

MODULE DESCRIPTOR | 2025-2026 |

Tikrit UNIVERSITY

جامعة تكريت



Bachelor of Science in Chemistry

بكالوريوس علوم في الكيمياء



1- Overview

This catalogue is about the courses (modules) given by the program of Science in Chemistry to earn 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.

نظرة عامة

يتناول هذا الدليل المواد الدراسية التي يقدمها برنامج علوم الكيمياء للحصول على درجة بكالوريوس العلوم. يقدم البرنامج (٤٨) مادة دراسية مع (٦٠٠٠) إجمالي ساعات حمل الطالب و (٢٤٠) إجمالي وحدات أوروبية. يعتمد تقديم المواد الدراسية على عملية بولونيا.

2- Undergraduate Courses 2025-2026

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Code	Course/Module Title	ECTS	Semester
CHE-1101	Qualitative analytical chemistry	6	1
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/sem)
4	4	109	٦٦
Description			
Analytical Chemistry is a measurement science consisting of a set of powerful ideas and methods that provide qualitative or quantitative information about the chemical composition of a sample. Analytical measurements are required in a wide range of fields beyond the chemical industry, such as biochemistry and the pharmaceutical industry, environmental sciences, forensic sciences, and the food industry, amongst others. The module will provide a classification of analytical chemistry, weight and concentration units, methods of expressing concentrations, aqueous-solution chemistry, chemical equilibrium, solubility, activity, and activity coefficient.			

2

Code	Course/Module Title	ECTS	Semester
CHE 1101	Inorganic Chemistry I	6	1
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/sem)
3	2	79	71
Description			
The module includes lectures on the origin of the elements, atoms and the Periodic Table, shapes and properties of molecules, chemistry of the elements, properties of solutions, thermochemistry, thermodynamics and kinetics.			

3

Code	Course/Module Title	ECTS	Semester
CHE-1103	Physics	6	1
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/sem)
2	4	93	57
Description			
Physics is concerned with describing the interactions of energy, matter, space, and time, and it is especially interested in what fundamental mechanisms underlie every phenomenon. The concern for describing the basic phenomena in nature essentially defines the realm of physics.			

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Code	Course/Module Title	ECTS	Semester
CHE-1104	Laboratory Safety	3	1
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/sem)
2	1	48	27
Description			
ان المختبرات الكيميائية تواجه عدداً من المخاطر منها ما يتعلق بكيفية التعامل مع المواد ومنها ما يتعلق بالأشخاص ومنها ما يتعلق بالمواد نفسها ولهذا أن تؤدي السلامة والأمن الكيميائي إلى تخفيف أو ازالة أثار هذه المخاطر. لقد تطورت ثقافة جديدة بشأن الوعي وكذلك مدى المسؤولية والتنظيم والتعليم بشأن السلامة والأمن الكيميائي داخل مختبرات الكيميائية والأكاديميات والمعاهد المنتشرة في أنحاء العالم . ولقد طورت المختبرات الكيميائية مجموعة من الإجراءات الخاصة ومجموعة من الأجهزة للتعامل مع وإدارة المواد الكيميائية بما يحقق السلامة والأمان . إن تطوير ثقافة (السلامة والأمن الكيميائي) اداء الى إقامة مختبرات تتعم بيئة آمنة وصحية يمكن أن تتم فيها ممارسة التدريس والتعلم والعمل على حد سواء. ويمكن تعريف إجراءات السلامة داخل المختبر الكيميائي: بأنها قواعد واسس عالمية يجب أن يلتزم بها كل من يعمل في هذا المضمار حمايةً لنفسه والعاملين معه والبيئة الخارجية.			

