Tafila Technical University
College of Science
Department of Chemistry and
Techno - Chemistry

Study Plan Approval Date	Study Plan in Techno - Chemistry	Study Plan Code
06/11/ 2024		SCI._CHEM._0204

Tafalla Technical University

College of Science

This study plan is applied to the students admitted into the Bachelor's program in Techno - Chemistry for the academic year 2024/2025

Study Plan for B.Sc. in Techno - Chemistry

Offered Degree: B.Sc. in Techno - Chemistry

Tafila Technical University
College of Science
Department of Chemistry and Techno - Chemistry

Department	Program	Official Stamp
Department of Chemistry	B.SC. in Techno - Chemistry	
The Chemistry study plan was approved by the **dean's council** on 06/11/ 2024 / Decision Number (281/2024)		

TTU Techno - Chemistry Program

The department of Chemistry and Chemical Technology was established at the beginning of the 2005/2006 academic year, coinciding with the inception of Tafila Technical University. This was to keep pace with the significant and tremendous technological progress our world is witnessing today. This progress requires educating, training, and preparing individuals so that they can fulfil our collective aspirations for comprehensive development in all fields.

With the launch of the department, two programs, i.e. the Chemistry program and Techno - Chemistry Program were initiated, which are unique to Tafila Technical University. These programs aim to provide the governmental and private national institutions with qualified personnel to work as researchers, teachers, and technicians and preparing them for higher education studies as well. In addition, the two programs aim to provide high-quality educational and research programs, striving to establish and enhance the students' scientific and experimental knowledge. This is in addition to using the best educational methods in teaching and encouraging students to reach a high level of knowledge.

The department offers a bachelor's degree in chemistry and chemical technology and a Master's degree (research track) in Chemical Technology. The department includes 20 faculty members, assisted by nine lab supervisors and technicians. Currently, the department is working to increase its teaching staff to enhance the educational process and scientific research, and to keep up with the increasing number of students who are enrolling each year. The department has five laboratories, each accommodating up to 20 students. These are: Organic Chemistry Lab, Inorganic Chemistry Lab, Analytical Chemistry Lab, Physical Chemistry Lab, and Instrumental Analysis lab.

The department continues to feed the local and Arab market with undergraduates who have proven their success and excellence in various chemical fields such as industry, chemical analysis, pharmaceutical companies, laboratory equipment, chemical materials, university teaching, and secondary education.

The department seeks to elevate the educational process according to the latest applied systems. This aligns with the mission and vision of the university, which always emphasizes implementing global quality standards for all its programs across various specializations. It also continues to support scientific research and encourages researchers with the aim of building effective cooperation with universities and research centres at both local and global levels, enabling the department to better achieve its mission and objectives.

Vision and Mission	
Vision	The Department of Chemistry and Chemical Technology aims for global excellence in the fields of education, scientific research, and industry, in line with the requirements of the modern era and serving the needs of the local community.
Mission	The Department of Chemistry and Chemistry Technology is committed to provide practical skills to students with immediate employment. Providing distinguished educational, research and training services.

Program Objectives (POs)	
PO_1	**Providing** the undergraduate with the basic knowledge in all fields of chemistry necessary to develop the skills of criticism, analysis, scientific research, and interpretation of scientific phenomena
PO_2	**Empowering** and **qualifying** the undergraduate to excel and succeed in pursing postgraduate studies by acquiring scientific and research skills, as well as enabling them to continue their practical life in the fields of education and industry.
PO_3	**Providing** the undergraduate with the skills to deal with scientific equipment, modern educational programs, and training in scientific techniques.
PO_4	**Developing** skills in using modern scientific research resources in order to build research capcities, criticism, discussion, and scientific writing skills
PO_5	**Providing** chemistry materials to serve other specializations in the departments of the College of Science, the College of Engineering, and other colleges.

Program Educational Outcomes (PEOs)	
PEO_1	**Understand** the properties of chemical elements and compounds
PEO_2	**Interpreting** and **analyzing** scientific phenomena by linking the fields of chemistry with each other and linking basic chemistry concepts with other scientific fields (mathematics, physics, biology, and computers)
PEO_3	Using laboratory skills to **design** experiments on scientific foundations and apply chemical safety principles
PEO_4	**Demonstrate** a spirit of initiative and a high degree of independence to work effectively and responsibly in an individual context and within a collaborative teamwork environment.
PEO_5	**Applying** a deep understanding of scientific principles in understanding, criticizing, and evaluating research issues and scientific studies, as well as in solving scientific dilemmas and interpreting scientific phenomena.

Student Learning Outcomes (SLOs)	
SLO_1	**Identify**, **formulate**, and **solve** broadly defined technical or scientific problems by applying knowledge of mathematics, science, and technical subjects in areas related to physics.
SLO_2	**Formulate** or **design** a system, process, procedure, or program to meet desired needs.
SLO_3	**Develop** and **conduct** experiments or test hypotheses, analyze and interpret data, and use scientific judgment to draw conclusions.
SLO_4	**Communicate** effectively with a wide range of audiences.
SLO_5	**Understand** ethical and professional responsibilities and the impact of technical and scientific solutions in global, economic, environmental and societal contexts.
SLO_6	**Work** effectively in teams that set goals, plan tasks, meet deadlines, and analyse risks.

Cognitive Domains for Techno - Chemistry Program	
Domain	**Fundamental Cognitive Domains**
1	Organic and Biochemistry
2	Analytical Chemistry
3	Inorganic Chemistry
4	Physical Chemistry
5	Fundamental sciences
	Supporting Cognitive Domains
	Courses support the Chemistry program that are offered by department of Applied physics and Mathematics

Numbering System for Techno - Chemistry Program				
College NO.	Program NO.	Course Level	Domain NO.	Course order within the cognitive Domain
02	04	From 1 to 4	From 1 to 5	From 1 to 9

Credit Hours Distribution for B.SC. in Techno - Chemistry			
Classification	**Credit Hours**		
	Obligatory	**Elective**	**Total**
University Requirements	21	6	27
College Requirements	21	0	21
Specialty Requirements	76	10	86
	118	**16**	**134**

Classification of the Requirements for the B.SC. Degree in Techno - Chemistry According to Teaching Mode (Online – Blended – Face to Face)

Classification / Requirements	Specialty Requirements		College Requirements	Elective University Requirements	Obligatory University Requirements
	Obligatory	Elective			
Credit Hours	76	10	21	6	21
% Credit Hours	57.0 %	7.4 %	15.6 %	4.4 %	15.6 %
% (Total)	**64.4 %**		**15.6 %**	**20 %**	

Teaching Mode	Specialty Requirements			College Requirements			Elective University Requirements			Obligatory University Requirements		
	F-to-F	Blended	Online	F-to-F	Blended	Online	F-to-F	Blended	Online	F-to-F	Blended	Online
Credit Hours	63	23	0	3	18	0	0	0	6	0	0	21
% (Total)	**48.1 %**	**16.3 %**	0 %	**2.2 %**	**13.3 %**	0 %	0 %	0 %	**4.4 %**	0 %	0 %	**15.6 %**

