

Syllabus for CHEM501900 BIOPHYSICAL CHEMISTRY

Fall 2008

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Lecture:

Time: M3M4R1

Room: CHEM325

Method: Lecture, 3 credits

Course Outline:

Part I:

- Amino Acids and Protein Structures
 - Review properties of amino acids
 - Secondary structures
 - Noncovalent interactions in proteins
 - Globular and fibrous proteins
- Protein Folding and Unfolding
 - Protein stability and thermodynamics
 - Folding kinetics
 - Protein design
 - Protein misfolding
 - Spectroscopic techniques for folding study

Part II:

- Spin-Label Electron Spin Resonance
 - Fundamental principles
 - Modern ESR experiments
 - Biophysical applications
- Dynamics of Biomolecules
 - Brownian motion
 - Physical Chemistry of Drug delivery

Grading:

Homework & Problem set	30%
Mid-term exam	30%
Final exam	40%

Reference (* indicates important books):

- A.Schweiger, *Principles of Pulse Electron Paramagnetic Resonance**.
- K.E. van Holde, W.C. Johnson, P.S. Ho, *Principles of Physical Biochemistry**.
- D. Eisenberg, D. Crothers, *Physical Chemistry with Applications to the Life Sciences**.
- T.E. Creighton, *Proteins – Structures and Molecular Properties*.
- M. Daune, *Molecular Biophysics – Structures in Motion*.
- P. Atkins and J. Paula, *Physical Chemistry for the Life Sciences*
- A.V. Finkelstein, O.B. Ptitsyn, *Protein Physics**
- A. Fersht, *Structure and Mechanism in Protein Science**
- C. Branden, J. Tooze, *Introduction to Protein Structure, 2nd Ed.*