UCLouvain

linfo2145

2023

Cloud Computing

5.00 credits	30.0 h + 15.0 h	Q1

Teacher(s)	Riviere Etienne ;
Language :	English > French-friendly
Place of the course	Louvain-la-Neuve
Prerequisites	You would already have passed LINGI2172 Databases
Main themes	• Architectural principles of cloud computing • Scalability of cloud services (storage, computing, ...) • Building blocks for cloud services • Large scale computations in cloud environments • Programming models for cloud services • Providing scalable web services from the cloud
Learning outcomes	**At the end of this learning unit, the student is able to :** 1 Given the learning outcomes of the "Master in Computer Science and Engineering" program, this course contributes to the development, acquisition and evaluation of the following learning outcomes: • INFO1.1-3 • INFO2.2-3, INFO2.5 • INFO5.2, INFO5.4-5 • INFO6.1, INFO6.3, INFO6.4 Given the learning outcomes of the "Master [120] in Computer Science" program, this course contributes to the development, acquisition and evaluation of the following learning outcomes: • SINF1.M1 • SINF2.2-3, SINF2.5 • SINF5.2, SINF5.4-5 • SINF6.1, SINF6.3, SINF6.4 Students having completed this course successfully will be able to • explain the goals, benefits and models of cloud computing, providing practical examples • describe the main components of cloud computing • design and conceive cloud services which operate reliably at scale • explain how storage and virtualization are used in the cloud and apply this in practice • apply the fundamental principles of multi-tier web applications and services in a cloud environment • tackle big data computation problems (e.g., through the Map Reduce computing paradigm)

Evaluation methods	The final grade is computed as follows for the first session (January): • Project 45% • Final exam 45% • Online quiz and peer review of other students work 10% It will not be possible to redo the project or the quizzes for the second session. However, the scale for the second session (September) is changed to: • Project 45% • Final exam 55% Continuous evaluation initially proposed with formative evaluation only could be graded and account for all or a part of the grade devoted to the final exam, if dictated by circumstances. The professor may request a student to go through an additional oral exam as a complement of the final exam and/or of the project, in cases including, but not limited to, technical issues, or suspicion of irregularities. The evaluation of the project leads to a grade for each of its two parts. Any violation of deontological obligations (including but not limited to plagiarism, collaboration with students outside of the project group or with third parties, etc.) will lead to a grade of 0 for the entirety of the project, and students will be denounced to the relevant authorities. The exam may use all or a subset of the following evaluation modalities. The respective proportion of points for each part is announced at the beginning of the exam: • open questions on the course content • open problems requiring an application of skills and knowledge acquired during the course • multiple-choice and multiple-answer questions under the principle of the "standard-setting". An incorrect answer to one of the questions cannot lead to a negative grade, and the exam part as a whole cannot grant negative points. However, a minimum threshold (announced in the exam) of correct answers is necessary before effectively acquiring points for this exam part.
Teaching methods	• Lectures • Scientific readings or/and videos from the industry • Quizzes (about readings, labs and lectures) • Practical lab sessions (tutorials) • Project
Content	This course focuses on the use and understanding of modern cloud computing technologies. It covers the systems aspects of dematerialized computing, including virtualization, storage, and fault tolerance; as well as software engineering aspects such as the construction of elastically scalable service-oriented applications backend. The course also covers data management and processing in the cloud, and its integration into cloud applications, as well as an introduction to advanced topics such as cloud security and decentralized trust. Concepts and tools covered in class are applied in a project where students build from the ground up a cloud-native backend for a representative application.
Inline resources	https://moodleucl.uclouvain.be/course/view.php?id=14866
Other infos	Required background: • LINFO1252 Recommended background: • LINFO1341 • LINFO1121 It is, in general, recommended to have good notions in networking, operating systems, and databases. The professor can advise supplementary reading to catch up on these topics upon request.
Faculty or entity in charge	INFO

Programmes containing this learning unit (UE)

Program title	Acronym	Credits	Prerequisite	Learning outcomes
Master [120] in Data Science : Statistic	DATS2M	5		
Master [120] in Computer Science and Engineering	INFO2M	5		
Master [120] in Computer Science	SINF2M	5		
Master [120] in Mathematical Engineering	MAP2M	5		
Master [120] in Data Science Engineering	DATE2M	5		
Master [120] in Data Science: Information Technology	DATI2M	5		