



The University of Georgia

University Council
Athens, Georgia 30602

October 10, 2012

UNIVERSITY CURRICULUM COMMITTEE – 2012-2013

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Dear Colleagues:

The attached proposal for a new Area of Emphasis in Neuroscience under the major in Psychology (B.S.) will be an agenda item for the October 17, 2012, Full University Curriculum Committee:

Sincerely,

David E. Shipley, Chair
University Curriculum Committee

cc: Provost Jere W. Morehead
Dr. Laura D. Jolly

Dean Alan T. Dorsey
Franklin College
Old College

July 21, 2012

Dear Dean Dorsey,

In coordination with the Division of Biological Sciences, the Department of Psychology would like to propose a major in Psychology with an area of emphasis in Neuroscience. This would complement within Franklin College a parallel area of emphasis that is being established this year within the Biology major, providing a related option for students whose interests are directed more toward behavioral, psychological and clinical facets of neuroscience.

Neuroscience is an interdisciplinary topic that focuses on cognitive, behavioral, molecular, structural and physiological aspects of the interplay between brain and behavior. It includes study of cognition, sensation and perception, psychopharmacology, brain science, anatomy and physiology of the central nervous system, molecular and biochemical bases of information processing, behavioral neuroscience, cognitive neuroscience, biology of mental illness and clinical science. The proposed neuroscience area of emphasis will involve UGA faculty from across the campus to provide students with the background necessary to pursue their interest in, and prepare for graduate study and careers in neuroscience and related disciplines. The Psychology major with Neuroscience area of emphasis combines a strong foundation in basic life sciences with more specialized courses in psychology and biology to examine specific cognitive, behavioral and brain functions from structural, functional, evolutionary and other viewpoints.

Neuroscience focuses on the entire nervous system and involves various aspects of cognitive and behavioral psychology, neurobiology and neurophysiology. Encompassing everything from the cell biology of neurons to the physiological and anatomical support of complex cognitive functioning, neuroscience is a rapidly growing field that is central to many fields of endeavor. As an area of study, it is expanding rapidly, and is now offered as a separate degree program at a growing number of colleges and universities. At UGA it is currently offered as a graduate program but not as an undergraduate program.

At UGA there is a large and growing number of Psychology/Biology double majors, as well as Psychology majors with a minor in Biology. For example, in fall 2010 there were an estimated 138 students in these categories. Informal surveys of these students suggest that many members of this group who would appreciate the opportunity to earn a B.S. degree with an area of emphasis in Neuroscience. Further evidence of the interest is that, despite the current lack of an undergraduate degree program in Neuroscience at UGA, there is an established undergraduate student organization focused on Neuroscience, the Undergraduate Neuroscience Organization (UNO; <http://www.uno.uga.edu/>). Many of these double majors end up taking courses that do not align well with their goals. Furthermore, many

whose first interest lies in Psychology may be tempted to take the less rigorous introductory courses in physical and biological sciences, which are sufficient for the degree in Psychology with no area of emphasis, limiting their ability to pursue an interest in more advanced neuroscience topics later in college.

The Neuroscience area of emphasis will be geared to meet the needs of students who intend to pursue postgraduate professional programs. Many of these will be in the area of medicine with an emphasis on neurology, neurosurgery, neural development or psychiatry. Others will pursue graduate training leading to careers in basic research. Thus the curriculum will have a heavy emphasis on basic behavioral and biological sciences combined with a diverse mix of neuroscience electives.

Degree options in Neuroscience are becoming increasingly common among UGA's comparator and aspirational peer institutions. For example, Ohio State University and the University of Maryland offer an undergraduate minor in Neuroscience, and the University of Arizona offers a major in Neuroscience and Cognitive Science. The University of Minnesota and the University of California – Los Angeles both have Neuroscience departments that offer undergraduate majors; the University of Texas offers the same option but in an Institute for Neuroscience. The University of Illinois has neuroscience program facilities and offers an undergraduate Neuroscience major through Independent Programs of Study. The University of Virginia offers a Neuroscience major administered jointly by their Psychology and Biology departments; and Pennsylvania State University offers a Neuroscience "option" within their undergraduate Psychology program that appears to function similarly to an area of emphasis at UGA.

Faculty: A significant body of faculty members currently resides at the University of Georgia, in the department of Psychology, the division of Biological Sciences and elsewhere, whose research encompasses aspects of the field of neuroscience. This breadth of expertise will enhance the interdisciplinary nature of the Neuroscience area of emphasis and provide for a unique and appropriately specialized educational and pre-professional training program.

