



# UNIVERSITY OF NICOSIA

## ΠΑΝΕΠΙΣΤΗΜΙΟ ΛΕΥΚΩΣΙΑΣ

<b>Course Code</b> PHAR-361	<b>Course Title</b> Pharmacognosy and Chemistry of Natural Products II/ Φαρμακογνωσία και Χημεία Φυσικών Προϊόντων II	<b>Credits (ECTS)</b> 6
<b>Department</b> Life & Health Sciences	<b>Semester</b> Spring	<b>Prerequisites</b> PHAR360,
<b>Type of Course</b> Required	<b>Field</b> Pharmacy	<b>Language of Instruction</b> Greek/English
<b>Level of Course</b> 1 <sup>st</sup> Cycle	<b>Year of Study</b> 3 <sup>rd</sup> year	<b>Lecturer</b> Christos Petrou/ Staff
<b>Mode of Delivery</b> face-to-face	<b>Work Placement</b> N/A	<b>Co-requisites</b> None

### Objectives of the Course:

Drugs important in Pharmacy and medicine which are derived from natural products. This course covers their isolation (extraction), chemical constitution, biochemical nature, and physiological actions. The course will also incorporate the study of herbal medicine. The module includes main topics of Botany.

### Learning Outcomes:

After completion of the course students are expected to:

1. to explain the origin of drugs from natural sources.
2. to explain the role of natural products as the source of many drugs and pharmaceutical ingredients
3. to identify some drugs available in the healthcare system that are obtained or sourced from natural products.
4. to discuss the occurrences of side effects, overdose and interactions with Herbal products which occur frequently for which a patient may seek medical care
5. to discuss the processes of standardization of natural products following WHO and other existing guidelines
6. The students will be able to explain the role of the pharmacist in the use of Herbal medicine and other natural products including nutraceuticals.
7. to describe and prepare a herbarium specimen
8. Know the important natural products, their origin, properties and biological activity;
9. Know the common adulterations;
10. Know the contribution of natural products in drug design and development of new drugs with hemisynthetic routes or with total synthesis

**Course Contents:**

Occurrence, distribution, organoleptic evaluation, microscopical evaluation, chemical constituents including tests wherever applicable and therapeutic efficacy of following categories of drugs.

- a) Drugs acting on nervous system – Hyoscyamus, Belladonna, Aconite  
Ashwagandha, Ephedra, Opium, Cannabis, Nux vomica.
- b) Antihypertensives – Rauwolfia
- c) Antitussives – Vasaka, tolu balsam, Tulsi
- d) Antirheumatics – Guggul, Colchicum
- e) Antitumour – Vinca
- f) Antileprotics – Chaulmoogra Oil
- g) Antidysenterics – Ipecacuanha
- h) Antiseptics and disinfectants - Benzoin, Myrrh, Neem, curcuma.
- i) Antimalarials – Cinchona
- j) Oxytocics – Ergot
- k) Vitamins
- l) Volatile Oils : General methods of obtaining volatile oils from plants; Study of volatile oils of Mentha, Cassia, Lemon peel, Orange peel, Lemon grass, Citronella, Caraway, Dill, Spearmint, Eucalyptus, Chenopodium, Valerian, Musk, Gaultheria. Medicinal and aromatic plants of Cyprus. Research and efforts for adaptation of foreign plants of high economic value, as sources of medicine or aromatic constituents, to the environmental conditions of Cyprus, e.g. climate, temperature, humidity and chemical constitution of the soil.

Safe use of herbal medicinal products by the pharmacists and Regulatory Affairs: Directive of EU 2001/83 EC as amended by 2004/24/EC (European Medicines Agency - EMA) and its Committee responsible for Herbals (HMPC- Herbal Medicinal Products Committee).

Indicative Lab exercises

*Exercise 1:* Preparation of an extract from a pharmaceutical plant containing, e.g. alkaloids, anthraquinones sugars and/or flavonoids, saponins;

*Exercise 2:* Separation of a mixture and identification of at least three alkaloids;

*Exercises 3-4:* Field work, finding and identification of at least eight medicinal or aromatic plants;

*Exercises 5-6:* Steam distillation or extraction of essential oil from aromatic plants;

*Exercises 7-8:* Chemical, physicochemical and physical characterisation of the obtained essential oils (exercises 5-6).

*Exercise 9:* Isolation of purine alkaloids from tea leaves

**Learning Activities and Teaching Methods:**

Lectures, class discussion, assignments, laboratory

**Assessment Methods:**

Final Examination, Course work

**Required Textbooks/Reading:**

Authors	Title	Publisher	Year	ISBN
G.	Drugs of Natural	Μετάφραση στα Ελληνικά,		

Samuelson	Origin, A textbook of Pharmacognosy	Πανεπιστημιακές Εκδόσεις Κρήτης		
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**Recommended Textbooks/Reading:**

<b>Authors</b>	<b>Title</b>	<b>Publisher</b>	<b>Year</b>	<b>ISBN</b>
K. Torssell	Natural Product Chemistry: A mechanistic, biosynthetic and ecological approach	Swedish Pharmaceutical Press	1997	
M. Heinrich, J. Barnes, S. Gibbons, E. Williamson	Fundamentals of pharmacognosy and phytotherapy	Churchill Livingstone- London	2006	
G. Samuelson	Drugs of Natural Origin, A textbook of Pharmacognosy	Μετάφραση στα Ελληνικά, Πανεπιστημιακές Εκδόσεις Κρήτης		
Χ. Σουλελής	Φαρμακογνωσία	Εκδόσεις Πήγασος, Θεσσαλονίκη	2000	