

Kingdom of Saudi Arabia

The National Commission for

Academic Accreditation & Assessment



Course Specifications

Chemistry of Natural Products 402335

Course Specifications

Institution: Umm Al-Qura University	Date of Report: 2015
College/Department : Faculty of Applied Science/ department of chemistry	

A. Course Identification and General Information

1. Course title and code: Chemistry of Natural Products/ 402335			
2. Credit hours: 2 (2+0)			
3. Program(s) in which the course is offered. Chemistry program			
4. Name of faculty member responsible for the course: Doctor Nizar El Guesmi			
5. Level/year at which this course is offered: 6th level / 3rd year			
6. Pre-requisites for this course (if any): Chemistry of Heterocyclic Compounds/ 402333			
7. Co-requisites for this course (if any)---			
8. Location if not on main campus: both on El-Abedyah, and El-Zaher			
9. Mode of Instruction (mark all that apply)			
a. Traditional classroom	☐	What percentage?	☐
b. Blended (traditional and online)	☒	What percentage?	100%
c. e-learning	☐	What percentage?	☐
d. Correspondence	☐	What percentage?	☐
f. Other	☐	What percentage?	☐
Comments:			

2

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B Objectives

1. What is the main purpose for this course?

By the end of this course student will be familiar with nomenclature, structure elucidation, general properties and methods of preparation of natural products

2. Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field)

The students will be mentioned to prepare an essay or a report from literature using the library, data base services, and/or websites to follow up and update the new topics of the subject of the course

C. Course Description (Note: General description in the form to be used for the Bulletin or handbook should be attached)

1. Topics to be Covered		
List of Topics	No. of Weeks	Contact Hours
a. Definition, classification, nomenclature and Identification of natural products: Terpenoids – Steroids – Alkaloids – Carotenoids – Anthocyanins – Vitamins.	2	4
b. Terpenoids : Introduction and isolation from plants – general structure and nomenclature – classification – general methods of determination of the structure and preparations.	3	6
c. Steroids : Introduction and their natural abundance – the difference between steroid compounds – nomenclature – structure elucidation of steroids (sterols – cholesterol – Ergosterol – bile acids – Oestrogens – androgens – Testosterone – and Progesterone) – methods of preparation of steroids.	2	4
d. Alkaloids : Introduction and methods of extractions – general properties – classification of alkaloids (adrenaline – Ephedrine – papaverine – morphine – heroin – tropane – atropine – cocaine) – structure elucidation of alkaloids and methods of preparation.	2	4
e. Carotenoids : Introduction and types – methods of isolation and preparation.	1	2
f. Anthocyanins : general properties – methods of isolation and preparation.	1	2
g. Vitamins : Introduction and importance – classification – Examples of some vitamins and their structures and its methods of preparation.	1	2

Practical Part:

NOT APPLICABLE

2. Course components (total contact hours and credits per semester):						
	Lecture	Tutorial	Laboratory	Practical	Other:	Total
Contact Hours	24	-	-	-	-	24
Credit	2	-	-	-	-	2

3. Additional private study/learning hours expected for students per week.	~ 4 Hours
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4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy
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	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
1.0	Knowledge		
1.1	Recognize the natural abundance of natural products	• Lectures • Scientific discussion • Library visits • Web-based study	• Exams • web-based student performance systems • portfolios • long and short essays • posters lab manuals
1.2	Name different natural products classes		
1.3	Know the methods of isolation from plants of natural products		
1.4	Describe the different methods of extraction of the natural products		
1.5	Familiar with the general properties of different natural products and their relation with the structure		
1.6	Select the proper method of elucidation of structure of an natural products		
1.7	Identify the natural products		
1.8	Write a mechanism for a natural product transformation		
1.9	Recognize the importance of natural products and their impact on the human body		
1.10	Memorize different name natural products with general structure		
1.11	Outline the different uses of natural products		
2.0	Cognitive Skills		
2.1	Compare each class of natural products through its structure	• Lectures • Scientific discussion • Library	• Exams • web-based student performance
2.2	Explain the different strategies for preparation of natural products		
2.3	Analyze the reasons for the unique properties in some		

