Cognitive Science

This section presents the requirements for programs in:

- Cognitive Science with Concentration in Philosophical and Conceptual Issues Bachelor of Cognitive Science Honours
- Cognitive Science with Concentration in Language and Linguistics Bachelor of Cognitive Science Honours
- Cognitive Science with Concentration in the Biological Foundations of Cognition Bachelor of Cognitive Science Honours
- Cognitive Science with Concentration in Cognition and Psychology Bachelor of Cognitive Science Honours
- Cognitive Science with Concentration in Cognition and Computation Bachelor of Cognitive Science Honours
- Cognitive Science Bachelor of Cognitive Science General
- Post-Baccalaureate Diploma in Cognitive Science

Program Requirements

Cognitive Science with Concentration in Philosophical and Conceptual Issues
Bachelor of Cognitive Science Honours (20.0 credits)

A. Credits Included in the Major CGPA (15.5 credits)

1. 1.0 credit from:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>FYSM 1607</td>
<td>Cognitive Science: Thinking and Knowing</td>
</tr>
<tr>
<td>FYSM 1400</td>
<td>Cognition: A Scientific Exploration of the Mind</td>
</tr>
<tr>
<td>CGSC 1001</td>
<td>Mysteries of the Mind</td>
</tr>
<tr>
<td>PHIL 1301</td>
<td>Mind, World, and Knowledge</td>
</tr>
</tbody>
</table>

2. 1.0 credit in:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>CGSC 2001</td>
<td>Introduction to Cognitive Science</td>
</tr>
<tr>
<td>CGSC 2002</td>
<td>Theories and Methods in Cognitive Science</td>
</tr>
</tbody>
</table>

3. 1.0 credit in:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>CGSC at 3000-level or higher</td>
<td></td>
</tr>
</tbody>
</table>

4. 0.5 credit from:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>CGSC 1005</td>
<td>Computational Methods in Cognitive Science</td>
</tr>
<tr>
<td>COMP 1005</td>
<td>Introduction to Computer Science I</td>
</tr>
</tbody>
</table>

5. 0.5 credit in:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>CGSC 4001</td>
<td>Artificial Intelligence for Cognitive Scientists</td>
</tr>
</tbody>
</table>

6. 0.5 credit in:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>LING 1001</td>
<td>Introduction to Linguistics I</td>
</tr>
</tbody>
</table>

7. 1.0 credit in:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>LING 2005</td>
<td>Linguistic Analysis</td>
</tr>
<tr>
<td>LING 2007</td>
<td>Phonetics</td>
</tr>
</tbody>
</table>

8. 1.0 credit in:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHIL 2001</td>
<td>Introduction to Logic</td>
</tr>
<tr>
<td>PHIL 2501</td>
<td>Introduction to Philosophy of Mind</td>
</tr>
</tbody>
</table>

9. 0.5 credit from:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHIL 2301</td>
<td>Introduction to the Philosophy of Science</td>
</tr>
<tr>
<td>PHIL 2504</td>
<td>Language and Communication</td>
</tr>
<tr>
<td>PHIL 3104</td>
<td>The Roots of Analytic Philosophy</td>
</tr>
<tr>
<td>PHIL 3301</td>
<td>Issues in the Philosophy of Science</td>
</tr>
<tr>
<td>PHIL 3306</td>
<td>Symbolic Logic</td>
</tr>
<tr>
<td>PHIL 3501</td>
<td>Philosophy of Cognitive Science</td>
</tr>
<tr>
<td>PHIL 3502</td>
<td>Mind and Action</td>
</tr>
<tr>
<td>PHIL 3504</td>
<td>Pragmatics</td>
</tr>
<tr>
<td>PHIL 3506</td>
<td>Semantics</td>
</tr>
<tr>
<td>PHIL 3530</td>
<td>Philosophy of Language</td>
</tr>
<tr>
<td>CGSC 3004</td>
<td>Philosophy and Cognitive Science</td>
</tr>
</tbody>
</table>

10. 2.0 credits in:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSYC 1001</td>
<td>Introduction to Psychology I</td>
</tr>
<tr>
<td>PSYC 1002</td>
<td>Introduction to Psychology II</td>
</tr>
<tr>
<td>PSYC 2001</td>
<td>Introduction to Research Methods in Psychology</td>
</tr>
<tr>
<td>PSYC 2700</td>
<td>Introduction to Cognitive Psychology</td>
</tr>
</tbody>
</table>

11. 0.5 credit from:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSYC 2307</td>
<td>Human Neuropsychology I</td>
</tr>
<tr>
<td>NEUR 1202</td>
<td>Neuroscience of Mental Health and Psychiatric Disease</td>
</tr>
</tbody>
</table>

12. 1.5 credits from:

a. Thesis pathway

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>CGSC 3908</td>
<td>Honours Seminar in Cognitive Science</td>
</tr>
<tr>
<td>CGSC 4908</td>
<td>Honours Thesis</td>
</tr>
</tbody>
</table>

