Università degli Studi di L'Aquila - Dipartimento di Ingegneria e Scienze dell'Informazione e Matematica

Course catalogue

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Programme of Course "Telerilevamento"

- Code: DT0190
- Type of course unit: Compulsory (Laurea Magistrale in Ingegneria delle Telecomunicazioni curriculum Comune)
- Level of course unit: Postgraduate Degrees
- Semester: 2

Number of ects credits: (Laurea Magistrale in Ingegneria delle Telecomunicazioni) 6 (workload 150 hours)

Teachers: Domenico Cimini (domenico.cimini@imaa.cnr.it)

1	**Course objectives**	The Remote Sensing class aims at introducing the theory, the techniques, and the applications of Remote Sensing of the Environment.
2	**Course content and learning outcomes (dublin descriptors)**	Topics of the module include: • I) Fundaments of Remote Sensing - Introduction to Remote Sensing (scopes and applications, electromagnetic spectrum); - Elements of electromagnetic (EM) waves (propagation, absorption, reflection, Planck's law); - Radiative Transfer (absorption and emission, surface characteristics, boundary conditions); - Radiative process for active sensors (backscattering equation); - Direct and inverse problems and solutions; - Estimation methods. • II) Instruments and Techniques of Remote Sensing - Passive and active instruments (radiometers, photometers, interferometers, radar, lidar,…); - Remote Sensing platforms (ground-based, airborne, satellite, geometry, orbits). - Remote Sensing applications: meteorology, climate, monitoring (pollution, vegetation, soil) • III) Laboratory of Remote Sensing - Ground-based Remote Sensing: observations and data analysis from real instruments; - Satellite Remote Sensing: observations and data analysis from real satellite instruments. On successful completion of this module, the student should : • Be able to describe the main principles and applications of Remote Sensing • Know the main techniques and technologies for Remote Sensing • Design an approach for monitoring environmental variables with Remote Sensing • Apply appropriate algorithm to extract environmental information from Remote Sensing data
3	**Course prerequisites**	
4	**Teaching methodsand language**	The course consists of three parts: I) Fundaments of Remote Sensing II) Instruments and Techniques for Remote Sensing III) Laboratory of Remote Sensing **Language**: Italian **Reference textbooks** • Elachi, van Zyl, ***Introduction to physics and techniques of remote sensing***. Wiley. (vol. 2nd Edition) 2006. *http://www.wiley.com/WileyCDA/WileyTitle/productCd-0471475696.html* • Long, Ulabi, ***Microwave Radar And Radiometric Remote Sensing***. Artech House. 2015. *http://us.artechhouse.com/Microwave-Radar-And-Radiometric-Remote-Sensing-P1738.aspx* • Solimini, ***Understanding Earth Observation***. Springer. 2016. *http://www.springer.com/gp/book/9783319256320*
5	**Assessment methods**	The final test consists in a oral exam and a critical discussion of the laboratory assignment results