

Code	II.6.
Course Title (English)	Mathematics II
Course Title (Polish)	Matematyka II
Credits	6 ECTS

Language of instruction **English**

Type of studies BSc studies

Unit running the programme Institute of Mathematics and Computer Science

Course coordinator and academic teachers **M. Klimek Ph. D.**, B. Mochnacki Prof. (Lec.), M. Klimek Ph. D. (Tut.)

Form of classes and number of hours

Semester	Lec.	Tut.	Lab.	Proj.	Sem.	Credit points
II	45	30	-	-	-	6

Learning outcomes Acquiring knowledge of differential and integral calculus of functions of several variables as well as ordinary differential equations. Learning mathematical skills that can be applied in other technical and economic courses.

Prerequisites Mathematics I

Course description

LECTURE

Functions of two and three variables: domain, graph, level curves for function of two variables; limit of a function; continuity; partial derivatives; the chain rule, critical points and extrema; implicit function theorem.

Double integrals: definition, properties, interpretation; expressing the double integral as an iterated integral; integration by substitution (polar coordinates' case); application of double integrals.

Triple integrals: definition, properties, interpretation; expressing the triple integral as an iterated integral; integration by substitution (cylindrical and spherical coordinates); application of triple integrals.

Line integrals of the first kind : definition, properties and interpretation; transforming the line integral to the corresponding definite integral.

Line integrals of the second kind (along oriented curves): definition, properties and interpretation; transforming the line integral to the corresponding definite one; Green's theorem; independence of the path.

Ordinary differential equations: particular and general solutions of an ODE of the first order; initial value problems; integral curves; existence and uniqueness of a solution of the initial value problem (Peano and Cauchy's theorem); classification of ODE's of the first order and methods to find their solutions; ODE's of the second order reducible to the first order; linear equations of the second order with constants coefficients.

TUTORIALS: see lecture content

LABORATORY

Not applicable

PROJECT

Not applicable

SEMINAR

Not applicable

Form of assessment

Basic reference materials

Other reference materials

e-mail of the course coordinator and academic teachers	klimek@imi.pcz.czest.pl
Average student workload (teaching hours + individ)	5 teaching hours + 3 hours of individual work per week