OR

b. Project pathway

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>CGSC 4909</td>
<td>Honours Project</td>
</tr>
</tbody>
</table>

and 0.5 credit in CGSC at the 3000-level or higher

OR

c. Coursework pathway

1.5 credits in CGSC, COMP, LING, NEUR, PHIL, or PSYC at the 3000 level or higher

13. 4.5 credits in the concentration:

a. 4.0 credits from:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHIL 2301</td>
<td>Introduction to the Philosophy of Science</td>
</tr>
<tr>
<td>PHIL 2504</td>
<td>Language and Communication</td>
</tr>
<tr>
<td>PHIL 2540</td>
<td>Personal Identity and the Self</td>
</tr>
<tr>
<td>PHIL 3104</td>
<td>The Roots of Analytic Philosophy</td>
</tr>
<tr>
<td>PHIL 3140</td>
<td>Epistemology</td>
</tr>
<tr>
<td>PHIL 3301</td>
<td>Issues in the Philosophy of Science</td>
</tr>
<tr>
<td>PHIL 3306</td>
<td>Symbolic Logic</td>
</tr>
<tr>
<td>PHIL 3501</td>
<td>Philosophy of Cognitive Science</td>
</tr>
<tr>
<td>PHIL 3502</td>
<td>Mind and Action</td>
</tr>
<tr>
<td>PHIL 3504</td>
<td>Pragmatics</td>
</tr>
<tr>
<td>PHIL 3506</td>
<td>Semantics</td>
</tr>
<tr>
<td>PHIL 3530</td>
<td>Philosophy of Language</td>
</tr>
<tr>
<td>CGSC 3004</td>
<td>Philosophy and Cognitive Science</td>
</tr>
</tbody>
</table>

b. 0.5 credit from:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHIL 4055</td>
<td>Lexical Semantics</td>
</tr>
<tr>
<td>PHIL 4210</td>
<td>Seminar in philosophy of Language or Linguistics</td>
</tr>
<tr>
<td>PHIL 4220</td>
<td>Seminar in philosophy of Mind or Cognition</td>
</tr>
<tr>
<td>Course Code</td>
<td>Course Title</td>
</tr>
<tr>
<td>------------</td>
<td>------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>PHIL 4230</td>
<td>Seminar in Metaphysics, Epistemology, or Philosophy of Science</td>
</tr>
<tr>
<td>PHIL 4503</td>
<td>Special Topic in Philosophy of Computing</td>
</tr>
<tr>
<td>PHIL 4505</td>
<td>Formal Semantics</td>
</tr>
</tbody>
</table>

**B. Credits not included in the Major (4.5 credits)**

14. 4.5 credits in free electives.

**Note:** normally, students may not offer more than one credit of independent study (e.g., CGSC 4801 Independent Study and CGSC 4802 Independent Study) in their total program, including independent study credits taken through other departments.

### Cognitive Science with Concentration in Language and Linguistics

**Bachelor of Cognitive Science Honours (20.0 credits)**

#### A. Credits Included in the Major CGPA (15.5 credits)

1. 1.0 credit from:
   - FYSM 1607 [1.0] Cognitive Science: Thinking and Knowing
   - FYSM 1400 [1.0] Cognition: A Scientific Exploration of the Mind
   - CGSC 1001 [0.5] Mysteries of the Mind
   - PHIL 1301 [0.5] Mind, World, and Knowledge

2. 1.0 credit in:
   - CGSC 2001 [0.5] Introduction to Cognitive Science
   - CGSC 2002 [0.5] Theories and Methods in Cognitive Science

3. 1.0 credit in:
   - CGSC at the 3000 level or higher

4. 0.5 credit from:
   - CGSC 1005 [0.5] Computational Methods in Cognitive Science
   - COMP 1005 [0.5] Introduction to Computer Science I

5. 0.5 credit in:
   - CGSC 4001 [0.5] Artificial Intelligence for Cognitive Scientists

6. 0.5 credit in:
   - LING 1001 [0.5] Introduction to Linguistics I

7. 1.0 credit in:
   - LING 2005 [0.5] Linguistic Analysis
   - LING 2007 [0.5] Phonetics

8. 1.0 credit in:
   - PHIL 2001 [0.5] Introduction to Logic
   - PHIL 2501 [0.5] Introduction to Philosophy of Mind

9. 0.5 credit from:
   - CGSC 3004 [0.5] Philosophy and Cognitive Science
   - PHIL 2301 [0.5] Introduction to the Philosophy of Science
   - PHIL 2504 [0.5] Language and Communication
   - PHIL 3104 [0.5] The Roots of Analytic Philosophy
   - PHIL 3301 [0.5] Issues in the Philosophy of Science
   - PHIL 3306 [0.5] Symbolic Logic
   - PHIL 3501 [0.5] Philosophy of Cognitive Science
   - PHIL 3502 [0.5] Mind and Action

10. 2.0 credits in:
    - PSYC 1001 [0.5] Introduction to Psychology I
    - PSYC 1002 [0.5] Introduction to Psychology II
    - PSYC 2001 [0.5] Introduction to Research Methods in Psychology

11. 0.5 credit from:
    - NEUR 1202 [0.5] Neuroscience of Mental Health and Psychiatric Disease
    - PSYC 2307 [0.5] Human Neuropsychology I

12. 1.5 credits from:
    a. **Thesis pathway**
       - CGSC 3908 [0.5] Honours Seminar in Cognitive Science
       - CGSC 4908 [1.0] Honours Thesis
    OR
    b. **Project pathway**
       - CGSC 4909 [1.0] Honours Project
       and 0.5 credit in CGSC at the 3000 level or higher
    OR
    c. **Coursework pathway**
       - 1.5 credits in CGSC, COMP, LING, NEUR, PHIL, or PSYC at the 3000 level or higher

