



Course Specifications

Course Title:	Selected Topics in Organic Chemistry
Course Code:	613CHEM-2
Program:	Master of Science in Chemistry
Department:	Chemistry
College:	College of Science
Institution:	King Khalid University

Table of Contents

A. Course Identification	3	
6. Mode of Instruction (mark all that apply)		3
B. Course Objectives and Learning Outcomes	4	
1. Course Description		4
2. Course Main Objective		4
3. Course Learning Outcomes		5
C. Course Content	5	
D. Teaching and Assessment	6	
1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods		6
2. Assessment Tasks for Students		7
E. Student Academic Counseling and Support	7	
F. Learning Resources and Facilities	7	
1. Learning Resources		7
2. Facilities Required		8
G. Course Quality Evaluation	8	
H. Specification Approval Data	8	



A. Course Identification

1. Credit hours:	2
2. Course type	
a.	University <input type="checkbox"/> College <input type="checkbox"/> Department <input checked="" type="checkbox"/> Others <input type="checkbox"/>
b.	Required <input checked="" type="checkbox"/> Elective <input type="checkbox"/>
3. Level/year at which this course is offered:	Level 3/ Year 2
4. Pre-requisites for this course (if any):	No pre-requisite
5. Co-requisites for this course (if any):	No prerequisite

6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	2	100%
2	Blended	0	0%
3	E-learning	0	0%
4	Correspondence	0	0%
5	Other	0	0%

7. Actual Learning Hours (based on academic semester)

No	Activity	Learning Hours
Contact Hours		
1	Lecture	30
2	Laboratory/Studio	0
3	Tutorial	0
4	Others (specify)	0
	Total	30
Other Learning Hours*		
1	Study	50
2	Assignments	20
3	Library	20
4	Projects/Research Essays/Theses	10
5	Others(specify) Present a communication and poster	0
	Total	100

*The length of time that a learner takes to complete learning activities that lead to achievement of course learning outcomes, such as study time, homework assignments, projects, preparing presentations, library times

B. Course Objectives and Learning Outcomes

1. Course Description

This course describes the basic techniques of elucidation of new bioactive natural products: The course explains how to interpret the results by analyzing 1D (1H and 13C) and 2D (HSQC, HMBC, COSY, HMBC and NOESY) NMR spectra of completely unknown compounds.

Also The main ionisation methods (EI, CI, FAB, ES, MALDI) and their specificity were involved.



2. Course Main Objective

The main aim of this course is to demonstrate how to determine the structure of new natural products and to give advanced ideas on physical and spectroscopic methods to determine the molecular structures of organic compounds. The course aims to Provide students with advanced skills to attribute spectral data: 1D and 2D NMR, mass spectra and to solve problems concerning the determination of chemical structures of new natural products.

3. Course Learning Outcomes

CLOs		Aligned PLOs
1	Knowledge:	
1.1	To outline different techniques of elucidation of organic compound.	K1 and K2
1.2	To describe how to elucidate the structure of an unknown organic compound.	K2 and K3
2	Skills :	
2.1	To use the main methods of structural elucidation of an organic compound	S4
2.2	To interpret the results by analyzing the 1D (¹ H and ¹³ C) and 2D (HSQC, HMQC, COSY, HMBC and NOESY) NMR spectra of completely unknown compounds.	S4
3	Competence:	
3.1	To present an oral explanation for a subject in the area.	C2, C3 and C4
3.2	To interact positively with colleagues in a group work	C2, C3 and C4
3.3	To contribute with colleagues to prepare and deliver a presentation and report of group work	C1
3.4	To conclude the literature and sources for an area in the course	C4

C. Course Content

No	List of Topics	Contact Hours
1	Elucidation techniques of the structure of synthetic organic compounds and new natural products. Section1: Reminder about the General principles of 1D NMR (¹ H and ¹³ C).	4
2	Elucidation techniques of the structure of synthetic organic compounds and new natural products. Section2: Reminder about the General principles of 2D NMR (HSQC, HMQC, COSY, HMBC an NOESY).	8
3	Elucidation techniques of the structure of synthetic organic compounds and new natural products. Section3:General principles of Mass spectrometry: The main ionisation methods and their specificity (Practical examples)	4