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Code	Course/Module Title	ECTS	Semester
UoT- 1105	Human and democracy	3	1
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/sem)
2	1	48	52
Description			
زيادة معرفة الطالب بالجانب المفاهيم النظري والتطور التاريخي لمادة حقوق الانسان والديمقراطية تنمية مهارات الطالب التحليلية والنقدية فيما يتعلق بواقع ومستقبل حقوق الانسان والديمقراطية تدريب الطالب على اهمية المشاركة الفاعلة في جوانب الحياة العامة كتعزيز احترام مبادئ حقوق الانسان العامة والمشاركة الفاعلة في الحياة السياسية والثقافية. تمكين الطلاب من فهم اهمية التعليم ودوره في نشر ثقافة حقوق الإنسان والديمقراطية في بناء مجتمع حضاري يقوم على أساس الحكم الصالح الذي من اهم مقوماته الإيمان بحقوق الإنسان والتربية عليها والمشاركة الفاعلة في الحكم عبر الانتخابات الحرة والعادلة			

6

Code	Course/Module Title	ECTS	Semester
UoT- 1106	Mathematics	4	1
Lectures (hr/w)	Lab./Prac./Tutor.	SSWL (hr/sem)	USSWL (hr/sem)
2	1	48	52
Description			
<p>Now that you have completed Foundation Mathematics, you will be able to study techniques that are applied to current engineering problems. This module will introduce you to the techniques you will develop further in your engineering or mathematics degree: you will learn the basics of the mathematics used in the construction of machines, buildings or satellites; develop the skills in calculus needed for basic weather forecasting and climate studies; study the mechanics used for planning the movements of objects, such as car engines, trains pulling uphill or rockets launching into space; and the trigonometry used to design communications networks, aeriels and medical treatments for diseases such as cancer.</p>			

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Code	Course/Module Title	ECTS	Semester
CHE-1217	Volumetric analytical chemistry	7	2
Lectures (hr/w)	Lab./Prac./Tutor	SSWL (hr/sem)	USSWL (hr/sem)
3	4	109	71
Description			
<p>Analytical Chemistry is a measurement science consisting of a set of powerful ideas and methods that provide qualitative or quantitative information about the chemical composition of a sample. Analytical measurements are required in a wide range of fields beyond the chemical industry, such as biochemistry and the pharmaceutical industry, environmental sciences, forensic sciences, and the food industry, amongst others.</p>			

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Code	Course/Module Title	ECTS	Semester
CHE-1218	Inorganic chemistry 2	6	2
Lectures (hr/w)	Lab./Prac./Tutor.	SSWL (hr/sem)	USSWL (hr/sem)
3	2	79	71
Description			
<p>The module includes lectures on the origin of the elements, atoms and the Periodic Table, shapes and properties of molecules, chemistry of the elements, properties of solutions, thermochemistry, thermodynamics and kinetics.</p>			

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Code	Course/Module Title	ECTS	Semester
CHE-1209	Statistics	4	2
Lectures (hr/w)	Lab./Prac./Tutor.	SSWL (hr/sem)	USSWL (hr/sem)
2	1	63	37
Description			
<p>The module is intended as a first course in random variables and distributions for students studying a degree in which mathematics is to be the main subject throughout that degree as it provides a good foundation to higher level probability and statistics modules. The module assumes that a student will be competent in basic probability rules of events. Topics include: exploring features of a wide range of discrete and continuous random variables; evaluating probabilities for a specified probability distribution by calculation and by using statistical software; defining and determining generating functions for random variables, i.e. the probability generating function, the moment generating function and the cumulant generating function</p>			

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Code	Course/Module Title	ECTS	Semester
CHE-12010	Physic	6	2
Lectures (hr/w)	Lab./Prac./Tutor.	SSWL (hr/sem)	USSWL (hr/sem)
2	3	93	57
Description			
<p>The aim of this module is for the student to understand and gain experience of the application and delivery of a range of core and specialised methods and techniques and to understand their importance in the clinical investigation of patients</p>			

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Code	Course/Module Title	ECTS	Semester
CoS- 12011	computer program 1	3	2
Lectures (hr/w)	Lab./Prac./Tutor(hr/w)	SSWL (hr/sem)	USSWL (hr/sem)
0	3	48	27
Description			
<p>This course introduces fundamental computing principles and programming concepts. Students use the high-level programming language,</p>			

