

# **STAND-ALONE CERTIFICATE IN NEUROSCIENCE**

## **Certificate Type**

Stand-Alone Certificate in Neuroscience

## **Program Offering Stand-Alone Certificates in Neuroscience**

Interdisciplinary Neuroscience Program (INP)

## **Educational Objective**

The purpose of this certificate is to provide formal recognition to post-baccalaureate students who are taking neuroscience courses and conducting research in neuroscience laboratories. This stand-alone certificate will allow “post-bac” students to have something specific on their Resume/CV to show for their efforts beyond the bachelor’s degree.

## **Demonstrated Need**

On the MU campus, there are a number of post-baccalaureate students who are informally taking life sciences and neuroscience course work, and some of these students also are working in neuroscience laboratories performing research. The purpose of this stand-alone certificate in neuroscience is to provide formal recognition to these students who are taking neuroscience courses and conducting research in neuroscience laboratories. This stand-alone certificate would allow post-baccalaureate students to have a specific, formal indication of their advanced studies and would be very beneficial to students who are considering applying to graduate programs or health sciences programs, such as medical or dental school.

## **Impact on Existing Graduate Degree Programs**

All of the possible courses students might take (see below) are already offered by various departments on campus. Thus, besides a very slight increase in enrollment in some of these courses, there should be little or no negative consequences to existing graduate degree programs. The benefits will be two-fold: (1) attraction of post-baccalaureate students to the neuroscience discipline; and (2) possible future enrollment of these students in our graduate programs.

## **Course Work List**

(1) Required core courses: All students who will receive a stand-alone certificate in neuroscience will be required to take the following two courses: (a) BioSci 8440 and BioSci 8442 - Integrative Neuroscience I and II (3 credit hr each; cross listed as Neurosci 8440 and 8442).

Rationale: These two graduate courses expose students to a broad range of topics in neuroscience as well as allow students to learn from a large fraction of neuroscience faculty on campus.

(2) Postbac students receiving a stand-alone certificate in neuroscience will select one course from the following two groups.

(a) Cellular/molecular courses:

- i. BE 7070 - Bioelectricity (3 credit hrs)
- ii. BioSci 7002 - Neurobiology of Disease (3 credit hrs)
- iii. BioSci 8450 - Developmental Neurobiology (3 credit hrs)
- iv. MPP 9421 - Neural Pharmacology (1-3 credit hrs)
- v. MPP 9424 - Principles of Drug Action (4 credit hrs)
- vi. MPP 9426 - Transmembrane Signaling (4 credit hrs)
- vii. MPP 9432 - Mammalian Membrane Physiology (1-3 credit hrs)

(b) System/behavior courses:

- i. BioSci 7560 - Sensory Physiology and Behavior (3 credit hrs)
- ii. BioSci 7986 - Neurology of Motor System (3 credit hrs)
- iii. BioSci 7580 - Computational Neuroscience (4 credit hrs)
- iv. ECE 8570 - Theoretical Neuroscience I (3 credit hrs)
- v. ECE 8580 - Theoretical Neuroscience II (3 credit hrs)
- vi. Psych 7240 - Cognitive Neurosciences (3 credit hrs)

- vii. Psych 8210 - Functional Neuroscience (3 credit hrs)
- viii. Psych 9210 - Psychopharmacology for Psychologists (3 credit hrs)
- ix. Psych 9001.5 - Advanced Neural Systems (3 credit hrs)
- x. VBMS 8100 - Veterinary Neuroscience (2 credit hrs)
- xi. VBmS 9467/MPP 9437 - Neural Control of the Circulation (1-3 credit hrs)

Rationale: The proposed requirements for the Stand-Alone Certificate will allow students to focus on their specific area of neuroscience (cellular/molecular or systems/behavioral) and be recognized for this specialization. It should be noted that departments will not be obligated to offer any course listed above in “a” and “b”, and some courses may not be available. In addition, students may petition the INP to make appropriate substitutions to the courses listed in “a” and “b” depending on student interest and focus. However, the substitute courses must be bona fide neuroscience courses with substantial neuroscience content.

