UCLouvain	lepl1501 2022		Project 1
	5.00 credits	30.0 h + 30.0 h	Q1

Teacher(s)	Bollen Xavier (compensates Raucent Benoît) ;Pecheur Charles ;Raucent Benoît ;Soares Frazao Sandra ;
Language :	French
Place of the course	Louvain-la-Neuve
Main themes	The first part of the project consists of a pre-project (P0) and aims, during the first week, to introduce students to university work and prepare them for teamwork. The P1 project aims to enable each student to acquire the essential characteristics of the various professions practiced by engineers and more particularly in the design of systems by following a systematic approach. The student will thus better understand the methodological and disciplinary objectives pursued during his studies. The second objective of the P1 project is to introduce students to the methodological aspects of project work and collaborative work. The third objective of P1 aims to apply disciplinary concepts worked in the disciplines of the first semester and which are involved in the design of a mechanical system. Finally, the P1 project will allow students to approach technical drawing on the computer as well as prototyping by exploiting the possibilities offered by 3D printers.
Learning outcomes	**At the end of this learning unit, the student is able to :** 1 At the end of the course the students will be able to: • to use technical drawing (by hand) as a design and communication tool: 2D plan and simple perspectives (cavalier and axonometric). • to build a kinematic model of a mobile robot, to compute internal efforts of a simplified robot model, to measure torques and internal frictions, to measure power and work produced by robot motors, to establish a balance of electrical and mechanical energy. • to develop and test a JAVA program that allows the robot to perform, at scale, arbitrary manoeuvers and trajectories. The project aims at developing the following cross-cutting skills: • Working in team to carry through an engineering-type project. • Carrying a multi-disciplinary project. • Exercising scientific research practices. • Communicate verbally in an efficient manner. • Communicate in writing in an efficient manner. • Self-appraise with respect to target training objectives in order to progress.
Evaluation methods	The students' achievements are measured during the oral presentation in a team, with a synthetic visual support. In addition, an individual exam assesses the skills and knowledge acquired in relation to the disciplinary concepts used within the framework of the project.
Teaching methods	The project is a particular situational problem due to its duration (one semester) and due to the possibility of integrating the knowledge and skills it provides. The project aims at the contextualization, integration and application of the subjects taught during the same semester. A P0 pre-project will be organized the first week to introduce students to project management and teamwork. The device will make extensive use of the principles of the flipped classroom with the provision of resources on Moodle and group work on the basis of instructions. A weekly course will aim to answer students' questions. A tutor will meet the student teams every week to take stock.
Content	The project aims to design a mechanically powered device (rolling, flying or floating), to model and simulate its behavior. A prototype, based on standard mechanical parts, as well as on the production of 3D prototyping parts, will make it possible to compare the simulation with the real behavior. The project will include the following stages: · pre-project (P0); · propose a design based on specifications; · make a model; · make a plan for prototyping; · prototype the plan using 3D printing; · model the physical behavior of the machine;

	· simulate the behavior of the machine; · create illustrations to communicate the behavior of the machine; · prepare a summary and present it orally.
Faculty or entity in charge	BTCI

Programmes containing this learning unit (UE)				
Program title	Acronym	Credits	Prerequisite	Learning outcomes
Bachelor in Engineering	FSA1BA	5		🔍