[redacted]

Persons to Contact for Further Information: Dr. Neil Asting
Dr. Donald McKelvey

Course Affected: None

Desired Effective Semester for Change: Fall 1986

Approvals: Dept. Committee Chairperson: [redacted]

Suggested Text -

Physical Chemistry for the Life Sciences, by Gordon M. Barrow, McGraw-Hill Book Company (Second Edition 1981)

Order of Presentation of Topics -

Week No.	Description
1-2	**Some Properties of Matter and Molecules:** Particle Nature of Light, Macroscopic--Molecular Relations, PVT Behavior of an [illegible]
	Molecular Motions, Quantum Restrictions, Boltzmann Distribution, Mathematical Review, etc.
3	**Energy Changes in Chemical Reactions:**
	The First Law of Thermodynamics, Internal Energy and Enthalpy, Heats of Reaction, Heat Capacity, Bond Energies, Molecular Interactions, etc.
4	**Entropy and the Direction of Chemical**
	Change: The Second Law of Thermodynamics
	Effect of Phase and Temperature on Entropy Changes, Entropy Changes and Mixing, Molecular Basis for Entropy, The Third Law

Binding Sites, Expressions for Sequential Binding, Independent and Equivalent Binding Sites, etc.

8 **Physical Equilibria & Membrane Phenomena:** Vapor Pressure of a Liquid, Physical Equilibria Involving Solutions, Colligative Properties, Molecular Weights from Osmotic Pressure, Dialysis Equilibria, Donnan Membrane Equilibria, Ion Transport and Membrane Potentials, Active Transport, etc.

9 **Rates of Transport Processes:** Diffusion, Determination of Diffusion Coefficients, Diffusion and the Random Walk, Molecular Interpretation of Diffusion, Ultra-Centrafuge and Sedimentation-Velocity Methods, Sedimentation-Equilibrium Method, Electrophoresis, Shapes of

[redacted]

Measurements, etc.

10 **Rates of Chemical Reactions:** Measurement of Rates of Chemical Reactions, Rate Equations, Fitting Data to a First-Order

[redacted]

Reactions, Inhibition of Enzyme Action, Series of Reactions, Relaxation Methods, Temperature Dependence of Rates of Chemical

Molecules in Crystals; Molecular Structure: Classification of Crystals and Their Internal Structures, X-Ray Diffraction and the Determination of Fiber Structure, X-Ray Diffraction Determination of Crystal Structure, The Unit Cell, Intensities of Diffraction and the [redacted]

and Some Aspects of Protein Structures, etc.

A3. Academic Need:

This course is a required part of a newly proposed major at [redacted]

"why" of this science, modern biochemistry takes a view that is increasingly "molecular" in its approach. Thus, in order for students of this major to gain full insight into biochemical processes, a firm foundation on the physical laws and principals which govern all "chemical" systems is needed. This special Physical Chemistry Course with emphasis on systems of biological interest is intended to meet this need.

Effect on Dept. Programs:

A6. Trial Offering:

[redacted]

C. Evaluation

The evaluation of student performance in this course will arise from three primary sources: homework assignments, hour examinations and a cumlative final examination. More specifically, it is anticipated that 8-10 homework exercises would be assigned during the course of the semester and that 3-4 hour examinations would be also be administered. Finally, a comprehensive final examination would be given during the normally scheduled final exam period. These three sources would then contribute the following percentages to the total score:

Homework (8-10 sets)	15% (total)
Hour Exams (3-4)	60% (total)
Final Exam	25%

C2. Variable Credits:

This course will be assigned 3 credits and will not have a variable number of credits associated with it.

D. Implementation

D1. Resources Needed:

a. Faculty - Currently, the Chemistry Department has the personnel needed to teach this course.

b. Space & Equipment - No equipment other than standard audio-visual aids which the department already possesses are neeeded. The department has sufficient class room space to teach

D3. No. of Se

Since the number of majors in this proposed Biochemistry program most likely will be small and since only a few Biolo

all students (with the proper [illegible] who sign up for this course.