NEW COURSE PROPOSAL

1. Catalog Description of the Course.
BINF 513 PROGRAMMING FOR BIOINFORMATICS (3)
Three hours lecture per week.
Prerequisite COMP 462 or equivalent, BINF 501, or permission of instructor.

This course will provide theory and practical training in the development of programming tools and data processing systems for use in genomic/sequence analysis. There will be a strong emphasis on the development of fully-functional web-based applications under the client/server model. Students will be required to complete a term project which will involve the development of a complete client/server application directed toward a relevant bioinformatics task.

2. Mode of Instruction.

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<tr>
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<th>Units</th>
<th>Hours per Unit</th>
<th>Benchmark Enrollment</th>
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<tbody>
<tr>
<td>Lecture</td>
<td>3</td>
<td>1</td>
<td>15</td>
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<tr>
<td>Seminar</td>
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<td>Laboratory</td>
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<td>Activity</td>
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3. Justification and Learning Objectives for the Course. (Indicate whether required or elective, and whether it meets University Writing, and/or Language requirements) [Use as much space as necessary]

This course is an elective element of the bioinformatics emphasis for the proposed Professional Science Masters degree in Bioinformatics

Upon completion of this course, students will be able to:
- design object-oriented algorithms in high-level language,
- describe optimization problems and performance tradeoffs.
- implement algorithms
- develop a fully functional web-based application for use in genome analysis
- identify and address issues in the storage, extraction, organization, analysis, interpretation, and utilization of genomic data that require specialized programming solutions.

4. Is this a General Education Course  NO
If Yes, indicate GE category:

<table>
<thead>
<tr>
<th>A (English Language, Communication, Critical Thinking)</th>
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<tr>
<td>B (Mathematics &amp; Sciences)</td>
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<tr>
<td>C (Fine Arts, Literature, Languages &amp; Cultures)</td>
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<td>D (Social Perspectives)</td>
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<td>E (Human Psychological and Physiological Perspectives)</td>
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5. Course Content in Outline Form. [Be as brief as possible, but use as much space as necessary]

algorithm design
complex data structures
object oriented programming
relational databases
designing modules
graphics programming
web programming
6. References. [Provide 3 - 5 references on which this course is based and/or support it.]


7. List Faculty Qualified to Teach This Course.

Computer science faculty and/or computer science professionals

8. Frequency.

   a. Projected semesters to be offered: Fall  _____ Spring  _X____ Summer  _____

9. New Resources Required.

   a. Computer (data processing), audio visual, broadcasting needs, other equipment
   b. Library needs
   c. Facility/space needs

   None.

10. Consultation.

    Dr. Peter Smith, Professor of Computer Science, has been consulted regarding the content and requirements of this course.

11. If this new course will alter any degree, credential, certificate, or minor in your program, attach a program modification.

Amy Denton
William Wolfe 31 October 2003

Proposer of Course Date