Syllabus

Kursbeschreibung

Titel der Lehrveranstaltung	Advanced geomatics and environmental impact assessment
Code der Lehrveranstaltung	47032
Zusätzlicher Titel der Lehrveranstaltung	
Wissenschaftlich-disziplinärer Bereich	
Sprache	Englisch
Studiengang	Master in Umweltmanagement in Bergregionen
Andere Studiengänge (gem. Lehrveranstaltung)	
Dozenten/Dozentinnen	Prof. Davide Geneletti, Davide.Geneletti@unibz.it https://www.unibz.it/en/faculties/agricultural-environmental-food-sciences/academic-staff/person/35030 dr. Massimiliano Schiavo, Massimiliano.Schiavo@unibz.it https://www.unibz.it/en/faculties/agricultural-environmental-food-sciences/academic-staff/person/51418
Wissensch. Mitarbeiter/Mitarbeiterin	
Semester	Zweites Semester
Studienjahr/e	1
KP	6
Vorlesungsstunden	36
Laboratoriumsstunden	24
Stunden für individuelles Studium	90
Vorgesehene Sprechzeiten	18
Inhaltsangabe	- Introduction to environmental impact assessment (EIA): philosophy, concepts and legislation - Procedural and technical aspects in EIA: key stages and actors

	- EIA screening and scoping - Impact analysis: characterization, prediction and assessment of environmental impacts - Impact mitigation and off-sets - Cumulative effects and principles of sustainability assessment - Case studies and applications relevant for mountain areas - Geodesy: analyse territorial datasets - Geomatics: employment of GIS-based software and data georeferencing - Spatial analysis and interpolation - Uncertainty analysis - Communication skills 1 (preparing a technical report on real case studies using GIS-based products) - Communication skills 2 (discussing a scientific paper on the topic of the course)
Themen der Lehrveranstaltung	Advanced Geomatics: - basics of geodesy - basics of cartography - basics of topography - basics of spatial statistics - basics of spatial interpolation - fundamental plugins in QGIS (free software) - basics of programming to manage data and outputs (MATLAB online free version) - basics of GPS - use of territorial datasets Environmental Impact Assessment: The course will cover the following topics: 1. Introduction to environmental impact assessment (EIA): origin, purposes, and legislative framework 2. Procedural and technical aspects in EIA: key stages and actors 3. EIA screening and scoping (purposes and main techniques) 4. Impact analysis: characterization, prediction and assessment of environmental impacts 5. Impact mitigation and off-sets 6. Cumulative effects and principles of sustainability assessment; 7. Case studies and application examples, with particular focus on mountain areas.

Stichwörter	Advanced Geomatics: topography, geomatics, geostatistics, spatial analysis Environmental Impact Assessment: biodiversity, Impact Mitigation, Sustainability
Empfohlene Voraussetzungen	
Propädeutische Lehrveranstaltungen	No
Unterrichtsform	Advanced Geomatics: - frontal lectures, including: (i) oral notes, (ii) projected notes via slides (in English), and (iii) written notes via blackboard teaching - mini-assignment during the course to be completed before the written test - written test (2h) - brief field exercise with GPS - use of freely available online territorial datasets Environmental Impact Assessment: Lectures are combined with presentation and discussion of case studies, short assignments and a field-trip, using also problem-based learning techniques.
Anwesenheitspflicht	No
Spezifische Bildungsziele und erwartete Lernergebnisse	Knowledge and understanding -->
- apply spatial information systems for land management and planning
- assess the natural hazards typical of mountain environments and their impact on society, identifying the most appropriate mitigation strategies
- collaborate with other professionals in the fields of architecture, engineering and natural sciences Ability to apply knowledge and understanding -->
The tests (written and oral examinations, reports) and exercises involve the performance of specific tasks in which the student demonstrates mastery of tools, methodologies and critical autonomy. Autonomy of judgement -->
Autonomy of judgement is developed by means of training aimed

