

## Planning and Quality Assurance Affairs

Form (A)

### Course Specifications

#### General Information

Course name	Orrganic Chem.(Speacial Topics)
Course number	CHEM4238
Faculty	
Department	
Course type	College Needs
Course level	4
Credit hours (theoretical)	2
Credit hours (practical)	0
Course Prerequisites	

#### Course Objectives

- 1 - The purpose of this course is to teach the chemist how to identify organic compounds using spectroscopic spectra: mass, infrared nuclear magnetic resonance and ultraviolet. Essentially, the molecule in question subjected to energy probes, and the molecules responses are recorded as spectra. The application for spectral methods including spectrometric identification of organic compounds including mass spectrometry deals with instrumentation mass spectrum determination of a molecular formula, recognition of the molecular ion peak, fragmentation, rearrangement derivatives, mass spectra of some chemical class, INFRARED spectrophotometer . (IR) Theory and Instrumentation, sample handling, interpretation of spectra, characteristic groups absorption of organic molecules.

#### Course Contents

- 1 - 1. Molecular formula and what can be learned from them 1.1 Elemental analysis and calculations 1.2 Determination of molecular mass 1.3 Molecular formulas 1.4 Index of hydrogen deficiency 2. Introduction to spectroscopy 3. Infrared spectroscopy 3.1 The infrared absorption process 3.2 Preparation of samples for IR analysis 4. Nuclear magnetic resonance spectroscopy Part 1: Basic concepts 4.1 Nuclear spin states 4.2 The chemical shifts and shielding 4.3 Chemical equivalence 4.4 Coupling constants 4.5 Problems with integration in H-spectra 5. Nuclear magnetic resonance spectroscopy Part 2: Carbon-13 spectra 5.1 The carbon-13 nucleus 5.2 Carbon-coupled and carbon-decoupled spectra 5.3 Problems with integration in Carbon-13 spectra 6. Ultraviolet spectroscopy 6.1 Principles of absorption spectroscopy 6.2 Instrumentations 6.3 Presentation of spectra 7. Mass spectrometry 7.1 Sample introduction 7.2 Ionization methods 7.3 Mass analysis 8. Combined structure problems

#### Teaching and Learning Methods

- 1 - Lectures and discussions

#### Students Assessment

Assessment Method	TIME	MARKS
Final exam 50% Carry marks 30%		
Assignments 15% Attendance and participation 5%		

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## Books and References

Recommended books	Introduction to Spectroscopy 4th Edition, by Donald L. Pavia, Gary M. Lampman, George S. Kriz and James A. Vyvyan (Author)
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