

**Syllabus**  
**BIIN 201: Bioinformatics 2**  
**Spring 2005**  
**Call #20321**

<http://bistro.mscs.mu.edu/biin201.php>

**Instructor: Craig A. Struble, Ph.D.**

**Office:** 369 Cudahy Hall  
**Office Hours:** 4:30-6:00 p.m. MW, 3:00-4:00 p.m. TuTh and by appointment.  
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**Class Meets: 4:20–5:35 p.m., TuTh, Cudahy 114**

## Overview

This course is the second semester of a two semester introduction to bioinformatics. This semester focuses on building bioinformatic solutions to biological problems. This will be accomplished by building a web-based system implemented tools needed to answer biological questions provided by an investigator in biology.

The goals of this semester are to learn to

- Communicate with biological scientists and computational scientists
- Design and develop a medium sized bioinformatic system
- Use design and development tools for building software systems
- Report on system design and development
- Report on bioinformatic results

## Topics Covered

Biological background appropriate for the central problem, systems analysis for bioinformatic problems, modeling languages such as UML and entity relationship diagrams, relational database systems and SQL, APIs for bioinformatic tool development such as BioPerl, constructing dynamic web sites using CGI programming, analyzing, reporting, and publishing bioinformatic results.

## Prerequisites

BIIN200 or consent of the instructor.

## Textbook and References

### Required

- David W. Mount, *Bioinformatics: Sequence and Genome Analysis*, 2nd edition, Cold Spring Harbor Laboratory, 2004, ISBN 0-87969-687-7.
- Paul Weston, *Bioinformatics Software Engineering: Delivering Effective Applications*, Wiley, 2004, ISBN 0-470-85772-2.

### Optional

Additional reference material will be available in the Bistro lab (Cudahy 368), on the course web site, or placed on reserve in the library.

## Grading

Your grade will consist of the following components, weighted as shown:

Written Homework	15%
Peer Evaluations	20%
Term Project	60%
Intangibles	5%

The following grading scale is used to assign letter grades. I recommend reading Dr. Struble's *grading philosophy*, which is available on his web site, to understand why we have chosen the following grading scale. Grades for each assignment, exam, etc. will be curved to fit this grading scale.

Range	Letter Grade
[90–100]	A
[80–90)	AB
[70–80)	B
[60–70)	BC
[50–60)	C
[40–50)	CD
[30–40)	D
[0–30)	F

## Writing Expectations

Good writing skills are essential for effective communication of your ideas. All work submitted in this class is expected to be in well written English. If your writing is of extremely poor quality, you will be asked to rewrite and resubmit your work before I grade it. In these cases, I may not correct your entire paper before I give up trying to interpret it.

All written work should contain citations to referenced papers, web sites, books, etc. For examples of acceptable citation style, look at articles from journals and magazines such as Bioinformatics, Nature, Science, etc.

You should obtain help from the Ott Memorial Writing Center before resubmitting your work. Visit <http://www.marquette.edu/writingcenter/> for more information.

## Homework Assignments

There will be a few small exercises given throughout the semester to expose students to all aspects of the project. Homework assignments must be prepared neatly and submitted **at the beginning** of class the day the assignment is due. Homework may **NOT** be submitted via email, unless specified otherwise. Poorly prepared (i.e., messy) homework solutions will have points deducted; the instructor will not attempt to decipher messy work. Each assignment is graded on a 100 point scale.

## Project

There will be a large term project, which comprises the bulk of your overall grade in this course. The project will be carried out by the entire class, and focus on a specific problem provided by a biologist.

Each student will be assigned one or more *primary roles* as part of the project team. For example, a primary role may be as the database specialist on the team. The database specialist is responsible for designing, building, maintaining, and providing software libraries to access the underlying data.

It is the responsibility of the project team(s) to interact with the biologists and the course instructor. The course instructor will provide guidance on: design, tool selection, interacting with the investigator, writing, code management, and implementation details. The instructor is not be responsible for carrying out the actual work.

Project team(s) are to submit weekly status reports to the instructor summarizing the meetings held, work accomplished by each member, and work plan for the following week.

Milestone	Date	Percentage
Progress reports	Weekly	10%
Requirements analysis, project plan	Thursday, February 24	20%
Prototype 1	Thursday, March 17	15%
Prototype 2	Thursday, April 21	20%
Final System and Report	Tuesday, May 10	35%

Each of the requirements analysis and prototype milestones is to be accompanied by a 30 minute presentation, accompanying written documentation, and involve a review of source code (if appropriate) by the instructor.

The final system will be accompanied by a 45 minute presentation, which will be attended by the investigator(s) for the project(s). Accompanying written documentation, in the form of a project report, is to be submitted and source code will be reviewed by the instructor.

## Peer Evaluation

For grading on the project portion of the course, there will be three (3) evaluations performed during the semester. Each student will be asked to evaluate themselves and each peer and submit their evaluations to the instructor(s). The instructor will create a summary evaluation based on peer comments and the instructor(s)' comments on performance. Student evaluation forms will be available through the course web site.

The due dates are given in the table below

Evaluation	Student Evaluation Due	Instructor Evaluation Returned
1	Tuesday, February 15	Tuesday, February 22
2	Thursday, March 31	Thursday, April 7
3	Wednesday, May 11	Friday, May 13

## Intangibles

A small portion of your grade consists of items not easily measured and categorized. These include things like class participation, meetings with the instructor, keeping up with the reading, using the course message boards/ mailing list, etc.

## Late Policy

Assigned work in this course must be turned in by the specified due date. Each student receives three (3) late days, which can be used to turn in one assignment three days late or three assignments one day late, or any combination of three days during the semester. Once the three late days are used up, assignments cannot be turned in late. Sundays do not count as a late day.

Late days may **not** be used on project deadlines.

## Attendance Policy

While attendance at lecture is optional, it has been my experience that there is a direct correlation between attendance and the overall grade received in this course. If you miss class, you are responsible for finding out what you missed from a classmate, including notes and assignments. Requests from absent students for notes or for meetings to discuss what was missed will be ignored. Absences on days when an assignment is due or an exam is scheduled must be accompanied by official documentation in order to make up the work or exam.

## Academic Honesty

All students are expected to adhere to the standards of student conduct as described in the *Community Expectations* section of the Marquette student handbook.

Homework assignments are intended to reflect individual effort in the course. Students may discuss homework assignments in a general way; i.e., discussing the *nature* of the assignment or providing clarifications. Sharing source code, pseudo-code, or homework solutions is strictly prohibited, unless otherwise stated.

You are **ENCOURAGED** to refer to outside material such as journals, web pages, and books. Do not feel guilty about using outside material; just make sure that you cite your references. Furthermore, you must write your solutions in your own words. It is not acceptable to directly copy material from another source. **Failure to properly cite your references may result in a charge of plagiarism. Give proper credit where credit is due!**