Program Catalogue | 2023-2024 | دليل البرنامج الدراسي



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| **University of Technology** **Chemical Engineering Department** **الجامعة التكنولوجية** **قسم الهندسة الكيمياوية** |  |

*Chemical Processes Engineering Branch*

*فرع هندسة العمليات الكيمياوية*

Bachelor’s Degree (B.Sc.) بكالوريوس



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9. **Mission & Vision Statement**

***The vision of the Chemical Engineering Department:***

Delivering exceptional teaching and learning experiences while enhancing the standards of scientific performance in research, fact-finding, and community service in the fields of applied chemical engineering sciences.

***Chemical Engineering Department Mission:***

Preparing practically trained engineering professionals who are scientifically and ethically distinguished in an academic environment that promotes self-learning, encourages initiative and innovation and provides research and advisory services with the aim of serving the community, taking into account the quality of performance.

***Vision Statement of Chemical Processing Engineering Branch.***

Being a part of international education in promoting leadership and innovation in education, research, and societal service.

***Mission Statement of Chemical Processing Engineering Branch.***

Providing academic programs in physical and chemical processes, as well as engineering design to prepare chemical engineers able to work in different industrial sectors.

1. **Program Specification**

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| --- | --- | --- | --- |
| Program code: | Bsc- CES.PR | ECTS | 240 |
| Duration:  | 4 levels, 8 Semesters | Methods of Attendance  | Full Time |

The program's educational objectives align harmoniously with the mission statements of both the University of Technology and the Chemical Engineering Department. These statements reflect shared educational values, emphasizing the graduation of students who possess professional competence, leadership qualities, and the ability to work effectively as part of a team in various scenarios. Additionally, the program aims to instill in students an understanding of the significance of their work, not only to their own development but also to the betterment of society as a whole. The **Chemical Process Engineering** curriculum has been deliberately designed in main three categories of courses:

1. **General Engineering (Engineering Science and Engineering Design):** These courses are standard for most undergraduate engineering students and provide instruction in fundamental engineering principles. They serve as an introduction to engineering basics and serve as a complement to the mathematics and basic sciences that students encounter prior to or concurrently with these courses. The general engineering courses swiftly establish the context for the mathematics and basic sciences that students may find challenging to fully grasp and appreciate.
2. **Basic Mathematics and Science:**

The Math & Basic Science requirements are covered by courses required for graduation Basic Sciences requirements are met by the requirement for 5 courses, Chemistry with Lab, Engineering Drawing with Lab, Computer Programming with Lab, and Basic Principles of Chem. Eng. Basic Science courses are foundational material to the basic engineering science courses.

The mathematics sequence includes calculus through differential equations and an applied math, Optimization courses in engineering.

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Because **Chemical Process Engineering** as a discipline has a heavy reliance on mathematics, three years of mathematics courses are required. The courses in the second and third year are important foundational material for **Chemical Process Engineering** courses in the third and fourth years.

1. **General Education:**

These are largely university requirements, but also support engineering student outcomes. The general education component provides students with a breadth of knowledge that enables them to work collaboratively with others and have an appreciation for other disciplines. It enhances their understanding of the culturally diverse nature of the local, national and international society. Furthermore, it helps them become socially responsible leaders, capable of making humane and informed decisions.

1. **Program Goals**

***General objectives of the Chemical Engineering Department:***

Preparing engineers specialized in the fields of chemical engineering to meet the needs of the labor market by training them on modern technologies, theoretical engineering skills, and practical laboratories that simulate industrial reality. On the other hand, encouraging and supporting them during preparation periods to prepare designs for productive industrial projects and to use information sources and modern scientific programs.

2. Supporting scientific research and discreet global publishing in international journals, and enhancing the spirit of scientific honesty and accuracy in conducting experiments and laboratory tests.

3. Developing and strengthening postgraduate programs, recognizing their significance as a vital contributor to the advancement of scientific research. These programs serve as a crucial channel to stay abreast of the latest scientific developments happening worldwide. By offering postgraduate opportunities, we aim to foster a culture of continuous learning and ensure that our faculty and students remain at the forefront of scientific knowledge and innovation.

4. Enhancing the department's leading role in community service and the labor market, supporting the national industry.

5. Enhancing financial resources by conducting research, academic work, and knowledge commercialization initiatives that contribute to the country, university, and department's financial sustainability.

