**General Information:**

**Name of Course: Mathematics b/2**

**Course Code:** PM-KMANB006A

**Semester:** 2nd

**Number of Credits:** 4

**Allotment of Hours per Week:** 2 Lectures /Week, 2 Seminars /Week

**Evaluation:** Grading

**Prerequisites: Mathematics B/1**

**Instructors: Dr Zsolt BIRÓ, assistant professor**

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**Introduction, Learning Outcomes:**

This lecture and practical based course aims to give architecture students a solid mathematics basis through covering the following topics:

Differential- and integral calculus of functions in one and two variables, elements of differential geometry.

Students are taught 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.

The Students must successfully solvepass two intermediate tests, and the written exam test. The language of the exam is English.

**General Course Description and Main Content:**

The Mathematics b/2 course includes:

* Differential calculus of functions in one variable: differential coefficient, derivatives, relations between differentiability and continuity, rules of derivation, derivatives of elementary functions, l’Hospital rule, Taylor-polynomials, testing functions.
* Integral calculus: antiderivatives, basic integration formulas, techniques of integration: integration by parts, substitution, integral of trigonometric function. Definite integral, Riemann-sum, numerical integration. The fundamental theorem of calculus: Newton-Leibniz theorem. Applications of integral: area between curves, volumes by slicing and rotation about an axes, length of a plane curve, areas of surfaces of revolution. Improper integration.
* Functions of two variables: partial derivatives, directional derivatives, gradient vector. Double integrals. Elements of differential geometry: curves in space and their tangents

**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.

**Schedule:**

1. Rules of derivation, derivatives of elementary functions
2. l'Hospital rule, Osculation of curves in higher order contact, Taylor-polynomials,
3. Applications of differential calculus to the study of properties of functions
4. Antiderivatives, basic integration formulas
5. Integration by parts, substitution,
6. Integral of trigonometric function
7. Test 1
8. Definite integral, Riemann-sum, numerical integration
9. Newton-Leibniz theorem. Applications of integral: area between curves
10. Spring holiday
11. Volume, length, areas of surfaces. Improper integration
12. Partial derivatives, directional derivatives, gradient vector
13. Double integral
14. Test 2
15. Curves in space and their tangents

**Attendance:**

Attendance of all the classes is required. Unexcused absences will adversely affect the grade, and in the case of absence from more than 30% of the total number of lesson will be grounds for failing the course. Arrivimg in class at the beginning and staying until the scheduled end of the lesson is required, 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.

**Evaluation + Grading**

1. Achieving over 40% in the two written tests during the semester.

2. Written exam in the exam period. A minimum of 40% is required to pass the exam.

Grading Scale:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Numeric Grade: | 5 | 4 | 3 | 2 | 1 |
| Evaluation in points: | 86%-100% | 71%-85% | 56%-70% | 41%-55% | 0-40% |

**PTE Grading Policy:**

Information on PTE’s grading policy can be found at the following location:

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**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:**

George B. Thomas, Jr.: Thomas’ Calculus, Pearson Addision Wesley, 2005.