First: Obligatory University Requirements (21 Credit Hours)

Course NO.	Course Name	Number Of Credit Hours			Pre-requisite	Teaching Mode
		Theoretical	Practical	Total		
0501100	Communication Skills in Arabic Language	3	0	3	(1)	Online
0502100	Communication Skills in English Language	3	0	3	(2)	Online
0603099	Computer complementary course (3)	3	0	0	------	Online
0302100	Life skills	3	0	3	None	Online
0301199	Leadership and Social Responsibility	3	0	3	None	Online
0404199	Entrepreneurship and innovation	3	0	3	None	Online
0503101	National Education (4)	3	0	3	None	Online
0503112	Military Science (4)	3	0	3	None	Online

(1) "Arabic Placement Test" or Prerequisite Arabic Language 0501099.
(2) "English Placement Test" or Prerequisite English Language 0502099.
(3) " Computer skill placement test" 0602098 , If the student passes in placement test, the grade will record "pass".
(4) Obligatory course for Jordanian students and optional for non-Jordanians. Non-Jordanian students, who do not choose this course, must study another course from the elective university requirements and the grade for this course will not be included in the student's GPA, but will be counted as **pass** or **fail**.

Second: Elective University Requirements (6 Credit Hours)

The student can choose one course from each of the following **groups**:

Course NO.	Course Name	Number of Credit Hours			Pre-requisite	Teaching Mode
		Theoretical	Practical	Total		
Humanities Group Offered by College of Arts, College of Education and College of Business						
0302099	Islamic Culture	3	0	3	None	Online
0503108	Human Rights	3	0	3	None	Online
0503110	Introduction to Domestic Violence	3	0	3	None	Online
0301102	Principles of Thinking	3	0	3	None	Online
0301105	Family Counseling	3	0	3	None	Online
0404100	Work Ethics	3	0	3	None	Online
0403099	Development and Environment	3	0	3	None	Online
Applied Sciences Group Offered by College of Engineering, College of Science and College of Information Technology and Telecommunications						
0105103	Mineral Resources in Jordan	3	0	3	None	Online
0601104	E-Learning	3	0	3	None	Online
0602100	Digital Culture	3	0	3	None	Online
0106140	Traffic Safety	3	0	3	None	Online
0105102	Sustainable Development	3	0	3	None	Online
0202103	Physics and Society (5)	3	0	3	None	Online
0212111	Radiation Sources and its Applications (5)	3	0	3	None	Online

(5) Can be chosen by all university students except students of Applied Physics Department.

Third: Obligatory College Requirements (21 Credit Hours)

Course NO.	Course Name	Number of Credit Hours			Pre-requisite	Teaching Mode
		Theoretical	Practical	Total		
0213105	Calculus 1	3	0	3	(5)	Blended
0213106	Calculus 2	3	0	3	0213105	Blended
0213101	General Physics 1	3	0	3	(6)	Blended
0213107	General Chemistry 1	3	0	3	(7)	Blended
0213109	General Biology 1	3	0	3	None	Blended
0213131	Principles of Statistics 1	3	0	3	None	Blended
0213103	General Physics Laboratory 1	0	3	1	0213101(8)	F-to-F
0213108	General Chemistry Laboratory 1	0	3	1	0213107(8)	F-to-F
0213132	Principles of Statistics Laboratory 1	0	3	1	0213131(8)	F-to-F

(5) "High School Mathematics " or Prerequisite Mathematics 0213098.
(6) "High School Physics " or Prerequisite Physics 0213097.
(7) "High School Chemistry"or Prerequisite Chemistry 0213099.
(8) or concurrent

Fourth: Obligatory Specialization Requirements (77 credit hours)

Course NO.	Course Name	Number of Credit Hours			Pre-requisite	Teaching Mode
		Theoretical	Practical	Total		
0205113	General Chemistry 2	3	0	3	0213107	Blended
0205114	General Chemistry Laboratory 2	0	3	1	0205113	F-to-F
0213102	General Physics 2	3	0	3	0213101	Blended
0213104	General Physics Laboratory 2	0	3	1	0213102	F-to-F
0205251	Mathematics for Chemists	3	0	3	0213106	F-to-F
0205215	Organic Chemistry 1	3	0	3	0205113	F-to-F
0205216	Organic Chemistry Laboratory 1	0	6	2	0205114 & 0205215(8)	F-to-F
0205213	Organic Chemistry 2	3	0	3	0205215	F-to-F
0205214	Organic Chemistry Laboratory 2	0	6	2	0205213 & 0205216(8)	F-to-F
0205221	Inorganic Chemistry 1	3	0	3	0205113 & 0205215	F-to-F
0205234	Analytical Chemistry	3	0	3	0205113	F-to-F
0205235	Analytical Chemistry Laboratory	0	3	1	0205114 & 0205234(8)	F-to-F
0205243	Physical Chemistry 1	3	0	3	0205113 & 0205251	F-to-F

0205242	Physical Chemistry Laboratory 1	0	3	1	0205114 & 0205243(8)	F-to-F
0205252	Computer Applications in Chemistry	2	3	3	0205113 & 0205251	F-to-F
0205311	Organic Chemistry 3	3	0	3	0205213	F-to-F
0205312	Organic Spectroscopy	3	0	3	0205213	Blended
0205313	Systematic Identification of Organic Compounds Laboratory	0	6	2	0205214 & 0205311(8)	F-to-F
0205324	Inorganic Chemistry 2	3	0	3	0205221 & 0205213	F-to-F
0205325	Inorganic Chemistry Laboratory	0	6	2	0205324	F-to-F
0205323	Organometallic Chemistry	3	0	3	0205216 & 0205324	F-to-F
0205331	Instrumental Analysis	3	0	3	0205234 & 0205216	F-to-F
0205332	Instrumental Analysis Laboratory	0	6	2	0205235 & 0205331(9)	F-to-F
0205341	Physical Chemistry 2	3	0	3	0205243	F-to-F
0205344	Physical Chemistry Laboratory 2	0	3	1	0205341 & 0205242(8)	F-to-F
0204431	Management and Industrial Methods	3	0	3	0205344 & 0205325	Blended
0204452	Chemical Process Technology	3	0	3	0205344 & 0205323	F-to-F
0204432	Industrial Analysis	3	0	3	0205331	Blended
0204433	Industrial Analysis Laboratory	0	3	1	0204432(8) & 0205332	F-to-F
0204453	Practical field training	0	12	4	0205332 & 0205312	F-to-F
0204454	Graduation Project	1	3	2	0204453	F-to-F

(8) or concurrent

Fifth: Elective Specialization Requirements (10 Credit Hours)

