York University
Faculty of Liberal Arts and Professional Studies

Proposal for the Creation of an Honours Minor Program in Cognitive Science in the Department of Philosophy

Prepared by Muhammad Ali Khalidi
Program Coordinator, Cognitive Science

16 June 2015

1. Introduction

The Department of Philosophy is proposing to create a minor program in Cognitive Science to commence in the 2016-2017 academic year. The Cognitive Science program is an inter-disciplinary undergraduate program, which is housed in the Department of Philosophy but draws on the resources of four other units in three different faculties: Psychology (Health), Linguistics (DLLL, LA&PS), Information Technology (LA&PS), and Computer Science (School of Engineering). The program offers a Specialized Honours BA in Cognitive Science, which provides students with a solid training in this expanding area of knowledge. The Specialized Honours BA in Cognitive Science is now just over a decade old and it has grown to comprise around 100 majors (double the original projection when the program was first proposed). Cognitive Science students have gone on to study a range of subjects at the graduate level and have pursued a variety of different careers.

The Cognitive Science Program at York is unique in Ontario, and rare in Canada, in providing a single multi-disciplinary program of study that integrates the various disciplines and sub-disciplines that study the mind, rather than providing a number of different tracks with different emphases (e.g. Psycholinguistics, Artificial Intelligence, Philosophy of Mind). Moreover, York is a natural home for such a program, since it boasts world-renowned research in the study of cognition, from the investigation of neural mechanisms to theoretical research on the nature of mental processes. The Cognitive Science Program has been very active on campus in organizing a thriving speaker series, as well as regular workshops, conferences, and other events. It has also collaborated with other programs in sponsoring academic events, including the Center for Vision Research and the Neuroscience Graduate Diploma Program, among others. The Program now includes around 50 affiliated faculty members from a range of departments and other faculties, many of them world leaders in their fields, and has forged inter-disciplinary connections with a number of other units on campus. The Cognitive Science Students Association is an active student organization affiliated with Calumet College, which organizes various academic and social events for Cognitive Science majors and others.

