# TEMPLATE FOR COURSE SPECIFICATION

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| **HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW** |

**COURSE SPECIFICATION**

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| **This Course Specification provides a concise summary of the main features of the course and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if he/she takes full advantage of the learning opportunities that are provided. It should be cross-referenced with the programme specification.** |

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| **1. Teaching Institution** | **Al Nahrain University** |
| **2. University Department/Centre** | **Department of Chemistry** |
| **3. Course title/code** | **Analytical chemistry- 121** |
| **4. Modes of Attendance offered** | **Attended lectures** |
| **5. Semester/Year** | **Semester ((courses)) (second stage) 2022-2023 first semester** |
| **6. Number of hours tuition (total)** | **45 hours** |
| **7. Date of production/revision of this specification** | **9-10-2022** |
| **8. Aims of the Course** |
| **1- Introducing students to the basic concepts related to descriptive analysis methods** |
| **2 - Focusing on the method of sedimentation of elements in descriptive analytical chemistry and calculating their quantities** |
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| **9· Learning Outcomes, Teaching ,Learning and Assessment Methode** |
| **A- Cognitive goals . A1. Introduce students to the basic concepts related to descriptive analytical chemistry** **A2. Increasing awareness and educating students by solving problems related to segregation and sedimentation methods** |
| **B. The skills goals special to the course. B1. practical skills****B2. Analytical and inferential skills****B3. Development skills** |
| **Teaching and Learning Methods** |
| **Providing students with the basics and additional topics related to thinking outcomes****Discussing the topics of the lesson that require thinking and analysis****- Raising a set of thinking questions during the lectures, which increases and motivates students to analyze and conclude****Giving students homework that requires self-explanations** |
| **Assessment methods** |
| **Oral exams for the previous lecture****Participation scores for competition questions related to the subject****Specific grades for homework****- Semester exams** |
| **C. Affective and value goals** **C1. Enabling students to solve problems related to the intellectual framework of the lecture material****C2 - Enabling students to think intellectual questions from the lecture material****C3- Linking the lecture curriculum with practical applications, especially with our daily life** |
| **Teaching and Learning Methods** |
| **Providing students with the basics and additional topics related to thinking outcomes****Discussing the topics of the lesson that require thinking and analysis****- Raising a set of thinking questions during the lectures, which increases and motivates students to analyze and conclude****Giving students homework that requires self-explanations** |
| **Assessment methods** |
| **Oral exams for the previous lecture****Participation scores for competition questions related to the subject****Specific grades for homework****- Semester exams** |
| **D. General and rehabilitative transferred skills(other skills relevant to employability and personal development)****D1. Providing students with the basics and additional topics related to the outputs of thinking****Discussing the topics of the lesson that require thinking and analysis****D2- Raising a set of thinking questions during the lectures, which increases and motivates students to analyze and conclude****Giving students homework that requires self-explanations****.** |

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| **10. Course Structure** |
| **Week** | **Hours** | **ILOs** | **Unit/Module or Topic Title** | **Teaching Method** | **Assessment Method** |
| **1** | **2 hour** | **Introducing the student to the subject of descriptive analysis in analytical chemistry** | **Introduction of Gravimetric analysis and classification of** | **Explanation of the article and****Use of illustrations** | **Short oral and written exams** |
| **2** | **2 hour** | **Introduce the student to the methods of sedimentation and their characteristics** | **gravimetric methods, properties, precipitation gravimetric, examples**  | **Explanation of the article and****Use of illustrations** | **Short oral and written exams** |
| **3** | **2 hour** | **Learn about arithmetic methods** | **Calculation** | **Explanation of the article and****Use of illustrations** | **Short oral and written exams** |
| **4** | **2 hour** | **Identify the best characteristics of the precipitating agent and the methods of forming the precipitate** |  **Properties of precipitates and precipitating agents,**  | **Explanation of the article and****Use of illustrations** | **Short oral and written exams** |
| **5** | **2 hour** | **Identify the types of sediments and their specifications** | **factors that determine the particle size of precipitate,Colloids precipitate and structure ,** | **Explanation of the article and****Use of illustrations** | **Short oral and written exams** |
| **6** | **2 hour** |  | **Mid Exam** |  |  |
| **7** | **2 hour** | **Recognize the types of sedimentation** | **coagulation of colloids, types of co precipitation** | **Explanation of the article and****Use of illustrations** | **Short oral and written exams** |
| **8** | **2 hour** | **Identify the sedimentation mechanism Identify the methods of** | **Mechanism of precipitate formation**  | **Explanation of the article and****Use of illustrations** | **Short oral and written exams** |
| **9** | **2 hour** | **sedimentation in homogeneous solutions** | **Precipitation from homogeneous solution, drying and ignition of precipitate, types of organic reagents** | **Explanation of the article and****Use of illustrations** | **Short oral and written exams** |
| **10** | **2 hour** | **Identify the gravimetric method applications** | **Application of gravimetric methods,** | **Explanation of the article and****Use of illustrations** | **Short oral and written exams** |
| **11** | **2 hour** | **Learn about the types of titration method and how to calculate it** | **types of titration curves, solubility of precipitates, calculation**  | **Explanation of the article and****Use of illustrations** | **Short oral and written exams** |
| **12** | **2 hour** | **Identify the types of saturation of the mixture and how to calculate it** | **Titration curve for mixtures of anion, examples of indicators for precipitation titration**  | **Explanation of the article and****Use of illustrations** | **Short oral and written exams** |
| **13** | **2 hour** | **Recognize how complexes are formed and how to correct them** | **Complexometric reaction and titration, EDTA titrations, EDTA equilibrium, titration curves** | **Explanation of the article and****Use of illustrations** | **Short oral and written exams** |
| **14** | **2 hour** |  | **Mid exam** |  |  |

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| **11. Infrastructure** |
| **1. Books Required reading:** | **1-Analytical chemistry, skoog 2nd  edition** **Fundamentals of analytical chemistry, skoog 8th edition** |
| **2. Main references (sources)** | **Fundamentals of Analytical Chemistry 9e by Douglas A. Skoog"** **2- Fundamentals of Analytical Chemistry 8e by Douglas A. Skoog** |
| **A- Recommended books and references (scientific journals, reports…).** |  |
| **B-Electronic references, Internet sites…** | **Web Site****http://www.acs.org/content/acs/en.html** |
| **12. The development of the curriculum plan** |
| **Development and updating are carried out according to the information available from modern sources, in addition to developing illustrations to increase the student's understanding and awareness of the course material.** |
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