COURSE UNIT (MODULE) DESCRIPTION

Course unit (module) title	Code
Applied Mathematics	

Academic staff	Core academic unit(s)
Coordinating: Prof. dr. Darius Šiaučiūnas **Other:**	Šiauliai Academy

Study cycle	Type of the course unit
First cycle studies	Compulsory

Mode of delivery	Semester or period when it is delivered	Language of instruction
Face-to-face	I semester	English

Requisites	
Prerequisites: Knowledge of the school mathematics	**Co-requisites (if relevant):** No

Number of ECTS credits allocated	Student's workload (total)	Contact hours	Individual work
5	133	56	77

Purpose of the course unit
To form the basis for further studies. To develop logical thinking and spatial perception. To learn to perform actions with complex numbers written in algebraic, trigonometric and exponential forms. To master the basic concepts of algebra, analytic geometry and mathematical analysis (function of one and more variables, limits, continuity, derivative and differential). To learn to apply the acquired theoretical knowledge independently in solving various practical tasks.

Learning outcomes of the course unit	Teaching and learning methods	Assessment methods
To understand the basic operations of matrix algebra and to demonstrate the ability to apply them in solving systems of linear equations and vector algebra	Lectures, workshops, laboratory works	Exam, colloquium, control work, defence of laboratory work
To operate with the concepts and formulas of vector algebra and analytical geometry and show the ability to apply them in solving problems of analytical geometry and physics	Lectures, workshops, laboratory works	Exam, colloquium, control work, defence of laboratory work
To know the main theorems and formulas of differential calculus of functions of one variable and to demonstrate the ability to apply them in solving problems related to the concept of derivative	Lectures, workshops, laboratory works	Exam, colloquium, control work, defence of laboratory work
To understand the concepts of indefinite and definite integrals, to know principal methods of integration.	Lectures, workshops, laboratory works	Exam, colloquium, control work, defence of laboratory work
To understand the rules for differentiating functions of several variables	Lectures, workshops, laboratory works	Exam, colloquium, control work, defence of laboratory work

Content	Contact hours							Individual work: time and assignments	
	Lectures	Tutorials	Seminars	Workshops	Laboratory work	Internship	**Contact hours, total**	**Individual work**	**Tasks for individual work**
1. Complex numbers	2			1			**3**	**5**	Literature analysis, problems solving
2. Matrices and determinants	3			2	1		**6**	**6**	Literature analysis, problems solving, laboratory work
3. Methods for solving systems of linear equations	3			2	1		**6**	**6**	Literature analysis, problems solving, laboratory work
4. Linear vector spaces	2			1			**3**	**5**	Literature analysis, problems solving
5. Vectors in the plane and in the space	2			1	1		**4**	**7**	Literature analysis, problems solving, laboratory work
Control work No. 1				2			**2**	**5**	Problems solving
6. Functions of one variable, their limits	2			2	1		**5**	**6**	Literature analysis, problems solving, laboratory work
7. Diferentiating of the functions of one variable	4			2	1		**7**	**9**	Literature analysis, problems solving, laboratory work
8. Indefinite and definite integral	6			3	2		**11**	**16**	Literature analysis, problems solving, laboratory work
9. Functions of many variables, their limits and diferentiating	4			2	1		**7**	**6**	Literature analysis, problems solving, laboratory work
Control work No. 2				2			**2**	**6**	Problems solving
Total	**28**			**20**	**8**		**56**	**77**	

Assessment strategy	Weight %	Deadline	Assessment criteria
Control work No. 1	20	During the Semester	The Control work No. 1 consists of 5 problems from 1 – 5 themes which are evaluated by the same rate
Control work No. 2	20	During the Semester	The Control work No. 2 consists of 5 problems from 6 – 9 themes, which are evaluated by the same rate
Defence of laboratory works	20	During the semester	4 laboratory works are defended which are evaluated by the same rate
Colloquium	20	During the semester	The Colloquium consists from 3 theoretical problems from 1 – 5 themes which are evaluated by the same rate
Exam	20	During the exams session	The Exam consists from 3 theoretical problems from 6 – 9 themes which are evaluated by the same rate

Author (-s)	Publishing year	Title	Issue of a periodical or volume of a publication	Publishing house or web link
Required reading				
K. Binmore, J. Davies	2002	Calculus. Concepts and Methods		Cambridge: Cambridge University Press
J. Valantinas	2007	Lecture notes in linear algebra and differential calculus		Kaunas: Technologija

Recommended reading				
V. A. Zorich	2004	Mathematical Analysis I		Berlin: Springer Verlag
http://planetmath.org				
http://www.math-atlas.org				