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Code	Course/Module Title	ECTS	Semester
UoT- 12012	Arabic language	٣	2
Lectures (hr/w)	Lab./Prac./Tutor (hr/w)	SSWL (hr/sem)	USSWL (hr/sem)
2	1	48	27
Description			
توضيح أهمية اللغة العربية وفوائدها بالنسبة للطلاب الجامعي			

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Code	Course/Module Title	ECTS	Semester
CHE-23113	Gravity analytical chemistry	6	3
Lectures (hr/w)	Lab./Prac./Tutor (hr/w)	SSWL (hr/sem)	USSWL (hr/sem)
2	3	79	71
Description			
The module includes lectures on the origin of the elements, atoms and the Periodic Table, shapes and properties of molecules, chemistry of the elements, properties of solutions, thermochemistry, thermodynamics and kinetics.			

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Code	Course/Module Title	ECTS	Semester
CHE-23114	Inorganic chemistry 3	6	3
Lectures (hr/w)	Lab./Prac./Tutor (hr/w)	SSWL (hr/sem)	USSWL (hr/sem)
2	4	94	56
Description			
The module includes lectures on the origin of the elements, atoms and the Periodic Table, shapes and properties of molecules, chemistry of the elements, properties of solutions, thermochemistry, thermodynamics and kinetics.			

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Code	Course/Module Title	ECTS	Semester
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CHE-23115	Physical chemistry 1	6	3
Lectures (hr/w)	Lab./Prac./Tutor (hr/w)	SSWL (hr/sem)	USSWL (hr/sem)
2	4	94	56
Description			
The student should acquire a broad understanding of the knowledge base in Physical Chemistry and its terminology or discourse. They will operate in a range of varied but predictable contexts that require the use of a specified range of techniques and information sources. Additionally, the student will be required to identify principles and concepts underlying theoretical frameworks.			

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Code	Course/Module Title	ECTS	Semester
CHE-23116	organic chemistry 1	6	3
Lectures (hr/w)	Lab./Prac./Tutor (hr/w)	SSWL (hr/sem)	USSWL (hr/sem)
2	4	94	56
Description			
To introduce students to the basic concepts of organic chemistry (to encompass the structure of organic compounds, isomerism, the concept of a functional group and the unifying concepts of mechanism) in order to provide the foundation for treatment at a greater depth in later modules or to better appreciate related subjects such as Biochemistry and Medicinal Chemistry.			

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Code	Course/Module Title	ECTS	Semester
CoS- 23118	Mathematics II	3	3
Lectures (hr/w)	Lab./Prac./Tutor/Sem (hr/w)	SSWL (hr/sem)	USSWL (hr/sem)
2	1	48	27
Description			
This course introduces fundamental computing principles and programming concepts. Students use the high-level programming language,			

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Code	Course/Module Title	ECTS	Semester
CoS- 23117	COMPUTER PROGRAM II	3	3
Lectures (hr/w)	Lab./Prac./Tutor(hr/w)	SSWL (hr/sem)	USSWL (hr/sem)
0	3	48	27
Description			

This course introduces fundamental computing principles and programming concepts. Students use the high-level programming language,

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Code	Course/Module Title	ECTS	Semester
CHE-35125	Coordination chemistry 1	6	5
Lectures (hr/w)	Lab./Prac./Tutor (hr/w)	SSWL (hr/sem)	USSWL (hr/sem)
2	4	79	71
Description			
This course introduces knowledge essential to the understanding of coordination chemistry. Following this, Theories related to metal complexes including VB, CFT, MO theories. These topics lead to a description of molecular structures including 4 and 6 coordination number complexes.			

