**Course Description**

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| **Faculty** | **Pharmacy** | | | | | | |
| **Department** | Pharmaceutical Chemistry | | | **Level** | | | 7 |
| **Course** | Pharmaceutical Instrumental Methods of Analysis | **Code** | 1703218 | **Prerequisite** | | | 1703114 |
| **Credit hours** | 2 | **Theoretical** |  | **Practical** | | |  |
| **Coordinator** |  | **Email** |  | | | | |
| **Teachers** | Prof. Dr. WAEL ABU DAYYIH Dr. MOUSA MAGHARBEH | **Emails** |  | | | | |
| **Lecture Time** |  | **Place** |  | | **Attendance mode** | Face to face | |
| **Semester** |  | **Preparation date** |  | | **Modification Date** |  | |

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| **Abstracted Course Description** |
| This course aims to implement and augment the knowledge given in the course pharmaceutical instrumental analysis and technology of analysis. This course will give basics of Pharmaceutical analysis which significantly influences the formation of logical train of thought of incoming pharmacist and his/her orientation in the field. Pharmaceutical analysis involves separating, identifying, and determing the relative amount of components in a sample of matter y using an instrument. Qualitative analysis reveals the chemical identity of species in the sample. Experimentally skilled student becomes familiar with a wide scale of pharmaceutically important substances and their properties related to biological activity and therapeutic action. The development of all parts of analytical chemistry as a scientific discipline is characterized by emphasis on microanalysis and trace analysis, development of new methods and procedures and their optimization. From the methodological point of view, the recent trend is based on computer art including data acquisition and processing and automation of analytical operations. These aspects form a theoretical background of education process with relation to the application of chemical and instrumental methods in pharmaceutical practice. |
| **Course Goals** |
| By the end of this course, the students will acquire essential skills for identifying analytical signal, measuring the efficacy and potency of different quantitively methods and qualitative methods, using different methods of analysis with various signals and detecting and designing optimum concentration levels and monitoring quality and quantity for pharmaceutical dosage forms. |

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| **CILOs** | | | | | |
| **Knowledge** | | | | | |
| A.1 Know the main rules in an analysis, Present results correctly, and test for precision and accuracy  A.2 Know the different qualitative and quantitative tests that are used to evaluate pharmaceutical concentrations in different dosage forms  A.3 Know the different techniques that are used to monitor the signals for qualitative and quantitative analysis in pharmaceutical process of preparations | | | | | |
| **Skills** | | | | | |
| B.1 Calculate and interpret the concentrations of different API’s  B.2 Judge the method of analysis of different pharmaceutical preparation and  environmental conditions  B.3 Quantifying excipients in their limit of detection | | | | | |
| **Competencies** | | | | | |
| C.1 Practical skills of analysis techniques  C.2 Practical skills of handling the concentration of API’s  C.3 Practical skills of identifying and quantifying types of method use in analysis | | | | | |
| **Learning Methods** | | | | | |
| * Lectures * Oral dissection * Assignment | | | | | |
| **Evaluation Tools** | | | | | |
| **Exams**  **Quiz** | | | | | |
| **Week** | **Topics** | **Learning methods** | **Evaluation tool** | **ILOs** | **Hours** |
| **1.** | Introduction Instrumental analysis, Qualitative and Quantitative analysis, Analytical methodology | Textbook and handouts | QUIZ | **A** | **1** |
| **2.** | Introduction Instrumental analysis, Qualitative and Quantitative analysis, Analytical methodology | Textbook and handouts |  | **A** | **1** |
| **3.** | Errors and the treatment of the analytical data Type of errors, significant figures, Statistical treatment of finite samples, method of least square. Accuracy and Precision in analysis | Textbook and handouts |  | **A** | **1** |
| **4.** | Validation of an analytical method | Textbook and handouts |  | **A** | **1** |
| **5.** | Control of Quality and physical and chemical properties of drug molecules | Textbook and handouts |  | **B** | **1** |
| **6.** | General principles, concentration systems, terminology in analysis, ionization of drugs | Textbook and handouts | Exam | **B** |  |
| **7.** | Buffer solution and standard solution, internal standards, stock solutions , blanks , | Textbook and handouts | Exam | **B** | **1** |
| **8.** | EVISIONS | Textbook and handouts | **C** | **1** |
| **9.** | Exam – 1 | Textbook and handouts | Exam | **C** | **1** |
| **10.** | Spectral Methods – EMR Properties | Textbook and handouts | **C** | **1** |
| **11.** | Main concepts in spectral analysis UV-Vis and IR | Textbook and handouts | homework | **A** | **1** |
| **12.** | Separation Methods – Introduction to Chromatography LC, GC, LC/Ms | Textbook and handouts | **C** | **1** |
| **13.** | elucidation of structures NMR+IR Introduction to Electrochemistry | Textbook and handouts | Exam | **Abc** | **1** |
| **14.** | Elucidation of structures NMR+IR Introduction to Electrochemistry |  | Exam |  | **1** |
| **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. Principles of Instrumental Analysis 6th Edition Douglas A. Skoog -2020**  **2. Pharmaceutical Analysis, A Textbook for Pharmacy Students, David G. Watson,**  **RuAngelie Edrada-Ebe, Elsevier Health Sciences 2019**  **3. Lecture Notes** |
| **References** | 1. Principles of Instrumental Analysis 6th Edition Douglas A. Skoog -2020  2. Pharmaceutical Analysis, A Textbook for Pharmacy Students, David G. Watson,  RuAngelie Edrada-Ebe, Elsevier Health Sciences 2019  3. Lecture Notes |
| **Recommended Readings** |  |
| **Electronic materials** |  |
| **Other websites** |  |

**Subject Coordinator:**

**Dr. Yasser Gaber**

**Head of Curriculum Committee:**

**Department Head:**

**Faculty Dean:**

**Last update date**