Course Specification
(Bachelor)

Course Title:	Computer Applications in Chemical Laboratories
Course Code:	CHM 1153
Program:	Bachelor of Science in Chemical Laboratories
Department:	Chemistry
College:	Science
Institution:	Imam Mohammed Ibn Saud Islamic University
Version:	2024- 1
Last Revision Date:	15 September 2024

Table of Contents

A. General information about the course: 3

B. Course Learning Outcomes (CLOs), Teaching Strategies and Assessment Methods 4

C. Course Content 6

D. Students Assessment Activities 6

E. Learning Resources and Facilities 6

F. Assessment of Course Quality 7

G. Specification Approval 8

A. General information about the course:

-1. Course Identification

1. Credit hours: 2 (0, 0, 4)					
2 (0 Lectures, 0 Tutorials, 4 Lab)					
2. Course type					
A.	☐University	☐College	☒ Department	☐Track	☐Others
B.	☒ Required		☐Elective		
3. Level/year at which this course is offered: Level 2/ Second year					
4. Course general Description:					
The course covers all required knowledge and information for appropriate software that will be used in labs and courses. It will provide sufficient information and application to perform searches, use software associated with lab instruments, and write reports and data.					
5. Pre-requirements for this course (if any)**:**					
General Chemistry 1 - CHM 1101					
6. Co-requisites for this course (if any)**:**					
None					
7. Course Main Objective(s):					

At the end of this course the student will be able to:

- **Analyze the various chemical databases**
- **Use the computer software such as Excel to present his data graphically and obtain constants**
- **Utilize the computational tools to solve the chemical problems**
- **Apply various associated software with spectroscopic lab instruments**
- **Apply various computational methods to solve chemical problems**

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	**60**	**100%**
2	E-learning	**0**	**0**
3	Hybrid • Traditional classroom • E-learning	**0**	**0**
4	Distance learning	**0**	**0**

3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	**Lectures**	**0**
2.	**Laboratory/Studio**	**60**
3.	**Field**	**0**
4.	**Tutorial**	**0**
5.	**Others (specify)**	**0**
Total		60

B. Course Learning Outcomes (CLOs), Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Code of PLOs aligned with program	Teaching Strategies	Assessment Methods
1.0	**Knowledge and understanding**			
1.1	**To identify the importance of software chemistry**	**K1; K2; K4**	• Four hours weekly, containing laboratory activities and oral discussions. • A Private study, including work on writing a report.	**Direct:** • Laboratory Reports. • Oral Discussion marks • Participation.
1.2	**To list of applications of software chemistry**	**K1; K2; K4**	• Four hours weekly containing laboratory activities with group discussion. Think and discuss the Required Software chemistry	**Direct:** • Lab. Reports. • Oral Discussions.
1.3	**To recognize scientific journals and database.**	**K1; K2; K4**	• Four hours are weekly containing Laboratory activities with group discussion. • Think and write about the chemical equation by	**Direct:** • Laboratory Reports • Oral Discussions.

Code	Course Learning Outcomes	Code of PLOs aligned with program	Teaching Strategies	Assessment Methods
			appropriate software	
2.0	**Skills**			
2.1	**To illustrate a simple mechanism using appropriate software program**	**S1; S2**	• Laboratory activities Think and write about the chemical equation by appropriate software	**Direct:** • Questions in labs. • Participation through Laboratories Oral Discussion,
2.2	**To compare between the software programs**	**S1; S2**	Encourage students to communicate their logic chemical thinking, and to work and discuss cooperatively with their peers to develop individual skills.	**Direct:** • Questions in labs. • Participation through Laboratories Oral discussion
2.3	**To use Computer, software in, Perform Calculations, and chemical drawing.**	**S4**	Encourage the students to use the Chemicals Glass wares and Instruments with caring and safety	**Direct:** • Oral Discussion. • Discussion marks Giving marks for participation in the lab.
3.0	**Values, autonomy, and responsibility**			
3.1	**To show self-confidence attitudes through single and team work practical sessions, presentations, and discussions.**	**V1, V2**	• labs and Group discussion • Have the ability to ask and answer questions as they arise • Brain storming Exercises	**Direct:** • Questions in labs. • Participation through Laboratories • Oral discussion.

C. Course Content

No	List of Topics	Contact Hours
1.	Introduction to computer: Introduction and Fundamentals of Computer, MS office and applications, basic commands, handling Cookies.	10
2.	Chemistry software's: Introduction to chemoffice, Chemsketch tools to draw chemical structures. Convert chemical name to structure and vice versa, Chemical data bases like CAS, Pubmed,	20
3	Microsoft Excel, Elementary structural features such as bond lengths, bond angles, dihedral angles etc., of molecules.	15
4	Bibliographic Databases using Endnote, Mendeley, Chemical Abstracts, Journals, Conferences, Reports, Patents, Softwares associated with spectroscopic instruments, origin, sigmaplot.	15
Total		60

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Midterm 1	6th/ 7th week	20 %
2.	Midterm 2	11th/ 12th week	20 %
3.	Quizzes, Home Works, class participation, and mini projects	During the semester	20 %
5.	Final Exam	16thweek	40 %
6.	Total	All weeks	100 %

*Assessment Activities (i.e., Written test, oral test, oral presentation, group project, essay, etc.).

E. Learning Resources and Facilities

1. References and Learning Resources

Essential References	Peter C. Jurs, , **Computer Software Applications in Chemistry**, 2nd Edition. ISBN: 978-0-471-10587-9
Supportive References	Blackboard

Electronic Materials	
Other Learning Materials	

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	**Each Laboratory should be equipped with maximum 20 seats**
Technology equipment (projector, smart board, software)	**The rooms are equipped with data show, Smart Board, WI-FI access.**
Other equipment (depending on the nature of the specialty)	**Software: Chem Draw, office (Words, Excel), ACD labs Computers**

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	**Students**	**Direct:** Questionnaire.
	Course Responsible	**Direct:** Course e-Portfolio. **Indirect:** Second examiner checklist-Course report.
	Peer Reviewer	**Direct:** Questionnaire. **Indirect:** External assessor report.
Effectiveness of Students assessment	**Program Leaders**	**Direct:** Course e-Portfolio. **Indirect:** Course report.
Quality of learning resources	**Students**	**Indirect:** Second examiner checklist-Course report.
	Faculty (Academic Advisory)	**Direct:** course Entrance/Exit. **Indirect:** Observations - Accreditation review.
	Program Leaders	**Direct:** Course e-Portfolio. **Indirect:** Course evaluation survey- Observations- Syllabus review- Accreditation review.
The extent to which CLOs have been achieved		
Other		

Assessors (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify)

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	COUNCIL OF DEPARTMENT OF CHEMISTRY
REFERENCE NO.	3 (NO. 1/3)
DATE	5/3/1446- 8/09/2024