13. 4.5 credits in the concentration:
    a. 2.5 credits in:
       - LING 3004 [0.5] Syntax I
       - LING 3005 [0.5] Morphology I
       - LING 3007 [0.5] Phonology I
       - LING 3505 [0.5] Semantics
       - LING 3601 [0.5] Language Processing and the Brain
    b. 1.0 credit from:
       - LING 2604 [0.5] Communication Disorders I
       - LING 3604 [0.5] Communication Disorders II
       - LING 3504 [0.5] Pragmatics
       - LING 3603 [0.5] Child Language
    c. 1.0 credit from:
       - LING 4004 [0.5] Syntax II
       - LING 4005 [0.5] Morphology II
       - LING 4007 [0.5] Phonology II
       - LING 4505 [0.5] Formal Semantics
       - LING 4601 [0.5] Cognitive Neuroscience of Language

#### B. Credits not included in the Major (4.5 credits)

14. 4.5 credits in free electives

**Note:** Normally, students may not offer more than one credit of independent study (e.g., CGSC 4801 [0.5] Independent Study and CGSC 4802 [0.5] Independent Study) in their total program, including independent study credits taken through other departments.
### Cognitive Science with Concentration in the Biological Foundations of Cognition Bachelor of Cognitive Science Honours (20.0 credits)

**A. Credits Included in the Major GPA (15.5 credits)**

1. **1.0 credit from:**
   - FYSM 1607 [1.0] Cognitive Science: Thinking and Knowing
   - FYSM 1400 [1.0] Cognition: A Scientific Exploration of the Mind
   - CGSC 1001 [0.5] Mysteries of the Mind
   - PHIL 1301 [0.5] Mind, World, and Knowledge

2. **1.0 credit in:**
   - CGSC 2001 [0.5] Introduction to Cognitive Science
   - CGSC 2002 [0.5] Theories and Methods in Cognitive Science

3. **1.0 credit in:**
   - CGSC at the 3000 level or higher

4. **0.5 credit from:**
   - CGSC 1005 [0.5] Computational Methods in Cognitive Science
   - COMP 1005 [0.5] Introduction to Computer Science I

5. **0.5 credit in:**
   - CGSC 4001 [0.5] Artificial Intelligence for Cognitive Scientists

6. **0.5 credit in:**
   - LING 1001 [0.5] Introduction to Linguistics I

7. **1.0 credit in:**
   - LING 2005 [0.5] Linguistic Analysis
   - LING 2007 [0.5] Phonetics

8. **1.0 credit in:**
   - PHIL 2001 [0.5] Introduction to Logic
   - PHIL 2501 [0.5] Introduction to Philosophy of Mind

9. **0.5 credit from:**
   - PHIL 2301 [0.5] Introduction to the Philosophy of Science
   - PHIL 2504 [0.5] Language and Communication
   - PHIL 3104 [0.5] The Roots of Analytic Philosophy
   - PHIL 3301 [0.5] Issues in the Philosophy of Science
   - PHIL 3306 [0.5] Symbolic Logic
   - PHIL 3501 [0.5] Philosophy of Cognitive Science
   - PHIL 3502 [0.5] Mind and Action
   - PHIL 3504 [0.5] Pragmatics
   - PHIL 3506 [0.5] Semantics
   - PHIL 3530 [0.5] Philosophy of Language
   - CGSC 3004 [0.5] Philosophy and Cognitive Science

10. **2.0 credits in:**
    - PSYC 1001 [0.5] Introduction to Psychology I
    - PSYC 1002 [0.5] Introduction to Psychology II
    - PSYC 2001 [0.5] Introduction to Research Methods in Psychology
    - PSYC 2700 [0.5] Introduction to Cognitive Psychology

11. **0.5 credit in:**
    - NEUR 1202 [0.5] Neuroscience of Mental Health and Psychiatric Disease

12. **1.5 credits from:**
    - a. Thesis pathway

13. **4.5 credits in the concentration:**
    - a. 0.5 credit in:
      - NEUR 1203 [0.5] Neuroscience of Mental Health and Neurological Disease
    - b. 2.5 credits in:
      - NEUR 2002 [0.5] Introduction to Statistics in Neuroscience

14. **4.5 credits in free electives.**

**B. Credits Not Included in the Major CGPA (4.5 credits)**

14. **4.5 credits in free electives.**

**Total Credits**: 20.0

**Note**: normally, students may not offer more than one credit of independent study (eg. CGSC 4801 Independent Study and CGSC 4802 Independent Study) in their total program, including independent study credits taken through other departments.

### Cognitive Science with Concentration in Cognition and Psychology Bachelor of Cognitive Science Honours (20.0 credits)

**A. Credits Included in the Major GPA (15.5 credits)**

1. **1.0 credit from:**
   - FYSM 1607 [1.0] Cognitive Science: Thinking and Knowing
   - FYSM 1400 [1.0] Cognition: A Scientific Exploration of the Mind
   - CGSC 1001 [0.5] Mysteries of the Mind
   - PHIL 1301 [0.5] Mind, World, and Knowledge

2. **1.0 credit in:**
   - CGSC 2001 [0.5] Introduction to Cognitive Science

3. **0.5 credit from:**
   - CGSC 3908 [0.5] Honours Seminar in Cognitive Science
   - CGSC 4908 [1.0] Honours Thesis

**OR**

4. **b. Project Pathway**
   - CGSC 4909 [1.0] Honours Project
   - and 0.5 credit in CGSC at the 3000 level or higher

