Topics in Bioinformatics Spring 2016 (BMSC-GA 4456)

Course Directors:
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Course overview

The course is meant to provide students with an overview of bioinformatics techniques. It consist of 7 modules and each module has the same structure:
1. A lecture introducing the project (Tuesday Week 1).
2. The students present their analysis plans and preliminary analysis results (Friday Week 1).
3. A session for discussion of problems encountered (Tuesday Week 2).
4. The students present their final analysis (Friday Week 2).
5. Final report due (Tuesday Week 3).

Learning objectives

At the conclusion of the course, the student will have hands-on experience with common bioinformatics analysis

Course Assessment

• Projects (100%): Students will complete 7 projects based on 7 assigned papers and one project selected by each student. For each project an analysis plan, a project presentation, and a final report has to be completed.

General Policies

• Late/missed work: You must adhere to the due dates for all required submissions. If you miss a deadline, then you will not get credit for that assignment/post. Try to avoid last minute submissions.
• Incompletes: No “Incompletes” will be assigned for this course unless we are at the very end of the course and you have an emergency.
• Responding to Messages: I will check e-mails daily during the week, and I will respond to course related questions within 48 hours.
• Announcements: I will make announcements throughout the semester by e-mail. Make sure that your email address is updated; otherwise you may miss important emails from me.
• Safeguards: Always back up your work on a safe place (electronic file with a backup is recommended) and make a hard copy. Do not wait for the last minute to do your work. Allow time for deadlines.
• Plagiarism: Plagiarism, the presentation of someone else's words or ideas as your own, is a serious offense and will not be tolerated in this class. The first time you plagiarize someone else's work, you will receive a zero for that assignment. The
second time you plagiarize, you will fail the course with a notation of academic dishonesty on your official record.

**Lecture 1** Historical Overview of Bioinformatics (January 26, 2016 TRB 718 4pm)  
Lecturer: Brown

**Lecture 2** Historical Overview of Bioinformatics (January 29, 2016 TRB 718 4pm)  
Lecturer: Brown

**Lecture 3** Molecular Classification of Cancer: Introduction to Project (February 2, 2016 TRB 718 4pm)  
Lecturer: Brown

**Lecture 4** Molecular Classification of Cancer: Presentation of Analysis Plan (February 5, 2016 TRB 718 4pm)  
Lecturer: Brown

**Lecture 5** Molecular Classification of Cancer: Discussion of Problems Encountered (February 9, 2016 TRB 718 4pm)  
Lecturer: Brown

**Lecture 6** Molecular Classification of Cancer: Presentation of Results (February 12, 2016 TRB 718 4pm)  
Lecturer: Brown

**Lecture 7** Cancer Genomics: Introduction to Project (February 16, 2016 TRB 718 4pm)  
Lecturer: Wang

**Lecture 8** Cancer Genomics: Presentation of Analysis Plan (February 19, 2016 TRB 718 4pm)  
Lecturer: Wang

**Lecture 9** Cancer Genomics: Discussion of Problems Encountered (February 23, 2016 TRB 718 4pm)  
Lecturer: Wang
Lecture 10 Cancer Genomics: Presentation of Results (February 26, 2016 TRB 718 4pm)  
Lecturer: Wang

Lecture 11 DNA Methylation: Introduction to Project (March 1, 2016 TRB 718 4pm)  
Lecturer: Shen

Lecture 12 DNA Methylation: Presentation of Analysis Plan (March 4, 2016 TRB 718 4pm)  
Lecturer: Shen

Lecture 13 DNA Methylation: Discussion of Problems Encountered (March 8, 2016 TRB 718 4pm)  
Lecturer: Shen

Lecture 14 DNA Methylation: Presentation of Results (March 11, 2016 TRB 718 4pm)  
Lecturer: Shen

Lecture 15 Chromosome Conformation Capture: Introduction to Project (March 15, 2016 TRB 718 4pm)  
Lecturer: Tsirigos

Lecture 16 Chromosome Conformation Capture: Presentation of Analysis Plan (March 18, 2016 TRB 718 4pm)  
Lecturer: Tsirigos

Lecture 17 Chromosome Conformation Capture: Discussion of Problems Encountered (March 22, 2016 TRB 718 4pm)  
Lecturer: Tsirigos

Lecture 18 Chromosome Conformation Capture: Presentation of Results (March 25, 2016 TRB 718 4pm)  
Lecturer: Tsirigos

Lecture 19 Machine Learning: Introduction to Project (March 29, 2016 TRB 718 4pm)  
Lecturer: Ma
Lecture 20 Machine Learning: Presentation of Analysis Plan (April 1, 2016 TRB 718 4pm)
Lecturer: Ma

Lecture 21 Machine Learning: Discussion of Problems Encountered (April 5, 2016 TRB 718 4pm)
Lecturer: Ma

Lecture 22 Machine Learning: Presentation of Results (April 8, 2016 TRB 718 4pm)
Lecturer: Ma

Lecture 23 Dynamics of Bacterial Communities: Introduction to Project (April 12, 2016 TRB 718 4pm)
Lecturer: Fenyo

Reading List


Lecture 24 Dynamics of Bacterial Communities: Presentation of Analysis Plan (April 15, 2016 TRB 718 4pm)
Lecturer: Fenyo

Lecture 25 Dynamics of Bacterial Communities: Discussion of Problems Encountered (April 19, 2016 TRB 718 4pm)
Lecturer: Fenyo

Lecture 26 Dynamics of Bacterial Communities: Presentation of Results (April 22, 2016 TRB 718 4pm)
Lecturer: Fenyo

Lecture 27 Proteomics: Introduction to Project (April 26, 2016 TRB 718 4pm)
Lecturer: Ruggles

Reading List


**Lecture 28** Proteomics: Presentation of Analysis Plan (April 29, 2016 TRB 718 4pm)
Lecturer: Ruggles

**Lecture 29** Proteomics: Discussion of Problems Encountered (May 3, 2016 TRB 718 4pm)
Lecturer: Ruggles

**Lecture 30** Proteomics: Presentation of Results (May 6, 2016 TRB 718 4pm)
Lecturer: Ruggles

**Lecture 31** Final Presentation (May 20, 2016 TRB 718 4pm)