| Form: Course Syllabus | | |
|---|---|---|
| | **Form Number** | EXC-01-02-02A |
| | **Issue Number and Date** | 2963/2022/24/3/2<br>5/12/2022 |
| | **Number and Date of Revision or Modification** | 2/(10/12/2023) |
| | **Deans Council Approval Decision Number** | 50/2023 |
| | **The Date of the Deans Council Approval Decision** | 26/12/2023 |
| | **Number of Pages** | 06 |

| | | |
|---|---|---|
| **1.** | **Course Title** | **Biotechnology and Pharmaceuticals** |
| **2.** | **Course Number** | 0905760 |
| **3.** | **Credit Hours (Theory, Practical)** | (3,0) |
| | **Contact Hours (Theory, Practical)** | (3,0) |
| **4.** | **Prerequisites/ Corequisites** | |
| **5.** | **Program Title** | M.Sc. in Chemical Engineering |
| **6.** | **Program Code** | 050 |
| **7.** | **School/ Center** | School of Engineering |
| **8.** | **Department** | Department of Chemical Engineering |
| **9.** | **Course Level** | Master |
| **10.** | **Year of Study and Semester (s)** | |
| **11.** | **Other Department(s) Involved in Teaching the Course** | |
| **12.** | **Main Learning Language** | English |
| **13.** | **Learning Types** | ☐Face to face learning ✓Blended ☐Fully online |
| **14.** | **Online Platforms(s)** | ☐Moodle ☐Microsoft Teams |
| **15.** | **Issuing Date** | |
| **16.** | **Revision Date** | |

**17. Course Coordinator:**

| | |
|---|---|
| Name: | Contact hours: |
| Office number: | Phone number: |
| Email: | |

**18. Other Instructors:**

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|---|
| Name: |
| Office number: |
| Phone number: |
| Email: |
| Contact hours: |
| Name: |
| Office number: |
| Phone number: |
| Email: |
| Contact hours: |

**19. Course Description:**

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| As stated in the approved study plan.<br><br>This course introduces the principles of biochemical engineering and pharmaceutical engineering and their applications in chemical engineering. Topics include the fundamentals of bioprocess engineering, such as microbial kinetics, bioreactor design, and downstream processing, alongside pharmaceutical engineering concepts like drug formulation, delivery systems, and manufacturing processes. The course covers enzyme and microbial technologies, fermentation, and the production of biologics, as well as the design of pharmaceutical unit operations, including crystallization, sterile processing, and tablet manufacturing. Students explore how biochemical and pharmaceutical processes influence product yield, purity, and stability, and how these can be optimized to enhance process efficiency and develop innovative therapeutics. The course provides hands-on experience through lab practical's and insights into cutting-edge research and industrial applications, including biopharmaceutical production, vaccine development, and continuous manufacturing, preparing students to address challenges in biotechnology and pharmaceutical industries. |

**20. Program Intended Learning Outcomes:** (To be used in designing the matrix linking the intended learning outcomes of the course with the intended learning outcomes of the program)

**1.**

**2.**

**3.**

**4.**

**21. Course Intended Learning Outcomes:** (Upon completion of the course, the student will be able to achieve the following intended learning outcomes)

**1.**

**2.**

**3.**

**4.**

| Course ILOs | The learning levels to be achieved | | | | | |
|---|---|---|---|---|---|---|
| | **Remembering** | **Understanding** | **Applying** | **Analysing** | **evaluating** | **Creating** |
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**22. The matrix linking the intended learning outcomes of the course with the intended learning outcomes of the program:**

| ~~Program ILOs~~ / ~~Course ILOs~~ | ILO (1) | ILO (2) | ILO (3) | ILO (4) | ILO (5) |
|---|---|---|---|---|---|
| 1 | | | | | |
| 2 | | | | | |
| 3 | | | | | |

| | | | | | |
|---|---|---|---|---|---|
| 4 | | | | | |
| 5 | | | | | |
| 6 | | | | | |
| 7 | | | | | |
| 8 | | | | | |

**23. Topic Outline and Schedule:**

| Week | Lecture | Topic | ILO/s Linked to the Topic | Learning Types (Face to Face/ Blended/ Fully Online) | Platform Used | Synchronous / Asynchronous Lecturing | Evaluation Methods | Learning Resources |
|---|---|---|---|---|---|---|---|---|
| 1 | 1.1 | | | | | | | |
| | 1.2 | | | | | | | |
| | 1.3 | | | | | | | |
| 2 | 2.1 | | | | | | | |
| | 2.2 | | | | | | | |
| | 2.3 | | | | | | | |
| 3 | 3.1 | | | | | | | |
| | 3.2 | | | | | | | |
| | 3.3 | | | | | | | |
| 4 | 4.1 | | | | | | | |
| | 4.2 | | | | | | | |
| | 4.3 | | | | | | | |
| 5 | 5.1 | | | | | | | |
| | 5.2 | | | | | | | |
| | 5.3 | | | | | | | |
| 6 | 6.1 | | | | | | | |
| | 6.2 | | | | | | | |
| | 6.3 | | | | | | | |
| 7 | 7.1 | | | | | | | |
| | 7.2 | | | | | | | |
| | 7.3 | | | | | | | |
| 8 | 8.1 | | | | | | | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 8.2 | | | | | | | |
| | 8.3 | | | | | | | |
| 9 | 9.1 | | | | | | | |
| | 9.2 | | | | | | | |
| | 9.3 | | | | | | | |
| 10 | 10.1 | | | | | | | |
| | 10.2 | | | | | | | |
| | 10.3 | | | | | | | |
| 11 | 11.1 | | | | | | | |
| | 11.2 | | | | | | | |
| | 11.3 | | | | | | | |
| 12 | 12.1 | | | | | | | |
| | 12.2 | | | | | | | |
| | 12.3 | | | | | | | |
| 13 | 13.1 | | | | | | | |
| | 13.2 | | | | | | | |
| | 13.3 | | | | | | | |
| 14 | 14.1 | | | | | | | |
| | 14.2 | | | | | | | |
| | 14.3 | | | | | | | |
| 15 | 15.1 | | | | | | | |
| | 15.2 | | | | | | | |
| | 15.3 | | | | | | | |

**24. Evaluation Methods:**

Opportunities to demonstrate achievement of the ILOs are provided through the following assessment methods and requirements:

| Evaluation Activity | Mark | Topic(s) | ILO/s Linked to the Evaluation activity | Period (Week) | Platform |
|---|---|---|---|---|---|
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**25. Course Requirements:**

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| (e.g.: students should have a computer, internet connection, webcam, account on a specific software/platform…etc.): |

**26. Course Policies:**

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| A- Attendance policies: |
| B- Absences from exams and submitting assignments on time: |
| C- Health and safety procedures: |
| D- Honesty policy regarding cheating, plagiarism, misbehavior: |
| E- Grading policy: |
| F- Available university services that support achievement in the course: |

**27. References:**

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| A- Required book(s), assigned reading and audio-visuals: |
| B- Recommended books, materials, and media: |

**28. Additional information:**

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|---|---|---|
| Name of the Instructor or the Course Coordinator: | Signature: | Date: |
| …… | ……..…… | ……..…… |
| Name of the Head of Quality Assurance Committee/ Department | Signature: | Date: |
| ……. | ……..…… | ……..…… |
| Name of the Head of Department | Signature: | Date: |
| ……. | ……..…… | ……..…… |
| Name of the Head of Quality Assurance Committee/ School or Center | Signature: | Date: |
| ……. | ……..…… | ……..…… |
| Name of the Dean or the Director | Signature: | Date: |
| ……. | ……..…… | ……..…… |