

Study programme(s): Mathematics (M), Applied Mathematics (MAP)		
Course title: PROGRAMMING 1 (M107)		
Lecturer(s): Boris B. Šobot		
Course status: compulsory		
ECTS points: 7		
Requirements:		
Learning Objectives Training students in solving mathematical and programming problems on a computer, mastering algorithmic thinking patterns and precision of expression, using an integrated development environment (IDE) and a debugger.		
Learning Outcomes <i>Minimal:</i> Understanding and usage of basic data types and data structures, control structures, and decision-making statements. Developing habits of algorithmic thinking. <i>Desirable:</i> Understanding and usage of concepts of procedural programming, especially of structured programming. Utilization of arrays, collections, data structures. Capability to solve mathematical problems using advanced programming techniques and essential algorithms.		
Syllabus <i>Theoretical instruction</i> Identifiers, commands. Variables, common data types, expressions. Branching statements and repetition statements. Arrays, sorting, extreme elements. Methods. Strings. Multidimensional arrays. Iterative and recursive procedures. Working with basic combinatorial data structures. <i>Practical instruction</i> Training and understanding the basic principles of programming. Mastering branching statements and repetition statements, as well as basic programming techniques. Implementation of algorithms for solving concrete mathematical problems, and modification of standard algorithms to solve similar problems.		
Literature <ol style="list-style-type: none"> 1. Gutttag, John. Introduction to computation and programming using Python: With application to understanding data. MIT Press, 2016. 2. Michael Dawson. Python: Uvod u programiranje, prevod 3. izdanja, Mikro knjiga, 2010. 3. J. Sharp, Microsoft Visual C# 2005 korak po korak, CET (Microsoft Press), Beograd, 2006. 4. T. Covaci, G. O'Brien, R. Stephens, V. Varalo, MCSD Certification Toolkit, Programming in C#, John Wiley & Sons, 2013. 		
Number of active classes	Lectures: 3	Exercises: 3
Teaching methods Classical teaching methods are used in lectures with the aid of a projector. using projectors. Exercises are aimed at practicing the techniques acquired in lectures and discussing the possible applications of the programming methods on specific problems, including the possibilities of modifying existing algorithms and applying them to related problems. Knowledge is tested through programming exercises on a computer including exercises in code understanding and error detection.		

Grading (maximum number of points 100)			
Pre-exam obligations	Points	Final exam	Points
colloquia	50	oral exam	40
		tests	10