**General Information:**

**Name of Course: Mathematics 2**

**Course Code:** EPE076ANEM

**Semester:** 2nd

**Number of Credits: 4**

**Allotment of Hours per Week:** 1 Lecture and 2 Practice Sessions/Week

**Evaluation:** Examination

**Prerequisites:**

**Instructors: Enikő Dinnyés, assistant lecturer**

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**Introduction, Learning Outcomes:**

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.

**General Course Description and Main Content:**

Differential calculus, analysis of functions. Definite and indefinite integral. Applications of integration: finding the centre of gravity, surface area, volume. Calculating integrals. Definition of multivariate functions, way of plotting their graphs. Partial and directional derivatives. Definition of double integrals and their calculation. Euclidean, affine and projective mappings on the plane. Systematisation of geometries. Mapping of spaces to spaces. Linear mapping of N-dimensional spaces and their applications.

**Methodology:**

The presentations give an introduction to important mathematical techniques. Students solve exercises alone and with the teacher on the practice sessions.

**Schedule:**

1st week: Difference quotient, derivative, derivative of power functions.

2nd week: Rules of differentiation, derivatives of elementary functions.

3rd week: Limit of functions.

4th week: Analysis of functions (monotonicity, extrema, convexity, inflections).

5th week: Analysis of functions, continued.

6th week: Solving exercises using differentiation.

7th week: 1st test

8th week: Definite and indefinite integrals.

9th week: Spring holiday

10th week: Applications of integral: centre of gravity.

11th week: Applications of integral: surface area, volume.

12th week: Definition of multivariate functions, way of plotting their graphs.

13th week: Partial and directional derivatives, gradient.

14th week: Double integrals.

15th week: 2nd test

Programme of the practice sessions: Exercises in the topics of each lecture listed above.

**Attendance:**

Course will start with a minimum number of 3 students. Course can be attended by gradual and Erasmus students. Students have to participate on the lectures. Unexcused absences will adversely affect the grade, and in case of absence from more than 30% of the total number of lessons student will fail the course. It is required to be in the class at the beginning and stay until the scheduled end of the lesson, tardiness of more than 20 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.

**Requirements:**

Requirements in the study period of the term (for a signature about fulfilling the entry requirements to the exam): Participation in the classes is required according to the rules about studies and exams at the university.

2 tests are to be written in the study period (6th and 12th weeks).

Signature is given to students if they reach 55% of the available marks at the two tests in total.

Otherwise, they can correct their previous result by writing a third test, covering the previous topics, in the first week of the exam period.

Requirements in the exam period (conditions for passing the exam):

Only those who have a signature can take an exam. Form of the exam: written test. Final grade in the subject will be given based on the exam result.

Students have to register for an exam in the Neptun system.

**Evaluation and Grading**

The evaluation and the final grade in the subject will be given based on the average of total marks gained on the two tests in the study period and the marks gained in the exam.

Grading Scale:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Numeric Grade: | 5 (excellent) | 4 (good) | 3 (average) | 2 (satisfactory) | 1 (fail) |
| Evaluation in points: | 88%-100% | 77%-87% | 66%-76% | 55%-65% | 0-54% |

**Students with Special Needs:**

Students with a disability and needs to request special accommodations, please, notify the Deans Office. Proper documentation of disability will be required. All attempts to provide an equal learning environment for all will be made.

**Readings and Reference Materials:**

[Apostol, Tom M.](https://en.wikipedia.org/wiki/Tom_M._Apostol) *(1967), Calculus, Vol. 1: One-Variable Calculus with an Introduction to Linear Algebra (2nd ed.),* [Wiley](https://en.wikipedia.org/wiki/John_Wiley_%26_Sons)

[Lieb, Elliott](https://en.wikipedia.org/wiki/Elliott_H._Lieb)*;* [Loss, Michael](https://en.wikipedia.org/wiki/Michael_Loss) *(2001), Analysis,* [Graduate Studies in Mathematics](https://en.wikipedia.org/wiki/Graduate_Studies_in_Mathematics)*, 14 (2nd ed.),* [American Mathematical Society](https://en.wikipedia.org/wiki/American_Mathematical_Society)