

NEW COURSE PROPOSAL

PROGRAM AREA _____

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.

	Units	Hours per Unit	Benchmark Enrollment
Lecture	____3____	____1____	____15____
Seminar	_____	_____	_____
Laboratory	_____	_____	_____
Activity	_____	_____	_____

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:

A (English Language, Communication, Critical Thinking)	
B (Mathematics & Sciences)	
C (Fine Arts, Literature, Languages & Cultures)	
D (Social Perspectives)	
E (Human Psychological and Physiological Perspectives)	

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.]*

Setubal, J. and Meidanis, J. 1997. Introduction to Computational Molecular Biology. Brooks Cole Publishing, ISBN: 0534952623
Durbin, R., Eddy, S., Krogh, A., and Mitchison, G. 1998. Biological Sequence Analysis: Probabilistic Models of Proteins and Nucleic Acids, Cambridge University Press, ISBN 0521629713
Gusfield, D. 1997. Algorithms on strings, trees, and sequences: computer science and computational biology. Cambridge University Press, ISBN: 0521585198
Reese, G. 2000. Database Programming with JDBC and Java, 2nd ed., O'Reilly & Associates, ISBN 1565926161
Gibas, C., and P. Jambeck. 2001. Developing Bioinformatics Computer Skills. O'Reilly & Associates, ISBN: 1565926641
Waterman, M. Introduction to Computational Biology: Maps, Sequences and Genomes. 1995. CRC Press, ISBN: 0412993910

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