

SYLLABUS

| Basic course data | |
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| Faculty: | Faculty of Engineering and Informatics |
| Course Title: | Chemistry and Physics |
| Level of studies: | Bachelor |
| Type: | Core |
| Year: | I |
| Hours per week: | 4 |
| Credits: | 5 |
| Time / location: | |
| Lecturer: | Asoc. Prof. Dr. Milihate Aliu & Ganimete Heta |
| Contact details: | milihate.aliu@ushaf.net ; ganimete.heta@ushaf.net |
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| Course description: | <i>The course will inform students about matter and energy. Measurement and units. The effect of heat on the thermal expansion of liquids, gases and solids. Periodic table of elements. Inorganic and organic compounds. Chemical bonds and their impact on material properties. Chemical and physical equilibrium. Kinetic and potential energy. Reversible and irreversible processes. Types of forces and elasticity of bodies.</i> |
| Objectives of the subject: | <i>To provide an introduction to the fundamental principles underlying all chemical and physical phenomena, to engage prior knowledge and understanding, to introduce new concepts and establish a sound basis for further units of study. This course will include aspects of structure, bonding, molecular shape and reactivity, the distribution of energy in microscopic and macroscopic terms, and an introduction to the important physical parameters which describe the states of matter (solid, liquid and gaseous phases).</i> |
| Expected learning outcomes: | <i>After successful completion of the course, students will be able to:</i> <ul style="list-style-type: none"> • <i>know the basic properties of matter and molecular bonds based on their current understanding as well as the periodic properties derived from the atomic structure,</i> • <i>interpret the states of different types of matter based on the molecular or atomic structure of the components and describe the main intermolecular interactions (forces).</i> • <i>explain the effect of heat on the thermal expansion of solids, liquids and gases.</i> |

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| | <ul style="list-style-type: none"> • apply the laws of thermodynamics. • explain the concepts of balance and elasticity and use them to solve problems related to everyday phenomena | | |
| 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 | 1 | 5 | 5 |
| Consultations with the teacher | - | - | - |
| On site training | 2 | 2 | 4 |
| Colloquium, seminars | 2 | 8 | 16 |
| Homework | 3 | 10 | 30 |
| Student self study time (in library or at home) | 2 | 5 | 10 |
| Preparing for the final exam | 2 | 2 | 4 |
| Time spent in assessment (tests, quizzes, final exam) | - | - | - |
| Projects, presentations, etc. | | | |
| Total | | | 129 hours |
| Teaching Methodology: | <i>Lectures and exercises combined with tutorials and classroom exercises</i> | | |
| Assessment and grading: | <p><i>The student can choose to be evaluated one of the two forms of assessment given below:</i></p> <p><i>1. Form 1: Assessment with colloquiums and project 2. Form 2: Assessment with the final exam.</i></p> <p><i>Form 1:</i></p> <p><i>In the first form of assessment "Assessment with colloquiums and project" the student is assessed in four activities that are carried out during the lectures:</i></p> <p><i>1. Colloquium 1 (30%), individual assessment</i></p> <p><i>2. Colloquium 2 (30%), individual evaluation</i></p> <p><i>3. Class activity (10%), individual assessment 4. Project and laboratory exercises (30%).</i></p> <p><i>Additional clarification: If the student in each activity above reaches the maximum points, then he will be evaluated with 100 points.</i></p> <p><i>Students who pass the exam according to form 1 of the assessment, are released from the obligation to take the final exam. Only if the student is not satisfied with the grade achieved according to form 1, then he can undergo the final exam to obtain a higher grade.</i></p> <p><i>Form 2:</i></p> <p><i>In the second form of evaluation, "Evaluation with the</i></p> | | |

final exam", the student will undergo the exam which is held after the completion of the course lectures, and is organized in the exam deadlines, determined by the University senate.

Through the final exam, the student can achieve a maximum of 70% of the points from the total of 100 points.

The rest of the 30% points must be completed by the Project work and laboratory exercises, an activity carried out during the lectures.

In Colloquium 1, Colloquium 2 and Final Exam, the assessment of students will be done through an assessment form, which must be completed individually by the student. The evaluation form will contain objective and subjective questions through which the student's learning outcomes will be evaluated:

- Objective questions will be of the following types: (5) multiple choice task, (4) Correct/ Not Correct, (5) Completion (open questions) Matching; questions that will be used to assess the student's abilities to recall and recognize the concepts and material of the course.*

- The subjective questions will be of the Essay/written task type that will be used to assess the student's understanding and abilities to apply the knowledge gained in the analysis, synthesis and evaluation of the problem, from the answers prepared by the student to the question of submitted.*

Activity in the class means the student's engagement in dealing with the discussed issues and solving the tasks in the class, during the lectures.