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Code	Course/Module Title	ECTS	Semester
CHE-35126	Kinetic chemistry	6	5
Lectures (hr/w)	Lab./Prac./Tutor (hr/w)	SSWL (hr/sem)	USSWL (hr/sem)
2	4	94	56
Description			
يصف الكورس الى تعريف الطلبة ما هي الكيمياء الفيزيائية الحركية والكهربائية وكيف يمكن ان يتبع الطالب التفاعلات وما يحدث خلال التفاعل في فترات زمنية مختلفة وعند درجة حرارة ثابتة ومختلفة كما يصف الكورس الى تعريف الطالب ماهو الكم وفوائده للطلاب الكيميائي واهمية الدراسة النظرية والحسابية للكيميائي ووصف البرنامج التعليمي بشكل حسابي وكما يصف تعريف الطيف الجزيئي وكيفية معرفة مناطق الطيف المغناطيسي وإيجاد المجهول منها وتشخيص المركب الكيميائي لكل منطقة من من مناطق الطيف بطريقة حسابية .			

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Code	Course/Module Title	ECTS	Semester
CHE-35127	Organic chemistry 3	6	5
Lectures (hr/w)	Lab./Prac./Tutor (hr/w)	SSWL (hr/sem)	USSWL (hr/sem)
2	4	94	56
Description			

A vital aim of organic chemistry is to be able to synthesize biologically active molecules. With this in mind, you will explore some of the most important organic reactions used in research laboratories. These reactions, along with those introduced in earlier modules, are then studied in the laboratory. Having been introduced to modern spectroscopic methods for determining the structures of organic molecules, these techniques are then used to identify the compounds which have been prepared in the laboratory. Aromatic compounds are central to the structure of a vast number of important organic molecules and the chemistry of these species will also be studied.

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Code	Course/Module Title	ECTS	Semester
CHE-35128	Biochemistry	6	5
Lectures (hr/w)	Lab./Prac./Tutor (hr/w)	SSWL (hr/sem)	USSWL (hr/sem)
2	4	79	71
Description			
The study of biochemistry shows how organic compounds present in living organisms interact to maintain and perpetuate life. In this brief introduction, we will describe the milestones in the history of biochemistry, the different branches of the field, the attributes of living organisms, and the various elements that comprise living organisms			

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Code	Course/Module Title	ECTS	Semester
CHE-35129	Industrial chemistry 1	4	5
Lectures (hr/w)	Lab./Prac./Tutor (hr/w)	SSWL (hr/sem)	USSWL (hr/sem)
2	1	48	52
Description			
This module provides an overview of the industrial production of major chemicals, and their use in society. The focus is on the chemical aspects of processes with a small components looking at economics, societal effects, health and safety and engineering. The delivery is split into the broad areas of bulk inorganic chemicals, polymeric materials, pharmaceuticals and petrochemicals.			

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Code	Course/Module Title	ECTS	Semester
CHE-36131	Coordination chemistry 2	6	6
Lectures (hr/w)	Lab./Prac./Tutor (hr/w)	SSWL (hr/sem)	USSWL (hr/sem)
2	4	79	71
Description			

This course introduces knowledge essential to the understanding of Stability of transition metal complexes. Following this, Factors affection the stability of metal complexes. Also, the introductory of Reaction mechanism and magnetic properties of metal complexes.

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Code	Course/Module Title	ECTS	Semester
CHE-36132	Electrochemistry	6	6
Lectures (hr/w)	Lab./Prac./Tutor (hr/w)	SSWL (hr/sem)	USSWL (hr/sem)
2	4	79	71
Description			
This module will build on the material covered by the Physical Chemistry 1 module. By the end of this module, students should have a deeper understanding of thermodynamics, including statistical thermodynamics. This module will also introduce students to electrochemistry, quantum mechanics, colloids and physical chemistry at surfaces and interfaces			

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Code	Course/Module Title	ECTS	Semester
CHE-36133	Organic chemistry 3	6	6
Lectures (hr/w)	Lab./Prac./Tutor (hr/w)	SSWL (hr/sem)	USSWL (hr/sem)
2	4	79	71
Description			
A vital aim of organic chemistry is to be able to synthesize biologically active molecules. With this in mind, you will explore some of the most important organic reactions used in research laboratories. These reactions, along with those introduced in earlier modules, are then studied in the laboratory. Having been introduced to modern spectroscopic methods for determining the structures of organic molecules, these techniques are then used to identify the compounds which have been prepared in the laboratory. Aromatic compounds are central to the structure of a vast number of important organic molecules and the chemistry of these species will also be studied.			

