# CGSC 5103
# Formal Methods
# Fall 2021

**Raj Singh**
Department of Cognitive Science
Carleton University

## 1 General Information

### 1.1 Class Time and Location

Tuesdays 8:35-11:25, on-line

### 1.2 Instructor's Contact Information

**Instructor** Raj Singh

**Email** raj.singh@carleton.ca

**Phone** 613-520-2600 x1778

**Office** 2206A Dunton Tower

### 1.3 Office Hours

Mondays By appointment
Location: Zoom

## 2 Course Description

The course introduces students to formal methods that are relevant to various branches of cognitive science. There is a particular focus on logic and computation and their relation to linguistics, artificial intelligence, psychology, and philosophy. The course will involve lectures and homework assignments, with an attempt to cover both technical material as well as application to cognitive science.

## 3 Readings

We will use Sam Buss's 1998 handbook article *An introduction to proof theory* as our starting point, and I will direct you to various other sources as the course proceeds.

## 4 Prerequisites

A willingness to learn, cooperate, and share with others. Access to a solid desk with a straight-back chair and pencils will also be good but is not required.

# 5 Evaluation

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| Participation | 15% |
| Four homework assignments | 50% |
| Take-home exam | 35% |

## 5.1 Participation (15%)

Participation is crucial. Like going to the gym, attendance is a big part of it. But you should also consider this to be like your "job". You are expected to show up and to contribute with in-class discussion and questions. Everybody comes to the class with a unique background and you will learn from each other. If you feel anxious about speaking in class, please let me know and we will sort something out.

## 5.2 Homework assignments (50%)

You will have four homework assignments. You will have a week to do each one, and they will cover material from the readings and lectures and in-class discussion. You will be allowed to work in groups on these if you wish, but everyone will have to submit their own assignment along with an acknowledgment of who you worked with. The assignments will involve a mix of technical and conceptual questions.

## 5.3 Take-home exam (35%)

You will have a take-home exam that will be due on the last day of classes. You will have the freedom to select from a set of questions which you end up answering. The exam will include a mix of technical and conceptual questions.

# 6 Brightspace

This class will make use of Brightspace for slides and handouts. You will also be able to submit assignments there.

# 7 Student requirements

Students are required to keep copies of any submitted work.
Students must complete the assigned readings before each class.
Students are required to attend class.

## 7.1 Submission Policies

1. You can submit your work either on Brightspace or in class, and you are encouraged to do both.
2. Please keep copies of all the work you submit.

## 7.2 Missed assignments

All assignments and papers must be submitted by the deadline. If you think you will not be able to submit your assignment in time (because of illness or bereavement), contact me as soon as possible to make alternate arrangements. If any of your work is handed in late, you may receive no credit or reduced credit for it.

### 7.3 Policy on collaborative work

Students are allowed to discuss their work with other students. However, each student must write up their papers and assignments individually. In other words, you can get together and discuss the issues and share ideas. The work you submit must be your own. Copying is not allowed. Please see the statement regarding plagiarism below.

### 7.4 Statement Regarding Plagiarism

The Senate of the University has labeled plagiarism an instructional offence. For the University's purposes, plagiarism is *presenting, whether intentionally or not, the ideas, expression of ides or work of others as one's own.* Plagiarism is a serious offence that cannot be resolved directly by the course's instructor. The Associate Dean of the Faculty conducts a rigorous investigation, including an interview with the student, when an instructor suspects a piece of work has been plagiarized. Penalties are not trivial. They can include a final grade of "F" for the course. For more information, please go to the following web page: https://carleton.ca/registrar/academic-integrity/.

## 8 Requests for Academic Accommodation

You may need special arrangements to meet your academic obligations during the term. For an accommodation request, the processes are as follows:

### 8.1 Pregnancy obligation

Please contact your instructor with any requests for academic accommodation during the first two weeks of class, or as soon as possible after the need for accommodation is known to exist. For more details, visit the Equity Services website: carleton.ca/equity/wp-content/uploads/Student-Guide-to-Academic-Accommodation.pdf

### 8.2 Religious obligation

Please contact your instructor with any requests for academic accommodation during the first two weeks of class, or as soon as possible after the need for accommodation is known to exist. For more details, visit the Equity Services website: carleton.ca/equity/wp-content/uploads/Student-Guide-to-Academic-Accommodation.pdf

### 8.3 Academic Accommodations for Students with Disabilities

If you have a documented disability requiring academic accommodations in this course, please contact the Paul Menton Centre for Students with Disabilities (PMC) at 613-520-6608 or pmc@carleton.ca for a formal evaluation or contact your PMC coordinator to send your instructor your Letter of Accommodation at the beginning of the term. You must also contact the PMC no later than two weeks before the first in-class scheduled test or exam requiring accommodation (if applicable). After requesting accommodation from PMC, meet with your instructor as soon as possible to ensure accommodation arrangements are made. carleton.ca/pmc

### 8.4 Survivors of Sexual Violence

As a community, Carleton University is committed to maintaining a positive learning, working and living environment where sexual violence will not be tolerated, and is survivors are supported through academic accommodations as per Carleton's Sexual Violence Policy. For more information about the services available at the university and to obtain information about sexual violence and/or support, visit: carleton.ca/sexual-violence-support

### 8.5 Accommodation for Student Activities

Carleton University recognizes the substantial benefits, both to the individual student and for the university, that result from a student participating in activities beyond the classroom experience. Reasonable accommodation must be provided to students who compete or perform at the national or international level. Please contact your instructor with any requests for academic accommodation during the first two weeks of class, or as soon as possible after the need for accommodation is known to exist. https://carleton.ca/senate/wp-content/uploads/Accommodation-for-Student-Activities-1.pdf

For more information on academic accommodation, please contact the departmental administrator or visit: students.carleton.ca/course-outline