Kingdom of Saudi Arabia

The National Commission for

Academic Accreditation & Assessment

Course Specifications

Advanced Organic Chemistry

(402435-3)

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: **Advanced Organic Chemistry (402435-3)**
2. Credit hours: **3 (2+1)**
3. Program(s) in which the course is offered: **Chemistry program**
4. Name of faculty member responsible for the course:
5. Level/year at which this course is offered: **8th level/4 year (2nd term)**
6. Pre-requisites for this course (if any): **Organic reactions and preparations (402336-3)**
7. Co-requisites for this course (if any): ----------
8. Location if not on main campus: ----------
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:

B Objectives

1. What is the main purpose for this course? **By the end of this course student will be familiar with Studying of Photochemistry of carbenes and nitrenes, dyes and definition of chemotherapy**
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- Pericyclic reactions	2	4
b- Photochemistry and carbenes and nitrenes : Photooxidation – reduction – photochemical elimination Reactions – photochemical rearrangement – photochemical annulation – photochemical addition.	3	6
c- Chemotherapy : Introduction – Sulfa drugs (Preparations and their uses) – Antibiotics (Penicillin – *Cephalosporin* – Streptomycin – *Chloramphenicol* – *Polypeptide* Antibiotics – Polyacetylenes Antibiotics).	3	6
d- Chemistry of Dyes : Introduction and Classification – Types of Dyes (Nitro – Nitroso – Azo – Diarylmethane – Triarylmenthane – Xanthine – *Acridine* – Quinoline – Anthraquinone) – methods of preparations of dyes – Uses dyes (Dyeing cellulosic fiber – Dyeing of Jute – Dyeing of Wool).	4	8

Practical Part:

1- Identifing the protocol of security and safety in lab. and developing of the environmental awareness
2- Synthesis of sudan dye {Phenyl azo *β*-naphthol}
3- Synthesis of methyl Orange

4- Synthesis of orange (II)
5- Synthesis of parared {1-((4-nitrophenyl)diazenyl)naphthalen-2-ol}
6- Synthesis of 4-(phenyldiazenyl)benzene-1,3-diol
7- Coupling of aromatic amines with active methylene derivatives (ethyl acetoacetate)
8- Desizing, Scouring and Bleaching of raw cotton fabric
9- Synthesis of asprin (O-acetylsalicylic acid)
10- Synthesis of *p*-cetamol {*N*-(4-hydroxyphenyl)acetamide}
11- Synthesis of hexamethylene tetramine

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

	Lecture	Tutorial	Laboratory	Practical	Other:	Total
Contact Hours	24	-		33		57
Credit	2	-		1		3

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

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	Studying the definition and properties of pericyclic reactions	• Lectures • Scientific discussion • Library visits • Web-based study	• Exams • web-based student performance systems • portfolios • long and short essays • posters lab manuals
1.2	Describing the classification of of pericyclic reactions according to their different types (*Electrocyclic reactions, Cycloaddition reactions*.and *Sigmatropic rearrangement*)		
1.3	Knowledge of different reactions by photochemistry		
1.4	Showing the multiple methods of preparation of sulphadrugs and antibiotics,		
1.5	Recognizing the chemical properties and uses of sulphadrugs and antibiotics		
1.6	Identifying the chemical properties, types and synthesis of different dyes and how do dyestuff in lab.		

2.0	**Cognitive Skills**		
2.1	Development of reverse thinking skill (back thinking) and the student's acquiring the training skill to choose the suitable method for organic compounds preparation	• Lectures • Scientific discussion • Library visits • Web-based study	• Exams • web-based student performance systems • portfolios • posters • demonstrations
2.2	Making the student acquire the skill of naming azo dyes		
2.3	The student's acquiring of the skill of how to predict the outcomes of interactions of organic compounds by light		
2.4	The student can pick the appropriate methods for the preparation of different drugs		
2.5	Design of different ways to synthesize several types of dyes		
2.6	Student invents different ideas for the construction of many of the different organic compounds with interested effect		
2.7	The student is planning to make a research programm in the field of advanced organic chemistry and their effectiveness		
3.0	**Interpersonal Skills & Responsibility**		
3.1	The division of students collectively for teams to make some common reports	• Lectures • Scientific discussion • Web-based study	• Exams • web-based student performance systems
3.2	Self-reliance and take individual responsibility and the ability to work within the group		
4.0	**Communication, Information Technology, Numerical**		
4.1	The ability to conduct a successful style of dealing with data analysis, describing his strategy in the image and draw conclusions from them	• Lectures • Scientific discussion • Library visits • Web-based study	• web-based student performance systems • individual and group presentations
4.2	Introductory lecture at the beginning of the semester to use the computer and the internet to search for sources of new researches and collect the researches which help in writing reports on topics related to syllabus.		
4.3	Evaluating the performance of the students through examination, duties and the discussion in		

	the lecture which constitute 30 % of the total evaluation.		
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	**Exam**	**5-14**	**20%**
2	**Assignments (Home work + Activities+ Attendance)**		**10**
3	**Practical Exam**	**15**	**30%**
4	**Final Exam**	**16**	**40%**

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

- Axel Griesbeck**,** Michael Oelgemöller**,** Francesco Ghetti "CRC Handbook of Organic Photochemistry and Photobiology, 3rd Edition - Two Volume Set", CRC Press (2012)

• Petr Klán, Jakob Wirz "Photochemistry of Organic Compounds: From Concepts to Practice", Wiley-Blackwell (2009)
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) • J. March, Advanced Organic Chemistry, John Wiley & Sons, 2009. • Paula Y. Bruice, Organic Chemistry (7th Edition) 2013, Prentice Hall • J. McMurry, Organic Chemistry, 8th Edition 2012, Brooks/Cole, Cengage Learning • J. March, Advanced Organic Chemistry, 4th Edition 1992, John Wiley & Sons • J. March, Advanced Organic Chemistry, 4th Edition 1992, John Wiley & Sons. • F. A. Carey and R. J. Sundberg, Advanced Organic Chemistry, 1994.
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.** • **Iindependent 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:

Signature: **Date Report Completed: 2016**

Received by: **Dr Refat El-Sayed**

Signature: _____ Date: _____