



THE UNIVERSITY
of NORTH CAROLINA
at CHAPEL HILL

Department of Psychology
Davie Hall
Campus Box 3270
Chapel Hill, NC 27599-3270

August 14, 2014

Dr. James Thompson
Office of Undergraduate Curricula
CB# 3504

Dear Dean Thompson,

We are pleased to submit this request for approval of an interdisciplinary Neuroscience minor here at the University of North Carolina at Chapel Hill (UNC-CH). Neuroscience is the academic field that seeks to understand how neural systems give rise to thought and behavior.

Neuroscience embodies the liberal arts experience because it draws on techniques and findings from several academic disciplines including biology, chemistry, computer science, mathematics, physics, and psychology. The development of a Neuroscience minor at UNC-CH will give our highly qualified and motivated undergraduates the opportunity to study neuroscience, providing them with the fundamental knowledge and exposure needed to pursue careers and post-graduate studies in fields related to psychology, human development and aging, health and disease, rehabilitation, biomedical research, human-machine interactions, and other emerging disciplines.

The field of neuroscience has become of increasing interest to our undergraduate students, and current demand for a Neuroscience minor is very high. In March 2009 the undergraduate Carolina Neuroscience Club (CNC) was formed with more than 100 student members. Today, the club includes more than 200 students, representing all undergraduate years and a wide variety of declared majors, including Psychology, Biology, Chemistry, Philosophy, Computer Science, Exercise and Sports Science, Economics, English, Environmental Health, Physics, Linguistics, Mathematics, Political Science/International Studies, and Business. Since the inception of the Carolina Neuroscience Club, the students have met each week, focusing on professional development, undergraduate opportunities (including research, summer programs, and conferences), social events, and service (e.g., Brain Awareness Week). The CNC invites professors, post-doctoral fellows, and graduate students to discuss their research and careers in neuroscience. To date, the club has hosted several panels of guest speakers to answer questions related to pursuing neuroscience at UNC and beyond. To preview their past, current, and planned events, please visit the CNC website at <http://carolinaneuroscience.web.unc.edu/>.

Spurred by the sheer number of students, as well as the consistency and intensity of their interest in the field, we are pursuing the approval of a Neuroscience minor. A minor concentration in neuroscience would provide students with a formal study of the field, broadening their awareness of, and exposure to the behavioral effects, cellular and molecular processes, and computational mechanisms of the brain. Currently, several peer or local institutions provide undergraduate

training in neuroscience, including Duke University, Elon University, University of California at Los Angeles, University of Maryland, University of Michigan, University of North Carolina at Asheville, University of Virginia, and Wake Forest University. The establishment of a Neuroscience minor will meet the undergraduate demand for neuroscience on our campus, and substantively strengthen the UNC system in undergraduate neuroscience education.

While assessing the feasibility of a Neuroscience minor at UNC-CH, it became apparent that a 'gateway course' was needed. In response to this need, we applied for, and were granted funding to support, "Carolina Neuroscience" - a team-taught, multidisciplinary, research-oriented course that accommodates up to 300 students per year. This course, taught for the first time in fall 2013 and filling within hours of opening for enrollment, focuses on the behavioral, cellular, molecular, and computational mechanisms of the brain. Topics covered include addiction, aging, autism, brain development, concussion, methods in neuroimaging, diseases of the nervous system, and machine learning, with several distinguished faculty providing lectures each time the course is offered. The permanent number for this gateway course is PSYC 315 "Introduction to Neuroscience."

Beyond PSYC 315, students enrolled in the Neuroscience minor will be required to complete 4 additional courses for a total of 15 hours of coursework. A list of these additional courses appears on the attached pages. Given that these courses are taught by faculty across several academic units in the College, we have met with the Chairs of each impacted unit (Dr. Valerie Ashby, Chemistry; Dr. Victoria Bautch, Biology; Dr. Edward Carlstein, Statistics and Operations Research; Dr. Christopher Clemens, Physics and Astronomy; Dr. Anselmo Lastra, Computer Science; Dr. Richard McLaughlin, Mathematics; and Dr. Darin Padua, Exercise and Sports Science). Each Chair has graciously given his or her approval for the Neuroscience minor application and provided a letter of support. Additionally, it was determined that there are no existing majors or minors whose students should be prohibited from enrolling in the minor due to overlap of course requirements or proximity of subject matter.