4	Section4: Structural study of unknown natural products (Practical examples)	10
5	Exams	4
Total		30

D. Teaching and Assessment

1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
1.0	Knowledge		
1.1	To outline different techniques of elucidation of organic compound.	Lectures, Interactive teaching sessions	Written exams, electronic quizzes
1.2	To describe how to elucidate the structure of an unknown organic compound.	Tutorials, problem solving sessions	1. Written exams, electronic quizzes 2. Oral discussion and examinations
2.0	Skills		
2.1	To use the main methods of structural elucidation of an organic compound	Lectures, problem solving sessions	Written and oral exams
2.2	To interpret the results by analyzing the 1D (1H and 13C) and 2D (HSQC, HMQC, COSY, HMBC and NOESY) NMR spectra of completely unknown compounds.	Tutorials, problem solving sessions	Oral discussion, written examinations.
3.0	Competence		
3.1	To present an oral explanation for a subject in the area.	Open essays on selected topics	Class activities
3.2	To interact positively with colleagues in a group work	Interactive teaching sessions	Oral presentation
3.3	To contribute with colleagues to prepare and deliver a presentation and report of group work	Interactive teaching sessions	Discussion within a group
3.4	To conclude the literature and sources for an area in the course	Guided reading of books and articles	Written Reports and summaries

2. Assessment Tasks for Students

#	*Assessment task	Week Due	Percentage of Total Assessment Score
1	Homework 1, Quiz -1	4 th	5
2	Presentation	5 th	5

3	Homework 2, Quiz -2	9 th	5
4	Mid-1	6 th	15
5	Mid-2	10 th	15
6	Oral discussion	12 th	5
7	Final exam	16 th	50

*Assessment task (i.e., written test, oral test, oral presentation, group project, essay, etc.)

E. Student Academic Counseling and Support

Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice:

10 office hours are offered for students for individual consultations. Communications are available on-site, phone conversations, and chatting by social media.

F. Learning Resources and Facilities

1. Learning Resources

Required Textbooks	<ol style="list-style-type: none"> J. Mohan, Organic Spectroscopy: Principles and Applications, 2nd ed., CRC Press, 2003. H. Friebolin Basic One- and Two-Dimensional NMR Spectroscopy, 5th ed., Horst Friebolin, 2010. Neil E. Jacobsen, NMR Spectroscopy Explained: Simplified Theory, Applications and Examples for Organic Chemistry and Structural Biology, 1st ed., 2007.
Essential References Materials	Progress in Nuclear Magnetic Resonance Spectroscopy (An International Review Journal)
Electronic Materials	Saudi Digital Library www.organic-chemistry.org/books/navi/naturalproducts.shtm
Other Learning Materials	

2. Facilities Required

Item	Resources
Accommodation Classrooms, laboratories, demonstration) (rooms/labs, etc)	Classroom and computer lab
Technology Resources (.AV, data show, Smart Board, software, etc)	Accessible databases and internet, ChemDraw software
Other Resources Specify, e.g. if specific laboratory equipment is required, list requirements or (attach a list	NA

G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
-------------------------	------------	--------------------



Course delivering	Student	Questionnaire
Course contents (update)	Plan and curriculum committee	Report
Teaching materials	Faculty	Meeting
Learning materials	Student	Discussion
Assignment	Program instructor and Faculty	Report
Exams	Program instructor and Faculty	Report

Evaluation areas (e.g., Effectiveness of teaching and assessment, Extent of achievement of course learning outcomes, Quality of learning resources, etc.)

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

Assessment Methods (Direct, Indirect)

H. Specification Approval Data

Council / Committee	Chemistry Department Council
Reference No.	Session number 22
Date	27/04/2021M / 15/09/1442H

