

**New Graduate Program (Majors, Sequences, Certificates) Proposal**  
**Illinois State University - Graduate Curriculum Committee**

**Program Department** Biological Sciences

**Submission Date** Saturday, November 02, 2013

**Initiator** Paul Garris

**Email** pagarri@ilstu.edu

**Phone** 438-2664

**Campus Address** 4120 Biological Sciences

**Initiator Department** Biological Sciences

**Coauthor(s)** Wolfgang Stein (wstein@ilstu.edu), Craig Gatto (cgatto@ilstu.edu)

**Version** 3

**Title of New Program** Ph.D. Sequence in Neuroscience and Physiology

**Proposed Starting Catalog Year** 2015 Supplement

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**Associated Course Proposal(s):**

New Graduate Course proposal BSC 430 titled *Neuroscience*

New Graduate Course proposal BSC 435 titled *Mammalian Physiology*

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**1. Proposed Action**

New Major

**Major CIP Code** 26.0101

✓ New Sequence

New Certificate

More than 50% of courses in this program are Distance Education

**Sequence Major**

Biological Sciences

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**2. Provide *Graduate Catalog* copy for new program.**

## **Ph.D. in Biological Sciences**

. . . Doctoral students may design an individual plan of study in consultation with advisors, or they may elect to pursue a sequence within the Ph.D. program in (1) Behavior, Ecology, Evolution, and Systematics (BEES), (2) Molecular and Cellular Biology, or (3) Neuroscience and Physiology, each of which includes specific requirements (see below)...

**Neuroscience and Physiology:** Students pursuing the Ph.D. may elect to pursue a Sequence in Neuroscience and Physiology, a course of study that provides students with a strong conceptual background in these two fields of biological sciences. The sequence is designed to enhance students' understanding of the canonical concepts that underlie neuroscience and physiology, including biostatistics, while providing the opportunity for training in related fields such as cell and molecular biology, chemistry, behavior and psychology. In addition to 4 hours of Graduate Seminar in Biology (BSC 420) and 15 hours of Dissertation Research (BSC 599), students are required to take 10 hours of sequence core courses (BSC 430, 435, 490, and 420.27) and 12 hours of sequence elective courses chosen from BSC 411, 415, 418, 419, 425, 450.37, 450.40, 450.47, 486, and 470. To complete these 12 hours of sequence elective courses, no more than two of the following may also be taken: BSC 301, 325, 327, 345, 346, 353, 354, 355, 367, and 396; CHE 442, 444, and 464; PSY 418, 421, and 468. Additional elective courses (unspecified hours) are selected through consultation among the major professor, the student's committee, and the student. For further information, see the Department's Web site at [www.bio.ilstu.edu](http://www.bio.ilstu.edu).

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3. Provide a description for the proposed <sup>Ph.D. Sequence in Neuroscience and Physiology 08/11/2014</sup> program.

We propose a Ph.D. Sequence in Neuroscience and Physiology. Ph.D. students interested in these two fields of the biological sciences will take core courses in neuroscience, physiology and biostatistics, and elective courses in more specific areas of these fields, as well as in related fields such as cellular and molecular biology, behavior, chemistry and psychology. Additional courses may be considered for students in this sequence at the discretion of the faculty advisor, the student, and the student's graduate committee. The overall objective of this proposed graduate sequence is to provide a canonical conceptual foundation for students pursuing doctoral research in neuroscience and physiology. This proposed graduate sequence

will also provide a “cohort” experience for new students, thus enhancing graduate training, and will also benefit recruitment of prospective students, by offering a cohesive curriculum for those students interested in pursuing graduate study in neuroscience and physiology.

