

# CS898 - On the Synergy between Computer Science and Biology

Winter 2021

## Course Outline

University of Waterloo, School of Computer Science

Instructor: Gladimir V. G. Baranoski

Email: [gvgbaran@gmail.com](mailto:gvgbaran@gmail.com)

### Lectures delivery:

Remote and asynchronous.

### Course Website

<http://pedrinho.cs.uwaterloo.ca/~gvgbaran/cs898-W21.html>

### Course Description

The main topics to be addressed during this course are the following:

- the use of computational methods to investigate and model biological systems, and
- the use of biological processes to derive solutions to computational problems.

### Course Objectives

The main goal of this course is to explore the forefront of research involving the interaction between computer science and biology. This course will also address practical aspects associated with the scientific methodology used in the search for solutions of problems in physical and life sciences.

### Reading Materials

- Selected papers and additional resources will be provided in the course website, under “Selected Papers” and “Additional Resources”, respectively. The selected papers are divided into two groups, namely P (Presentation & Reading) and R (Reading). All papers should be read by the students, preferably before the dates specified in course schedule (available in course website under “Hand-outs”).

- The instructor will assign specific P papers to the students on the days specified in the course schedule (please refer to the section **Paper Assignment Process** below). The students will then submit presentations of these papers by the dates specified in the course schedule. These presentations will be made available through the course website under “Presentations”. Guidelines about the preparation and submission of these presentations are available in the course website under “Handouts”.
- There will be quizzes about the P papers on the days specified in the course schedule. These quizzes are based on the actual papers. Thus, even if a paper is not presented by a student, it still should be read by the students and questions about it may be included in a quiz. More detailed information about the quizzes will also be available in the course website under “Handouts”.
- Students will submit commentaries about the R papers on the days specified in the course schedule. More detailed information about the preparation and submission of these commentaries are also available in the course website under “Handouts”.
- Students should choose a topic involving both computer science and biology. During the term, students should investigate the current state of the art of the chosen topic and prepare a written report about it. In addition, students should prepare and submit a slide presentation (along with its transcript) employing guidelines similar to those used in the paper presentations. Guidelines about the preparation and submission of these materials will also be available in the course website under “Handouts”. No code implementations are required.
- Students should go over the technical report presentations (to be available in course website under “Presentations” later in the term) and select the two (other than their own) that have impressed them the most. For each selected report presentation, students should justify their choice by providing the two most significant aspects that have influenced their selection. In addition, for each selected presentation, they will have to provide at least one suggestion for improvement or extension. More detailed information about the preparation and submission of these assessments will also be available in the course website under “Handouts”.

## Marking Scheme

- Participation in course activities (55%):
  - paper presentations (30%),
  - paper quizzes (15%).
  - paper commentaries (10%),
- Technical report (45%):
  - presentation (15%),
  - written report (20%).
  - assessment (10%)

Important notes:

- The deadline for the submission of course materials is **6 PM** Eastern Time (US and Canada) on the days specified in the course schedule available in course website under “Handouts”.
- Late submissions (up to 24h from the specified deadline) of the materials will receive a penalty of 50%. Submissions after 24h from the specified deadline will receive **ZERO** marks.
- Reports whose topic was not approved by the instructor by **March 24, 2021** will receive **ZERO** marks. For more information, please refer to the technical report guidelines to be made available in the course website under “Handouts”.
- The quizzes will be available via Learn on the days specified on the course schedule. Students should read the papers covered in a given quiz before the day that they are taking the quiz.
- The guidelines for the preparation and submission of the course materials listed above are indicated in respective instruction documents available (or to be made available) in the course website under “Handouts”.
- The instructor reserves the right, where appropriate, to adjust raw marks downward in the case of any **violation of academic integrity** (please refer to the section **University Mandatory Information** below) and upward in other situations.
- Marking issues will not be discussed via email. Students should attend the instructor virtual office hours (please refer to the section **Course Delivery Policies** below) to clarify any aspect related to the their marks.

## Paper Assignment Process

- Students will present two papers (from the list of P papers available in the course website under “Selected Papers”) during this term. The paper presentations will be divided in two rounds.
- For each round of paper presentations, students can indicate three papers that they would like to present in decreasing order of preference. The instructor will assign papers to the students on a first come first serve basis taking into account their preferences. However, if all three papers chosen by a student have already been assigned to other students, the instructor will assign another paper from the list of P papers. The paper assignments made by the instructor will be announced via email and Learn.
- Students should submit their three choices to the instructor via email using his email address (gvgsaran@gmail.com) and the subject “CS898: Paper-Preferences”.
- For the first round of presentations, the students should submit their choices (from papers P1 to P15) before **January 13, 2021** at **6PM** Eastern Time (US and Canada).
- For the second round of presentations, the students should submit their choices (from papers P1 to P30, with the exception of those presented in the first round) after **January 14, 2021** and before **February 10, 2021** at **6PM** Eastern Time (US and Canada).

