



Syllabus

Term: 2026/27/1 **Subject name:** Fundamental Chemistry I. - lecture **Subject code:** ENBIOB0201

Unit (Unit code) (BIOLOGIA)

Lecturer responsible for the course: PONGRÁCZ Péter Tibor

Requirement: Exam

Classes per week : 2/0/0

Classes per term: 26/0/0

Purpose of education:

The main aim of this course is to be familiar the fundamentals of chemistry.

Contents:

1. week: SI system, Classification of material. Dalton's atom model. Chemical formulae. Classification of chemical systems.

2. week: Structure of atoms. Thomson's experiment, Millikan's experiment, Rutherford's experiment. Improvement of atom models. Atomic numbers, mass number, isotopes. Relative atomic mass, relative molecular mass, molar mass.

3. week: Dual characteristics of light. Fotoelectronic effect. Line spectra of atoms and their interpretation. Bohr's atom model. Wave characteristics of particles. Schrödinger's-equation

4. week: Quantumnumbers. Atomic orbitals and their shapes. Electron building-up principles. Atomic core, valence shell electrons. Electron configuration.

5. week: Periodic table, periodic characteristics.

6. week: Primary chemical bonds. Ionic bond. Metallic bond. Covalent bond. Octet rule. Lewis's structure.



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- 7. week: Geometry of molecules. VSEPR-theory. VB-theory. Octet expansion.
- 8. week: MO-theory. Polarity of chemical bonds. Polarity of molecules.
- 9. week: Secondary bonds. Concentration calculations.
- 10. week: Gibbs's phase rule, Phase diagram of water. Colligative properties. Colloids.
- 11. week: Fundamentals of reaction kinetics. Rate of reaction, kinetic orders. Zero-, first- and second-order reactions.
- 12. week: Temperature dependence of reaction rate. Catalysis.
- 13. week: Reaction quotient. Chemical equilibrium. Law of mass action. Le Chatelier-Brown's principle.
- 14. week: Acid-base theories. pH calculations (strong acids, strong bases, weak acids and weak bases).

System of examing and valuation:

During the semester the students are scheduled to write 2 written test. In each case we provide one extra opportunity for retaking them. To pass the subject at 40% of the overall score has to be fulfilled. During the semester there will be 2 joker lectures. Someone participating on those lectures will obtain 2 extra points for each case and those points will be added to the overall points. If the overall score is higher than 90% the offered grade is excellent (5), if it is between 70-90% then the grade is good (4) and if the overall score is between 55-70% then the offered grade is average (3), while it is at least 40% then it is passed (2). Students who want to improve the grade will have an extra chance to take an oral exam during the examination period.



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Bibliography:

1. D. Ebbing: General Chemistry, Boston, MA : Cengage Learning, Boston, 2016

Bibliography: