Subject code	ECTS credits
MAT2006	6

Course title in Lithuanian

MATEMATINĖ ANALIZĖ 4

Course title in English

MATHEMATICAL ANALYSIS 4

Short course annotation in Lithuanian (up to 500 characters)

Šio kurso tikslas yra suteikti studentams teorinių ir praktinių žinių apie įvairių tipų integralus, Furjė eilutes ir integralus. Kursas suteiks pagrindines žinias apie kreivinius ir paviršinius integralus, tiesioginius ir netiesioginius integralus, priklausančius nuo parametro, Oilerio integralus, Furjė eilutes ir integralus.

Short course annotation in English (up to 500 characters)

The main objectives of the course are to present basics of various types of integrals, Fourier series and integral. Teaching methods are lectures and practical works. The main topics cover: line integral, surface integral, integrals of a function depending on a parameter, improper integrals as functions of a parameter. Euler's gamma and beta integral, Fourier series integral.

Prerequisites for entering the course

Mathematical Analysis 1, Mathematical Analysis 2, Mathematical Analysis 3

Course aim

Course aim is to provide understanding of various types of integrals and their properties, Fourier series.

Links between course outcomes, criteria of learning achievement evaluation, study methods and methods of learning achievement assessment

No	Course outcomes	Criteria of learning achievement evaluation	Study methods	Methods of learning achievement assessment
1	Knowledge and understanding of the line and surface integrals	Student demonstrates the ability to is able to solve given line and surface integrals	Lectures, practical works, individual work, consulting	Mid-term exam, Assessment of practical works
2	Knowledge and understanding of the derivatives of an integral with respect to the parameter	Student demonstrates the ability to solve simplest computational problems related derivatives of an integral with respect to the parameter	Lectures, practical works, individual work, consulting	Mid-term exam, Assessment of practical works
3	Knowledge and understanding of integration of an integral with respect to the parameter	Student demonstrates the ability to integrate simplest integrals with respect to the parameter	Lectures, practical works, individual work, consulting	Mid-term exam, Assessment of practical works
4	Knowledge and understanding of Fourier series and Fourier integrals	Student demonstrates the ability to solve simplest computational problems related to Fourier series and Fourier integrals	Lectures, practical works, individual work, consulting	Final exam, assessment of practical works
5	Knowledge of propositions and proofs of this course	Student knows main propositions of this course and can to proof them	Lectures, practical works, individual work, consulting	Final exam, assessment of practical works

Links between study programme outcomes and course outcomes

Study programme outcomes	Running number of course outcome

	1	2	3	4	5
Know and comprehend concepts and propositions of fundamental mathematical subjects, recognize and apply them solving practical/theoretical tasks	+	+	+	+	+
Identify the problem, collect and analyze real/theoretical data using various mathematical methods, tools and IT technologies	+				
Operating with formal mathematical symbols and terms, determine mathematical connections between various mathematical quantities; conceive mathematical propositions and logical proofs, construct and prove new statements	+	+	+	+	+
Think logically and analytically, evaluate alternative ways of task solving and implement optimal solutions	+	+	+	+	+

Content

No	Content (topics)
1.	Line integrals.
2.	Green's formula.
3.	Surface integrals.
4.	Integrals of a function depending on a parameter.
5.	Differentiability of an integral with respect to the parameter.
6.	Improper integrals as functions of a parameter.
7.	Differentiation of improper integrals with respect to a parameter.
8.	Integration of improper integrals with respect to a parameter.
9.	Euler's gamma integral.
10.	Euler's beta integral.
11.	Fourier series.
12.	Fourier integral.

Distribution of workload for students (contact and independent work hours)

Lectures	**45 hours**
Practical work	**30 hours**
Individual students work	**85 hours**
Total:	**160 hours**

Structure of cumulative score and value of its constituent parts

Final written exam (50%), mid-term written exam (25%), assessment of practical work (25%).

Recommended reference materials

No	Publication year	Authors of publication and title	Publishing house	Number of copies in		
				University library	*Self study rooms*	*Other libraries*
Basic materials						
1	1998	Misevičius E. Matematinė analizė. I (Mathematical Analysis)	Vilnius, TEV	30	2	
2	2001	Misevičius E. Matematinė analizė. II (Mathematical Analysis)	VU leidykla	34	2	
3	1996	Pekarskas V. Diferencialinis ir integralinis skaičiavimas. I (Differential and Integral Calculus I)	Kaunas, Technologija	25	6	

4	2000	Pekarskas V. Diferencialinis ir integralinis skaičiavimas. II (Differential and Integral Calculus II)	Kaunas, Technologija	22	6	
Supplementary materials						
1	2007	Misevičius E. Matematinė analizės uždavinynas. I (Tasks for Mathematical Analysis I)	VU leidykla			
2	2009	Misevičius E. Matematinė analizės uždavinynas. II (Tasks for Mathematical Analysis II)	VU leidykla			

Course programme designed by

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