



Course title: ALGEBRA 2

ECTS credit allocation (and other scores): 4,5

Semester: spring

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

Branch of science: Natural sciences

Language: English

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

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

Type of classes: classes and lectures

Substantive content

CLASSES:

Solving tasks related to the content of the lecture. Fields, examples of fields, the characteristics of a field. Constructions of finite fields. Field extensions, algebraic and transcendental. The construction of the algebraic closure of the field. The splitting field of a polynomial. Abel's theorem about the primitive element. Types of algebraic extensions: separable, normal, and radical. Automorphisms of fields and of extensions of fields. Information about Galois theory.

LECTURES:

Fields, examples of fields, the characteristics of a field. Constructions of finite fields. Field extensions, algebraic and transcendental. The construction of the algebraic closure of the field. The splitting field of a polynomial. Abel's theorem about the primitive element. Types of algebraic extensions: separable, normal, and radical. Automorphisms of fields and of extensions of fields. Information about Galois theory.

Learning purpose:

Knowledge of the concepts and theorems of classical algebra. The ability to see structures in other branches of mathematics. The use algebra to solve problems in geometry, combinatorics and mathematical analysis. Preparation for further education in the field of algebra.

On completion of the study programme the graduate will gain:

Knowledge:

The student knows the basic theorems of abstract algebra. Understand the place and importance of this subject among other mathematical objects, recognizes algebraic structures in other branches of mathematics. He knows basic examples both illustrating specific mathematical concepts, as well as allowing refute false hypothesis or incorrect reasoning

Skills:

The student is able to formulate a comprehensible statements and definitions in the field of abstract algebra. Can create new algebraic structures by constructing quotient structures and Cartesian products. He sees the presence of structures algebraic (groups, rings, fields) in a variety of mathematical topics, not necessarily



directly related to the algebra.

Social Competencies:

The student knows the limits of their knowledge and understands the need for further education, can independently search information in the bibliography.

Basic literature:

1) M. Bryński, J. Jurkiewicz,, Zbiór zadań z algebry , wyd. PWN, 1978 ; 2) J. Browkin,, Teoria ciał, wyd. PWN, 1973 ; 3) S. Lang, Algebra, wyd. PWN, 1973

Supplementary literature:

1) Cz. Bagiński, Wstęp do teorii grup, wyd. PWN, 2002

The allocated number of ECTS points consists of:

Contact hours with an academic teacher: 2,38 ECTS points,

Student's independent work: 2,12 ECTS points,