

National Commission for Academic Accreditation & Assessment

Course Specification

Institution: King Khalid University
College/Department : Faculty of Science/ Chemistry Department

A Course Identification and General Information

1. Course title and code: Organic Chemistry (1), Chem 212
2. Credit hours: 3
3. Program(s) in which the course is offered. B.Sc. Medicine, B.sc. Pharmacy, B.sc. dentistin (If general elective available in many programs indicate this rather than list programs)
4. Name of faculty member responsible for the course: Prof. Dr. Ayman Salah
5. Level/year at which this course is offered: 3/1
6. Pre-requisites for this course (if any): Nothing
7. Co-requisites for this course (if any):
8. Location if not on main campus: Main Building in Kreger

B Objectives

<p>1. Summary of the main learning outcomes for students enrolled in the course.</p> <ul style="list-style-type: none">• Acquiring the students the basic skills of identification of physical and chemical properties of basic organic compounds.• Familiarize students with the functional groups in organic compounds.• Recognize the different types of chemical reagents used to carry out organic reactions.• Understanding different methods used in the preparation of alkanes, alkenes, alkyl halides, benzene and substituted benzene• The ability to investigate the reaction mechanism of SN^1, SN^2, E1, E2 and electrophilic aromatic substitution.
<p>2. Briefly describe any plans for developing and improving the course that are being implemented. (eg 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">• Class lectures using board.• electronic learning using computer.• Drawing structures & using some models.• training on representative solved problems• Work effectively both in a team, and independently on solving the problems to get the right pathway for reaction.• communicate effectively with his teacher and colleagues.

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
<p>Theoretical part</p> <ul style="list-style-type: none">• Introduction in organic chemistry: Atomic structure, Electronic distribution, Hybridization, Types of chemical bonds, Formal Charge, Polarization, Dipole moment, Lewis Structure, Inductive effect, Resonance, Empirical and molecular formula, Acid & Base, Type of chemical reactions, Homolytic and heterolytic fission of covalent bond, Using of chemical arrow, Functional groups.	2	6
<p>Practical Part</p> <ul style="list-style-type: none">• Safety precautions associated with the purification of laboratory chemicals, uses of different glassware in laboratory, identification of flammable and inflammable solvents.	1	2
<p>Determination the melting points of known, unknown and mixed substances.</p>	1	2

<p style="text-align: center;">Theoretical part</p> <ul style="list-style-type: none"> Alkanes: Nomenclature, Physical properties, Source of Alkanes, Preparation of symmetrical and unsymmetrical alkanes, Chemical properties of alkanes. <p style="text-align: center;">Practical Part</p> <p style="text-align: center;">Purification of solid organic compounds by recrystallization techniques.</p>	1	1
<p style="text-align: center;">Theoretical part</p> <ul style="list-style-type: none"> Cycloalkanes: Nomenclature, Structure & stability of cycloalkanes, Preparation of cycloalkanes. <p style="text-align: center;">Practical Part</p> <p style="text-align: center;">Purification of solid organic compounds by sublimation techniques.</p>	1	3
<p style="text-align: center;">Theoretical part</p> <ul style="list-style-type: none"> Alkenes: Nomenclature, Geometric isomerism (cis, trans, E- & Z-), Preparation of alkenes, Reactions of alkenes. <p style="text-align: center;">Practical Part</p> <ul style="list-style-type: none"> Purification of liquid organic compounds by simple distillation technique. Purification of liquid organic compounds by fractional distillation technique. <ul style="list-style-type: none"> Purification of liquid organic compounds by steam distillation technique. 	3	3
	1	2
	2	2
	1	2
<p style="text-align: center;">Theoretical part</p> <ul style="list-style-type: none"> Dienes & Alkynes: Nomenclature, Types of Dienes, Preparation of Dienes, 1,2- & 1,4-Addition reactions of Dienes, Physical properties & preparation of Alkynes, Reactions of Alkynes. <p style="text-align: center;">Practical Part</p> <ul style="list-style-type: none"> First semi-semester practical exam. 	2	6
	1	2
<p style="text-align: center;">Theoretical part</p> <ul style="list-style-type: none"> Alkyl halides: Nomenclature, Preparation of alkyl halides, Nucleophilic substitution reaction of alkyl halides, Elimination reaction of alkyl halides. <p style="text-align: center;">Practical Part</p> <ul style="list-style-type: none"> Separation of solid mixture consists of (Acid & Neutral), (Base Neutral). Separation of solid mixture consists of Acid, Base & Neutral. <ul style="list-style-type: none"> Isolation of liquid mixture using separating funnel techniques. 	1	3
	1	2
	1	2
	1	2
<p style="text-align: center;">Theoretical part</p> <ul style="list-style-type: none"> Aromatic hydrocarbons: Nomenclature, Structure of Benzene, Aromaticity, Huckel rule, Preparation of benzene & its derivatives, Electrophilic aromatic substitution reactions, Nucleophilic aromatic substitution reactions, Oxidation & reduction of benzene, Structure of Benzyne. <p style="text-align: center;">Practical Part</p> <ul style="list-style-type: none"> Isolation of caffeine from Tea. Chromatographic separation, Thin Layer Chromatography (TLC), Paper Chromatography (PC). 	3	9
	1	2
	1	2

