

# Cognitive Science (CGSC)

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## Cognitive Science (CGSC) Courses

### CGSC 1001 [0.5 credit]

#### Mysteries of the Mind

Challenges faced in understanding the mind, and some of the approaches cognitive science has brought to bear on them. Topics may include the nature of knowledge, how we learn, the extent to which human thinking is rational, biases in thinking, and evolutionary influences on cognition.

Lectures three hours per week.

### CGSC 1005 [0.5 credit]

#### Computational Methods in Cognitive Science

Introduction to computational methods, with an emphasis on programming. Topics and assignments will focus on applications in cognitive science. No prior computing experience required.

Includes: Experiential Learning Activity

Lecture three hours and tutorial one and a half hours a week.

### CGSC 2001 [0.5 credit]

#### Theories in Cognitive Science

An integrated background of the discipline of Cognitive Science, with an historical overview (1940's onward) and examination of the extent to which the discipline has assimilated the collective knowledge of contributing disciplines (e.g., psychology, philosophy, linguistics, artificial intelligence and neuroscience).

Prerequisite(s): second-year standing and FYSM 1607 or CGSC 1001, or permission of the Department.

Lectures three hours a week.

### CGSC 2002 [0.5 credit]

#### Methods in Cognitive Science

Selected topics in cognitive science covered from the perspectives of psychology, computer science, linguistics, philosophy, and other related disciplines. Students may be required to complete independent research projects.

Includes: Experiential Learning Activity

Prerequisite(s): CGSC 1001 or FYSM 1607, second year standing, or permission of the Department. Restricted to students enrolled in B.Cog.Sc. programs.

Seminars and tutorials six hours per week.

### CGSC 3004 [0.5 credit]

#### Philosophy and Cognitive Science

An examination of the significance and role of philosophy in cognitive science. Topics may include: philosophical methods for studying the mind, prospects for naturalizing consciousness and intentionality, assessing competing models of the mind.

Prerequisite(s): CGSC 2001 and PHIL 2501, and third-year standing.

Seminar three hours per week.

### CGSC 3201 [0.5 credit]

#### Cognitive Processes

An examination of research findings on cognitive processes. Topics may include attention, speech perception, memory, intelligence, reasoning, learning, working memory, reading, and mathematics.

Prerequisite(s): third-year standing, and CGSC 2001 or PSYC 2700.

Seminar three hours per week.

### CGSC 3301 [0.5 credit]

#### Language and Cognitive Science

Issues related to language and cognitive science are examined through a detailed consideration of selected topics.

Prerequisite(s): third-year standing, and CGSC 2001.

Seminar three hours per week.

### CGSC 3501 [0.5 credit]

#### Cognitive Neuroscience

Issues related to the role of cognitive neuroscience research in cognitive science are examined through a detailed consideration of selected topics.

Prerequisite(s): third-year standing and CGSC 2001.

Seminar, three hours per week.

### CGSC 3601 [0.5 credit]

#### Artificial Intelligence and Cognitive Science

An introduction to the contribution of artificial intelligence and computer modeling of cognitive processes to cognitive science.

Includes: Experiential Learning Activity

Precludes additional credit for CGSC 4001.

Prerequisite(s): third-year standing and CGSC 2002 and (CGSC 1005 or COMP 1005). Restricted to students enrolled in B.Cog.Sc. Honours.

Seminars and labs six hours per week.

**CGSC 3603 [0.5 credit]****Artificial Intelligence: Philosophical and Ethical Issues**

Topics examined through the lens of philosophy and cognitive science may include humans' obligations towards AI, sentient AI, implications of AI for models of cognition, designing ethical AI systems, implications of using AI in healthcare, and social inequality and job displacement related to AI.

Also listed as PHIL 3503.

Prerequisite(s): CGSC 2001 or PHIL 2501 and third-year standing in Cognitive Science or Philosophy.

Seminar 3 hours per week.