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Code	Course/Module Title	ECTS	Semester
CHE-36134	Biochemistry 2	6	6
Lectures (hr/w)	Lab./Prac./Tutor (hr/w)	SSWL (hr/sem)	USSWL (hr/sem)
2	4	79	71
Description			

The study of biochemistry shows how organic compounds present in living organisms interact to maintain and perpetuate life. In this brief introduction, we will describe the milestones in the history of biochemistry, the different branches of the field, the attributes of living organisms, and the various elements that comprise living organisms

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Code	Course/Module Title	ECTS	Semester
CHE-36135	Industrial chemistry 2	4	6
Lectures (hr/w)	Lab./Prac./Tutor (hr/w)	SSWL (hr/sem)	USSWL (hr/sem)
2	1	48	52
Description			
This module provides an overview of the industrial production of major chemicals, and their use in society. The focus is on the chemical aspects of processes with a small components looking at economics, societal effects, health and safety and engineering. The delivery is split into the broad areas of bulk inorganic chemicals, polymeric materials, pharmaceuticals and petrochemicals.			

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Code	Course/Module Title	ECTS	Semester
CHE-36137	Instrumental analysis 1	6	7
Lectures (hr/w)	Lab./Prac./Tutor (hr/w)	SSWL (hr/sem)	USSWL (hr/sem)
2	3	79	71
Description			
This module presents a review of standardisation and use of commoner reagents in acid/base, redox, precipitation and complexation reactions It will also offer an Introduction to gravimetry, principles, instrumentation and applications of UV/VIS, IR and atomic absorption spectrometry as well as a comparative overview of methods.			

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Code	Course/Module Title	ECTS	Semester
CHE-36138	Organic identification 1	5	7
Lectures (hr/w)	Lab./Prac./Tutor (hr/w)	SSWL (hr/sem)	USSWL (hr/sem)
2	3	79	48
Description			

- تزويد الطلبة بالأساسيات والمواضيع الإضافية المتعلقة بمخرجات التفكير والتحليل الكيميائي العضوي. تكوين مجموعات نقاشيه خلال المحاضرات لمناقشة مواضيع الكيمياء العضوية تتطلب التفكير والتحليل. - طلب حل مجموعة من الاسئلة التفكيرية خلال المحاضرات مثل ماذا وكيف ومتى ولماذا لمواضيع محدهه.- اعطاء الطلبة واجبات بيتيه تتطلب تفسيرات ذاتيه بطرق سببيه.

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Code	Course/Module Title	ECTS	Semester
CHE-36139	Biochemistry 3	5	7
Lectures (hr/w)	Lab./Prac./Tutor (hr/w)	SSWL (hr/sem)	USSWL (hr/sem)
2	3	79	46
Description			
<p>Life is driven by biochemical reactions. Biochemistry is an introductory module providing the essentials for understanding all living processes. You will study protein structure, enzyme kinetics and basic metabolism; understanding how each of these processes function and shape the living cell. Practical sessions offer you vital hands-on experience, learning key techniques and how to apply them. Core biochemical experience is highly relevant to applications in biotechnology and medical science. This module provides the foundation from which you may progress to higher level modules in Metabolism, Analytical Techniques in Biochemistry, Bioinorganic Chemistry, and Pharmacology and Medicinal Chemistry.</p>			

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Code	Course/Module Title	ECTS	Semester
CHE-36140	Industrial chemistry 3	6	7
Lectures (hr/w)	Lab./Prac./Tutor (hr/w)	SSWL (hr/sem)	USSWL (hr/sem)
2	3	78	72
Description			
<p>This module provides an overview of the industrial production of major chemicals, and their use in society. The focus is on the chemical aspects of processes with a small components looking at economics, societal effects, health and safety and engineering. The delivery is split into the broad areas of bulk inorganic chemicals, polymeric materials, pharmaceuticals and petrochemicals.</p>			

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Code	Course/Module Title	ECTS	Semester
CHE-36141	SPECTROSCOPY CHEMISTRY	4	7
Lectures (hr/w)	Lab./Prac./Tutor (hr/w)	SSWL (hr/sem)	USSWL (hr/sem)
2	1	48	52
Description			

This module provides an overview of the industrial production of major chemicals, and their use in society. The focus is on the chemical aspects of processes with a small components looking at economics, societal effects, health and safety and engineering. The delivery is split into the broad areas of bulk inorganic chemicals, polymeric materials, pharmaceuticals and petrochemicals.