Theoretical part		
<ul style="list-style-type: none"> • Stereochemistry: Isomerism, Chirality, Stereoisomers, R,S-Nomenclature, Fischer projection, Resolution of Enantiomers, Chiral atoms other than carbon atom, Regioselective reaction, stereospecific reaction, stereoselective reaction, Stereochemistry of electrophilic addition of alkenes. 	2	6
Practical Part		
<ul style="list-style-type: none"> • Identification of simple aromatic hydrocarbons, Nitration test, Unsaturation test. 	1	2
<ul style="list-style-type: none"> • Second semi-semester practical exam. 	1	2

2 Course components (total contact hours per semester):				
Lecture: 45	Tutorial: -	Laboratory: 30	Practical/Field work/Internship	Other:-

3. Additional private study/learning hours expected for students per week. (This should be an average for the semester not a specific requirement in each week): Nothing
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4. Development of Learning Outcomes in Domains of Learning
For each of the domains of learning shown below indicate:
<ul style="list-style-type: none"> • A brief summary of the knowledge or skill the course is intended to develop; • A description of the teaching strategies to be used in the course to develop that knowledge or skill; • The methods of student assessment to be used in the course to evaluate learning outcomes in the domain concerned.
a. Knowledge
(i) Description of the knowledge to be acquired
<ul style="list-style-type: none"> • Understanding the basic principle of organic chemistry. • Identification the physical and chemical properties of alkanes, alkenes, alkylhalides and aromatic compounds.
(ii) Teaching strategies to be used to develop that knowledge
<ul style="list-style-type: none"> • Lectures

<ul style="list-style-type: none"> • Practical sessions • Solved problems
<p>(iii) Methods of assessment of knowledge acquired</p> <ul style="list-style-type: none"> • Two mid-term exams • Continuous assessment and solving problems • Final written examination
<p>b. Cognitive Skills</p>
<p>(i) Description of cognitive skills to be developed</p> <ul style="list-style-type: none"> - Skill of how to prepare alkanes, alkenes, alkynes, alkyl halides and aromatic compounds - Skill of how to identify unknown organic compounds - Skill of how to differentiate between organic compounds which belong to different groups - Skill of how to differentiate between organic compounds which belong to the same group
<p>(ii) Teaching strategies to be used to develop these cognitive skills</p> <ul style="list-style-type: none"> • Practical presentation by demonstrator under the supervision of lab supervisor. • Practical presentation by students under the supervision of lab supervisor.
<p>(iii) Methods of assessment of students cognitive skills</p> <ul style="list-style-type: none"> • Written and Oral exams. • Lab note
<p>c. Interpersonal Skills and Responsibility</p>
<p>(i) Description of the interpersonal skills and capacity to carry responsibility to be developed</p> <ul style="list-style-type: none"> • Ability to work in groups. • Change the instrument and tools between students. • Ability of student to do experimental alone.
<p>(ii) Teaching strategies to be used to develop these skills and abilities</p> <ul style="list-style-type: none"> • Cooperative learning • Work in groups
<p>(iii) Methods of assessment of students interpersonal skills and capacity to carry responsibility</p> <ul style="list-style-type: none"> • Lab note

