UCLouvain

licar1104

2023

Computer science and numerical methods

5.00 credits	30.0 h + 30.0 h	Q1

Teacher(s)	Stephan André ;
Language :	French
Place of the course	Louvain-la-Neuve
Learning outcomes	
Evaluation methods	Assessment in this subject has both formative and summative aspects to it. You will have an opportunity to provide formative feedback to your peers and receive constructive feedback in return, as well as from the subject coordinator. This will give you the opportunity to develop and improve on particular skills throughout the course of the subject. There are two assessment tasks in this subject – Ongoing assignments and a Final Examination. The ongoing assignments are aligned and build upon each other to lead to the final Examination. Should you attend classes and tutorials and succeed in completing your assignments, you are setting yourself up for success at the exam. In case of a second session examination, you will pass an oral exam, worth 100% of your assessment.
Teaching methods	The learning approach is based on two blocks of two hours duration once a week, including one lecture session and one tutorial session. These sessions will involve a range of teaching modes, including lectures; group activities; and tutorials on specific topics to provide both specialist knowledge and to place your studies into a real-world context. The lectures and tutorials will be used to develop your knowledge on numerical methods and python, and their broad application in architectural engineering. During lectures and tutorials you will be expected to participate in activities, answer questions and reflect on the subject content. Tutorials in particular will provide an opportunity for you to share your knowledge, ask questions and discuss and further explore the subject material. It is expected you will spend at least a 4 hours per week on related tasks (reading, assignments, peer discussion, etc.) to enable you to successfully complete the subject.
Content	This subject aims to equip you with the knowledge and skills to understand and use numerical methods in solving various (architectural) engineering problems, using the Python programming language. The subject starts by introducing you to Python, one of the most popular programming languages, globally. Once you have developed a basic understanding of Python, the subject moves on to cover a broad range of different numerical methods, used in the field of engineering, to approximate reality and deliver working solutions. At the end of the semester, you will have developed your skillset in Python programming and numerical methods. The subject is targeted towards bachelor students at the Faculty of Architecture, Architectural Engineering and Urban Planning undertaking a Bachelor of Architectural Engineering. 1. **Learning objectives** At the end of this course, you will be able to: 1. Distinguish between a physical phenomenon, its mathematical formulation and the associated numerical model; 2. Discuss the different aspects of numerical methods, i.e. precision, convergence and stability; 3. Use the different elements of the Python programming language; 4. Apply numerical methods using Python; and 5. Critically appraise results obtained using numerical methods. 6. **Generic skills** On completion of this subject you should have acquired the following skills: 1. Digital literacy in Python and numerical methods 2. Development of logical computer code that is easy to read and maintain 3. Modelling engineering problems using numerical methods 4. Collaborate with others to develop a common solution to a problem
Inline resources	https://pythonnumericalmethods.berkeley.edu/

Faculty or entity in charge	LOCI

Programmes containing this learning unit (UE)

Program title	Acronym	Credits	Prerequisite	Learning outcomes
Bachelor in Engineering : Architecture	ARCH1BA	5		