

Planning and Quality Assurance Affairs

Form (A)

Course Specifications

General Information

Course name	Physical Pharmacy 2
Course number	PHTC2203
Faculty	
Department	
Course type	Major Needs
Course level	2
Credit hours (theoretical)	2
Credit hours (practical)	0
Course Prerequisites	

Course Objectives

- 1 - To recognize the area of pharmacy that deals with the quantitative and theoretic principles of science as they apply to the practice of pharmacy.
- 2 - To aid the pharmacist, pharmacologist, and the pharmaceutical chemist in their attempt to predict the solubility, stability, compatibility, and biologic action of drug products.
- 3 - To be in a better position to develop new drugs and dosage forms and to improve upon the various modes of administration.
- 4 - To be able to use the physico chemical principles in various branches of pharmacy.
- 5 - To help students, researchers and manufacturing pharmacists to use the elements of mathematics, chemistry, and physics in their work and study.
- 6 - To recognize the responsibilities and duties of the pharmaceutical department.
- 7 - To be able to conduct preformulation studies in the pharmaceutical units.
- 8 - To recognize the problems encountered during the manufacturing of pharmaceutical dosage forms.

Intended Learning Outcomes

Knowledge and Understanding	<ul style="list-style-type: none">* To be able to deal with the duties of the pharmaceutical department: research and development department, quality control department, and quality assurance department.* To have the ability to conduct preformulation studies, such as accelerated stability studies and compatibility studies.* To know various problems encountered during the manufacturing of the pharmaceutical dosage forms, and the possible remedies for each problem.* To be able to perform quality control tests for the pharmaceutical dosage forms.
Intellectual Skills	<ul style="list-style-type: none">* To be able to analyze and present the data obtained from the different pharmaceutical units.* To be able to suggest remedies for the problems encountered during the manufacturing and formulation of pharmaceutical dosage forms.
Professional Skills	<ul style="list-style-type: none">* To gain knowledge and analytical skills to work with people in the pharmaceutical units.* To have the ability for quick adaptation to the working environment in pharmaceutical units.* To have the ability to deal with and suggest solutions to the problems encountered during the manufacturing process of pharmaceutical dosage forms in the pharmaceutical units.

Course Contents

1 - Interfacial phenomena: liquid interfaces, adsorption at the liquid interfaces, adsorption at the solid interfaces, application of surface active agents, electric properties of interfaces.
2 - Colloids: introduction, types of colloidal system, optical properties of colloids, kinetic properties of colloids, electric properties of colloids, micellar solubilization.
3 - Rheology: introduction, Newtonian systems, Non-Newtonian systems, Thixotropy, Negative Thixotropy, Rheopexy, determination of rheologic properties, viscoelasticity, psychorheology, applications to pharmacy.
4 - Diffusion and dissolution: steady state diffusion, procedures and apparatus, dissolution, drug release, diffusion principles in biologic systems, Ficks first and second laws, diffusion and ecology, pH partition theory.
5 - Kinetics: rates and orders of reactions, influence of temperature and other factors on reaction rates, decomposition and stabilization of medicinal agents, kinetics in the liquid state, accelerated stability analysis.
6 - Coarse dispersions (will be discussed within the previous chapters): suspensions, interfacial properties of suspended particles, settling in suspensions, emulsions, physical stability of emulsions, preservation of emulsions, rheologic properties of emulsions.

Teaching and Learning Methods

1 - Lectures.
2 - Assignments for self analytical learning.

Students Assessment

<u>Assessment Method</u>	<u>TIME</u>	<u>MARKS</u>
Midterm Exam	Approximately during the 8th week.	30%-40%
Final Exam	Approximately during the 14th week.	60%
Homework	During the course time	10%
Quizzes	During the course time	10%

Books and References

Essential books	Martin, A., Bustamante, P. and Chun, A.H.C. 1993. Physical Pharmacy. Physical Chemical Principles in the Pharmaceutical Sciences. Fourth edition. Lea and Febiger. Philadelphia, London.
Recommended books	<p>Allen Jr., Loyd V., Popovich, Nicholas G. and Ansel, Howard C. 2011. Ansel's Pharmaceutical Dosage Forms and Drug Delivery Systems. Ninth edition. Lippincott Williams & Wilkins. Philadelphia. USA.</p> <p>Ansel, H.C., Popovich, N.G. and Allen, L.V. Jr. 1995. Pharmaceutical Dosage Forms and Drug Delivery Systems. Sixth edition. Lea and Febiger, USA.</p> <p>Attwood, D. and Florence, T.A. 1983. Surfactant Systems, Their Chemistry, Pharmacy and Biology. First edition. Chapman and Hall. London, New York.</p> <p>Aulton, E.M. 1990. Pharmaceutics. The Science of Dosage Form Design. Second edition. ELBS, UK.</p> <p>Aulton, Michael E. 2007. Aulton's Pharmaceutics: The Design and Manufacture of Medicines. Third edition. A Churchill Livingstone, Elsevier limited.</p> <p>Florance, A.T. and Attwood, D. 1985, Physicochemical Principles in Pharmacy. Second edition. Macmillan, UK.</p> <p>Lechman, L., Libberman, H.A., and Kanig, J.L. 1986. The Theory and Practice of Industrial Pharmacy. Third edition. Lea and Febiger, Philadelphia, USA.</p> <p>Libberman, H.A. and Lechman, L. 1981. Pharmaceutical Dosage Forms. Second edition. Marcel Dekker. Inc., N.Y., USA.</p> <p>Sinko, Patrick J. 2010. Martin's Physical Pharmacy and Pharmaceutical Sciences. Sixth edition. Lippincott Williams & Wilkins. Philadelphia. USA.</p> <p>Sinko, P.J. and Singh, Y. 2011. Martin's Physical Pharmacy and Pharmaceutical Sciences. Physical Chemical and Biopharmaceutical Principles in the Pharmaceutical Sciences. Sixth edition. Wolters Kluwer- Lippincott Williams & Wilkins. USA.</p> <p>Troy, David B. 2005. Remington – The Science and Practice of Pharmacy. Twenty first edition. Lippincott Williams & Wilkins. Philadelphia. USA.</p> <p>Yalkowsky, S.H., Sinkula, A.A. and Valvani S.C. 1980. Physical Chemical Properties of Drugs. Marcel Dekker, INC, USA.</p>
Other References (Periodical, web sites, etc.)	<p>Rowe, Raymond C., Sheskey Paul J. and Quinn Marian E. 2009. Handbook of Pharmaceutical Excipients. Sixth edition. Pharmaceutical Press and American Pharmacists Association. London, UK and Washington USA. Available online at the link: https://nurirjawati.files.wordpress.com/2012/01/handbook-of-pharmaceutical-excipients-6th-edition.pdf</p>