# Syllabus

## *Course Description*

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| **Course Title** | Structure and Function of Mountain Ecosystems |
| **Course Code** | 40200 |
| **Course Title Additional** | |
| **Scientific-Disciplinary Sector** | BIOS-01/C |
| **Language** | German |
| **Degree Course** | Bachelor in Agricultural, Food and Mountain Environmental Sciences |
| **Other Degree Courses (Loaned)** | |
| **Lecturers** | Prof. Dr. Camilla Wellstein, Camilla.Wellstein@unibz.it https://www.unibz.it/en/faculties/agricultural-environmental-food-sciences/academic-staff/person/33786 |
| **Teaching Assistant** | |
| **Semester** | First semester |
| **Course Year/s** | 3 |
| **CP** | 6 |
| **Teaching Hours** | 36 |
| **Lab Hours** | 24 |
| **Individual Study Hours** | 90 |
| **Planned Office Hours** | 18 |
| **Contents Summary** | The core subjects of the course are ecology, biology, and environmental sciences. Characteristic subjects include vegetation science, botany, landscape ecology, and nature conservation. Related subjects are soil science, restoration ecology, grassland agriculture, and forestry. The course is a compulsory subject within the study branch 2 "Management of Mountain Environments," which is offered in the Bachelor's degree program "Agricultural, Food, and Mountain Environmental Sciences."<br>The aim of the course is to impart basic theoretical and methodological knowledge in the core subjects as well as |

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| | specialized knowledge in the characteristic subjects.<br>Students gain an overview of the fundamentals and applied aspects of the entire field of ecosystem research. In-depth knowledge of the structure, function, services, historical development, control variables, evaluation, management, sustainable aspects, as well as the use and protection of ecosystems in mountain areas is provided.<br>Students develop an understanding of the structure and function of mountain ecosystems and their relationship to the environment.<br>On the practical side, students will learn how to identify plants, measure functional plant traits, measure and calculate ecosystem parameters, and evaluate ecosystems.<br>Upon completion of the course, students should:<br>• Understand theoretical concepts and technical terms of ecosystem research,<br>• Know the structures, functions, and processes of mountain ecosystems,<br>• Be able to apply vegetation science, botanical, environmental science, and ecological methods,<br>• Be able to characterize and evaluate mountain ecosystems,<br>• Have gained a comprehensive understanding of ecosystems in mountain areas in space and time. |
| Course Topics | 1) Theory and Concept of Ecosystems<br>2) Ecosystem Functions and Services<br>3) Types and Diversity of Mountain Ecosystems<br>4) Semi-Natural Systems<br>5) Natural Systems<br>6) Ecosystem Ecology<br>7) Historical Development of Landscapes and Ecosystems<br>8) Biodiversity in Ecosystems<br>9) Impacts of Land-Use Change on Ecosystems<br>10) Impacts of Climate Change on Ecosystems and Mitigation Strategies<br>11) Productivity, Nutrient Cycling, and Nitrogen Deposition<br>12) Ecosystem Evaluation Criteria<br>13) Taxonomic Evaluation (including plant identification and knowledge)<br>14) Functional Evaluation (including functional plant traits)<br>15) Multidisciplinary Evaluation |

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| | 16) Conversion and Restoration<br>17) Ecosystem Protection |
| **Keywords** | Ecosystem theory, ecosystem functions, ecosystem services, ecosystem change, ecosystem diversity, ecosystem evaluation, ecosystem protection, ecosystem restoration, grasslands, forests, mires, agroecosystems, alpine ecosystems |
| **Recommended Prerequisites** | Principals of Botany |
| **Propaedeutic Courses** | no |
| **Teaching Format** | The course combines lectures with exercises and excursions. Media and methods used include PowerPoint presentations, blackboards, binoculars, herbariums, practical work, presentations, group work, project work, discussions, and excursions. The PowerPoint presentations will be made available via OLE after the lecture. Additional materials will be provided by the professor if necessary. |
| **Mandatory Attendance** | no |
| **Specific Educational Objectives and Learning Outcomes** | Knowledge and understanding of the fundamentals of ecosystem research and ecology. This includes acquiring basic knowledge in vegetation science, botany, environmental sciences, and ecology.<br>Students acquire skills in applying knowledge and understanding regarding methods for investigating, characterising, analysing, and evaluating ecosystems.<br>They understand the basics of the structure and function of ecosystems and their relationship to the environment.<br>Students gain the ability to independently assess the structure and function of ecosystems as well as the methods for their investigation.<br>Students acquire competence in communication regarding the structuring and presentation of scientific content, particularly in the field of ecology and the environment.<br>Students develop learning strategies for autonomous knowledge acquisition through reading and understanding scientific literature and textbooks. Additionally, they develop strategies for learning taxonomic plant knowledge. |
| **Specific Educational Objectives and Learning Outcomes (additional info.)** | |
| **Assessment** | The course assessment is divided into three parts:<br>- Written final exam |

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| | - Projects<br>- Presentation<br><br>The written final exam assesses the content of the theory (lectures) and practice (exercises and excursions) covered in the knowledge, description, and analysis of ecosystems. Transfer questions are also asked to assess the ability to apply the acquired knowledge and to make judgments. The projects and presentations assess the acquisition of communicative competence. |
| **Evaluation Criteria** | The three parts of the exam are weighted as follows when calculating the overall grade:<br>- Written final exam (70%)<br>- Projects (15%)<br>- Presentation (15%)<br><br>The written final exam must be passed successfully (i.e., 18-30 points out of a maximum of 30).<br>The criteria for assessing the individual parts of the exam are:<br>- Written final exam: accuracy, relevance to content<br>- Projects: ability to collaborate, creativity and critical thinking, analytical skills, judgment<br>- Presentation: accuracy, relevance to content, communication skills, ability to synthesize |
| **Required Readings** | - Ellenberg, Leuschner – Vegetation Mitteleuropas mit den Alpen (2010), Ulmer Verlag, 6. Aufl. |
| **Supplementary Readings** | - Poschlod – Geschichte der Kulturlandschaft (2015), Ulmer Verlag<br>- Fischer, Oswald, Adler (2008): Exkursionsflora von Österreich, Liechtenstein und Südtirol. 3. Aufl.<br>- Hobohm (2021): Perspectives for Biodiversity and Ecosystems. Springer Verlag. |
| **Further Information** | |
| **Sustainable Development Goals (SDGs)** | Life on land, Responsible consumption and production |