CALIFORNIA STATE UNIVERSITY CHANNEL ISLANDS

NEW COURSE PROPOSAL

PROGRAM: MULTIPLE PROGRAMS/ CHEMISTRY

1. **Catalog Description of the Course.** *[Include the course prefix, number, full title, and units. Provide a course narrative including prerequisites and corequisites. If any of the following apply, include in the description: Repeatability (May be repeated to a maximum of ___ units); time distribution (Lecture ___ hours, laboratory ___ hours); non-traditional grading system (Graded CR/NC, ABC/NC). Follow accepted catalog format.]*

   CHEM 373. Physical Chemistry II (3)
   Three hours lecture per week.
   Prerequisite: CHEM 122 with a grade of C or better, PHYS 101 or PHYS 201, and MATH 150.
   Introduction to quantum mechanics, atomic and molecular structure, spectroscopy, and statistical mechanics.

2. **Mode of Instruction.**

	Units	Hours per Unit	Benchmark Enrollment
Lecture	3	1	36
Seminar			
Laboratory			
Activity			

3. **Justification and Learning Objectives for the Course.** (Indicate whether required or elective, and whether it meets University Writing, and/or Language requirements) *[Use as much space as necessary]*

   This course isan elective for students in the Chemistry major, and may be taken by some other science majors, who are interested in physical chemistry for their profession or post-graduate studies. This course will be an upper-division elective for students wanting to receive a degree in chemistry, or an elective for the minor in chemistry.

   Students who successfully complete this course will be able to:
   - Analyze, both qualitatively and quantitatively, how molecular shape, electronic structure, thermodynamics, kinetics, and intermolecular interactions (Big Ideas in Chemistry) are interrelated in Physical Chemistry.
   - Describe classical mechanics and quantum mechanics as they apply to chemical systems.
   - Calculate quantities using quantum mechanical principles
   - Derive the atomic structure and spectroscopic properties of atoms using quantum mechanical principles.
   - Derive the molecular orbitals for small molecules.
   - Identify the symmetry elements of a molecule and its influence on electronic structure and electronic spectra.
   - Discuss the rotational, vibrational, and electronic spectra of molecules

4. **Is this a General Education Course** **YES** **(NO)**
   If Yes, indicate GE category:

5. **Course Content in Outline Form.** *[Be as brief as possible, but use as much space as necessary]*

   Quantum theory: principles, techniques, and applications
   Atomic structure and atomic spectra
   Molecular structure
   Symmetry: description and consequences
   Rotational and vibrational spectra
   Electronic transitions
   Magnetic resonance
   Statistical thermodynamics
   Statistical thermodynamics

6. References. *[Provide 3 - 5 references on which this course is based and/or support it.]*

Atkins, P.W. *Physical Chemistry*, 7th Ed. 2001
Levine, I.N. *Physical Chemistry,* 5th Ed. 2001
McQuarrie, D.A.; Simon, J.D. *Physical Chemistry* 1st Ed. 1997

7. List Faculty Qualified to Teach This Course.

Dr. Simone Aloisio

8. Frequency.

a. Projected semesters to be offered: Fall _____ Spring __X___ Summer _____

9. New Resources Required.

None.

10. Consultation.

Attach consultation sheet from all program areas, Library, and others (if necessary)

11. If this new course will alter any degree, credential, certificate, or minor in your program, attach a program modification.

Philip D. Hampton October 4, 2004

Proposer of Course Date

Approvals

_____

Program Coordinator Date

_____

GE Committee Chair Date
(If applicable)

_____

Curriculum Committee Chair Date

_____

Dean Date

Effective Semester: _____

California State University Channel Islands
New Course Proposal Consultation Sheet

1. Course prefix, number, title, and units: CHEM 371. Physical Chemistry (3 units)

2. Program Area: Multiple Programs/ Chemistry

Recommend Approval

Program Area/Unit	Program/Unit Coordinator	YES	NO (attach objections)	Date
Art				
Business & Economics				
Education				
ESRM				
Humanities				
Liberal Studies				
Mathematics & CS				
Sciences				
Library*				
Information Technology*				

* If needed