

ATTACHMENT 5.

Kingdom of Saudi Arabia
**The National Commission for Academic Accreditation &
Assessment**

T6. Course Specifications
(CS)

Advanced Organic Synthesis

(402633-3)



Course Specifications

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

A. Course Identification and General Information

1. Course title and code: Advanced Organic Synthesis / 402633-3			
2. Credit hours: 3 hrs (theoretical)			
3. Program(s) in which the course is offered: M. Sc. in chemistry			
4. Name of faculty member responsible for the course: Prof. Dr. Saleh A. Ahmed			
5. Level/year at which this course is offered: 3rd / 2nd			
6. Pre-requisites for this course (if any): not applicable			
7. Co-requisites for this course (if any): not applicable			
8. Location if not on main campus: El-Abedyah, El-Azizya, and El-Zaher			
9. Mode of Instruction (mark all that apply)			
a. traditional classroom	<input type="checkbox"/>	What percentage?	<input type="checkbox"/>
b. blended (traditional and online)	<input checked="" type="checkbox"/>	What percentage?	<input type="checkbox" value="80%"/>
c. e-learning	<input checked="" type="checkbox"/>	What percentage?	<input type="checkbox" value="20%"/>
d. correspondence	<input type="checkbox"/>	What percentage?	<input type="checkbox"/>
f. other	<input type="checkbox"/>	What percentage?	<input type="checkbox"/>
Comments:			

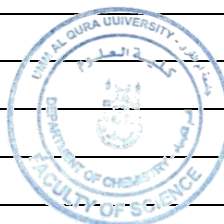
B Objectives

<p>1. What is the main purpose for this course?</p> <p>By the end of this course student will be familiar with different reactions to synthesis of different classes of organic compounds.</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"> • The use of smart teaching halls for lectures. • Increased use of IT or web based reference material. • Encourage students to carry out research reports in the field the course using the library, data base services, and/or websites. • Changes in content as a result of new research in the field.

C. Course Description (Note: General description in the form used in Bulletin or handbook)

Course Description:

1. Topics to be Covered		
List of Topics	No. of Weeks	Contact hours
Protecting and deprotecting groups	1	3
Click chemistry in heterocyclic synthesis.	1	3
1,3-Dipolar cycloadditions.	1	3
Pericyclic reactions.	2	6
Formation of C-C bond via coupling reactions.	1	3
Formation of C-C bond via Aldol-enolates.	2	6
Formation of C-C bond via radical processes.	1	3
Heterocyclic synthesis via ring elaboration.	1	3
Metal mediated cycloadditions and metathesis processes.	1	3



Retrosynthesis and disconnection approach.	2	6
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2. Course components (total contact hours and credits per semester):

	Lecture	Tutorial	Laboratory or Studio	Practical	Other:	Total
Contact Hours	39	--	--	--	--	39
Credit	3	--	--	--	--	3

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

On the table below are the five NQF Learning Domains, numbered in the left column.

First, insert the suitable and measurable course learning outcomes required in the appropriate learning domains (see suggestions below the table). **Second**, insert supporting teaching strategies that fit and align with the assessment methods and intended learning outcomes. **Third**, insert appropriate assessment methods that accurately measure and evaluate the learning outcome. Each course learning outcomes, assessment method, and teaching strategy ought to reasonably fit and flow together as an integrated learning and teaching process. (Courses are not required to include learning outcomes from each domain.)

