Freie Universität Bozen
Libera Università di Bolzano
Università Liedia de Bulsan

Syllabus
Course description

Course title	Geomatics and Landscape Planning
Course code	47001
Scientific sector	GEO/04 - ICAR/20
Degree	Environmental Management of Mountain Areas
Semester	1
Year	*I*
Academic year	2022/2023
Credits	6
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	Course Offering - enrolled from 2021 / Free University of Bozen-Bolzano (unibz.it)

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. Geomatics incorporates Geographic Information Systems (GIS), cartography, and GPS, along with other spatial sciences. It is designed to give students an introduction to spatial information and the current and emerging technologies for accessing, analyzing, and communicating that information. In the practical part, students will learn when and how to apply the acquired knowledge using real world case studies. Landscape planning organizes the special requirements of different land uses into a visually satisfying and healthily functioning whole. Students will learn how to spatially plan mountain regions to increase the biological and cultural richness of the landscape, to have adequate forest cover, wildlife and greater biological diversity, and a harmonious balance between humans and nature. They will see how the mountain landscape functions and is used by people and how design interventions influence this functioning and use. By the end of the course, the student is expected to have acquired:

	1) the fundamental concepts of a GIS including spatial data models, spatial analysis and cartographic principles; 2) the ability to manipulate and manage large spatial datasets adequately; 3) the ability to apply state of the art GIS software packages on environmental datasets; 4) the ability to analyze and critically question methods and results; 5) the key concepts and operational stages of landscape and land-use planning; 6) skills in collecting and interpreting relevant information to inform planning processes; 7) the ability to apply key methods to support planning processes; 8) hands-on experience with case studies in mountain areas.

Module 1	**Geomatics**
Lecturer	Dr. Egarter-Vigl Lukas
Scientific sector of the lecturer	
Teaching language	English
Office hours	From Monday to Friday on appointment
Teaching assistant *(if any)*	Tscholl Simon, Dell'Agnese Andrea
Office hours	-
List of topics covered	The course will cover the following topics: 1. Introduction to GIS concepts and techniques 2. Projections and geographical reference systems 3. Spatial data structure (vector/raster) 4. Spatial data management 5. Spatial data analysis 6. Data visualization and map creation
Teaching format	Frontal lectures and exercises on the computer. PPP and data will be available at a dedicated sharepoint site.

Module 2	**Landscape Planning**
Lecturer	Prof. Dr. Tommaso Sitzia
Scientific sector of the lecturer	ICAR/20
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. Introduction and definitions. 2. Landscape invariants. 3. Landscape planning: a regulated practice. 4. Identification and interpretation of people needs and land-use demands. 5. Instruments of analysis and interpretation. 6. Land-use supply: capacity of land cover and land

	use to respond to people needs. 7. Case studies for different sectors and spatial scales.
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 OLE.

Learning outcomes	**Knowledge and understanding** of i) basic and applied concepts in Landscape Planning and GIS; ii) usefulness of different tools and techniques to support planning and GIS processes. **Applying knowledge and understanding** to i) proposing solutions to landscape planning problems by generating and comparing possible alternative strategies ii) Be able to apply state of the art GIS software packages on key environmental datasets. **Making judgements** on the most suitable approaches, methodologies and workflows to address a broad range of problems in GIS and landscape planning, and on the datasets required to perform the analysis. **Communication skills** to present basic concepts and case study applications related to GIS and ecological and landscape planning 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 reports (student assignments) and ii) oral exam;
Assessment language	English
Evaluation criteria and criteria for awarding marks	The final grade for the entire course will be calculated as the average of the final grades obtained in the two modules. The mark for Module 1 will be assigned based on written home assignments (50%) and on an oral/practical exam (50%). The positive evaluation of student assignments is a pre-requisite to do the oral/practical exam. Criteria for the evaluation of the student assignments:

	completeness, clarity, and correctness of reported results Criteria for the evaluation of the oral/practical exam: correctness and clarity of answers/results and correctness and clarity of the methodological approach. The mark for Module 2 will be assigned based on an oral exam (100%) divided into an assignment consisting of an individual presentation (10 minutes, 10 slides) of a case study and open questions on the contents of the course. Criteria for the evaluation of the exam will be: soundness of the analysis and interpretation of the case study; clarity and conciseness; capability to refer to relevant literature; critical thinking; mastery of the technical language.

Required readings	• Lloyd, C. (2010): Spatial data analyses. An introduction for GIS users. Oxford University Press. • Lang, S.; Blaschke, T. (2007): Landschaftsanalyse mit GIS. Utb; Ulmer. • Campbell, J. B. (2011): Introduction to Remote Sensing. The Guilford press. • There is no book that meets all the needs of the landscape planning module offered here. Frederick R. Steiner's book "The living landscape: an ecological approach to landscape planning" (Island Press, 2008) is comprehensive and in-depth and focuses on North America and can be used by students wishing to explore the topics in depth. Slides, lectures and the field practice provide a good preparation to the exam. For non-attending students, the content of the slides and the recording of the lectures are a valuable support. The lecturer gives assistance during office hours or by appointment to be arranged by email. • Slides, scientific papers, technical documents and case study material provided in class.
Supplementary readings	• Additional scientific papers, books and case study material suggested in class.