CHEM 140B: PHYSICAL CHEMISTRY LECTURE II

In Workflow

1. CHEM Committee Chair (ghermanb@csus.edu)
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11. PeopleSoft (PeopleSoft@csus.edu)

Approval Path

1. Wed, 02 Oct 2019 20:35:00 GMT
   Benjamin Gherman (ghermanb): Approved for CHEM Committee Chair
2. Fri, 04 Oct 2019 04:29:15 GMT
   Roy Dixon (rdixon): Approved for CHEM Chair
3. Mon, 21 Oct 2019 22:23:02 GMT
   Thomas Krabacher (tsk): Approved for NSM College Committee Chair
4. Wed, 23 Oct 2019 18:00:51 GMT
   Shannon Datwyler (datwyler): Approved for NSM Dean

Date Submitted:Fri, 27 Sep 2019 17:22:28 GMT

Viewing:CHEM 140B : Physical Chemistry Lecture II

Last edit:Fri, 27 Sep 2019 17:22:26 GMT

Changes proposed by: Benjamin Gherman (102085943)

Contact(s):

Name (First Last)	Email	Phone 999-999-9999
Benjamin Gherman	ghermanb@csus.edu	916-278-6600

Catalog Title:
Physical Chemistry Lecture II

Class Schedule Title:
Phys Chemistry Lect II

Academic Group: (College)
NSM - Natural Sciences & Mathematics

Academic Organization: (Department)
Chemistry

Will this course be offered through the College of Continuing Education (CCE)?
No

Catalog Year Effective:
Fall 2020 (2020/2021 Catalog)

Subject Area: (prefix)
CHEM - Chemistry

Catalog Number: (course number)
140B

Course ID: (For administrative use only.)
108821

Units:
3

In what term(s) will this course typically be offered?
Spring term only

Does this course require a room for its final exam?
Yes, final exam requires a room

Does this course replace an existing experimental course?
No

This course complies with the credit hour policy:
Yes

Justification for course proposal:
Correction for term typically offered is being made for this course. Currently indicated erroneously as Fall/Spring, and being corrected to Spring only (as has been the case for Chem 140B in the chemistry department for at least 20 years). No other changes made to the Form A.

Course Description: (Not to exceed 80 words and language should conform to catalog copy.)
Introduction to molecular quantum chemistry, structure of matter, molecular spectroscopy, and statistical thermodynamics.

Are one or more field trips required with this course?
No

Fee Course?
No

Is this course designated as Service Learning?
No

Does this course require safety training?
No

Does this course require personal protective equipment (PPE)?
No

Does this course have prerequisites?
Yes

Prerequisite:
CHEM 140A.

Prerequisites Enforced at Registration?
Yes

Does this course have corequisites?
No

Graded:
Letter

Approval required for enrollment?
No Approval Required

Course Component(s) and Classification(s):
Discussion

Discussion Classification
CS#04 - Lecture /Recitation (K-factor=1 WTU per unit)

Discussion Units

3

Is this a paired course?

No

Is this course crosslisted?

No

Can this course be repeated for credit?

No

Can the course be taken for credit more than once during the same term?

No

Description of the Expected Learning Outcomes: Describe outcomes using the following format: "Students will be able to: 1), 2), etc."

Students will be able to:
1) Explain experiments leading to the development of quantum mechanics.
2) Apply principles of mathematics and calculus relevant to quantum mechanics (e.g., eigenfunctions/eigenvalues, orthogonal functions, normalized functions, complete sets).
3) Apply the five basic postulates of quantum mechanics to work with quantum mechanical wave functions and to study quantum mechanical systems.
4) Apply quantum mechanics to the study of translational, vibrational, and rotational degrees of freedom using the particle in a box, harmonic oscillator, and rigid rotor models, respectively.
5) Understand the quantum mechanics underlying vibrational, rotational, and electronic spectroscopies.
6) Apply the principles of quantum mechanics to describe wave functions for atoms and molecules, electron configurations in atoms, and bonding (via valence bond and molecular orbital theories) in molecules.
7) Use statistical thermodynamics principles (e.g., Boltzmann distribution) to predict the distribution of energy in a collection of molecules.
8) Become skilled at calculations occurring in quantum mechanics, including, but not limited to, dimensional analysis and applications of differential and integral calculus.

Assessment Strategies: A description of the assessment strategies (e.g., portfolios, examinations, performances, pre-and post-tests, conferences with students, student papers) which will be used by the instructor to determine the extent to which students have achieved the learning outcomes noted above.

• Homework assignments (L.O. #1-#8)
• Quizzes (L.O. #1-8)
• Midterm exams and final exam (L.O. #1-#8)

Is this course required in a degree program (major, minor, graduate degree, certificate?)

Yes

Has a corresponding Program Change been submitted to Workflow?

No

Identify the program(s) in which this course is required:

Programs:
BS in Chemistry
BA in Chemistry (Biochemistry)
BA in Chemistry (General)

Does the proposed change or addition cause a significant increase in the use of College or University resources (lab room, computer)?

No

Will there be any departments affected by this proposed course?

No

I/we as the author(s) of this course proposal agree to provide a new or updated accessibility checklist to the Dean's office prior to the semester when this course is taught utilizing the changes proposed here.

I/we agree

University Learning Goals

Undergraduate Learning Goals:

Competence in the disciplines
Integrative learning
Intellectual and practical skills

Is this course required as part of a teaching credential program, a single subject, or multiple subject waiver program (e.g., Liberal Studies, Biology) or other school personnel preparation program (e.g., School of Nursing)?

No

GE Course and GE Goal(s)

Is this a General Education (GE) course or is it being considered for GE?

No

Please attach any additional files not requested above:

140B_syllabus.pdf

Key: 664