## Course Syllabus

| | |
|---|---|
| **Code - Course Title** | **KİM170 - Analytical Chemistry I** |
| **Course Type** | II. SEMESTER |
| **Laboratory + Practice** | 4+2 |
| **ECTS** | **6.0** |
| **Language of Instruction** | Türkçe |
| **Course Type** | Required Courses |
| **Course Instructor(s)** | DR. ÖĞR. ÜYESİ ARIN GÜL DAL POÇAN, PROF. DR. EROL ŞENER |

| | |
|---|---|
| **Mode of Delivery** | The mode of delivery of this course is Face to face |
| **Prerequisites** | There is no prerequisite or co-requisite for this course. |
| **Courses Recomended** | There is no recommended optional programme component for this course. |
| **Work Placement** | Not Applicable |

## Course Syllabus

| Weeks | Learning Outcomes | Topics | Teaching Methods |
|---|---|---|---|
| **Week - 1** | | Chemicals, Materials, and Fundamental Processes in Analytical Chemistry. Introduction to Basic Laboratory Applications and Qualitative Ion Analysis. | |
| **Week - 2** | | Concentration Calculations. Anions. | |
| **Week - 3** | | Chemical Equations & Stoichiometry. Anions. | |
| **Week - 4** | | Chemical Equilibrium. Solution Preparation. | |
| **Week - 5** | | Buffer Solutions. Group I Cations. | |
| **Week - 6** | | Activity. Group III-A Cations. | |
| **Week - 7** | | Heterogeneous Equilibrium. Group V Cations. | |
| **Week - 8** | | Solubility. Systematic Analysis of Group I-V Cations. | |
| **Week - 9** | | Gravimetry, Systematic Analysis of Group I-V Cations. | |
| **Week - 10** | | Analytical Method Development and Sample Preparation. Gravimetric Analysis Applications. | |
| **Week - 11** | | Evaluation of Analytical Data. Gravimetric Analysis Applications. | |
| **Week - 12** | | Evaluation of Analytical Data. Statistical Evaluation of Gravimetric Experimental Data. | |
| **Week - 13** | | Analytical Method Validity. Statistical Evaluation of Gravimetric Experimental Data. | |
| **Week - 14** | | Analytical Method Validity. Statistical Evaluation of Gravimetric Experimental Data. | |

## Learning Outcomes

| # | Learning Outcome |
|---|---|
| 1 | Will explain the nature of analytical chemistry. |
| 2 | Will explain the selection and use of reagents and other chemicals. |
| 3 | Will provide information on the cleaning and labeling (marking) of laboratory materials. |
| 4 | Will explain general procedures related to weighing. |
| 5 | Will explain basic operations performed in the laboratory. |
| 6 | Will explain the measurement of volume. |
| 7 | Will explain the calibration of volumetric containers. |
| 8 | Will explain percent-based and density-based solutions. |
| 9 | Will explain normality. |
| 10 | Will explain molarity. |
| 11 | Will explain molality, formality, and osmolarity. |
| 12 | Will explain how valence numbers are determined. |
| 13 | Will explain reaction balancing. |
| 14 | Will explain basic stoichiometric calculations. |
| 15 | Will explain complex stoichiometric calculations. |
| 16 | Will explain chemical equilibrium and equilibrium constant. |
| 17 | Will explain types of chemical equilibrium. |
| 18 | Will explain the ionization of water. |
| 19 | Will explain the ionization of acids and bases. |
| 20 | Will explain buffer solutions. |
| 21 | Will explain ionic strength. |
| 22 | Will explain activity. |
| 23 | Will explain dissolution equilibria. |
| 24 | Will explain the common ion effect. |
| 25 | Will explain the effect of foreign ions. |
| 26 | Will explain solubility constants. |
| 27 | Will explain multiple dissolution equilibria. |
| 28 | Will explain gravimetry. |
| 29 | Will explain precipitation gravimetry. |
| 30 | Will explain volatilization gravimetry. |
| 31 | Will explain method selection. |
| 32 | Will explain sample preparation. |
| 33 | Will explain sources of error in chemical analysis. |
| 34 | Will explain the evaluation of analytical data. |
| 35 | Will explain method validation. |
| 36 | Will explain parameters of analytical method validation. |
| 37 | Will explain the laboratory environment and basic rules. |
| 38 | Will identify the laboratory bench and equipment. |

## Learning Outcomes

| # | Learning Outcome |
|---|---|
| 39 | Will explain qualitative analysis. |
| 40 | Will explain basic laboratory procedures. |
| 41 | Will explain the analysis of anions. |
| 42 | Will explain the analysis of chloride ion. |
| 43 | Will explain the analysis of sulfate ion. |
| 44 | Will explain the analysis of nitrate ion. |
| 45 | Will explain the analysis of phosphate ion. |
| 46 | Will explain the analysis of carbonate ion. |
| 47 | Will explain the analysis of an unknown sample containing anions. |
| 48 | Will explain the basic procedures in solution preparation. |
| 49 | Will explain the analysis of Group I cations. |
| 50 | Will explain the systematic analysis of Group I cations. |
| 51 | Will explain the Group III-A cations. |
| 52 | Will explain the systematic analysis of Group III-A cations. |
| 53 | Will explain the analysis of Group V cations. |
| 54 | Will explain the analysis of sodium ion. |
| 55 | Will explain the analysis of potassium ion. |
| 56 | Will explain the analysis of ammonium ion. |
| 57 | Will explain the analysis of magnesium ion. |
| 58 | Will explain the systematic analysis of Group I-V cations. |
| 59 | Will explain quantitative analysis. |
| 60 | Will explain the precipitation process. |
| 61 | Will explain the filtration process. |
| 62 | Will explain the combustion process. |
| 63 | Will explain the weighing process. |
| 64 | Will explain analytical calculations. |
| 65 | Will explain statistical calculations for repeated measurements. |
| 66 | Will explain significance tests. |

## Sustainable Development Goals

*No content has been provided.*

## Course Theme

*No content has been provided.*

## AKTS Workload

| Activity | Duration (Hour) | Count | Workload |
|---|---|---|---|

## AKTS Workload

| Activity | Duration (Hour) | Count | Workload |
|---|---|---|---|
| Teorik Derse Katılım | 0 | 0 | 0 |
| Sınıf Dışı Çalışma (Ön Hazırlık & Pekiştirme Amaçlı) | 0 | 0 | 0 |
| Ödevler | 0 | 0 | 0 |
| Proje - Rapor - Sunum Hazırlama | 0 | 0 | 0 |
| Ara Sınav Hazırlığı (sınav süresi dahil) | 0 | 0 | 0 |
| Final Sınavı Hazırlığı (sınav süresi dahil) | 0 | 0 | 0 |
| Uygulama (Laboratuvar, Müzik/Enstrüman Uygulaması, Atölye/Saha Çalışması vb.) | 0 | 0 | 0 |
| Staj Uygulaması | 0 | 0 | 0 |
| | | **Calculated ECTS** | **0** |

## Assessment Method and Passing Requirements

*No content has been provided.*