



Course Specifications

Course Title:	Chemistry of Natural Products
Course Code:	4024571-2
Program:	Chemistry
Department:	Chemistry
College:	Applied Science
Institution:	Umm Al-Qura University

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A. Course Identification

1. Credit hours: 2 hours
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: 7 th level / 4 rd year
4. Pre-requisites for this course (if any): Organic reactions and Preparations
5. Co-requisites for this course (if any): not applicable

6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	√	73%
2	Blended	-	-
3	E-learning	√	27%
4	Distance learning	-	-
5	Other	-	-

7. Contact Hours (based on academic semester)

No	Activity	Contact Hours
1	Lecture	22
2	Laboratory/Studio	-
3	Tutorial	-
4	Others (E-learning + Exams + office hours)	10
	Total	32

B. Course Objectives and Learning Outcomes

1. Course Description Study of classification, nomenclature, methods of preparation, properties, reactions and elucidation of the structure of different natural products
2. Course Main Objective By the end of this course the student will be familiar with chemistry related to the different classes of natural products including elucidation of their structure and synthesis

3. Course Learning Outcomes

CLOs		Aligned PLOs
1	Knowledge and understanding	
1.1	Name and identify of different classes of natural products	K2
1.2	Describe the theoretical basis of the elucidation of different classes of natural products	K1
1.3	Outline the general properties of different natural products and techniques	K2

CLOs		Aligned PLOs
	used to confirm their structure	
1.4	Discuss the importance and uses of natural products and their applications in our life	K3
2	Skills:	
2.1	Discover the type of the natural products from their structure	S1
2.2	Explain the different strategies for structural elucidation of different natural products	S2
2.3	Apply the spectroscopic concepts applied for structural elucidation of different natural products	S1
2.4	Summarize the different chemical methods to synthesis the different natural products	S1
2.5	Use computers and internet to find all information related to natural products and their applications	S5
2.6	Communicate effectively using theoretical basis of structural elucidation of the natural products to a variety of audiences	S4
3	Values:	
3.1	Write and present a chemical report related to aliphatic chemistry.	V2
3.2	work individually and in a team to perform a specific experiment or preparing a report on the natural products chemistry	V3
3.3	Demonstrate commitment to professional and academic values and ethics	V1

C. Course Content

No	List of Topics	Contact Hours
1	Introduction to natural product chemistry: Definition, classification, nomenclature and general methods of Identification of natural products	4
2	Terpenoids: Introduction and isolation from plants – general structure and nomenclature – classification – general methods of determination of the molecular structures and their preparations.	6+4E
3	Steroids: Introduction and their natural abundance – the difference between steroid compounds – nomenclature – structure elucidation of steroids – methods of preparation of steroids.	4+2E
4	Alkaloids: Introduction and methods of extractions – general properties – classification of alkaloids, structure elucidation of alkaloids and methods of their preparation.	8+2E
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 and understanding		
1.1	Name and identify of different classes of natural products	Lectures	Exams
1.2	Describe the theoretical basis of the elucidation of different classes of natural products	Lectures	Exams
1.3	Outline the general properties of different natural products and techniques used to confirm their structure	Lectures	Exams
1.4	Discuss the importance and uses of natural products and their applications in our life	Lectures Library visits	Exams
2.0	Skills		
2.1	Discover the type of the natural products from their structure	Lectures	Quiz.
2.2	Explain the different strategies for structural elucidation of different natural products	Lectures	Final and mid-term exam.
2.3	Apply the spectroscopic concepts applied for structural elucidation of different natural products	Lectures	Quiz.
2.4	Summarize the different chemical methods to synthesis the different natural products	Lectures E-Learning	Final and mid-term exam. Assignments and activities on blackboard
2.5	Use computers and internet to find all information related to natural products and their applications	Lectures Web based study.	Quiz. Final and mid-term exam. Assignments and activities
2.6	Communicate effectively using theoretical basis of structural elucidation of the natural products to a variety of audiences	Scientific discussion Self-Directed private Study	Assignments and activities
3.0	Values		
3.1	Write and present a chemical report related to aliphatic chemistry.	Library visits	Individual and group presentations
3.2	work individually and in a team to perform a specific experiment or preparing a report on the aliphatic chemistry	Scientific discussion	Web-based student performance systems
3.3	Demonstrate commitment to professional and academic values and ethics	Scientific discussion	Individual and group presentations

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Assignments and activities	All weeks	10%
2	E-Learning	All weeks	10%
3	Mid-term Exam	6	30%
4	Final Exam. (2 hours exam)	12	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:

- A faculty member was assigned to provide counseling and advice (about 20-25 student/ one faculty member).
- Office hours of the instructor: during the working hours weekly.

F. Learning Resources and Facilities

1. Learning Resources

Required Textbooks	<ul style="list-style-type: none"> • Raymond Cooper, George Nicola" Natural Products Chemistry : Sources, Separations and Structures, 1stEdition" 2014, CRC Press. • Rensheng Xu, Yang Ye, Weimin Zhao" Introduction to Natural Products Chemistry, 1stEdition" 2011, CRC Press • Sujata V. Bhat, B.A. Nagasampagi, Meenakshi Sivakumar "Chemistry of natural products, 1stEdition" 2005, Springer.
Essential References Materials	<ul style="list-style-type: none"> • P.M. Dewick "Medicinal Natural Products: A Biosynthetic Approach", 2nd Edition, Wiley & Sons, 2002 and 3rd Edition, Wiley & Sons, 2009. • J. R. Hans Editor E. W. Abel "Natural Products : The Secondary Metabolites" Copyright: 2003.Print ISBN: 978-0- 85404-490-0 • T. W. Graham Solomons, Craig B. Fryhle, Scott A. Snyder "Organic Chemistry, 11th Edition, International Student Version" (2013), John Wiley & Sons.
Electronic Materials	<ul style="list-style-type: none"> • http://www.chemweb.com • http://www.sciencedirect.com • http://www.rsc.org
Other Learning Materials	Computer-based programs/CD, professional standards or regulations and software.

2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	Classroom with capacity of (30) students. A laboratory with capacity of (15) students Including all practical facilities

Item	Resources
Technology Resources (AV, data show, Smart Board, software, etc.)	Teaching halls and laboratories are equipped with data show.
Other Resources (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	<ul style="list-style-type: none"> No other requirements.

G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Effectiveness of teaching and assessment	Program leader, curriculum committee; external reviewers	Direct
Extent of achievement of CLO's	Peer Reviewer	Direct
Quality of learning resources	Students, faculty members and External reviewers	Direct

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	Quality committee and department counsel
Reference No.	
Date	2022

Head of Chemistry Department


Dr Moataz Morad