To meet the training and research needs of the State of Georgia, in 2005 the University of Georgia established a new doctoral degree program in Neuroscience. This interdisciplinary graduate program (<http://biomed.uga.edu/divisions/neuroscience/programs-neuroscience-phd>) is administered by the Biomedical Health Sciences Institute (BHSI) and is comprised of 30 faculty from 15 different departments and other units. Support comes primarily from the departments of Psychology, Biochemistry and Molecular Biology, Cellular Biology and Veterinary Physiology and Pharmacology. Neuroscience is a strong and growing facet of the university, with extramural funding currently exceeding \$11 million. The faculty members in the graduate program also teach a significant number of undergraduate courses that are directly applicable to study in Neuroscience.

Facilities: UGA's investment in world-class facilities are assets that would greatly benefit undergraduate instruction, including introduction to research experience, in the field of Neuroscience. The UGA Bio-Imaging Research Center (BIRC; <http://psychology.uga.edu/BIRC/index.html>) has a state-of-the-art, General Electric 16-channel fixed-site Signa HDx3.0 Tesla Magnetic Resonance Imaging (MRI) magnet

capable of multiple magnetic resonance imaging techniques, including structural tissue imaging (MRI), functional neuroimaging (fMRI) for studies of brain activation in real time, magnetic resonance spectroscopy (MRS) for the study of chemical changes in the brain, magnetic resonance angiography (MRA) for the study of vascular changes throughout the system, multinuclear spectroscopy (MNS) for enhanced spectroscopic studies, magnetoencephalography (MEG) for study of electrically induced magnetic field strength in the brain, electroencephalography (EEG), and an fMRI simulator for training purposes.

Advising: Undergraduate advising will be overseen by the advising staff of Psychology, utilizing a combination of faculty advisors and professional full time advisors. Because the majority of students expected to enroll in the Neuroscience area of emphasis are currently Biology/Psychology double majors, we envision that the Neuroscience area of emphasis will not increase the advising load that is currently borne by either of these two units. The professional advising staff in Psychology has recently been increased, and has also consulted on the development of this proposal, both of which considerations enhance the feasibility of their assisting in this endeavor.

Administrative Staff: The department of Psychology currently has sufficient clerical and secretarial staff to manage the psychology major with Neuroscience area of emphasis.

In summary, UGA currently has the faculty, course offerings, world-class research facilities and staffing necessary to establish a Neuroscience area of emphasis within the Psychology undergraduate major.

Sincerely,

W. Keith Campbell
Professor and Department Head, Psychology

Bachelor of Science in Psychology
Checklist for PSYCHOLOGY MAJORS with NEUROSCIENCE AREA OF EMPHASIS
Declared FALL 2008 OR LATER

CORE (Areas I-VI are 1000 and 2000 level courses only)

AREA I: Foundation Courses (9 hours)

- _____ ENGL 1101 (3 hours)
- _____ ENGL 1102 (3 hours)
- _____ MATH 1113 (3 hours)

AREA II: Sciences (7-8 hours)

With Labs

_____ Life Science (Biological, 4 hours); *Students interested in pursuing the neuroscience area of emphasis MUST take BIOL 1107L*

_____ Physical Science (3-4 hours); *Students interested in pursuing the neuroscience area of emphasis MUST take CHEM 1211L*

AREA III: Quantitative Reasoning (3-4 hours)

With Labs

- _____ MATH 2250

AREA IV: World Languages & Culture, Humanities and the Arts (12 hours)

World Languages and Cultures

- _____ Course 1 (3-4 hours)
- _____ Course 2 (3-4 hours)
- _____ Course 3 (3-4 hours)

Humanities and the Arts

- _____ Course 1 (3 hours)

AREA V: Social Sciences (9 hours)

- _____ PSYC 1101 (3 hours)
- _____ POLS 1101 (3 hours)
- _____ HIST 2111 or 2112 (3 hours)

AREA VI: Psychology Major Related (18 hours)

- _____ PSYC 1101 (can also count in Area V)
- _____ BIOL 1107L / 1108L (1107L can also count in Area II)
- _____ MATH 2250 (can also count in Area III)

_____ Physical science (select from CHEM 1212L, PHYS; CHEM1212L can also count in Area II);
Note, some upper level electives relevant to the neuroscience area of emphasis require CHEM 1212L

General Electives (31-32 hours; 17 hours of upper level [3000+]; 9 hours in a biological science)
CHEM 2211L and CHEM 2212L are recommended lower level electives
BIOL 3100 is a recommended upper-level elective

Other Requirements

- _____ Physical Education
- _____ History: American and Georgia requirement
- _____ Constitutions: Federal and Georgia requirement
- _____ Environmental Literacy
- _____ Multicultural requirement
- _____ Literature
- _____ Foreign Languages
- _____ Fine arts, philosophy or religion (2 courses)