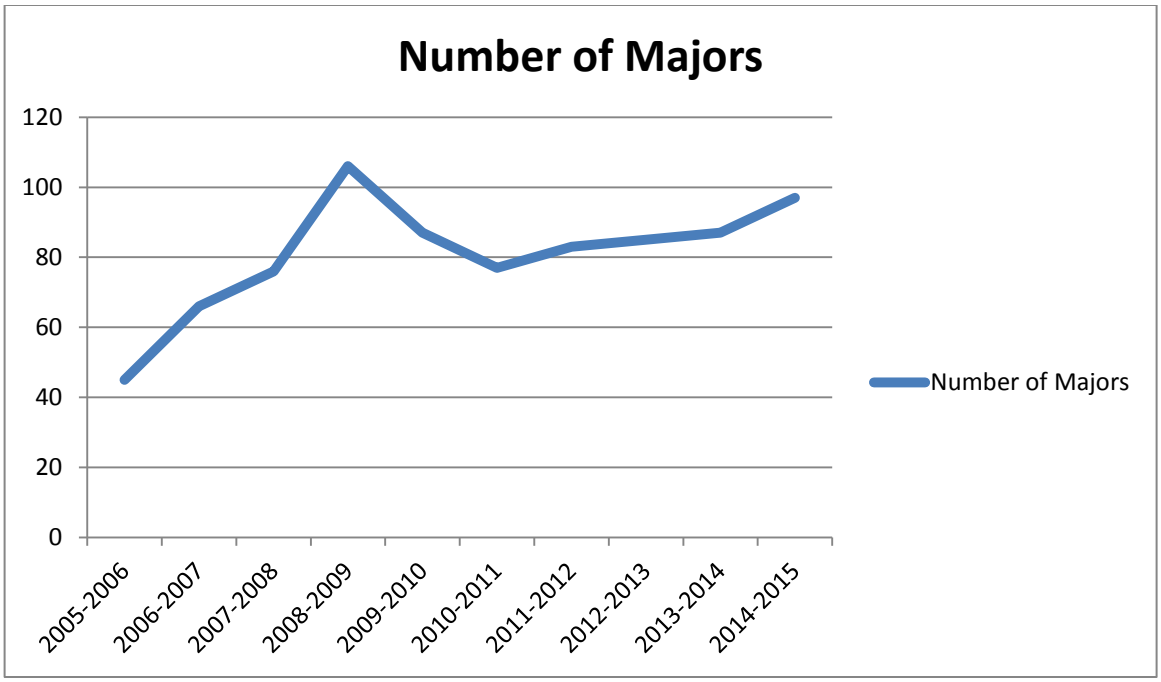
2. General Objectives

The main objective of the minor program would be to provide a basic understanding of the main concepts, methodologies, and debates within the inter-disciplinary area of Cognitive Science. This would be of potential interest to students majoring in one of the component disciplines, who would acquire an enhanced appreciation of the other main disciplines that make up this inter-disciplinary area. For example, Psychology majors would benefit from acquiring a theoretical and conceptual grounding in Philosophy, Linguistics, and other disciplines. Similarly, Philosophy majors would gain exposure to the empirical methods and techniques of Psychology, Neuroscience, and others. At the same time, the minor in Cognitive Science is likely to appeal to students majoring in a variety of other disciplines that would complement their own majors and connect a diverse set of subjects with the study of mental processes. To give just two examples, students majoring in Human Resource Management could gain insight into the decision-making processes of employees and employers, while students majoring in Information Technology would be able to acquire a broader appreciation for human perceptual and cognitive processes in order to better design human-computer interfaces.

3. Need and Demand

The minor program will have no competition in the Greater Toronto Area or at other major universities in Ontario. The University of Toronto does not currently offer a minor in Cognitive Science and Ryerson University offers neither a major nor a minor. Moreover, few other universities in Ontario offer majors in Cognitive Science, much less minors. There is neither a major nor a minor in Cognitive Science at Western, McMaster, or Wilfred Laurier. Although there is a Cognitive Science major (or near equivalent) at Queen's, Waterloo, and Carleton, there is no minor in Cognitive Science at any of these universities.

The number of Cognitive Science majors has grown dramatically over the past decade, from just over 40 to nearly 100 majors. Moreover, demand for this inter-disciplinary area of study shows no signs of abating and will probably grow further given the general public interest in research about the mind and cognitive processes. Based on the steady rise in the number of Cognitive Science majors over the past few years, there is likely to be a parallel rise in the number of minors. Even though there may initially only be a handful of minors, demand is certain to increase as the minor is publicized and word spreads.



Each semester, the Coordinator of the Cognitive Science program fields several inquiries from students about the possibility of enrolling in a minor in Cognitive Science. Moreover, over the past decade, a number of students have undertaken a double major in Cognitive Science and other disciplines. Some have combined a Cognitive Science major with majors in Psychology, Philosophy, and Computer Science, among others. Several of these students have eventually found a double major too demanding and have ended up with just one of the majors rather than both. A minor in Cognitive Science would enable such students to acquire a grounding in Cognitive Science without pursuing a full-fledged major.

4. Program Content and Curriculum

The proposed minor in Cognitive Science is composed entirely of existing courses that are consistently offered on an annual or biennial basis. The minor combines most of the core courses for a Cognitive Science major with a selection of upper-level courses in Philosophy that pertain directly to the study of cognition and the mind (e.g. Philosophy of Psychology, Philosophy of Artificial Intelligence, Philosophy of Neuroscience). It consists of three categories of courses, amounting to a total of 30 credits. Category A consists of 15 (or 18) credits in required core courses, Category B consists of 6 (or 9) credits in second- and third-year Philosophy courses, and Category C consists of 6 credits in fourth-year Philosophy seminars. The minor would ideally be pursued over three years, but it could also be completed in two years. (See Appendix 1 for Calendar Copy of the Honours Minor in Cognitive Science.) As with the major, the minor does not involve a concentration in one of the component disciplines, instead taking an integrative approach that combines the disciplines making up Cognitive Science.

