Course Syllabus

According to JORDAN National Qualification Framework (JNQF)

Course Name: Computer Applications in Chemistry

Course Number: 11014161

General Course Information:

Course title	**Computer Applications in Chemistry**
Course number	11014161
Credit hours	**3 Credit hours**
Education type	**Face-to-Face**
Prerequisites/corequisites	**06051112**
Academic Program	**Bachelor**
Program code	**01**
Faculty	**Faculty of science**
Department	**Department of Chemistry**
Level of course	**Fourth- year students**
Academic year /semester	**First semester 2022/2023**
Awarded qualification	**BSc degree of chemistry**
Other department(s) involved in teaching the course	**None**
Language of instruction	**English**
Date of production/revision	**2022/2023**

Course Coordinator:

Coordinator's name	Ms. Dareen Hemedat
Office No	
Office Phone extension number	2635
Office Hours	
Email	dareenhmedat@yahoo.com

Other Instructors:

Instructor name	
Office No	
Office Phone extension number	
Office Hours	
Email	

Course Description *(English/Arabic)*:

English	Introduction to the importance of the use of computer in chemistry; using Microsoft word processor in writing scientific articles and mathematical equations in the field of chemistry; using Microsoft excel processor in various chemical calculations, statistical analysis, and graphing; Using special programs for writing chemical equations, drawing chemical compounds, finding spectra of chemical compounds, and design scientific experiments; search for data; using Microsoft PowerPoint processor to design presentations in different topics.
Arabic	مقدمة في اهمية استخدام الحاسوب في الكيمياء؛ استخدام Microsoft word processor في كتابة المقالات العلمية و المعادلات الرياضية في مجال الكيمياء؛ استخدام Microsoft excel processor في الحسابات الكيميائية المختلفة و التحليل الاحصائي و الرسم البياني؛ كتابة المعادلات الكيميائية و رسم المركبات الكيميائية و ايجاد الاطياف الحسابية لها و تصميم التجارب العلمية باستخدام برامج مختلفة مثل Chemdraw؛ البحث عن البيانات؛ استخدام Microsoft PowerPoint processor لتصميم عرض تقديمي في مواضيع مختلفة

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Textbook: *Author(s), Title, Publisher, Edition, Year, Book website.*

Lecture notes and Assignments

References: *Author(s), Title, Publisher, Edition, Year, Book website.*

Course Educational Objectives (CEOs):

1.	Improve students' skills in using word Microsoft in writing scientific texts and writing mathematical equations.
2.	Improve students' skills in using excel Microsoft in entering data , doing calculations and plotting different relationships in chemistry.
3.	Learning students the way of using Chemdraw office in writing chemical formula and chemical equation, drawing chemical structures and construct laboratory experiments equipment's.
4.	Improve students' skills in using PowerPoint Microsoft in preparing seminars.

Intended Learning Outcomes (ILO's):

1.		**Subject Intended learning outcomes (ILOs) describe what students are expected to know and be able to do at the end of the course. These outcomes are related to the knowledge, skill and competence that students acquire:**	**Relationship to CEOs**	**Contribution to PLOs**	**Bloom Taxonomy Levels***	**Descriptors****
2.	**A**	**Knowledge and Understanding:**				
3.	**A1**	**Student able to use Microsoft office (word ,excel and PowerPoint)to do their drawing chemical structures, writing chemical equations, scientific text and chemical formulas ,calculations and report sheets of different chemistry laboratories and prepare seminars and representations.**	**1,2,4**	**1,2**	**1,3**	**S,K**
4.	**A2**	**Students will master using Chemdraw program in drawing chemical structures, writing chemical equations and chemical formulas, construct Laboratory experiment apparatus in addition to find NMR spectra for different chemical compounds.**	**3**	**1,2**	**1,3**	**S,K**
5.	**B**	**Intellectual skills:**				
6.	**B1**	**Student able to employ computer skills and computer programs in their study of chemistry.**	**1,2,3,4**	**4**	**1,3**	**S,K**
7.	**C**	**Subject specific skills:**				

8. C1						
9. D	**Transferable skills:**					
10. D1						

*Bloom Taxonomy Levels

Level #	1	2	3	4	5	6
Level Name	Knowledge	Comprehension	Application	Analysis	Evaluation	Synthesis

** Descriptor (National Qualification Framework Descriptors): K : Knowledge, S: Skill, C: Competency.

Program Learning Outcome (PLOs):

Program Learning Outcomes describe what students are expected to know and be able to do by the time of graduation. These relate to the knowledge, skills, and behaviours that students acquire as they progress through the program. A graduate of the (Chemistry) program will demonstrate:	Descriptors**		
	K	S	C
1. An ability to acquire and apply new knowledge as required across different fields of chemistry, using appropriate learning strategies.	✔		
2. An ability to identify, formulate, and solve problems by applying principles and theories of chemistry, science and mathematics based on critical thinking.	✔		
3. An ability to develop and conduct appropriate experimentation, analyze, interpret data, and draw conclusions.			✔
4. An ability to apply scientific principles and theories of chemistry to serve community in health, economic and environmental sectors.		✔	
5. An ability to communicate effectively with a wide range of audiences			✔
6. An ability to recognize ethical and professional responsibilities in the field of chemistry, and make informed judgments that consider the impact of chemistry in global, economic, environmental and societal contexts.			✔
7. An ability to function effectively as a part of a team, take on leadership positions, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives		✔	

