Announcement and Application Form
BCS206: Undergraduate Research in Cognitive Science
BCS207: Advanced Undergraduate Research in Cognitive Science
March 2016

Synopsis. BCS offers a year-long research course for undergraduate BCS majors. The goal of the 1st semester (BCS206) is for students to gain experience with research methods in cognitive science by performing a project that involves replicating an important finding in the field. The goal of the 2nd semester (BCS207) is to perform a more substantial original research project that builds upon the first semester project to address a novel research question. The course will consist of a combination of weekly class-based meetings and group-based reading and research under the supervision of the course instructors, with the help of a faculty mentor for each research group.

Students will work collaboratively in small groups, and will gain extensive hands-on experience with critical analysis of scientific literature, experimental design, programming of stimuli and behavioral tasks, data collection, statistical analysis, oral presentation, and writing of research manuscripts. The end-goal of the course is for each group to produce a research manuscript that may be of sufficient quality to be submitted for publication.

Prerequisites and Requirements. The following are requirements for students to be able to enroll in the BCS206/207 course sequence:

- The course is open to rising juniors who are declared BCS majors (or planning to declare soon), as well as rising sophomores who fully intend to declare a BCS major. The course is not open to NSC majors or other majors at this time.
- **Students must commit to enrolling in BCS206 in Fall 2016 <u>and</u> BCS207 in Spring 2017.** It is not possible to take just one of the two courses, nor is it possible to take them out of sequence.
- Enrollment will be capped at 20 students who will be allowed to register with permission of the instructor. Interested students <u>must</u> complete the attached application form.
- Considerable facility with computer programming is required. Students must have completed at least one semester of a computer programming course, or have equivalent experience that can be documented. Experience with Matlab, Python, or R is desirable but experience with other programming languages is also acceptable.
- Students should have taken <u>at least 2 of the following 5 courses</u> prior to enrolling: BCS110, BCS111, BCS151, BCS152, BCS153.
- Students should have taken a statistics course (e.g., STT212) or will need to take it concurrently with BCS206 in the first semester of this sequence.

Other considerations.

- Students who are selected to enroll in BCS206 will be relieved from one BCS laboratory requirement (e.g., BCS204, BCS205, or BCS208). In addition, BCS207 will satisfy one open-elective or one track-elective. Thus, taking this course sequence should not extend time-to-degree.
- BCS 206/207 can be used to substitute certain other requirements for the BCS major/minor. In case of doubt check with your advisor or the undergraduate program coordinator, Melinda Adelman.
- Students will work collaboratively in a small group throughout the course of the two semesters. Interested students should be comfortable with working on group projects and should strongly value teamwork
- We expect that the course will be offered on MW 9-10:15 AM in both semesters, but please check the registrar web site for any possible changes. Students should plan accordingly for Spring 2017.

Example projects conducted in year 2015-2016.

- Visual psychophysics study on the role of certainty and confidence in visual perception
- Internet-based investigation of speech perception/adaptation study
- Eye-tracking experiment on online language comprehension

Last year, students presented their research projects at

- University of Rochester undergraduate research fair
- National conference for undergraduate research
- International conferences

Course overview

Introduction

BCS 206 (Fall2016)

In classes, course instructors and guest instructors provide lectures on topics and research methods in Cognitive Science throughout the semester

Group project

- Students choose among topics offered by BCS faculty members
- Weekly meetings with faculty members (in addition to weekly class meetings) to carry out replication study
- Stimuli design
- Subject testing
- Data analysis
- Fall semester final presentation and write-up in paper form

BCS 207 (Spring2017)

In classes, students learn about statistical analyses on their own data, making scientific figures, writing a research paper, and preparing a poster presentation.

Group project

- Students will form an original hypothesis building on the result obtained in the replication project in BCS 206
- Weekly meetings with faculty members (in addition to weekly class meetings)
- Stimuli design, Subject testing, Data analysis
- Poster presentation at UR undergraduate research fair
- Scientific paper summarizing original results to be submitted to journal

Application Form
BCS Research Course, BCS206/207

Name:_____

Email address: _____

Current Year (Freshman, Sophomore, etc):_____

Check one of the following:
    _____ I am a sophomore and have already declared as a BCS major
    _____ I am a freshman or sophomore and I intend to declare as a BCS major

I understand that enrolling in BCS206 in Fall 2016 implies that I am fully committed to enroll in BCS207 in Spring 2017:
             Signature: _____

Current GPA: _____

Course Prerequisites: place a check mark next to the courses that you have taken or are currently taking
    _____ BCS110   _____ BCS111   _____ BCS151   _____ BCS152   _____ BCS153

Please list the statistics course(s) that you have taken or plan to take concurrently with BCS 206:

_____

Please describe your computer programming experience, including programming courses that you have taken:

_____

_____

_____

On a separate sheet of paper, please write a short description that includes:
- Reasons why you are interested in taking the BCS research course sequence
- Previous or current research experiences you have had, including the names of any faculty members with whom you have worked, at UR or elsewhere (previous research experience is not a requirement)

Applications should include an *unofficial* transcript of courses taken and grades.

Please submit your application materials and/or any questions to co-instructors Ralf Haefner (rhaefne2@ur.rochester.edu) or Chigusa Kurumada (ckurumada@bcs.rochester.edu) with subject line

"BCS206 application" and "BCS206 question", respectively, by Monday April 11th. Permission codes for registration will be provided after review of applications.