SYLLABUS OF A MODULE

Polish name of a module	***Wprowadzenie do metod numerycznych***
English name of a module	***Introduction To Numerical Methods***
ISCED classification - Code	0541
ISCED classification - Field of study	*Mathematics*
Languages of instruction	*English*
Level of qualification:	*2 – MSc (EQF 7)*
Number of ECTS credit points	*6*
Examination:	*A - assignment*

Number of hours per semester:

Lecture	Exercises	Laboratory	Seminar	E-learning	Project
15	-	45	-	-	-

MODULE DESCRIPTION

MODULE OBJECTIVES

O1. Making the students familiar with selected elements of numerical methods

O2. Acquaint students with practical skills to solve and interpret solutions to simple problems in the field of numerical methods

PRELIMINARY REQUIREMENTS FOR KNOWLEDGE, SKILLS AND OTHER COMPETENCES

1. Course of linear algebra.
2. Course of the calculus of one variable
3. Ability to use different sources of information
4. Ability to work independently and in a group

LEARNING OUTCOMES

LO 1 – student will be able to solve simple numerical problems using Maple

MODULE CONTENT

Type of classes – lecture	Number of hours
Course introduction. Taylor series. Order of convergence.	1
Maple's floating-point arithmetic.	2
Errors in floating-point arithmetic.	2
Solving equations and systems of equations.	2
Interpolation.	3
Numerical differentiation.	1
Numerical integration – interpolatory quadrature .	2
Numerical integration – Gauss quadrature.	2
Sum	**15**
Type of classes– laboratory.	Number of hours
Maple introduction.	6
Errors in floating-point arithmetic.	9
Solving equations and systems of equations by using Maple.	6
Interpolation.	6
Numerical differentiation – estimation of the order of convergence.	3
Numerical integration – interpolatory quadrature.	6
Numerical integration – Gauss quadrature.	6
Error and convergence analysis of rules for numerical integration .	3
Sum	**45**

TEACHING TOOLS

1. – lectures using multimedia presentations
2. – computers with Maple software

WAYS OF ASSESSMENT (F – FORMATIVE, S – SUMMATIVE)

F1. - assessment of preparation for laboratory exercises
F2. - assessment of activity during classes
S1. - assessment of the ability to solve the problems posed and the manner of presentation obtained results - pass mark

STUDENT'S WORKLOAD

L.p.	Forms of activity	Average number of hours required for realization of activity
1.	**Contact hours with teacher**	
1.1	Lectures	15
1.2	Tutorials	-
1.3	Laboratory	45
1.4	Seminar	-
1.5	Project	-
1.6	Consulting teacher during their duty hours	5
1.7	Examination	-
	Total number of contact hours with teacher:	65
2.	**Student's individual work**	
2.1	Preparation for tutorials and tests	-
2.2	Preparation for laboratory exercises	30
2.3	Preparation of project	-
2.4	Preparation for final laboratory assessment	20
2.5	Preparation for examination	-
2.6	Individual study of literature	15
	Total number of hours of student's individual work:	65
	Overall student's workload:	130
Overall number of ECTS credits for the module		6 ECTS
Number of ECTS points that student receives in classes requiring teacher's supervision:		3 ECTS
Number of **ECTS** credits acquired during practical classes including laboratory exercises and projects:		-

BASIC AND SUPPLEMENTARY RESOURCE MATERIALS

1.	Lloyd N. Trefethen and David Bau, Numerical Linear Algebra, SIAM, 1997.
2.	Ǵregoire Allaire and Sidi Mahmoud Kaber. Numerical linear algebra, volume 55 of Texts in Applied Mathematics. Springer, New York, 2008. Translated from the 2002 French original by Karim Trabelsi.
3.	W.H. Press, S.A. Teukolsky, W.T. Vetterling and B.P. Flannery, Numerical Recipes: The Art of Scientific Computing, 3rd Ed. Cambridge University Press, New York, 2007.
4.	Jonathan M. Borwein, Matthew P. Skerritt, An Introduction to Modern Mathematical Computing with Maple, Springer Undergraduate Texts in Mathematics and Technology, Springer-Verlag, New York, 2011.
5.	W. Cheney, D. Kincaid, Numerical Mathematics and Computing, Brooks/Cole: Cengage Learning, 2013.

MODULE COORDINATOR (NAME, SURNAME, E-MAIL ADDRESS)

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