

## COURSE SYLLABUS

### BINF 210: INTRODUCTION TO BIOINFORMATICS APPLICATIONS

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#### Catalogue Description

This course provides an introduction to Bioinformatics, and experience with select bioinformatics tools and databases currently utilized in the life sciences. Focus is on analysis, storage, and manipulation of genomic and proteomic information. Topics include major databases, common sequence formats, protein and nucleotide sequence alignment, BLAST, genome annotation, microarrays, gene expression, primer design, high-throughput data analysis.

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|---------------------------------|---|
| <b>Prerequisite(s):</b>         | BMSC 200.3 or equivalent  |
| <b>Note:</b>                    | Students with credit for BINF 200 cannot get credit for BINF 210.<br>Students cannot take BINF 200 and BINF 210 concurrently. |
| <b>Class Time and Location:</b> | Tuesdays, Thursdays 11:30am–12:50pm in Arts 208.  |
| <b>Tutorial:</b>                | Tuesdays 5:30pm–6:20pm in Arts 140.   |
| <b>Website:</b>                 | <a href="https://moodle.cs.usask.ca/course/view.php?id=129">https://moodle.cs.usask.ca/course/view.php?id=129</a>             |

#### Instructor Information

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|----------------------|---|
| <b>Instructor</b>    | Dr. Ian McQuillan   |
| <b>Contact:</b>      | Email: <a href="mailto:mcquillan@cs.usask.ca">mcquillan@cs.usask.ca</a> , |
| <b>Office Hours:</b> | Location: Thorvaldson S423 (Spinks Extension),<br>Thursdays 2:00-3:00pm   |

#### Course Objectives

- Gain comfort with using biological databases.
- Gain comfort with various bioinformatics programs.
- Understand and manipulate biological sequence information using computers, as well as different file formats.
- Understand how to perform sequence alignments, create phylogenetic trees, and analyze microarray data, while interpreting results, and generating conclusions.
- Gain an appreciation for interplay between biology, algorithms and mathematics.
- Understand how to adjust parameters for various programs, learn their effect on results, as well as understand which parameters are better depending upon the context.

#### Student Evaluation

##### Grading Scheme

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|--------------|--|
| Assignments  | 30% (evenly distributed for 4 assignments) |
| Midterm Exam | 20%  |
| Final Exam   | 50%  |
| Total        | 100%                                       |

## Important Dates

- First day of class: Thursday September 4.
- First tutorial: Tuesday September 16, 5:30pm.
- Assignment 1 due date: Tuesday September 23, 10pm.
- Assignment 2 due date: Tuesday October 7, 10pm.
- Midterm date (during class): Tuesday October 21.
- Assignment 3 due date: Tuesday November 4, 10pm.
- Reading week: November 10–14.
- Assignment 4 due date: Tuesday November 25, 10pm.
- Last day of class: Thursday December 4.

## Final Exam Scheduling

The Registrar schedules all final examinations, including deferred and supplemental examinations. Students are advised not to make travel arrangements for the exam period until the official exam schedule has been posted.

**Note: All students must be properly registered in order to attend lectures and receive credit for this course.**

## Textbook Information

### Required Text

There are no required texts.

### Recommended Texts

- Jonathan Pevsner, *Bioinformatics and Functional Genomics*, second edition. Wiley-Blackwell, (2009).
- Nello Cristianini, Matthew W. Hahn, *Introduction to Computational Genomics: A Case Studies Approach*. Cambridge University Press, (2007).

## Course Overview

- There will be a short tutorial, most Tuesdays from 5:30pm–6:20pm in Arts 140 (first one is on September 16). Attendance is optional. The material for the tutorials will be posted on the course website. A Teaching Assistant will be present and can help with some sample questions to be provided. They can also help with the assignments, or help with any other questions you have. These will not occur every week, and the exact schedule will be announced on the website and in class.
- Students will be expected to check the course website for all lecture notes, tutorial notes, resources and scheduling information.

## Policies

### Late Assignments

Late assignments will not be accepted.

## Assignment Extensions

Extensions on assignments will be granted only by the course instructor. As a general rule, individual requests for extensions on medical or compassionate grounds will only be considered if made prior to the due date of the assignment.

