1. Course number and name

RB-S2-20-I08-C, **Mathematics II**

2. Credits and contact hours*

6 ECTS, lectures: 30 hours**, classes: 30 hours**

3. Instructor's or course coordinator's name

Iwona Nowak PhD

4. Text book, title, author, and year

- OpenStax on-line free textbooks (https://openstax.org/subjects/math) – Calculus 2, College Algebra
- E.Łobos, B. Sikora, Advanced calculus. Selected topics, Wydawnictwo Pol. Śl. Gliwice 2006;
- E.Łobos, J.Macura, B.Sikora, Calculus and Linear Algebra in Exercises, Part 1, Wydawnictwo Pol. Śl. Gliwice 2020;

a. other supplemental materials

5. Specific course information

a. brief description of the content of the course (catalog description)

Lectures: During lectures, the necessary definitions and theorems (always illustrated by examples) are presented and discussed.

The program of the course belongs: (1) Integration and its applications (2) Ordinary differential equations (3) Differential and integral calculus of function of n-variables.

Classes: Discussing practical problems related to currently discussed chapters are solved and discussed with students; materials useful in classes (e.g. sample sets of tasks) are placed on the platform.

b. prerequisites or co-requisites

No prerequisites and additional requirements

c. indicate whether a required, elective, or selected elective (as per Table 5-1) course in the program

Required.

6. Specific goals for the course

a. specific outcomes of instruction, ex. The student will be able to explain the significance of current research about a particular topic

The student who has completed the course understands and has ordered knowledge of:

- O1 - integral calculus of functions of one variable,
- O2 - ordinary differential equations,
- O3 - differential and integral calculus of functions of several variables,

be able to:

- O4 - apply the known integration techniques to a determination of uncomplicated indefinite integrals; determine definite integral; use integrals in basic applications,
- O5 - use appropriate techniques for solving the selected types of ordinary differential equation,
- O6 - use the basic concepts of differential and integral calculus of functions of several variables.

b. explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course.

K1A_W01, K1A_U05

7. Brief list of topics to be covered

1. Indefinite integral, basic methods of integration, integration by parts and by substitution; definition of definite and improper integral; applications of integration.
2. Ordinary differential equations, including the definition of the general, singular and particular solution of the diff. equation, initial value problem, solution procedures for selected types of diff. eq. (1st order separable, linear, Bernoulli differential equation, chosen types of the 2nd order diff. eq.).
3. Differential calculus of functions of many variables: partial derivative, gradient, directional derivative, determination of the extreme value of the function. The double integral and its applications.

*- Consultations were not included in the contact hours

**-per semester