Arab International University

Faculty: Pharmacy; Department: Pharmaceutics and pharmaceutical Technology

Course No: 021003 **Course Name:** Introduction to pharmacy

Course Description

Credit hours: 3 hours (weekly). Theoretical: 2 hours. Practical: 2 hours.
Prerequisite: None.

Course Objectives

1- To provide an introduction to the profession of pharmacy to student, who will start understanding his role as a pharmacist in the society.
2- To provide an overview on drug discovery and new drug dosage forms development to student, that could passionate him about his future profession.
3- To provide an understanding of how the subjects that comprise the five-year pharmaceutical education combine to provide the knowledge and skills needed for general pharmacy practice.
4- To learn how to prepare medical prescriptions by using different laboratory equipments.
5- Providing the students with the main skills needed for pharmacy practice, such as problem-solving, reading prescriptions, and using lab equipment.

Activities description by ABC LD

- **Acquisition activities (AA):** Learning through acquisition is what learners are doing when they are listening to a lecture or podcast, reading from books or websites, and watching demos or videos.
- **Collaboration activities (CA):** Learning through collaboration embraces mainly discussion, practice, and production. Building on investigations and acquisition it is about taking part in the process of knowledge building itself.
- **Discussion activities (DA):** Learning through discussion requires the learner to articulate their ideas and questions, and to challenge and respond to the ideas and questions from the teacher, and/or from their peers.
- **Investigation activities (IA):** Learning through investigation guides the learner to explore, compare and critique the texts, documents and resources that reflect the concepts and ideas being taught.
- **Practice activities (PraA):** Learning through practice enables the learner to adapt their actions to the task goal, and use the feedback to improve their next action. Feedback may come from self- reflection, from peers, from the teacher, or from the activity itself, if it shows them how to improve the result of their action in relation to the goal.
- **Production activities (ProA):** Learning through production is the way the teacher motivates the learner to consolidate what they have learned by articulating their current conceptual understanding and how they used it in practice.

The course was redesigned using needs and suggestions mentioned in 1- Course Introduction to Pharmacy -Pre-design work.pdf

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Theoretical hours outline

Week	Topic (LN, Lecturer notes; PCSA, Pre-class student activity; DCSA, During class student activity, HW, Homework)	Textbook Chapters and Pages *T:C,p-p
1	**Introduction to drugs and the heritage of pharmacy.** LN: reading Introduction to Drugs and Pharmacyv3.pdf (p1-5) (AA, 1 hour) PCSA: search on internet about drug definition, history of pharmacy, drug discovery, and, drug development. (IA, 2 hours) DCSA: discussing the internet research done by students and compared with LN. (DA, 1.5 hours) HW: ask students to form groups of 4 students to prepare 5 minutes' video about drug definition and history of pharmacy. (ProA, 2 hours; CA, 2 hour))	1:1, 1-6
2	**Drug standard, regulation and control.** LN: reading Introduction to Drugs and Pharmacyv3.pdf (p6-11) (AA, 1 hour) PCSA: search on internet about drug standards, USP-NF, European Pharmacopeia, United Stat or Syrian Arab Republic acts concerning drug regulation and control. (IA, 2 hours) DCSA: discussing the internet research done by students and compared with lecturer notes. (DA, 1.5 hour) HW: ask students to form groups of 4 students to discuss the regulation of biological drugs using discussion forums in moodle. (DA, 2 hours)	1:1, 7-18
3	**The pharmacist's contemporary role.** LN: reading Introduction to Drugs and Pharmacyv3.pdf (p12) (AA, 1 hour) PCSA: reading in What does a pharmacist do? (General Pharmaceutical Council). (AA, 1 hours) DCSA: 15 minutes' webinar with a member of pharmacy syndicate. (DA, 0.25 hours) 15 minutes' webinar with a professional pharmacist who work in official pharmacy. (DA, 0.25 hours) 15 minutes' webinar with a professional pharmacist who work in pharmaceutical laboratory. (DA, 0.25 hours) 15 minutes' webinar with a professional pharmacist who work in pharmaceutical manufacture. (DA, 0.25 hours) 15 minutes' webinar with a professional pharmacist who work as medical representative. (DA, 0.25 hours) HW: ask students to form groups of 4 students and prepare a project titled: New pharmacist role. The group of students must present this project before the course ending. (ProA, 1 hour; CA, 2 hour)	1:1, 19-26

