# Syllabus

## *Descrizione corso*

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| **Titolo insegnamento** | Management of forests and agriculture resources in mountain areas |
| **Codice insegnamento** | 47051 |
| **Titolo aggiuntivo** | |
| **Settore Scientifico-Disciplinare** | |
| **Lingua** | Inglese |
| **Corso di Studio** | Corso di laurea magistrale in Gestione sostenibile dell´ambiente montano |
| **Altri Corsi di Studio (mutuati)** | |
| **Docenti** | prof. Damiano Zanotelli,<br>Damiano.Zanotelli@unibz.it<br>https://www.unibz.it/en/faculties/agricultural-environmental-food-sciences/academic-staff/person/18696<br>dr. Michele Torresani,<br>Michele.Torresani@unibz.it<br>https://www.unibz.it/en/faculties/agricultural-environmental-food-sciences/academic-staff/person/37414<br>prof. Roberto Tognetti,<br>Roberto.Tognetti@unibz.it<br>https://www.unibz.it/en/faculties/agricultural-environmental-food-sciences/academic-staff/person/47243 |
| **Assistente** | dott. Francesco Gubert<br>dott. Vincenzo Saponaro |
| **Semestre** | Primo semestre |
| **Anno/i di corso** | 1 |
| **CFU** | 9 |
| **Ore didattica frontale** | 54 |
| **Ore di laboratorio** | 36 |
| **Ore di studio individuale** | 135 |

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| **Ore di ricevimento previste** | 27 |
| **Sintesi contenuti** | - Introduction to mountain forests<br>- Mountain forests and disturbances<br>- Silvicultural systems<br>- Forest types<br>- Forests and biogeochemical cycles<br>- Multi-objective Forestry<br>- Fundamentals of Climate Smart Forestry<br>- Introduction and peculiarities of mountain agriculture (facts and figures, challenges, and opportunities)<br>- Production protocols, sustainability, principles of agroecology<br>- Sustainable management of soil and water in mountain agriculture<br>- Adaptation and management of the main climatic variables in mountain agricultural systems<br>- Analysis of specific case studies of mountain agriculture through lectures, exercises and the assignments |
| **Argomenti dell'insegnamento** | Module A – Management of Mountain Forests<br>Introduction to mountain forests<br>Silvicultural systems in mountain regions<br>Mountain forests and natural disturbances<br>Module B – Management of Agricultural Resources<br>Overview of mountain agriculture: facts, challenges, and opportunities<br>Sustainable production protocols and agroecology principles<br>Soil and water resource management in mountain agriculture<br>Management of climatic variables (temperature, radiation, wind, etc.)<br>Case studies of crop production systems (horticultural, arable, vegetable, pasture, meadow) |
| **Parole chiave** | Mountain forests, silvicultural systems, forest disturbances, biogeochemical cycles, mountain agriculture, agroecology, soil and water management, climate factors in agriculture, sustainable production, resource management. |
| **Prerequisiti** | Students should have a basic knowledge of forest management. |
| **Insegnamenti propedeutici** | No |
| **Modalità di insegnamento** | Lectures introducing core concepts and methods.<br>Field excursions to observe forest and agricultural systems in |

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| | mountain areas.<br>Focus seminars and case studies using problem-based learning.<br>Assignments and student presentations to apply concepts to practical examples. |
| **Obbligo di frequenza** | No |
| **Obiettivi formativi specifici e risultati di apprendimento attesi** | Knowledge and understanding --><br>- apply the basic principles of safety management in workplaces (outdoor and indoor), related to both agricultural and silvicultural activities in mountainous areas<br><br>Ability to apply knowledge and understanding --><br>In addition to having acquired a solid scientific-technological basis, the graduate of the Master's degree in "Environmental Management of Mountain Areas" acquires the ability to tackle and solve new problems. Thanks to a technical-scientific education, integrated with technological-managerial subjects, he or she is able to analyse, design, plan and manage the mountain territory and its specificities, vulnerabilities and characteristics. The graduate must also be able to coordinate interdisciplinary teams in the fields of ecology, restoration and functional maintenance of mountain ecosystems, agro-forestry management and socio-economic development.<br>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.<br>The final thesis will play a central role in assessing the students' ability to design, plan, and manage forest ecosystems, with particular reference to the mountain environment.<br><br>Autonomy of judgement --><br>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.<br>Another fundamental means of developing independence and critical awareness is through the drafting of the final thesis, in which the student must demonstrate that he or she has acquired autonomy of choice and design skills. |

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| | The writing of the thesis, which is experimental in nature, will follow the editorial style of a scientific publication, further consolidating the student's critical skills.<br>Other key training moments for the development of independent judgement include educational visits and internships in companies and public or private institutions.<br><br>Communication skills --><br>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.<br>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.<br>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.<br>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).<br><br>Learning capacity --><br>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 |

