Course title: **Algebra 2**

ECTS credit allocation (and other scores): **4**

Semester: spring

Level of study: ISCED-6 - first-cycle programmes (EQF-6)

Branch of science: Natural sciences

Language: English /Polish

Number of hours per semester: 30 lectures + 30 classes = 60 hours

Course coordinator/ Department and e-mail: Erasmus coordinator Anna Szczepkowska/ WMiI, erasmuswmii.uwm.edu.pl

Type of classes: classes and lectures

Substantive content

CLASSES:

Solving problems and issues relating to the content shown in the lecture. Ring of polynomials, properties. Euclidean rings, Euclidean algorithm. Fields, examples, body characteristics. Field extensions, polynomial decomposition field. Automorphisms of fields. Distributive and non-distributive extensions. Information about Galois theory. Algebraically closed fields. Fundamental theorem of algebra.

LECTURES:
The field of ring fractions. Ring of polynomials, properties. Theory of divisibility in rings. Rings with distribution and unique distribution, Euclidean rings, Euclidean algorithm. Fields, examples, body characteristics. Field extensions, polynomial decomposition field. Automorphisms of fields. Distributive and non-distributive extensions. Information about Galois theory. Algebraically closed fields. Fundamental theorem of algebra.

LEARNING PURPOSE

Familiarization with the concepts and theorems of classical algebra. The ability to notice structures in other areas of mathematics. Using algebra methods to solve problems in geometry, combinatorics and mathematical analysis. Preparation for further education in algebra.

On completion of the study programme the graduate will gain:

Knowledge:

The student knows basic theorems of abstract algebra. He knows the basics
examples that both illustrate specific mathematical concepts and help refute false hypotheses or unjustified reasoning.

Skills:

The student can use the language of algebra and can describe many concepts occurring in other areas of mathematics.

Social Competencies:

The student is ready for further education, is able to independently search for information in the literature.

BASIC LITERATURE

[1] A. Białynicki-Birula, ,,Zarys algebry", PWN, Warszawa (1987).
[2] J. Browkin, ,,Wybrane zagadnienia algebry", PWN Warszawa (1968).
[3] M. Bryński, J. Jurkiewicz, ,,Zbiór zada´n z algebry", PWN, Warszawa (1978).
[4] M. Bryński, ,,Elementy teorii Galois", Wydawnictwo ,,Alfa" (1985).
[5] ,,Zbiór zadań z algebry" pod redakcją A.I. Kostrikina, PWN, Warszawa (1995).

SUPPLEMENTARY LITERATURE

[1] J. Browkin, ,,Teoria ciał", PWN Warszawa (1977).
[2] A. Kostrikin, ,,Wstęp do algebry, cz. I i II", PWN (2012).

The allocated number of ECTS points consists of:

Contact hours with an academic teacher: 2,14 ECTS points,

Student's independent work: 1,86 ECTS points,