***Objectives of the Chemical Processing Engineering Branch:***

1. Prepare chemical engineers who can integrate engineering theories with chemical engineering processes to design and analyze process problems considering environmental impacts and safety.
2. Giving the gradualists the required scientific and technical skills to work successfully in chemical engineering processing sectors.
3. Preparing engineers who can work in an effective work team in terms of exchanging opinions and successful leadership while preserving the ethics of the profession
4. Maintain lifelong learning for professional development in both academic and industrial processing sectors.
5. **Student learning outcomes**

The graduate attributes have been adopted as Program learning outcomes (PLOs) of the Chemical and Refinery Engineering program and approved by department.

Following is the list of Program Learning Outcomes (PLO) that graduates of the Chemical and Refinery Engineering Program will attain during their stay at University of Technology-Iraq.

 **Outcome 1**

*Mathematics, Science ,Problem solving*

An ability to identify, formulate, and solve engineering problems by applying principles of engineering, science, and mathematics.

**Outcome 2**

*Design/Development of Solutions*

An ability to apply the engineering design process to produce solution that meet specified needs with consideration for public health and safety, and global, cultural, social, environmental, economic, and other factors as appropriate to the discipline.

**Outcome 3**

*Experimentation work*

An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.

**Outcome 4**

*Communication*

An ability to communicate effectively with a range of audiences.

**Outcome 5**

*Ethics, Broad education*

An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solution in global, economic, environmental, and societal contexts.

**Outcome 6**

*Long-life learn, Contempt Topics, Eng. tool*

An ability to recognize the ongoing need to acquire new knowledge, to choose appropriate learning strategies, and to apply this knowledge.

**Outcome 7**

*Teamwork*

An ability to function effectively as a member or leader of a team that establishes goals, plans tasks, meets deadlines, and creates a collaborative teams and inclusive environment.

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1. **Credits, Grading and GPA**

***Credits***

University of Technology-Iraq is following the Bologna Process with the European Credit Transfer System (ECTS) credit system. The total degree program number of ECTS is 240, 30 ECTS per semester. 1 ECTS is equivalent to 25 hrs student workload, including structured and unstructured workload.

***Grading***

Before the evaluation, the results are divided into two subgroups: pass and fail. Therefore, the results are independent of the students who failed a course. The grading system is defined as follows:

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| Grading Schemeمخطط الدرجات |
| Group | Grade | التقدير | Marks (%) | Definitions |
| Success Group(50-100) | A-Excellent | امتياز | 90-100 | Outstanding Performance |
| 1. Very Good
 | جيد جداً | 80-89 | Above average with some errors |
| 1. Good
 | جيد | 70-79 | Sound work with notable errors |
| 1. Satisfactory
 | متوسط | 60-69 | Fair but with major shortcomings |
| 1. Sufficient
 | مقبول | 50-59 | Work meets minimum criteria |
| Fail Group(0-49) |  FX-Fail | راسب (قيد المعالجة) | (45-49) | More work required but credit awarded |
|  F-Fail | راسب | (0-44) | Considerable amount of work required |
|  |
| Note: |  |
| Marks with decimal places above or below 0.5 will be rounded up or down to the nearest whole number (for example a mark of 54.5 will be rounded to 55 ,whereas a mark 54.4 will be rounded to 54. The University has policy NOTE to condone “near –pass fail” so the only adjustment to marks awarded by the original marker (s) will be the automatic rounding outlined above.  |

***Calculation of the Cumulative Grade Point Average (CGPA)***

1. The CGPA is calculated by the summation of each module score multiplied by its ECTS, all are divided by the program total ECTS.