Course NO.	Course Name	Number of Credit Hours			Pre-requisite	Teaching Mode	Group
		Theoretical	Practical	Total			
0205422	Industrial Inorganic Chemistry	3	0	3	0205323	F-to-F	A
0204424	Chemistry of Construction Materials	3	0	3	0205323	Blended	
0204422	Chemistry of Inorganic Compounds	3	6	4	0205323	Blended	
0204419	Biochemistry	2	3	3	0205311 & 0213109	Blended	B
0205418	Chemistry of Natural Products	2	3	3	0205311	F-to-F	
0204425	Medicinal Chemistry	2	6	4	0205323	Blended	
0204444	Polymer Chemistry	3	0	3	0205344 0205323&	F-to-F	C
0204445	Advanced Polymer Chemistry	2	3	3	0205344	Blended	
0204435	Industrial Polymer Technology	2	6	4	0205344	Blended	
0205417	Advance Water Treatment	2	6	4	0205341	Blended	D
0205444	Nanotechnology	3	0	3	0205311 & 0205341	F-to-F	
0204418	Applications of Artificial Intelligence in Environmental Treatment	2	3	3	0205341	Blended	

(8) or concurrent

Advisory Plan for B.SC. Degree in Techno - Chemistry Technology

First Academic Year - Techno - Chemistry Program

The First Semester					The Second Semester			
Course Number	Course Name	NO. of Credit Hours	Pre-requisite		Course Number	Course Name	NO. of Credit Hours	Pre-requisite
0213105	Calculus 1	3	(1)		0213106	Calculus 2	3	0213105
0213107	General Chemistry 1	3	(3)		0205113	General Chemistry 2	3	0213107
0213108	General Chemistry Lab .1	1	0213107		0205114	General Chemistry Lab. 2	1	0205113
0213101	General Physics 1	3	(2)		0213102	General Physics 2	3	0213101
	Obligatory University Requirement	3			0213103	General Physics Lab. 1	1	0213101(4)
	University Elective Requirement	3			0213131	Principles of Statistics 1	3	None
					0213132	Principles of Statistics Lab.1	1	02013131(4)
						University Elective Requirement	3	
Total		**16**			**Total**		**18**	**Total**

(1) "High School Mathematics " or Prerequisite Mathematics 0213098.
(2) "High School Physics " or Prerequisite Physics 0213097.
(3) "High School Chemistry"or Prerequisite Chemistry 0213099.
(4) or concurrent

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Second Academic Year - Techno - Chemistry Program

The First Semester

Course Number	Course Name	NO. of Credit Hours	Pre-requisite
0205251	Mathematics for Chemists	3	0213106
0205234	Analytical Chemistry	3	0205113
0520523	Analytical Chemistry Lab.	1	0205114 & 0205234(4)
0205215	Organic Chemistry 1	3	0205113
0205216	Organic chemistry Lab. 1	2	0205215(4) &0205114
0205243	Physical Chemistry 1	3	0205251& 0205113
	Obligatory University Requirement	3	
Total		**18**	

The Second Semester

Course Number	Course Name	NO. of Credit Hours	Pre-requisite
0213104	General Physics Lab. 2	1	0213102
0205213	Organic Chemistry 2	3	0205215 & 0205216(4)
0205214	Organic Chemistry Lab. 2	2	0205213 & 0205216(4)
0205221	Inorganic Chemistry 1	3	02013113 & 0205215
0205252	Computer Applications in Chemistry	3	0205113 & 0205251
	Obligatory University Requirement	3	
	Obligatory University Requirement	3	
Total		**18**	

(4) or concurrent

Third Academic Year - Techno - Chemistry Program

The First Semester

Course Number	Course Name	NO. of Credit Hours	Pre-requisite
0205312	Organic Spectroscopy	3	0205216
0205324	Inorganic Chemistry 2	3	0205221 & 0205213
0205331	Instrumental Analysis	3	0205234 & 0205216
0205332	Instrumental Analysis Lab.	2	0520523 & 0205331(4)
0205341	Physical Chemistry 2	3	0205243
0205242	Physical Chemistry Lab. 1	1	0205114 & 0205243(4)
	Obligatory University Requirement	3	
Total		**18**	

The Second Semester

Course Number	Course Name	NO. of Credit Hours	Pre-requisite
0205313	Systematic Identification of Organic Compounds Lab.	2	0205214 & 0205311
0205323	Organometallic Chemistry	3	0205216 & 0205324
0205325	Inorganic Chemistry lab.	2	0205324
0205344	Physical Chemistry Lab. 2	1	0205245 & 0205341(4)
0205311	Organic chemistry (3)	3	0205213
	University Elective Requirement	3	
	Obligatory University Requirement	3	
Total		**17**	

(4) or concurrent

Forth Academic Year - Techno - Chemistry Program

The First Semester

Course Number	Course Name	NO. of Credit Hours	Pre-requisite
0204432	Industrial Analysis	3	0205331
0204433	Industrial Analysis Laboratory	1	0204432(4) & 0205332
0204453	Practical Field Training	4	0205332 & 0205312
0205459	Graduation Project	2	0204453
	Elective Specialization Requirement	3	
Total		**13**	

The Second Semester

Course Number	Course Name	NO. of Credit Hours	Pre-requisite
0204431	Management and Industrial Methods	3	0205344 & 0205325
0213109	General Biology 1	3	None
0205450	Chemical Process Technology	3	0205344 & 0205323
	Elective Specialization Requirement	4	
	Obligatory University Requirement	3	
Total		**16**	

Courses that Cover Fundamental Cognitive Domains for the Techno - Chemistry Program

Cognitive Domain	Course number	Course Name	Number of credit hours			Pre-requisite
			Theoretical	Practical	Total	
Organic and Biochemistry (1)	0204419	Biochemistry	2	3	3	0213109 & 0205311
	0204425	Medicinal Chemistry	2	6	4	0205323
	0204444	Polymer Chemistry	3	0	3	0205344 & 0205323
	0204445	Advanced Polymer Chemistry	2	3	3	0205344
	0204435	Industrial Polymer Technology	2	6	4	0205344
	0205215	Organic Chemistry 1	3	0	3	0205113
	0205216	Organic Chemistry Laboratory 1	0	6	2	0205114 & 0205215(1)
	0205213	Organic Chemistry 2	3	0	3	0205215 & 0205216(1)
	0205214	Organic Chemistry Laboratory 2	0	6	2	0205213 & 0205216(1)
	0205311	Organic Chemistry 3	3	0	3	0205213
	0205312	Organic Spectroscopy	3	0	3	0205216
	0205313	Systematic Identification of Organic Compounds Laboratory	0	6	2	0205214 & 0205311(1)
	0205418	Chemistry of natural products	2	3	3	0205311
Inorganic Chemistry (2)	0204424	Chemistry of Construction Materials	3	0	3	0205323
	0204422	Chemistry of Inorganic Compounds	3	0	3	0205323
	0205221	Inorganic Chemistry 1	3	0	3	0205113 & 0205215
	0205324	Inorganic Chemistry 2	3	0	3	0205221 & 0205213
	0205325	Inorganic Chemistry Laboratory	0	6	2	0205324
	0205323	Organometallic Chemistry	3	0	3	0205216 & 0205324
	0205422	Industrial Inorganic Chemistry	3	0	3	0205323
	0204431	Management and Industrial Methods	3	0	3	0205344 & 0205325
	0204432	Industrial Analysis	3	0	3	0205331