The Honours Minor in Cognitive Science must be pursued jointly with an Honours BA program in the Faculty of Liberal Arts & Professional Studies or any other Faculty. The Honours Minor in Cognitive Science consists of at least 30 credits, distributed as follows:

A. Students must take all of the following courses (18 credits):

LING 1000	6.0	Introduction to Linguistics
PSYC 1010	6.0	Introduction to Psychology
COGS/PHIL 2160	3.0	Minds, Brains, and Machines
PSYC 3260	3.0	Cognition

B. Students must take 6 credits from the following list:

COGS/LING 2800	3.0	Mind and Language
PHIL 2240	3.0	Introduction to the Philosophy of Mind
PHIL 3260	3.0	Philosophy of Psychology
PHIL 3265	3.0	Philosophy of Mind
PHIL 3635	3.0	Philosophy of Neuroscience
COGS/PHIL 3750	3.0	Philosophy of Artificial Intelligence

C. Students must take 6 credits from the following list:

PHIL 4080	3.0	Seminar in the Philosophy of Mind
PHIL 4082	3.0	Philosophy of Cognitive Science
PHIL 4083	3.0	Philosophy of Clinical Psychology
PHIL 4084	3.0	Animals & the Philosophy of Mind
PHIL 4085	3.0	Philosophy of Psychiatry

Course Descriptions

A. Students must take all of the following courses (18 credits):

LING 1000 – Introduction to Linguistics (6.0, offered annually)

This course examines fundamental principles of language structure and interpretation. The focus is on the core areas, specifically phonology, morphology, and syntax, but a brief survey of phonetics, semantics, language acquisition, historical linguistics, and language variation is also offered. Data and analytic exercises from a wide range of the world's languages are used for illustration.

PSYC 1010 – Introduction to Psychology (6.0, offered annually)

A survey of psychology introducing basic terms, concepts and methods. Included are topics such as biological bases of behaviour, learning, perception, motivation, cognition, child development, personality, and abnormal and social psychology.
Note: This course is required for all students who intend to pursue additional courses in psychology at the 2000, 3000 and 4000 levels. Students must pass the course with a minimum grade of C (4.00) in order to pursue further studies in psychology.

COGS/PHIL 2160 – Minds, Brains, and Machines (3.0, offered annually)

An introduction to the study of human cognition and the interdisciplinary field of cognitive science. Questions covered include: What is artificial intelligence? Is it possible that we will someday build computers that think? Does language affect thought? Do we think in language or pictures? How is conscious experience related to the brain?

PSYC 3260 – Cognition (3.0, offered annually)

A survey of higher-order cognitive processes in humans. Topics include attention, memory, problem solving, thinking and language.

B. Students must take 6 credits from the following list:

COGS/LING 2800 – Mind and Language (3.0, offered annually)

This course explores how the structures of human language reflect the architecture of the human mind. Linguistics issues are related to topics in vision, philosophy, and psychology, among others. The course focuses primarily on internalist views of language, as exemplified in the generative tradition.

PHIL 2240 – Introduction to the Philosophy of Mind (3.0, offered annually)

An introduction to metaphysical theories the relationship between the mind and the body. We examine Descartes' mind-body dualism as well as 20th century theories including: behaviourism, the identity theory, machine and causal functionalism, instrumentalism, eliminativism, and emergentism.

PHIL 3260 – Philosophy of Psychology (3.0, offered annually)

An examination of whether psychological research can help to answer traditional philosophical questions. Case studies may include: psychiatric and mental disorders, rational thought, animal cognition, the placebo effect, the nature of concepts, attribution theory, moral psychology, or consciousness.

PHIL 3265 – Philosophy of Mind (3.0, offered annually)

Topics covered include the ontological status of the mind, the nature of mental causation, consciousness and its relation to our status as rational persons equipped with free will. Other possible questions include: Is language necessary for thought? Can some nonhuman animals think? What is the relationship between emotions and rationality?

