


Module: Geoscientific Programming				 UNIVERSITÄT BONN		
Module number / code: MG 14						
1. Content and qualification objectives						
Contents		This course offers an introduction to programming with MATLAB with a focus on applications in geology and hydrogeology. It is designed for students with little to no prior programming experience and aims to build a solid foundation in using MATLAB as a computational and visualization tool for geoscientific modeling and data analysis. Key topics include: <ul style="list-style-type: none">• Basics of MATLAB environment, syntax, and operations• Visualization, plotting techniques, and data handling• Algorithms, variables, loops, and indexing• Writing scripts and functions for geoscientific workflows• Introduction to numerical methods relevant to geologic and hydrogeologic problems• Practical applications such as time series analysis, groundwater data processing, and data visualization The course combines weekly lectures with hands-on computer sessions and guided exercises tailored to typical tasks encountered in geology and hydrogeology. Students will have to work independently and will also complete a group project toward the end of the course, applying the skills learned to a relevant dataset or problem of interest.				
Qualification objectives		Upon successful completion of the course, students will be able to: <ul style="list-style-type: none">• Navigate the MATLAB environment and write basic scripts and functions• Import, organize, and analyze geoscientific data using MATLAB• Create effective visualizations of time series, spatial, and tabular data• Automate repetitive analysis tasks using programming techniques• Apply basic numerical methods to solve problems in hydrogeology and geology				
2. Teaching and learning methods						
	LV-Art	Theme	Language of instruction	Group size	SWS	Workload [h]
	V	Basics of programming	en	15	3	120
	Ü	Basics of programming	en	15	2	60
3. Requirements for participation in the module						
causing obligation to prove		-				
recommended		Familiarity with any other programming languages				
4. Usability of the module						
	Study program/sub-study program		Compulsory/elective		Semester	
	M.Sc. Geologie		Elective		1st, 2nd or 3rd semester	
	M.Sc. Geochemie/Petrologie		Elective		1st, 2nd or 3rd semester	
5. Requirements for the award of credit points according to the ECTS					6 ECTS credits	
Academic achievement(s)		Successful completion of the exercises			6	
Examinations and examination language		Project (en)				
7. Frequency			8. Workload	9. Duration		
Winter semester	<input checked="" type="checkbox"/>	Winter and summer semesters	180 hours	1 semester		
Summer semester	<input type="checkbox"/>					
Module organization						
Teacher		Muniruzzaman				
Module coordinator		Prof. Dr. Muhammad Muniruzzaman				
Offering organizational unit		Institute for Geosciences				
Miscellaneous						
literature		Will be presented at the beginning of the event.				