

UNIVERSITY of TECHNOLOGY

الجامعة التكنولوجية



Bachelor of Applied Science (B.Sc.) – Applied
Chemistry

بكالوريوس علوم تطبيقية – كيمياء تطبيقية



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1. Overview

This catalogue is about the courses (modules) given by the program of Applied Chemistry to gain the Bachelor of Applied Science degree. The program delivers (40) Modules with (6000) total student workload hours and 240 total ECTS. The module delivery is based on the Bologna Process.

نظرة عامه

يتناول هذا الدليل المواد الدراسية التي يقدمها برنامج الكيمياء التطبيقية للحصول على درجة بكالوريوس العلوم التطبيقية . يقدم البرنامج (٤٠) مادة دراسية مع (٦٠٠٠) إجمالي ساعات حمل الطالب و ٢٤٠ إجمالي وحدات أوروبية. يعتمد تقديم المواد الدراسية على عملية بولونيا.

2. Undergraduate Courses 2023-2024

1

Code	Course/Module Title	ECTS	Semester
ANCH111	Analytical Chemistry 1	8	1
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
3	2	93	107
Description			

General introduction , Classification of analytical chemistry
 Weight and concentration Units , Methods of expressing of concentrations
 Aqueous -solution Chemistry , Solutions of Electrolytes and Classification of electrolytes , acid - base theories , Acids, Bases and Conjugated Acids/Bases , Amphiprotic Species .
 Chemical equilibrium , Types of equilibrium , equilibrium constants (Ionic -product constant of water ,
 Solubility and Solubility product constant, Dissociation of a weak acid or base , Hydrolysis constant (KH), Formation constant of complex ,Multistep equilibrium types , definitions , calculations , Effect of common ion, Effect of complex formation on solubility, and problems
 Activity and activity coefficient : definitions , examples , calculations , Ionic strength: definitions , examples , calculations
 Exam

2

Code	Course/Module Title	ECTS	Semester
INCH112	Inorganic Chemistry1	7	1
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
3	1	63	112
Description			
The students will going to learn: Historical development of atom discovery, Lewis dot , Lewis's structures , Bohr Model of atom, Electromagnetic radiation, Black body radiation, Quantum Theory			

3

Code	Course/Module Title	ECTS	Semester
MATH113	Mathematics	6	1
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)

4		63	87
Description			
<p>Functions, graph of function, continuous function, odd and even functions, Invers of functions .</p> <p>Limits, find the limits for real functions . Derivative , Derivative for Transcendental functions, chain rule, partial derivative , Exponential Functions, Logarithmic functions and chemical application of these functions . Trigonometric functions, Derivative of trigonometric functions. The invers of trigonometric function, derivative of trigonometric functions .</p>			

4

Code	Course/Module Title	ECTS	Semester
GEPH114	General Physics	5	1
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	2	78	47
Description			
<p>Probability theory, Law of probability, Bayes theory. Random Variable, discrete random variable, continuous random variable, define distributive theorem for random Variable. Distribution and density function continuous random variable Expectation and Variance probability and Mathematical statistics , moment , moment generating functions . Define the concepts of distribution theory , distribution theory (for two or more random variables) Probability mass function and Probability density function, Normal distribution ,Uniform distribution and exponential distribution</p>			

5

Code	Course/Module Title	ECTS	Semester
HURI115	Human Rights	2	1
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2		33	17
Description			
<p>Developing and flourishing the human personality in its emotional, intellectual and social dimensions, and rooting in its sense of dignity, freedom, equality, social justice and democratic practice. Enhancing people's awareness - women and men - of their rights in a way that helps enable them to transform the principles of human rights into a social, economic, cultural and political reality, and raise their ability to defend, maintain and advance them at all levels. Strengthening the bonds of friendship and solidarity among peoples, enhancing respect for the rights of others, preserving cultural pluralism and diversity, flourishing national cultures for all groups and peoples, enriching the culture of dialogue and mutual tolerance, rejecting violence and terrorism, promoting non-violence and combating intolerance, and providing all people with strong immunity against hate speech. Promoting a culture of peace based on justice and respect for human rights, foremost of which is the right to self-determination, the right to resist occupation, and the democratization of international relations and the institutions of the international community, so as to reflect the common interests of humanity.</p>			

6

Code	Course/Module Title	ECTS	Semester
WORSH11	Workshops	2	1
Lectures (hr/w)	Lab./Prac./Tutor.	SSWL (hr/sem)	USSWL (hr/w)

