Syllabus

Basic course data	
University	**University of Applied Sciences in Ferizaj**
Academic unit	**Faculty of Engineering and Informatics**
Program	**Industrial Engineering with Informatics**
Course Title:	**Chemistry**
Level of studies:	**Bachelor**
Type:	**Core**
Year:	**I, Semestrer I**
Hours per week:	**3**
Credits:	**5**
Time / location:	
Lecturer:	
Contact details:	
Course description:	Within the Chemistry subject, students will learn about matter, its structure and content; substances and their phase state. The periodic table of elements. Inorganic and organic compounds. Chemical bonds and their effect on material properties. Phase transformations. Chemical equilibrium. Reversible and irreversible processes. Types of forces. Catalysts.
Objectives of the subject:	The main purpose of this course is to introduce new concepts to reinforce basic knowledge that includes aspects of structure, bonding, molecular shape and reactivity, matter and energy distribution in microscopic and macroscopic terms, and an introduction to the important physical parameters that describe states of matter (solid, liquid and gaseous phases).
Expected learning outcomes:	After completing this course (subject), the student will be able to: • To know the structure of matter and the changes that occur during its transformation. • To explain the formation of chemical bonds and their influence on the properties of materials. • Distinguish inorganic compounds from organic ones. • Work in the laboratory independently and solve problems - tasks with stoichiometric calculations.
Prerequisites	N/A

Contribution to student workload which should correspond to student learning outcomes			
Activity	**Hours**	**Day/week**	**Overall**
Lectures	2	15	30
Numerical exercises / Labs	2	15	30
Consultations with the teacher	2	15	30
Colloquium	1	5	5
Student self study time (in	2	15	30

library or at home)			
Total			**125 hours**
Requirements for the realization of the teaching topic:	Hall equipped with white board, computer and projector.		
Ratio between theory and practice:	50% Lectures 50% Numerical Exercises/Labs		
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. Students will be given step-by-step procedures that are fluently described, which they will be able to use for laboratory work.		
Assessment and grading:	The student is subject to continuous assessment of basic theoretical knowledge and assessment of skills during laboratory work. 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. • **Activity in numerical exercises and laboratory work is assessed with 15%:** *Individual or group assessment.* The student is assessed individually based on his active participation in solving numerical tasks and laboratory work. The laboratory exercise can be worked on individually and in small groups consisting of 2 to 3 students, therefore the assessment criteria will be in accordance		

	with this. • **The colloquium is evaluated with 40%** As a part of the course, students should participate in the colloquia, which are usually held in the middle of the semester (colloquium I - week 7) and at the end of the semester (colloquium II - week 15). Each colloquium is evaluated with 40%. The colloquium will be supervised by the subject teacher. • **The final or summative exam is evaluated with 80%:** The final exam evaluates the basic knowledge of students in the taught subject who did not participate in the assessment with colloquiums. 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. Note: 1. The recognition of the points gained from the activity in the classroom, the activity in numerical exercises and laboratory work will be valid until the student takes the exam. ***Student evaluation criterion (in %):*** % value Grade 91 - 100% 10 (excellent) 81 – 90% 9 (very good) 71 - 80% 8 (good) 61 - 70% 7 (satisfactory) 51 – 60% 6 (pass) 0 - 50% 5 (failed)
Required or recommended literature resources:	
Required literature	1. Prof. Asoc. Dr. Milihate Aliu, “Chemistry”, Script, 2023
Recommended literature:	1. Filipoviq, S. Lipanoviq, Kimia e përgjithshme dhe inorganike, Prishtinë, 1996. 2. A. Lajçi, V. Kalaj, '' Kimia'' Prishtinë, 1998.
Course details:	
Week	**Lectures**
Week 1:	**States of matter** - Interatomic and intermolecular forces - Gases, liquids and Solids
Week 2:	**Atomic structure** - The structure of the atom and elementary particles - Hydrogen atom and isotopes - Quantum numbers of electrons in the atom
***Week 3*:**	**Periodic Table of chemical elements**

	- The structure of the periodic system. - Properties of elements in the periodic system. - Electronic configuration and hybridization**.**
Week 4:	**Substances and their classification** - Pure substances and mixtures. - Methods for separating substances from mixtures. - Homogeneous and heterogeneous systems.
Week 5:	**Organic compounds** - Formulas of organic compounds - Properties of organic compounds. - Classification of organic compounds - Functional groups Heteroatoms (O, N, S, P, Si)
***Week 6*:**	**Inorganic compounds** - Hydrides, carbides and nitrides - Oxides, acids, bases and salts
Week 7:	**Colloquium I**
Week 8:	**Effect of chemical bonds on material properties** - Primary bonds: ionic, covalent and metallic bond - Secondary bonds: hydrogen bond, Ven der Walls forces
Week 9:	**The structure of ionic compounds** - Formation of ionic bond. - Ionization energy and electron affinity
Week 10:	**The structure of covalent compounds** - Covalent bond formation and electronegativity. - Coordinative covalent bond
***Week 11*:**	**Solutions** - Properties of solutions. - Dissolution of substances and concentration of the solution. - Solubility. - Dilution of solutions
***Week 12*:**	**Electrolytes** - Electrolytic dissociation - Aqueous solutions of acids, bases and salts. - Application of the law of action of masses on the electrolyte. - Dissociation constant. - Ionic product of water and pH.
***Week 13*:**	**Chemical kinetics** - Chemical equilibrium - Le Chatelier's Principle - Change in concentrations - Change in temperature - Change in pressure
***Week 14*:**	**Catalysis and catalysts** - Activation energy

	- Catalysts - Inhibitors
***Week 15*:**	**Colloquium II**
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 and be attentive to the class. • It is mandatory to have and show the ID on the exam.	