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Code	Course/Module Title	ECTS	Semester
CHE-48143	INSTRUMENTAL ANALYSIS 1	6	8
Lectures (hr/w)	Lab./Prac./Tutor (hr/w)	SSWL (hr/sem)	USSWL (hr/sem)
2	4	79	71
Description			
<p>This module presents a review of standardisation and use of commoner reagents in acid/base, redox, precipitation and complexation reactions It will also offer an Introduction to gravimetry, principles, instrumentation and applications of UV/VIS, IR and atomic absorption spectrometry as well as a comparative overview of methods. In addition, the module will include coverage of the following: application of Beer's Law to calibration and to mixtures, brief introduction to principles of chromatography and sorption processes - partition, ion exchange etc, columns, detector types, mobile and stationary phases, outline of high performance liquid chromatography, qualitative and quantitative analysis</p>			

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Code	Course/Module Title	ECTS	Semester
CHE-48144	Organic identification 1	5	8
Lectures (hr/w)	Lab./Prac./Tutor (hr/w)	SSWL (hr/sem)	USSWL (hr/sem)
2	3	79	48
Description			
<p>- تزويد الطلبة بالأساسيات والمواضيع الإضافية المتعلقة بمخرجات التفكير والتحليل الكيميائي العضوي. تكوين مجموعات نقاشيه خلال المحاضرات لمناقشة مواضيع الكيمياء العضوية تتطلب التفكير والتحليل. طلب حل مجموعة من الاسئلة التفكيرية خلال المحاضرات مثل ماذا وكيف ومتى ولماذا لمواضيع محدهه.- اعطاء الطلبة واجبات بيتيه تتطلب تفسيرات ذاتيه بطرق سببيه.</p>			

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Code	Course/Module Title	ECTS	Semester
CHE-48145	Biochemistry 3	5	8
Lectures (hr/w)	Lab./Prac./Tutor (hr/w)	SSWL (hr/sem)	USSWL (hr/sem)
2	3	79	46
Description			

Life is driven by biochemical reactions. Biochemistry is an introductory module providing the essentials for understanding all living processes. You will study protein structure, enzyme kinetics and basic metabolism; understanding how each of these processes function and shape the living cell. Practical sessions offer you vital hands-on experience, learning key techniques and how to apply them. Core biochemical experience is highly relevant to applications in biotechnology and medical science.

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Code	Course/Module Title	ECTS	Semester
CHE-36146	Industrial chemistry 4	6	8
Lectures (hr/w)	Lab./Prac./Tutor (hr/w)	SSWL (hr/sem)	USSWL (hr/sem)
2	3	78	72
Description			
This module provides an overview of the industrial production of major chemicals, and their use in society. The focus is on the chemical aspects of processes with a small components looking at economics, societal effects, health and safety and engineering. The delivery is split into the broad areas of bulk inorganic chemicals, polymeric materials, pharmaceuticals and petrochemicals.			

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Code	Course/Module Title	ECTS	Semester
CHE-36147	QUANTUM CHEMISTRY	4	8
Lectures (hr/w)	Lab./Prac./Tutor (hr/w)	SSWL (hr/sem)	USSWL (hr/sem)
2	1	48	52
Description			
This module provides an overview of the industrial production of major chemicals, and their use in society. The focus is on the chemical aspects of processes with a small components looking at economics, societal effects, health and safety and engineering. The delivery is split into the broad areas of bulk inorganic chemicals, polymeric materials, pharmaceuticals and petrochemicals.			