Course Inventory Change Request

New Course Proposal

Date Submitted: 09/12/14 9:58 am

Viewing: CHEM 3060: Physical Chemistry 1

Last edit: 09/12/14 9:58 am

Changes proposed by: kbringhurst

Course Prefix: CHEM 3060

Effective Semester: Fall 2015

Department: Physical Sciences (PS)

School: School of Science & Technology

Course Title: Physical Chemistry 1

Short Course Title: Physical Chemistry 1

Credits: 4

Workload Factors: 4

Primary Grade Type: Standard Letter

Secondary Grade Type:

Instructor Permission Required: No

Repeatable for Credit: No

Schedule Type/Hours:

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<tr>
<th>Schedule Type</th>
<th>Hrs/Wk</th>
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Approval Path

1. 09/12/14 11:57 am
   Ruth Bruckert (bruckert): Approved for SC Dean

In Workflow

1. SC Dean
2. University Curriculum Committee Chair
3. Banner
LEC 4

Catalog Prerequisites? Yes

Catalog Prerequisites:
Chem 1220 AND Phys 2210
Grade Required on C
Prerequisite(s):

Corequisites? No
Course/Lab Fee? No
Instruction Index Code: NAT202

GE Status Requested: No

Catalog Description
A problem-oriented course in atomic and molecular structure, states of matter, and chemical kinetics. Introduction to efficient retrieval of information from the physical chemical literature and thinking critically about the material. Students will understand the difference between classical and quantum mechanics, understanding the time, length, and energy scales on which chemical processes occur, and connect common approximation methods to standard chemical frameworks.

Course Rotation:
Fall (odd)

Justification for course/change:
This course will be an elective for the Minor in Chemistry. This course is appropriate for students wishing to learn the underlying concepts behind the chemical theories learned in both the general chemistry and organic chemistry series.

Library Resources Adequate: Yes
Tech Resources Adequate: Yes

Comparable Courses:
(use USHE course first)

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<tr>
<th>Institution</th>
<th>Prefix/Number</th>
<th>Credit(s)</th>
<th>Course Title</th>
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https://newcatalog.dixie.edu/courseleaf/approve/?role=admin
Course Learning
Outcomes:
• understanding the time, length, and energy scales on which chemical processes occur
• understanding the differences between classical and quantum mechanics
• connecting operators to observables
• distinguishing probabilities, amplitudes, averages, expectation values, and observables
• understanding the origin and implications of quantum coherence
• interpreting spectra
• connecting common approximation methods to standard chemical frameworks (Born-Oppenheimer, molecular orbitals)
• developing molecular-level critical thinking skills

How do your Course Learning Outcomes align to your Program Learning Outcomes?

Physical Science Learning Outcomes:
1. Will be able to demonstrate knowledge of the skills required to make informed personal and social decisions about the issues that we will face locally as well as globally.
2. Will be able to demonstrate knowledge of basic fundamental laws, concepts, and theories in the physical sciences and be able to apply them to everyday life.
3. Will understand the process of science — how scientific knowledge is generated and validated — so that they can make independent, empirical inquiries about the natural world.
4. Will be able to demonstrate knowledge of the process of science by being able to interpret data in the form of tables, graphs, and charts and then communicate those findings in oral and or written form.

CLO #1 aligns with PLO # 2, 3, 4
CLO #2 aligns with PLO # 1, 4
CLO #3 aligns with PLO # 2, 4
CLO #4 aligns with PLO # 3, 4
CLO #5 aligns with PLO # 3, 4
CLO #6 aligns with PLO # 1, 2 , 3 ,4

Schedule of lesson activities that meet Course Learning Outcomes

Quantum Theory
Atomic Structure
Atomic Spectra
Molecular Orbitals
Molecular Symmetry
Spectroscopy
Statistical Thermodynamics
Chemical Reaction Rates
Chemical Kinetics
Reaction Dynamics

Assessment
activities that
provide evidence of
student learning
Assessment will include individual and group assignments (25% of total grade), exams (25% of total grade), a final exam (20% of total grade), participation in class discussions (10%), and a report/proposal based current topics and reports in the scientific literature (20%).

Is this a Concurrent Enrollment Course?

Course Reviewer
Comments
lee_s|Fri, 12 Sep 2014 15:35:42 GMT|Rollback: From Sharon Lee. Kelly: On your prerequisites, are all the classes listed, "AND" prerequisites, or are they "OR" prerequisites. If they're "AND" prerequisites, you only need to list CHEM 2310 because 1220 is a prereq to 2310; 1210 is a prereq to 1220, so we only list the last course in the series. Math 1220 is also a prereq to PHYS 2210, so I don't think we need to list Math 1220 either. If they're "OR" prereq's, then these will be OK; however, it needs to state Chem 1210 OR CHEM 1220 OR CHEM 2310, etc. If it's AND, then CHEM 2310 AND PSY 2210 (Grade C or better in both) because the lower courses are all prereq's to the upper numbers. Does this sound OK to you?