Analytical Chemistry (3)	0204433	Industrial Analysis Laboratory	0	3	1	0204432(1) &0205332
	0205234	Analytical Chemistry	3	0	3	0205113
	0520523	Analytical Chemistry Laboratory	0	3	1	0205114 & 0205234(1)
	0205331	Instrumental Analysis	3	0	3	0205234 & 0205216
	0205332	Instrumental Analysis Laboratory	0	6	2	0520523 & 0205331(1)
Physical Chemistry (4)	0205243	Physical Chemistry 1	3	0	3	0205113 & 0205251
	0205242	Physical Chemistry Laboratory 1	0	3	1	0205114 & 0205243(1)
	0205341	Physical Chemistry 2	3	0	3	0205243
	0205344	Physical Chemistry Laboratory 2	0	3	1	0205242(1) & 0205341
	0205417	Advance Water Treatment	2	6	4	0205341
	0205444	Nanotechnology	3	0	3	0205311 & 0205341
	0204418	Applications of Artificial Intelligence in Environmental Treatment	2	3	3	0205341
	0205252	Computer Applications in Chemistry	2	3	3	0205243
	0205450	Chemical Process Technology	3	0	3	0205344 & 0205323
	0204453	Practical field training	0	12	4	0205332 & 0205312
	0205459	Graduation Project	1	3	2	0204453

(1) or concurrent

Supporting courses for the Techno - Chemistry Program that are offered by other programs in the College of Science or by other Colleges

Cognitive Domain	Course Number	Course Name	Number of credit hours			Pre-requisite
			Theoretical	Practical	Total	
Supporting Domains	0205251	Mathematics for Chemists	3	0	3	0213106
	0213105	Calculus 1	3	0	3	(1)
	0213106	Calculus 2	3	0	3	0213105
	0213101	General Physics 1	3	0	3	(2)
	0213107	General Chemistry 1	3	0	3	(3)
	0213109	General Biology 1	3	0	3	None
	0213131	Principles of Statistics 1	3	0	3	None
	0213103	General Physics Laboratory 1	0	3	1	0213101(4)
	0213108	General Chemistry Laboratory 1	0	3	1	0213107(4)
	0213102	General Physics 2	3	0	3	0213101
	0213104	General Physics Laboratory 2	0	3	1	0213102(4)
	0213132	Principles of Statistics Laboratory 1	0	3	1	0213131(4)
	0213097	Prerequisite Physics (5)	3	0	0	None
	0213098	Prerequisite Calculus (5)	3	0	0	None
	0213099	Prerequisite Chemistry (5)	3	0	0	None

(1) "High School Physics " or Prerequisite Physics 0213097.
(2) "High School Chemistry" or Prerequisite Chemistry 0213099.
(3) "High School Mathematics " or Prerequisite Calculus 0213098.
(4) or concurrent
(5) This course is marked **PASS** or **FAIL**.

Description of the Courses that Cover Fundamental Cognitive Domains of the Techno - Chemistry Program (Mandatory requirements)

Course name: **General Chemistry 2**		Course number: **0205113**	NO. of credit hours: **3** Theoretical Hrs.
Pre-requisite: **0213107**		Teaching language: **English**	Offered by: Chemistry Program
Course Description	The course topics are gases; thermochemistry; spontaneity; entropy; and free energy; liquids and solids properties of solutions; chemical kinetics; chemical equilibrium and acids and bases.		
Course name: **General Chemistry Laboratory 2**		Course number: **0205114**	NO. of credit hours:**1**(**3** Experimental Hrs.)
Pre-requisite: **0213108 & 0205113**		Teaching language: **English**	Offered by: Chemistry Program
Course Description	The course experiments are bleach analysis; molar mass of volatile liquid; determination of rate law; factors affecting reaction rates; solubility product constant and common ion effect; equilibrium constant for slightly soluble salt; and analysis of $KClO_3$ mixture.		
Course name: **Organic Chemistry 1**		Course number: **0205215**	NO. of credit hours: **3** Theoretical Hrs.
Pre-requisite: **0205113**		Teaching language: **English**	Offered by: Chemistry Program
Course Description	The course topics are structure and bonding; polar covalent bonds; acids and bases, organic compounds: alkanes and their stereochemistry; organic compounds: cycloalkanes and their stereochemistry; stereochemistry at tetrahedral centers; an overview of organic reactions; alkenes: structure and reactivity; alkenes: structure and reactivity; alkenes: reactions and synthesis.		
Course name: **Organic Chemistry Laboratory 1**		Course number: **0205216**	NO. of credit hours: **2**(**6** Experimental Hrs.)
Pre-requisite: **0205114 & 0205215 ****		Teaching language: **English**	Offered by: Chemistry Program
Course Description	The laboratory experiments are melting point and boiling point determination; distillation; recrystallization; extraction; thin layer chromatography (TLC); Aspirin synthesis; nucleophilic substitution (alkyl halides); preparation of t-butyl chloride and alkenes.		
Course name: **Organic Chemistry 2**		Course number: **0205213**	NO. of credit hours: **3** Theoretical Hrs.
Pre-requisite: **0205215 &0205216 ****		Teaching language: **English**	Offered by: Chemistry Program
Course Description	The course topics are benzene and aromaticity; chemistry of benzene; alcohols and phenols; ethers and epoxides; thiols and sulphides; aldehydes and ketones; carboxylic acids; and carboxylic acid derivatives and nucleophilic acyl substitution reactions.		
Course name: **Organic Chemistry Laboratory 2**		Course number: **0205214**	NO. of credit hours: **2** (**6** Experimental Hrs.)
Pre-requisite: **0205213 & 0205216 ****		Teaching language: **English**	Offered by: Chemistry Program
Course Description	The course topics include the oxidation and reduction reactions; nucleophilic addition reactions; hydration reactions; Aldol condensation reactions; esterification reactions; and the general chemical tests used for the identification of the carbonyl; alcohol; alkenes; and amines. In addition to review some experimental techniques such as: melting and boiling points determination, crystallization, extraction, and suction filtration.		