Week	Topic (LN, Lecturer notes; PCSA, Pre-class student activity; DCSA, During class student activity, HW, Homework)	Textbook Chapters and Pages *T:C,p-p
4	**New drug development, approval process, drug discovery and drug design.** LN: reading New Drug Development and Approval Process1v3.pdf (p1-8) (AA, 1 hour), watching New Drug Development and Approval Process.svg PCSA: reading in Development & Approval Process | Drugs - FDA (AA, 1 hour), watching 5 Things You Need to Know About the Drug Approval Process and Introduction to Investigational New Drug (IND) Applications (AA, 1 hour) search on internet about clinical trials (IA, 1 hour) DCSA: discussing the PCSA and compared with LN. (DA, 1.5 hour), HW: The students are invited to express their opinion about drug discovery method using discussion forums in moodle. (DA, 0.5 hour)	1:2, 27-36
5	**Biologic characterization and early formulation studies.** LN: reading New Drug Development and Approval Process1v3.pdf (p8-10) (AA, 1 hour) PCSA: search on internet about ADME and toxlogy of new API (IA, 3 hours), watching Everything You Wanted to Know About Preclinical ADME and Human AME But Were Afraid to Ask: Part 1 (AA, 0.25 hour) DCSA: discussing the PCSA and compared with LN. (DA, 1.5 hour). HW: ask students to form groups of 4 students and prepare 5 minutes' video on pharmacokinetics of a API. (ProA, 2 hours; CA, 2 hour)	1:2, 37-44
6	**The investigational new drug application.** LN: reading New Drug Development and Approval Process1v3.pdf (p11-14) (AA, 1 hour) PCSA: watching Introduction to Investigational New Drug (IND) Applications (AA, 1 hour) DCSA: discussing the PCSA and compared with LN. (DA, 1.5 hour)	1:2, 45-57
7	**The new drug application, supplemental, abbreviated drug applications and other applications.** LN: reading New Drug Development and Approval Process1v3.pdf (p14-17) (AA, 1 hour) PCSA: watching So, Your NDA Was Approved – Now What?! Post-approval Responsibilities and Obligations (AA, 1 hour) DCSA: discussing the PCSA and compared with LN. (DA, 1.5 hour) HW: ask students to form groups of 4 students and prepare a project titled: Discovery and Development of New Drug to treat "????". The group of students must present this project before the course ending. (ProA, 3 hour; CA, 2 hour)	1:2, 58-65

Week	Topic (LN, Lecturer notes; PCSA, Pre-class student activity; DCSA, During class student activity, HW, Homework)	Textbook Chapters and Pages *T:C,p-p
8	**Current good manufacturing practice and current good compounding Practices.** LN: reading cGMPv3.pdf (p1-6) (AA, 1 hour) PCSA: reading Current Good Manufacturing Practice (CGMP) Regulations, (AA, 1 hours), search on internet about cGCP (IA, 2 hours) DCSA: discussing the PCSA and compared with LN. (DA, 1.5 hour) HW: ask students to form groups of 4 students and watching Episode 4: ISO vs. cGMP vs. FDA Requirements and prepare summary report (ProA, 1 hours, CA, 2 hour).	1:3, 66-79
9	**Packaging, labeling, and storage of pharmaceuticals.** LN: reading cGMPv3.pdf (p6-9) (AA, 1 hour) PCSA: reading Good Label and Package Practices Guide for Prescription Drugs (AA, 1 hour), watching Common Labeling Deficiencies and Tips for Generic Drug Applications. DCSA: discussing the PCSA and compared with LN. (DA, 1.5 hour)	1:3, 80-89
10	**Dosage form design: Pharmaceutical and formulation considerations, the need for dosage forms, preformulation studies.** LN: reading Pharmaceutical and Formulation Considerationsv3.pdf (p1-3) (AA, 1 hour) PCSA: search on internet about (physical description, microscopic examination, heat of vaporization, melting point, phase rule) (IA, 1.5 hours) DCSA: discussing the PCSA and compared with LN. (DA, 1.5 hour)	1:4, 90-98
11	**Preformulation studies** LN: reading Pharmaceutical and Formulation Considerationsv3.pdf (p4-10) (AA, 1 hour) PCSA: search on internet about (polymorphism, particle size, solubility, dissolution, dissociation constant, partition coefficient, membrane permeability) (IA, 1.5 hours) DCSA: discussing the PCSA and compared with LN. (DA, 1.5 hour)	1:4, 99-110
12	**Active principle ingredient and drug product stability.** LN: reading Pharmaceutical and Formulation Considerationsv3.pdf (p10-13) (AA, 1 hour) PCSA: search on internet about mechanisms of API degradation, Shelf Life, Q_{10} method of shelf life estimation, enhancing stability of drug products, and, Stability Testing (IA, 1.5 hours) DCSA: discussing the PCSA and compared with LN. (DA, 1.5 hour)	1:4, 111-127