	3	45	5
Description			
<p>Preparing applied engineers in the field of engineering sciences who are distinguished by a high level of knowledge and technological creativity, in line with the strict standards adopted globally in quality assurance and academic accreditation of the corresponding engineering programs, while adhering to the ethics of the engineering profession. Enable the student to know and understand work systems, risks, and the factors surrounding them. Enable the student to know and understand theoretical principles in handicrafts and measurements.</p>			

7

Code	Course/Module Title	ECTS	Semester
ANCH121	Analytical Chemistry2	8	2
Lectures (hr/w)	Lab./Prac./Tutor.	SSWL (hr/sem)	USSWL (hr/w)
3	2	93	107
Description			
<p>This course will deal with: Volumetric Methods of Analysis, Requirements for a primary standard, Volumetric Calculations for Acid-Base Titrations, Equilibrium in acid-base solutions, Calculating the pH of weak acids and base solutions, Calculating the pH of salts solutions, Salt differential from strong acid and strong base, Salt differential from weak acid and strong base, Salt differential from strong acid and weak base, Salt differential from weak acid and weak base. Buffer solutions.</p> <p>-Selection of suitable indicator or choice of indicator, Calculation the concentration of pieces of weak acids in known pH, Indicators in oxidation-reduction titrations</p>			

8

Code	Course/Module Title	ECTS	Semester
INCH122	Inorganic Chemistry 2	8	2
Lectures (hr/w)	Lab./Prac./Tutor.	SSWL (hr/sem)	USSWL (hr/w)
4	1	78	112
Description			
<p>The students will learn: Periodic properties, calculation effective nucleonic charge, atomic Radius, electronegativity, electron affinity, covalent molecules Bonding in Molecules Covalent Bonding, Hybridization of covalent molecules, Theories of Covalent Bonding Valence Bond Theory (V.B.T), examples and questions about VBT. Molecular Orbital Theory, MOT of Diatomic Molecules, homonuclear diatomic molecule.</p>			

9

Code	Course/Module Title	ECTS	Semester
GEBI123	General biology	6	2
Lectures (hr/w)	Lab./Prac./Tutor.	SSWL (hr/sem)	USSWL (hr/w)
3	2	78	55
Description			
<p>During this course the students will achieve: Biochemistry and Cell Membrane Application of Biochemistry, Biomolecules , Cell Membrane The Contents of the Cell Wall,</p>			

Cellular Activities, Transport Across Cell Membranes , Mechanism of Transfer of Materials, Carrier Proteins , Channel Proteins, Channel Protein Transport, Functions of Water in the Body and Cell, The Solubility of Compounds in Water , Buffer Solution. Principles of Buffering, Acidic Buffer Solutions.

10

Code	Course/Module Title	ECTS	Semester
COSC124	Computer Science	4	2
Lectures (hr/w)	Lab./Prac./Tutor.	SSWL (hr/sem)	USSWL (hr/w)
2	2	63	37
Description			
<p>This course, the students will deal with the Introduction to Computer (definition, types of computer, Computer Data Representation Number system, generations of computer) Structure of the computer and its components. Hardware (Input and Output Devices, Computer Memory) Software: (Definition of Operating System, Objectives, types, and functions of Operating Systems, Working with Windows10 Operating System: Introduction, Working with Windows Operating System: Introduction, The Desktop, Structure of Windows, Windows Explorer, File and Folder Operations, Introduction to Application Communication Tools</p>			

11

Code	Course/Module Title	ECTS	Semester
ENLA125	English Language	2	2
Lectures (hr/w)	Lab./Prac./Tutor.	SSWL (hr/sem)	USSWL (hr/w)

2		33	17
Description			
<p>The students will deal with the tenses (simple & progressive), Using auxiliary verbs such as: (do, be, have) Use of modal verbs, Why question, Yes/No question, Speak in a polite way. Learn some of the vocabulary, Expression of opinion, Explain the tenses (perfect, perfect continuous), learn how to apologize, permission, and how to give advice, Active & Passive Voice. Using positive and negative properties, Training on a short conversation and building a complete sentence. Condition clauses, Parts of the sentences (words, phrases & clauses) Learn (how to use (used to) (Using sentences with more than one clause. English Phonetics</p>			

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Code	Course/Module Title	ECTS	Semester
WORSH11	Workshops	2	2
Lectures (hr/w)	Lab./Prac./Tutor.	SSWL (hr/sem)	USSWL (hr/w)
	3	45	5
Description			
<p>Preparing applied engineers in the field of engineering sciences who are distinguished by a high level of knowledge and technological creativity, in line with the strict standards adopted globally in quality assurance and academic accreditation of the corresponding engineering programs, while adhering to the ethics of the engineering profession. Enable the student to know and understand work systems, risks, and the factors surrounding them. Enable the student to know and understand theoretical principles in handicrafts and measurements.</p>			

