COURSE DESCRIPTION CARD - SYLLABUS

Course name
Mathematics [S1IŚrod1>Mat1]

Course

Field of study	Year/Semester
Environmental Engineering	1/1

Area of study (specialization)	Profile of study
–	general academic

Level of study	Course offered in
first-cycle	polish

Form of study	Requirements
full-time	compulsory

Number of hours

Lecture	Laboratory classes	Other (e.g. online)
45	0	0

Tutorials	Projects/seminars
30	0

Number of credit points

6,00

Coordinators	Lecturers
dr Małgorzata Zbąszyniak malgorzata.zbaszyniak@put.poznan.pl	dr Małgorzata Zbąszyniak malgorzata.zbaszyniak@put.poznan.pl

Prerequisites

Basic knowledge with range of secondary school. The ability to associate facts, information processing, reasoning, interpretation and ability to reflect. Student understands the need and cnows the possibility of studying, improving language skills, professional, personal and social skills.

Course objective

The recognizing methods and applications of mathematical analysis and linear algebra.

Course-related learning outcomes

Knowledge:
1. The student explains the basic mathematical laws and explains conditions for their application.
2. The student knows rules for finding derivative, indefinite and definite integrals and their applications.

Skills:
1. The student uses the literature and also other sources of knowledge.
2. The student uses calculus in calculations resulting from the needs of engineering practice.

3. The student formulates simple conclusions on the basis of results.

Social competences:
1. The sens of usefulness of mathematical competence in engineering practice.
2. The ability to work in a team.

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

LECTURE.A two-part written examination at the and of the semestr:
-sat.1 theoretic knowledge;
-sat.2 applications in practical exercises.
Duration of test: 70 minutes.
Classes: tests during the semestr (5x30 minutes).

Programme content

-Complex numbers.
-Elementary function and sequences of numbers.
-Differential and integral calculus.De L'Hospital rule. Trigonometric and rational integrals, partial fractions and quadratic expressions, miscellaneous substitutions. Areas, lenghts of curves, the area and the volumeof the surface of revolution obtained by revolving C about the x-axis. Mas, moments Mx and My and the center of mass. Integrals with infinite limits of integration.
-Functions of several variables. Partial derivatives, differentials,extrema of functions of several variables.

Teaching methods

Traditional education:
Lecture with presentation supplemented by examples given on the board. Interactive lectures with problems and questions for students. The activity of students is taken into account in valuation of them. Discussion during lectures is expected.
Connections with others mathematical subjects are indicated.
Practical lessons. Solving of exemplary exercises on a blackboard. Discussion of solutions with relative comments.

Bibliography

Basic:
1. W. Stankiewicz, J. Wojtowicz, Zadania z matematyki dla wyższych uczelni technicznych, PWN, część pierwsza i druga, Warszawa.
2. M. Gewert, Z.Skoczylas, Analiza matematyczna 1. Definicje, twierdzenia, wzory. Oficyna Wydawnicza GiS.
3. I. Foltyńska, Z. Ratajczak, Z. Szafrański, Matematyka część I i II, Wydawnictwo Politechniki Poznańskiej.

Additional:
1. E. Swokowski, Calculus with analytic geometry, Prindle, Weber, Schmidt, Boston, Massachusetts.
2. W. Krysicki, L.Włodarski,Analiza matematyczna w zadaniach, PWN, Warszawa.

Breakdown of average student's workload

	Hours	ECTS
Total workload	150	6,00
Classes requiring direct contact with the teacher	75	3,00
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	75	3,00