Project and laboratory exercises (30%), individual evaluation: it is an activity that each student applies the acquired knowledge in a concrete project. It is carried out by a student who has the obligation to carry out the activity, document and present it to the subject professor.

For the form of realism and documentation of the activity, all students listen and can ask questions and will be evaluated with the same points, and the laboratory exercises must be defended and evaluated with (20%), while the evaluation of the presentation skills of the individual activity and includes 10 %.

91-100 points - evaluated with a grade of 10 (ten)

81-90 points - evaluated with a grade of 9 (nine)

71-80 points - evaluated with a grade of 8 (eight)

61-70 points - evaluated with grade 7 (seven)

51-60 points - evaluated with grade 6 (six)

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| | 0-50 points - The student repeats the exam. |
| Required or recommended literature resources: | |
| Required literature: | 1. Prof. Asoc. Dr. Milihate Aliu, "Chemistry", Dispensë, 2018 |
| Recommended literature: | 2. Dr. I. Filipoviq, Dr. S. Lipanoviq (shqipëruar nga Dr. Xhavit Ahmeti), KIMIA E PËRGJITHSHME DHE INORGANIKE, Prishtinë. 3. Dr. Azem Lajqi, KIMIA INORGANIKE, Prishtinë 4. Skender Skenderi, "Fizika". |
| Course details: | |
| Week | Lectures |
| Week 1: | Module 1: States of matter - Interatomic and intermolecular forces - Gases and liquids - Solids |
| Week 2: | Module 2: Atomic structure and Periodic table of elements. - Atoms, elements and compounds |
| Week 3: | Module 3: Inorganic compounds - Hydrides, carbides and nitrides - Oxides, acids, bases and salts |
| Week 4: | Module 4: Organic compounds - Formulas of organic compounds - Properties of organic compounds. - Classification of organic compounds - Functional groups - Heteroatoms (O, N, S, P, Si) |
| Week 5: | Module 5: Metals - Distribution of metals in nature - Benefit of metals. - Physical and chemical properties of metals. |
| Week 6: | Module 6: Chemical bonds and effect on material properties - Primary bonds: ionic, covalent and metallic - Secondary bonds: Hydrogen Bonding, Van der Waal's Forces |
| Week 7: | Module 7: Chemical and physical equilibrium - Homogeneous Equilibrium - Heterogeneous Equilibrium - Reversible and irreversible reactions |
| Week 8: | Module 8: Catalysis and catalysts - Activation energy |

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| | <ul style="list-style-type: none"> - Catalysts - Inhibitors |
| Week 9: PHYSICS | <p>Module 9: Physical quantities and their units</p> <ul style="list-style-type: none"> - Fundamental units of the International System of Units - Derived units of the International System of Units - Measurement of length, surface and volume - The volume of solids, liquids and gases. - Measurement of time, mass and density. - Accurate reading of measurement results |
| Week 10: | <p>Module 10: The effect of heat on matter</p> <ul style="list-style-type: none"> - Thermal expansion of solids, liquids and gases |
| Week 11: | <p>Module 11: Work, energy and mechanical strength</p> <ul style="list-style-type: none"> - Types of energy: - Kinetic energy - Potential energy |
| Week 12: | <p>Module 12: The laws of thermodynamics</p> <ul style="list-style-type: none"> - The first law - Law of Conservation of Energy - The second law of thermodynamics - The third law of thermodynamics |
| Week 13: | <p>Module 13: Forces, types of forces and force measurement</p> <ul style="list-style-type: none"> - Gravitational force. - Magnetic force. - Electrostatic force. - Tension force. - Frictional force - Elastic (spring) force |
| Week 14: | <p>Module 14: Equilibrium and elasticity</p> <ul style="list-style-type: none"> - Stable static equilibrium - Unstable static equilibrium - Elastic modulus - Stress - Strain |
| Week 15: | <p>Module 15: As a part of the course, it is obligatory for students to participate in the colloquia, usually held in the middle of the semester. Colloquia will be supervised by one of the professors.</p> |

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
- 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.