

Curriculum Proposal Signature Sheet

Reposted w/ CHEM + BIO CHAIRS' SIGNATURES

Change in Proteomics/Proteomics Lab BCMB 440/440L

TITLE OF PROPOSAL

Type of Proposal

Program

- New
- Changes within Major
- Changes within Cognate *
- Changes in Minor or Track
- Changes in Concentration*
- Program Deletion

Course

- New
- Changes in Course taken only by Majors
- Changes in Course required of Non-Majors*
- Changes in Course open to Non-Majors
- Deletion of Course taken only by Majors
- Deletion of Course required of Non-Majors*
- Deletion of Course open to Non-Majors

Biochemistry, Cell, & Molecular Biology Review and Approval Feb 2009
SPONSORING DEPARTMENT(S) PROGRAM DATE(S)

Signature of Sponsoring Chair(s)/Date Joan W. Muskuski (3-6-09) Kathleen Aug (3-7-09)
Program Co-Sponsors

* For starred items Chairs of affected Departments/Programs must sign below before Dean's review

Dean's Preliminary Review Proposal: Complete
 Satisfies U of S Curricular Requirements
 Consistent with College Goals/Mission

Additional preliminary comments below

Dean's Signature/Date [Signature] 3-10-09
 CAS CPS SOM GRAD DHC

Preliminary FSCC Disposition:

- Committee recommends approval (new program proposals require a Recommendation from the full Senate)
- Proposal will require minimal review: Anticipated FS Meeting Date: _____
- Proposal will require significant review: Anticipated FS Meeting Date: _____

FSCC Chair Signature/Date _____

Issues: _____

Additional Signatures

<u>CHEMISTRY</u> <small>Department</small>	<u>[Signature]</u> <small>Signature</small>	<u>4-6-09</u> <small>Date</small>
<u>BIOLOGY</u> <small>Department</small>	<u>[Signature]</u> <small>Signature</small>	<u>4/6/09</u> <small>Date</small>
_____	_____	_____

Course Revision
Course taken only by Majors

Home Dean: <input checked="" type="checkbox"/> CAS <input type="checkbox"/> CPS <input type="checkbox"/> SOM <input type="checkbox"/> GRAD <input type="checkbox"/> DHC

Course Title: **Proteomics**

Course Number: **BCMB 440** **Date:** **2/10/09**

**Nature
of
revision:**

Proteomics and Proteomics Lab courses will be merged into one 3 credit course.
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**Rationale
for
revision:**

Some of the basics of proteomics will be covered in other courses in the BCMB major (biochemistry and molecular biology courses); allowing for laboratory experiences to be included in the proteomics course.
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Will the revision have an impact on the core curriculum? Yes No

If Yes, indicate impact below:

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Will the revisions have any impact on another department? Yes No
If yes, indicate the impact on and the response of the affected department:

Will the revisions require allocation/reallocation of University resources?
Yes No

If Yes, indicate resources needed for revision:

Signature of Sponsoring Chair: see signature sheet for signature Date: 3-9-09

Course Deletion
Course taken only by Majors

Course Title: Proteomics Lab

Course Number: BCMB 440 L Date: 2/10/09

**Rationale
for course
deletion:**

This course will be merged with Proteomics (BCMB 440)

Has this course been offered in the last five years? Yes No

If Yes, will this course be replaced by another course?

No

Yes (Course _____)

Will the replacement have any impact on any other department?

No

Yes (indicate below the impact on and the response of the affected department)

Signature of Sponsoring Chair: (see signatures) Date: 3-9-09
(shelby signatures)

BCMB 440 Syllabus

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Textbooks:

“Proteins and Proteomics” by Richard J. Simpson (Cold Spring Harbor Press, 2002),
and/or “Introduction to Proteomics” edited by Agnieszka Kraj (Wiley, 2008).

Course Goals and Objectives:

Students will be introduced to the fundamental concepts and techniques utilized in proteomic studies. Proteomics is the large-scale study of proteins, particularly their structures and functions. This course will consist of lectures focused on principles associated with study in the post-genomic era, including protein identification strategies using 2- dimensional gel electrophoresis and protein microarrays, mass spectrometry and use of the publicly available protein databases. The course will include lectures describing the clinical and biomedical applications of proteomics, particularly the ways in which proteomic study continues to impact disease diagnosis, cancer research and drug design. A laboratory component of the course will allow the students to apply their acquired knowledge to techniques in a laboratory setting. Hands on experience will be provided in 2D electrophoresis, mass spectrometry, and protein identification using available databases. Working in groups, students will have the opportunity to become familiar with the specific workings of proteomics research, and compose group lab reports summarizing their findings. The course will be delivered as approximately 28 classes (75 min each).

Topics:

- I. Introduction to the Proteome, relationship between protein structure and function
Lab Safety (more extensive assuming the lab class wouldIMBM),
presentations on proper record keeping, tour of labs, etc.
Protein isolation (probably from *E. Coli* and Bacteria X)
- II. Two- Dimensional Gel Electrophoresis
High Throughput 2D PAGE
Future Directions of 2D PAGE
Protein quantification (Bradford)
- III. Protein Identification Strategies
Purpose of Protein ID and overview of ID strategies
Isoelectric point, Experimental mass vs. theoretical mass

Exam I

- IV. Intro to Mass spectrometry Peptide Mass Fingerprinting
1D polyacrylamide gel electrophoresis (PAGE) and imaging on Fuji Imager
(2 of 4 groups will perform 1D on each organism). **Quiz 1**
- V. Proteome Databases
SWISS-PROT, TrEMBL, Genome databases
2D PAGE Databases
2D PAGE – set up isoelectric focusing (IEF; strips will have to be re-hydrated for 24 hours prior to class). Protein will be the same as that used for 1D for visual comparison. Students will then set up second dimension run with strips already run through IEF (these will have to run for 18 hours and be stained by someone else).

Exam II

- VI. Clinical and Biomedical Applications of Proteomics
Diagnosis, Proteomics, and Cancer
Visualize stained gels from previous class using the Fuji Imager (visual comparisons can now be made between the 1D and 2D gels for *E. Coli*, and students will write a lab report based on these comparisons). **Quiz 2**
- VII. Protein structure and drug design
Microbial proteomics (Immunogenetics and Virulence Factors)
HT Analyzer Comparison of 2D gels prepared prior to class using different IPG strips of differing pH range (pH 4-7 vs. 1 unit pH)

Exam III

GRADING:

In addition to the 3 exams (100 points each) listed, 2 quizzes (25 points) will be given based specifically on techniques. Three laboratory reports will also be written and each will be worth 50 points.