**OR**

5. **c. Coursework pathway**
   - 1.5 credits in CGSC, COMP, LING, NEUR, PHIL, or PSYC at the 3000 level or higher

13. **4.5 credits in the concentration:**

   a. 0.5 credit in:
      - NEUR 1203 [0.5] Neuroscience of Mental Health and Neurological Disease
   b. 2.5 credits in:
      - NEUR 2002 [0.5] Introduction to Statistics in Neuroscience

   **Note**: normally, students may not offer more than one credit of independent study (eg. CGSC 4801 Independent Study and CGSC 4802 Independent Study) in their total program, including independent study credits taken through other departments.
### Cognitive Science with Concentration in Cognition and Computation

#### Bachelor of Cognitive Science Honours (20.0 credits)

**A. Credits Included in the Major CGPA (15.5 credits)**

1. **1.0 credit from:**
   - CGSC 2001 [0.5] Introduction to Cognitive Science
   - CGSC 2002 [0.5] Theories and Methods in Cognitive Science

2. **1.0 credit in:**
   - CGSC at the 3000 level or above
   - COMP 1005 [0.5] Introduction to Computer Science I
   - CGSC 4001 [0.5] Artificial Intelligence for Cognitive Scientists
   - LING 1001 [0.5] Introduction to Linguistics I
   - LING 2005 [0.5] Linguistic Analysis
   - LING 2007 [0.5] Phonetics
   - PHIL 2001 [0.5] Introduction to Logic
   - PHIL 2501 [0.5] Introduction to Philosophy of Mind
   - PHIL 2301 [0.5] Introduction to the Philosophy of Science
   - PHIL 2504 [0.5] Language and Communication
   - PHIL 3104 [0.5] The Roots of Analytic Philosophy
   - PHIL 3301 [0.5] Issues in the Philosophy of Science
   - PHIL 3306 [0.5] Symbolic Logic
   - PHIL 3501 [0.5] Philosophy of Cognitive Science
   - PHIL 3502 [0.5] Mind and Action
   - PHIL 3504 [0.5] Pragmatics
   - PHIL 3506 [0.5] Semantics
   - PHIL 3530 [0.5] Philosophy of Language
   - CGSC 3004 [0.5] Philosophy and Cognitive Science

3. **2.0 credits in:**
   - PSYC 1001 [0.5] Introduction to Psychology I
   - PSYC 1002 [0.5] Introduction to Psychology II
   - PSYC 2001 [0.5] Introduction to Research Methods in Psychology
   - PSYC 2700 [0.5] Introduction to Cognitive Psychology

4. **0.5 credit from:**
   - PSYC 2307 [0.5] Human Neuropsychology I
   - NEUR 1202 [0.5] Neuroscience of Mental Health and Psychiatric Disease

5. **1.5 credits from:**
   - **Thesis pathway**
   - CGSC 3908 [0.5] Honours Seminar in Cognitive Science
   - CGSC 4908 [1.0] Honours Thesis
   - **Project pathway**
   - CGSC 4909 [1.0] Honours Project
   - **Coursework pathway**
   - 1.5 credits in CGSC, COMP, LING, NEUR, PHIL, or PSYC at the 3000 level or above

6. **4.5 credits in the concentration:**
   - **1.5 credits in:**
     - PSYC 2002 [0.5] Introduction to Statistics in Psychology
     - PSYC 3000 [1.0] Design and Analysis in Psychological Research
   - **0.5 credit in PSYC at the 2000 level or above**
   - **2.0 credits from:**
     - PSYC 3700 [1.0] Cognition (Honours Seminar)
     - PSYC 3307 [0.5] Human Neuropsychology I
     - PSYC 3506 [0.5] Cognitive Development
     - PSYC 3508 [0.5] Child Language
     - PSYC 3702 [0.5] Perception
     - PSYC 3709 [0.5] Language Processing and the Brain
     - NEUR 3303 [0.5] The Neuroscience of Consciousness
   - **0.5 credit in PSYC at the 4000 level or above**

7. **4.5 credits in free electives.**

**Total Credits**

20.0

**Note:** Normally, students may not offer more than one credit of independent study (eg. CGSC 4801 [0.5] Independent Study and CGSC 4802 [0.5] Independent Study) in their total program, including independent study credits taken through other departments.
### PHIL 2301 [0.5]
Introduction to the Philosophy of Science

### PHIL 2504 [0.5]
Language and Communication

### PHIL 3104 [0.5]
The Roots of Analytic Philosophy

### PHIL 3301 [0.5]
Issues in the Philosophy of Science

### PHIL 3306 [0.5]
Symbolic Logic

### PHIL 3501 [0.5]
Philosophy of Cognitive Science

### PHIL 3502 [0.5]
Mind and Action

### PHIL 3504 [0.5]
Pragmatics

### PHIL 3506 [0.5]
Semantics

### PHIL 3530 [0.5]
Philosophy of Language

### CGSC 3004 [0.5]
Philosophy and Cognitive Science

#### 10. 2.0 credits in:
- **PSYC 1001 [0.5]** Introduction to Psychology I
- **PSYC 1002 [0.5]** Introduction to Psychology II
- **PSYC 2001 [0.5]** Introduction to Research Methods in Psychology
- **PSYC 2700 [0.5]** Introduction to Cognitive Psychology

