

Code: 7 „*MATERIAL SCIENCE AND TECHNOLOGY*”

ECTS credits: 5

Forms of assessments: Exam

Number of hours per week: 2+0+2

Types of assessment: Exam - written with oral discussion

Department, providing instruction on the discipline:

Department: *MATERIALS SCIENCE AND TECHNOLOGY*

FACULTY OF MECHANICAL ENGINEERING AND TECHNOLOGIES

Lecturer: Assoc.Prof. Sergei Kirov

Department: *MATERIALS SCIENCE AND TECHNOLOGY*

Tel.. 052 383 443

e-mail: s_kirov@abv.bg

Annotation:

Material Science and Technology of Materials is an engineering general technical discipline, which is the basis of mechanical engineering. The training course provides basic information about the methods of processing materials in acquisition, modification of the form, improvement of their properties through thermal and complex methods of impact. The basics of the structure and properties of metallic materials, their interrelation, the ways of their research and modification are discussed.

The course examines the main engineering materials - alloys of iron and non-ferrous metals: aluminum, copper, magnesium, titanium. An important section is devoted to non-metallic materials - polymers, ceramics, composites, as well as some modern materials with specific properties.

One of the goals of the course is for students to acquire knowledge about the metallurgical production of ferrous and non-ferrous alloys, as well as methods of processing metallic and non-metallic materials by casting, plastic deformation, welding, heat treatment formaking products from plastics, rubber, cermets.

The knowledge obtained from the course of *Material Science and Technology of Materials* is a prerequisite for in-depth mastering of the study material in the specialized disciplines studied further, as well as for solving various problems of engineering practice in transport equipment and technologies related to its production and repair.

Main issues of the syllabus content:

- Structure and properties of materials.
- Basic engineering materials on iron and non-iron basis
- Fundamentals of the theory and practice of heat treatment
- Non-metallic materials - polymers, ceramics, composites
- Extraction and basic technological operations for deformation of materials

Content presentation:

The lectures are delivered with the help of a software multimedia presentation. The lecture material is available to students on electronic media. The exercises are held mainly in the Materials Science and Mechanical Testing Laboratory of the Department of MATERIALS SCIENCE AND TECHNOLOGY.