Freie Universität Bozen
Libera Università di Bolzano
Università Liedia de Bulsan

Syllabus
Course description

Course title	Advanced Geomatics and Environmental Impact Assessment
Course code	47032
Scientific sector	AGR/10 – ICAR/20
Degree	Environmental Management of Mountain Areas
Semester	II
Year	I
Academic year	2019/2020
Credits	6 (3+3)
Modular	*yes*

Total lecturing hours	40 (20+20)
Total lab hours	-
Total exercise hours	20 (10+10)
Attendance	Recommended
Prerequisites	Familiarity with IT-Systems
Course page	https://www.unibz.it/en/faculties/sciencetechnology/master-environmental-management-mountain-areas/course-offering/

Specific educational objectives	The course belongs to the class related ("affini") in the curriculum "Environmental Management of Mountain Areas (EMMA)". It aims to teach both scientific foundations and practical methods. The Environmental Impact Assessment module aims at providing students with: - Theoretical knowledge to understand the main environmental assessment procedures, methods and techniques; - Operational knowledge to design and conduct environmental impact assessments of projects. Upon completion of this course, students will be able to: 1. Understand the main stages of environmental impact assessment of projects; 2. Select and apply suitable analytical tools to design and perform impact analysis on selected environmental components; 3. Assess and compare the impacts of alternative proposals; 4. Critically evaluate the quality of an environmental impact assessment. The Advanced Geomatics module aims to give the students advanced tools to virtually approach any Geomatics related

	problem. Students will be introduced into the techniques of geographic scripting, which will allow them to then solve complex geographic matters by writing simplified programs to access online datasets, download them, process them in batch mode, generate spatially aggregated data and produce reports to describe them. Upon completion of this course, students will be able to: 1. write simple geographic scripts 2. generate spatially aggregated datasets from spatial and non spatial information 3. process raster and vector data 4. embed advanced processing modules for forestry analysis into geographic scripts

Module 1	Environmental Impact Assessment
Lecturer	*Davide Geneletti, davide.geneletti@unibz.it* *University of Trento, email davide.geneletti@unitn.it, tel: 0461282685, webpage: http://www.planningfores.com*
Scientific sector of the lecturer	ICAR/20
Teaching language	English
Office hours	See timetable
Teaching assistant (if any)	-
List of topics covered	The course will cover the following topics: 1. Introduction to environmental assessment: concepts, procedures and legislation; 2. Environmental Impact Assessment: procedural and technical aspects; actors; 3. Main stage of Impact Assessment 4. Scoping and baseline study for environmental impact assessment; 5. Impact analysis on selected environmental components; 6. Impact mitigation and off-sets; 7. Cumulative effects and principles of sustainability assessment; 8. Multicriteria analysis to compare project alternatives; 9. Case studies in mountain areas.
Teaching format	Lectures are combined with presentation and discussion of case studies and short assignments, using problem-based learning techniques. Presentations, reading material and links to additional resources will be made available on the Reserve collection.

Module 2	Advanced Geomatics
Lecturer	Andrea Antonello, Free University of Bolzano. Email:

	andrea.antonello@unibz.it
Scientific sector of the lecturer	AGR/10
Teaching language	English
Office hours	See timetable
Teaching assistant *(if any)*	//
Office hours	//
List of topics covered	The course will cover the following topics: 1. Installation of the tools and quickstart 2. Review of data types and coordinate reference systems 3. Geographic scripting 4. Processing vector data 5. Processing raster data 6. Introduction to existing processing modules Producing aggregated reports
Teaching format	The lectures will be composed of presentations and exercises at the computer. The presentations will be available on the unibz reserve collection.

Learning outcomes	**Knowledge and understanding** of i) basic and applied concepts in Environmental Impact Assessment; ii) usefulness of different tools and techniques to support impact assessment; **Applying knowledge and understanding** to i) proposing solutions to impact assessment problems by assessing and comparing possible alternatives **Making judgements** on the most suitable approaches, methodologies and workflows to address a broad range of problems in environmental impact assessment, and on the datasets required to perform the analysis. **Communication skills** to present basic concepts and case study applications related to impact assessment to both a technical and non-technical audience clearly, concisely and using adequate technical terminology. **Learning skills** to autonomously deepen and update the knowledge acquired during the course seeking relevant information on scientific and technical literature, for their future professional and/or academic studies

Assessment	The assessment will be carried out through i) written report (student assignments) (Module 1 and 2); ii) oral exam (Module 2);
Assessment language	English
Evaluation criteria and	The final grade for the entire course will be calculated as

criteria for awarding marks	the average of the final grades obtained in the two modules. The mark for Module 1 will be assigned based on a group "case study" report (70%) and an individual written report on a selected topic (30%). The assessment criteria for the written reports include: soundness of the proposed approach; clarity and conciseness of the text; capability to refer to relevant literature; critical thinking; mastery of the technical language. The mark for Module 2 will be assigned based on a set of written modules (80%) and an individual oral exam (20%). The assessment criteria for the written report include: critical thinking; clarity in the presented solution; capability to refer to the documentation to solve the problem; Relevant for the oral exam assessment are correctness and clarity of answers, mastery of the technical language, capability to establish relationships between different topics.

Required readings	• Scientific papers, technical documents and case study material provided in class
Supplementary readings	• Additional scientific papers and case study material provided in class