**Course Description**

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| **Faculty** | **Pharmacy** |
| **Department**  | Pharmaceutical chemistry  | **Level** | 7 |
| **Course**  | Medicinal Chemistry II Practical | **Code** | 1703327 | **Prerequisite** | 1703326 or (simultaneous) |
| **Credit hours** | 2 | **Theoretical**  |  | **Practical** | 1 |
| **Coordinator** |  | **Email** |  |
| **Teachers** | Dr. Hayat Albtoush • Instructor: Laboratory assistanc | **Emails** |  |
| **Lecture Time** |  | **Place** |  | **Attendance mode** | Face to face  |
| **Semester**  |  | **Preparation date**  |  | **Modification Date** |  |

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|  **Abstracted Course Description**  |
| This course aims mainly at introducing the students to practical experience related to assays, tests of medicinal substances and their chemical preparations, to provide means of quality control by applying the various methods and techniques described in the official compendia. The course focuses on multui-step synthesis of medicinal drugs illustration different principles in synthesis such as steric hindrance and protection groups. |
| **Course Goals** |
| 1. To provide students with the significance of multi-step synthesis as a tool in medicinal drugs. 2. To introduce a practical skills in organic synthesis of drugs, as part of SARS studies. 3. To understand the and utilize functional groups in organic pharmaceutical compounds, and the importance of these functional groups in the chemical and physical behavior and synthetic reactions of different drugs. 4. To introduce practically the concepts of protecting, leaving and activating groups in drug synthesis. Mutah University Detailed Syllabus Form 5. Employ theoretical organic chemistry knowledge for the synthesis of Medicinal compounds. 6. To Employ background knowledge in purification techniques, separation and distillation such as (i.e., crystallization, decantation, distillation,..) for purifying chemical structures during synthesis. 7. Employ analytical techniques, i.e., thin layer chromatography for characterizing chemical structures during synthetic steps |

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| **CILOs** |
| **Knowledge** |
| A.1 Understand the importance of multi-step synthesis and SAR in pharmaceutical Drugs synthesis and design. A.2 Understanding the basis of analytical techniques, separation and purification techniques and their relation to synthesis and assay of drug |
| **Skills** |
| B.1 Define and recognize these practical skills in preparing some usefully pharmaceutical drugs using multi-step Approach B.2 Student should apply his basic knowledge in analysis, separation and purification of drugs/compounds. B.3 Ability to apply this knowledge to explain drug activity, behavior, solubility, oxidation, and stability. |
| **Competencies** |
| C.1 Acquire good practical skills regarding chemical synthetic procedures and organic reactionsC.2 Understand and Apply the concepts of directing, protecting and bulk functional groups in the synthesis of high yield and assay of drugs C.3 Practicing special techniques related to organic synthesis such as crystallization, melting point determination, distillation, decantation, and refluxing, in addition to safe chemical handling and disposal |
| **Learning Methods** |
| 1Practical sessions, short lectures, discussion 2 Assignment, oral discussion, and short questions and quizzes 3. Assignments and group discussion |
| **Evaluation Tools** |
| **No.****1. 8 Midterm Exam 30%****2. 10 Assignment & Quizes 20%****3. 15 Final Exam 50** |
| **Week** | **Topics** | **Learning methods** | **Evaluation tool** | **ILOs** | **Hours** |
| **1.** | ntroduction: Safty and instrumentation- Multi-step Synthesis of Sulfanilamide | Textbook and handouts | QUIZ | **A**  | **3** |
| **2.** | art 1: Synthesis of Acetanilide Saturated | Textbook and handouts |  | **A**  | **3** |
| **3.** | Part 2: Preparation of pAcetamidobenzenesulfo nyl chlorid | Textbook and handouts |  | **A**  | **3** |
| **4.** | Part 3: Preparation of pAcetamidobenzenesulfo namide | Textbook and handouts |  | **A**  | **3** |
| **5.** | Part 4: Preparation of pAminobenzenesulfonam ide (Sulfanilamide)-Multi-step Synthesis of Benzocaine | Textbook and handouts |  | **B**  | **3** |
| **6.** | Part 1: Synthesis of pAcetotoluidide | Textbook and handouts | Exam | **B**  | **3** |
| **7.** | Midterm Exam | Textbook and handouts | Exam | **B**  | **3** |
| **8.** | art 2: Synthesis of pAcetamidobenzoic acid | Textbook and handouts | **C**  | **3** |
| **9.** | part 3: Synthesis of a Amino benzoic acid (PABA)3- Multi-step Synthesis of Phenytoin (Dilantin ® ) | Textbook and handouts | Exam | **C**  | **3** |
| **10.** | Part 1: Benzoin Condensation | Textbook and handouts | **C**  | **3** |
| **11.** | Part 2: Oxidation of Benzoin to benzyl | Textbook and handouts | homework | **A**  | **3** |
| **12.** | Part 3: Condensation of Benzil with Urea to Form Phenytoin | Textbook and handouts | **C**  | **3** |
| **13.** | Part 3: Condensation of Benzil with Urea to Form Phenytoin |  |  |  | **3** |
| **14.** | Part 3: Condensation of Benzil with Urea to Form Phenytoin |  |  |  | **3** |
| **15.** | Final exam  |  |  |  | **2** |

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| **Plan of Course Evaluation** |
| **Evaluation Tools** | **Mark** | **ILOs** |
| **A1** | **A2** | **A3** | **B1** | **B2** | **B3** | **C1** | **C2** | **C3** |
| **First Exam (Mid-term)**  | **30%** | \* | \* |  |  | \* |  |  |  | \* |
| **Second Exam (If available)** |  |  |  |  |  |  |  |  |  |  |
| **Final Exam** | **50%** |  |  |  |  |  | \* | \* | \* |  |
| **Activities** | **20%** |  |
| **Activities Evaluation** | Homework/Tasks | 10% |  |  |  | \* | \* |  | \* |  |  |
| Case Study  |  |  |  |  |  |  |  |  |  |  |
| Discussion and Interactions |  |  |  |  |  |  |  |  |  |  |
| Group Activities |  |  |  |  |  |  |  |  |  |  |
| Laboratory Exams |  |  |  |  |  |  |  |  |  |  |
| Presentations |  |  |  |  |  |  |  |  |  |  |
| Quizzes | 10% |  | \* |  |  | \* | \* |  |  | \* |
| Others |  |  |  |  |  |  |  |  |  |  |
| **Total** | 100% |  |  |  |  |  |  |  |  |  |

 **Components**  |
| **Book** | 1. Introduction to Modern Experimental organic Chemistry, By Robert Gilbert 2. Unitized Experiments in Organic Chemistry, 4th ed., by Brewster, VanderWerf and McEwen |
| **References** |  1. Introduction to Modern Experimental organic Chemistry, By Robert Gilbert 2. Unitized Experiments in Organic Chemistry, 4th ed., by Brewster, VanderWerf and McEwen |
| **Recommended Readings** |  |
| **Electronic materials** |  |
| **Other websites** |  |

**Subject Coordinator:**

**Head of Curriculum Committee:**

**Department Head:**

**Faculty Dean:**

**Last update date**