Course name: **Organic Chemistry 3**	Course number: **0205311**	NO. of credit hours: **3** Theoretical Hrs.
Pre-requisite: **0205213**	Teaching language: **English**	Offered by: Chemistry Program
Course Description	The course topics are carbonyl alpha-substitution reactions; carbonyl condensation reactions; amines and heterocycles; orbitals; and organic chemistry; and pericyclic reactions.	
Course name: **Organic Spectroscopy**	Course number: **0205312**	NO. of credit hours: **3** Theoretical Hrs.
Pre-requisite: **0205216**	Teaching language: **English**	Offered by: Chemistry Program
Course Description	The course content, firstly, describes the basic instrumental principles involved in the operation of the studied spectroscopic technique. Then, the methods of sample handling and preparation, finally, the students are trained to interpret useful information about the molecular composition and structure of the organic compound from the spectral data generated from the studied technique. The course topics are Infrared Spectrometry (IR), Mass Spectrometry, Nuclear Magnetic Resonance Spectrometry (1H-NMR), and Nuclear Magnetic Resonance Spectrometry (13C-NMR).	
Course name: **Systematic Identification of Organic Compounds Laboratory**	Course number: **0205313**	NO. of credit hours: **2** (**6** Experimental Hrs.)
Pre-requisite: **0205214 & 0205311****	Teaching language: **English**	Offered by: Chemistry Program
Course Description	The course topics are identification of unknowns and preliminary examination; physical properties; elemental analysis; classification of organic compounds by solubility; chemical tests for functional groups; separation of mixtures; the preparation of derivatives and solving structural problems by IR, NMR and elemental analysis.	
Course name: **Inorganic Chemistry 1**	Course number: **0205221**	NO. of credit hours: **3** Theoretical Hrs.
Pre-requisite: **02013113 &** 0205215	Teaching language: **English**	Offered by: Chemistry Program
Course Description	The course topics are: basic concepts of atoms; Electronic structure of Hydrogen and multi electron atoms; the periodic table and periodic properties of the elements; oxidation numbers, oxidation states; common and uncommon periodic trends; acid- base concepts and donor acceptor chemistry concepts; ionic compounds and bonding in polyatomic molecules; Chemistry of the main group elements.	
Course name: **Inorganic Chemistry 2**	Course number: **0205324**	NO. of credit hours: **3** Theoretical Hrs.
Pre-requisite: **0205221 &** 0205213	Teaching language: **English**	Offered by: Chemistry Program
Course Description	The course topics are: Coordination Compounds and Isomers: definitions, complexes, and ligands coordinate bond and coordination numbers, nomenclature of coordination compounds, ligands of various types and coordination polyhedral; Isomerism: types of isomers; Basic concepts of molecular symmetry; bonding theories of coordination compounds; electronic and magnetic properties of transition metals; Introduction to types of reactions of inorganic complexes	
Course name: **Inorganic Chemistry Laboratory**	Course number: **0205325**	NO. of credit hours: **2** (**6** Experimental Hrs.)
Pre-requisite: **0205324**	Teaching language: **English**	Offered by: Chemistry Program
Course Description	The course experiments are the stabilization of a complex by Chelate effect: Effect of ligand type; Stabilization of a complex containing monodentate ligand; Effect of metal electronic structure; Stereoisomerism; Constitutional; geometrical; and optical isomers of cobalt (III) containing complexes; and identification of complexes by instrumental techniques; Conductivity and visible spectrophotometry.	

Course name: **Organometallic Chemistry**	Course number: **0205323**	NO. of credit hours: **3** Theoretical Hrs.
Pre-requisite: **0205216 & 0205324**	Teaching language: **English**	Offered by: Chemistry Program
Course Description	The course topics are introduction to organometallic complexes; alkyls and hydrides; carbonyls; phosphines and substitution; pi complexes.	
Course name: **Management and industrial methods**	Course number: **0204431**	NO. of credit hours: **3** Theoretical Hrs.
Pre-requisite: **0205344 &0205325**	Teaching language: **English**	Offered by: Chemistry technology Program
Course Description	This course covers: Characteristics of the Industry: scale of operations, major chemical producing countries., major sectors and their products, turning chemicals into useful products Quality and Safety ; management tasks and theories; Organization of chemical projects; Neutral refraction analysis; Decision making and choices; Control of assets; Cost estimation and reduction; Benefit equations; Financial audit chart.	
Course name: **Analytical Chemistry**	Course number: **0205234**	NO. of credit hours: **3** Theoretical Hrs.
Pre-requisite: 0205113	Teaching language: **English**	Offered by: Chemistry Program
Course Description	The course topics are errors and treatment of analytical data; gravimetric analysis; titrimetric methods of analysis; acid- base titration; precipitation titration, complex formation and oxidation reduction titrations; titration of complex systems; and introduction to electrochemistry.	
Course name: **Analytical Chemistry Laboratory**	Course number: **0520523**	NO. of credit hours: **1 (**3 Experimental Hrs.)
Pre-requisite: 0205114 **& 0205234 ****	Teaching language: **English**	Offered by: Chemistry Program
Course Description	The laboratory experiments are calibration of volumetric glassware; statistical handling of data; gravimetric methods; neutralization titration in aqueous media (acid-base titration); application neutralization titration in aqueous media: quantitation of phosphoric acid in commercial acid; complexometric titration: titration with EDTA; precipitation titration: the Mohr's method; precipitation titration: the Volhard's method; determination of calcium by quantitative precipitation and titration; and gravimetric methods: gravimetric determination of sulfate.	
Course name: **Instrumental Analysis**	Course number: **0205331**	NO. of credit hours: **3** Theoretical Hrs.
Pre-requisite: **0205216 & 0205234**	Teaching language: **English**	Offered by: Chemistry Program
Course Description	The course topics are atomic spectroscopy; optical atomic absorption spectroscopy; molecular spectroscopy; optical instrumentation; applications of UV-Vis spectroscopy; infrared spectroscopy; mass spectroscopy; high performance liquid chromatography; and gas chromatography.	
Course name: **Instrumental Analysis Laboratory**	Course number: **0205332**	NO. of credit hours:**2** (**6** Experimental Hrs.)
Pre-requisite: **0520523 & 0205331 ****	Teaching language: **English**	Offered by: Chemistry Program
Course Description	The laboratory experiments are Spectrophotometric Determination of Fe(III) solution λmax, calibration curve; calculation of molar absorptivity; pH effect; refractometry; simultaneous determination of manganese and chromium ions; flame photometry; polarimetry; IR spectroscopy; potentiometry, high performance liquid chromatography; and gas chromatography.	