Finally, students in the Neuroscience minor will be advised by Dr. Kelly Giovanello, Associate Professor in the Department of Psychology, who has led the initiative to develop the Neuroscience proposal and serves as the faculty mentor to the Carolina Neuroscience Club. She will assist students with information for planning and completing the minor. Dr. Beth Jordan, the Psychology Director of Advising, and other faculty who traditionally serve as advisors will also be available to talk with students about the Neuroscience minor. We anticipate that peer advising might also occur through the Carolina Neuroscience Club.

Thank you for considering this proposal. If you have any questions, please feel free to contact us. Sincerely,



Donald T. Lysle, Ph.D.
Kenan Distinguished Professor
Chair, Department of Psychology



Kelly S. Giovanello, Ph.D.
Associate Professor
Department of Psychology

Beth Kurtz-Costes

Beth Kurtz-Costes, Ph.D.
Professor and Director of Undergraduate Studies
Department of Psychology

Neuroscience Minor: Proposed Requirements

The minor is open to all, including psychology majors. However, students should note that they are limited to no more than 45 credit hours within a specific department. Students must earn a grade of C or better in at least four of the five courses.

All students must complete PSYC 315, Introduction to Neuroscience. In addition, students must complete at least four of the following courses, earning a minimum of 15 hours toward minor requirements:

Department of Psychology

PSYC 225 – Sensation and Perception
PSYC 245 – Abnormal Psychology
PSYC 320 – Drugs and Human Behavior
PSYC 401/Neurobiology 401 – Animal Behavior
PSYC 402/Neurobiology 402 – Advanced Biopsychology
PSYC 403 – Advanced Biopsychology Lab
PSYC 404 – Clinical Psychopharmacology
PSYC 425 – Advanced Perceptual Processes
PSYC 426 – Molecular Mechanisms of Memory
PSYC 427 – Neurobiology of Aging
PSYC 428 – Neuroscience and the Media
PSYC 429 – Neuroeconomics
PSYC 431 – Introduction to Cognitive Science
PSYC 434 – Cognitive Neuroscience
PSYC 437– Neurobiology of Learning and Memory
PSYC 455 – Behavioral Neuroscience (cross-listed with BIOL 455)
PSYC 469 – Evolution and Development of Biobehavioral Systems
PSYC 507– Autism
PSYC 533 – The General Linear Model in Psychology
PSYC 568 – Emotion
PSYC 602 – Evolutionary Psychology

Department of Biology

BIOL 252 – Fundamentals of Human Anatomy and Physiology
BIOL 278 - Animal Behavior
BIOL 431 – Biological Physics (cross-listed with PHYS 405)
BIOL 450 – Introduction to Neurobiology
BIOL 451 – Comparative Physiology
BIOL 452 – Mathematical and Computational Models in Biology (cross listed with MATH 452)
BIOL 455 – Behavioral Neuroscience (cross-listed with PSYC 455)
BIOL 552 – Behavioral Endocrinology

Department of Chemistry

CHEM 430– Introduction to Biological Chemistry

Department of Computer Science

COMP 555 – Bioalgorithms

Department of Exercise and Sports Science

EXSS 380 – Neuromuscular Control and Learning

Department of Mathematics

MATH 383 – First Course in Differential Equations

MATH 452 – Mathematical and Computational Models in Biology (cross-listed with BIOL 452)

MATH 528 – Mathematical Methods for the Physical Sciences I

MATH 529 – Mathematical Methods for the Physical Sciences II

MATH 547 – Linear Algebra for Applications

MATH 564 – Mathematical Modeling

MATH 566 – Introduction to Numerical Analysis

MATH 577 – Linear Algebra

Department of Physics

PHYS 405 – Biological Physics

Department of Statistics and Operations Research

STOR 215 – Introduction to the Decision Sciences

STOR 445 – Stochastic Models in Operations Research

STOR 455 – Statistical Methods I

STOR 456 – Statistical Methods II

STOR 565 – Introduction to Machine Learning