

COURSE SYLLABUS AND COURSE REQUIREMENTS

ACADEMIC YEAR 2024/2025 SEMESTER 1

<i>Course title</i>	<i>Engineering Mathematics 1</i>
<i>Course Code</i>	MSB593ANMI
<i>Hours/Week: le/pr/lab</i>	2/2/0
<i>Credits</i>	4
<i>Degree Programme</i>	Civil-, Electrical- Computer science engineering BSc
<i>Study Mode</i>	<i>full-time class</i>
<i>Requirements</i>	course grade
<i>Teaching Period</i>	2024/25 Semester 1
<i>Prerequisites</i>	-
<i>Department(s)</i>	Engineering Mathematics
<i>Course Director</i>	László István, associate professor
<i>Teaching Staff</i>	<i>lflinger Adél, lecturer</i>

COURSE DESCRIPTION

Neptun: Instruction/Subjects/Subject Details/Basic data/Subject description

This lecture and practical based course aims to give students a solid mathematics basis through covering the following topics: sets of numbers (natural, integer, rational, real and complex numbers); vectors and operations with vectors, scalar and vector products and their applications; sets and operations with sets; matrix and determinant, solving linear equation systems definition of functions. Presentation of elementary functions; polynomials; rational functions; algebraic functions, trigonometric and logarithmic functions. Sequences of real numbers (definition of monotonicity, limit, convergence and divergence); limit and continuity of functions; types of discontinuity; definition of tangents; differential calculus of functions in one variable, differential coefficient, derivatives, relations between differentiability and continuity; rules of derivation, derivatives of elementary functions; osculating circles, tangent of the plane curve at a given point.

Students learn the basics of mathematics enabling them to interpret and understand engineering sciences and through solving elementary tasks they deepen their basic theoretical knowledge in the field of engineering. The practical sessions are designed to complement the requirements of different specialisations.

Methodology:

The presentations give an introduction to important mathematical techniques of exercise solving and the basic theory of calculus. Equal emphasis is given to learning new mathematics and to learning how to construct and write down correct mathematical arguments.

SYLLABUS

1. GOALS AND OBJECTIVES

Upon completion of this course the student should be able to: **interpret, and put into practice**

- operations with vectors,
- elementary functions in one variable,
- sequences of real numbers
- differential calculus of functions

2. COURSE CONTENT

TOPICS

LECTURE	TOPICS
	<ol style="list-style-type: none">operations with vectors,elementary functions in one variable,sequences of real numbersdifferential calculus of functions

DETAILED SYLLABUS AND COURSE SCHEDULE

LECTURE

week	Topic	Compulsory reading;	Required tasks	Completion date, due date
1.	(Sept. 02) <i>Introduction to the course</i> , Basic concepts of mathematics: definition, theory, proof, symbols of mathematics.	ppt	mid-tem test	7 th week October 14
2.	(Sept. 09) Real numbers, sets and operations with sets.	ppt	mid-tem test	7 th week October 14
3.	(Sept. 16) Complex numbers: operations with algebraic form, trigonometrical and exponential form.	ppt	mid-tem test	7 th week October 14
4.	(Sept. 23) Vectors and operations with vectors, scalar and vector products	[1.]678-713, 719-724 [2.]1-72	mid-tem test	7 th week October 14
5.	(Oct. 30) Matrix and determinant	ppt	mid-tem test	7 th week October 14
6.	(Oct. 07) Solving linear equation systems using Cramer's rule and Gauss-Jordan elimination	ppt	mid-tem test	7 th week October 14
7.	(Oct. 14) Definition of functions, presentation of elementary functions, operations on functions.	[1.]1-23	end-term test	14 th week December 2
8.	(Oct. 21) Composite functions, invertible functions, restricting domains of functions. Inverse function, classifying functions, Logarithmical and exponential function	[1.]34-57	end-term test	14 th week December 2
9.	(Oct. 28) Autumn break – NO CLASS			
10.	(Nov. 04) Basic trigonometric constructions, trigonometric function and their inverses.	[1.]34-57	end-term test	14 th week December 2
11.	(Nov. 11) Sequences of real numbers	[1.]550-627	end-term test	14 th week December 2
12.	(Nov. 18)) Limit and continuity of functions	[1.]58-121	end-term test	14 th week December 2
13.	(Nov. 25) Differential coefficient, derivative. Relations between differentiability and continuity. Rules of derivation, derivatives of elementary functions	[1.]122-221	end-term test	14 th week December 2
14.	(Dec. 2) Revision (Dec. 9) CORRECTIONS		end-term test	

