



## Syllabus

**Term:** 2025/26/2      **Subject name:** Chemistry basics I. lecture      **Subject code:** ENAFOTNA0301

---

**Unit (Unit code)**      Institute of Geography and Earth Sciences (FOLDRAJZ)

**Lecturer responsible for the course:** Dr. HORVÁTH Attila

**Requirement:** Exam

**Classes per week :** 2/0/0

**Classes per term:**

---

### 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.
7. week: Geometry of molecules. VSEPR-theory. VB-theory. Octet expansion.



## Syllabus

**Term:** 2025/26/2

**Subject name:** Chemistry basics I. lecture

**Subject code:** ENAFOTNA0301

### Contents:

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: Fundaments 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.

### Bibliography:

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



## Syllabus

**Term:** 2025/26/2

**Subject name:** Chemistry basics I. lecture

**Subject code:** ENAFOTNA0301

**Bibliography:**

**Bibliography:**