



Course Specifications

Institution:	Majmaah University
Academic Department :	Chemistry
Programme :	Chemistry



Course :	Natural Products Chemistry
Course Coordinator :	Dr. Amani Hassan Ahmed
Programme Coordinator :
Course Specification Approved Date :	7/ 12 / 1435 H

A. Course Identification and General Information

1 - Course title	Natural Products Chemistry	Course Code:	CHEM 421
2. Credit hours :	(3hours)		
3 - Program(s) in which the course is offered:	Chemistry		
4 – Course Language :	Arabic language		
5 - Name of faculty member responsible for the course:			
6 - Level/year at which this course is offered :	course offered in the eighth level of the chemistry curriculum		
7 - Pre-requisites for this course (if any) :	Chemistry of Heterocyclic Compounds (CHEM 221)		
8 - Co-requisites for this course (if any) :	Natural products Laboratory		
9 - Location if not on main campus :	on main campus		
10 - Mode of Instruction (mark all that apply)			
A - Traditional classroom	<input checked="" type="checkbox"/>	What percentage?	50%
B - Blended (traditional and online)	<input type="checkbox"/>	What percentage?	0 %
D - e-learning	<input checked="" type="checkbox"/>	What percentage?	25 %
E - Correspondence	<input type="checkbox"/>	What percentage?	0 %
F - Other	<input checked="" type="checkbox"/>	What percentage?	25 %
Comments :	In 1436 H we use e-learning –correspondence(D2L)		

B Objectives

<p>What is the main purpose for this course?</p> <p>Natural Products Chemistry course is three credit hours, course offered in the eighth level of the chemistry curriculum. This course provides an introduction to the broad field of Natural Products Chemistry by reviewing the major classes of Natural Products compounds.</p>
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knowledge on the identification and chemistry of natural products.
 knowledge on The identification and biosynthesis of the various classes of natural products such as(terpenes, steroids , alkaloids and flavonoids)

Acquirement skills to extraction, isolate and purify simple products that are derived from plants

Briefly describe any plans for developing and improving the course that are being implemented :

- Use electronic Materials
- Use Web Sites
- The course content are reviewed and updated annually at the beginning of each academic year by the department curriculum committee and any major changes are reported to the college curriculum committee.

C. Course Description

1. Topics to be Covered

List of Topics	No. of Weeks	Contact Hours
Introduction on identification ,chemistry of natural products and classification of the various classes of natural products.	2	4
Topics that are covered include general methods of isolation, separation, purification, and structure determination of the natural products	1	2
Chemistry of of terpenes, the structure ,classification and biosynthesis of the terpenes, building blocks of Monoterpenes sesquiterpenes diterpenes and triterpenes based on the combination of a given number of isoprene units.	4	8



Chemistry of of alkaloids, general properties of the alkaloids; the structure,classification and biosynthesis of alkaloids. The importance of these compounds to humans will be mentioned.	4	8
Chemistry of flavonoids ,The general definition of flavonoids, , general properties, the structure, their classifications,. The uses and benefits will be explored.	4	8
Total	15	30
Laboratory part :		
Techniques and methodologies for the extraction and separation methods of natural products from plants	6	12
Techniques and methodologies for the isolation and purification methods of natural products from plants	6	12
The instrumental characterization techniques of IR, NMR, Mass Spectroscopy, Liquid and Gas Chromatography are applied in studying compounds of interest.	3	6
Total	15	30

2. Course components (total contact hours and credits per semester):

	Lecture	Tutorial	Laboratory	Practical	Other:	Total
Contact Hours	30 hours	-	30 hours	-	-	60 hours
Credit	30hours	-	15 hours	-	-	45 hours

3. Additional private study/learning hours expected for students per week.

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4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy

	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
1.0	Knowledge		
1.1	<p>By the end of this course the student will be able to:</p> <p>Identify and characterize various classes of natural products by their structure and knows biosynthesis of the various classes of natural products .</p>	<p>1- Lectures - format presentation</p> <p>2- Practical sessions</p> <p>3- Home assignment</p>	<ul style="list-style-type: none"> • Interm I (writing questions) • Interm II (writing questions) • Final exam (writing questions) • lab exam : • Including interm I and final exams
1.2	Draw structural and molecular and formulas of natural products compound		
1.3	Recognize the structure of terpenes, steroids, alkaloids, flavonoids		
1.4	Use modern instrumentation and classical techniques, to design experiments, and to properly record the results of their experiment.		
1.5	Identify and solve organic chemical problems and explore new areas of research		
1.6	Use modern library search tools to locate and retrieve scientific information about a topic, organic chemical, chemical		



	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
	technique, or an issue relating to natural product chemistry.		
2.0 Cognitive Skills			
2.1	<p>By the end of this course the student will be able to:</p> <p>Analyze and discuss the Information and data related to the various classes of natural products</p>	<p>1-Lectures 2- ractical sessions 3- Home assignment</p>	<p>Interm I (writing questions) Interm II (writing questions) Final exam (writing questions) lab exam : Including interm I and final exams</p>
2.2	Apply organic chemical knowledge to solve some problems.		
2.3	Use organic chemical theories to explain and predict observable phenomena, using the principles developed in organic chemistry.		
2.4	The student will follow a logical process based on well-established scientific principles and demonstrate the ability to use the appropriate problem-solving techniques to solve a scientific problem such as an various classes of natural products biosynthesis or a determination of the structure of terpenes, steroids, alkaloids, flavonoids		
2.5	When conducting a laboratory experiment, the student will follow written procedures commonly used in the organic lab accurately and safely. The student will maintain an accurate and organized lab		



	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
	notebook. When completing a lab report the student will apply the scientific method correctly by being able to state a hypothesis, take careful measurements, estimate uncertainties and draw appropriate conclusions based on gathered data and scientific principles.		
2.6
3.0 Interpersonal Skills & Responsibility			
3.1	<p>By the end of this course the student will be able to:</p> <p>Students will effectively and respectfully communicate and collaborate with colleagues.</p>	<p>1-Student-directed learning: Small groups of students are given individual assignments. Students will introduce their assignment in the form of: Power point presentation. Written assignment.</p> <p>2- collaborative education</p>	<p>Through observation in practical and presentations.</p>
3.2	Acquire the skill of team work.		
3.3	Acquire the skill of respect colleagues		
3.4	Students will contribute their own		



	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
	knowledge and experiences to their community and the broader society by participating in professional and/or community activities.		
3.5	Value the role of natural products in our life		
3.6			
4.0 Communication, Information Technology, Numerical			
4.1	<p>By the end of this course the student will be able to:</p> <p>Students will demonstrate proficiency in writing and speaking about organic chemistry topics in a clear and concise manner to both chemists and non-chemists according to professional standards.</p>	<p>1-Small group teaching. 2- Practical sessions. 3-Power point presentation. 4-Written assignment.</p>	<p>Through, home work, observation in practical, presentation skills and exam.</p>
4.2	Are skilled in problems solving, critical thinking and analytical reasoning.		
4.3	Use computers in data acquisition and processing and use available software as a tool in data analysis.		
4.4			
4.5			
4.6			
5.0 Psychomotor			
	<p>By the end of this course the student will be able to:</p>		<p>Through observation in</p>



	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
5.1	Apply the proper procedures and regulations for safe handling and use of chemical.	1-Practical sessions.	practical skills and lab. exam
5.2	Use modern instrumentation and classical techniques, to design experiments,		
5.3	Design, carry out, record and analyze the results of chemical experiments.		
5.4	Acquire the skills to extraction, isolate and purify simple products that are derived from plants		
5.5		
5.6		

5. Schedule of Assessment Tasks for Students During the Semester:

	Assessment task	Week Due	Proportion of Total Assessment
1	Participation, Written assignment. Reports	All term	5%
2	Term Paper on Descriptive organic Chemistry II Topic	Through term	15%
3	first term exam	6 th week	10%
4	Midterm exam	12 th week	10%
5	Final exam	15 th week	40%
6	Lab	15 th week	20%
7	Total		100%
8			

D. Student Academic Counseling and Support



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

-Every teaching staff has to be available for the students for 2 hours 3 days a week.

-There will be a schedule for office hours of every staff member declared to the students.