#### 11. 0.5 credit from:
- **PSYC 2307 [0.5]** Human Neuropsychology I
- **NEUR 1202 [0.5]** Neuroscience of Mental Health and Psychiatric Disease

#### 12. 1.5 credits from:
- **a. Thesis pathway**
  - **CGSC 3908 [0.5]** Honours Seminar in Cognitive Science
  - **CGSC 4908 [1.0]** Honours Thesis
- **b. Project pathway**
  - **CGSC 4909 [1.0]** Honours Project and 0.5 credit in CGSC at the 3000 level or higher
- **c. Coursework pathway:**
  - 1.5 credits in CGSC, COMP, LING, NEUR, PHIL, or PSYC at the 3000 level or higher

#### 13. 4.5 credits in the concentration:
- **a. 0.5 credit in:**
  - **COMP 1006 [0.5]** Introduction to Computer Science II
- **b. 0.5 credit in COMP at the 1000 level or above**
- **c. 2.0 credits from:**
  - **COMP 2401 [0.5]** Introduction to Systems Programming
  - **COMP 2402 [0.5]** Abstract Data Types and Algorithms
  - **COMP 2404 [0.5]** Introduction to Software Engineering
  - **COMP 2406 [0.5]** Fundamentals of Web Applications
  - **COMP 3008 [0.5]** Human-Computer Interaction
- **d. 1.0 credit in COMP at the 2000 level or above**
- **e. 0.5 credit from:**
  - **COMP 4102 [0.5]** Computer Vision
  - **COMP 4106 [0.5]** Artificial Intelligence
  - **COMP 4107 [0.5]** Neural Networks
  - **COMP 4805 [0.5]** Theory of Automata

### B. Credits not included in the Major CGPA (4.5 credits)

#### 14. 4.5 credits in free electives.

**Total Credits:** 20.0

**Note:** Normally, students may not offer more than one credit of independent study (e.g. CGSC 4801 Independent Study and CGSC 4802 Independent Study) in their total program, including independent study credits taken through other departments.

### Cognitive Science Bachelor of Cognitive Science General (15.0 credits)

#### A. Credits Included in the Major CGPA (9.0 credits)

1. **1.0 credit from:**
   - **CGSC 1001 [0.5]** Mysteries of the Mind
   - **FYSM 1400 [1.0]** Cognition: A Scientific Exploration of the Mind
   - **FYSM 1607 [1.0]** Cognitive Science: Thinking and Knowing
   - **PHIL 1301 [0.5]** Mind, World, and Knowledge

2. **1.0 credit in:**
   - **CGSC 2001 [0.5]** Introduction to Cognitive Science
   - **CGSC 2002 [0.5]** Theories and Methods in Cognitive Science

3. **1.0 credit in CGSC at the 3000 level or above**

4. **0.5 credit from:**
   - **CGSC 1005 [0.5]** Computational Methods in Cognitive Science
   - **COMP 1005 [0.5]** Introduction to Computer Science I

5. **1.5 credits in:**
   - **LING 1001 [0.5]** Introduction to Linguistics I
   - **LING 2005 [0.5]** Linguistic Analysis
   - **LING 2007 [0.5]** Phonetics

6. **1.0 credit in:**
   - **PHIL 2001 [0.5]** Introduction to Logic
   - **PHIL 2501 [0.5]** Introduction to Philosophy of Mind

7. **0.5 credit from:**
   - **CGSC 3004 [0.5]** Philosophy and Cognitive Science
   - **PHIL 2301 [0.5]** Introduction to the Philosophy of Science
   - **PHIL 2504 [0.5]** Language and Communication
   - **PHIL 3104 [0.5]** The Roots of Analytic Philosophy
   - **PHIL 3301 [0.5]** Issues in the Philosophy of Science
   - **PHIL 3306 [0.5]** Symbolic Logic
   - **PHIL 3501 [0.5]** Philosophy of Cognitive Science
   - **PHIL 3502 [0.5]** Mind and Action
   - **PHIL 3504 [0.5]** Pragmatics
   - **PHIL 3506 [0.5]** Semantics
   - **PHIL 3530 [0.5]** Philosophy of Language

8. **2.0 credits in:**
   - **PSYC 1001 [0.5]** Introduction to Psychology I
   - **PSYC 1002 [0.5]** Introduction to Psychology II
   - **PSYC 2001 [0.5]** Introduction to Research Methods in Psychology
   - **PSYC 2700 [0.5]** Introduction to Cognitive Psychology

9. **0.5 credit from:**
   - **NEUR 1202 [0.5]** Neuroscience of Mental Health and Psychiatric Disease
Post-Baccalaureate Diploma in Cognitive Science (4.0 credits)

Admission to this program requires the permission of the Institute of Cognitive Science. Normally, students are required to have completed an undergraduate degree with a minimum B average or higher to be admitted. Applications will be reviewed on a case-by-case basis.

Requirements:

1. 0.5 credit in:
   - CGSC 2001 [0.5] Introduction to Cognitive Science
   - or CGSC 2002 [0.5] Theories and Methods in Cognitive Science
2. 1.0 credit in:
   - CGSC 3908 [0.5] Honours Seminar in Cognitive Science
   - CGSC 4001 [0.5] Artificial Intelligence for Cognitive Scientists
3. 1.5 credits in CGSC at the 3000 level or higher
4. 1.0 credits in:
   - CGSC 4908 [1.0] Honours Thesis
   - or CGSC 4909 [1.0] Honours Project

Total Credits 4.0

Regulations

In addition to the program requirements listed in this section, students must satisfy the academic regulations of the university, and the faculty regulations for the Bachelor of Cognitive Science.

