

University of Petra

Faculty of Arts & Sciences
Department of Chemistry



كلية الآداب والعلوم
قسم الكيمياء

Course Syllabus

Year : 2019/2020

Semester : First

Course No.	Course Title	Prerequisite	Co-requisite	Credit Hours Lectures / ECTS: European Credit Transfer System
101456	Computer Applications in Chemistry (1)	Chem 322	None	3/5

Instructor Name	e-mail	Office No.	Office ext.	Office Hours
Prof.Rami Abdel-Rahem	rabdelrahem@uop.edu.jo	7115	6500	Sun, Tue, Thu: 9-10 Mon, Wed:11-12

Coordinator's Name: (if applicable)	
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Course Description	An overview, formation of course E-mail, Scientific Search, Typing mathematical equations, drawing the structural of chemical compounds (one and three dimension), presenting a chemical reaction by MS-power point Program, applications of some softwares in chemistry (ISIS, chemdraw, Origin & H-NMR programs)
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Course Objectives

- To search and access chemical information in internet and literature survey in chemistry data bases.
- To provide students of chemistry with computer skills associated with data processing (collection, computation, analysis, plotting).
- To inspire in students a sense of interest for computer applications in chemistry, an appreciation of its application in different contexts and to involve them in an intellectually stimulating and satisfying experience of learning and studying.
- To develop in students the ability to apply their software knowledge and skills to the solution of theoretical and practical problems in chemistry.
- To provide students with a knowledge and skills base from which they can proceed to further studies in specialized areas of chemistry or multi-disciplinary areas involving chemistry.

Course Intended Learning Outcomes (ILOs) and their Alignment with Program ILOs, Teaching and Learning Methods, and Assessment Methods:

Upon successful completion of this course, students are expected to achieve the following learning outcomes:

Course ILOs	Program ILOs	Teaching and Learning Method	Assessment Method
Knowledge (K)			
1. Review of commands used in specific scientific search inside the local area network, on-line journals and literature search, as well as through different scientific databases.	P(5)	White board, computer facility, discussions.	Exams, Quizzes Reports
Intellectual Skills (I)			
2. Apply software programs to find out physical properties and NMR spectra of organic chemical compounds.	I(2)	White board, computer facility, discussions.	Exams, Quizzes Reports
3. Data processing using Origin software: find best fitting of different behaviours with special focus on applications to chemical problems.	I(2)	White board, computer facility, discussions.	Exams, Quizzes Reports
4. Perform excellent scientific search that lead to specific results.			Exams, Quizzes Reports
Transferable Skills (T)			
5. Drawing programs (MS-paint, isis draw), Microsoft office; MS-word (typing, Microsoft equation 3.0, and tables), MS-power point (slide show, animation, of chemical reactions and other different applications in chemistry)	T(2)	White board, computer facility, discussions.	Exams, Quizzes Reports
Practical Skills (P)			
This skill is already achieved through ILOs (1-3)			

Course Schedule:

Week	Topic Details	Course ILO number	Reference
1	Formation of an E-mail by each student special for this course.	T(1)	Handouts and lecture notes
2	Google search, and scientific search (searching for a scientific article using internet explorer) and chemistry data bases.	K(1), T(1)	Referances 1-2
3	Typing mathematical equations by using Microsoft equation 3.0 inside MS-word program.	K(1), T(1)	Handouts and lecture notes
4	Drawing the chemical structure of chemical compounds	K(1), T(1)	Handouts, lecture notes & program CD
5	Drawing the chemical structure of chemical compounds	K(1), T(1)	Handouts, lecture notes & program CD
6	Using MS-power point Program to build a slide to show "step by step" a chemical reaction	K(1), T(1)	Handouts and lecture notes
7	Practical Midterm Exam	K(1), T(1)	
8	Data import, manipulation, plotting, linear fitting,	K(1), I(1),I(2), I(3), T(1)	Handouts, lecture notes & program CD
9	Nonlinear fitting and Multilayer graphs	K(1), I(1),I(2), I(3), T(1)	Handouts, lecture notes & program CD
10	Some Applications in Chemistry.	K(1), I(1),I(2), I(3), T(1)	Handouts, lecture notes & program CD
11	Using Chemdraw program to name and draw chemical compounds in two and three dimensions.	K(1), I(1),I(2), I(3), T(1)	Handouts, lecture notes & program CD
12	Predicting the H-NMR of chemical compounds.	K(1), I(1),I(2), I(3), T(1)	Handouts, lecture notes & program CD
13	Predicting the H-NMR of chemical compounds.	K(1), I(1),I(2), I(3), T(1)	Handouts, lecture notes & program CD
14	All through	K(1), I(1),I(2), I(3), T(1)	Handouts, lecture notes & program CD
15	All through	K(1), I(1),I(2), I(3), T(1)	Handouts, lecture notes & program CD
16	Practical Final Exam	K(1), I(1),I(2), I(3), T(1)	Handouts, lecture notes & program CD

Assessment Methods:

Assessment method	Grade	Comments
Midterm Exam	30	
Reports	20	
Homework and Quizes	10	
Final Exam	40	
Total	100	

Learning References:

1- Textbook (s):
Handouts, lecture notes, Internet & program CD
2- References:
1. The complete Idiot's Guide to the internet, Que Corporation, 1997. 2. Internet skills in Scientific Research, Musa Al-Akhras, Emman Al-Momani, Zamzam, 2011.
3- Other Resources:
<<Labs, computer resources, lecture rooms needed for the course>>
Computer lab and Origin, Chemdraw, ISIS, HNMR programs.

Course Policies¹

- Attendance Policy: University regulations apply to attendance.
- Academic Honesty: Academic dishonesty is an unacceptable mode of conduct, and will not be tolerated in any form at University of Petra. All persons involved in academic dishonesty and plagiarism in any form will be disciplined in accordance with University rules and regulations.

Approved by	Name	Date	Signature
Head of Department	Dr. Abdelmnim Altwaiq	14/10/2019	
Faculty Dean	Prof. Rami Abdel-Rahem	15/10/2019	

**Controlled
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¹ Additional information may be added in this section according to the nature of the course.