



ATTACHMENT 2 (e)

Course Specifications

Kingdom of Saudi Arabia

The National Commission for Academic Accreditation & Assessment

Special Topics in Organic Chemistry

4024583-2

**Course Specifications
(CS)**





Course Specifications

Institution: Umm Al-Qura University	Date of Report: 2017
College/Department : Faculty of Applied Science/ department of chemistry	

A. Course Identification and General Information

1. Course title and code: Special topics in Organic chemistry/ 4024583-2
2. Credit hours: 2 hrs (theoretical)
3. Program(s) in which the course is offered. Chemistry program
4. Name of faculty member responsible for the course: Prof. Dr. Thoraya A. Farghaly
5. Level/year at which this course is offered: 8th level/4 year
6. Pre-requisites for this course (if any): Chemistry of Natural Products
7. Co-requisites for this course (if any)---
8. Location if not on main campus: both on El-Abdyah, and El-Zaher
9. Mode of Instruction (mark all that apply)
a. Traditional classroom <input checked="" type="checkbox"/> What percentage? 100%
b. Blended (traditional and online) <input type="checkbox"/> What percentage?
c. e-learning <input type="checkbox"/> What percentage? <input type="checkbox"/>
d. Correspondence <input type="checkbox"/> What percentage? <input type="checkbox"/>
f. Other <input type="checkbox"/> What percentage? <input type="checkbox"/>
Comments:



B Objectives

<p>1. What is the main purpose for this course? By the end of this course student will be familiar with the chemistry of carbohydrates, nucleic acids, amino acid, fats and oils. Also, provide basic understanding of the basic principles of photochemical reactions and to ensure that students gain basic knowledge in regards to photoenergy and solar energy conversion. The students will also learn about some of the main applications of photochemistry in research and industry</p>
<p>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)</p> <ul style="list-style-type: none"> • Out of class review sessions, reading assignments and homework that require using university online library will be considered to enrich the scope of the course. • The course material will be posted online so that it could be accessed by the students enrolled in the course. • Will utilize various internet resources that offer informative details and illustrative pictures, schemes, and videos to support the lecture course material.

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. Introduction to carbohydrate chemistry (classifications, different chemical structures of mono and disaccharides)	1	2
b. Reactions of carbohydrates, synthesis of Ascorbic acid, ascending and descending in sugar chain.	1	2
c. Nucleosides – Nucleotides –Nucleic Acids	1	2
d. Amino acid (protection of amino and carboxylic groups, Synthesis and reactions of amino acids	1	2
e. Proteins and peptides (chemical reactions, physical and chemical properties and different methods for their chemical configurations)	1	2
f. Fats and oils (chemical reactions, physical and chemical properties, saponification)	1	2
g. Chemistry and reaction of Carbenes and nitrene	1	2
h. Introduction to the basic principle photochemistry-Introductory concepts, The quantization of light and matter and the three principles of light matter interaction	1	2
i. Light nature and light sources	1	2
j. Light absorption and electronically excited states: Ground state (S_0), Excited states (S_1 , T_1 , T_2), and energy transfer- fluorescence - phosphorescence	1	2



k. The fate of excited state: a) Physical radiative and non-radiative deactivations processes of the excited state (Jablonski diagram); b) Aspects of the chemical processes of excited states; c) Intermolecular radiationless transitions of excited states; d) Intermolecular physical processes of excited states	1	2
l. General types of photochemical reactions: The photochemistry of alkenes and carbonyl compounds. Photochemical cross-linking and degradation of polymers.	1	2
m. Applications of photochemistry in semiconductors (solar cells, storage of solar energy and its conversions)	1	2
n. Selected photochemical reactions	1	2



II-General scheme for identification of organic aliphatic unknowns

2. Course components (total contact hours and credits per semester):						
	Lecture	Tutorial	Laboratory	Practical	Other:	Total
Contact Hours	28	-				28
Credit	2	-				2

