

Bioinformatics (Biol 485) Fall 2009

Dr. Tom Lewis

T 8:40-12:00 COE 421

Office hours: Rm. 217 Science Hall

(by appointment) Ph. 657-2024

tlewis@msubillings.edu

Course Description: This course is designed to introduce students to the field of bioinformatics; the use of computing techniques and various types of sequence data to address biological questions. The course is essentially a how-to manual for web-based software and databases available to the public and essential for modern molecular bioscience research.

Course Guidelines: Prepare for the class in advance by reading assigned material.

Ask questions; it's important that you be willing to interact with the instructor as we cover the course material. This course should be interactive. Students will be expected to collaborate both inside and outside the classroom, therefore **attendance is very important**. Remember, the goal is for you to learn, and for us to help you learn. That's difficult to achieve if you don't attend class.

Assessment: Written assessment will be used to formally determine how well you understand the material we are discussing. This assessment will take the form of a portfolio of assigned projects and a written exam. An oral presentation on a project, chosen by the student in consultation with the instructor, will also be a component of learning assessment. Projects in the portfolio will cover material presented in each class session and will generally be due the following class session. More detailed descriptions of expectations for projects will be given in handout material posted on the course D2L website.

Exam: The final exam will be short answer and long answer essay format.

Points:

| | |
|--------------|----------------|
| Portfolio | 300 pts |
| Presentation | 50 pts |
| Final | <u>100 pts</u> |
| Total | 450 pts. |

Grading:*

90-100% A
 80-89% B
 65-79% C
 50-64% D
 below 50% F

*Final grades are based on total points.

The instructor reserves the right to utilize a grading curve to determine your final grade.

Text:

St. Clair and Visick; *Exploring Bioinformatics; A Project-based Approach*, Jones and Bartlett Publishers

Biol 485 Topics (tentative)

| <u>Day/Date</u> | <u>Class Period</u> | <u>Topic; Text Material Covered</u> |
|-----------------|---------------------|---|
| 9-15 | 1 | Introduction to Databases; Ch. 1 |
| 9-22 | 2 | Retrieving Sequence Data, Alignments etc.; Ch. 2 |
| 9-29 | 3 | Multiple Alignments and Alignment Searching; Ch. 3 |
| 10-6 | 4 | “ “ |
| 10-13 | 5 | Protein Alignments in Function Determination; Ch. 4 |
| 10-20 | 6 | Structure Prediction; Ch. 7 |
| 10-27 | 7 | “ “ |
| 11-3 | 8 | Sequence Assembly/Genomics; Ch. 5, 6 |
| 11-10 | 9 | “ “ |
| 11-17 | 10 | Molecular Phylogeny; Ch. 8 |
| 11-24 | 11 | “ “ |
| 12-1 | 12 | Gene Expression Analysis; Ch. 9 |
| 12-8 | 13 | Student presentations |
| W 12-16 | FINAL EXAM | 12:00 – 1:50 |