Philadelphia University	PHILADELPHIA UNIVERSITY THE WAY TO THE FUTURE	**Approved Date: 13/10/2021**
Faculty: Pharmacy		**Issue:**
Department: Pharmacy		**Credit Hours: 3**
Academic Year: 2021-2022	**Course Syllabus**	**Bachler:**

Course Information

Course No.	Course Title	Prerequisite
0510221	**Pharmacognosy and Phytochemistry**	**Pharmaceutical Organic Chemistry (2) (0510210)**

Course Type	Class Time	Room No.
☐ Univirsity Requirement ☐ Fuclty Requirement ☐ Major Requirement ☐ Elective ■ Compulsory	**Sec.1**: Sun, Tue: 11:15 - 12:45	611
	Sec2: Mon, Wed:12:45-2:15	613

Instructure Information

Name	Office No.	Phone No.	Office Hours	E-mail
Dr. Manal Alhusban	**834**	**2641**	**Sun, Tue: 10:15-11:15 Mon, Wed-11:30-12:30**	**malhusban@philadelphia.edu.jo**

Course Delivery Method

☐ Blended	☐ Online	■ Physical
Learning Model		
Percentage	**Synchronous**	**Asynchronous**	**Physical**
		100%

Course Description

The course is designed to provide the student with basic information about pharmacognosy & phytochemistry, in terms of nomenclature, taxonomy, monographs, quality control, methods for extraction, characterization, detection of active ingredient in medicinal plants, complementary and alternative medicine (CAM), pharmacologically active compounds obtained from natural origin mainly the plant origin, secondary metabolites as alkaloids, cardiac glycosides and anthraquinone glycosides. The chemical structures of these studied phytochemicals will be granted much interest. The student has to recognize the chemical structure mostly with its main features and is expected to be able to relate it to its botanical source, use, toxicity, and interactions with other drugs. Special emphasis will be made on those products used in pharmacy as a prescription-only medicine, controlled drugs, and OTC. The course also has a mention of examples of semi-synthetic or synthetic drugs related to naturally occurring drugs, such as opium alkaloids.

Course Learning Outcomes

Number	Outcome	Corresponding Program Outcomes	Corresponding Competencies
Knowledge			
K1	Be familiar with the main terminology and definitions in pharmacognosy.	**Kp1**	**C1**
K2	Demonstrate the principles of the related analytical and scientific techniques.	**Kp1**	**C1**
K3	Categorize the main active ingredients from the natural sources (plants, animals, etc.), recognize their chemical structures, and illustrate the structure-activity relationship.	**Kp1, Kp2**	**C1, C2**
K4	Summarize the main putative pharmacological effects of the studied medicinal plants depending on their phytochemical content.	**Kp1, Kp2**	**C1, C2**
K5	State the main features of the pharmacological profile of the main active ingredients in plants and other natural sources (activity, toxicity, mechanism of action, etc.).	**Kp1, Kp2**	**C1, C2**
Skills			
S1	Perform some studied analytical techniques (extraction, chromatography, tissue culture, etc.)	**Sp2, Sp3, Sp5**	**C8, C9, C11**
S2	Classify medicinal plants according to their expected biological activities.	**Sp2, Sp3, Sp5**	**C8, C9, C11**
S3	Approve and validate medicines as possible treatments, or part of treatment for diseases.	**Sp2, Sp3, Sp5**	**C8, C9, C11**
S4	Evaluate the possible benefits and risks of the use of medicinal plants in the treatment of diseases and ailments.	**Sp2, Sp3, Sp5**	**C8, C9, C11**

Learning Resources

Course Textbook	Pharmacognosy Trease and Evans. 16th Edition, 2009, Published by ELBS, London ISBN 978-0702029332
Supporting References	• Drugs of Natural Origin, 7th edition 2015 Gunnar Samuelsson. Swedish Pharmaceutical Press, ISBN 978—91-980942-5-1. • Medicinal natural products, a biosynthetic approach, 3rd edition, 2009 Paul Dewick, John Wiley & Sons Ltd, The Atrium, Southern Gate, Chichester, West Sussex, PO19 8SQ, United Kingdom, ISBN 0 471 49640