** Descriptors according to the national qualifications framework (K: knowledge, S: skill, C: Competency)

Weekly Schedule *(please choose the type of teaching)*

☐ **√** *(3 hrs Face – To - Face)*

☐ **Hybrid** *(2 Lectures Face – To - Face +1 Lecture Asynchronous)*

☐ **Hybrid (***1 Lectures* Face – To - Face *+1 Lecture* Asynchronous*)*

☐ **Online** *(2 Lectures Synchronous +1 lecture Asynchronous)*

Week	First Hour (face to face)	Second Hour (face to face)	Third Hour (face to face)	Ach. ILOs	Ach. PLOs	Descriptors*
1	**Microsoft word in Chemistry (Introduction)**	**Microsoft word in Chemistry**	**Applications on Microsoft Word**	A1,B1	1,2,4	s

		11. (Writing scientific text using Microsoft word)				
2	**Microsoft word in Chemistry (Learning how to write references and the citation process)**	**Microsoft word in Chemistry (Learning how to write references and the citation process)**	**Applications on Microsoft Word**	A1,B1	1,2,4	s
3	**Microsoft word in Chemistry (Insert table using Microsoft word and format it)**	**Microsoft word in Chemistry** 12. (Insert table using Microsoft word and format it))	**Applications on Microsoft Word**	A1,B1	1,2,4	s
4	**Microsoft word in Chemistry (Writing and insertion of chemical symbols)**	**Microsoft word in Chemistry** 13. (Writing mathematical equations using Microsoft word)	**Applications on Microsoft Word**	A1,B1	1,2,4	s
5	**Microsoft excels in Chemistry (Introduction)**	**Microsoft excels in Chemistry (Doing mathematical operations using functions in Microsoft excel)** 14.	**Applications on Microsoft excels**	A1,B1	1,2,4	s
6	**Microsoft excels in Chemistry (Doing mathematical operations using functions in Microsoft excel)**	**Microsoft excels in Chemistry** 15. (Doing mathematical operations using functions in	**Applications on Microsoft excels**	A1,B1	1,2,4	s

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		Microsoft excel)				
7	**Microsoft excels in Chemistry (Learning how to create plots with different styles using excel)**	**Microsoft excels in Chemistry (Learning how to create plots with different styles using excel)** 16.	**Applications on Microsoft excels**	A1,B1	1,2,4	s
8	**Microsoft excels in Chemistry (Learning how to create plots with different styles using excel)**	**Microsoft excels in Chemistry** 17. (Learning how to determine both Slope and intercept and correlation coefficient on the plot)	**Applications on Microsoft excels**	A1,B1	1,2,4	s
9	**Microsoft excels in Chemistry (Learning how to determine both Slope and intercept and correlation coefficient on the plot)**	18. Microsoft excels in Chemistry 19. (Learning how to determine both Slope and intercept and correlation coefficient on the plot)	**Applications of Microsoft excel in solving different chemistry problems.**	A1,B1	1,2,4	s
10	**Applications of Microsoft excel in solving different chemistry problems.**	20. Applications of Microsoft excel in solving different chemistry problems.	**Applications of Microsoft excel in solving different chemistry problems.**	A1,B1	1,2,4	s
11	**Chemdraw (Introduction)**	Chemdraw (Introduction)	**Applications of Chemdraw**	A2,B1	1,2,4	s
12	**Chemdraw (Drawing chemical structures)**	**Chemdraw (Drawing chemical structures)** 21.	**Applications of Chemdraw**	A2,B1	1,2,4	s

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13	**Chemdraw (Writing chemical equations)**	**Chemdraw** 22. (Drawing apparatus and construct chemical experiments)	**Applications of Chemdraw**	A2,B1	1,2,4	s
14	**Power point for presentation (Introduction)**	**Power point for presentation (Introduction)** 23.	**Applications of Power point**	A1,B1	1,2,4	s
15	**Applications of Power point**	**Applications of Power point** 24.	**Applications of Power point**	A1,B1	1,2,4	s
16	**Final exam**	25.				

* **K: Knowledge, S: Skills, C: Competency**

Teaching Methods and Assignments:

Development of ILOs is promoted through the following teaching and learning methods:
- **(3 hrs Face – To - Face)**
- **Practice Labs**
- **Discussion Forums**
- **Quizzes**
- **Other Interactive online activities**
- **Reports**

Course Policies:

A- Attendance policies:

    The maximum allowed absences is 15% of the lectures.

B- Absences from exams and handing in assignments on time:

    Midterm exam can be retaken based on approval of excuse by the instructor's discretion.

    Not handing assignment on time will incur penalties.

C- Academic Health and safety procedures

D- Honesty policy regarding cheating, plagiarism, and misbehaviour:

    Cheating, plagiarism, misbehaviour will result in zero grade and further disciplinary actions may be taken.

E- Grading policy:

- All homework is to be posted online through the e-learning system.
- Exams will be marked within 72 hours and the marked exam papers will be handed to the students.
- Online Activities (Course Videos, Practice labs, Discussion Forums, Quizzes) **20%**
- Midterm **30 %**
- Final Exam **50 %**

F- Available university services that support achievement in the course: **E-Learning Platform, Labs, Library.**

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Required equipment:

- **PC / Laptop with webcam and mic**
- **Internet Connection**
- **Access to the IU E-Learning Platform at: https://elearn.iu.edu.jo/**
- **E-learning plan**
- Satisfaction questionnaires for online and face-to-face learning
- Software for e-learning
- Training

Assessment Tools implemented in the course:

- Final Exam
- Midterm Exam
- Quizzes
- Homework
- Practice Labs
- Discussion Forums
- Periodic reports for learning assessment
- Improvement plans for online or face-to-face teaching

Responsible Persons and their Signatures:

Course Coordinator	M.Sc. Dareen Hmedat	Completed Date	16/ 10 / 2022
		Signature	Dareen Hmedat

Received by (Department Head)	Dr. Manal Al Khabas	Received Date	17/10/2022
		Signature	

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