*Core Courses (take all)<sup>1</sup>*

BSC 430 Neuroscience (3 hrs; to be proposed)

BSC 435 Mammalian Physiology (3 hrs; to be proposed)

BSC 490 Biostatistics (3 hrs) and BSC 420.27 Biostatistics Lab (1 h)

*Graduate Seminars (4 hrs)*

BSC 420 Graduate Seminar in Biology (1 hr)<sup>2</sup>

*Dissertation Research (15 hrs)*

BSC 599 Dissertation Research (1 hr)

*Elective Courses (12 hrs)*

BSC 411 Confocal Microscopy in Biology (2 hrs)

BSC 415 Advanced Cell Biology I (3 hrs)

BSC 418 Biological Microscopy (4 hrs)

BSC 419 Molecular Biology of the Gene (4 hrs)

BSC 425 Advanced Cell Biology II (3 hrs)

BSC 450.37 Advanced Biostatistics (3 hrs)

BSC 450.40 Advanced Immunology (3 hrs)

BSC 450.47 Principles of Neurophysiology (3 hrs)

BSC 486 Ethology (4 hrs)

BSC 470 Evolution (3 hrs)

Not more than two of the following:

BSC 301 Entomology (4 hrs)

BSC 325 Ecological Physiology of Animals (3 hrs)

BSC 327 Hormones and Behavior (3 hrs)

BSC 345 Introduction to Endocrinology (3 hrs)

BSC 346 Developmental Biology of Animals (3 hrs)

BSC 353 Biotechnology Lab I (3 hrs)

BSC 354 Biotechnology Lab II (3 hrs)

BSC 355 Genomics and Bioinformatics (3 hrs)

BSC 367 Immunology (4 hrs; will not count if 450.xx is also taken)

BSC 396 Avian Biology (4 hrs)

CHE 442 Proteins (3 hrs)

CHE 444 Lipids (3 hrs)

CHE 464 Kinetics and Dynamics (3 hrs)

PSY 418 Learning and Cognition (3 hrs)

PSY 421 Advanced Behavior Modification (3 hrs)

PSY 468 Advanced Psychopathology and Mental Health Diagnosis (3 hrs)

<sup>1</sup>Substitutions are permitted with consent of Thesis/Dissertation Committee and the Director of Graduate Studies.

<sup>2</sup>Excluding BSC 420.27.

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**4. Provide a rationale of proposed program.**

The primary motivation for proposing a Ph.D. sequence in Neuroscience and Physiology is that doctoral students in the School of Biological Sciences and studying in these two fields have striking unmet curricular needs. Currently, there are only two Ph.D. Sequences in the School, Behavior, Ecology, Evolution, and Systematics (BEES) and Molecular and Cellular Biology (MCB). While attractive for doctoral students wishing to pursue graduate study in the fields served by these sequence, neither offers the canonical conceptual grounding required for doctoral students wishing to pursue graduate study in neuroscience and behavior. Simply put, neuroscience and behavior are profoundly different areas than those served by Sequences in BEES and MCB, and a separate and dedicated Sequence in Neuroscience and Behavior is necessary to best meet the teaching needs of doctoral students interesting in studying neuroscience and physiology. Secondary motivations for proposing a Ph.D. sequence in Neuroscience and Behavior are instilling a sense of belonging to a cohort among doctoral students interesting in studying neuroscience and behavior and a device to enhance doctoral student recruitment.

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**5. Describe the expected effects of the proposed program on existing campus programs (if applicable).**

The proposed Ph.D. Sequence in Neuroscience and Behavior will not affect other existing campus programs. We anticipate that the creation of the Sequence will help to attract a modest number (1-2 per year) of high quality Ph.D. students to the School of Biological Sciences' graduate program. The program has the capacity to accept these additional students.

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**6. Describe the expected curricular changes required, including new courses. If proposals for new courses that will be or have been submitted, please reference those related proposals here:**

The proposed Ph.D. Sequence in Neuroscience and Physiology will require the addition of two new courses at the 400 level, BSC 430 Neuroscience (3 hrs) and BSC 435 Mammalian Physiology (3 hrs). These two courses will

form the core of the proposed sequence along with Biostatistics (BSC 490 and 420.27).

