Course Objectives:
This course is intended to introduce pharmacy students to the concept of the drugs from natural resources according to their biosynthetic origin. Isolation/identification and the biological activities of the plant constituents of the acetate-malonate and shikimic acid pathways and drugs containing these constituents will be discussed. The remaining pathways comprise the topics of the Phytochemistry II lectures. The aim of the lectures is not to rely just on factual information but to impart an understanding of natural product structures and the way they are put together in living organisms.

1- Current updated information of the biosynthetic pathways of the acetate malonate and shikimic acid pathways

2-Origin and isolation / identification methods of bioactive substances belonging to these pathways

3-Therapeutic and toxicological activities of these substances

4-Chemical ecology of these substances
Learning Outcomes:

A) Knowledge and understanding
   A1) To know the potentially useful medicinal plants of these pathways
   A2) To know the importance and value of ethnopharmacology 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/anallogues
   A6) To use different references to collect the necessary information

B) Intellectual skills (cognitive and analytical)
   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 natural products
   B4) To predict the physico-chemical properties of natural products
   B5) To evaluate the plant/plant, plant/animal and plant/insect interactions based on the secondary plant constituents

C) Subject specific skills
   C1) Ethnobotanical and ethnopharmacological aspects of plant drugs
   C2) To acquire updated information on old known medicinal plants
   C3) To be acquainted with the reputed 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

D) Transferable skills
   D1) Provision of advice on the use of medicinal plants as natural remedies
   D2) Provision of advice on the limitations and precautions of commonly used herbal medicines especially by pregnant and lactating mothers
   D3) Provision of advice on the activities and toxicities of important addictive drugs of plant origin
Teaching Methods:
1) Lectures: 2 credit hours/week
2) Demos: Demonstration of the dried plant materials and isolates from the faculty collection
3) Tutorials
4) Laboratory: see separate description
5) Case study
6) Assignments, reports, projects: (At times, when the number of the registered students was not increasing above 100 students, they were assigned to prepare and present a report discussing different aspects of medicinal plants using published papers – not Textbook information-, which is at present with classes 250 or more not possible)

Tests & Evaluations:

Midterm Exam (30%)
Semester works (quizzes, assignments, etc.) (20%)
Final exam (50%)
Course Contents and Schedule:

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Text book: Pharmacognosy, Phytochemistry, Medicinal Plants (by Jean Bruneton).

References:
1. Pharmacognosy (V.E. Tyler)
2. Medicinal Natural Products (P.M. Dewick)
3. Trease and Evan's Pharmacognosy (W.C. Evans)

Important Regulations: University rules and regulations are applied.