

ORIGINATOR'S SECTION:														
1. College: <input checked="" type="checkbox"/> CoAS <input type="checkbox"/> CoBA <input type="checkbox"/> CoE	Desired Term and Year of Implementation (e.g., Fall 2008): Fall 2009													
2. Course is to be considered for G.E.? (If yes, also fill out appropriate GE form*) <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No														
3. Course will be a variable-topics (generic) course? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No ("generic" is a placeholder for topics)														
4. Course abbreviation and Number:* CHEM 450														
5. Title: (Titles using jargon, slang, copyrighted names, trade names, or any non-essential punctuation may not be used.) Protein Structure and Function														
6. Abbreviated Title for Banner: (no more than 25 characters, including spaces) Protein Struct. & Funct.														
7. Number of Units: 3														
8. Catalog Description: (Not to exceed 80 words; language should conform to catalog copy. Please consult the catalog for models of style and format; include all necessary information regarding consent for enrollment, pre- and/or corequisites, repeated enrollment, crosslisting, as detailed below. Such information does <u>not</u> count toward the 80-word limit.) Intended for science majors, the goal of this course is to introduce students to an in-depth analysis of protein structure and function. Topics covered are: fundamentals of protein structure including structural motifs, domains, and folding, methods of protein structure determination, structural bioinformatics, and an in-depth consideration of the structure-function relationship in representative proteins involved in important biological functions such as transport, enzyme catalysis, protein-nucleic acid interactions, signal transduction, immunity, and membrane channels and receptors. Prerequisite: CHEM 341 or 351 with a minimum grade of C (2.0) or consent of instructor. <i>(Formerly CHEM 491B)</i>														
9. Why is this course being proposed? The department of chemistry continues to observe increased growth and interest in our biochemistry major and related course offerings. This proposed course will offer advanced undergraduate students in chemistry, biochemistry, biological sciences, and biotechnology the opportunity to participate in an in-depth discussion of protein structure and function that cannot be offered through our current biochemistry courses (CHEM 351 and 352). Furthermore, with the completion of many genomic sequencing efforts considerable interest and resources are being invested in studying the structure and function of protein coded for in an organisms' genome (proteomics). In this era of proteomics students preparing for careers related to biochemistry must appreciate the intimate relationship between protein structure and function and the chemical principles that govern this relationship. This course will explore this protein structure-function relationship and thus will benefit our students in their future careers.														
10. Mode of Instruction* (See pages 17-23 at http://www.calstate.edu/cim/data-elem-dic/APDB-Transaction-DED-SectionV.pdf for definitions of the Course Classification Numbers)														
	<table border="1"> <thead> <tr> <th>Type of Instruction</th> <th>Number of Credit Units</th> <th>Instructional Mode (Course Classification Number)</th> </tr> </thead> <tbody> <tr> <td>Lecture</td> <td>3</td> <td>C-02</td> </tr> <tr> <td>Activity</td> <td></td> <td></td> </tr> <tr> <td>Lab</td> <td></td> <td></td> </tr> </tbody> </table>	Type of Instruction	Number of Credit Units	Instructional Mode (Course Classification Number)	Lecture	3	C-02	Activity			Lab			
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Lecture	3	C-02												
Activity														
Lab														
11. Grading Method:* <input checked="" type="checkbox"/> Normal (N) (Allows Letter Grade +/-, and Credit/No Credit) <input type="checkbox"/> Normal Plus Report-in-Progress (NP) (Allows Letter Grade +/-, Credit/No Credit, and Report-in-Progress) <input type="checkbox"/> Credit/No Credit Only (C) <input type="checkbox"/> Credit/No Credit or Report-in-Progress Only (CP)														
12. If the (NP) or (CP) grading system was selected, please explain the need for this grade option.														
13. Course Requires Consent for Enrollment? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Faculty <input type="checkbox"/> Credential Analyst <input type="checkbox"/> Dean <input type="checkbox"/> Program/Department - Director/Chair														
14. Course Can be Taken for Credit More than Once? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If yes, how many times? (including first offering)														
15. Is Course Crosslisted: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If yes, indicate which course and check "yes" in item #22 below.														

see new description att.

* If Originator is uncertain of this entry, please consult with Program/Department Director/Chair.

16. Prerequisite(s): Yes No CHEM 341 or CHEM 351

17. Corequisite(s): Yes No

18. Documentation attached:
 Syllabus Detailed Course Outline

19. If this course has been offered as a topic, please enter topic abbreviation, number, and suffix: *
 CHEM 491B

20. How often will this course be offered once established? * Spring every other year

PROGRAM DIRECTOR/CHAIR - COLLEGE CURRICULUM COMMITTEE SECTION:
(Mandatory information – all items in this section must be completed.)