PRACTICE

week	Topic	Compulsory reading; page number (from ... to ...)	Required tasks (assignments, tests, etc.)	Completion date, due date
1.	(Sept. 02) <i>Introduction to the course</i> , Basic concepts of mathematics: definition, theory, proof, symbols of mathematics.	ppt	mid-tem test	7 th week October 14
2.	(Sept. 09) Real numbers, sets and operations with sets.	ppt	mid-tem test	7 th week October 14
3.	(Sept. 16) Complex numbers: operations with algebraic form, trigonometrical and exponential form.	ppt	mid-tem test	7 th week October 14
4.	(Sept. 23) Vectors and operations with vectors, scalar and vector products	[1.]678-713, 719-724 [2.]1-72	mid-tem test	7 th week October 14
5.	(Oct. 30) Matrix and determinant	ppt	mid-tem test	7 th week October 14

6.	(Oct. 07) Solving linear equation systems using Cramer's rule and Gauss-Jordan elimination	ppt	mid-tem test	7 th week October 14
7.	(Oct. 14) Mid-term test			
8.	(Oct. 21) Composite functions, invertible functions, restricting domains of functions. Inverse function, classifying functions, Logarithmical and exponential function	[1.]34-57	end-term test	14 th week December 2
9.	(Oct. 28) Autumn break – NO CLASS			
10.	(Nov. 04) Basic trigonometric constructions, trigonometric function and their inverses.	[1.]34-57	end-term test	14 th week December 2
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13.	(Nov. 25) Differential coefficient, derivative. Relations between differentiability and continuity. Rules of derivation, derivatives of elementary functions	[1.]122-221	end-term test	14 th week December 2
14.	(Dec. 2) End-term test			

3. ASSESSMENT AND EVALUATION

ATTENDANCE

In accordance with the Code of Studies and Examinations of the University of Pécs, Article 45 (2) and Annex 9. (Article 3) a student may be refused a grade or qualification in the given full-time course if the number of class absences exceeds 30% of the contact hours stipulated in the course description.

Method for monitoring attendance

Attending is compulsory for all classes, and will impact the grade, it is monitored by attendance sheet. Unexcused absences will adversely affect the grade, and in case of absence from more than 30% of the total number of lesson will be grounds for failing the class. It is also required to be in class at the beginning time and stay until the scheduled end of the lesson. Being late by more than 10 minutes will be counted as an absence. In the case of an illness or family emergency, the student must present a valid excuse, such as a doctor's note.

ASSESSMENT

Course resulting in mid-term grade (PTE TVSz 40§(3))

Mid-term assessments, performance evaluation and their ratio in the final grade

Grading will follow the course structure with the following weight:

Type	Assessment	Ratio in the final grade
Mid-term test	45 points	45 %
End-term test	45 points	45 %
Class performance and attendance	10 points	10 %

1. Offered exam grade: achieve over 40 % during the study and correction period. Both tests has to be over 35%.
2. In case one of the tests is under 35%, the student has the option to retake the test.
3. In case both tests are under 35% a written exam has to be completed in the exam period. A minimum of 40% is required to pass the exam from the materials of the course.

Grade calculation as a percentage

Course grade	Performance in %
excellent (5)	85 % ...
good (4)	70 % ... 84 %
satisfactory (3)	55 % ... 69 %
pass (2)	40 % ... 54 %
fail (1)	below 40 %

The lower limit given at each grade belongs to that grade.

The course is successful if the result is minimum 40 %.

Opportunity and procedure for re-takes (PTE TVSz 47§(4))

If the student misses one or both tests they can be retaken in the first week of the exam period (9th December 2024). The same applies to improving previous grades. All tests can be repeated or improved once in the first two weeks of the exam period.

4. SPECIFIED LITERATURE

COMPULSORY READING AND AVAILABILITY

[1.] GEORGE B. THOMAS, JR.: THOMAS' CALCULUS, PEARSON ADDISION WESLEY, 2005. ONLINE ON TEAMS

[2.] ANTHONY J. PETTOFREZZO: VECTORS AND THEIR APPLICATIONS, DOVER BOOKS ON MATHEMATICS, 2005. ONLINE ON TEAMS