Subject code	ECTS credits
MAT1004	6

Course title in Lithuanian

MATEMATINĖ ANALIZĖ 2

Course title in English

MATHEMATICAL ANALYSIS 2

Short course annotation in Lithuanian (up to 500 characters)

Šio kurso tikslas yra suteikti studentams teorinių ir praktinių žinių apie neapibrėžtinį ir apibrėžtinį integralus, skaičių, funkcijų ir laipsnines eilutes. Kursas suteiks pagrindines žinias apie neapibrėžtinius ir apibrėžtinius integralus, pagrindinius integravimo metodus, apibrėžtinio integralo taikymus, skaičių eilutes ir jų savybes, funkcijų eilutes ir jų konvergavimo srities sąvokas, laipsninės eilutėmis, Teiloro eilutes, laipsninių eilučių taikymus apytiksliame skaičiavime.

Short course annotation in English (up to 500 characters)

The main objectives of the course are to present fundamental knowledge of basic concepts of mathematical analysis: integration methods of indefinite integral, Riemann sums, improper integral, approximate calculation of definite integral, application of definite integral in geometry, infinite series, convergence tests for series, alternating series, functional series, power series, convergence set, Taylor series, and application of series in approximate calculation. Teaching methods are lectures and practical works.

Prerequisites for entering the course

Mathematical Analysis 1

Course aim

Course aim is to provide knowledge of basic concepts of mathematical analysis: solving indefinite and definite integrals, approximate calculation definite integral, investigation of the converge of number series, assessment of the convergence set of function series, representation function as a Taylor 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 indefinite and definite integrals	Student demonstrates the ability to solve given integral, adapt suitable integration methods	Lectures, practical works, individual work, consulting	Mid-term exam, Assessment of practical works
2	Knowledge and understanding of the converge of improper integrals	Student demonstrates the ability to establish the converge of particular improper integrals	Lectures, practical works, individual work, consulting	Mid-term exam, Assessment of practical works
3	Provide knowledge on calculation of definite integral	Students demonstrates the ability to calculate particular definite integral	Lectures, practical works, individual work, consulting	Mid-term exam, Assessment of practical works
4	Knowledge and understanding on investigation of the converge of number series	Students demonstrates the ability to establish the converge of particular number series	Lectures, practical works, individual work, consulting	Final exam, assessment of practical works
5	Knowledge and understanding on the convergence set of function series	Students demonstrates the ability to assess the convergence set of a given function series	Lectures, practical works, individual work, consulting	Final exam, assessment of practical works

6	Represent function as a Taylor series	Students demonstrates the ability to represent a given function as a Taylor series	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**	**6**
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.	Indefinite integral.
2.	Integration methods of indefinite integral.
3.	Riemann sums, definite integral, Newton - Leibniz formula.
4.	Improper integral, convergence.
5.	Approximate calculation of definite integral.
6.	Application of definite integral in geometry, physics and mechanics.
7.	Infinite series, convergence tests for series.
8.	Alternating series.
9.	Functional series.
10.	Power series, convergence set.
11.	Taylor series.
12.	Application of series in approximate calculation.

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.	VU leidykla	34	2	

		Matematinė analizė. II (Mathematical Analysis)				
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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