## Course Work and Integrity Policies

- All course materials should be prepared and submitted individually.
- All password protected materials available on the course website are intended for the exclusive academic use of students enrolled in this offering (Winter 2021) of CS898. Accordingly, these materials should not be distributed by the students to people not enrolled in the course.
- The instructor will provide students with temporary passwords in the first week of classes. During the term, these passwords will be changed for security reasons. The instructor will then provide the new passwords for the students enrolled in the course. Students should not share course passwords with people not enrolled in the course during this term.
- Any breach of these guidelines will be considered a **violation of academic integrity**, and it will be dealt with according to the university procedures described in Policy 71, Student Discipline, [www.adm.uwaterloo.ca/infosec/Policies/policy71.htm](http://www.adm.uwaterloo.ca/infosec/Policies/policy71.htm).

## Course Delivery Policies

- We remark that, for this offering (Winter 2021), we will employ a non-traditional, asynchronous course-delivery approach due to special circumstances. Hence, students' self-motivation and dedication will be particularly important.
- Students should note that the course schedule and the other supplementary documents available in the course website under "Handouts" may be subjected to change during the term. In that case, the instructor will inform the students about such changes will be via email/Learn, and release revised versions of the respective documents in the course website under "Handouts".
- All announcements from the course instructor will be provided using email and/or Learn. It is the students' responsibility to ensure that they are up-to-date on reading these announcements and to regularly check on the course website information regarding course updates and weekly activities.
- During this term, in-person meetings with course instructor will be replaced by one-on-one virtual meetings (virtual office hours, or simply VOH). Detailed information about the registration and participation in these meetings are available in the course website under "Handouts".
- General questions about the contents of this course outline or the other available handouts should be directed to the instructor via email with the subject "CS898: Handout Question" within the first two weeks of classes. If a question requires a detailed answer (more than two lines), then the instructor will tell the student to register and participate in the next available VOH.
- Use the course instructor's email for specific issues related to course materials and activities. Issues requiring detailed answers should be addressed during course instructor's virtual office hours. Email messages that do not follow the instructions outlined above will **not** be answered by the instructor.
- Marking issues will not be addressed via email. They should be addressed during course instructor's virtual office hours.

- In case of a special hardware or software issue preventing a student to submit a course material by its due date, the student must contact the instructor at least 24h before that deadline.
- In case of a medical issue preventing a student to submit a course material by its due date, the student should promptly notify the course instructor and provide the appropriate documentation.
- Students that enrol in the course after **January 11, 2021** should contact the course instructor no later than **January 25, 2021**.

## University Mandatory Information

**Academic Integrity:** In order to maintain a culture of academic integrity, members of the University of Waterloo community are expected to promote honesty, trust, fairness, respect and responsibility. [Check [www.uwaterloo.ca/academicintegrity/](http://www.uwaterloo.ca/academicintegrity/) for more information.]

**Grievance:** A student who believes that a decision affecting some aspect of his/her university life has been unfair or unreasonable may have grounds for initiating a grievance. Read Policy 70, Student Petitions and Grievances, Section 4, [www.adm.uwaterloo.ca/infosec/Policies/policy70.htm](http://www.adm.uwaterloo.ca/infosec/Policies/policy70.htm). When in doubt please be certain to contact the department's administrative assistant who will provide further assistance.

**Discipline:** A student is expected to know what constitutes academic integrity [check [www.uwaterloo.ca/academicintegrity/](http://www.uwaterloo.ca/academicintegrity/) ] to avoid committing an academic offence, and to take responsibility for his/her actions. A student who is unsure whether an action constitutes an offence, or who needs help in learning how to avoid offences (e.g., plagiarism, cheating) or about 'rules' for group work/collaboration should seek guidance from the course instructor, academic advisor, or the undergraduate Associate Dean. For information on categories of offences and types of penalties, students should refer to Policy 71, Student Discipline, [www.adm.uwaterloo.ca/infosec/Policies/policy71.htm](http://www.adm.uwaterloo.ca/infosec/Policies/policy71.htm). For typical penalties check Guidelines for the Assessment of Penalties, at the following web site [www.adm.uwaterloo.ca/infosec/guidelines/penaltyguidelines.htm](http://www.adm.uwaterloo.ca/infosec/guidelines/penaltyguidelines.htm).

**Appeals:** A decision made or penalty imposed under Policy 70 (Student Petitions and Grievances) (other than a petition) or Policy 71 (Student Discipline) may be appealed if there is a ground. A student who believes he/she has a ground for an appeal should refer to Policy 72 (Student Appeals) [www.adm.uwaterloo.ca/infosec/Policies/policy72.htm](http://www.adm.uwaterloo.ca/infosec/Policies/policy72.htm).

**Note for Students with Disabilities:** The AccessAbility Services Office (AAS), located in Needles Hall, Room 1401, collaborates with all academic departments to arrange appropriate accommodations for students with disabilities without compromising the academic integrity of the curriculum. If you require academic accommodations to lessen the impact of your disability, please register with the AAS at the beginning of each academic term.