**School of Engineering and Natural Sciences / Industrial Engineering (English)**

**2023 - 2024 Academic Year**

**GENERAL CHEMISTRY**

**Syllabus**

| **Course Description** | | | | | |
|---|---|---|---|---|---|
| **Name** | **Code** | **Semester** | **T+A Hour** | **Credit** | **ECTS** |
| GENERAL CHEMISTRY | IND1210757 | Spring Semester | 3+0 | 3 | 5 |

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| **Prerequisites Courses** | |
| **Recommended Elective Courses** | |
| **Language of Instruction** | English |
| **Course Level** | First Cycle (Bachelor's Degree) |
| **Course Type** | Required |
| **Course Coordinator** | Prof.Dr. Yasemin YÜKSEL DURMAZ |
| **Name of Lecturer(s)** | Prof.Dr. Yasemin YÜKSEL DURMAZ |
| **Assistant(s)** | Teaching Assistant |
| **Aim** | This course lays the foundation for all subsequent study in chemistry. During the semester, we will focus on the key chemical themes of structure and equilibrium. We start with a quick review of basic concepts like matter, atom, molecules, and ionic compounds, writing equations to describe chemical reactions, particularly, in solution, mass and mole relationship and stereochemistry. We will review the basic of ideal gas behavior as well. The rest of the semester fleshes out the theme of structure and equilibrium. First we introduce key concepts about light and quantum mechanics and use them to explain the properties of atom and the structure of periodic table. Next, we develop a set of powerful model that explains how atom forms chemical bonds, and three-dimensional structure of organic and inorganic molecules. We conclude with physical properties of solutions, chemical equilibrium and the solution phase reactions of acid and bases. |
| **Course Content** | This course contains; Matter, Atom and Atomic Theory,Chemical Compounds,Chemical Reactions,Reaction In Aqueous Solution,Gases,Thermochemistry,Electron in Atom,The Periodic Table and Same Atomic Properties,Chemical Bonding I-Basic Concepts,Chemical Bonding II-Additional Aspects,Intermolecular Forces,Solutions and Their Physical Properties,Principles of Chemical Equilibrium,Acids and Bases. |

| **Course Learning Outcomes** | **Teaching Methods** | **Assessment Methods** |
|---|---|---|
| Remembers main subjects of general chemistry with updated knowledge | 12, 14, 9 | A, E, G |
| Predict chemical compounds, their reactions and the role of the compound in the reaction | 12, 14, 9 | A, E, G |
| Evaluate the gas laws | 12, 14, 9 | A, E, G |
| Recognize the interactions between atoms and molecules | 12, 14, 9 | A, E, G |
| Asses the solution properties and solution components | 12, 14, 9 | A, E, G |
| Interpret the temperature, heat and work relation in chemical reactions | 12, 14, 9 | A, E, G |
| Evaluates the bond theories | 12, 14, 9 | A, E, G |
| Recognizes the acids and bases reactions | 12, 14, 9 | A, E, G |
| Evaluates the chemical equilibrium conditions | 12, 14, 9 | A, E, G |

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| **Teaching Methods** | 12: Problem Solving Method, 14: Self Study Method, 9: Lecture Method |
| **Assessment Methods** | A: Traditional Written Exam, E: Homework, G: Quiz |

**Lecture Schedule**

| **Sequence** | **Topics** | **Preliminary Preparation** |
|---|---|---|
| 1 | Matter, Atom and Atomic Theory | Going through course materials |
| 2 | Chemical Compounds | Going through course materials |
| 3 | Chemical Reactions | Going through course materials |
| 4 | Reaction In Aqueous Solution | Going through course materials |
| 5 | Gases | Going through course materials |
| 6 | Thermochemistry | Going through course materials |
| 7 | Electron in Atom | Going through course materials |
| 8 | The Periodic Table and Same Atomic Properties | Going through course materials |
| 9 | Chemical Bonding I-Basic Concepts | Going through course materials |
| 10 | Chemical Bonding II-Additional Aspects | Going through course materials |
| 11 | Intermolecular Forces | Going through course materials |
| 12 | Solutions and Their Physical Properties | Going through course materials |
| 13 | Principles of Chemical Equilibrium | Going through course materials |
| 14 | Acids and Bases | Going through course materials |

| **Evaluation Methods** | **Weight(%)** |
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| Midterm Exam | 30 |
| General Exam | 70 |

| **Resources** |
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| General Chemistry Principles and Modern Applications (Ralph H. Petrucci, 11th edition)Lecture notes presentation |