Discipline	**Material Science** code: 11 **2 semester – / summer/**	
Specialty	Industrial Management	
ECTS credits: **5**	Form of assessment: exam	
Lecturer	assoc. professor / scientific title/ Plamen Petrov /name/ Room 204 M Phone: +359 878148152 E-mail: plpet@tu-varna.bg, petpl@abv.bg	
Department	Material Science and Technology	
Faculty	Faculty of Manufacturing Engineering and Technology	

Learning objectives: The course covers the traditional training materials (ferrous, nonferrous metals, engineering ceramics and polymers) and new promising composites and powder-metallurgical alloys.

/ANNOTATION/

The course " Material Science " builds fundamental training of students in area of specialty. The aim is to acquaint students with the types of materials used in different sectors of industrial production. By knowing the structure and properties of materials and different modalities to improve their quality, aims to give students knowledge about the selection of materials and their interchangeability in designing products for specific operating conditions.
The knowledge will give a broader view of the efficient use of materials in various industries.
The material is basically a study of future disciplines of the specialty curriculum, namely: "Technology for producing blanks", "Manufacturing Technologies", "Machine tools and equipment" and some elective specialized courses.

CONTENTS:

Training Area	Hours lectures	Hours seminar exercises

Introduction. Classification of materials. Requirements and evaluation of materials in industrial production	6	6
Structure of the metals-liquid and solid state. Crystallization mechanism. Crystal structure - types of crystal defects in the crystal.	2	4
Theory of alloys	4	2
Iron and its alloys	6	6
Non-ferrous metals and alloys-Types, structure, properties and application	2	2
Metal**s** and alloys with especially physical properties- difficult and easy melting, high collars, superplastic, electrical and more.	2	-
Plastics and elastomers - Basic physical, chemical and mechanical properties	2	2
Ceramics- Traditional and technical metal and oxide ceramics, glass. Properties of ceramic products.	2	1
Composites- types, application and development. Technologies for production and processing of various types of non-metallic materials.	2	1
Corrosion and destruction of materials-species protection. Destruction of materials. Choice of materials when designing products.	1	4
Ecological characteristics and material recycling.	1	2
TOTAL: 60 h	**30**	**30**