(3) Post-baccalaureate students receiving a stand-alone certificate in neuroscience will take 3 credits of a non-degree research course their first semester (e.g. BioSci 7990, Neurosci7990). Students are not required to perform additional research, but they are strongly encouraged to get a head start by beginning to work in a laboratory the summer before enrolling in the Certificate Program. Also, students are encouraged to perform additional research after their first semester.

### **Sample Plan of Study and Proposed Completion Timeline**

On the attached page is a sample Plan of Study for the Stand-Alone Certificate in Neuroscience. This certificate should be completed within 9-12 months.

### **Management Structure**

(1) Designated Director of the Stand-Alone Certificate in Neuroscience. This will be the faculty member who is the current Director of the Interdisciplinary Neuroscience Program (INP) at MU.

Current Director of INP: Andrew McClellan  
 114 Lefevre Hall  
[McClellanA@missouri.edu](mailto:McClellanA@missouri.edu)  
 882-1447

This individual will oversee the program, communicate applications to the Advisory Committee, maintain files of participants, and help determine participants’ progress towards completion of the Certificate. The Director will also ensure that the INP web site (<http://www.neurosci.missouri.edu>) contains an informational section on Graduate Certificates in Neuroscience and is up-to-date, including links to relevant web sites, <http://gradschool.missouri.edu/programs/graduate-certificates/index.php>; <http://gradschool.missouri.edu/policies/faculty-senate/curriculum/grad-certificate-changes.php> as well as forms and application material (e.g. “[Plan of Study form for a graduate certificate](#)”; “[Application for Graduate Change of Division, Program, Degree Emphasis or Adviser Form](#)”).

(2) Advisory Committee. This committee will be made up of members of the Graduate Recruitment Committee of INP as well as the Director of INP and will consider student applications for the Graduate Certificate in Neuroscience as well as determine participants’ progress towards completion of the Certificate.

Current Members of Committee:	David Beversdorf (chair) Kevin Gillis Dennis O’Brien Gary Weisman Matt Will Troy Zars	Neurology, Psychology Biological Engineering Vet Biomedicine Biochemistry Psychology Biological Sciences
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(3) Participating Faculty Members. All of the current faculty who are members of INP are eligible to participate in the Certificate program (see <http://gradschool.missouri.edu/programs/catalog/neuroscience/> and <http://www.neurosci.missouri.edu>).

(4) Tuition Dollars. The INP would like to receive a fair share of tuition dollars that are collected from students who enroll in the Stand-Alone Certificate Program in Neuroscience to help pay for the INP seminar series and poster sessions, and to improve INP to make it competitive for training program grants.

# EXAMPLE ONLY



## Graduate Certificate Plan of Study

*Submit to the Graduate School, 210 Jesse Hall.*

Student name: \_\_\_\_\_

Mizzou ID number: \_\_\_\_\_

Certificate program: \_\_\_\_\_

Anticipated certificate completion date: \_\_\_\_\_

*(if applicable)*

Academic program: \_\_\_\_\_

Degree (i.e. MS, MA, PhD): \_\_\_\_\_ Major: \_\_\_\_\_

### Consult the Graduate Catalog for a list of approved graduate certificate courses

leave grade blank if  
you have not yet  
taken the course

**Proposed Plan of Study:** List the course numbers, course titles, number of credit hours and the term in which the courses have been/will be taken. The certificate Plan of Study must be approved by the official certificate coordinator.

Course number	Title	Hours	Semester/Year	Grade

**Total Hours** (12 graduate hours minimum) \_\_\_\_\_

The program of study is approved as stated. Subsequent changes must be reported on a Program of Study Course Substitution form.

\_\_\_\_\_

Student signature                                  Date                                  Graduate dean's signature                                  Date

\_\_\_\_\_

Certificate coordinator's signature                                  Date

<b>DO NOT WRITE IN THIS BOX (office use only)</b>	Date copies sent to the coordinator: _____
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