

MOPH 862 (3 CR)

Advanced Pharmaceutics

(Fall Semester of 2010)

- Coordinator:** MJCho, PhD
- Instructors:** MJCho and Guest Lecturers
- Description:** Discussion of physicochemical principles involved in drug delivery systems development.
- Prerequisite:** PHCY 410 and PHCY 411 (Basic Pharmaceutics I and II), or equivalents. Pre-approval by course director is required for the latter case.
- Time and Place:** Mon and Wed, 10:00 AM – 11:15 AM, Beard 105
- References:**
- Alfred Martin, "Physical Pharmacy," 4th Ed., Lea & Febiger, Philadelphia, PA, 1993.
- S.R. Byrn, R.R. Pfeiffer, and J.G. Stowell, "Solid-State Chemistry of Drugs," 2nd Ed., SSCI, Inc., West Lafayette, IN, 1999.
- J.T. Carstensen, "Theory of Pharmaceutical Systems," Academic Press, 1972.
- J.N. Butler, "Ionic Equilibrium: Solubility and pH Calculations," John Wiley, New York, 1998.
- I.H. Segel, "Biochemical Calculations," 2nd Ed., John Wiley, New York, 1976.
- W.P. Jencks, "Catalysis in Chemistry and Enzymology," McGraw-Hill, New York, 1969 (Paperback in 1987).
- M. L. Bender, "Mechanisms of Homogeneous Catalysis from Protons to Proteins," Wiley-Interscience, New York, 1971.
- Examination:** There will be two mid-term exams, each contributing 25% to the final grade, and a final examination worth 50%

Lecture Schedule

<u>Lecture No</u>	<u>Date</u>	<u>Topic (Instructor)</u>
I. Equilibria in Pharmaceutics		
1	8/25/Wed	Thermodynamics and LFER
2	8/30/Mon	Optical Properties of Drug Molecules
3	9/1/Wed	pKa of Weak Acids and Bases
4	9/8/Wed	Ionic Equilibria and Buffers
5	9/13/Mon	Colligative Properties
6	9/15/Wed	Partition Phenomena and Lipophilicity
7	9/20/Mon	Solubility and Solubilization
8	9/22/Wed	Molecular Interaction
9	9/27/Mon	Interfacial Phenomena
10	9/29/Wed	1st Mid-Term Exam (Lectures No 1-9) Beard 105, 10 AM to 1 PM
II. Rate Processes and Drug Degradation Mechanisms		
11	10/4/Mon	Diffusion, Convection & Dissolution (Fan Yuan)
12	10/6/Wed	Chemical Kinetics
13	10/11/Mon	Reaction Mechanisms
14	10/13/Wed	Catalysis in Hydrolytic Reactions
15	10/18/Mon	pH-Rate Profile
16	10/20/Wed	Stability of Drugs: Case Study I
17	10/25/Mon	Stability of Drugs: Case Study II
18	10/27/Wed	Chemical Stability of Peptides and Proteins
19	11/1/Mon	Protein Denaturation
20	11/3/Wed	2nd Mid-Term Exam (Lectures No 11-19) Beard 105, 10 AM to 1 PM

III. Applied Physical Pharmacy

21	11/8/Mon	Polymorphism (Govindarajan)
22	11/10/Wed	Influence of Water on Product Stability (Govindarajan)
23	11/15/Mon	Chemical Transformations in the Solid State
24	11/17/Wed	Salt Selection (Brashear)
25	11/22/Mon	Micromeritics
26	11/29/Mon	Statistics in Pharmaceutics (Hird)
27	12/1/Wed	In Vitro-In Vivo Correlations (Burke/Brashear)
28	12/6/Mon	Formulation in Drug Development: Overview (Hird)
29	12/8/Wed	Course Review
30	12/13/Mon	Final Exam (All Lectures) Beard 105, 8 AM to 1 PM