# Jordan University of Science and Technology

## Faculty of Engineering

## Chemical Engineering Department

| CHE528 Pharmaceutical Process Engineering - JNQF Level: 7 |
|---|
| Second Semester 2022-2023 |

| Course Catalog |
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| 3 Credit Hours. Industrial processes in the pharmaceutical industry, manufacture of conventional solid and liquid dosage forms, mixing, granulation, tableting, coating, encapsulation, and crystallization. |

| Text Book | |
|---|---|
| **Title** | Chemical Engineering in the Pharmaceutical Industry: R&D to Manufacturing |
| **Author(s)** | David J. am Ende |
| **Edition** | 1st Edition |
| **Short Name** | Ref #1 |
| **Other Information** | |

**Course References**

| Short name | Book name | Author(s) | Edition | Other Information |
|---|---|---|---|---|
| Ref #2 | Pharmaceutics: The Design and Manufacture of Midicines | Aulton M.E | 3rd Edition | |
| Ref #3 | Unit Operations of Chemical Engineering | McCabe W.L., Smith J.C. and Harriot, P. | 7th Edition | |
| Ref #4 | Transport Processes and Separation Process Principles | Geankoplis C.J. | 4th Edition | |

| Instructor | |
|---|---|
| Name | **Prof. Rami Jumah** |
| Office Location | CH1 L2 |

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|---|---|
| Office Hours | Sun : 10:30 - 12:30<br>Mon : 11:00 - 12:00<br>Tue : 10:30 - 12:30<br>Thu : 10:30 - 11:30 |
| Email | ramij@just.edu.jo |

| Class Schedule & Room |
|---|
| Section 1:<br>Lecture Time: Sun, Tue, Thu : 12:30 - 13:30<br>Room: CH2107 |

| Prerequisites | | |
|---|---|---|
| **Line Number** | **Course Name** | **Prerequisite Type** |
| 224630 | CHE463 Separation Processes | Pre./Con. |
| 223621 | CHE362 Unit Operations | Prerequisite / Study |

| Tentative List of Topics Covered | | |
|---|---|---|
| **Weeks** | **Topic** | **References** |
| Week 1 | Introduction | From **Ref #1**,<br>From **Ref #2** |
| Week 1 | Overview of the Pharmaceutical Industry | From **Ref #1**,<br>From **Ref #2** |
| Weeks 2, 3 | Industrial Processes in the Pharmaceutical Industry | From **Ref #1**,<br>From **Ref #2** |
| Weeks 4, 5, 6, 7, 8, 9 | Manufacture of Conventional Solid Dosage Forms | From **Ref #1**,<br>From **Ref #2** |
| Week 10 | Manufacture of Liquid Dosage Forms | From **Ref #1**,<br>From **Ref #2** |
| Weeks 11, 12 | Principles and Design of Liquid Mixing Equipment | From **Ref #1**,<br>From **Ref #3**,<br>From **Ref #4** |
| Weeks 13, 14, 15 | Principles and Design of Crystallizers | From **Ref #1**,<br>From **Ref #3**,<br>From **Ref #4** |

| Mapping of Course Outcomes to Program Outcomes and NQF Outcomes | Course Outcome Weight (Out of 100%) | Assessment method |
|---|---|---|
| Be familiar with the pharmaceutical process industry description and characterization [3SO1, 2SO4] [1L7K1, 1L7C2] | 5% | |

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|---|---|---|
| Understand the various industrial processes in the pharmaceutical industry [6SO1, 4SO4] [1L7K1, 1L7C2] | 10% | |
| Understand the methods of preparation and manufacture of powders and granules [6SO1, 4SO4] [1L7K1, 1L7C2] | 10% | |
| Understand the methods of preparation and manufacture of tablets [12SO1, 8SO4] [1L7K1, 1L7C2] | 20% | |
| Understand the methods of preparation and manufacture of hard gelatin and soft gelatin capsules [10SO1, 5SO4] [1L7K1, 1L7C2] | 15% | |
| Understand the methods of preparations and manufacture of liquid dosage forms [7SO1, 3SO4] [1L7K1, 1L7C2] | 10% | |
| Understand the principles and design of mixing equipment [8SO1, 7SO2] [1L7K1, 1L7S2] | 15% | |
| Understand the principles and design of crystallizers [8SO1, 7SO2] [1L7K1, 1L7S2] | 15% | |

| Relationship to Program Student Outcomes (Out of 100%) | | | | | | |
|---|---|---|---|---|---|---|
| SO1 | SO2 | SO3 | SO4 | SO5 | SO6 | SO7 |
| 60 | 14 | | 26 | | | |

| Relationship to NQF Outcomes (Out of 100%) | | |
|---|---|---|
| L7K1 | L7S2 | L7C2 |
| 50 | 15 | 35 |

| Evaluation | |
|---|---|
| **Assessment Tool** | **Weight** |
| Exam 1 | 20% |
| Exam 2 | 20% |
| Exam 3 | 20% |
| Final Exam | 40% |

| Policy | |
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| Attendance | Attendance will be checked at the beginning of class. University regulations will be followed for students exceeding the maximum number of absences. |
| Student Conduct | It is the responsibility of each student to adhere to the principles of academic integrity. Academic integrity means that a student is honest with him/herself, fellow students, instructors, and the University in matters concerning his or her educational endeavors. Cheating will not be tolerated in this course. University regulations will be pursued and enforced on any cheating student. |