

Course Syllabus

I. General Information

Course name	Computing laboratory
Programme	Mathematics
Level of studies (BA, BSc, MA, MSc, long-cycle MA)	BA
Form of studies (full-time, part-time)	full-time
Discipline	Mathematics
Language of instruction	English

Course coordinator/person responsible	Armen Grigoryan
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Type of class (<i>use only the types mentioned below</i>)	Number of teaching hours	Semester	ECTS Points
lecture			4
tutorial			
classes			
laboratory classes	30	IV	
workshops			
seminar			
introductory seminar			
foreign language classes			
practical placement			
field work			
diploma laboratory			
translation classes			
study visit			

Course pre-requisites	Introduction to mathematics Linear algebra with geometry I, II Calculus I, II Ordinary differential equations Introduction to computer science
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II. Course Objectives

Teaching students of basic techniques of numerical and symbolic calculations using computer algebra systems (CAS).
Teaching visualisation techniques in CAS.
Teaching programming aspects in CAS.

III. Course learning outcomes with reference to programme learning outcomes

Symbol	Description of course learning outcome	Reference to programme learning outcome
KNOWLEDGE		
W_01	The student has knowledge in basic aspects of numerical and symbolic calculations in computer-aided calculations and algebra systems (CAS).	K_W08, K_W09
W_02	The student knows visualisation techniques in CAS.	K_W08, K_W09
W_03	The student is familiar with programming aspects of CAS.	K_W08, K_W09
SKILLS		
U_01	The student is able to solve mathematical problems using computer-aided calculations and CAS.	K_U15, K_U28, K_U39, K_U41
U_02	The student can utilize programming techniques in computer-aided calculations and CAS in order to automate tasks.	K_U15, K_U28, K_U39, K_U41
SOCIAL COMPETENCIES		
K_01	The student is aware of the importance of computer-aided calculations and computer algebra systems in solving problems.	K_K02
K_02	The student is ready to present results using visualisation techniques.	K_K05

IV. Course Content

Numerical calculations. Algebraic calculations. Lists. Functions of one and several variables. Vectors and matrices. Solving equations. Systems of linear equations. Limits. Series. Differentiation. 2D and 3D graphics. Visualisation techniques. Indefinite and definite integrals. Solving ordinary differential equations Programming aspects.

V. Didactic methods used and forms of assessment of learning outcomes

Symbol	Didactic methods (choose from the list)	Forms of assessment (choose from the list)	Documentation type (choose from the list)
KNOWLEDGE			
W_01	Laboratory classes	Test	Protocol
W_02	Laboratory classes	Test	Protocol
W_03	Laboratory classes	Test	Protocol
SKILLS			
U_01	Laboratory classes	Test	Protocol
U_02	Laboratory classes	Test	Protocol
SOCIAL COMPETENCIES			
K_01	Laboratory classes	Test	Protocol
K_02	Laboratory classes	Test	Protocol

VI. Grading criteria, weighting factors.....

Graded pass: a test - 100%.

91 – 100% - 5,

81 – 90% - 4.5,

71 – 80% - 4.0,

61 – 70% - 3.5,

51 – 60% - 3.0,

0 - 50% -2.0

Detailed assessment rules are given to students with each subject edition.

VII. Student workload

Form of activity	Number of hours
Number of contact hours (with the teacher)	laboratory classes - 30 consultations - 30
Number of hours of individual student work	30

VIII. Literature

Basic literature
<ol style="list-style-type: none"> 1. S. Wolfram, "The mathematica book", Wolfram Media, University Press, 1996. 2. J. Penny, Numerical methods using MALAB, Ellis Horwood, 1995. 3. https://www.mathworks.com/products/matlab.html 4. http://maxima.sourceforge.net/
Additional literature
<ol style="list-style-type: none"> 1. www.wolfram.com/mathematica 2. www.wolframalpha.com