PHIL 3635 – Philosophy of Neuroscience (3.0, offered biennially)

This course is a critical examination of philosophical problems raised by neuroscientific research, which asks whether such research can help to answer traditional philosophical questions. The course introduces the goals, methods, techniques and theoretical as well as conceptual commitments of neuroscience and examines the field's background assumptions, limitations and pitfalls.

COGS/PHIL 3750 – Philosophy of Artificial Intelligence (3.0. offered annually)

An introduction to philosophical issues in Artificial Intelligence (AI). The goal is for students to be able to gain basic understanding of the cognitive architectures used by AI programmers, and reflect critically on research in AI from a philosophical perspective.

C. Students must take 6 credits from the following list:

PHIL 4080 – Seminar in the Philosophy of Mind (3.0, offered annually)

This course is an intensive examination of one or more of the following topics: mind and body, thinking, intention, emotions, desires, motives, reasons, dispositions, memory, the unconscious and the concept of a person.

PHIL 4082 – Philosophy of Cognitive Science (3.0, offered biennially)

An examination of philosophical issues at the foundations of cognitive science, such as: mental representation, perception, concepts, rationality, memory, intelligence, modularity, evolutionary psychology, extended and embodied cognition, and consciousness.

PHIL 4083 – Philosophy of Clinical Psychology (3.0, offered biennially)

A study of the logic and epistemology of psychoanalysis, psychodynamic psychotherapy, and clinical psychology. Some of the questions explored are: Is psychodynamic psychotherapy empirically testable? How do we know that it works? Is it a science?

PHIL 4084 – Animals and the Philosophy of Mind (3.0, offered biennially)

This course is an examination of the history of animal cognition research, and methodological and conceptual issues related to animal minds.

PHIL 4085 – Philosophy of Psychiatry (3.0, offered annually)

Explores contemporary analytic and existential/phenomenological work to understand: 1) the role of values in psychiatric diagnosis and treatment; 2) the meaning of a mentally disordered person's experiences, beliefs and utterances; 3) conceptual and scientific foundations of psychiatry; 4) ethical issues pertaining to psychiatric research and care

5. Program Structure, Learning Outcomes and Assessment

The minor program is structured in such a way as to be completable in three years by taking 12 credits in the first year, 9 credits in the second year, and 9 credits in the third year. But it could be completed in as few as two years. In the first year of the minor, students would typically complete PSYC 1010 and LING 1000. Then in the second year, they would typically complete COGS/PHIL 2160 and six credits from category B, while in the third year, they would complete PSYC 3260 and six credits from category C.

The learning outcomes for the minor in Cognitive Science include a basic understanding of some of the main disciplines that study the mind and the different methodologies that they employ. Students are expected to acquire an understanding of the methods used by these disciplines to study different aspects of mental processes and cognition, and gain an appreciation of the ways in which they can be used to illuminate each other. Moreover, students will also be expected to understand some of the difficulties in bridging the gaps between these disciplines and the obstacles that stand in the way of integrating theoretical insights with empirical results, or behavioral data with neurological evidence. At the end of the minor program of study, students should have some ability to analyze critically the main theoretical frameworks for understanding mental phenomena, including the main approaches to the "mind-body problem." Students are also expected to be able to assess the limitations of some of the main empirical methods for studying cognition and behavior and to be able to critically examine the claims made in empirical studies.

Most courses in the minor will train students in the skills of critical reading and argumentative writing. Some lower-level courses will afford them ample opportunities to write analytic essays, while upper-level courses will also train students in reading original research articles dealing with the mind and cognition. After completing the minor program, students will be expected to be able to read original research on the mind and cognitive processes, and be capable of responding to it in a critical manner.