21. Does this course fulfill a requirement for any major (i.e., core course or elective for a major, majors in other departments, minors in other departments)? Yes No

If yes, please specify:
 Could be taken as an elective by chemistry and biochemistry majors.

22. Does this course impact other discipline(s)? *(If there is any uncertainty as to whether a particular discipline is affected, check "yes" and obtain signature.)* Yes No

If yes, obtain signature(s). Any objections should be stated in writing and attached to this form.

Discipline _____	Signature _____	Date _____	Support _____ Oppose _____
Discipline _____	Signature _____	Date _____	Support _____ Oppose _____

SIGNATURES : (COLLEGE LEVEL) :

1. Originator (please print or type name) Sajith Jagasinghe Date 4/28/08

2. Program Director/Chair JAT Date 4/30/08

3. College Curriculum Committee Mark Wallace Date 05/07/08

4. College Dean (or Designee) [Signature] Date 5/12/08

(UNIVERSITY LEVEL)

5. UCC Committee Chair _____ Date _____

6. Vice President for Academic Affairs (or Designee) _____ Date _____

7. President (or Designee) _____ Date _____

* If Originator is uncertain of this entry, please consult with Program/Department Director/Chair.

CHEMISTRY 450: Protein Structure and Function

Term:	Fall, 2009
Prerequisites:	CHEM 351 with a minimum grade of C (grade point 2.0).
Class time:	TBD
Class location:	TBD
Instructor:	TBD
Inst. Office:	TBD
Inst. Office hours:	TBD
Inst. Phone:	TBD
Inst. E-mail:	TBD

Course Objective: Intended for science majors, the goal of this course is to introduce students to an in-depth analysis of protein structure and function. Topics covered are: fundamentals of protein structure including structural motifs, domains, and folding, methods of protein structure determination, structural bioinformatics, and an in-depth consideration of the structure-function relationship in representative proteins involved important biological functions such as transport, enzyme catalysis, protein-nucleic acid interactions, signal transduction, immunity, and membrane channels and receptors. The course included a molecular graphics components aimed at providing hands on experience to the student.

Student Learning Outcomes:

Upon completion of this course students should be able to demonstrate:

- (1). a detailed knowledge of the four levels of protein structure including the forces and interactions that are responsible for protein structure, folding and stability.
- (2). their knowledge of protein motifs and domains and how these elements dictate protein structure and the classification of proteins based on their structure.
- (3). an introductory knowledge of the techniques used in determining protein structure such as X-ray crystallography, NMR spectroscopy, CD spectroscopy, and Fluorescence spectroscopy.
- (4). a detailed understanding of the relationship between structure and function using representative examples of proteins involved in various biological processes.
- (5). their knowledge, and ability to use, the tools of structural bioinformatics to predict and analyze protein structure and function.

These are general learning outcomes. Students are responsible for everything we discuss in class and available to you through your textbook.

Textbook (Required): TBD (for example Protein Structure and Function by Petsko and Ringe)

WebCT: The course website can be accessed via the campus WebCT system. The following will be available or done through the WebCT site:

- (i). Posting of all assignments.
- (ii). Submission of all assignments and the return of graded assignments (*also see below*).
- (iii). E-mail communication with the instructor and receiving notices from the instructor.
- (iv). A calendar tool indicating important course/assignment dates.
- (v). The syllabus
- (vi). Lecture notes (*also see below*).
- (vii). Links to worthwhile biochemistry related web sites.

If you are not already familiar with the use of WebCT (version 6) please consult the IITS help desk or the instructor as soon as possible.

Lecture Notes:

PDF files of lecture slides are available online via webCT. It is highly suggested that you print a copy of these files and bring it to class with you. These lecture notes should NOT be considered as a substitute for attending class. *You will notice that the notes contain more questions than answers.*

Topic List:

Unless otherwise noted all chapters refer to the course textbook. Below is the topic list for CHEM 450 for the fall semester of 2009. Although every attempt will be made to adhere to this list I reserve the right to adjust this list of topics and/or the time spent on each topic as the semester progresses. **Read the relevant chapters in the textbook before the lecture.**

Tentative Schedule of Topics:

- (1). *Amino acids and their properties.*
- (2). *Protein structure:*
primary, secondary, tertiary and quaternary structure, properties of secondary structure elements, forces/interactions responsible for protein structure, and protein folding
- (3). *Protein structure:*
motifs, domains, and the classification of proteins according to structure.
- (4). *Methods in protein structure determination:*
X-ray diffraction, NMR, EPR, CD and Fluorescence spectroscopy
- (5). *Structural bioinformatics:*
sequence alignments, prediction of protein structure and function from sequence, prediction of protein secondary structure, prediction of protein tertiary structure using homology modeling, structure visualization.
- (6). *Case studies in protein structure and function:*
 - (a). transport: hemoglobin and related proteins
 - (b). catalysis: trypsin, chymotrypsin and subtilisin, HIV protease
 - (c). signal transduction: G proteins (Ras)
 - (d). Immunity: Immunoglobins IgG class
 - (e). Membrane channels: KscA potassium channel, aquaporin
 - (f). Protein-DNA interactions: TBP, p53

Exams:

There will be one (1) mid-semester exam and a final examination. The midsemester exam will be one hour in length. The final exam is two hours in length. The mid-semester exam is scheduled as follows:

1st mid-semester exam – TBD

The final examination is comprehensive, and is scheduled for, **TBD**.

Make up examinations will only be given if the student has a valid excuse (severe illness, death in the family, etc.) and notifies the instructor prior to test time (if possible). No make-up examination will be given unless the instructor is notified of the emergency within two (2) days of the test.

Exams will contain multiple choice, short answer, and essay type questions. Please bring a scantron.

Use of Electronic Devices:

The use of cell phones, PDAs, or any other electronic device during exams is not allowed. Scientific calculators are permitted.

Use of Cellular Phones:

All cellular phones must be set to the silent mode. Please refrain from using your cellular phone during class. If you must answer your phone, due to an emergency, please leave the classroom.

Assignments:

A set of assignments (one to two page written reports) will be provided throughout the semester. These assignments will be available via WebCT. Due dates will be posted on WebCT. Although you may work in groups to complete these assignments, all submitted work must be your own. All assignments must be **submitted as PDF files** through the course web site on WebCT.

Late submission will be assessed a 2% (of the assignment grade) penalty per day of lateness.

Assignment Submission:

Assignments **must be submitted as PDF files via WebCT**. Please DO NOT submit hard copies of your work. Submission of Microsoft word files is discouraged as it can lead to changes in document formatting. Assignments should be properly paginated and should contain 1 inch margins.

Grading (points):

mid-semester examination	50	16.7%
Assignments	200	66.6%
Final examination	50	16.7 %
Total	<u>300</u>	<u>100%</u>

Letter grades:

Letter grades will be assigned based on the following cutoff values:

Percentage	Grade
90% and above	A
88 – 89.9%	B+
82.1 – 87.9%	B
80 – 82%	B-
78 – 79.9%	C+
72.1 – 77.9%	C
70 – 72%	C-
68 – 69.9%	D+
62.1 – 67.9%	D
60 – 62%	D-
59.9% and below	F

Writing Requirement: The University Writing Requirement will be satisfied upon completion of course assignments and the term paper.

Students with Disabilities:

Students with disabilities who require accommodation must be approved by the Office of Disabled Student Services (DSS). Please contact this office as soon as possible and should meet with the instructor during office hours (or at some other mutually agreeable time). The DSS office is located in Craven hall 5205. Their telephone number is (760) 750-4905 or TTY (760) 750-4909.

Academic Honesty: All students are expected to maintain academic honesty. This is especially true with regards to the completion of assignments and the term paper. **All submitted work must be your own and must be written in your own words.**

All students should be familiar with the university policies and procedures concerning academic honesty as detailed in the university catalog. An online version of these policies and procedures can also be found at: http://lynx.csusm.edu/policies/procedure_online.asp?ID=187

Cheating, plagiarism, and other forms of academic dishonesty will not be tolerated. If you are caught cheating on an exam you will receive a grade of zero. All cases of academic dishonesty will be reported to the dean of students for appropriate action.

Use of Plagiarism Detection Software:

Where appropriate the instructor will use software (TURNITIN) for the detection of plagiarism.

Plagiarized work will not be graded (see above).

Classroom Behavior and Student Code of Conduct:

Students are expected to respect and follow standards of student conduct while in class and on the campus. As your instructor, I have the following expectations concerning your behavior in this class:

1. Promote a courteous learning atmosphere by exhibiting mutual respect and consideration of the feelings, ideas, and contributions of others.
2. Practice consideration for others by maintaining a clean and orderly classroom.
3. Recognize everyone's opportunity to contribute information in a relevant and meaningful manner by not monopolizing discussions, interrupting, interjecting irrelevant, illogical or inappropriate questions or comments.
4. Do not dominate class discussion—give others a chance to contribute!
5. If you must eat in class do so discreetly.