Course name: **Industrial Analysis**	Course number: **0204432**	NO. of credit hours: **3** Theoretical Hrs.
Pre-requisite: **0205331**	Teaching language: **English**	Offered by: Techno - Chemistry Program
Course Description	The industrial analysis course is designed to improve the analytical chemistry skills of government and industrial employees who are engaged in chemical, pharmaceutical, bio-analytical, forensic, food and environmental fields. Aims to provide the undergraduate student in techno chemistry student's principles of industrial methodology for the analysis. Which is an extension and more comprehensive to analytical and instrumental analysis topics. The course offers a specific introduction to methods of analysis that are practiced in industry. The methods including sampling of different types of analytes and how to systematically analyses them from step one. Then demonstrate the quality assurance, QA and quality control QC that are practiced in industry. Validation parameters: specificity precision, accuracy, linearity, stability, LOD, LOQ, recovery, stability, system suitability. Review for classical analytical methods and applications. Review for instrumental analysis and applications in industrial chemistry.	
Course name: **Industrial Analysis Laboratory**	Course number: **0204433**	NO. of credit hours: **1** (**3** Experimental Hrs.)
Pre-requisite: **0204432(9) &0205332**	Teaching language: **English**	Offered by: Techno - Chemistry Program
Course Description	Laboratory experiments in this course: Theoretical and practical aspects of chemical analysis methods used in industries, including: methods of verifying the validity and accuracy of analysis; extraction methods and their applications in industry; analysis of drugs, detergents, cosmetics, dyes, pesticides, oils and fats, and natural products.	
Course name: **Physical Chemistry 1**	Course number: **0205243**	NO. of credit hours: **3** Theoretical Hrs.
Pre-requisite: **0205113 & 0205251**	Teaching language: **English**	Offered by: Chemistry Program
Course Description	Students will explore the properties and behavior of gases, delve into the core concepts of thermodynamics such as energy; enthalpy; entropy; and free energy; and examine the principles governing chemical equilibrium.	
Course name: **Physical Chemistry Laboratory1**	Course number: **0205242**	NO. of credit hours: **1** (**3** Experimental Hrs).
Pre-requisite: 0205114 **& 0205243 ****	Teaching language: **English**	Offered by: Chemistry Program
Course Description	The experiments are determination of the heat capacity of a calorimeter; heat of neutralization; heat of solution from solubility; freezing point depression; adsorption of acetic acid by activated carbon in aqueous medium; determination of critical temperature of phenol-water system; heating and cooling curve of sodium thiosulfate.	
Course name: **Physical Chemistry 2**	Course number: **0205341**	NO. of credit hours: **3** Theoretical Hrs.
Pre-requisite: **0205243**	Teaching language: **English**	Offered by: Chemistry Program
Course Description	This course covers the ideal solution and colligative properties; the ideal dilute solution; equilibrium between condensed phases; equilibrium in non-ideal systems; the basic principles of chemical kinetics including reaction rate; rate laws; activation energy; collision theory; the transition state theory; Gibbs energy and entropy of activation; heterogeneous reactions; kinetics of complex reactions; kinetics of catalysis by enzymes; kinetics of photochemical reactions. The basic theory and application of electrochemical science: general electrochemical concepts; introduction to electrochemistry; thermodynamics; electrode potentials; galvanic and electrolytic cells.	

Course name: **Physical Chemistry Laboratory2**	Course number: **0205344**	NO. of credit hours: **1** (**3** Experimental Hrs).
Pre-requisite: **0205341 & 0205242 ****	Teaching language: **English**	Offered by: Chemistry Program
Course Description	The laboratory experiments are determination of the solubility product of sparingly soluble salt, dissociation constant and molar conductivity at infinite dilution of weak electrolyte by conductance measurement, determination of conductivity coefficient, rate law determination of everyday processes, halogenation of acetone in solution, catalytic decomposition of hydrogen peroxide, saponification of ethyl acetate by conductivity measurements, effect of temperature on reaction rate.	
Course name: **Computer Applications in Chemistry**	Course number: **0205252**	NO. of credit hours: **3 (1** theoretical &**2** experimental Hrs.)
Pre-requisite: 0205243	Teaching language: **English**	Offered by: Chemistry Program
Course Description	This course introduces students to the wide range of software tools and applications used in modern chemical research and industry. Students will learn how to utilize computational chemistry software, molecular modeling programs, data analysis tools, and laboratory management systems to enhance their research capabilities and streamline workflows. The course emphasizes practical skills and hands-on experience with industry-standard software.	
Course name: **Chemical process technology**	Course number: **0205450**	NO. of credit hours: **3** Theoretical Hrs.
Pre-requisite: **0205344 &0205323**	Teaching language: **English**	Offered by: Chemistry technology Program
Course Description	This topic designed to describe the industrial processes and methods used in the chemical industry, such as the synthetic process of mineral acids, bases, and construction materials; the concepts forming the basis of the Chemical Process Industry and gives a solid background for innovative process developmen, the chemical kinetics, and physical transport phenomena; reactor design for each chemical synthetic pathway.	
Course Name: **Applications of Artificial Intelligence in Environmental Treatment**	Course number: **0204418**	NO. of credit hours: **3** (**2** theoretical & **3** experimental Hrs.)
Pre-requisite: 0205341	Teaching language: **English**	Offered by: Chemistry technology Program
Course Description	This course explores the innovative use of artificial intelligence (AI) techniques to address and solve complex environmental challenges. Students will learn how AI can be applied to improve environmental monitoring, optimize treatment processes, and enhance sustainability efforts. The course covers a range of AI methodologies, including machine learning, neural networks, and data analytics, with a focus on their application in air, water, and soil treatment technologies.	
Course Name: **Practical field training**	Course number: **0204453**	NO. of credit hours: **4** (**120** Field Training Hrs)
Pre-requisite: 0205332 & 0205312	Teaching language: **English**	Offered by: Techno - Chemistry Program
Course Description	This field training course is designed to deepen student understanding of the principles, concepts, and real-world chemical technology applications acquired during their study. student train in an organization that adopts chemical analysis such as factories of cement, potash, phosphate, petroleum refinery, pharmaceutical companies, and water companies where the student spend 120 training hours. The student must have finished 90 credit hours to be enrolled in this training course.	

Course name: **Graduation Project**	Course number: **0205459**	NO. of credit hours: **2** (1Theoretical &3 Experimental Hrs.)
Pre-requisite: **0204453**	Teaching language: **English**	Offered by:Techno - Chemistry Program
Course Description	This applied research course aims to develop the student's self-learning, interpersonal skills, critical thinking and problem solving through conducting a scientific review, applied experiment. This course includes a fortnightly two-hours session to follow up on the student's progress in the research and to enable the student demonstrating, discussing and evaluating his/her achievement with peers and the department faculty members.	