Academic Regulations and Requirements for the Bachelor of Cognitive Science Degree

The regulations presented below apply to all Bachelor of Cognitive Science programs. In addition to the requirements presented here, students must satisfy the University regulations common to all undergraduate students including the process of Academic Performance Evaluation (consult the Academic Regulations of the University section of this Calendar).

First-Year Seminars

B.Cog.Sc. degree students are strongly encouraged to include a First-Year Seminar (FYSM) during their first 4.0 credits of registration. Students are limited to 1.0 credit in FYSM (one 1.0-credit FYSM or two 0.5-credit FYSM’s) and can only register in a FYSM while they have first-year standing in their B.Cog.Sc. program. Students who have completed the Enriched Support Program (ESP) or who are required to take a minimum of one English as a Second Language (ESLA) credit are not permitted to register in a FYSM.

Change of Program Within the B.Cog.Sc. Degree

Students may transfer to a program within the B.Cog.Sc. degree, if upon entry to the new program they would be in Good Standing. Other applications for change of program will be considered on their merits;

students may be admitted to the new program in Good Standing or on Academic Warning. Students may apply to declare or change their program within the B.Cog.Sc. Degree at the Registrar’s Office according to the published deadlines. Acceptance into a program or into a program element or option is subject to any enrolment limitations, specific program, program element or option requirements, as published in the relevant Calendar entry.

Minors, Concentrations and Specializations

Students may apply to the Registrar’s Office to be admitted to a minor, concentration or specialization during their first or subsequent years of study. Acceptance into a minor, concentration or specialization is subject to any specific requirements of the intended Minor, Concentration or Specialization as published in the relevant Calendar entry. Acceptance into a Concentration or Specialization requires that the student be in Good Standing.

Mention: Français

Students registered in the B.Cog.Sc. may earn the notation Mention: Français by completing part of their requirements in French and by demonstrating a knowledge of the history and culture of French Canada. The general requirements are listed below.

Requirements:

1. 1.0 credit in the French language;
2. 1.0 credit devoted to the history and culture of French Canada;
3. 1.0 credit at the 2000- or 3000-level and 1.0 credit at the 4000-level taken in French. These credits may come from any of Philosophy, Psychology, Computer Science, Linguistics, Neuroscience, or Cognitive Science, without restriction.

Students in the B.Cog.Sc. Honours program must present:

1. 1.0 credit in the French language;
2. 1.0 credit devoted to the history and culture of French Canada;
3. 1.0 credit at the 2000- or 3000-level taken in French. This credit may come from any of Philosophy, Psychology, Computer Science, Linguistics, Neuroscience, or Cognitive Science, without restriction.

Courses taught in French (Item 3, above) may be taken at Carleton, at the University of Ottawa on the Exchange Agreement, or at a francophone university on a Letter of Permission. Students planning to take courses on exchange or on a Letter of Permission should take careful note of the residence requirement for a minimum number of Carleton courses in their programs. Consult the Academic Regulations of the University section of this Calendar for information regarding study on Exchange or Letter of Permission.

Regulations

Post-Baccalaureate Diploma

In addition to the requirements presented here, students must satisfy the University regulations (see the Academic Regulations of the University section of this Calendar).
Definition
A post-baccalaureate diploma is defined as a stand-alone undergraduate credential intended to:

• qualify a candidate for consideration for entry into a master's program, or
• bring a candidate who already possesses a bachelor's degree up to a level of a bachelor's degree of 20.0 credits or more in another discipline, or
• provide a candidate who already possesses a twenty-credit bachelor's degree in the same discipline the opportunity to bring their previous studies to current equivalents and/or to examine alternative areas, or
• provide a candidate with a professional undergraduate credential for which the prior completion of an undergraduate degree program is appropriate.

Program Requirements
• A post-baccalaureate diploma is normally constituted of a minimum of 3.0 credits to a maximum of 5.0 credits of advanced undergraduate courses.
• A minimum of 3.0 residency credits counting toward the post-baccalaureate diploma.

English as a Second Language Requirement
In addition to the program requirements, completion of English as a Second Language (ESLA) courses may be required from the following sequence: ESLA 1300, ESLA 1500, ESLA 1900, ESLA 1905. No credits from this sequence will be counted toward the post-baccalaureate diploma.

Continuation
All post-baccalaureate diploma students are expected to complete their diploma requirements within two calendar years after the date of initial registration. After this period student may be withdrawn.

Graduation
• A candidate for a post-baccalaureate diploma must have an overall CGPA of at least 6.5 to graduate.
• A candidate for a post-baccalaureate diploma must obtain a grade of C- or higher in each course taken in fulfillment of the program requirements.
• Students should consult with the Department, School or Institute when planning their diploma and selecting courses.

Co-operative Education
For more information about how to apply for the Co-op program and how the Co-op program works please visit the Co-op website.

All students participating in the Co-op program are governed by the Undergraduate Co-operative Education Policy.

Undergraduate Co-operative Education Policy
Admission Requirements
Students can apply to co-op in one of two ways; directly from high school or after beginning a degree program at Carleton.

