Study programme(s): bachelor academic study of physics	
Level: bachelor	
Course title: Programming and numerical mathematics	
Lecturer: Dr. Sanja Rapajić, associate professor	
Status: obligatory	
ECTS: 6	
Requirements: none	

Learning objectives

Introduction to the basic concept of programming and the theoretical foundations of numerical mathematics. Acquiring knowledge about numerical algorithms and C++ programming language.

Learning outcomes

Acquiring the basic knowledge about numerical mathematics. Acquiring skills for programming in C++ and solving problems that arise from physics.

Syllabus

Theoretical instruction

The syntax of C++. Classes, operators and variables, declarations, class declarations, statements, expressions.

Theory of errors. Interpolation. Least squares. Regression and empirical formulas. Numerical differentiation. Numerical integration. Systems of linear and nonlinear equations.

Practical instruction

It consists of exercises that follow the theoretical lessons with the focus on solving practical problems.

Literature

1. Д. Крпић, Увод у нумеричку физику и Windows C++ програмирање, Универзитетски уџбеник, ИЦНТ, 2008.

2. О. Hadžić, D. Herceg, K. Surla: *Numeričke i statističke metode u obradi eksperimentalnih podataka I, II, III*, Institut za matematiku, Novi Sad, 1992.

Weekly teaching load				Other:
Lectures: 3	Exercises: 2	Other forms of teaching:	Student research:	

Teaching methodology

Lectures are presented using standard teaching methods and appropriate software. Exercises are aimed at practising, analyzing and solving problems which arise from physics, by using software.

Grading (total number of points 100)			
Pre-exam obligations	**points**	**Final exam**	**points**
colloquia	20	oral exam	50
activity	5	written exam	20
homework	5		