## Missed Examinations

1. "Students who have missed an exam or assignment must contact their instructor as soon as possible. Arrangements to make up the exam may be arranged with the instructor. Missed exams throughout the year are left up to the discretion of the instructor if a student may make up the exam or write at a different time. If a student knows prior to the exam that she/he will not be able to attend, they should let the instructor know before the exam."
2. "Final exams - a student who is absent from a final examination through no fault of his or her own, for medical or other valid reasons, may apply to the College of Arts and Science Dean's office. The application must be made within three days of the missed examination along with supporting documentary evidence. Deferred exams are written during the February mid-term break for Term 1 courses and in early June for Term 2 and full year courses."

## Incomplete Course Work and Final Grades

When a student has not completed the required course work, which includes any assignment or examination including the final examination, by the time of submission of the final grades, they may be granted an extension to permit completion of an assignment, or granted a deferred examination in the case of absence from a final examination. Extensions for the completion of assignments must be approved by the Department Head, or Dean in non-departmentalized Colleges, and may exceed thirty days only in unusual circumstances. The student must apply to the instructor for such an extension and furnish satisfactory reasons for the deficiency. Deferred final examinations are granted as per College policy.

**In the interim, the instructor will submit a computed percentile grade for the course which factors in the incomplete course work as a zero, along with a grade comment of INF (Incomplete Failure) if a failing grade. In the case where the instructor has indicated in the course outline that failure to complete the required course work will result in failure in the course, and the student has a computed passing percentile grade, a final grade of 49% will be submitted along with a grade comment of INF (Incomplete Failure).**

If an extension is granted and the required assignment is submitted within the allotted time, or if a deferred examination is granted and written in the case of absence from the final examination, the instructor will submit a revised computed final percentage grade. The grade change will replace the previous grade and any grade comment of INF (Incomplete Failure) will be removed.

For provisions governing examinations and grading, students are referred to the University Council Regulations on Examinations subsection of the Calendar.

(2011 University of Saskatchewan Calendar/Academic Courses Policy)

## Academic Honesty

The University of Saskatchewan is committed to the highest standards of academic integrity and honesty. Students are expected to be familiar with these standards regarding academic honesty and to uphold the policies of the University in this respect. Students are particularly urged to familiarize themselves with the provisions of the Student Conduct & Appeals subsection of the University Secretary Website and avoid any behaviour that could potentially result in suspicions of cheating, plagiarism, misrepresentation of facts and/or participation in an offence. Academic dishonesty is a serious offence and can result in suspension or expulsion from the University.

All students should read and be familiar with the Regulations on Academic Student Misconduct, <http://www.usask.ca/secretariat/student-conduct-appeals/StudentAcademicMisconduct.pdf>, as well as the Standard of Student Conduct in Non-Academic Matters and Procedures for Resolution of Complaints and Appeals,

<http://www.usask.ca/secretariat/student-conduct-appeals/StudentNon-AcademicMisconduct.pdf>.

Academic honesty is also defined and described in the Department of Computer Science Statement on Academic Honesty:

<http://www.cs.usask.ca/undergrad/honesty.php>.

For more information on what academic integrity means for students see the Student Conduct & Appeals subsection of the University Secretary Website at:

<http://www.usask.ca/secretariat/student-conduct-appeals/forms/IntegrityDefined.pdf>

### **Examinations with Disability Services for Students (DSS)**

Students who have disabilities (learning, medical, physical, or mental health) are strongly encouraged to register with Disability Services for Students (DSS) if they have not already done so. Students who suspect they may have disabilities should contact DSS for advice and referrals. In order to access DSS programs and supports, students must follow DSS policy and procedures. For more information, check

<http://www.students.usask.ca/disability/>,

or contact DSS at 966-7273 or [dss@usask.ca](mailto:dss@usask.ca).

Students registered with DSS may request alternative arrangements for mid-term and final examinations. Students must arrange such accommodations through DSS by the stated deadlines. Instructors shall provide the examinations for students who are being accommodated by the deadlines established by DSS.