PSYCHOLOGY MAJOR REQUIREMENTS, NEUROSCIENCE AREA OF EMPHASIS

Methods (7 hours)

- _____ PSYC 3980 (3 hours) Research Design in Psychology
- _____ PSYC 3990 (4 hours) Research Analysis in Psychology

Group A - Biological Psychology Courses (9 hours)

Choose 3 courses from the following, OR 2 courses from the following and one area of emphasis-related elective from the list below:

- PSYC 4100 Cognitive Psychology
- PSYC 4120 Sensation and Perception
- PSYC 4130 Physiological and Comparative Psychology
- PSYC 4140 Cognitive Neuroscience
- PSYC 4150 Biological Foundations of Health Psychology

- _____ Course 1 (3 hours)
- _____ Course 2 (3 hours)
- _____ Course 3 or Elective (3 hours)

Group B - Social, Developmental and Applied Courses (3 hours)

Choose 1 course from the following:

- PSYC 4200 Social Psychology
- PSYC 4210 Psychological Testing
- PSYC 4220 Developmental Psychology
- PSYC 4230 Psychology of the Workplace

PSYC 4240 Psychopathology (students may not receive credit for both 4240 AND 3230, *Abnormal Psychology*)

_____ Course 1 (3 hours)

Advanced Laboratory or Seminar (3 hours from one of the following options, selections subject to departmental approval)

- _____ PSYC 4300 (3 hours) Psychology Laboratory
- _____ PSYC 4330 (3 hours) Physiological Psychology Laboratory
- _____ PSYC 5850 (3 hours) Psychopharmacology – Drugs and Behavior
- _____ PSYC 5000+ (3 hours)

Area of Emphasis-Related Electives

Select two courses from the following list: (Note that these classes can also be used to fill the 9-hour biological sciences general elective requirement)

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|-----------------------|--|
| FDNS 3000 | Human Nutrition for Health Professionals (3 hours) |
| GENE(BIOL) 3000 | Evolutionary Biology (<i>NOTE: BIOL1108/L is prerequisite</i>) (4 hours) |
| CBIO 3000-3000L | Comparative Vertebrate Anatomy (4 hours) |
| PBIO(BIOL)(CRSS) 3020 | Genomic Biology (3 hours) |
| BCMB(BIOL)(CHEM) 3100 | Introductory Biochemistry and Molecular Biology (4 hours) |
| BIOL 3110L | Basic Skills in the Laboratory (4 hours) |
| GENE(BIOL) 3200 | Genetics (<i>NOTE: This course requires additional prerequisites, such as CHEM 2211 AND CHEM 2212, which are recommended lower-level electives</i>) (4 hours) |
| CBIO(BIOL) 3300 | Developmental Biology (<i>NOTE: BCMB(BIOL)(CHEM) 3100, a recommended upper-level elective, satisfies the prerequisite</i>) (4 hours) |
| CBIO(BIOL) 3400 | Cell Biology (<i>NOTE: This course requires additional prerequisites, such as CHEM 2211 AND CHEM 2212, which are recommended lower-level electives, as well as BCMB(BIOL)(CHEM) 3100, a recommended upper-level elective, and GENE(BIOL) 3200</i>) (4 hours) |
| BCMB(GENE) 3433 | Biology for Medicine (4 hours) |
| BIOL(WILD) 3700 | Animal Behavior (3 hours) |
| CBIO 3710 | Principles of Physiology (3 hours) |
| CBIO(BIOL) 3800 | Neurobiology (4 hours) |
| CBIO(BIOL) 3800L | Neurobiology Laboratory (2 hours) |
| PSYC 3810 | Psychology of Health (3 hours) |
| GRNT 4010/6010 | Biogerontology (3 hours) |
| GENE 4050 | Behavior Genetics (3 hours) |
| BCMB 4120/6120 | Human Biochemistry and Disease (<i>NOTE: BCMB(BIOL)(CHEM) 3100, a recommended upper-level elective, is a prerequisite</i>) (4 hours) |
| BCMB 4130 | Mechanisms of Human Disease (<i>NOTE: BCMB(BIOL)(CHEM) 3100, a recommended upper-level elective, is a prerequisite</i>) (4 hours) |

CBIO 4200 Biomedical Research in Health and Disease (*NOTE: BCMB(BIOL)(CHEM) 3100, a recommended upper-level elective, is a prerequisite*) (3 hours)

CBIO 4340/6340 Biology of Aging (*NOTE: BCMB(BIOL)(CHEM) 3100, a recommended upper-level elective, is a pre-requisite*) (3 hours)

BIOL 4960 Undergraduate Research in Biology (4 hours)

CBIO 4730/6730 Endocrinology (3 hours)

Other Biological Psychology courses listed above (3 hours)