Modules Catalogue | 2023-2024 | دليل المواد الدراسية



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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



# الجامعة التكنولوجية - العراق

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# 1. Overview

This catalogue is about the courses (modules) given by the program of Chemical Engineering - Chemical Processing Engineering to gain the Bachelor of Science degree. The program delivers (48) Modules with (6000) total student workload hours and 240 total ECTS. The module delivery is based on the Bologna Process.

نظره عامه

يتناول هذا الدليل المواد الدراسية التي يقدمها برنامج الهندسة كيمياوية- فرع هندسة العمليات الكيمياوية للحصول على درجة بكالوريوس العلوم. يقدم البرنامج (48) مادة دراسية مع (6000) إجمالي ساعات حمل الطالب و 240 إجمالي وحدات أوروبية. يعتمد تقديم المواد الدراسية على عملية بولونيا.

**2. Undergraduate Courses 2023-2024**

**Module 1**

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| --- | --- | --- | --- |
| **Code** | **Course/Module Title** | **ECTS** | **Semester** |
| ENLA107 | English Language  | 2 | 1 |
| **Class (hr/w)** | **Lec./Lab./Prac./Tut. (hr/w)** | **SSWL (hr/sem)** | **USWL (hr/sem)** |
| 2 | 0 | 33 | 17 |
| **Description** |
| This course aims to improve students' English language skills through a two-part approach. The first part focuses on developing practical communication abilities, including listening, speaking, reading, and writing. Students will engage in interactive exercises to enhance their ability to effectively communicate in English. The second part concentrates on building knowledge of language structure, including pronunciation, vocabulary, and grammar. Through clear instruction and practice, students will enhance their understanding and application of these essential language components. By the end of the course, students will have improved their language skills and acquired a strong foundation in both practical communication and language structure in English. |

**Module 2**

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| --- | --- | --- | --- |
| **Code** | **Course/Module Title** | **ECTS** | **Semester** |
| GEMA111 | General Mathematics | 7 | 1 |
| **Class (hr/w)** | **Lec./Lab./Prac./Tut. (hr/w)** | **SSWL (hr/sem)** | **USWL (hr/sem)** |
| 3 | 1 (Tut.) | 63 | 112 |
| **Description** |
| This course offers students a solid mathematical foundation and equips them with quantitative skills applicable across various disciplines. It covers essential topics such as functions, limits, special functions, derivatives, different types of derivative solutions, and the chain rule. Students will not only gain a comprehensive understanding of these concepts but also learn how to apply them in practical scenarios. By the end of the course, students will have developed a strong mathematical background and acquired the ability to utilize these mathematical principles effectively. |

**Module 3**

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| --- | --- | --- | --- |
| **Code** | **Course/Module Title** | **ECTS** | **Semester** |
| ANCH112 | Analytical Chemistry | 7 | 1 |
| **Class (hr/w)** | **Lec./Lab./Prac./Tut. (hr/w)** | **SSWL (hr/sem)** | **USWL (hr/sem)** |
| 2 | 2 (Lab.) | 63 | 112 |
| **Description** |
| This course focuses on enhancing students' proficiency in analytical chemistry by covering key principles. Students will delve into the fundamentals of atoms, molecules, quantitative analysis, and transition metal chemistry. Additionally, they will explore spectroscopic techniques extensively employed in various chemical engineering disciplines. By studying these spectroscopic techniques, students will gain a solid foundation that will prove valuable in their pursuit of other chemical engineering courses. Through a combination of theoretical knowledge and practical applications, students will develop essential analytical chemistry skills that are applicable in real-world scenarios. |

**Module 4**

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| --- | --- | --- | --- |
| **Code** | **Course/Module Title** | **ECTS** | **Semester** |
| PHSM113 | Physics and Strength of Materials | 7 | 1 |
| **Class (hr/w)** | **Lec./Lab./Prac./Tut. (hr/w)** | **SSWL (hr/sem)** | **USWL (hr/sem)** |
| 4 | 1 (Tut.) | 78 | 97 |
| **Description** |
| This course is divided into two parts. The first part focuses on providing students with a comprehensive understanding of fundamental physics concepts, laws, and processes. It aims to develop their knowledge of the underlying principles that govern the physical world. The second part of the course delves into the field of Strength of Materials. Students will study topics such as equilibrium of force systems, moments of forces, centroids and centers of gravity, analysis of internal forces, strains, stress-strain diagrams, Hook's law, shearing deformation, Poisson's ratio, volumetric strain, thin-walled cylinders, thermal stress, and shear and bending moment in beams. Through theoretical explanations and practical examples, students will gain a solid foundation in both physics and the behavior of materials. By the end of the course, students will possess the necessary skills to analyze and understand various physical phenomena and the strength characteristics of materials. |