Students who have completed the Minor in Cognitive Science will achieve the following learning objectives:

1. Depth and Breadth of Knowledge: Become familiar with some of the main disciplines that study the mind and cognitive processes, including Psychology, Philosophy, Linguistics, Neuroscience, and Artificial Intelligence.
2. Knowledge of Methodologies: Gain an appreciation of the different methodologies used to study the mind and cognitive processes, comprising both theoretical and empirical methods (including observation, experimentation, and computational modeling).
3. Application of Knowledge: Acquire an awareness of the possibility of inter-disciplinary collaboration among the different disciplines that study the mind and the ways in which different disciplinary frameworks can illuminate each other in practice and make progress towards understanding cognitive processes.
4. Awareness of Limits of Knowledge: Acquire an understanding of the limitations of these methodologies and the obstacles that stand in the way of integrating results achieved using one methodology with those reached using another.
5. Integration of Knowledge: Grasp the distinction between different levels of analysis and explanation involved in studying the mind-brain, and comprehend the different relationships that may obtain between these levels of analysis (e.g. reduction, elimination, multiple realization).
6. Autonomy and Professional Capacity: Engage critically with recent research on the mind-brain and cognitive processes, including both empirical and theoretical research, resulting in an ability to interpret and grasp the significance of novel research in this inter-disciplinary domain.
7. Communication Skills: Communicate their critical understanding of the mind-brain and cognitive processes in analytic essays, oral presentations, and by other means.

The chart below summarizes the alignment between the above learning objectives and the courses offered in the minor program:

Learning Objective	**Courses**
1. Depth and Breadth of Knowledge	LING 1000, COGS/LING 2800, PSYC 1010, COGS/PHIL 2160, PHIL 2240, PSYC 3260
2. Knowledge of Methodologies	LING 1000, COGS/LING 2800, PSYC 1010, COGS/PHIL 2160, PSYC 3260, PHIL 3635, COGS/PHIL 3750
3. Application of Knowledge	PHIL 3260, PHIL 3635, COGS/PHIL 3750, PHIL 4080, PHIL 4082, PHIL 4083, PHIL 4084, PHIL 4085
4. Awareness of Limits of Knowledge	PHIL 3260 PHIL 3635, COGS/PHIL 3750, PHIL 4080, PHIL 4082, PHIL 4083, PHIL 4084, PHIL 4085
5. Integration of Knowledge	PHIL 3260, PHIL 3635, PHIL 4082, PHIL 4083, PHIL 4084, PHIL 4085
6. Autonomy and Professional Capacity	PHIL 4080, PHIL 4082, PHIL 4083, PHIL 4084, PHIL 4085
7. Communication Skills	PHIL 2240, PHIL 3260, PHIL 3265, PHIL 4080, PHIL 4082, PHIL 4083, PHIL 4084, PHIL 4085

6. Admission Requirements

There will be no admission requirements for the minor, but students enrolled in the minor will be expected to maintain a GPA of 5.0 in their minor courses, in line with the requirements for Specialized Honours majors.

7. Resources

This minor will require no new resources. Most of the courses listed are offered on an annual basis and some are offered on a bi-annual basis, usually by full-time faculty members, and occasionally by CLAs and contract faculty.

There are at least 7 faculty members in Philosophy who teach the Philosophy courses listed on a regular basis:

Faculty member	**Home Unit**	**Relevant Area of Specialization**
Kristin Andrews	Philosophy	Phil of Cognitive Science
Jacob Beck	Philosophy	Phil of Cognitive Science
Verena Gottschling	Philosophy	Phil of Cognitive Science
Brian Huss	Philosophy	Phil of Cognitive Science
David Jopling	Philosophy	Phil of Psychiatry
Muhammad Ali Khalidi	Philosophy	Phil of Cognitive Science
Duff Waring	Philosophy	Phil of Psychiatry

The non-COGS or PHIL courses listed among the required courses (PSYC 1010, PSYC 3260, LING 1000) are taught very regularly, generally in multiple sections.

No additional library resources will be required for the minor, beyond those already provided for the major (see Appendix 5 for Library statement).