	at stimulating students' critical analysis. This includes the use of case studies, simulations using spreadsheets and videos, the critical reading and discussion of scientific articles, as well as specialised seminars conducted by experts from the forestry and environmental sector. The assessment of the autonomy of judgement acquired by the students is entrusted to the individual lecturers responsible for the training activities, who will assess it through oral and/or written reports on specific topics and/or through the examination. Communication skills --> Graduates will be able to work professionally and scientifically in one or more foreign languages, since in addition to English (the official language of the course) in which all compulsory and part of the optional courses are offered, they will be able to follow optional courses offered in Italian or German. The Language Centre of the Free University of Bozen/Bolzano also offers students, in accordance with the policy for trilingualism that characterises the profile of the Free University of Bozen/Bolzano, the possibility of taking extracurricular courses at level (A1-C1) in Italian and German. Finally, the graduate will be able to effectively communicate what he or she has learnt to the different professional categories with which he or she works and has the ability, given the international nature of the degree course, to share projects with foreign interlocutors. Written and oral communication skills are developed in seminars, tutorials and training activities, which also include the preparation of written reports and documents and the oral presentation of these, compulsorily in English and possibly in Italian and German for optional courses. The acquisition and assessment/verification of the achievement of communication skills is also envisaged through the writing of the final dissertation and its discussion in English. The Master's degree course promotes the acquisition of additional language skills (Italian/German), which are also aimed at increasing the ability of graduates to effectively market themselves on the labour market in part of the Alpine region (Austria-Switzerland-Italy-Germany). Learning capacity -->

	The graduate will have the ability to learn by synthesising the notions learnt in the course of studies, in order to address complex design issues, by expanding and updating the knowledge and technical skills acquired by using analysis, design and management tools appropriate to the situations in which the graduate operates. The graduate will be able to manage the different information networks in order to be able to continue to learn and thus to update himself/herself for his/her own cultural improvement and professional advancement. In addition, the graduate will be able to identify the appropriate training tools and paths for the development of their own cultural and specialist knowledge. Learning skills are attained during all phases of the course of study. The Master's degree course enables students to consolidate their self-study skills, especially when they carry out group work on proposed topics; again, this ability is enhanced during a compulsory course, which involves group work, and subsequently in the preparation of the final thesis of an experimental nature. In particular, this practical course requires students to work in small groups (3-5) on a project (e.g., rural development plan for a mountainous area, rehabilitation project for a degraded terrestrial or river ecosystem) from its initial stages (identification of objectives, conceptual development of actions, collection of available data) through to interaction with the various stakeholders and communication activities towards society. The projects will take place under the supervision of two or more professors from the two universities involved, but also by having the students interact with professional firms and/or public technical offices that have already expressed interest and willingness to do so. Learning ability is assessed through continuous forms of verification during the training activities and during the conduct of the activity related to the final examination.
Spezifisches Bildungsziel und erwartete Lernergebnisse (zusätzliche Informationen)	
Art der Prüfung	Advanced Geomatics: written test 2h Environmental Impact Assessment: oral discussion
Bewertungskriterien	Advanced Geomatics and Environmental Impact Assessment: clarity, scientific robustness of the discussion, problem solving,

	critical thinking
Pflichtliteratur	Advanced Geomatics: lecture notes, including both slides and personal notes taken during the lessons Environmental Impact Assessment: The reading material includes the references mentioned during lectures and uploaded or cited in the presentations made available on OLE. This material includes scientific reports, book chapters and scientific papers, guidelines and case-study documents.
Weiterführende Literatur	Advanced Geomatics: • QGIS free documentation: https://docs.qgis.org/3.40/en/docs/index.html • QGIS User's Guide (in Italian): https://docs.qgis.org/3.16/pdf/it/QGIS-3.16-DesktopUserGuide-it.pdf • Handbook of Big Geospatial Data. Werner and Chiang Eds. (2021). Springer International Publishing. • Isaaks, E. H., & Srivastava, R. M. (1989). An introduction to applied geostatistics. Oxford University Press. Environmental Impact Assessment: Selected introductory textbooks on Environmental Impact Assessment (e.g., Glasson et al., Therivel et al, Morrison-Saunders)
Weitere Informationen	
Ziele für nachhaltige Entwicklung (SDGs)	Hochwertige Bildung, Geschlechter-Gleichheit, Sauberes Wasser und Sanitär-Einrichtungen, Leben an Land, Industrie, Innovation und Infrastruktur, Nachhaltige Städte und Gemeinden, Bezahlbare und saubere Energie