Week	Topic (LN, Lecturer notes; PCSA, Pre-class student activity; DCSA, During class student activity, HW, Homework)	Textbook Chapters and Pages *T:C,p-p
13	**Pharmaceutical ingredients and excipients.** LN: reading Pharmaceutical and Formulation Considerationsv3.pdf (p13-16) (AA, 1 hour) PCSA: search on internet about different types of excipients and their functions (IA, 1.5) DCSA: discussing the PCSA and compared with LN. (DA, 1.5 hour)	1:4, 128-142
14	**Dosage form design: Biopharmaceutical and pharmacokinetic considerations.** LN: reading Biopharmaceutical and Pharmacokinetic Considerationsv3.pdf (p1-8) (AA, 1 hour) PCSA: search on internet about absorption, bioavailability, and, bioequivalence (IA, 1.5) DCSA: discussing the PCSA and compared with LN. (DA, 1.5 hour)	1:5, 143-161
15	The student are invited to play the **Racer Master educational** game installed in moodle to prepare to Final Exam (you can see its video screen shot here).	

*T is the reference number as cited under the textbook information paragraph, C is the chapter's number and p-p is page numbers.
AA, Acquisition activities; CA, Collaboration activities; DA, Discussion activities; IA, Investigation activities; PraA, Practice activities; ProA, Production activities.

Practical hours outline: All these hours are considered as practical activities (lab work). Hence, total PA is 28 hours

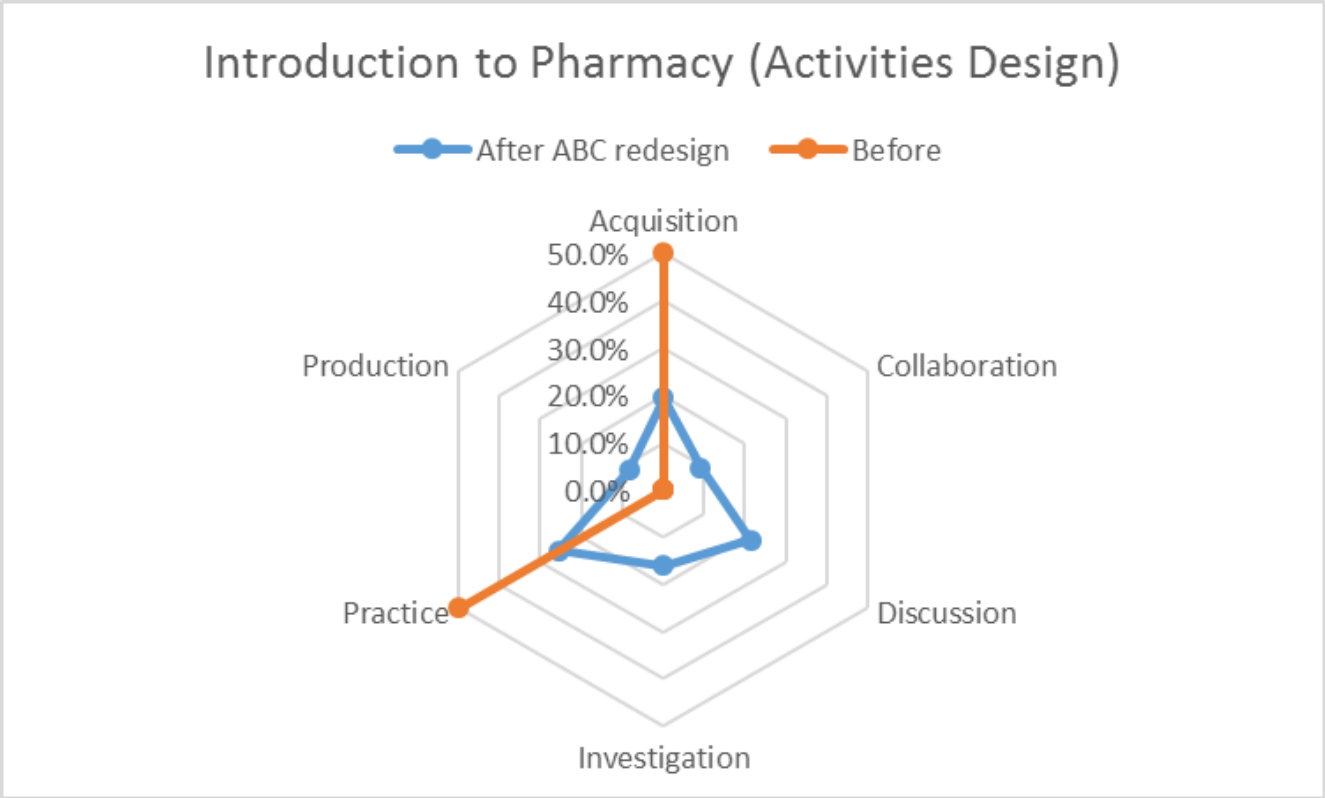
Week	Topic	Textbook Chapters and Pages. *T:C,p-p
1	Introduction to pharmacopoeias, drug references and laboratory equipments. Medical prescription definition and terminology.	2:1, 2-7
2	Pharmaceutical dosage forms. Powders definition, preparation and usage. Pharmaceutical calculations. Excipients: fillers and effervescent couple.	1:6, 184-202 2:2: 8-11
3	Capsules definition, types, sizes, preparation and usage. Tapped density and flow properties. Excipients: disintegrants, lubricants and glidants.	1:7, 203-223 2:3, 12-14
4	Solutions definition, classification, preparation and usage. Solubility and dissolution. Density and specific gravity. Excipients: Preservatives, vehicles.	1:13, 331-375 2:4, 15-17
5	Topical solution definition, preparation and usage. Tinctures. Excipient: solvent and solubilizing agents.	1:13, 331-375 2:5, 18-19
6	Oral solutions definition, preparation and usage. Effervescent reaction to	1:13, 331-375

