

Syllabus

Course description

Course title	Computer Programming
Course code	47053B
Scientific sector	INF/01
Degree	Environmental Management of Mountain Areas
Semester	I
Year	I
Academic year	2022/2023
Credits	3
Modular	<i>yes</i>

Total lecturing hours	15
Total lab hours	-
Total exercise hours	15
Attendance	Recommended
Prerequisites	Familiarity with Computer
Course page	Course Offering - enrolled from 2021 / Free University of Bozen-Bolzano (unibz.it)

Specific educational objectives	<p>The course aims to teach computer programming from a scientific point of view. Given the diverse prior training of the students, that usually have no computer programming knowledge, the course focuses on scripting languages, in order to ease the steepness of the initial learning curve. The course has a strong practical focus and as such students should consider to attend to class in presence, for a better interaction and discussion of the contents as well as the chosen techniques.</p> <p>The course introduces the student to the general purpose scripting language Groovy and the statistical computing language R. These languages are mandatory knowledge for the courses of Applied Statistics and Advanced Geomatics.</p> <p>Upon completion of this course, students will be able to:</p> <ol style="list-style-type: none"> 1. write simple scripts in groovy and R 2. parse complex data structures or files and create simple statistics to investigate datasets 3. produce reports and charts about the data analyzed 4. create simple scientific computational modules
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Module	Computer Programming
Lecturer	Andrea Antonello, Free University of Bolzano. Email: andrea.antonello@unibz.it , tel. 3288497722
Scientific sector of the lecturer	AGR/10
Teaching language	English
Office hours	See timetable
Teaching assistant (if any)	
Office hours	
List of topics covered	<p>The course will cover the following main topics:</p> <ol style="list-style-type: none"> 1. Installation of the tools and quickstart 2. Introduction to Jupyter Notebooks 3. Introduction to Groovy 4. Data parsing and plotting with Groovy 5. Introduction to R 6. Data parsing and plotting with R
Teaching format	The lectures will be composed of presentations and many exercises at the computer. The presentations and datasets will be available on the TEAMS space of the course.

Learning outcomes	<p>A new mindset on problem solving that only computer programming can foster.</p> <p>A set of tools that can be applied in any scientific domain to batch analyze datasets of the most diverse type.</p> <p>The knowledge foundations to extend desktop applications like GIS, CAD or Spreadsheet software that allow to add functionalities through scripting.</p>
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Assessment	The assessment will be carried out through an oral exam
Assessment language	English
Evaluation criteria and criteria for awarding marks	<p>The final grade for the entire course will be calculated as the average of the final grades obtained in this module and the one of Applied Statistics.</p> <p>The mark for this module will be assigned based on an individual oral exam.</p>

Required readings	<ul style="list-style-type: none"> • Technical documentation provided in class
Supplementary readings	<ul style="list-style-type: none"> • Additional documentation provided in class