# **George Mason University**–Office of the Registrar **Undergraduate Course Approval Form**

Please complete this form and attach a copy of the syllabus and catalog description for new courses. Forward the form and attachments to your departmental curriculum committee for approval, and then to your College/School curriculum committee, or Dean's office, for final approval. The approved form should then be forwarded to the Academic Scheduling Office, MS 3D1. This is for ***undergraduate course approval only***. Please see the Provost Office/Graduate Council website to obtain a copy of the Graduate Course Approval Form and for details about the graduate course approval process.

**Note:** Colleges and Schools are responsible for submitting new or modified catalog descriptions (35 words or less, using catalog format) to Creative Services by deadlines outlined in the yearly Catalog production calendar.

**Please indicate:** **New** N **Modify**_____ **Delete**_____

**Department/Unit:** Bioinformatics and Computational Biology **Course Subject/Number:** BINF 491

**Submitted by:** Jennifer W Weller **Ext:** 3-8329 **Email:** *jweller@gmu.edu*

**Course Title:** Senior Research in Bioinformatics I

**Effective Term** (New/Modified Courses only)**:** Fall 2007 **Final Term** (deleted courses only)**:**_____

**Credit Hours:** (Fixed) 1 (Var.) _____ to _____ **Grade Type** (check one)**:** X Regular graduate (A, B, C, etc.)
_____ Satisfactory/No Credit only
_____ Special graduate (A, B, C, etc. + IP)

**Repeat Status*** (check one)**:** X **NR**-Not repeatable ____ **RD**-Repeatable within degree ____ **RT**-Repeatable within term
***Note: Used only for special topics, independent study, or internships courses** **Total Number of Hours Allowed:** _____

**Schedule Type Code(s):** 1. LAB **LEC**=Lecture **SEM**=Seminar **STU**=Studio **INT**=Internship **IND**=Independent Study
2. RCT **LAB**=Lab **RCT**=Recitation (second code used only for courses with Lab or Rct component)

**Prereq** _____ **Coreq** X (Check one)**:**____ BINF401

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**Note: Modified courses - review prereq or coreq for necessary changes; Deleted courses - review other courses to correct prereqs that list the deleted course.**

**Description of Modification** (for modified courses)**:**_____

**Special Instructions** (major/college/class code restrictions, if needed)**:**_____

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***Approval Signatures*:**

**Department or Unit:** _____ **Date:** _____
*(Signature)*

**College/School Committee:** _____ **Date:** _____
*(Signature)*

**George Mason University** **Undergraduate Course Coordination Form**

**Approval from other units:**

Please list those units outside of your own which may be affected by this new, modified, or deleted course. Each of these units should approve this action prior to its being submitted to the COS Curriculum Committee for approval.

| | | |
|---|---|---|
| Unit: | Head of Unit's Signature: | Date: |
| Unit: | Head of Unit's Signature: | Date: |
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| Unit: | Head of Units Signature: | Date: |

COS Curriculum Committee approval: _____ Date: _____

# Course Proposal Submitted to the Curriculum Council
# by
# The College of Science

**1. COURSE NUMBER AND TITLE:**
BINF491 (1 credit) Senior Research in Bioinformatics and Computational Biology I.

**Prerequisites:**
**Corequisites:** BINF 401

**Catalog Description:** BINF 491 Senior Research in Bioinformatics I (1,1) Prerequisites: the bioinformatics minor core classes and a previous passing grade or concurrent enrollment in BINF 401. An experimental design with materials and methods is completed under the guidance of a bioinformatics department faculty member. An oral progress report with a poster at the Fall semester Student Research Day is required.

**2. COURSE JUSTIFICATION:**

**Course objectives:** This course is designed to give students a mentored research experience in the research area of particular interest to a BCB faculty member. The student will learn to identify an important question, frame a hypothesis and devise an experimental plan, investigate the current literature, obtain data sets and identify the necessary tools to carry out the research. The student will then defend this plan of work by designing a poster and defending it to students and faculty at the end of semester BCB department Student Research Day.

**Course Necessity:** Bioinformatics and computational biology research require an unusual mixture of using modeling tools and large volumes of real data. However, unlike in many of the biological sciences, the students do not typically produce the data and the process of obtaining and vetting data produced at a number of disparate sites is challenging. In addition it is often difficult for students to understand how to formulate a problem such that they are really testing a hypothesis rather than running an algorithm through a number of parameter values. To qualify as well-trained scientists, our students must be able to not only critically evaluate the published research but be able to design experiments that will hold up to critical evaluation from their peers.

**Course Relationship to Existing Programs:** This course is proposed as an in-depth research experience for students who want to delve into a problem as an active, if junior, scientist. Research experience for undergraduates is a highly rated activity by many granting agencies since when well done it tends to draw students into post-graduate training and research careers. The mentoring aspect is known to be essential to the development of a passion for research. This will be the course that really rewards the most excellent of the students in the minor program, and the level of interest will indicate whether the undergraduate degree should be expanded from a minor to a major eventually. The department members currently have extensive experience directing Masters level students in projects and theses so this will be an extension of existing practices rather than a break with them. There are no programs at GMU outside of this department and course that offer this experience to undergraduates in this research area.

**Course Relationship to Existing Courses:** There are no undergraduate senior research offerings in this area in other departments.

**3. SCHEDULING AND PROPOSED INSTRUCTORS:**

**Semester of Initial Offering:** Fall 2007

**Proposed instructors:** Available full-time, adjunct and affiliate faculty members of the Bioinformatics and Computational Biology department.

TENTATIVE SYLLABUS: a week by week syllabus cannot be detailed since each professor will have a different field and the specific area of emphasis will change from year to year. The responsibilities of the faculty member are to meet with the student once a week (at least) for one hour, to provide introductory material in the area of the research field of focus during the first meeting along with 3-4 open questions the faculty mentor has some confidence the student can make progress on in a term, and a list of any software tools and their documentation that the student will need to become familiar with. The student should expect to spend 2-4 hours per week reading and 2-4 hours per week actively doing experiments, although the proportion of time spent on each activity will almost certainly vary week by week through the semester. The goal of the first semester is to have a concrete research plan that the student understands well enough to be able to defend in an open forum.