8. Enrolment Projections

Based on current interest and the number of majors, we project an enrollment of 5-10 students per year in the first 3 years, rising to a target of around 20 students per year after 5 years, achieving a steady state of a total of 60-80 minors after around 10 years (see Figure 1). These numbers are admittedly modest, but the target may well be exceeded in future years, given that the number of majors is now double the original target. The minor may also prove to be a gateway to the major for students who come to university without a clear idea of Cognitive Science.

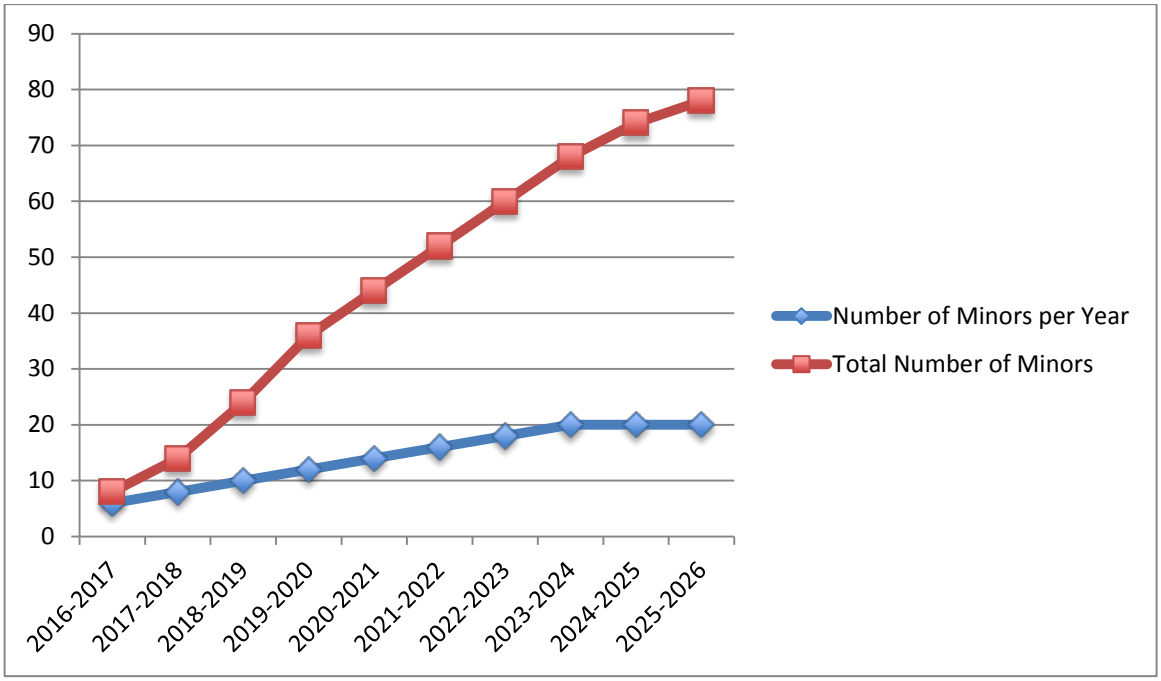


Figure 1. Projected Enrollments in Cognitive Science Minor 2016-2026

Appendix 1: Calendar Copy

Honours Minor BA in Cognitive Science

The Honours Minor BA program described may be combined with any approved Honours BA program that offers a major/minor option in the Faculties of Environmental Studies, Fine Arts, Health, Liberal Arts and Professional Studies, or Science and Engineering. For further details on requirements, refer to the listings for specific Honours programs that may be pursued jointly with other Faculties.

Minor credits: the Honours Minor in Cognitive Science comprises at least 30 credits in philosophy, distributed as follows:

A. Students must take all of the following courses (18 credits):

LING 1000	6.0	Introduction to Linguistics
PSYC 1010	6.0	Introduction to Psychology
COGS/PHIL 2160	3.0	Minds, Brains, and Machines
PSYC 3260	3.0	Cognition

B. Students must take 6 credits from the following list:

COGS/LING 2800	3.0	Language and Mind
PHIL 2240	3.0	Introduction to the Philosophy of Mind
PHIL 3260	3.0	Philosophy of Psychology
PHIL 3265	3.0	Philosophy of Mind
PHIL 3635	3.0	Philosophy of Neuroscience
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C. Students must take 6 credits from the following list:

PHIL 4080	3.0	Seminar in the Philosophy of Mind
PHIL 4082	3.0	Philosophy of Cognitive Science
PHIL 4083	3.0	Philosophy of Clinical Psychology
PHIL 4084	3.0	Animals & the Philosophy of Mind
PHIL 4085	3.0	Philosophy of Psychiatry

Appendix 2: Approval of Curriculum Committee, Department of Philosophy

YORK
UNIVERSITÉ
UNIVERSITY

FACULTY OF
LIBERAL ARTS &
PROFESSIONAL STUDIES

Department of
Philosophy

4700 KEELE ST.
TORONTO ON
CANADA M3J 1P3
T 416 736 5113
F 416 736 5114

5 October 2015

Re: Proposal for special minor in Cognitive Science, offered by the Department of Philosophy

Dear Committee on Curriculum, Curricular Policy and Standards:

I am writing in my capacity as Chair of the Curriculum Committee in the Department of Philosophy to confirm that the Curriculum Committee has approved the proposal for a special minor in Cognitive Science. A vote was conducted over e-mail, and concluded on August 7, 2015. The committee voted unanimously in favour of the proposal.

Sincerely,

Michael Giudice
Associate Professor and Undergraduate Program Director
Department of Philosophy
York University
4700 Keele Street
Toronto, ON
M3J 1P3
giudice@yorku.ca
416-736-2100 x77556

Appendix 3: Approval of Undergraduate Program Director, Psychology

--- Original Message ----
From: Jennifer Connolly Undergraduate Director <updpsyc@yorku.ca>
To: "Muhammad Ali Khalidi" <khalidi@yorku.ca>
Sent: Mon, Jun 15, 2015, 1:15 PM
Subject: Re: Cognitive Science minor

Hi Muhammad
I've looked at the minor requirements and the two psychology courses are fine to list. I do think it would be important for your students to know that they must achieve a minimum grade of C in 1010 in order to take any upper level courses including 3260. Second we are currently conducting a review of our undergraduate courses and we have a proposal to move 3260 from the 3000 level to the 2000 level. This switch would better align the course with the actual contents and also with common practice at other universities. Not sure if this will have implications for your programs.

Jennifer

Appendix 4: Approval of Undergraduate Program Director, Linguistics

Dear Muhammad Ali,

I have read the proposal regarding the minor in Cognitive Science and I fully approve of it.

Best regards,

GABRIELA ALBOIU, PhD
Associate Professor of Linguistics
Director, Undergraduate Program in Linguistics
Coordinator, TESOL Certificate

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York University
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Office: South Ross 541
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Website: http://www.yorku.ca/galboiu
Telephone: (1)-416-736-2100, extension 22574
Fax: (1)-416-736-5483

Appendix 5: Approval of Scott Library

Stacy Allison-Cassin

Room 208E, Scott Library
York University
sacassin@yorku.ca

September 21, 2015

Muhammad Ali Khalidi
Department of Philosophy and Cognitive Science Program
York University
4700 Keele Street
Toronto, ON M3J 1P3

ollections

4700 Keele St.
Toronto ON
Canada M3J 1P3
Tel 416 736 2100
Fax 416 736 5430
www.library.yorku.ca

Dear Muhammad Ali Khalidi,

Subject: Honours Minor Program in Cognitive Science

I have reviewed the above proposal and I am pleased to support the Honours Minor Program in Cognitive Science. York has a strong collection in the area of cognitive science and the broader disciplines of philosophy and psychology. Given this minor is comprised of already existing courses and will require no new resources I don't anticipate any issues with library support. Additional resources can be acquired if necessary.

I am confident that students taking this program will find our collections adequate to meet their research needs and I am pleased to support this proposal.

Sincerely,

Stacy Allison-Cassin, MMus, MISt, PhD Candidate
W.P. Scott Chair in E-Librarianship
Associate Librarian, Philosophy