Basic course data	
Academic unit:	**Faculty of Engineering and Informatics**
Title of the subject:	**Industrial support materials**
Level of studies:	**Master**
Course Status:	**Elective**
Year of studies:	**I**
Number of hours per week:	**4**
Value of Credits - ECTS:	**6**
Time / location:	
Course lecturer:	**Asoc. Prof. Dr. Milihate Aliu**
Contact details:	**milihate.aliu@ushaf.net**
Course description:	*This course will focus on the basics of material science, with particular emphasis on structure, properties, production and processing of materials such as polymer, ceramic and composite materials, as well as their application.*
Objectives of the subject:	*The objective of this course is to understand the structures of polymer, ceramic and composite materials, their mechanical behavior and be able to select engineering materials as per requirement*.
Expected learning outcomes:	*Upon successful completion of this subject, student will be able to:* • *Recognizes basic chemical and engineering processes for the processing of polymer, ceramic and composite materials.* • *Classify polymers, ceramic and composite materials and identify their physical characteristics.* • *Understand the polymer, ceramic and composite processing operations and the choice of operation depending on the material and end product requirements*

Contribution to student workload which should correspond to student learning outcomes			
Activity	**Hours**	**Day/week**	**Overall**
Lectures	4	15	60
Theoretical exercises / Labs	-	-	-
Practical work	-	-	-
Consultations with the teacher	1	5	5
On site training	-	-	-
Seminars	1	15	15
Homework	-	-	-
Student self study time (in library or at home)	4	15	60
Preparing for the final exam	1	10	10

Time spent in assessment (tests, quizzes, final exam)	-	-	-
Projects, presentations, etc.	-	-	-
Total			**150**

Teaching Methodology:	*Lectures combined with Seminars and classroom discussions.*
Assessment and grading:	*Seminars 30%* *Final exam 70 %*
Concretisation means	*Projector, computer, white board etc.*
Ratio between theory and practise	*70% Theory (lectures)* *30% Seminar work and participation in field trips*
Required or recommended literature resources:	
Required literature:	1. Prof. Asoc. Dr. Milihate Aliu, "*MATERIALET KOMPOZITE*", Script, 2016, Ferizaj. 2. Prof. Asoc. Dr. Milihate Aliu, "*MATERIALET QERAMIKE*", Script, 2014, Ferizaj.
Recommended literature:	3. W.D. Callister, Jr. and D.G. Rethwisch, *MATERIALS SCIENCE AND ENGINEERING: AN INTRODUCTION,* 8th edition, John Wiley and Sons, Inc. 2010. 4. Joel R. Fried, POLYMER SCIENCE AND TECHNOLOGY, Prentice Hall: New Jersey. 1995.

Course details:	
Week	**Lectures**
Week 1:	**Introduction to Material Science** *Classification of Materials*
Week 2:	**Materials Structure and Defects** *Fundamental understanding of the structure and properties of perfect and defective materials. Crystallography and crystal structures.*
***Week 3*:**	**Advanced Mechanical Behavior of Materials** *Description of stress, strain, strain rate and elastic properties of materials. Fundamental aspects of crystal plasticity. Theory and characteristics of dislocations. Strengthening mechanisms at low temperature. Deformation at elevated temperatures. Emphasizing the relationships between microscopic mechanisms and macroscopic behavior of materials.*
Week 4:	**Selection of Materials** *Selection criteria. Engineering requirement of materials.*
Week 5:	**Materials Selection and Design** *Material selection process, selection of materials for mechanical strength and other properties, design and selection of materials, failure prevention, case studies in design and selection of materials.*
Week 6:	**Deformation and Fracture Mechanics of Structural Materials**

	Material microstructure and properties. Dislocations and their role in controlling mechanical properties
***Week 7*:**	**Electronic, Optical and Magnetic Properties of materials** *Description of electronic, optical, and magnetic structure-property relationships of materials.*
Week 8:	**Engineering Nanomaterials** *Characterization of nanomaterials. Physical and mechanical properties of nanomaterials.*
Week 9:	**Engineering Polymers** *General properties of Polymers. Preparation and application of Polymers.*
Week 10:	**Methods of production and processing of plastics products** *Extrusion. Injection.*
Week 11:	**Engineering Ceramics** *Bonding in Ceramics. Structure of Ceramics. Processing Technologies. Properties of Ceramics, and Applications of Ceramics.*
***Week 12*:**	**Engineering Composite Materials** *Structure, types and manufacture of composites. Environmental effects.*
Week 13:	**Recycling of materials and preserving the environment** *Impact of recycling of materials on the environment*
***Week 14*:**	**Seminar** *Students must present at least one seminar.*
***Week 15*:**	**Prepare for exam**

Academic policies and rules of conduct:
Set the code of conduct according to the statute of UASF. • First of all, the student should be mindful and respectful towards the institution and the academic rules • Students are expected to attend all classes and to prepare for and participate in class discussions. • It is mandatory to have and show the ID on the exam and during the factory visits • When preparing seminar papers, the student must follow the instructions given by the teacher for the research and technical execution of the paper.