If a student is admitted to co-op from high school, their grades will be reviewed two terms to one year prior to their first work term to ensure they continue to meet the academic requirements after their 1st or 2nd year of study. The time at which evaluation takes place depends on the program of study. Students will automatically be notified via their Carleton email account if they are permitted to continue.

Students not admitted to Carleton University with the co-op option on their degree can apply for admission via the co-operative education program website. To view application deadlines, visit carleton.ca/co-op.

Admission to the co-op option is based on the completion of 5.0 or more credits at Carleton University, the CGPA requirement for the students’ academic program as well as any course prerequisites. The articulated CGPA for each program is the normal standard for assessment. Please see the specific degree program sections for the unique admission and continuation requirements for each academic program.

English Language Proficiency
Students admitted to Carleton based on CAEL, IELTS or TOEFL assessments and who are required to take an ESL course must take and pass the Oral Proficiency in Communicative Settings (OPECS) Test. The test must be taken before being permitted to register in COOP 1000. Admission to the co-op program can be confirmed with a minimum score of 4+.

Participation Requirements
COOP 1000
Once a student has been given admission or continuation confirmation to the co-op option s/he must complete and pass COOP 1000 (a mandatory online 0.0 credit course). Students will have access to this course a minimum of two terms prior to their first work term and will be notified when to register.

Communication with the Co-op Office
Students must maintain contact with the co-op office during their job search and while on a work term. All email communication will be conducted via the students’ Carleton email account.

Employment
Although every effort is made to ensure a sufficient number of job postings for all students enrolled in the co-op option of their degree program, no guarantee of employment can be made. Carleton's co-op program operates a competitive job search process and is dependent upon current market conditions. Academic performance, skills, motivation, maturity, attitude and potential will determine whether a student is offered a job. It is the student's responsibility to actively conduct a job search in addition to participation in the job search process operated by the co-op office. Once a student accepts a co-op job offer (verbally or written), his/her job search will end and access to co-op jobs will be removed for that term. Students that do not successfully obtain a co-op work term are expected to continue with their academic studies. The summer term is the exception to this rule. Students should
also note that hiring priority is given to Canadian citizens
for co-op positions in the Federal Government of Canada.

Registering in Co-op Courses
Students will be registered in a Co-op Work Term course
while at work. The number of Co-op Work Term courses
that a student is registered in is dependent upon the
number of four-month work terms that a student accepts.
While on a co-op work term students may take a maximum
of 0.5 credit throughout each four-month co-op work term.
Courses must be scheduled outside of regular working
hours.

Students must be registered as full-time before they
begin their co-op job search (2.0 credits). All co-op work
terms must be completed before the beginning of the final
academic term. Students may not finish their degree on a
co-op work term.

Work Term Assessment and Evaluation
To obtain a Satisfactory grade for the co-op work term
students must have:

1. A satisfactory work term evaluation by the co-op
   employer;
2. A satisfactory grade on the work term report.

Students must submit a work term report at the completion
of each four-month work term. Reports are due on the
16th of April, August, and December and students are
notified of due dates through their Carleton email account.

Workplace performance will be assessed by the workplace
supervisor. Should a student receive an unsatisfactory
rating from their co-op employer, an investigation by
the co-op program manager will be undertaken. An
unsatisfactory employer evaluation does not preclude a
student from achieving an overall satisfactory rating for the
work term.

Graduation with the Co-op Designation
In order to graduate with the co-op designation, students
must satisfy all requirements for their degree program
in addition to the requirements according to each co-op
program (i.e. successful completion of three or four work
terms).

Note: Participation in the co-op option will add up to one
additional year for a student to complete their degree
program.

Voluntary Withdrawal from the Co-op Option
Students may withdraw from the co-op option of their degree
program during a study term ONLY. Students at
work may not withdraw from the work term or the co-op
option until s/he has completed the requirements of the
work term.

Students are eligible to continue in their regular academic
program provided that they meet the academic standards
required for continuation.

Involuntary or Required Withdrawal from the Co-op Option
Students may be required to withdraw from the co-op
option of their degree program for one or any of the
following reasons:

1. Failure to achieve a grade of SAT in COOP 1000
2. Failure to pay all co-op related fees
3. Failure to actively participate in the job search process
4. Failure to attend all interviews for positions to which
   the student has applied
5. Declining more than one job offer during the job search
   process
6. Continuing a job search after accepting a co-op
   position
7. Dismissal from a work term by the co-op employer
8. Leaving a work term without approval by the Co-op
   manager
9. Receipt of an unsatisfactory work term evaluation
10. Submission of an unsatisfactory work term report

Standing and Appeals
The Co-op and Career Services office administers the
regulations and procedures that are applicable to all co-

op program options. All instances of a student's failure
during a work term or other issues directly related to their
participation in the co-op option will be reported to the
academic department.

Any decision made by the Co-op and Career Services
office can be appealed via the normal appeal process
within the University.

International Students
All International Students are required to possess a Co-

op Work Permit issued by Immigration, Refugees and
Citizenship Canada before they can begin working. It is
illegal to work in Canada without the proper authorization.
Students will be provided with a letter of support to
accompany their application. Students must submit their
application for their permit before being permitted to
view and apply for jobs on the Co-op Services database.
Confirmation of a position will not be approved until a
student can confirm they have received their permit.
Students are advised to discuss the application process
and requirements with the International Student Services
Office.