** Or concurrent.

Description of the Courses that Cover Fundamental Cognitive Domains of the Techno - Chemistry Program (Optional requirements)

Course Name: **Biochemistry**	Course number: **0204419**	NO. of credit hours: **3(2** theoretical & **3** experimental Hrs.)
Pre-requisite: **0213109 & 0205311**	Teaching language: **English**	Offered by:Techno - Chemistry Program
Course Description	The course first reviews the properties of aqueous solutions and elements of thermodynamics. Then, a description of the structures and functions of proteins, nucleic acids and lipids are given. Finally, an introduction to enzymes is given with an emphasis on structure, shape, and reaction kinetics. The course topics are water: the solvent for biochemical reactions, amino acids and peptides, the three-dimensional structure of proteins, protein purification and characterization techniques, the behavior of proteins: enzymes, carbohydrates, lipids and proteins, nucleic acids: how structure conveys information.	
Course Name : **Medicinal Chemistry**	Course number: **0204425**	NO. of credit hours: **4(2** theoretical & **6** experimental Hrs.)
Pre-requisite: 0205323	Teaching language: **English**	Offered by:Techno - Chemistry Program
Course Description	This course involve the knowledge and the understanding of the basic concepts and principles of their metabolism, laboratory analyses and their diagnostic utility. The course also deals with instrumentation and evaluation of the accuracy and precision of the procedures using analytical techniques. In general, students will learn at the knowledge, comprehension, application, analysis, synthesis and evaluation level, the relationships of structural properties of drugs to their: pharmacological properties; absorption, distribution, and metabolism profiles; chemical stability; mechanism of action; and clinically significant interactions. Drugs affecting the peripheral nervous system and the cardiovascular system will be emphasized.	
Course Name: **Nanotechnology**	Course number: **0205444**	NO. of credit hours: **3** Theoretical Hrs.
Pre-requisite: 0205311 & 0205341	Teaching language: **English**	Offered by: Chemistry Program
Course Description	This course covered the importance of the nanoparticles in industries and in our lives, classification of nanostructured and the chemical and physical properties of different nanostructured, Carbon Based Nanomaterials (Fullerenes, carbon-nanotubes and graphene); synthesis and fixtures nanoparticles and nanocolloids: synthesis and fabrication methods for nanomaterials; titanium nanotubes with and without palladium; silver and gold nanoparticles and some other fixtures; spectroscopic and microscopic tools used in nanomaterials characterizations; general industrial applications for nanoscale systems and fixtures, ; the most recent tools of nanomaterials characterization; the applications and fictionalization of nanomaterials; and nanotechnology and clean technologies.	

Course Name: **Chemistry of Construction Materials**	Course number: **0204424**	NO. of credit hours: **3** Theoretical Hrs.
Pre-requisite: 0205323	Teaching language: **English**	Offered by:Techno - Chemistry Program
Course Description	This course offers an in-depth exploration of the chemistry underlying the materials used in construction. Students will study the composition, properties, and chemical reactions of key construction materials such as cement, concrete, metals, polymers, and composites. The course aims to provide a comprehensive understanding of how these materials are synthesized, how they interact with their environment, and how their properties can be tailored to specific applications in construction.	
Course Name: **Chemistry of Inorganic Compounds**	Course number: **0204422**	NO. of credit hours: **3** Theoretical Hrs.
Pre-requisite: 0205323	Teaching language: **English**	Offered by:Techno - Chemistry Program
Course Description	This course provides an extensive exploration of the principles and applications of inorganic chemistry. Students will study the structure, bonding, and reactivity of inorganic compounds, including transition metal complexes, organometallics, and bioinorganic compounds. The course emphasizes understanding the periodic properties of elements, coordination chemistry, and the role of inorganic compounds in catalysis and materials science.	
Course Name: **Advance Water treatment**	Course number: **0205417**	NO. of credit hours: **4(2** theoretical & **6** experimental Hrs.)
Pre-requisite: **0205341**	Teaching language: **English**	Offered by:Techno - Chemistry Program
Course Description	The course covers a wide range of topics, including water quality assessment, and advanced treatment methods such as membrane technologies, adsorption, electro-degradation, photo-degradation and other techniques.	
Course Name: **Industrial Inorganic Chemistry**	Course number: **0205422**	NO. of credit hours: **3** Theoretical Hrs.
Pre-requisite: **0205323**	Teaching language: **English**	Offered by: Chemistry Program
Course Description	The course will cover the importance: availability, forms, structure and modifications of primary and manufactured inorganic compounds also the course will cover chemical industries concerning catalysis, basic principles, mechanisms, factors affecting the performance. The course will give brief ideas on distillation: batch and continuous	
Course Name: **Polymer Chemistry**	Course number: **0204444**	NO. of credit hours: **3** Theoretical Hrs.
Pre-requisite: **0205344 & 0205323**	Teaching language: **English**	Offered by: Techno - Chemistry Program
Course Description	This course provides a comprehensive introduction to the chemistry of polymers, focusing on their synthesis, characterization, and applications. Students will explore the fundamental concepts of polymer science, including polymerization mechanisms, molecular weight distribution, and the physical properties of polymers. The course will also cover the latest advancements in polymer technology and their applications in various industries, from materials science to biomedicine.	

Course Name: **Advanced Polymer Chemistry**	Course number: **0204445**	NO. of credit hours: **3** (**2** theoretical & **3** experimental Hrs.)
Pre-requisite: 0205344	Teaching language: **English**	Offered by:Techno - Chemistry Program
Course Description	This advanced course delves into the intricate aspects of polymer chemistry, focusing on cutting-edge research and applications. Students will explore advanced polymerization techniques, complex architectures, and the relationship between polymer structure and properties. The course covers the latest developments in polymer science, including stimuli-responsive polymers, nanocomposites, and biomedical applications.	
Course Name: **Industrial Polymer Technology**	Course number: **0204435**	NO. of credit hours: **4(2** theoretical & **6** experimental Hrs.)
Pre-requisite: 0205344	Teaching language: **English**	Offered by:Techno - Chemistry Program
Course Description	This course provides an in-depth study of the principles and practices involved in the industrial production and application of polymers. Students will explore the entire lifecycle of polymers, from synthesis and processing to their use in various industries and eventual recycling or disposal. The course emphasizes the practical aspects of polymer technology, including the design and operation of polymerization reactors, processing techniques, and quality control.	
Course Name: **Chemistry of Natural Products**	Course number: **0205418**	NO. of credit hours: **3** (**2** theoretical & **3** experimental Hrs.)
Pre-requisite: 0205311	Teaching language: **English**	Offered by Techno - Chemistry Program
Course Description	This course covered biological natural products and drugs of natural origin, including sources; principal components; structural component analysis; drug use; mechanism of action. A preliminary chapter is used to outline natural products resources; taxonomy; plant description and morphology; the role of natural products in drug discovery and development and approaches to discover new drug leads from nature.	

** Or concurrent.

Description of the Courses Offered by the Basic Sciences Department and Cover the Supporting Domains of the Techno - Chemistry Program

Course Name**: General Physics 1**	Course number: **0213101**	NO. of credit hours: **3** Theoretical Hrs.
Pre-requisite: *	Teaching language: **English**	Offered by: Basic Sciences Department
Course Description	The course covers units and measurement, scalar and vector quantities, vectors, motion in one dimension, projectiles, circular motion, laws of motion and their applications, work and energy, linear momentum, collisions, kinematics of rotational motion, center of mass, torque, angular momentum, applications of static and dynamic equilibrium.	
Course Name**: General Physics Lab. 1**	Course number: **0213103**	NO. of credit hours: **1**(**3** Experimental Hrs.)
Pre-requisite: **0213101 ****	Teaching language: **English**	Offered by: Basic Sciences Department
Course Description	This experimental course covers an introduction on measurements, accuracy and precision, collection and analysis of data, measurements and uncertainties, vectors: force table, kinematics of rectilinear motion, projectiles, newton's second law of motion with digital cart, force and displacement on a fixed pully, centripetal force/centrifugal force, coefficients kinetic and static friction, conservation of mechanical energy, conservation of momentum with digital-cart, simple pendulum, spring constant, moment of inertia of rigid object.	