	• Pharmacognosy, phytochemistry, Medicinal Plants. 2nd edition Jean Bruneton: Springer Verlag, 2008, ISBN: 1898298130, 2743000287
Supporting Websites	• Phytochemistry • Natural Products Research • Journal of Phytochemistry • Fitooterapia • Pharmaceutical Biology • Journal of Ethnopharmacology
Teaching Environment	■ **Classroom** ☐ **laboratory** ☐ **Learning Platform** ☐ **Other**

Meetings and Subjects Time Table

Week	Topic	Learning Method*	Task	Learning Material
1	Introductory guidance topics and issues: vision and mission of the Faculty, course syllabus			Provided in the Learning Resources table
2	Introduction, definitions: crude drug, advanced crude drug, Classification, indigenous and cultivated plants, factors involved in production of plants, official drugs, monographs.	Lecture		
3	Quality control	Lecture, Flipped learning	Homework	
4	Tissue culture.	Lecture Flipped, learning	Short presentation	
5	ALKALOIDS: Introduction, Nomenclature, Classification Physiological significance, Detection, Isolation, and Biosynthesis.	Lecture		
6	Amino alkaloids and Biosynthesis: Ephedrine and pseudoephedrine, cathine and cathinone, mescaline, muscarine, and colchicine	Lecture, Collaborative learning	Case study	
7	Aziridine alkaloids: Mytomicine C. Pyridine alkaloids and Biosynthesis: Nicotine, trigonelline, epibatidine Piperidine alkaloids and Biosynthesis: Coniine, arecoline, lobeline, pelletierine.	Lecture, Problem-solving based learning	Short report	
8	Pyrrolizidine alkaloids: Distribution in the plants and mechanism of hepatotoxicity Tropane alkaloids and Biosynthesis:	Lecture,	Video-washing report	

	Hyoscyamine and atropine, scopolamine, cocaine.	Problem-solving based learning		
9	Quinoline alkaloids and Biosynthesis: Cinchona alkaloids, camptothecin derivatives. Quinolizidine alkaloids and Biosynthesis: Sparteine, lupine, anagyrine.	Lecture, Collaborative learning	Homework	
10	Isoquinoline alkaloids and Biosynthesis: Berberine and protoberberine. Tetrahydroisoquinoline alkaloids: Emetine and cephaeline.	Lecture, Collaborative learning	Homework	
11	**MID-TERM EXAM** ********** Bisbenzylisoquinoline alkaloids: Tubocurarine, toxiferine. Benzophenanthridine alkaloids and Biosynthesis: Sanguinarine.			
12	Indole alkaloids and Biosynthesis: Physostigmine, ergot alkaloids, vinca alkaloids, and nux-vomica. Imidazole alkaloids: Pilocarpine. Amaryllidaceae alkaloids: Galanthamine.	Lecture, Problem-solving based learning	Case study	
13	CARDIAC GLYCOSIDES: Pharmacology and chemistry.	Lecture, Problem-solving-based learning. Video-watching	Case study Short report	
14	Digitalis, Strophanthus, squill, oleander	Lecture,		
15	ANTHRAQUINONES: Pharmacology and chemistry	Lecture		
16	Cascara, Rhubarb, Senna, Aloe, Carmine, Hypericin. **FINAL EXAM**			

Course Contributing to Learner Skill Development

Using Technology
• Using PowerPoint or any relevant program for preparing presentations. • Demonstration of data in various forms as plots, bars, etc., and illustrating them.
Communication Skills
• Report writing. • Teamwork in solving case studies and problems
Application of Concept Learnt
• The suggestion of medications for various diseases and ailments. • Participation in patient reassurance and support of his psychological health by offering advice and solutions.

- Involvement in the activities of drug discovery.

Assessment Methods and Grade Distribution

Assessment Methods	Grade	Assessment Time (Week No.)	Course Outcomes to be Assessed
Mid Term Exam	30%	11th Week	**K1-K5 S1-S4**
Term Works*	30%	Continous	**K1-K5 S1-S4**
Final Exam	40%	16th Week	**K1-K5 S1-S4**
Total	100%		

* Include quizzes, in-class and class assignments, presentations, reports, videotaped assignment, group, or individual project.