3. Additional private study/learning hours expected for students per week.	<input type="text"/>
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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 application of photochemistry	<ul style="list-style-type: none"> • Lectures • Scientific discussion • Library visits • Web-based study 	<ul style="list-style-type: none"> • Exams • web-based student performance systems • portfolios • long and short essays
1.2	Name different organic classes and bioactive molecules such as carbohydrate, nucleic acid, lipids and proteins		
1.3	Know the basic principles of photochemical reactions		
1.4	Describe the different methods of preparations of organic bioactive molecules such as carbohydrate, lipids and proteins.		
1.5	Familiar with the physical and chemical properties of different organic bioactive molecules such as carbohydrate, lipids and		



	proteins		• posters lab manuals
1.8	Write a mechanism for a photochemical transformation		
1.9	Determine the type of mechanism and intermediates in different organic reactions such as carbens and nitrens		
1.12	Outline the general types of photochemical reactions		
1.13	Define the different electronical excitation states		
2.0	Cognitive Skills		
2.1	Apply the basic principles of photochemistry	<ul style="list-style-type: none"> • Lectures • Scientific discussion • Library visits • Web-based study 	<ul style="list-style-type: none"> • Exams • web-based student performance systems • portfolios • posters • demonstrations
2.2	Compare between the different types of photochemical and pericyclic reactions		
2.3	Explain the different strategies for preparation of bioactive organic compounds		
2.4	Analyze the reasons for the unique physical properties in some bioactive organic compounds		
2.6	Summarize the different reactions of reactive intermediates such as carbenes and nitrenes		
3.0	Interpersonal Skills & Responsibility		
	<ul style="list-style-type: none"> • Ability to communicate results of work to classmates. • Ability to work in a team to perform a specific task. 	<ul style="list-style-type: none"> • Scientific discussion • Web-based study 	<ul style="list-style-type: none"> • web-based student performance systems
4.0	Communication, Information Technology, Numerical		
	<ul style="list-style-type: none"> • Evaluate the different methods of preparation of organic compounds • Demonstrate a synthetic pathways for synthesis of organic molecules • Use the internet as a means of communication and a source of information. • Encourage students to use internet for searching certain electronic journals regarding topics of the course. • Scientific writing. • 	<ul style="list-style-type: none"> • Lectures • Scientific discussion • Library visits • Web-based study 	<ul style="list-style-type: none"> • web-based student performance systems • individual and group presentations
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	Homework or activities.	--	10 %



2	First Periodic Exam.	6	20 %
3	Second Periodic Exam.	12	20 %
4	Final Exam.(2 hours exam)	16	50 %
5	Total	100 %	

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

- T. W. Graham Solomons, Craig B. Fryhle, Scott A. Snyder "*Organic Chemistry, 11th Edition, International Student Version*" **2013**, John Wiley & Sons.
- P. Finch, *Carbohydrates: Structures, Syntheses and Dynamics*, Springer Science & Business Media, 2013.
- Ian Fleming, *Pericyclic Reactions* (Oxford Chemistry Primers) 1st Edition, 1999.
- Axel Griesbeck, Michael Oelgemöller, Francesco Ghetti, *CRC Handbook of Organic Photochemistry and Photobiology*, Third Edition, 2012.

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

- Lecture Hand outs available on the coordinator website

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

- P. M. Collins, P. J. Ferrier, *Monosaccharides: Their Chemistry and Their Role in Natural Products*, 1995, John Wiley & Sons
- Nicholas J. Turro, *Modern Molecular Photochemistry*, University Science Books, 1991.

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.**

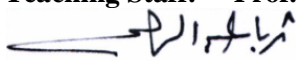
5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for



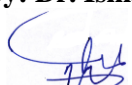
improvement.

- **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: Prof. Thoraya A. Farghaly

Signature:  Date Report Completed: 12/1/2019

Received by: Dr. Ismail Althagafi Department Head

Signature:  Date: 20/1/2019

