



**Philadelphia University**  
**Faculty of Pharmacy**  
**Department of Pharmaceutical Sciences**  
**Second Semester 2017/2018**

Course syllabus	
<b>Course Title: Pharmaceutics 1</b>	<b>Course code: 510321</b>
<b>Course Level: 3<sup>rd</sup> year</b>	<b>Course prerequisite :Physical pharmacy</b>
<b>Lecture Time:</b> <b>Class (1) Sunday ,Tuesday ,Thursday 8:10- 9:00</b> <b>Class (2) Sunday ,Tuesday ,Thursday 10:10- 11:00</b> <b>Class (3) Sunday ,Tuesday ,Thursday 11:10- 12:00</b> <b>Class (4) Monday, Wednesday 11:15- 12:45</b> <b>Class (5) Monday, Wednesday 8:15- 9:45</b>	<b>Credit hours: 3 hours</b>

**Academic Staff**  
**Specifics**

Name	Rank	Office Number and Location	Office Hours	E-mail Address
<b>Dr. Mohammad Bayan</b>	<b>Assistant Professor</b>	<b>P529</b>	<b>Sun ,Tues, Thurs</b> <b>9-10</b> <b>Mon,Wed</b> <b>12:45-1:45</b>	
<b>Ms. Alaa Adnan</b>	<b>Lecturer</b>	<b>532</b>	<b>Sun ,Tues</b> <b>12-1</b> <b>Mon,Thur11-12</b>	<b><u><a href="mailto:aadnan@philadelphia.edu.jo">aadnan@philadelphia.edu.jo</a></u></b>

### **Course description :**

At this level, the student will be familiar with the basics of solutions dosage form, Students apply that knowledge to the pharmaceutical dosage forms and will be introduced to coarse dispersions (suspension and emulsion) , in addition to this course provide the student with basic knowledge and understanding of the different types of interfaces, the term surface tension and interfacial tension and the mechanism of adsorption at interfaces, classifying the surface active agents and appreciating their application in pharmacy along with the basic knowledge of Rheology .

### **Course objectives:**

The course aims at:

1. Defining and understanding the concepts of different types of solution dosage forms.
2. Understanding the concepts of pharmaceutical suspensions and emulsions, factors that affect their stability and describing approaches used in preparing physically stable formulations
3. Familiarizing students with preformulation studies and their application.
4. Discuss types of dosage forms and administration routes in relation with therapeutic outcomes.
5. Explain physicochemical principles relevant to pharmaceutical dosage forms.
6. Classifying the surface active agents and appreciating their application in pharmacy.
7. Understanding the concepts of Rheology and its application in pharmaceutical preparations

### **Education resources**

- **Books**

- 1. Pharmaceutical Dosage Forms and Drug Delivery Systems**

by Loyd V. Allen, Jr & Howard C. Ansel, Lippincott Williams & Wilkins 10<sup>th</sup> Edition ,2014

- 2. Aulton's Pharmaceutics, The Design and Manufacture of Medicines, Edit.: Michael E. Aulton, Kevin M. G. Taylor Pub.: Churchill Livingstone, 4<sup>th</sup> edition, 2013.**

### **Teaching methods:**

Lectures (interactive; group discussion), Numerical problems and identification of some pharmaceutical compounds related to some topics will be discussed in the class.

***Learning outcomes:******Knowledge and understanding***

Upon completion of this course students will be able to:

- Defining and understanding the concepts of different types of liquid dosage forms (solution, suspensions and emulsions) factors that affect their stability and describing approaches used in preparing physically stable formulations
- Discuss types of dosage forms and administration routes in relation with therapeutic outcomes.
- Explain physicochemical principles relevant to liquid pharmaceutical dosage forms.
- Classifying the surface active agents and appreciating their application in pharmacy.
- Understanding the concepts of Rheology and its application in pharmaceutical preparations

***Cognitive skills (thinking and analysis)***

- Compare various liquid preparations used in pharmaceutical dosage forms and assess their advantages and disadvantages.
- Demonstrate capability of choosing the appropriate preparation method for a particular pharmaceutical product prescription compounding.
- Demonstrate and Apply physicochemical and biopharmaceutic concepts to interpret dosage form design.
- Choose appropriate formulations to achieve target properties of given medications.
- Read, evaluate, and interpret numerical, chemical and general scientific information.
- Evaluate and solve incompatibility problems encountered in the preparation of liquid dosage form.

***Transferable Skills***

- Use pharmaceutical techniques to calculate and find correct answers to solve simple problems in compounding and dispensing.
- Use pharmacopeia and references guidelines to develop processes, procedures, to produce pharmaceuticals of appropriate quality and quality assures them.
- Read, evaluate, and interpret numerical, chemical and general scientific information.
- Formulate significant research questions, design experiments, use appropriate chemical instrumentation, and analyze and interpret data.
- Search and use the chemical literature in both printed and electronic formats.

## Assessment instruments

- In-class quizzes
- Homework assignments
- Short reports and/ or presentations, and/ or Short research projects
- Final examination: 50 marks

<u>Allocation of Marks</u>	
<b>Assessment Instruments</b>	<b>Mark</b>
First examination	<b>20%</b>
Second examination	<b>20%</b>
Final examination: 50 marks	<b>40%</b>
Reports, research projects, Quizzes, Home works, Projects	<b>20%</b>
Total	<b>100%</b>

## Documentation and academic honesty

### • *Documentation style (with illustrative examples)*

Whenever applicable, students should conduct their assignments themselves whether individually or in a group work referencing all information, data, figures and diagrams taken from literature. The references should be given according to the acceptable format.

