

Planning and Quality Assurance Affairs

Form (A)

Course Specifications

General Information

Course name	Phytochemistry (2)
Course number	PHCG4209
Faculty	
Department	
Course type	Major Needs
Course level	4
Credit hours (theoretical)	2
Credit hours (practical)	0
Course Prerequisites	

Course Objectives

- 1 - 1- Current updated information of the biosynthetic pathways of the mevalonic acid pathway
- 2 - 2-Origin and isolation / identification methods of bioactive substances belonging to this pathway
- 3 - 3-Therapeutic and toxicological activities of these substances
- 4 - 4- Therapeutic application in pharmacy & home remedies specially aromatherapy

Intended Learning Outcomes

Knowledge and Understanding	<ul style="list-style-type: none"> * A1) To know the potentially useful medicinal plants of this pathway * A2) To know the importance and value of ethno pharmacology in drug discovery * A3) To study the biosynthesis of secondary metabolites and major biosynthetic pathways * A4) To know the Latin and bilingual (English/Arabic) common names of potentially used medicinal plants * A5) To know examples of commonly misused natural drugs and their semisynthetic/synthetic derivatives /analogues * A6) To use different references to collect the necessary information * D2) Establishment of advice on the limitations and precautions of commonly used herbal medicines especially by pregnant and lactating mothers
Intellectual Skills	<ul style="list-style-type: none"> * B1) To know and to correlate the mechanisms, concepts and principles of biosynthetic pathways in plants * B2) To expand the horizon of the organic chemistry * B3) To apply the fundamental principles of organic chemistry and biochemistry for construction of terpenoids * B4) To predict the physico-chemical properties of terpenoids * B5) To evaluate the plant/plant, plant/drug and plant/nutrient interactions based on the secondary plant constituents
Professional Skills	<ul style="list-style-type: none"> * C1) Ethnobotanical and ethnopharmacological aspects of plant drugs belong to terpenoids * C2) To acquire updated information on old known medicinal plants * C3) To be familiar with the supposed actions and uses of herbal ingredients whether or not these have been substantiated by animal and human studies * C4) Chemical, biological and therapeutic activities of plant constituents biosynthesized in the mentioned pathways
General Skill	<ul style="list-style-type: none"> * D1) Establishment of advice on the use of medicinal plants as natural remedies * D3) Establishment of advice on the activities and toxicities of important addictive drugs of plant origin

Course Contents

- 1 - Introduction
- 2 - Mevalonic acid Biosynthesis
- 3 - Monoterpenoid (C10) –chemistry
- 4 - Monoterpenoid – Drug
- 5 - Sesquiterpene (C15) – chemistry & Drugs
- 6 - Diterpene (C20) & Sesterterpenes (C25)
- 7 - Triterpenes (C30) – Chemistry) 1
- 8 - Triterpenes (C30) – Chemistry) 2
- 9 - Triterpenoid Saponins Steroids: cholesterol – phytosterols (1)
- 10 - Triterpenoid Saponins Steroids: cholesterol – phytosterols (2)
- 11 - Triterpenoid Saponins Steroids: cholesterol – phytosterols (3)
- 12 - Steroids: Vitamin D – Steroidal saponins
- 13 - Dioscorea spp – Steroidal Alkaloids 1
- 14 - Dioscorea spp – Steroidal Alkaloids 2
- 15 - Cardioactive Glycosides Chemistry (1)
- 16 - 1. Cardioactive Glycosides Chemistry (2)
- 17 - 2. Cardioactive Glycosides –Drugs-
- 18 - Bile Acids-chemistry
- 19 - Bile Acids-Applications
- 20 - Adrenocortical Hormones/Corticosteroids –chemistry-
- 21 - Corticosteroids drugs
- 22 - Progestogens
- 23 - Oestrogens – Phytoestrogens
- 24 - Androgens
- 25 - Steroidal hormone biosynthetic interrelationships
- 26 - Tetraterpenes (C40) – Vitamin A
- 27 - Higher terpenoids
- 28 - General Review/discussions

Teaching and Learning Methods

- 1 - 1) Lectures: 2 credit hours/week
- 2 - 2) Tutorials
- 3 - 3) Case study
- 4 - 4) Assignments, reports: they were assigned to prepare and present a report discussing different aspects of medicinal plants using published papers – not Textbook information.

Teaching and Learning Methods for the Disabled Students

- 1 - Depend on the kind of disability the teacher respectively method of teaching will determine.

Students Assessment

<u>Assessment Method</u>	<u>TIME</u>	<u>MARKS</u>
Midterm	After 8 weeks	30%
Oral / Discussion	After 6 weeks	8%
Assignments	After 4 weeks	5%
Research	End of the semester	7%
Final Exam	After 16 weeks	50%

Books and References

Course note	Mazen Awni El-Sakka
Essential books	Pharmacognosy, Phytochemistry & Medicinal Plants (by Jean Bruneton) 3rd ed 2008
Recommended books	Pharmacognosy (V.E. Tyler)
	Medicinal Natural Products (P.M. Dewick)
	Trease and Evans Pharmacognosy (W.C. Evans)

Knowledge and Skills Matrix

Main Course Contents	Study Week	Knowledge and Understanding	Intellectual Skills	Professional Skills	General Skill
Introduction Mevalonic acid Biosynthesis	1	A1) To know the potentially useful medicinal plants of this pathway A2) To know the importance and value of ethno pharmacology in drug discovery	B2) To expand the horizon of the organic chemistry B3) To apply the fundamental principles of organic chemistry and biochemistry for construction of terpenoids	C1) Ethnobotanical and ethnopharmacological aspects of plant drugs belong to terpenoids	D2) Establishment of advice on the limitations and precautions of commonly used herbal medicines especially by pregnant and lactating mothers
Biosynthetic pathways of the mevalonic acid pathway	1	A1) To know the potentially useful medicinal plants of this pathway A3) To study the biosynthesis of secondary metabolites and major biosynthetic pathways	B1) To know and to correlate the mechanisms, concepts and principles of biosynthetic pathways in plants B2) To expand the horizon of the organic chemistry	C1) Ethnobotanical and ethnopharmacological aspects of plant drugs belong to terpenoids	D1) Establishment of advice on the use of medicinal plants as natural remedies