Alignment of Course Outcomes with Learning and Assessment Methods

Number	Learning Outcomes	Corresponding Competencies	Learning Method*	Assessment Method**
Knowledge				
K1	Be familiar with the main terminology and definitions in pharmacognosy	C1	Lecture	Short exams with subjective and objective-typed questions.
K2	Demonstrate the principles of the related analytical and scientific techniques.	C1, C6	Lecture, flipped learning	-Short exams with subjective and objective-typed questions. -Video-watching assignment evaluation.
K3	Categorize the main active ingredients from the natural sources (plants, animals, etc.), recognize their chemical structures, and illustrate the structure-activity relationship.	C1, C2	Lecture, Collaborative learning, Problem solving-based learning	-Short exams with subjective and objective-typed questions.

K4	Summarize the main putative pharmacological effects of the studied medicinal plants depending on their phytochemical content.	**C1, C2**	Lecture, Flipped learning, collaborative learning, Problem solving-based learning.	--Short exams with subjective and objective-typed questions. -Short report-writing. - Homeworks. Presentation
K5	State the main features of the pharmacological profile of the main active ingredients in plants and other natural sources (activity, toxicity, mechanism of action, etc.).	C1, C2	Lecture, Flipped learning, collaborative learning, Problem solving-based learning.	-Case-study solving reports. -Short exams with subjective and objective-typed questions. Short report-writing. - Presentation.
Skills				
S1	Perform some studied analytical techniques (extraction, chromatography, tissue culture, etc.)	C8, C9, C11	Lecture, collaborative learning, problem-solving-based learning, flipped learning.	-Case-study solving reports. -Short exams with subjective and objective-typed questions. Short report-writing. - Presentation. -Plot and graph illustrations. -Video-watching commenting evaluation.

S2	Classify medicinal plants according to their expected biological activities.	C8, C9, C11	Lecture, problem-solving-based learning, flipped learning	-Short exams with subjective and objective-typed questions. Short report-writing. - Presentation. - Short report - writing.
S3	Approve and validate medicines as possible treatments, or part of treatment for diseases.	C8, C9, C11	Lecture, Case study, problem-solving-based learning, flipped learning.	-Short exams with subjective and objective-typed questions. Short report-writing. - Presentation. -Video-watching commenting evaluation. Homeworks. -Simulation scinarios.
S4	Evaluate the possible benefits and risks of the use of medicinal plants in the treatment of diseases and ailments.	C8, C9, C11	Lecture, case-study, flipped learning.	-Short exams with subjective and objective-typed questions. Short report-writing. - Presentation. -Video-watching commenting evaluation. Homeworks. -Simulation scenarios.

*Inclusion of lecture, flipped class, project-based learning, problem-solving learning, collaboration learning.
** Inclusion of quizzes, in-class and out-of-class assignments, presentations, reports, videotaped assignments, group or individual projects.

Course Polices

Policy	Policy Requirements
Passing Grade	The minimum pass for the course is (50%) and the minimum final mark is (35%).
Missing Exams	• Anyone absent from a declared semester exam without a sick or compulsive excuse accepted by the dean of the college that proposes the course, a zero mark shall be placed on that exam and calculated in his final mark. • Anyone absent from a declared semester exam with a sick or compulsive excuse accepted by the dean of the college that proposes the course must submit proof of his excuse within a week from the date of the excuse's disappearance, and in this case, the subject teacher must hold a compensation exam for the student. • Anyone absent from a final exam with a sick excuse or a compulsive excuse accepted by the dean of the college that proposes the material must submit proof of his excuse within three days from the date of holding that exam.
Attendance	The student is not allowed to be absent more than (15%) of the total hours prescribed for the course, which equates to six lecture days (n t) and seven lectures (days). If the student misses more than (15%) of the total hours prescribed for the course without a satisfactory or compulsive excuse accepted by the dean of the faculty, he is prohibited from taking the final exam and his result in that subject is considered (zero), but if the absence is due to illness or a compulsive excuse accepted by the dean of the college that The article is introduced, it is considered withdrawn from that article, and the provisions of withdrawal shall apply to it.
Academic Integrity	Philadelphia University pays special attention to the issue of academic integrity, and the penalties stipulated in the university's instructions are applied to those who are proven to have committed an act that violates academic integrity, such as cheating, plagiarism (academic theft), collusion, intellectual property rights.