MBBE 683 – Advanced Bioinformatics Topics for Biologists

1. **What is the course modification?**

   This is a new course.

2. **Why is this course being requested or modified?**

   This course is being requested based on a perceived need to provide a learning environment for graduate students that addresses their need for large-scale data analysis.

3. **How will the content be organized?**

   This is a problem-based course that addresses real-world research questions, thus the content is purposely kept flexible to address the specific needs of the very advanced stage graduate students. The content is molded to the students needs. Where appropriate, the instructor will provide problems with real-world practicality, e.g.:
   1) Design of a universal primer set that amplifies all nematode rDNA loci.
   2) Characterize the sequence diversity of these loci.

4. **What other courses at UHM closely parallel the proposed course and in what way will the latter make a distinct contribution?**

   Several ICS courses address bioinformatics and are listed as prerequisites for this course. These include:
   - ICS 491 SPRING 2005 INTRODUCTION TO BIOINFORMATICS
   - ICS 691 SPRING 2005 BIOINFORMATICS / COMPUTATIONAL BIOLOGY
   - ICS 471 SPRING 2005 PROBABILITY AND STATISTICS FOR BIOINFORMATICS
   It is expected that these courses will provide an excellent basis for the applied nature of the proposed course.

5. **Where or how does the proposed course fit into the current and future curriculum?**

   This course represents one of the final courses that a graduate student will take in their preparation for the data analysis component of their biology research.

6. **Why is the number of credits and level justified? Explain the prerequisites and the absence thereof.**

   This is an intensive course on biological data analysis. A thorough understanding of both the underlying biology as well as statistics/computer analysis are prerequisites.

   The course will consist of a combination lecture/laboratory/discussion for a total of four contact hours with the instructor per week.
7. **How will the course assist students to achieve the critical skills and competencies expected of CTAHR graduates?**

   This course will address all of the critical skills and competencies expected of a CTAHR graduate.

8. **How will students be evaluated?**

   Students will work in teams and address real-world problems. They will be evaluated based on their ability to solve the problems posed, on both individual and team basis.

9. **What are the minimum qualifications for teaching this course? Is a qualified instructor now available?**

   Course requires instructor with experience in modern biological/genomics research as well as statistical analysis/data mining and computer skills.

10. **How will the course be financed, assuming no further cutbacks?**

    This course requires a TA with knowledge of systems administration and familiarity in computational biology. The funding source for the TA-ship has not yet been determined.

11. **Has the course been offered before? Is there a demand for it?**

    This course has not been offered before. It is anticipated by the Academic Committee of the MBBE Department that by offering this course the students will be afforded the ability to move forward into the area of genomics research with the computationally intensive analysis.

12. **Is the course cross-listed with another department?**

    This course is not cross-listed with another department.