

Syllabus for ABT 780

Bioinformatic Inquiry

NOTE: This syllabus document contains the basic information of this course. The most current syllabus is available in the full course.

Course Description

Advances the development of competencies promoting efficient analysis of biological data. Emphasizes matching a research problem with the most effective tools for its completion, balancing use of existing software and de novo software development. Advanced aspects of Python and R, algorithmics, machine learning, simulations, and effective communication of results are emphasized.

Prerequisite(s)

ABT 720, ABT 730

Course Outcomes

Upon completing this course, you will be able to do the following:

- Implement successful solutions to tasks in bioinformatics using existing software and newly developed code.
- Use knowledge of evolutionary biology – particularly molecular evolution – to improve understanding of third-party software and aid personal code development.
- Write R scripts that are computationally efficient.
- Implement knowledge of algorithmics to write elegant solutions to bioinformatics tasks.
- Implement basic theory underlying bioinformatics algorithms/methods such as sequence alignment and hidden Markov Models.
- Decide when machine learning methods are appropriate to a task in bioinformatics.
- Communicate complicated methodology and results to the scientific community.

Course Requirements/Components

Component	Description	Points
Homework assignments	A mixture of coding assignments, questions on course content, and essay questions.	292 (28 @ 10 each, 1 @ 12)

Final project proposal	Details research problem and proposes bioinformatic solutions.	25
Final Project	A scientific paper in the format of a Discovery Note to <i>Bioinformatics</i> that covers the software program developed.	100

Grading

The following grading scale will be used to evaluate all course requirements and to determine your final grade.

Grade	Percentage Range
A	93% - 100%
A-	90% - 92.99%
B+	87% - 89.99%
B	83% - 86.99%
B-	80% - 82.99%
C+	77% - 79.99%
C	73% - 76.99%
C-	70% - 72.99%
F	0 - 69%