<ul style="list-style-type: none"> • Tutorial & Reports
d. Communication, Information Technology and Numerical Skills
(i) Description of the skills to be developed in this domain. <ul style="list-style-type: none"> • Ability to use Computer • Ability to work on different types of instruments in lab. • Ability to count and analysis the results of experimental using different types of program.
(ii) Teaching strategies to be used to develop these skills <ul style="list-style-type: none"> • Practical presentation • Data Show presentation and visual lab simulation.
(iii) Methods of assessment of students numerical and communication skills <ul style="list-style-type: none"> • Lab note • Written and Oral Exams. • Tutorials using Blackboard <i>via</i> electronic learning.
e. Psychomotor Skills (if applicable)
(i) Description of the psychomotor skills to be developed and the level of performance required <ul style="list-style-type: none"> • Nothing
(ii) Teaching strategies to be used to develop these skills <ul style="list-style-type: none"> • Nothing
(iii) Methods of assessment of students psychomotor skills <ul style="list-style-type: none"> • Nothing

5. Schedule of Assessment Tasks for Students During the Semester			
Assess ment	Assessment task (eg. essay, test, group project, examination etc.)	Week due	Proportion of Final Assessment
1	1 st semi-semester	7	10%
2	2 nd semi-semester	11	10%
3	Tutorials on Blackboard	continuous	5%
4	Practical exams	continuous	25%

5	Final Written exam		50%
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D. Student Support

<p>1. Arrangements for availability of teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week)</p> <ul style="list-style-type: none"> • Office hours (6h/w). • Electronic Learning (2h)

E Learning Resources

<p>1.Required Text(s): Organic Chemistry, for John McMurry , eighth edition, 2010</p>
<p>2. Essential References :</p> <p>Finer I. L., Organic Chemistry 5th Edn., ELBS & Longman group Ltd. (1975), Fessenden & Fessenden , Organic Chemistry</p>
<p>3- Recommended Books and Reference Material (Journals, Reports, etc) (Attach List)</p> <p>R. T. Morrison, R. N. Boyd; Organic Chemistry, 6 ed., Prentice Hall, 1992.</p>
<p>4-.Electronic Materials, Web Sites etc</p> <p>http://www.chemguide.co.uk/mechanisms/freerad/whatis.html#top</p>
<p>5- Other learning material such as computer-based programs/CD, professional standards/regulations</p> <ul style="list-style-type: none"> • Overhead projector with data show. • CD & DVD

F. Facilities Required

<p>Indicate requirements for the course including size of classrooms and laboratories (ie number of seats in classrooms and laboratories, extent of computer access etc.)</p>
<p>1. Accommodation (Lecture rooms, laboratories, etc.)</p> <ul style="list-style-type: none"> • Lecturer room contain Data Show. • Blackboard.
<p>2. Computing resources</p> <ul style="list-style-type: none"> • Hall contain at least 30 computer . • Chem draw or ISIS draw programs. • Internet access.
<p>3. Other resources (specify --eg. If specific laboratory equipment is required, list requirements or attach list)</p> <ul style="list-style-type: none"> • Lab equipments includes glass and instrument. • Lab emergency • Lab pharmacy • Save tools.

G Course Evaluation and Improvement Processes

<p>1 Strategies for Obtaining Student Feedback on Effectiveness of Teaching</p> <ul style="list-style-type: none">• Fill course report and analysis the outcome of leaning (feedback) to improve the learning process.• Direct and continuous with the students during lecturer and via blackboard.• Follow up the web site of university dardasha.
<p>2 Other Strategies for Evaluation of Teaching by the Instructor or by the Department</p> <ul style="list-style-type: none">• Revise the course file and course report by the aid of other colleagues in the same field.• Revise the course file and course report by the National Commission for Academic Accreditation & Assessment.• Participation in workshop concerning Academic Accreditation & Assessment.
<p>3 Processes for Improvement of Teaching</p> <ul style="list-style-type: none">• Participation in workshop dealing with the different method of teaching.• Revise the teaching strategy.
<p>4. Processes for Verifying Standards of Student Achievement (eg. 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 the correction of exam paper by another partner.• Correction of exam paper by more than one person.
<p>5 Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.</p> <ul style="list-style-type: none">• Course specification to improve the feedback.