Bachelor of Cognitive Science Honours: Co-op
Admission and Continuation Requirements

• Maintain full-time status in each study term (2.0
  credits);
• Be eligible to work in Canada (for off-campus work)
• Have successfully completed COOP 1000 [0.0]

In addition to the following:

1. Registered as a full-time student in the Bachelor of
   Cognitive Science program;
2. Obtained and maintained an overall CGPA of 8.50 or
   higher;
Bachelor of Cognitive Science Honours students must successfully complete three (3) work terms to obtain the Co-op designation.

**Work Term Report Course:** CGSC 3999 [0.0]

**Work/Study Pattern:**

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Legend

S: Study
W: Work
O: Optional

* indicates recommended work study pattern
** student finds own employer for this work-term.

**Admissions Information**

Admission Requirements are for the 2019-20 year only, and are based on the Ontario High School System. Holding the minimum admission requirements only establishes eligibility for consideration. The cut-off averages for admission may be considerably higher than the minimum. See also the **General Admission and Procedures** section of this Calendar. An overall average of at least 70% is normally required to be considered for admission. Some programs may also require specific course prerequisites and prerequisite averages and/or supplementary admission portfolios. Higher averages are required for admission to programs for which the demand for places by qualified applicants exceeds the number of places available. The overall average required for admission is determined each year on a program by program basis. Consult admissions.carleton.ca for further details.

Note: Courses listed as **recommended** are not mandatory for admission. Students who do not follow the recommendations will not be disadvantaged in the admission process.

**Degrees**

- Bachelor of Cognitive Science (Honours)
- Bachelor of Cognitive Science (General)

**Admission Requirements**

**First Year**

The Ontario Secondary School Diploma (OSSD) or equivalent including a minimum of six 4U or M courses. The six 4U or M courses must include a 4U course in English (or anglais). For applicants whose first language is not English, the requirement of English can also be met under the conditions outlined in the section "English Language Requirements" in the Admissions Requirements and Procedures section of this Calendar. The cut-off average for admission will be set annually and will normally be above the minimum requirement.

**Advanced Standing**

Applications for admission to the second or subsequent years will be assessed on their merits. Advanced standing will be granted only for those courses that are determined to be appropriate.

**Co-op Option**

**Direct Admission to the First Year of the Co-op Option**

Applicants must:

1. meet the required overall admission cut-off average and prerequisite course average. These averages may be higher than the stated minimum requirements;
2. be registered as a full-time student in the Bachelor of Cognitive Science;
3. be eligible to work in Canada (for off-campus work placements).

Meeting the above requirements only establishes eligibility for admission to the program. The prevailing job market may limit enrolment in the co-op option. Students should also note that hiring priority is given to Canadian citizens for co-op positions in the Public Service Commission. Note: continuation requirements for students previously admitted to the co-op option and admission requirements for the co-op option after beginning the program are described in the Co-operative Education Regulations section of this Calendar.

**Admissions Information**

Admission Requirements are for the 2019-20 year only, and are based on the Ontario High School System. Holding the minimum admission requirements only establishes eligibility for consideration. The cut-off averages for admission may be considerably higher than the minimum. See also the **General Admission and Procedures** section of this Calendar. An overall average of at least 70% is normally required to be considered for admission. Some programs may also require specific course prerequisites and prerequisite averages and/or supplementary admission portfolios. Higher averages are required for admission to programs for which the demand for places by qualified applicants exceeds the number of places available. The overall average required for admission is determined each year on a program by program basis. Consult admissions.carleton.ca for further details.

Note: Courses listed as **recommended** are not mandatory for admission. Students who do not follow the recommendations will not be disadvantaged in the admission process.

**Diploma**

- Post-Baccalaureate Diploma in Cognitive Science

Admission to this program requires the permission of the Institute of Cognitive Science. Normally, students are required to have completed an undergraduate degree with a minimum B average or higher to be admitted. Applications will be reviewed on a case-by-case basis.
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
Precludes additional credit for COMP 1005, COMP 1405.
Lecture three hours and tutorial one and a half hours a week.

CGSC 2001 [0.5 credit]
Introduction to 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 CGCS 1001, or permission of the Institute.
Lectures three hours a week.

CGSC 2002 [0.5 credit]
Theories and 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 Institute. Restricted to students enrolled in B.Cog.Sc. General or Honours.
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 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 4001 [0.5 credit]
Artificial Intelligence for Cognitive Scientists
An introduction to the contribution of artificial intelligence and computer modeling of cognitive processes to cognitive science.
Includes: Experiential Learning Activity
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 4601 [0.5 credit]
Cognitive Modelling in Cognitive Science
Introduction to the field of cognitive modelling. Different modelling systems and how to evaluate them against human data; how to create cognitive models using the ACT-R cognitive architecture.
Prerequisite(s): third year standing, CGSC 2001, and (CGSC 1005 or COMP 1005).
Also offered at the graduate level, with different requirements, as CGSC 5106, 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 Institute.

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 Institute.

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 CSGC 4908.
Prerequisite(s): 4th year standing, enrolment in B. Cog. Sc. Honours.
Seminar

Summer session: some of the courses listed in this Calendar are offered during the summer. Hours and scheduling for summer session courses will differ significantly from those reported in the fall/winter Calendar. To determine the scheduling and hours for summer session classes, consult the class schedule at central.carleton.ca

Not all courses listed are offered in a given year. For an up-to-date statement of course offerings for the current session and to determine the term of offering, consult the class schedule at central.carleton.ca