	natural products	visits • Web-based study	systems • portfolios • posters • demonstrations
2.4	Predict the benefits and harms of various natural products		
2.5	Summarize the different methods for the preparation of various natural products		
3.0	Interpersonal Skills & Responsibility		
3.1	Use the adequate method of isolation from plants of natural products	• Lectures • Scientific discussion • Web-based study	• Exams • web-based student performance systems
3.2	Choose the natural product class for a given structure		
4.0	Communication, Information Technology, Numerical		
4.1	Evaluate the different methods of preparation of natural products	• Lectures • Scientific discussion • Library visits • Web-based study	• web-based student performance systems • individual and group presentations
4.2	Demonstrate a synthetic pathways for synthesis of natural products		
5.0	Psychomotor		
5.1	NOT APPLICABLE		
5.2			

5. Schedule of Assessment Tasks for Students During the Semester			
	Assessment task (e.g. essay, test, group project, examination, speech, oral presentation, etc.)	Week Due	Proportion of Total Assessment
1	First regular Exam	6	20%
2	Second regular Exam	12	20%
3	Assignments		10
4	Final Exam	16	50%

D. Student Academic Counseling and Support

1. Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week)

- We have faculty members to provide counseling and advice.
- Office hours: During the working hours weekly.
- Academic Advising for students.

E. Learning Resources

1. List Required Textbooks

- John McMurry's "Organic Chemistry, 8th edition, International Edition" 2011, Brooks/Cole
- John A. Joule, Keith Mills "Heterocyclic Chemistry, 5th Edition" 2010, Wiley-Blackwell
- John A. Joule, Keith Mills "Heterocyclic Chemistry at a Glance, 2nd Edition" 2012, Wiley-Blackwell

2. List Essential References Materials (Journals, Reports, etc.)

3. List Recommended Textbooks and Reference Material (Journals, Reports, etc)

- Sujata V. Bhat, B.A. Nagasampagi, Meenakshi Sivakumar "Chemistry of natural products , 1stEdition" 2005, Springer
- 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

4. List Electronic Materials (eg. Web Sites, Social Media, Blackboard, etc.)

- <http://www.chemweb.com>
- <http://www.sciencedirect.com>
- <http://www.rsc.org>

5. Other learning material such as computer-based programs/CD, professional standards or regulations and software.

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (i.e. number of seats in classrooms and laboratories, extent of computer access etc.)

1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)

- **Classrooms capacity (30) students.**
- **Providing hall of teaching aids including computers and projector.**

2. Computing resources (AV, data show, Smart Board, software, etc.)

- **Room equipped with computer and projector and TV.**

3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list)

- **No other requirements.**

G Course Evaluation and Improvement Processes

1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching
Complete the questionnaire evaluation of the course in particular.

2 Other Strategies for Evaluation of Teaching by the Program/Department Instructor

- **Observations and the assistance of colleagues.**
- **Independent evaluation for extent to achieve students the standards.**
- **Independent advice of the duties and tasks.**

3 Processes for Improvement of Teaching

- **Workshops for teaching methods.**
- **Continuous training of member staff.**
- **Review of strategies proposed.**
- **Providing new tools for learning.**
- **The application of e-learning.**
- **Exchange of experiences internal and external.**

4. Processes for Verifying Standards of Student Achievement (e.g. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution)

- **Check marking of a sample of exam papers, or student work.**
- **Exchange corrected sample of assignments or exam basis with another staff member for the same course in other faculty.**

5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.

- **Periodic Review of the contents of the syllabus and modify the negatives.**
- **Consult other staff of the course.**
- **Hosting a visiting staff to evaluate of the course.**
- **Workshops for teachers of the course.**

Faculty or Teaching Staff: **Dr/ Nizar El Guesmi**

Signature:



Date Report Completed: 2015

Received by: **Dr Hatem Altass** Department Head

Signature: _____ Date: _____

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