GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

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|---|---|---|---|
| Subject name and code | Maths II, PG_00050274 | | |
| Field of study | Mechanical Engineering, Mechanical Engineering | | |
| Date of commencement of studies | October 2020 | Academic year of realisation of subject | 2020/2021 |
| Education level | first-cycle studies | Subject group | Obligatory subject group in the field of study |
| Mode of study | Full-time studies | Mode of delivery | at the university |
| Year of study | 1 | Language of instruction | English |
| Semester of study | 2 | ECTS credits | 6.0 |
| Learning profile | general academic profile | Assessment form | exam |
| Conducting unit | Mathematics Center -> Vice-Rector for Education | | |
| Name and surname of lecturer (lecturers) | Subject supervisor | dr Stanisław Domachowski | |
| | Teachers | dr Stanisław Domachowski | |

**Lesson types and methods of instruction**

| Lesson type | Lecture | Tutorial | Laboratory | Project | Seminar | SUM |
|---|---|---|---|---|---|---|
| Number of study hours | 30.0 | 30.0 | 0.0 | 0.0 | 0.0 | 60 |

E-learning hours included: 0.0

WIMiO - DaPE - MATH II 2020/21 (S.Domachowski) - Moodle ID: 13411
https://enauczanie.pg.edu.pl/moodle/course/view.php?id=13411

**Learning activity and number of study hours**

| Learning activity | Participation in didactic classes included in study plan | Participation in consultation hours | Self-study | SUM |
|---|---|---|---|---|
| Number of study hours | 60 | 8.0 | 82.0 | 150 |

**Subject objectives**

The aim of the subject is to obtain the student's competence in the use of the basic apparatus of mathematical analysis and linear algebra and the application of the acquired knowledge to solve simple theoretical and practical problems occurring in engineering fields.

**Learning outcomes**

| Course outcome | Subject outcome | Method of verification |
|---|---|---|
| K6_U01 | Student combines knowledge of mathematics with knowledge from other fields. | [SU2] Assessment of ability to analyse information |
| K6_W01 | Student wymienia zastosowania geometryczne całek oznaczonych. Student lists geometrical applications of definite integrals. Student analyses analitycal geometry problems. Student examines functions of several variables, using the concept of a limit, continuity and derivatives . Student calculates double and triple integrals and explains the method of substitution in these integrals. Student uses double and triple integrals in geometrical problems. | [SW1] Assessment of factual knowledge |

**Subject contents**

Indefinite integrals. Formula for the integration by parts, formula for the integration by substitution. Integration of rational functions. Integration of irrational functions of second degree. Integration of trigonometric functions. Geometric application of definite integrals. Improper integrals. Complex numbers. Matrices, system of linear equations. Vectors in three- dimensional space. The dot , and the cross product of vectors, their properties and applications. The scalar triple product of vectors, and its applications. Equations of a line and a plane in a space. Distance from a point to a plane. Angles between planes and lines. Limits and continuity of a function of several variables, partial derivatives, total differentia, extrema of functions of several variables, implicit functions.

**Prerequisites and co-requisites**

**Assessment methods and criteria**

| Subject passing criteria | Passing threshold | Percentage of the final grade |
|---|---|---|
| Final exam 90 minutes, 3 tests , active participation during classes | 50.0% | 100.0% |

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|---|---|---|
| Recommended reading | Basic literature | M.Lial, J.Hornsby, D.Schneider College Algebra. F.Ayres, E.Mendelson Calculus, ,T.Jankowski Linear Algebra. https://openstax.org/ subjectshttps: //cnm.pg.edu.pl/mathematics/welcome |
| | Supplementary literature | Kazimierz Kuratowski, Introduction to calculus W. Kaplan, Advanced calculus |
| | eResources addresses | |
| Example issues/ example questions/ tasks being completed | 1. Determine indefinite integrals of the following functions using the method of integration by parts or the method of substitution.<br>2. Find the area of the region bounded by y=…, y=… , x=… and x=.<br>3. Find the local extreme values of the function f(x,y)=x/(y+1)+8/x-y-1.<br>4. Find the equation of the plane tangent to the surface S at the point P.<br>5. Show that the points A, B, C, D do not lie on the plane.<br>6. Discuss the relative position of the line l and the plane S. | |
| Work placement | Not applicable | |