**Module 5**

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| --- | --- | --- | --- |
| **Code** | **Course/Module Title** | **ECTS** | **Semester** |
| COSC108 | Computer Science | 3 | 1 |
| **Class (hr/w)** | **Lec./Lab./Prac./Tut. (hr/w)** | **SSWL (hr/sem)** | **USWL (hr/sem)** |
| 1 | 2 (Lab.) | 48 | 27 |
| **Description** |
| This course provides students with a comprehensive overview of computer operating systems, including different types and smartphone systems. It covers Windows and Microsoft Office, with a specific focus on Microsoft Excel. Additionally, students will learn Visual Basic programming language, emphasizing the design environment and user interface elements. The course also introduces fundamental programming concepts in Visual Basic, including traditional and basic programming principles. Students will gain practical knowledge in designing and planning programs. By the end of the course, students will have a solid understanding of computer operating systems, proficiency in Microsoft Office applications, familiarity with Visual Basic programming, and the ability to design and plan effective programs. |

**Module 6**

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| --- | --- | --- | --- |
| **Code** | **Course/Module Title** | **ECTS** | **Semester** |
| HURD125 | Human Rights and Democracy | 2 | 2 |
| **Class (hr/w)** | **Lec./Lab./Prac./Tut. (hr/w)** | **SSWL (hr/sem)** | **USWL (hr/sem)** |
| 1 | 0 | 33 | 17 |
| **Description** |
| This course encompasses two main parts. The first part focuses on the concept of human rights, encompassing their characteristics, the role of human rights groups, and their interconnectedness with other concepts. Students will gain a comprehensive understanding of the fundamental principles and values that underpin human rights. In the second part, students will delve into the study of democracy, examining its historical context, its relationship with religions and development, as well as analyzing the advantages and disadvantages associated with democratic systems. By the end of the course, students will have acquired a deep knowledge of human rights and democracy, enabling them to critically evaluate and navigate these concepts within societal contexts. |

**Module 7**

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| --- | --- | --- | --- |
| **Code** | **Course/Module Title** | **ECTS** | **Semester** |
| WOSH116 | Workshops | 4 | 1 |
| **Class (hr/w)** | **Lec./Lab./Prac./Tut. (hr/w)** | **SSWL (hr/sem)** | **USWL (hr/sem)** |
| 0 | 6 (Prac.) | 93 | 7 |
| **Description** |
| This course focuses on enhancing students’ practical technical expertise through hands-on workshops. The objective is to prepare highly knowledgeable and technologically creative applied engineers. Emphasis is placed on operating in accordance with globally adopted quality assurance standards while upholding the ethical principles of the engineering profession. Students will gain an understanding of work systems, associated risks, and relevant factors. Additionally, theoretical principles in craftsmanship and measurements will be covered. By the end of the course, students will have developed practical skills, a strong knowledge base, and the ability to apply theoretical principles effectively in real-world engineering scenarios while adhering to professional ethics. |

**Module 8**

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| --- | --- | --- | --- |
| **Code** | **Course/Module Title** | **ECTS** | **Semester** |
| DIIN121 | Differentiation and Integration | 6 | 2 |
| **Class (hr/w)** | **Lec./Lab./Prac./Tut. (hr/w)** | **SSWL (hr/sem)** | **USWL (hr/sem)** |
| 2 | 1 (Tut.) | 48 | 102 |
| **Description** |
| The primary goal of this course is to facilitate student comprehension of fundamental mathematical concepts, such as differentiation, integration, various integration methods, definite integrals, and their applications. Additionally, the course covers topics like polar coordinates, vector analysis, determinants, and matrices. The intention is to equip students with the necessary skills to employ mathematical methods effectively as problem-solving tools in engineering contexts. By the end of the course, students will have developed a solid foundation in these mathematical techniques, enabling them to apply them confidently and proficiently to address engineering challenges. |

