Freie Universität Bozen
Libera Università di Bolzano
Università Liedia de Bulsan

Syllabus
Course description

Course title	Technologies for the Management of Mountain Areas
Course code	47015
Scientific sector	ING-INF/01
Degree	Master EMMA
Semester	1st
Year	1st
Academic year	2017/2018
Credits	5
Modular	No

Total lecturing hours	30
Total lab hours	
Total exercise hours	15
Attendance	Highly recommended
Prerequisites	
Course page	https://next.unibz.it/en/faculties/sciencetechnology/master-environmental-management-mountain-areas/course-offering/

Specific educational objectives	The course aims to provide a practical understanding of the technologies underlying the sensors and sensor systems employable to monitor and manage mountain areas. The students will acquire a basic knowledge in semiconductors physics and printed electronics. A special emphasis will be placed on the concept of measurement uncertainty and how this affects the design of sensing nodes. Finally, the application of these technologies to ground and mountain monitoring will be discussed and analysed.

Lecturer	Dr. Aniello FALCO Facoltà di Scienze e Tecnologie piazza Università, 5 39100 Bolzano falco.aniello@unibz.it
Scientific sector of the lecturer	ING-INF/01
Teaching language	English
Office hours	See timetable
Teaching assistant (if any)	
List of topics covered	The course will cover the following topics: - Sensors technologies and applications - Basics of semiconductors physics - Basic of electronics - Organic and printed sensors and systems - Introduction to measurement and uncertainty

	- Sensing automation and data acquisition systems - Remote monitoring of ground areas: air and land based sensors and systems
Teaching format	The lectures will alternate Power Point presentations and blackboard/whiteboard calculations to open discussions about state-of-the art articles. The exercises will be subdivided in equal number in analytical problem solving and presentation of practical sensing applications for the management of mountain areas

Learning outcomes	**Knowledge and understanding** The course aims to provide knowledge and the scientific basis for the understanding of electronic sensors and systems for mountain area monitoring and management applications. The application to the special case will be a straightforward adaptation of the general tools and concepts developed throughout the course. **Applying knowledge and understanding** By the end of the course, students should be able to: 1. Describe (verbally and analytically) the behavior of simple semiconductor-based systems; 2. Understand the basic concepts of organic and printed electronics 3. Analyze and discuss the functionality of simple electronic circuits with discrete components 4. Conceptually design a sensing node for mountain environment and discuss the possibilities of integration in more complex networks 5. Calculate the measurement uncertainty in simple cases of electrical measurements 6. Understand and being able to describe the basic functioning of sensor BUSs 7. Understand the terminology of datasheets of selected electronic components **Making judgments** Students will have the ability to decide whether a sensor (or a sensing network) is applicable to different situations, basing their judgement on feasibility, cost-effectiveness and accuracy **Communication skills** The students will be able to present the acquired concepts with a correct technical language. They will also be able to structure and hold presentations to discuss a technical case **Learning skills** Students will be able to extend autonomously the

	knowledge acquired during the study course by reading and understanding scientific and technical documentation.

Assessment	Oral exam divided in two phases: 1. One-to-one discussion with the lecturer, with questions on the technical concepts learned during the course and their applications. 2. Ten minute presentation of a specific topic chosen by the student, with Q&A
Assessment language	English
Evaluation criteria and criteria for awarding marks	Clarity of answers, correct employment of technical terms, ability to be effective and concise, ability to connect independently concepts in unusual contexts.

Required readings	The lecturer will provide lecture notes, scientific articles and book chapters relative to the each lecture.
Supplementary readings	