
Modest Curricular Proposal 2022

Historical Reflection

A number of years ago, maybe 6 or 8, I went on record with a goal of 40 cognitive science majors. We actually did reach that goal, in 2018, I think. And we had more than 30 minors at the time.

Unfortunately, the numbers didn't last. Why? (1) A really bad hire that adversely effected enrollments. (2) The pandemic. (3) CS2. The adverse hire is sufficiently far removed from the present that we can consider ourselves beyond it in most respects. Our introductory courses are now in very good hands, and will continue to be in the very capable hands of JL, TR, and CD for the foreseeable future. The pandemic is still with us, but it should not be particularly problematic for us as we move forward, since we now have faculty with an inclination to teach remotely, at least sometimes, and great skill at doing so. What about CS2? That is the issue that I would like to address with this proposal.

In recent semesters a number of students, more than is typically the case, have departed from the cognitive science major. As I became aware of this trend, I started asking "Why?" Invariably, CS2 was cited as the reason. Even some who passed the course were adversely effected by the experience to the point where they changed their major from cognitive science to something else. We should do something about this, something in a way that does not erode the computation flavor of the cognitive science program, something that does not cause the computer science department to break its stride with respect to the CS1/CS2 sequence.

What might that something be? In the abstract, it amounts to adding flexibility to what is now considered to be the CS2 requirement for those enrolled in the cognitive science BA degree. Please note that this proposal pertains to the BA degree only, not to the BS degree. This is because BS students need the actual CS2 course for a variety of reasons, most notably so that they have the prerequisite course for the sequence of artificial intelligence courses (Csc416 and Csc466) that is required for the BS degree.

The Desired Outcome

The primary desired outcome of the proposed change is a more robust cognitive science program, one that will flourish with 50-60 majors and almost as many minors. My sense is that this one small but significant change will in one decisive stroke dissolve the bottleneck that has been impeding growth of the program.

A secondary outcome is a broadened skill set with respect to computer programming that many of those enrolled in the cognitive science BA degree will acquire, as will quite a few others majoring or minoring in cognitive science.

The Proposal

The proposal is described informally in words. Then, with the words in mind, it is described more directly by juxtaposing a "before/after" sequence of the old BA degree and the new (proposed) BA degree.

Verbal Description

The proposal is simply to add a bit of flexibility to the BA core, by changing the requirement to take CS2 into a requirement to take one of two courses:

- CS2 (Csc241 or Cog241)
- Cog242 “Programming Languages for the Working Cognitive Scientist”

What is Cog242? It is a course, yet to be introduced into the curriculum, which would comprise a survey of 3 or 4 programming languages that cognitive scientists tend to use as tools do do work of various sorts. Python would probably be one of them. Maybe R. The list of languages selected for a particular instantiation of the course would be determined by the professor of the course. Why this course? It would be more resonant with most students who have the goal of a BA degree in cognitive science than is the traditional CS2 course, and these students are likely to succeed in the course, enjoy the course, and gain knowledge that is directly applicable to their needs and interests. Why the tentative name of the course? I am a big fan of Saunders MacLane (Mac Lane). But the title is certainly not carved in stone! Who will teach the course? Initially, JL. He has been wanting to teach just this course. When we hire someone in computer science, we generally encourage them to develop a course of their own. This could be John’s contribution. Not only is he perfectly poised to develop and teach the course (he knows the languages and how to apply them to work associated with the field of cognitive science), but he has a passion engaging in research projects that use these sorts of languages as tools. That said, it is not all that hard to teach a course like this if you have a background in computer science with a at least a modicum of interest in exploring phenomena associated with cognitive science. Others in the department could certainly teach this course.

It is noteworthy that this course would be a very attractive course for a range of computer science majors (it could serve as one of their “required electives”), for information science majors (many would find it an attractive “learning agreement” course), for cognitive science BS majors (many would find it an attractive “learning agreement” course), and for various minors. In short, the course will have a very healthy enrollment.

It is also noteworthy that this course is consistent with the distinctive computational orientation of Cognitive Science at Oswego, which has served us well in many respects. It does not reduce the computational component of the curriculum, even for BA majors, to whom it is most directly addressed. Moreover, it adds a bit more by way of computational options to cognitive science BS majors and the cognitive science minor.

→ *THE DIRECT REPRESENTATION OF THE PROPOSAL STARTS ON THE FOLLOWING PAGE*

Old BA Specification

This is an annotated specification of the “old BA degree” with *burnt orange* text to highlight just where the change is made.

Bookends: Two Gateway Courses and the Capstone

- **Cog166** Introduction to Cognitive Science
- **Cog266** Brains, Minds and Consciousness
- **Cog468** Cognitive Science Capstone Seminar

Programing / Computational Formalisms / Symbolic Computation

- **Cog212/Csc212** Programming and Problem Solving / Principles of Programming
- **Cog241/Csc241** Programming and Knowledge Representation / Abstract Data Types and Programming Methodology
- One of the following:
 - **Cog356** Cognitive Processes and Abstract Machines
 - **Cog366/Csc366** Computational Models of Cognitive Processing / Computational Models of Cognitive Processing

Psychological Component

- **Psy280** Analysis of Psychological Data
- **Psy290** Research Methods in Psychology
- **Psy305** Cognition

Language / Culture / Philosophy of Mind

- **Lin100** Introduction to Linguistic
- One of the following:
 - **Ant344** Language and Culture
 - **Cog444** Semiotics
- One of the following:
 - **Phl309** Language, Logic and Thought
 - **Cog376** Computer Models of Language Representation and Processing
- **Phl471** Philosophy of Mind

Learning Agreement

This component of the major consists of 9 upper division credit hours intended to serve one of two primary purposes:

1. To enrich the student’s perspective with respect to cognitive science content.
2. To provide an in-depth exploration of some particular area within the realm of cognitive science.

The first purpose is generally realized by three rather disparate courses, each with a significant relationship to cognitive science. The second purpose is generally realized by means of a thematically related collection of three courses, each with a justifiable relationship to cognitive science.

New BA Specification

This is an annotated specification of the “new BA degree” with *burnt orange* text to highlight just where the change is made.

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- **Cog166** Introduction to Cognitive Science
- **Cog266** Brains, Minds and Consciousness
- **Cog468** Cognitive Science Capstone Seminar

Programing / Computational Formalisms / Symbolic Computation

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- One of the following:
 - **Cog241/Csc241** Programming and Knowledge Representation / Abstract Data Types and Programming Methodology
 - **Cog242** Programming Languages for the Working Cognitive Scientist
- One of the following:
 - **Cog356** Cognitive Processes and Abstract Machines
 - **Cog366/Csc366** Computational Models of Cognitive Processing / Computational Models of Cognitive Processing

Psychological Component

- **Psy280** Analysis of Psychological Data
- **Psy290** Research Methods in Psychology
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Next Steps

1. The director would ask for the advisory board to express their collective opinion on the proposed change. Without their investment, the director will not pursue the matter.
2. The director would seek Doug's support on behalf of computer science. His support would be absolutely essential for this proposal to be realized.
3. The director would seek Damian's support from the HCI perspective. With the expected increase in cognitive science majors, there would be an expected increase in HCI applicants, since so many of our students like to move from the the cognitive science program directly into the HCI program. The good news is that they would typically have some really useful programming skills for implementing aspects of various HCI projects.
4. If the advisory board and the computer science department both express support for the proposal, we will proceed, as expeditiously as possible, to make the curricular change.