**George Mason University**  
**Graduate Course Approval/Inventory Form**

Please complete this form and attach a copy of the syllabus for new courses. Forward it as an email attachment to the Secretary of the Graduate Council. A printed copy of the form with signatures should be brought to the Graduate Council Meeting. Complete the Coordinator Form on page 2, if changes in this course will affect other units.

Please indicate:  

- **X** NEW  
- ___ MODIFY  
- ___ DELETE

**Local Unit:** SCS  

**Graduate Council Approval Date:**

**Course Designation:** BINF  

**Course Number:** 831

**Full Course Title:** Structural Genomics Project

**Abbreviated Course Title (24 characters max.):** Structural Genomics

**Credit hours:** 3  

**Program of Record:** Bioinformatics Ph.D.

**Repeatable for Credit?**  
- ___ D=Yes, not within same term  
- ___ T=Yes, within the same term  
- ___ N=Cannot be repeated for credit

**Activity Code:**  

- ___ Lecture (LEC)  
- ___ Lab (LAB)  
- ___ Recitation (RCT)  
- ___ Studio (STU)  
- ___ Internship (INT)  
- ___ Independent Study (IND)  
- ___ Seminar (SEM)

**Catalog Credit Format:** 3:3:0  

**Course Level:** GF(500-600)  

**Maximum Enrollment:** 20  

For NEW courses, first term to be offered: Spring 2006

**Prerequisites:** BINF 731 or permission of instructor

**Catalog Description (35 words or less):** Course covers knowledge-based large-scale protein structure analysis; classification and prediction of protein structure and function; and other current research topics in structural genomics. Projects address the entire research enterprise from developing and defending a proposal to peer-reviewed publication.

For MODIFIED or DELETED courses as appropriate:

- Last term offered:  
- Previous Course Abbreviation:  
- Previous number:

**APPROVAL SIGNATURES:**

Submitted by: ________________________________  

email: ________________

Department/Program: ________________________________  

Date: ________________________________

College Committee: ________________________________  

Date: ________________________________

Graduate Council Representative: ________________________________  

Date: ________________________________
Approval from other units:

Please list those units outside of your own who may be affected by this new, modified, or deleted course. Each of these units must approve this change prior to its being submitted to the Graduate Council for approval.

<table>
<thead>
<tr>
<th>Unit</th>
<th>Head of Unit’s Signature</th>
<th>Date</th>
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Graduate Council approval: ___________________________ Date: _________

Graduate Council representative: ______________________ Date: _________

Provost Office representative: _________________________ Date: _________
1. COURSE NUMBER AND TITLE:

BINF 831 - Structural Genomics

Prerequisites: BINF 731 or permission of instructor.

Catalog Description: Course covers knowledge-based large-scale protein structure analysis; classification and prediction of protein structure and function; and other current research topics in structural genomics. Projects address the entire research enterprise from developing and defending a proposal to peer-reviewed publication.

2. COURSE JUSTIFICATION:

Course objectives: Students will learn how to create training sets of protein structures for the knowledge-based approaches. They will develop or use existing software tools for the analysis, classification and prediction of protein structure and function. Student presentations of research topics will provide opportunity to polish analytical and verbal presentation skills.

Course Necessity: There is no similar course in GMU addressing the current research issues in computational structural genomics. This course prepares students to perform research in an important area of bioinformatics and computational biology.

Course Relationship to Exiting Programs: This course has been previously offered (Spring 04, 05) as BINF 739 Special Topics. It will be an elective course for students in the Ph.D. and MS programs in Bioinformatics.

Course Relationship to Existing Courses: There is no similar course at GMU.

3. APPROVAL HISTORY: NA

4. SCHEDULING AND PROPOSED INSTRUCTORS:

Semester of Initial Offering: Spring 2006

Proposed instructors: Dr. I. Vaisman

5. TENTATIVE SYLLABUS: See attached.
Course description: Collecting and analyzing information on the protein complement to genome is one of the most important frontiers in the postgenomic biology. This course will cover a broad scope of topics related to protein structure analysis. This is a project-based course, in which students work under the supervision of the instructor on solving the real-world problems in structural genomics. The course is designed to mimic a full cycle of the research enterprise: from developing and defending a proposal to peer-reviewed publication. Most projects will involve applications of various knowledge-based methods and computational geometry algorithms to the large scale protein structure analysis. The students will learn how to create training sets of protein structures for the knowledge-based approaches. They will develop or use existing software tools for the analysis, classification and prediction of protein structure and function. The course will be conducted in a seminar format centered around student projects. There will be several group meetings for the whole class and a number of individual meetings with the instructor. In this course the students will:

- select a topic for their project from the list of suggested topics
- perform a literature search and write a short (800-1200 words) literature review
- write a grant proposal for the selected project
- carry out computational work for the project
- present the results in a report (1500-2000 words) composed as a journal paper
- review two reports by other students and write comments (200-300 words)
- respond to the reviewers' comments, modifying the report if necessary

Course schedule:

<table>
<thead>
<tr>
<th>Week</th>
<th>Activity</th>
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<tbody>
<tr>
<td>1</td>
<td>Project topic selection</td>
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<tr>
<td>2 - 4</td>
<td>Review of the literature, proposal development</td>
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<tr>
<td>5 - 10</td>
<td>Work on the project</td>
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<tr>
<td>11 - 12</td>
<td>Work on the report</td>
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<tr>
<td>13</td>
<td>Review 2 reports of other students</td>
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<tr>
<td>14</td>
<td>Response to the reviewers' comments</td>
</tr>
<tr>
<td>15</td>
<td>Final project presentation</td>
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Grading: grades will be based on presentations (10% + 10%), literature review and grant proposal (20%), final report (40%), and two report reviews (20%).