Week	Topic	Textbook Chapters and Pages. *T:C,p-p
	produce active ingredient. Excipients: flavorant and dispersing agents	2:6, 20-21
7	Syrups definition, preparation and usage. Sugar and sugar substitutes. Excipients: sweetening agent, co-solvent, stabilizing and chelating agents	1:13, 331-375 2:6, 22-23
8	Elixirs definition, preparation and usage. Packaging and storage. Comparison between Syrups and Elixirs. Excipient: alcohol and colorant.	1:13, 331-375 2:6, 24-25
9	Gargles and mouth washes definition, preparation and usage. Administration conditions, shelf life. Excipient: Buffering agents and tonicity agents.	1:13, 331-375 2:6, 26-28
10	Drops definition, preparation and usage. Purified, distilled, deionized and filtrated waters. Viscosity. Excipients: Viscosity-increasing agent.	1:13, 331-375 2:7, 29
11	Dispersions, Suspensions, emulsions and colloidal dispersions.	1:14, 376-430
12	Glycerites definition, preparation and usage. Glycerin, propylene glycol and sorbitol. Excipients: humectants.	1:14, 376-430 2:8, 30
13	Mucilages definition, preparation and usage. Starch, gelatin and acacia. Excipients: suspending agents, emulsifying agents and adhesive agents.	1:14, 376-430 2:8, 31-33
14	Alcohol preparation and usage. Ethanol and isopropanol. Alcohol strength and density.	1:13, 331-375 2:8, 34-35
15	Exam	

*T is the reference number as cited under the textbook information paragraph, C is the chapter's number and p-p is page numbers.

Activities distribution after redesigning using by ABC LD

Introduction to Pharmacy (ABC LD Activities Design).		
	After ABC redesign	**Before**
Acquisition	19.5%	50%
Collaboration	9.2%	0
Discussion	21.3%	0
Investigation	16.1%	0
Practice	25.6%	50%
Production	8.3%	0
Total	100%	100%



Textbook Information:

- Loyd V. Allen, jr, Nicholas G. Popovich and Howard C. Ansel (2011) Ansel's pharmaceutical dosage forms and drug delivery systems. 9th Edition, Lippincott Williams & Wilkins, Baltimore MD, USA.
- Hind El Zein, Issa Hassan and Hala Alashmar(2005) Introduction to pharmacy laboratory manual. 1st Edition, Syria, Arab International University, Damascus, Syria.
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