**Module 9**

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| --- | --- | --- | --- |
| **Code** | **Course/Module Title** | **ECTS** | **Semester** |
| CHEP122 | Chemical Engineering Principles | 6 | 2 |
| **Class (hr/w)** | **Lec./Lab./Prac./Tut. (hr/w)** | **SSWL (hr/sem)** | **USWL (hr/sem)** |
| 3 | 1 (Tut.) | 63 | 87 |
| **Description** |
| The primary objective of this course is to enhance the skills of chemical engineering students in comprehending the fundamental concepts and expressions in the field. The course focuses on teaching calculations related to chemical reactions, material balance, gases, and vapors. Students will learn how to perform calculations involving chemical reactions, and understand the principles of material balance to track the flow of substances in chemical processes. By the end of the course, students will have acquired the necessary knowledge and skills to effectively apply these calculations and concepts in the context of chemical engineering. |

**Module 10**

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| --- | --- | --- | --- |
| **Code** | **Course/Module Title** | **ECTS** | **Semester** |
| ORCH123 | Organic Chemistry | 6 | 2 |
| **Class (hr/w)** | **Lec./Lab./Prac./Tut. (hr/w)** | **SSWL (hr/sem)** | **USWL (hr/sem)** |
| 2 | 2 (Lab.) | 63 | 87 |
| **Description** |
| This course focuses on enhancing students' proficiency in organic chemistry. It encompasses an introduction to organic compounds, their preparation, and their reactions, covering areas such as carbohydrates, polymers, and dyes. By doing so, the course fosters a deeper understanding of the fundamental chemical principles that serve as the foundation for chemical engineering. It allows students to grasp the technical concepts and principles essential to chemical engineering through a chemistry-oriented perspective. Through this course, students can develop the necessary knowledge and skills to apply organic chemistry principles in the field of chemical engineering. |

**Module 11**

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| --- | --- | --- | --- |
| **Code** | **Course/Module Title** | **ECTS** | **Semester** |
| EDAU124 | Engineering Drawing and AutoCAD | 6 | 2 |
| **Class (hr/w)** | **Lec./Lab./Prac./Tut. (hr/w)** | **SSWL (hr/sem)** | **USWL (hr/sem)** |
| 2 | 4 (Lab.) | 93 | 57 |
| **Description** |
| This course consists of two parts. In the first part, students will develop skills in engineering drawing, including applications, analysis models, sections, and projections. They will also learn to create isometric and oblique views. The second part introduces students to AutoCAD, covering components and commands like point, lines, rectangle, polygon, polyline, and arc for 2D engineering drawings. They will also explore modify commands, layer organization, and 3D drawing methods. By the end of the course, students will possess practical expertise in engineering drawing techniques and a solid grasp of AutoCAD's capabilities for creating 2D and 3D engineering drawings. |

**Module 12**

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| **Code** | **Course/Module Title** | **ECTS** | **Semester** |
| BAPC125 | Baath Party Crimes | 1 | 1 |
| **Class (hr/w)** | **Lec./Lab./Prac./Tut. (hr/w)** | **SSWL (hr/sem)** | **USWL (hr/sem)** |
| 1 | 0 | 21 | 7 |
| **Description** |
| According to Ministry Standard Syllabus |

**Module 13**

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| --- | --- | --- | --- |
| **Code** | **Course/Module Title** | **ECTS** | **Semester** |
| WOSH106 | Workshops | 4 | 2 |
| **Class (hr/w)** | **Lec./Lab./Prac./Tut. (hr/w)** | **SSWL (hr/sem)** | **USWL (hr/sem)** |
| 0 | 6 (Prac.) | 93 | 7 |
| **Description** |
| This course focuses on enhancing students' practical technical expertise through hands-on workshops. The objective is to prepare highly knowledgeable and technologically creative applied engineers. Emphasis is placed on operating in accordance with globally adopted quality assurance standards while upholding the ethical principles of the engineering profession. Students will gain an understanding of work systems, associated risks, and relevant factors. Additionally, theoretical principles in craftsmanship and measurements will be covered. By the end of the course, students will have developed practical skills, a strong knowledge base, and the ability to apply theoretical principles effectively in real-world engineering scenarios while adhering to professional ethics. |

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