HOW TO STUDY CHEMISTRY IN ORDER TO EARN A GRADE OF A, B, OR C.

1. **Take good lecture notes.** You are responsible for everything that I write or project on the board (except videos). Make use of the PDF files of my slides (see above) to reduce the amount of writing you have to do in class.
2. Make flash cards of definitions, concepts, reactions, structures, and nomenclature that are covered in lecture notes.
3. Use your lecture notes/flash cards as a guide to your **reading in the textbook**. Read the relevant chapter (or chapter section) before coming to the lecture and after attending the lecture (yes, twice).
4. **Solve the homework problems.** Some of the answers are in the back of the textbook. One of the best ways of learning is to find a study partner or to form a study group and work on the problems together. Doing the homework problems is how you develop the analytical/critical thinking skills to do well on exams.
5. **Attend class.**
6. **If you have questions, ask.** Make use of the instructor's office hours.

Debbie Schwarz

From: Denise Garcia
Sent: Friday, March 28, 2008 1:28 PM
To: Debbie Schwarz
Subject: CHEM 450 Proposal for Review

Biology approves this course.

From: Debbie Schwarz
Sent: Thu 3/27/2008 4:14 PM
To: Denise Garcia; Bianca Mothe
Cc: Staci Beavers
Subject: CHEMISTRY Proposal for Review

Hi Denise & Bianca,

Here is a proposal for your review. Thanks for your attention, d

To: Denise Garcia
Biology
Bianca Mothe

From: Curriculum & Academic Policy Committee
College of Arts & Sciences

Date: March 27, 2008

Re: Proposal for Review
CHEM 450 C Form

Good Afternoon,

Attached is a form and supporting document for Chemistry 450.

Please review and indicate your support or your opposition.

You may sign the attached document . Or you may reply with your response.

We appreciate your attention. Please call if you have questions .

Curriculum & Academic Policy Committee
College of Arts & Sciences

Virginia Mann

From: Sajith Jayasinghe
Date: Wednesday, January 14, 2009 2:52 PM
To: Virginia Mann; Jacqueline Trischman; Jose Mendoza
Cc: David Barsky; Olaf Hansen
Subject: RE: UCC and review of CHEM courses
Attachments: CHEM course descriptions.doc

Virginia,

Sorry about that. I took a look at the revised descriptions and they look fine. In the revised description for CHEM 341 there was an error I corrected. It read " May not be substituted for CHEM 315..." it should read "May not be substituted for CHEM 351...". I also added the 'biological sciences' where it says "(consult department)".

I am attaching the corrected version. I did not see any other problems with the descriptions.

Jay

-----Original Message-----

From: Virginia Mann
Sent: Wed 1/14/2009 12:01 PM
To: Jacqueline Trischman; Sajith Jayasinghe; Jose Mendoza
Cc: David Barsky; Olaf Hansen
Subject: FW: UCC and review of CHEM courses

Hello Jackie,

The UCC has still not reviewed the four CHEM courses we received at the beginning of Fall 08, as we are awaiting the revised descriptions from you. David had sent you some suggested new wording, which is attached. Please see my Oct. email below, and David's from August. Sorry to be such a nudge - just trying to wrap up loose ends.

Virginia

CHEM 450

Protein Structure and Function

Proposed description:

Intended for science majors, the goal of this course is to introduce students to an in-depth analysis of protein structure and function. Topics covered are: fundamentals of protein structure including structural motifs, domains, and folding, methods of protein structure determination, structural bioinformatics, and an in-depth consideration of the structure-function relationship in representative proteins involved in important biological functions such as transport, enzyme catalysis, protein-nucleic acid interactions, signal transduction, immunity, and membrane channels and receptors. Prerequisite: CHEM 341 or 351 with a minimum grade of C (2.0) or consent of instructor.

Comments: The first sentence in the proposed description doesn't really say anything that is not conveyed by either the title or the prerequisite. So this can be shortened to

Revised description:

Fundamentals of protein structure including structural motifs, domains, and folding; methods of protein structure determination; structural bioinformatics; and an in-depth consideration of the structure-function relationship in representative proteins involved in important biological functions such as transport, enzyme catalysis, protein-nucleic acid interactions, signal transduction, immunity, and membrane channels and receptors. *Prerequisite: CHEM 341 or 351 with a minimum grade of C (2.0).*
