question of interest, in particular the questions of transition to face the energy and environmental issues. The subjects are proposed by the teachers (according to their fields of interest and competences) as concrete and open questions. The tools that can be used at UCL for the bibliographic research are presented to the students. The later organise themselves as teams of 3-8 (preferably 4-5) students and to organize their work : 1. to seek and gather the relevant information concerning their subject; 2. to analyse, structure and synthesize this information; 3. to write a structured and synthetic final report that answer the initial questions; 4. to present and defend orally this report.
Inline resources	Moodle Autre:bibliographic databases accessible via the UCLouvain libraries
Bibliography	La recherche bibliographique utilise les bases de données accessibles à l'UCLouvain et est guidée par les enseignants en fonction du problème posé. Des documents de base et des recommandations de rédaction sont mises à disposition sur Moodle. *Bibliographic research uses databases available at UCLouvain and is guided by teachers according to the problem posed.* *Basic documents and writing recommendations are available on Moodle.*

Other infos	Although the course appears in the program of the 2nd quadrimester (as the assessment is associated with the 2nd quadrimester), it begins in mid-September with several compulsory activities (questionnaire to be completed on Moodle, assignment of project subjects, training to scientific bibliographic research, initiation to collaborative project management). Students should ensure that they are correctly registered at the university by early October at the latest and that they quickly register this course in their master's program, in order to be included in the information mailing list. Students should also register on Moodle by the end of September at the latest and monitor the course schedule on ADE. Participation in the various start-up activities in October is absolutely compulsory - students who have not fulfilled their obligations (homework and attendance) will not be allowed to participate in the rest of the course. Significant penalties will be applied on the final grade of the course to students who have only partially fulfilled their obligations. **In case of failure** *As the activities cannot be repeated during the summer (teamwork, coaching, intermediate deliverables), failed activities cannot be presented in the 2nd session. In case of failure, the full activity is postponed to the following academic year and must be repeated.* This course is strictly reserved for master students who have been credited for at least 165 credits of Bachelor courses. The course is organized from the first to the second quadrimester. It is therefore not accessible to students who are present in Louvain-la-Neuve during only a single term (eg mobility students). BIR22 students who should take this course in their final year are strongly recommended to contact the course coordinator at the start of the first term at the latest, in order to best link this course with their master thesis. This course (or an equivalent in mobility) is a prerequisite for the LBIRC2201 Industrial project course of the last annual block. This course includes activities in English.
Faculty or entity in charge	AGRO

Programmes containing this learning unit (UE)

Program title	Acronym	Credits	Prerequisite	Learning outcomes
Master [120] in Environmental Bioengineering	BIRE2M	5		