-Contact numbers, and mobile numbers should be available to the students.

-Office hours are held in faculties' offices of staff members.

E. Learning Resources

1. List Required Textbooks :

- المنتجات الطبيعية" حسن محمد الحازمي ، عمادة شئون المكتبات ،جامعة الملك سعود ، دار الخريجي للنشر و التوزيع ١٤٢٢ هـ

• Natural Products : The Secondary Metabolites.James R Hans
Editor E W Abel Copyright: 2003.Print ISBN: 978-0-85404-490-0

2. List Essential References Materials :

- المنتجات الطبيعية" حسن محمد الحازمي ، عمادة شئون المكتبات ،جامعة الملك سعود ، دار الخريجي للنشر و التوزيع ١٤٢٢ هـ

• Natural Products : The Secondary Metabolites.James R Hans
Editor E W Abel Copyright: 2003.Print ISBN: 978-0-85404-490-0

3. List Recommended Textbooks and Reference Material :

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4. List Electronic Materials :

Web Sites etc:

<http://dnp.chemnetbase.com/intro/>

<http://www.hc-sc.gc.ca/dhp-mps/prodnatur/index-eng.php>

<http://pubs.rsc.org/en/Content/eBook/978-0-85404-490-0>

(1) Individual computer access to *Chemdraw* or *Isis draw* software. The latest version of *Chemdraw* is 2008 and can be accessed at <http://scistore.cambridgesoft.com>; *Isis draw* can be accessed at <http://www.symyx.com/downloads> (2) Individual access to any on-line periodic table. Two good sites are (a) <http://www.americanelements.com> and (b) <http://www.webelements.com> (3) Individual accesses to the American Chemical Society web-site: <http://portal.acs.org> (4) the *wwwVirtual Library*:



<http://www.liv.ac.uk/Chemistry/Links/links.html> (5) A database such as ChemBioFinder for searching compounds and structures:
<http://www.cambridgesoft.com/databases> (6) Access to MSDS data pages:
<http://www.msdonline.com>(7) Reusch, Wm. H *Virtual Text of Organic Chemistry*, 1999, Michigan State University, Madison, WI, USA
<http://www2.chemistry.msu.edu/faculty/reusch/VirtTxtJml/intro1.htm>

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5. Other learning material :

- Either software includes a full range of molecular mechanics and quantum chemical methods, including Hartree-Fock *AbInitio* methods. This version of Spartan is commonly used in academic computer labs.

F. Facilities Required

1. Accommodation

- Lecture room with tables and/or movable chairs for student group work.
- laboratories

2. Computing resources

- In-class access to PC computers (provided or required of students) is recommended, but not required. It is, however, essential that the staff have a computer, projector and smart board for use during each class.

3. Other resources

- Advance laboratories,
- virtual laboratories,

G Course Evaluation and Improvement Processes

1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching:

- Analysis of students' performance on interm exam and final exam..
- Comparison of students' scores on interm I, interm II and Final exam.
- Asking students about their difficulties every now and then during the semester.
- Students' comments during office hours.
- Watch for students weaknesses while doing exercises in class.
- Administer a questionnaire at the end of the semester.

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





Instructor :

- A administer a questionnaire at the end of the semester.
- Analysis of students' performance on interm exam and final exam.
- Reflection on student evaluation comments and levels of student achievement of understanding can help identify successful implementation strategies.
- Self assessment

3 Processes for Improvement of Teaching :

- Record areas of difficulty.
- Focus on individualized instruction in class.
- Reflection on student behavior/understanding correlated with the strategies utilized during class sessions can help identify successful implementation of strategies.

4. Processes for Verifying Standards of Student Achievement

- Check marking by an independent member teaching staff of a sample of student work.
- Check paper research by an independent member teaching staff of a sample of student work.

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

- This would be achieved by issuing an annual course report at the end of the academic year and which will encompass a corrective/improvement action plan.

Course Specification Approved
Department Official Meeting No (.....) Date ... / / H

Course's Coordinator

Name : Amani Hassan Ahmed
Signature : Amani
Date : 7/ 12 / 1435 H

Department Head

Name :
Signature :
Date : .../ ... / H