Course Name**: General Chemistry 1**	Course number: **0213107**	NO. of credit hours: **3** Theoretical Hrs.
Pre-requisite: ***	Teaching language: **English**	Offered by: Basic Sciences Department
Course Description	The course covers chemistry and measurement, stoichiometry of atoms and molecules, stoichiometry of chemical reactions, properties of solutions, periodic table and electronic configurations of atoms and ions, molecular structure, chemical bonding, molecular shapes, gases, thermochemistry.	
Course Name**: General Chemistry Lab1**	Course number: **0213108**	NO. of credit hours: **1**(**3** Experimental Hrs.)
Pre-requisite: **0213107 ** **	Teaching language: **English**	Offered by: Basic Sciences Department
Course Description	This experimental course covers Lab. safety and basic Lab. techniques, formula of hydrate, empirical formula of a compound, limiting reactant, periodic chart and periodic law, spectroscopy and molecular geometry, properties of inorganic compounds and metathesis reactions, molecular weight of a volatile liquid, preparation of an alum, aspirin synthesis, standardization of NaOH solution and equivalent weight of an acid, bleach analysis.	
Course Name**: Calculus 1**	Course number: **0213105**	NO. of credit hours: **3** Theoretical Hrs.
Pre-requisite: *	Teaching language: **English**	Offered by: Basic Sciences Department
Course Description	The course covers functions and their properties, types of functions, equation of a straight line, curves of functions, average equations, limits and continuity, derivative, definition of the derivative, trigonometric functions, implicit differentiation, applications to derivatives, Rolle's theorem, mean value theorem, properties of integration, the first and second fundamental theorems, the fundamental theorem of calculus, applications to integration (area, volume, surface area, arc length).	
Course Name**: Calculus 2**	Course number: **0213106**	NO. of credit hours: **3** Theoretical Hrs.
Pre-requisite: **0213105**	Teaching language: **English**	Offered by: Basic Sciences Department
Course Description	The course covers exponential and logarithmic functions, Hyperbolic functions, Inverse functions, trigonometric and hyperbolic inverse functions, Integration techniques by parts, Trigonometric substations, fractions, integration of partial trigonometric functions, and improper integrals. Sequences test, series convergence test, ratio test, comparison test, root test conditional convergence, Maclaurin and Taylor series and their convergences, power series, differentiation and integration of power series.	
Course Name**: Principles of Statistics 1**	Course number: **0213115**	NO. of credit hours: **3** Theoretical Hrs.
Pre-requisite: **None**	Teaching language: **English**	Offered by: Basic Sciences Department
Course Description	The course covers data collection, survey, types of data, sampling techniques, data representations, measure of central location, measure of dispersion, probability, random variables and distribution, methods of counting, Independence, conditional probability, Bayes theorem, binomial distribution, normal distribution, expectations, Point estimation, interval estimation for mean, hypothesis testing for mean.	
Course Name**: Principles of Statistics Lab. 1**	Course number: **0213116**	NO. of credit hours: 1(**3** Experimental Hrs.)
Pre-requisite: **0213115****	Teaching language: **English**	Offered by: Basic Sciences Department
Course Description	This experimental course covers data representation by graphs and tables for ungrouped and grouped data, measures of central location (mean, median, and mode), measures of dispersion (range, variance, and standard deviation), probability distribution curves, binomial distribution, normal distribution, central limit theorem (CLT), Estimations of the confidence interval and hypothesis testing about the mean of one population, and correlation and regression. Statistical packages such as SPSS and Minitab are used for the above calculations.	

Course Name**: General Biology 1**	Course number: **0213109**	NO. of credit hours: **3** Theoretical Hrs.
Pre-requisite: **None**	Teaching language: **English**	Offered by: Basic Sciences Department
Course Description	This course cover chemical context of life, water and the fitness of the environment, carbon and the molecular diversity of life, the structure and function of large biological molecules, cell structure and function, membrane structure and function, introduction to metabolism, cellular respiration and fermentation, photosynthesis, the cell cycle, mitosis, meiosis and sexual life cycles, Mendel and the gene idea, and the chromosomal basis of inheritance.	
Cours Name: **Prerequisite Physics ***	Course number: **0213097**	NO. of credit hours: **0**(**3** Theoretical Hrs.)
Pre-requisite: **None**	Teaching language: **English**	Offered by: Basic Sciences Department
Course Description	The course covers measurement and system of units; Vectors; motion in one and two dimensions; Particle dynamics and Newton's laws of motion; Work and energy; Conservation of energy; Collisions, impulse; Conservation of linear momentum; Electric charge; Coulomb's law; Electric field; Gauss law; Electric potential: electric potential energy and electric potential of point charges; Current and resistance; Ohm's law; Kirchhoff's laws; Magnetic field: Magnetic force and concept of magnetic field.	
Cours Name: **Prerequisite Calculus ***	Course number: **0213098**	NO. of credit hours: **0**(**3** Theoretical Hrs.)
Pre-requisite: **None**	Teaching language: **English**	Offered by: Basic Sciences Department
Course Description	The course covers real numbers, Inequalities; Cartesian plane; Distance formula, Straight lines; Parabola; Graph of curves; Composition functions; Polynomials; Rational functions; Long division, Roots of polynomials; Exponents; Logarithms; Trigonometric functions, Limits, Continuity, Limits at infinity, Definition of derivative; Differentiation rules; Applications; chain rule; Implicit differentiation; Derivatives of logarithmic and trigonometric functions; Definite integration; Principles of integration; Fundamental theorem of calculus; Applications of integration; Area between two curves.	
Cours Name: **Prerequisite Chemistry ***	Course number: **0213099**	NO. of credit hours: **0**(**3** Theoretical Hrs.)
Pre-requisite: **None**	Teaching language: **English**	Offered by: Basic Sciences Department
Course Description	The course covers basic concepts in chemistry: The study of change; Mass relationships in chemical reactions, Gases, Physical periodic relationship among the elements; Chemical bonding; Physical properties of solutions; Acids, bases and their equilibria. The course emphasizes on developing the student's problem-solving skills by introducing examples on everyday examples whenever possible.	

* "High School Physics " or Prerequisite Physics 0213097.
** or concurrent
*** "High School Chemistry" or Prerequisite Chemistry 0213099.