Freie Universität Bozen
Libera Università di Bolzano
Università Liedia de Bulsan

Syllabus
Course description

Course title	Basics of environmental economics and natural risk management
Course code	47028
Scientific sector	AGR/01 - AGR/08
Degree	Environmental Management of Mountain Areas
Semester	1
Year	*I*
Academic year	2019/2020
Credits	6
Modular	*yes*

Total lecturing hours	40 (20 + 20)
Total lab hours	-
Total exercise hours	20 (10 + 10)
Attendance	Optional
Prerequisites	-
Course page	Module 2 on UNIBZ Moodle website https://next.unibz.it/en/faculties/sciencetechnology/master-environmental-management-mountain-areas/course-offering/

Specific educational objectives	This course belongs to those characterizing the Master program. By the end of the course, the student is expected to have acquired: 1) the most updated scientific knowledge on the main characteristics of these natural hazards; 2) the capacity to predict the possible interactions between fluvial and colluvial processes at the basin scale; 3) the capability to identify the most adequate structural and non-structural measures to mitigate the associated risk, as well as their pros and cons; 4) the economic rational underlying the need for environmental policy (e.g. market failure, externalities); 5) an advanced knowledge of policy instrument selection for environmental management problems; 6) the basic understanding of economic valuation techniques.

Module 1	**Environmental Economics**
Lecturer	Elisabeth Gsottbauer, elisabeth.gsottbauer@unibz.it
Scientific sector of the lecturer	AGR/01
Teaching language	English
Office hours	see timetable

Teaching assistant *(if any)*	-
Office hours	-
List of topics covered	The course will cover the following main topics: 1. Introduction to the relationship between the economy and the environment 2. Need for environmental policy making (market failures including external effects and public goods, internalisation of externalities) 3. Design of environmental policy instruments (review of policy instruments including legal instruments, taxes/subsidies, tradable permits, moral suasion and others; policy criteria and instrument selection) 4. International environmental problems (game-theoretic analysis, global public goods, international environmental agreements) 5. Environmental valuation methods (basic concepts & theory, revealed and stated preferences approaches, application to economics of valuing ecosystem services and biodiversity) 6. Policy instruments in practice (applied examples, amongst others, land-use and biodiversity conservation)
Teaching format	The course will consist of a mixture of lectures, exercises, a case study and a final written examination. Lectures will be closely linked to the course literature and presentations will be made available to you on the website of the University. Class exercises and case study work will also help students to understand contents and material presented.

Module 2	**Management of Natural Risk in Mountain Areas**
Lecturer	Francesco Comiti, building K, office K203, email francesco.comiti@unibz.it, tel: 0471017126
Scientific sector of the lecturer	AGR/08
Teaching language	English
Office hours	Any time, upon prior arrangement by email
Teaching assistant (if any)	Michael Engel
Office hours	upon arrangement by email
List of topics covered	The course will cover the following topics: 1. Basics of mountain geomorphology 2. Hillslope processes (snow avalanches, landslides) 3. Debris flows processes 4. Glacial and periglacial processes 5. Flood processes in mountain streams 6. Definition of hazard, vulnerability and risk 7. Modelling tools for natural hazards prediction 8. Structural and non-structural mitigation measures
Teaching format	Theoretical concepts are presented in the class by the Professor and field excursions are led by the Professor

	with the teaching assistant. Power Point presentations of the lectures will be made available on the Moodle website. Additional material will be provided on selected topics.

Learning outcomes	**Knowledge and understanding** of i) basic aspects of natural hazards and related risks; ii) main geomorphological processes typical of mountain areas and of their possible management strategies (iii) economic framework underlying environmental policy making; (iv) selection criteria for the evaluation of environmental policy instruments; (v) background and methods of environmental valuation techniques **Applying knowledge and understanding** to i) geomorphological analysis of mountain landscapes and in the proposal of the most suitable mitigation measures against hazard; (ii) select environmental policy options suited to an environmental management problem (iii) model international environmental problems using tools of game theory. **Making judgements** on (i) natural hazards types and management options through the personal interpretation of the study areas visited during the field trips (ii) selection and design of environmental policy instruments; (iii) institutional solutions to specific international environmental problems; (iv) use and choice of appropriate environmental valuation techniques. **Communication skills** (i) to present basic and applied aspects of geomorphological processes in mountain areas and of management strategies to stakeholders, scientists, and the public clearly and unambiguously with pertinent and adequate technical terminology; (ii) to present an economic analysis of specific environmental issues and an assessment of potential policy options **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 of students' outcomes will be carried out through i) written exam; ii) oral exam; iii) individual written reports and presentations
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 the final

	written exam (60%), home assignments and participation in exercises (20%), and a group case study presentation (20%). The mark for Module 2 will be assigned based on an oral exam (80 %) and on an individual report (20 %). Relevant for assessment of student reports: ability to use correct technical terminology, to present recent scientific results and to apply a critical thinking. 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	• Tietenberg, T., Lewis, L. (2009). Environmental and Natural Resources Economics. Pearson International Edition, Boston, MA. • Sterner, T., and Coria, J. (2012) Policy instruments for environmental and natural resource management. Second Edition. Resources for the Future. Routledge Taylor&Francis Group. • Perman, R., Ma, Y., McGilvray, J. and Common, M. (2010) Natural resource and environmental economics. Pearson. • P. L. Bierman and D. R. Montgomery (2013) Key concepts in Geomorphology. Macmillan learning (selected chapters) • Scientific papers provided in class
Supplementary readings	• Additional scientific papers provided in class