Code #	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
1.0	Knowledge		
1.1	Know the modern methods used in the preparation of various organic compounds	<ul style="list-style-type: none"> • Lectures • Scientific discussion 	<ul style="list-style-type: none"> • Exams • web-based student
1.2	Recognize the different methods used in the formation of various C-C bonds		

1.3	Identify the different protecting and deprotecting groups used in organic synthesis	<ul style="list-style-type: none"> • Web-based study • Library visits 	performance systems
1.4	Write the products of chemical reaction correctly		<ul style="list-style-type: none"> • portfolios • long and short essays
1.5	Recognize the modern methods used in the synthesis of heterocycles		<ul style="list-style-type: none"> • posters
2.0	Cognitive Skills		
2.1	Compare between different types of reactions used in organic synthesis	<ul style="list-style-type: none"> • Lectures • Scientific discussion • Web-based study • Library visits 	<ul style="list-style-type: none"> • Exams • web-based student performance systems
2.2	Design of different strategies for preparation of different classes of organic compounds		<ul style="list-style-type: none"> • portfolios
2.3	Predict the products of different organic reactions		<ul style="list-style-type: none"> • long and short essays
2.4	Summarize the different methods of organic synthesis		<ul style="list-style-type: none"> • posters
2.5	Discover the importance of different methods used inorganic reactions		<ul style="list-style-type: none"> • demonstrations
2.6	Formulate the outputs of different reactions used in organic synthesis		
2.7	Design the synthetic pathway of different organic compounds using retrosynthetic approach		
3.0	Interpersonal Skills & Responsibility		
3.1	Use the basic knowledge of organic chemistry to synthesis organic reaction mechanism	<ul style="list-style-type: none"> • Lectures • Scientific discussion • Web-based study 	<ul style="list-style-type: none"> • Exams • web-based student
3.2	Determine the different methods to synthesis of different classes of organic compounds		

3.3	Use the retrosynthetic approach to synthesis of different organic molecules		performance systems
4.0	Communication, Information Technology, Numerical		
4.1	Evaluate the importance of different organic reactions	<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
4.2	Demonstrate a synthetic pathways for synthesis of different classes of organic compounds		
4.3	Demonstrate the mechanism of different organic reactions		
4.5	Evaluate the different methods to synthesis of various organic compounds		
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	Mid-term exam	8	30%
2	Assignments and activities		10%
3	Final Exam	15-16	60%

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.

1. Dmitry V. Liskin, Penny Chaloner “Advanced Organic Synthesis”, 2015.
2. Jonathan Clayden, Nick Greeves, Stuart Warren, Peter Wothers “Organic chemistry”, 2000, Oxford.

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

- Lecture Handouts available on the coordinator website

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

1. John McMurry's "Organic Chemistry, 8th edition, International Edition" 2011, Brooks/Cole.

4. List Electronic Materials, Web Sites, Facebook, Twitter, etc.

- <http://www.organic-chemistry.org/reactions.htm>
- <http://www.chemweb.com>
- <http://www.sciencedirect.com>
- <http://www.rsc.org>
- <http://www.orgsyn.org>

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

- [ChemDraw Ultra 11.0](#)

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 (10) students.

<ul style="list-style-type: none"> • Providing hall of teaching aids including computers and projector.
<p>2. Computing resources (AV, data show, Smart Board, software, etc.)</p> <ul style="list-style-type: none"> • Room equipped with computer, projector and TV.
<p>3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list)</p> <ul style="list-style-type: none"> • No other requirements.

G Course Evaluation and Improvement Processes

<p>1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching</p> <ul style="list-style-type: none"> • Questionnaires can be used to collect student feedback. • Student representation on staff-student committees and institutional bodies. • Structured group discussions and/or focus groups.
<p>2 Other Strategies for Evaluation of Teaching by the Instructor or by the Department</p> <ul style="list-style-type: none"> • Observations and the assistance of colleagues. • Independent evaluation for extent to achieve students the standards. • Independent advice of the duties and tasks.
<p>3 Processes for Improvement of Teaching</p> <ul style="list-style-type: none"> • 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.
<p>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)</p> <ul style="list-style-type: none"> ▪ 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.

Name of Instructor: **Prof. Dr. Saleh A. Ahmed**

Signature: _____

Date Report Completed: **2017**

Name of Field Experience Teaching Staff:

Program Coordinator:

Signature: _____

Date Received: 2017

