linfo2146

2023

Mobile and Embedded Computing

5.00 credits	30.0 h + 15.0 h	Q2

Teacher(s)	Sadre Ramin ;
Language :	English > French-friendly
Place of the course	Louvain-la-Neuve
Main themes	• Cellular networks • Internet of things and sensor networks • Mobile and embedded applications
Learning outcomes	**At the end of this learning unit, the student is able to :** 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 • INFO2.4-5 • INFO5.2-5 • INFO6.1, INFO6.3 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: 1 • SINF1.M1 • SINF2.4-5 • SINF5.2-5 • SINF6.1, SINF6.3 Students completing this course successfully will be able to • Explain how in mobile cellular and sensor networks operate • Describe the key problems that affect these environments and identify their impact on the mobile and embedded systems • Integrate and combine the above concepts in order to solve complex mobile computing problems.
Evaluation methods	Mode of evaluation for the June session: • Exam (45% of the final mark) • Project (40% of the final mark) • Continuous assessment (in the form of quizzes, etc.) throughout the quadrimester (15% of the final mark) August session: The project activities and quizzes **cannot** be done or redone in the August session and the student will keep the grades obtained for them in the June session with the same weights for the final mark as indicated above. Not participating to the project or quizzes at the dates indicated by the teacher will result in a zero mark for the respective part. The teacher may request a student to go through an additional oral exam as a complement of the exam and/or of the project activities, in cases including, but not limited to, technical issues, or suspicion of irregularities.
Teaching methods	• Lectures • Scientific readings • Practical lab sessions • Project activities
Content	The Internet of Things is everywhere. Many different kinds of applications, from logistics to Smart Homes to eHealth, rely on continuous data collection by small, wireless devices. In this course, we will program such devices and learn about the technologies that enable them to communicate with servers in the Internet over short and long distances (>1km). The focus will be on software and network protocols for mobile and embedded devices. The design of hardware and antenna technology is not part of this course. • Wireless sensor networks • Internet of Things • Programming embedded systems with network connection • Network protocols for resource-constrained devices • Introduction to mobile networks (4G, 5G)

Inline resources	Moodle and/or Teams
Other infos	You will need basic knowledge of IP networks, of computer systems, and of programming in C, for example from these courses: • LINFO1252 or LINFO2241 (C and computer systems) • LINFO1341 or LELEC2920 (IP networks)
Faculty or entity in charge	INFO

Programmes containing this learning unit (UE)				
Program title	Acronym	Credits	Prerequisite	Learning outcomes
Master [120] in Electrical Engineering	ELEC2M	5		🔍
Master [120] in Computer Science and Engineering	INFO2M	5		🔍
Master [120] in Computer Science	SINF2M	5		🔍
Master [120] in Data Science Engineering	DATE2M	5		🔍
Master [120] in Data Science: Information Technology	DATI2M	5		🔍