Basic course data			
University	**University of Applied Sciences in Ferizaj**		
Academic unit	**Faculty of Engineering and Informatics**		
Programme	**Industrial Engineering with Informatics**		
Course Title	**Engineering materials II**		
Level of studies	**Bachelor**		
Course status	**Core**		
Year of studies	**I, Semester II**		
Number of hours per week	**3**		
Values of credits - ECTS	**5**		
Time/location			
Course lecturer			
Contact details			
Course description	Within this subject, students will get general knowledge about polymers, their types, structure and mechanisms of polymer formation reactions; the formation of composites reinforced with different materials: inorganic (ceramic) particles of different sizes and shapes, metals, and polymer fibers as well as their application.		
Objectives of the subject	The main goals of this subject (course) are: • To learn about the synthesis, structure, chemical and physical properties of polymers, as well as their application in life. • To clarify the notion of composite material and to explain the formation of composites reinforced with different materials: inorganic (ceramic) particles of different sizes and shapes, metals, and polymer fibers. • To clarify the influence of the size and shape of the reinforcement on the physical, chemical and mechanical properties of the composite.		
Expected learning outcomes	After completing this module, students will be able to: • Recognize and classify polymeric materials • Understand the concept of polymer and describe the structure and mechanisms of polymer formation reactions. • Describe the formation of composite materials depending on the type of matrix material and reinforcement, and interpret in particular the role of reinforcements in improving the properties of composites.		
Contribution to student workload which should correspond to student learning outcomes			
Activity	**Hours**	**Day/week**	**Overall**

Lectures	3	15	45
Consultations with the teacher	1	15	15
Seminars	2	15	30
Student self study time (in library or at home)	2	15	30
Preparing for the final exam	1	5	5
Total			**125 hours**

Prerequisites for the realization of the teaching topic	For successful completion of the teaching topic, as well as for the objective evaluation of students, it is very important that students have basic knowledge of natural science subjects such as Chemistry anf Physics, while basic knowledge of Mathematics is required for numerical exercises. Possessing basic knowledge from these subjects is a great priority for students because it allows them to participate actively in class, while for the teacher it is a good opportunity to evaluate the activity of each student.
Requirements for the realization of the teaching topic	Hall equipped with white board, computer and projector.
Ratio between theory and practice	70% Lectures 30% Seminar work and participation in practical visits
Teaching Methodology	In the first hour, students will be introduced to the course Syllabus, which means the content of the course, the basic and additional literature, the students' obligations to the course, as well as the methodology and evaluation criteria of the students. In order to achieve the objectives of teaching and learning, i.e. to acquire basic knowledge of the subject, to develop students' skills and abilities, student-centered teaching is used. The material will be given to the students before each lecture, so that the students can use the time of their own study either in the library or at home to familiarize themselves with the content of the topic of the next lecture. The presentation of the teaching topic is done in Powerpoint with active participation of students and immediate individual assessment; while additional clarifications are written in the table. Repetition of the previous topic is preferred as an introduction to the new topic, and is developed primarily through discussion and active student participation. The evaluation of the student's active participation is individual and is done during the lecture when the teacher asks questions, but also during the numerical exercises. At the end of the lecture, students will be informed briefly about the content of the next lecture.

	The seminars are directly related to all the topics included in the structure of the lectures of the course, while the selection of the topic is done by the students themselves.
Assessment and grading	The student is subject to continuous assessment of basic knowledge and assessment of critical thinking skills. Participation of evaluations in determining the final grade: • **Class activity is assessed with 5%:** *Individual assessment.* The student is assessed individually based on his active participation in discussions during lectures. • **The seminar paper is evaluated with 30%** Students have to prepare the Seminar, on the specific topic that deals with environmental issues, present them, as well as submit a physical copy. The seminar will also include a detailed question and answer session. The seminar can be worked individually and in small groups consisting of 2 to 3 students, therefore the evaluation criteria will be in accordance with this. Seminar evaluation criterion (30%): a) Individual evaluation: For the research and technical realization of the work, the student is evaluated with 10%, while for the presentation ability, the student is evaluated with 20%. b) Group evaluation: For the research and technical realization of the group work, each of the students in the group is evaluated with the same points (10%), while for the presentation skills, each student is evaluated individually up to 20%. • **Group work in tasks and case studies is assessed with 15%:** *Group assessment*. Includes case studies or assignments related to the knowledge gained in the taught topics. ***Rating:*** *91-100 points – graded 10 (ten)* *81-90 points – graded 9 (nine)* *71-80 points – grade 8 (eight)* *61-70 points – grade 7 (seven)* *51-60 points – grade 6 (six)* *0-50 points – The student repeats the exam.*

	Remarks: 1. The delivery of hard copy of the seminar and oral presentation of the seminar must be done only during the semester in which the subject is taught. 2. Recognition of the points gained from the seminar evaluation will be valid until the student takes the exam. 3. Recognition of the points gained from the activity in the classroom, group work in assignments and case studies will also be valid until the student takes the exam. • **The final or summative exam is evaluated with 50%:** The final exam evaluates the students' basic knowledge in the taught subject. The exam is individual and is carried out through a written test. The test is designed by the teacher who teaches the subject. The test contains 100 marks consisting of questions of different types such as open-ended questions, multiple-choice questions, combination questions, fill-in questions, etc.
Required or recommended literature resources:	
Required literature	1. Prof. Asoc. Dr. Milihate Aliu, "MATERIALET KOMPOZITE", Script, 2019, Ferizaj. 2. Prof. Asoc. Dr. Milihate Aliu, "KIMIA E MATERIALEVE POLIMERE", Script, 2014, Ferizaj.
Recommended literature	1. Muralisrinivasan, Natamai Subramanian, „Basics of Polymers: Materials and Synthesis", 2016. 2. Author: D.W. van Krevelen†, Klaas te Nijenhuis, „Properties of Polymers: Their Correlation with Chemical Structure", 2009. 3. Reinforced plastics handbook; Donald V. Rosato, Dominick V. Rosato, and John Murphy; Elsevier; 2004; page 586.

Course details:	
Week	**Lectures**
Week 1:	**Engineering materials and their classification**
Week 2:	**Chemical bonds and structure of engineering materials**
***Week 3*:**	**Polymeric materials. Mer's, monomers and polymers**
Week 4:	**Molecular mass of polymers**
Week 5:	**Polymer formation reactions**
***Week 6*:**	**Structure of polymers**
Week 7:	**Polymer materials in everyday life**
Week 8:	**Introduction to composite materials**
Week 9:	**Matrix and Reinforcements**
Week 10:	**Fibers, their types and characteristics**

***Week 11*:**	**Particles as reinforcements**
***Week 12*:**	**Polymer matrix composites**
***Week 13*:**	**Metal matrix composites**
***Week 14*:**	**Ceramics matrix composites**
***Week 15*:**	**Presentation of seminar topics by students** The student(s) will be required to prepare and deliver a Seminar, on the assigned topic with the help of Power Point Presentation as well as submit a type written report. The seminar shall also include a detailed question answer session.
Academic policies and rules of conduct:	
Etiquette policies are set in accordance with the UASF statute • First of all, the student should be mindful and respectful towards the institution and the academic rules • They should respect the schedule of lectures, exercises, practical work and be attentive to the class. • 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.	