Kursmodul

Titel des Bestandteils der Lehrveranstaltung	Advanced geomatics
Code der Lehrveranstaltung	47032A
Wissenschaftlich-disziplinärer Bereich	AGRI-04/C
Sprache	Englisch

Dozenten/Dozentinnen	dr. Massimiliano Schiavo, Massimiliano.Schiavo@unibz.it https://www.unibz.it/en/faculties/agricultural-environmental-food-sciences/academic-staff/person/51418
Wissensch. Mitarbeiter/Mitarbeiterin	
Semester	Zweites Semester
KP	3
Verantwortliche/r Dozent/in	
Vorlesungsstunden	18
Laboratoriumsstunden	12
Stunden für individuelles Studium	45
Vorgesehene Sprechzeiten	9
Inhaltsangabe	- Geodesy: analyse territorial datasets - Geomatics: employment of GIS-based software and data georeferencing - Spatial analysis and interpolation - Uncertainty analysis - Communication skills 1 (preparing a technical report on real case studies using GIS-based products) - Communication skills 2 (discussing a scientific paper on the topic of the course)
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Unterrichtsform	- frontal lectures, including: (i) oral notes, (ii) projected notes via slides (in English), and (iii) written notes via blackboard teaching - mini-assignment during the course to be completed before the written test

	- written test (2h) - brief field exercise with GPS - use of freely available online territorial datasets
Pflichtliteratur	• lecture notes, including both slides and personal notes taken during the lessons
Weiterführende Literatur	• QGIS free documentation: https://docs.qgis.org/3.40/en/docs/index.html • QGIS User's Guide (in Italian): https://docs.qgis.org/3.16/pdf/it/QGIS-3.16-DesktopUserGuide-it.pdf • Handbook of Big Geospatial Data. Werner and Chiang Eds. (2021). Springer International Publishing. • Isaaks, E. H., & Srivastava, R. M. (1989). An introduction to applied geostatistics. Oxford University Press.

Kursmodul

Titel des Bestandteils der Lehrveranstaltung	Environmental impact assessment
Code der Lehrveranstaltung	47032B
Wissenschaftlich-disziplinärer Bereich	CEAR-12/A
Sprache	Englisch
Dozenten/Dozentinnen	Prof. Davide Geneletti, Davide.Geneletti@unibz.it https://www.unibz.it/en/faculties/agricultural-environmental-food-sciences/academic-staff/person/35030
Wissensch. Mitarbeiter/Mitarbeiterin	
Semester	Zweites Semester
KP	3
Verantwortliche/r Dozent/in	
Vorlesungsstunden	18
Laboratoriumsstunden	12
Stunden für individuelles	45

Studium	
Vorgesehene Sprechzeiten	9
Inhaltsangabe	- Introduction to environmental impact assessment (EIA): philosophy, concepts and legislation - Procedural and technical aspects in EIA: key stages and actors - EIA screening and scoping - Impact analysis: characterization, prediction and assessment of environmental impacts - Impact mitigation and off-sets - Cumulative effects and principles of sustainability assessment - Case studies and applications relevant for mountain areas
Themen der Lehrveranstaltung	The course will cover the following topics: 1. Introduction to environmental impact assessment (EIA): origin, purposes, and legislative framework 2. Procedural and technical aspects in EIA: key stages and actors 3. EIA screening and scoping (purposes and main techniques) 4. Impact analysis: characterization, prediction and assessment of environmental impacts 5. Impact mitigation and off-sets 6. Cumulative effects and principles of sustainability assessment; 7. Case studies and application examples, with particular focus on mountain areas.
Unterrichtsform	Lectures are combined with presentation and discussion of case studies, short assignments and a field-trip, using also problem-based learning techniques.
Pflichtliteratur	The reading material includes the references mentioned during lectures and uploaded or cited in the presentations made available on OLE. This material includes scientific reports, book chapters and scientific papers, guidelines and case-study documents.
Weiterführende Literatur	Selected introductory textbooks on Environmental Impact Assessment (e.g., Glasson et al., Therivel et al, Morrison-Saunders)