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| | 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. |
| **Obiettivi formativi specifici e risultati di apprendimento attesi (ulteriori info.)** | |
| **Modalità di esame** | Evaluation is based on a combination of oral/written exams, assignments, and/or student presentations. |
| **Criteri di valutazione** | Criteria include correctness of answers, clarity of communication, critical thinking, ability to connect topics, and proper use of technical language. |
| **Bibliografia obbligatoria** | Provided via Open Learning Environment or MS Teams. |

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| **Bibliografia facoltativa** | Provided via Open Learning Environment or MS Teams. |
| **Altre informazioni** | Provided via Open Learning Environment or MS Teams. |
| **Obiettivi di Sviluppo Sostenibile (SDGs)** | Buona salute, Utilizzo sostenibile della terra, Lotta contro il cambiamento climatico, Utilizzo responsabile delle risorse |

# *Modulo del corso*

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| **Titolo della parte costituente del corso** | Management of mountain forests |
| **Codice insegnamento** | 47051A |
| **Settore Scientifico-Disciplinare** | AGRI-03/B |
| **Lingua** | Inglese |
| **Docenti** | dr. Michele Torresani,<br>Michele.Torresani@unibz.it<br>https://www.unibz.it/en/faculties/agricultural-environmental-food-sciences/academic-staff/person/37414<br>prof. Roberto Tognetti,<br>Roberto.Tognetti@unibz.it<br>https://www.unibz.it/en/faculties/agricultural-environmental-food-sciences/academic-staff/person/47243 |
| **Assistente** | dott. Vincenzo Saponaro |
| **Semestre** | |
| **CFU** | 6 |
| **Docente responsabile** | |
| **Ore didattica frontale** | 36 |
| **Ore di laboratorio** | 24 |
| **Ore di studio individuale** | 90 |
| **Ore di ricevimento previste** | 18 |
| **Sintesi contenuti** | - Introduction to mountain forests<br>- Mountain forests and disturbances<br>- Silvicultural systems<br>- Forest types<br>- Forests and biogeochemical cycles<br>- Multi-objective Forestry<br>- Fundamentals of Climate Smart Forestry |

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| **Argomenti dell'insegnamento** | Introduction to mountain forests<br>Silvicultural systems in mountain regions<br>Mountain forests and natural disturbances |
| **Modalità di insegnamento** | Lectures introducing core concepts and methods.<br>Field excursions to observe forest and agricultural systems in mountain areas.<br>Focus seminars and case studies using problem-based learning.<br>Assignments and student presentations to apply concepts to practical examples. |
| **Bibliografia obbligatoria** | Provided via Open Learning Environment or MS Teams |
| **Bibliografia facoltativa** | Provided via Open Learning Environment or MS Teams |

# *Modulo del corso*

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|---|---|
| **Titolo della parte costituente del corso** | Management of agricultural resources |
| **Codice insegnamento** | 47051B |
| **Settore Scientifico-Disciplinare** | AGRI-03/A |
| **Lingua** | Inglese |
| **Docenti** | prof. Damiano Zanotelli,<br>Damiano.Zanotelli@unibz.it<br>https://www.unibz.it/en/faculties/agricultural-environmental-food-sciences/academic-staff/person/18696 |
| **Assistente** | dott. Francesco Gubert |
| **Semestre** | |
| **CFU** | 3 |
| **Docente responsabile** | |
| **Ore didattica frontale** | 18 |
| **Ore di laboratorio** | 12 |
| **Ore di studio individuale** | 45 |
| **Ore di ricevimento previste** | 9 |
| **Sintesi contenuti** | - Introduction and peculiarities of mountain agriculture (facts and figures, challenges, and opportunities) |

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| | - Production protocols, sustainability, principles of agroecology<br>- Sustainable management of soil and water in mountain agriculture<br>- Adaptation and management of the main climatic variables in mountain agricultural systems<br>- Analysis of specific case studies of mountain agriculture through lectures, exercises and the assignments |
| **Argomenti dell'insegnamento** | The module will cover the following topics:<br>- The transition towards a sustainable agri-food sector<br>- Major constraints and opportunities in mountain agriculture<br>- Resources and environmental drivers in mountain agriculture, including soil, water and nutrient management and the effects of temperature and radiation on crop growth<br>- Principles of agroecology and smart farming for the sustainable management of resources |
| **Modalità di insegnamento** | Lectures, group activity, and field excursions |
| **Bibliografia obbligatoria** | The oral exam will be based on the content discussed in class and reported in the hand-outs of each lecture, which will be loaded on the dedicated Teams platform before each lecture. The group assignment is aimed at analyzing and presenting a selected case study of mountain agriculture, starting from the materials provided in class. |
| **Bibliografia facoltativa** | The reference book regarding the management of agricultural resources is:<br>· Principles of Agronomy for Sustainable Agriculture. Villalobos F.J., Fereres E., 2016. Springer ISBN 978-3-319-46115-1 |