

Syllabus for CHEM501900 BIOPHYSICAL CHEMISTRY, Fall 2010

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Lecture:

Time: M7M8F6

Room: CHEM325

Method: Lecture, 3 credits

Course Outline:

Part I:

- Amino Acids and Protein Structures
 - Review properties of amino acids
 - Secondary structures
 - Supersecondary 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 for Biophysical Study
 - Fundamental principles;
 - Magnetic resonance of the hydrogen atom; Spin dipolar interactions; Distance measurement of doubly labeled spins by CW-ESR;
 - Studying protein and membranes by cw- and Pulse-ESR.

Grading:

Homework & Problem set	25%
Mid-term exam	35%
Final exam	40%

Test Schedule:

Mid-term exam: 11/29/10

Final exam: 1/10/10

References (* indicates important books):

- *T. Engel, G. Drobny, P. Reid, Physical Chemistry for the Life Sciences.*
- *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.*
- *I. Tinoco, K. Sauer, J.C. Wang, J.D. Puglisi, Physical Chemistry: Principles and Applications in Biological Sciences*