**CGSC 3704 [0.5 credit]****Cognitive Science and the Digital Humanities**

Exploration of the roles of human and artificial cognition in the digital humanities. Topics may include virtual and augmented reality as applied to the humanities, cognitive issues in hypertext and hypermedia; linguistic and philosophical considerations in digital media, cognitive narratology, and artificial intelligence.

Also listed as DIGH 3704.

Prerequisite(s): CGSC 2001 or DIGH 2001 and third-year standing.

Seminar three hours per week.

**CGSC 3908 [0.5 credit]****Honours Seminar in Cognitive Science**

Major theories and empirical approaches within Cognitive Science are examined through a detailed consideration of selected topics. Students are required to complete independent research projects to prepare for their fourth-year honours theses.

Includes: Experiential Learning Activity

Precludes additional credit for CGSC 3001 (no longer offered) and CGSC 3002 (no longer offered).

Prerequisite(s): third year standing, CGSC 2001 and CGSC 2002, and enrolment in B. Cog. Sc. Honours with a CGPA in the major requirements of 8.0.

Seminars and tutorials six hours per week.

**CGSC 3999 [0.0 credit]****Co-operative Work Term**

Includes: Experiential Learning Activity

**CGSC 4601 [0.5 credit]****Cognitive Architectures**

Cognitive architectures and how to evaluate them against human data; how to create cognitive models using cognitive architectures such as ACT-R.

Prerequisite(s): third-year standing, CGSC 2001, and (CGSC 1005 or COMP 1005).

Also offered at the graduate level, with different requirements, as CGSC 5601, for which additional credit is precluded.

Seminar three hours per week, tutorial one and a half hours per week.

**CGSC 4605 [0.5 credit]****Hyperdimensional Cognitive Models**

Modelling cognition using artificial intelligence techniques such as reinforcement learning, vector-symbolic models, neural networks, and/or machine learning.

Prerequisite(s): third-year standing, (CGSC 1005 or COMP 1005), CGSC 2001, and CGSC 3601.

Also offered at the graduate level, with different requirements, as CGSC 5605, for which additional credit is precluded.

Seminar three hours per week, tutorial one and a half hours per week.

**CGSC 4801 [0.5 credit]****Independent Study**

A reading or research course for selected students who wish to investigate a particular topic of interest. Normally students may not offer more than one credit of independent study in their total program (including independent study credits taken through other departments).

Includes: Experiential Learning Activity

Prerequisite(s): third- or fourth-year standing and permission of the Department.

**CGSC 4802 [0.5 credit]****Independent Study**

A reading or research course for selected students who wish to investigate a particular topic of interest. Normally students may not offer more than one credit of independent study in their total program (including independent study credits taken through other departments).

Includes: Experiential Learning Activity

Prerequisite(s): third- or fourth-year standing and permission of the Department.

**CGSC 4900 [0.5 credit]****Special Topics in Cognitive Science**

The topic of this course will vary from year to year. Students may register in more than one section of CGSC 4900 but may register in each section only once. Prerequisite(s): each section will have its own prerequisites and permission of the department if is required. Seminar three hours per week.

**CGSC 4908 [1.0 credit]****Honours Thesis**

Interdisciplinary thesis. In developing a thesis, students must consult the Undergraduate Supervisor. Only the Undergraduate Supervisor can assign a supervisor or grant approval to register in this course. Faculty regulations governing Honours Research Essays and Honours Theses apply. Includes: Experiential Learning Activity. Precludes additional credit for CGSC 4909. Prerequisite(s): fourth year standing, CGSC 3908, and enrolment in B.Cog.Sc. Honours with a major CGPA of 8.0.

**CGSC 4909 [1.0 credit]****Honours Project**

Interdisciplinary project. Students engage in one or more group research projects. Includes: Experiential Learning Activity. Precludes additional credit for CGSC 4908. Prerequisite(s): 4th year standing, enrolment in B. Cog. Sc. Honours. Seminar