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**7. Anticipated funding needs and source of funds.**

While establishment of the proposed Sequence will require no new funds, its maintenance will require funds to hire one additional neuroscience faculty member. The ratio of majors to faculty members remains our top priority in Biological Sciences, and we will continue to request faculty positions to enable us to return to a sustainable balance. Thus, this is a perfect time to plan the directional growth of the School (Neuroscience is an area we have targeted) and an additional neuroscientist is one of the future position requests that we will put forth to the College. This new faculty position will also contribute to Neuroscience-related sequences at the undergraduate and M.S. level. No funds will be needed to support additional student advising, because internal effort will be re-allocated.

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**8. No Does this program count for teacher education?** Ph.D. Sequence in Neuroscience and Physiology 08/11/2014

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**9. The following questions must be answered.**

**Yes** Have you confirmed that Milner Library has sufficient resources for the proposed program?

**Yes** Have letter(s) of concurrence from affected departments/schools been obtained?  
*A departments/school is affected if it has a program with significant overlap or if it teaches a required or elective course in the program.*

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**10. Routing and action summary for New Graduate Program:** Ph.D. Sequence in Neuroscience and Physiology 08/11/2014

**1. Biological Sciences Department Curriculum Committee Chair**

Martha Cook (website)  
Signature

Martha Cook  
Print

11/2/2013 1:46:49 PM  
Date

**2. Biological Sciences Department Chair/School Director**

Craig Gatto (website)  
Signature

Craig Gatto  
Print

3/31/2014 10:06:07 AM  
Date

**3. College of Arts & Science College Curriculum Committee Chair**

Todd Stewart (website)  
Signature

Todd Stewart  
Print

4/3/2014 5:15:12 PM  
Date

**4. College of Arts & Science College Dean**

Sally Parry (website)  
Signature

Sally Parry  
Print

4/4/2014 9:56:23 AM  
Date

**5. Graduate Curriculum Committee Chair**

Denise Wilson (website)  
Signature

Denise Wilson  
Print

4/29/2014 10:02:24 AM  
Date

**6. Director of Graduate School**

*Amy Hurd (website)*

Signature

Amy Hurd

Print

4/29/2014 1:00:17 PM

Date

All new graduate programs (majors, sequences, certificates) are routed by the G.C.C. to the Academic Senate

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**Comments**

Ph.D. Sequence in Neuroscience and Physiology 08/11/2014



**ILLINOIS STATE  
UNIVERSITY**  
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**Department of Psychology**

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**MEMO**

Date: September 26, 2013

To: University Curriculum Committee

From: J. Scott Jordan, Chair of Psychology

Re: Letter of support for M.S. and Ph.D. sequence in Neuroscience and Physiology

The purpose of this memo is to express the Department of Psychology's support for the proposed M.S. and Ph.D. sequence in Neuroscience and Physiology. The creation of such a sequence at Illinois State University is both important and timely, and could lead to an increase in the number of research collaborations between faculty members in the Department of Psychology and the School of Biological Sciences.

The Department of Psychology will be able to accommodate 2-3 seats in the sections of PSY 418, 421, and 468 referred to in the proposal, as long as interested students have completed all pre-requisite courses and register in a timely fashion.



**ILLINOIS STATE  
UNIVERSITY**  
*Illinois' first public university*

**Craig C. McLauchlan**  
*Professor & Interim Chair*  
**Department of Chemistry**  
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[McLauchlan@IllinoisState.edu](mailto:McLauchlan@IllinoisState.edu)

October 1, 2013

To: University Curriculum Committee

From: Craig C. McLauchlan

Re: Department of Chemistry support for M.S. and Ph.D. Sequences in Neuroscience and Physiology

The Department of Chemistry is pleased to support the proposed M.S. and Ph.D. sequences in Neuroscience and Physiology. In consultation with our Departmental Curriculum Committee we strongly support the inclusion of Chemistry as an optional discipline of interest for this sequence. The courses indicated are certainly relevant. In addition, our DCC has also spoken with the typical instructors for the proposed courses and they are also supportive, provided that the interested students have completed all the pre-requisite courses.

The Department of Chemistry will be able to accommodate 2-3 qualified students in the sections of CHE 442, 444, and 464 referred to in the proposal, provided that interested students have completed all pre-requisite courses and register in a timely fashion.