




6.00 crédits

50.0 h + 10.0 h

Q1

Enseignants	Bogaert Patrick (coordinateur(trice)) ;Defourny Pierre ;Hanert Emmanuel ;
Langue d'enseignement	Français
Lieu du cours	Louvain-la-Neuve
Préalables	This project is open to any bioengineer master student (A, C, E or F) upon prior completion of the bachelor cycle.
Thèmes abordés	<p>The integrated project in Data Science and Sustainability Engineering projects requires the students from options 10 (Analyse et gestion de l'information) and 12 (sustainability engineering) to mobilize their knowledge and skills in an integrated and transverse way whatever their specific master. The goal is to understand and analyze a problem which is relevant to the field of bioengineering and that involves data of various nature and sources. The topics of the project will be specific for each option.</p> <p>For option 10, the project will cover topics that address the whole information processing chain, including data acquisition, data processing and communication issues directed towards various public or private stakeholders.</p> <p>For option 12, the project will address a real case-study with the objectives of assessing, designing or optimizing agricultural, industrial or ecological systems or processes such that they use energy and resources sustainably, The complexity and deadlines of the project correspond to situations that are expected to arise in a real professional context. The project will involve both written and oral communication of the results that can be understood and use by non-specialists.</p>
Acquis d'apprentissage	<p><b>A la fin de cette unité d'enseignement, l'étudiant est capable de :</b></p> <p>1. <u>Contribution of this activity to the learning outcomes referential :</u> 2.4, 4.1, 4.2, 4.3, 4.4, 4.5, 4.6, 4.7, 5.1, 5.2, 5.3, 5.4, 5.5, 5.6, 5.7, 5.8, 5.9, 6.2, 6.3, 6.5, 6.6, 6.7, 6.8, 7.1, 7.2, 8.1, 8.2</p> <p>1. <u>Specific formulation of the learning outcomes for this activity</u> A the end of this activity, the student is able to :</p> <ul style="list-style-type: none"> <li>• Integrate various scientific knowledge and skills for addressing a real-world complex problem of bioengineering that relates to technologies and management of information and by accounting for technical, legal and economic constraints;</li> <li>• Design original and scientifically sound approach for solving a multidisciplinary problem in the bioengineering framework;</li> <li>• Plan the necessary steps of the projects by working efficiently and in a liable way within a team;</li> <li>• Work within a team by promoting initiative, commitment and adaptation in order to honor deadlines;</li> <li>• Communicate efficiently about the proposed solutions both in a written and oral way by using a rigorous approach that still remains accessible for non-specialists;</li> <li>• Interact in an efficient and respectful way with various stakeholders by promoting dialogue, empathy and assertiveness;</li> <li>• Understand the legal and technical aspects that are relevant for the acquisition, processing and communication aspects that are involved in the framework of the project</li> </ul>
Modes d'évaluation des acquis des étudiants	Written report and oral presentation of the results at the end of the project.
Méthodes d'enseignement	Students will work jointly within in a group and will be supervised on a weekly basis by the teaching team.
Contenu	<p>Each year, a different real-world and topical problem will be presented to the students. This presentation may involve various stakeholders. In order to mimic a real engineering office, the students will organize themselves into groups that are composed of 2 to 4 students. They will summarize the problem and plan the work to be done (steps and milestones, external resources to be used, deadlines to honor) in order to achieve a scientifically sound and realistic solution.</p> <p>For option 10: Depending on the problem at hand, the work will include at least two priority tasks among the following list (other tasks are thus considered as subordinated) : data collection, data validation &amp; correction, management of the corresponding databases, statistical analyses and modeling, risk analysis about the project</p>

	<p>outcomes and proposed solution, written and oral communication towards stakeholders and scientists that are non-specialists, assistance for a proper diffusion of the results (indicators, computer interfaces, etc.).</p> <p>For option 12: Depending on the problem at hand, the work will include at least two priority tasks among the following list (other tasks are thus considered as subordinated) : data collection and analysis, system analysis, optimization/tradeoff, material flow accounting, life cycle analysis, footprint calculation, written and oral communication towards stakeholders and scientists that are non-specialists, assistance for a proper diffusion of the results</p> <p>The students will have to report the intermediate outcomes of the project at key steps. A joint written report must be delivered by the end of the semester. This report will be orally presented during the examination session.</p>
Autres infos	This course can be given in English.
Faculté ou entité en charge:	AGRO

<b>Programmes / formations proposant cette unité d'enseignement (UE)</b>				
Intitulé du programme	Sigle	Crédits	Prérequis	Acquis d'apprentissage
Master [120] : bioingénieur en gestion des forêts et des espaces naturels	BIRF2M	5		
Master [120] : bioingénieur en sciences et technologies de l'environnement	BIRE2M	6		
Master [120] : bioingénieur en chimie et bioindustries	BIRC2M	6		
Master [120] : bioingénieur en sciences agronomiques	BIRA2M	6		