**Course Description**

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| **Faculty** | **Pharmacy** |
| **Department**  | **Pharmaceutics and Pharmaceutical Technology** | **Level** |  |
| **Course**  | **Industrial pharmacy practical** | **Code** | **1701405** | **Prerequisite** | 1701404 |
| **Credit hours** | 1 | **Theoretical**  | 1701404 | **Practical** | 1701404 |
| **Coordinator** | Rehan Al kasasbeh | **Email** |  |
| **Teachers** | Rehan al kasasbeh | **Emails** |  |
| **Lecture Time** |  | **Place** |  | **Attendance mode** |  |
| **Semester**  |  | **Preparation date**  |  | **Modification Date** |  |

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| **Abstracted Course Description**  |
| The course covers some important unit operations used in Pharmaceutical technology and drug manufacturing of solid, semisolid and liquid preparations e.g., size analysis, size reduction, mixing, powder flow, micromeritics, drying and filteration. |
| **Course Goals** |
| * To offer practical training in essential unit operations of pharmaceutical manufacturing.
* To develop students' proficiency in handling pharmaceutical materials and conducting unit operations effectively.
* To provide practical insights into the parameters affecting pharmaceutical product quality during manufacturing.
* To prepare students for careers in the pharmaceutical manufacturing industry by equipping them with practical skills.
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| **CILOs** |
| **Knowledge** |
| a1. Apply theoretical knowledge to practical scenarios in pharmaceutical manufacturing.a2. Understand the principles and significance of unit operations in pharmaceutical technology.a3. Identify key parameters affecting pharmaceutical product quality during manufacturing.. |
| **Skills** |
| b1. Perform size analysis and assessment of pharmaceutical materials accurately.b2. Demonstrate proficiency in size reduction techniques and mixing processes.b3. Analyze and assess powder flow characteristics and micromeritics competently.b4. Apply knowledge of drying and filtration principles effectively in pharmaceutical manufacturing. |
| **Competencies** |
| c1. Conduct unit operations with precision and safety, ensuring high product quality.c2. Troubleshoot common issues in pharmaceutical manufacturing processes.c3. Collaborate effectively with peers in a pharmaceutical manufacturing team.c4. Demonstrate the ability to apply practical skills and knowledge in real-world industrial settings. |
| **Learning Methods** |
| * Practical laboratory sessions for hands-on experience in unit operations
* Supervised experiments in size analysis, size reduction, mixing, and powder flow
* Hands-on training in drying and filtration techniques
* Group projects and problem-solving exercises related to industrial pharmaceutical processes
* Collaborative work with peers to simulate real manufacturing environments
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| **Evaluation Tools** |
| Quizzes, Midterm exam, Final Exam, Reports |
| **Week** | **Topics** | **Learning methods** | **Evaluation tool** | **ILOs** | **Hours** |
| **1.** | Introduction | Lecture material and notes | Exams | **A2,a3,b1,b3,c2,c3** | **3** |
| **2.** | Particle size analysis: 1.Determination of average particles size | Homework and Projects, Presentation, … | Assignments, | **A2,a3,b1,b3,c2,c3** | **3** |
| **3.** | 2.Cumulative over-under size calculations | Lecture material and notes  | Exams | **A2,a3,b1,b3,c2,c3** | **3** |
| **4.** | Mixing:1. Determination of best method of mixing | Homework and Assignments, Projects, Presentation, … | Exams | **A1,a2,b1,b2,c1** | **3** |
| **5.** | 2. Optimum time of mixing | Lecture material and notes  | Exams | **A1,a2,b1,b2,c1** | **3** |
| **6.** | Particle size reduction 1 | Lecture material and notes  | Exams | **A1,a2,b1,b2,c1** | **3** |
| **7.** | Particle size reduction 1 | Homework and Assignments, Projects, Presentation, … | Exams | **A1,a2,b1,b2,c1** | **3** |
| **8.** | Midterm Exam | Lecture material and notes  | Exams | **A2,a3,b1,b3,c2,c3** | **3** |
| **9.** | Micromeritics:1.Determination of powder flowability | Lecture material and notes  | Exams | **A2,a3,b1,b3,c2,c3** | **3** |
| **10.** | 2.Enhancement of powder flowability | Lecture material and notes  | Exams | **A2,a3,b1,b3,c2,c3** | **3** |
| **11.** | Drying:1.Difference between granular and amorphous materials | Lecture material and notes | Exams | **A2,a3,b1,b3,c2,c3** | **3** |
| **12.** | 2.Determination of optimum time of drying | Lecture material and notes | Exams | **A1,a2,b1,b2,c1** | **3** |
| **13.** | Final Exam |  |
| **14.** |  |  |  |  |  |
| **15.** |  |  |  |  |  |
| **16.** |  |  |  |  |  |

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| **Components**  |
| **Book** |  |
| **References** |  |
| **Recommended Readings** |  |
| **Electronic materials** |  |
| **Other websites** |  |

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| **Plan of Course Evaluation** |
| **Evaluation Tools** | **Mark** | **ILOs** |
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| **First Exam (Mid-term)**  |  |  |  |  |  |  |  |
| **Second Exam (If available)** |  |  |  |  |  |  |  |
| **Final Exam** |  |  |  |  |  |  |  |
| **Activities** |  |  |
| **Activities Evaluation** | Homework/Tasks |  |  |  |  |  |  |  |
| Case Study  |  |  |  |  |  |  |  |
| Discussion and Interactions |  |  |  |  |  |  |  |
| Group Activities |  |  |  |  |  |  |  |
| Laboratory Exams |  |  |  |  |  |  |  |
| Presentations |  |  |  |  |  |  |  |
| Quizzes |  |  |  |  |  |  |  |
| Others |  |  |  |  |  |  |  |
| **Total** |  |  |  |  |  |  |  |