



SYLLABUS

Course Code	Course Num.	Course Name	Credit Hours	Lec.	Lab.	Tut.	Private study	Pre-requisites	Course Level	Language
CHM	202	Organic Chemistry	3	3	0	0	6	CHM 103	3	English

A. Instructor information

Name	e-mail	Office phone	Office location	Office hours
@imamu.edu.sa			

B. Course Description

This course is an introduction to the chemistry of carbon. The concepts of bonding, structure, and classification of compounds by functional groups, as well as reactions of aliphatic hydrocarbons, alkyl halides, alcohols, and ethers are presented from a mechanistic viewpoint. Stereochemical principles are emphasized.

C. Course Outcomes

At the end of this course the student will be able to:

1. Name organic compounds using the IUPAC system of nomenclature.
2. outline Chemical Behaviors of aliphatic organic compounds.
3. recognize the Stereochemistry of Organic Compounds structure To learn chemical reaction calculations
4. Memorize Organic Reactions types
5. define Structures and Reactivity relation.
6. predict the bonding and structural shapes of organic compounds

References:

Required Textbook

- **Organic Chemistry**, J. E. McMurry. Mary Finch (Cengage Group), (8th Ed.), (2012), | ISBN-10: 0495118370 | ISBN-13: 978-0495118374.
- **Vogel's' Textbook of Practical Organic Chemistry**, A. I. Vogel, A. R. Tatchell, B.S. Furnis, P. W. G. Smith, Longman Group UK Limited, (5th Ed.), 1989. ISBN 978-0-582-46236-6

Students are required to purchase the textbook/materials (it is an obligation). The book contains the lecture notes as well as activities for the students to take part in; the book serves as a workbook.

Other references:

- **Organic Chemistry**. P. Y. Bruice, (2nd Ed.), PRENTICE HALL, Upper saddle River New Jersey (07458), 1998. ISBN 10: 0138419256
- **Organic Chemistry**, R. T. Morrison,; R. N. Boyd, , (6th Ed.), Prentice Hall of India, (1996). ISBN-13: 978-0136436690

Course Website: Google Classroom Webpage: <http://www.imamm.org/>



D. Topics Outline

List of Topics	Contact Hours
Fundamental Concepts: Introduction to Nomenclature, Bond Polarity, Electronegativity Trends, Carbon's Hybridization, Concept of Resonance and Lewis Diagrams, Homolytic and Heterolytic Bond Cleavage, Free Radicals, Electrophiles and Nucleophiles.	8
Alkanes and their Stereochemistry: Simple Alkane Structure and Nomenclature, Alkyl Group, Properties of Alkanes, Ethane and other Alkane Conformation	4
Cycloalkanes and their Stereochemistry: Cycloalkane Nomenclature and Structure, Stability and Ring Strain, Cis, Trans Isomerism, Conformations of Cycloalkanes, Cyclohexanes, Axial and Equatorial Bond, Conformation of Mono- and Di- substituted Cycloalkanes, conformation of polycyclic molecules	8
Structure and Reactivity of Alkenes: Nomenclature, Cis Trans isomerism, Sequence Rules: E, Z Designation, Stability of alkenes, Electrophilic Addition Reactions, Orientation of Electrophilic Additions: Markovnikov's Rule, Carbocation Structure and Stability, Hammond Postulate, Evidence for Mechanism of Electrophilic Additions: Carbocation Rearrangement, Addition of Halogens to Alkenes, Addition of Water to Alkenes; Oxymercuration and Hydroboration, Oxidation of Alkenes, Radical Additions to Alkenes: Polymerization.	8
Alkynes: Naming Alkyne, Preparation of alkynes, Elimination Reaction: Dehydrohalogenation of Alkyl Dihalides, Reactions of alkynes: Electrophilic addition of HX and X ₂ to alkynes, Reduction to Alkenes and Alkanes, Oxidative Cleavage of Alkynes, Alkyne Acidity: Formation of Acetylide Anions, Alkylation of Acetylide Anions, An Introduction to Organic Synthesis of Alkynes.	4
An Overview of organic Reactions: Kinds of Organic Reactions, How organic reaction occur: Mechanisms, Radical Reactions, Polar Reaction, Using Curved Arrows in Polar Reactions Mechanisms, Describing a Reaction: Equilibria, Rates, Bond Dissociation Energy, Energy Diagrams and Transition States.	8
Stereochemistry: Enantiomers and Tetrahedral Carbon, The Reason of Handedness in Molecules: Chirality, Optical Activity, Sequence Rules for Specifying Configuration, Diastereomers, Meso Compounds, Racemic Mixtures and The Resolution of Enantiomers, Stereochemistry of Reactions: Addition of Water to an Achiral Alkenes, Addition of Water to a Chiral Alkenes.	8
Organo halids: Naming Alkyl Halides, Structure of Alkyl halides, Preparation of Alkyl Halides from Alkanes: Allylic Bromination, Stability of Allyl Radical, Preparation from Alkenes.	4
Reactions of Alkyl Halides: The Discovery of the Nucleophilic Substitutions: Characterization of S _N 1 and S _N 2 Reactions, Elimination Reactions of Alkyl Halides: Zaitsev Rule, A Summary of Alkyl Halides Reactivity in Substitution and Elimination Reactions.	8

E. Exams & Grading System

The semi-official dates and the workload of students for this course are:

- **Midterm 1: 1 exam**
- **Midterm 2: 1 exam**
- **Quizzes : 3 quizzes**
- **Homeworks: 5 homeworks**
- **Final Exam: 16th week.**



	Teaching/learning activities	Contact Hours	Frequency	Total Contact hours	Self-study hours (hrs)	Total self-study hours	Student Learning Time
1	Lecture	3	15	45	4	60	105
2	Tutorial	0	0	0	0	0	0
3	Lab\Practical	0	0	0	0	0	0
4	Lab report	0	0	0	0	0	0
5	Homework	0	5	0	1	5	5
6	Quiz	0.25	3	1	1	3	4
7	Test (Midterm)	1.5	2	3	5	10	13
8	Final Exam	2	1	2	8	8	10
1	Lecture	3	15	45	4	60	105
Total				63		86	137

Independent self-study = $86/15 \cong 6$ hrs per week

Your course grade will be based on your semester work as follows:

Midterm 1: 20 %	Midterm 2: 20 %	Final Exam: 40 %
Quizzes; Homework & Attendance & Participation: 20 %		

The grading distribution:

A+	A	B+	B	C+	C	D+	D	F
[95, 100]	[90, 95]	[85, 90]	[80, 85]	[75, 80]	[70, 75]	[65, 70]	[60, 65]	[0, 60]

F. Student Attendance/Absence

Only three situations will be considered as possible excused absences:

- Occurrence of a birth or death in the immediate family will be excused. ("Immediate family" is defined by the University as spouse, grandparents, parents, brother, or sister).
- Severe illness in which a student is under the care of a doctor and physically unable to attend class will be excused. Students are not excused for a doctor's appointment. Do not make appointments that conflict with rehearsals. Notes from the University Health Center will be accepted.



[Executive Rules for Study Regulations and Exams](#)

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