### ***Protection by copyright***

Students should realize that some published information or data are the property of their authors and they are not allowed to use it without asking permission from the originators.

### ***Avoiding plagiarism.***

Plagiarism is the unauthorized use or close imitation of the language and thoughts of another author and the representation of them as one's own original work, without proper acknowledgment of the author or the source. Students must pursue their studies honestly and ethically in accordance with the academic regulations. Cheating in exams and plagiarism are totally unacceptable and those who, intentionally, commit such acts would be subjected for penalties according to the University regulations.

## Course/module academic calendar

<b>week</b>	<b>Basic and support material to be covered</b>
<b>1</b>	1. Pharmaceutical dosage form: <ul style="list-style-type: none"><li>▪ Introduction dosage form and excipient</li><li>▪ Classification (physical form)</li><li>▪ Classification (route of administration)</li></ul>
<b>2</b>	2. Pharmaceutical solutions <ul style="list-style-type: none"><li>▪ Introduction</li><li>▪ Solvents and vehicles</li><li>▪ Preparation of solutions</li><li>▪ Formulation considerations</li></ul>
<b>3</b>	<ul style="list-style-type: none"><li>▪ Oral solutions</li><li>▪ Syrups</li><li>▪ Elixirs</li><li>▪ Tinctures</li></ul>
<b>4</b>	<ul style="list-style-type: none"><li>▪ Topical solutions</li><li>▪ Vaginal &amp; Rectal</li><li>▪ Miscellaneous:</li><li>▪ Aromatic waters</li><li>▪ Spirits</li><li>▪ Colloidons</li></ul>
<b>5</b>	3. Dispersed systems: Suspension: <ul style="list-style-type: none"><li>▪ Surface tension phenomena and surfactants</li></ul>
<b>6</b> <b>First examination</b>	<ul style="list-style-type: none"><li>▪ The mechanism of adsorption at interfaces</li></ul>
<b>7</b>	<ul style="list-style-type: none"><li>▪ Suspensions Sedimentation rate</li><li>▪ Preparation of flocculated suspensions</li></ul>
<b>8</b>	<ul style="list-style-type: none"><li>▪ Wetting, flocculating and suspending agents.</li></ul>
<b>9</b>	<ul style="list-style-type: none"><li>▪ Sustained release suspensions</li><li>▪ Packaging and storage</li></ul>
<b>10</b>	<ul style="list-style-type: none"><li>▪ Pharmaceutical applications</li></ul>
<b>11</b>	<ul style="list-style-type: none"><li>▪ Rheology of suspensions</li></ul>
<b>12</b> <b>Second examination</b>	4. Dispersed systems: Emulsions: <ul style="list-style-type: none"><li>▪ Types</li><li>▪ Tests for identification</li><li>▪ Purpose</li><li>▪ Preparation</li><li>▪ Emulsifiers and stabilizers</li></ul>
<b>13</b>	<ul style="list-style-type: none"><li>▪ HLB method</li></ul>
<b>14</b>	<ul style="list-style-type: none"><li>▪ Microemulsions</li><li>▪ Methods of emulsion preparation</li></ul>
<b>15</b>	<ul style="list-style-type: none"><li>▪ Stability of emulsions</li></ul>
<b>16</b> <b>Final Examination</b>	Final Exam Week

**Expected workload:**

On average students need to spend 2 hours of study and preparation for each 50-minute lecture/tutorial.

**Attendance policy:**

Absence from lectures and/or tutorials shall not exceed 15%. Students who exceed the 15% limit without a medical or emergency excuse acceptable to and approved by the Dean of the relevant college/faculty shall not be allowed to take the final examination and shall receive a mark of zero for the course. If the excuse is approved by the Dean, the student shall be considered to have withdrawn from the course.

**Other References:**

- **Books**

Students will be expected to give the same attention to these references as given to the Module textbook(s)

1. Martin's Physical Pharmacy and Pharmaceutical Sciences By : Patrick J. Sinko, Lippincott Williams & Wilkins , 2006, 5<sup>th</sup> Edition

2. Modern Pharmaceutics  
by Gilbert S. Banker (Editor), Christopher T. Rhodes (Editor) 4th edition (June 15, 2002), Marcel Dekker; ISBN: ISBN: 0824706749

3. Merck Index: An Encyclopedia of Chemicals, Drugs, & Biologicals  
by Merck, Co, Maryadele J. Oneil (Editor), Ann Smith (Editor) 13th edition (October 2001), Merck & Co; ISBN: 0911910131

4. The Theory and Practice of Industrial Pharmacy  
by Leon Lachman, Herbert A. Lieberman, Joseph L. Kanig. 3rd edition (August 1986), Lea & Febiger; ISBN: 0812109775

5. Physical Pharmacy: Physical Chemical Principles in the Pharmaceutical Sciences  
by Alfred Martin, Pilar Bustamante, A.H.C. Chun (Illustrator)  
622 pages 4th edition (January 15, 1993), Lea & Febiger; ISBN: 0812114388

6. Handbook of Pharmaceutical Excipients  
by Arthur H. Kibbe (Editor), Ainley Wade, Paul J. Weller  
665 pages 3rd edition Vol 3 (January 15, 2000), Amer. Pharmaceutical Assoc.; ISBN: 091733096X

7. Remington: The Science and Practice of Pharmacy  
by Alfonso R. Gennaro (Editor) 20th edition (December 15, 2000), Lippincott, Williams & Wilkins; ISBN: 0683306472