 CGPA of a 4-year B.Sc. degrees:

CGPA= [(1st. module score × ECTS) + (2nd. module score × ECTS) + (3rd. module score × ECTS) + (4th. module score × ECTS)] /240

1. **Curriculum/Modules**

**Semester 1 | 30 ECTS|1 ECTS = 25 hrs.**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **No.** | **Module Code** | **Module Name in English** | **اسم المادة الدراسية** | **Language** | **SSWL (hr/w)** |  | **Exam hr/sem** | **SSWL** | **USSWL** | **SWL** | **ECTS** | **Module Type** | **Prerequisite Module(s) Code** |
| **CL (hr/w)** | **Lect (hr/w)** | **Lab (hr/w)** | **Pr (hr/w)** | **Tut (hr/w)** | **Semn (hr/w)** | **hr/sem** | **hr/sem** | **hr/sem** |
| 1 | ENLA107 | English Language |  اللغة الانكليزية  | English | 2 |  |  |  |  |  | 3 | 33 | 17 | 50 | 2.00 | S |   |
| 2 | GEMA111 | General Mathematics | الرياضيات العامة | English | 3 |  |  |  | 1 |  | 3 | 63 | 112 | 175 | 7.00 | B |   |
| 3 | ANCH112 | Analytical Chemistry | الكيمياء التحليلة | English | 2 |  | 2 |  |  |  | 3 | 63 | 112 | 175 | 7.00 | B |   |
| 4 | PHSM113 | Physics and Strength of Materials | الفيزياء ومقاومة المواد | English | 4 |  |  |  | 1 |  | 3 | 78 | 97 | 175 | 7.00 | B |   |
| 6 | COSC108 | Computer Science | علوم الحاسوب | English | 1 |  | 2 |  |  |  | 3 | 48 | 27 | 75 | 3.00 | B |   |
| 7 | WSHE106 | Workshops | المعامل | Arabic |  |  |  | 6 |  |  | 3 | 93 | 7 | 100 | 4.00 | B |   |
|   |   |   |   | Total | 12 | 0 | 4 | 6 | 2 | 0 | 18 | 378 | 372 | 750 | 30.00 |   |   |

**Semester 2 | 30 ECTS|1 ECTS = 25 hrs.**

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **No.** | **Module Code** | **Module Name in English** | **اسم المادة الدراسية** | **Language** | **SSWL (hr/w)** | **Exam hr/sem** | **SSWL** | **USSWL** | **SWL** | **ECTS** | **Module Type** | **Prerequisite Module(s) Code** |
| **CL (hr/w)** | **Lect (hr/w)** | **Lab (hr/w)** | **Pr (hr/w)** | **Tut (hr/w)** | **Semn (hr/w)** | **hr/sem** | **hr/sem** | **hr/sem** |
| 1 | DIIN121 | Differentiation and Integration | التفاضل والتكامل | English | 2 |   |   |  | 1 |   | 3 | 48 | 102 | 150 | 6.00 | B |   |
| 2 | CHEP122 | Chemical Engineering Principles | مبادئ الهندسة الكيمياوية | English | 3 |   |   |  | 1 |   | 3 | 63 | 87 | 150 | 6.00 | C |   |
| 3 | BICH123 | Biochemistry | ألكيمياء الاحيائية | English | 2 |   | 2 |  |   |   | 3 | 63 | 87 | 150 | 6.00 | B |   |
| 4 | EDAU124 | Engineering Drawing and AutoCAD | الرسم الهندسي و الاوتوكاد | English | 2 |   | 4 |  |   |   | 3 | 93 | 57 | 150 | 6.00 | B |   |
| 5 | HURD125 | Human Rights and Democracy | حقوق الانسان والديمقراطية | Arabic | 1 |   |   |  |   |   | 3 | 18 | 7 | 25 | 1.00 | S |  |
| 6 | WOSH116 | Workshops | المعامل | Arabic |  |  |  | 6 |  |  |  | 93 | 7 | 100 | 4.00 | B |   |
|   |   |   |   | Total | 11 | 0 | 6 | 6 | 2 | 0 | 15 | 390 | 360 | 750 | 30.00 |   |  |

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| Note: The student should complete 4 weeks of Summer Internships to fullfil the requirements of the Bachelor of Science degree |
| **Structured SWL (hr/w) type** | **CL** | Class Lecture | **Module type** | **B** | Basic learning activities |  | **SWL:**  | Student Workload |
| **Lab** | Laboratory | **C** | Core learning activity |  | **SSWL:**  | Structured SWL |
| **Pr** | Practical Training | **S** | Suport or related learning activity |  | **USSWL:**  | Unstructured SWL |
| **Tut** | Tutorial | **E** | Elective learning activity |  |  |
| **Lect** | Online lecture |  |
| **Semn** | Seminar |  |

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