# 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 program specification. |

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| 1. Teaching Institution | Al‐Nahrain University |
| 2. University Department/Centre | Department of Chemistry |
| 3. Course title/code | Organic Chemistry/ Second Year/ CHEM 231 |
| 4. Modes of Attendance offered | Attendance |
| 5. Semester/Year | First Semester/ 2020-2021 |
| 6. Number of hours tuition (total) | Thirty-two hours |
| 7. Date of production/revision of this specification | 18-09-2020 |
| 8. Aims of the Course | |
| Basically, teaching students the naming of aromatic compounds and learning how to calculate aromaticity and their properties are firstly established. Teaching most of the benzene and its derivatives reactions and delivering the knowledge of their chemical structure are furthermore accomplished. Gaining clear explanations of the organic reactions mechanisms is also achieved. Benzene and its derivatives applications are demonstrated with showing their connections to the scientific development. | |
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| 9· Learning Outcomes, Teaching, Learning and Assessment Method |

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| 1. Cognitive goals.   A1. Enable students to acquire knowledge and understanding of the chemistry of aromatic compounds.  A2. Enabling students to understand the structures and nomenclature of aromatic organic compounds.  A3. Enable students to know and understand the mechanisms of organic reactions of the aromatic compounds.  A4. Enabling students to know and understand practical experiments related to aromatic compounds. |
| * B. The skills goals special to the course.   B1. Understanding of the underlying theoretical principles that explain chemical behavior.  B2. Development of analytical problem-solving skills in the major areas of chemical study.  B3. Ability to independently investigate and resolve an original problem  B4. Preparation for later advanced study. |
| Teaching and Learning Methods |
| Explanation and clarification of the lecture using the whiteboard and the use of video lectures.  Providing students with the basics and additional topics related to the outcomes of critical thinking and analysis of organic chemistry.  Making a group discussion during the lectures to discuss topics that require reflection and analysis  Presenting a set of critical thinking questions during the lectures such as what, how, when and why for specific topics.  Giving students homework that requires explanations and solving through reasonable methods  Giving students homework that requires explanations in causal ways |
| Assessment methods |
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| C. Affective and value goals  C1. Homework  C2. Tests  C3. Discussion |
| Teaching and Learning Methods |
| 1. To enable students to solve problems related to the philosophical framework of aromatic chemistry   2- Enabling students to solve problems related to the preparation of aromatic compounds  3- Enabling students to understand the scientific terms related to the chemistry of aromatic compounds in the English language |
| Assessment methods |
| C1. Homework  C2. Tests  C3. Discussion |

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| D. General and rehabilitative transferred skills (other skills relevant to employability and personal development)  D1. Follow up on scientific development by communicating with international universities *via* the Internet  D2. Participation in scientific conferences inside and outside the country  D3. Participation in workshops and scientific symposia inside and outside the country  D4. Field visits that applied industrial projects |

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| 10. Course Structure | | | | | |
| Week | Hours | ILOs | Unit/Module or Topic Title | Teaching Method | Assessment Method |
| 1 | 2 | Introducing the students to the chemistry of benzene and the delocalization and conjugation  phenomena | Structure and stability of benzene | Whiteboard and Data show | Daily exams  Homework |
| 2 | 2 | The nomenclature  monosubstituted, disubstituted polysubstituted of benzene | The nomenclature of benzene | Whiteboard and Data show | Daily exams  Homework  Monthly exams |
| 3 | 2 | Understanding aromaticity and calculate the Huckel rule | The Huckel 4n + 2 rule | Whiteboard and Data show | Daily exams  Homework  Monthly exams |
| 4 | 2 | Mechanism of halogenation, nitration and sulfonation | Electrophilic Aromatic Substitution | Whiteboard and Data show | Daily exams  Homework  Monthly exams |
| 5 | 2 | Mechanism of Friedel- Crafts acylation and Friedel- Crafts alkylation | Electrophilic Aromatic Substitution | Whiteboard and Data show | Daily exams  Homework  Monthly exams |
| 6 | 2 | A review of what was studied in the previous lectures with questions and with discussion and explanatory of typical answers | Discussion, questions and typical answers | Whiteboard and Data show | Daily exams  Homework  Monthly exams |
| 7 | 2 | Mid Exam-1 | Mid Exam | Whiteboard and Data show | - |
| 8 | 2 | The synthesis of substituted benzene using arenediazonium salts | Electrophilic Aromatic Substitution | Whiteboard and Data show | Daily exams  Homework  Monthly exams |
| 9 | 2 | Activating substituents and deactivating substituents | Theory of reactivity, theory of orientation. | Whiteboard and Data show | Daily exams  Homework  Monthly exams |
| 10 | 2 | Weakly, moderately and strongly activating substituents | Activating, ortho, para-directing substituents | Whiteboard and Data show | Daily exams  Homework  Monthly exams |
| 11 | 2 | Weakly, moderately and strongly deactivating substituents | Deactivating, meta-directing substituents | Whiteboard and Data show | Daily exams  Homework  Monthly exams |
| 12 | 2 | A review of what was studied in the previous lectures with questions and with discussion and explanatory of typical answers | Discussion, questions and typical answers | Whiteboard and Data show | Daily exams  Homework  Monthly exams |
| 13 | 2 | Mid Exam-2 | Mid Exam | Whiteboard and Data show | - |

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| 11. Infrastructure | | |
| 1. Books Required reading: | | Organic Chemistry - Paula Yurkanis Bruice, 7th Ed, 2014  Organic chemistry - J. Clayden, N. Greeves, S. G. Warren, 2nd Ed, 2012  David R. Klein - Organic Chemistry-John Wiley & Sons (2017 |
| 2. Main references (sources) | |  |
| A- Recommended books and references (scientific journals, reports…). | |  |
| B-Electronic references, Internet sites… | |  |
| 12. The development of the curriculum plan | |
| Familiarity with everything that is new in teaching and learning strategies  Benefit from recent publications of organic chemistry books  Implementation of some modern teaching strategies | |