PROGRAM AIMS

Neuroscience is an interdisciplinary program, drawing on faculty and courses from many campus units, including the Colleges of Liberal Arts, Science, and Engineering, and the School of Medicine. Study programs lead to the Master of Science and the Doctor of Philosophy degree. The program provides training in the core foundations of neuroscience, ranging from cellular mechanisms to cognition and behavior, with a wide range of options for advanced training and specialization within specific subdisciplines.

The program is designed to provide training in fundamental concepts and methods in modern neuroscience, and emphasize interdisciplinary and integrative approaches which are seen as central to major advances in the field. The program also emphasizes the development of research skills that will position students to be competitive in academic and research-oriented careers. Student learning outcomes include 1) comprehensive understanding and ability to critically evaluate current knowledge and theories in neuroscience; 2) research skills to effectively identify, design and carry out independent research; and 3) professional development including communication and teaching, grant-writing, and ethics.

DOCTOR OF PHILOSOPHY DEGREE

A. Program Entrance Requirements

An applicant to the program at the doctoral level must meet all requirements established by the Graduate School. Students admitted to the program will be expected to have obtained at least a 3.0 undergraduate grade point average (4 point system), and a combined GRE score of 300 (2012 scoring system). Course preparation for the program will be determined on an individual basis. However, all students will be expected to have a basic background in science including a minimum of 3 semester credits each in Calculus, Physics, Chemistry, and Biology. Students lacking this background may be admitted with the provision that appropriate remedial coursework is completed.

B. Program Requirements

Academic requirements as determined by the Graduate School and the Program must be met by all program students. Required and elective courses must be chosen from the program curriculum outlined below, and the plan of study requires approval of the student's advisor/examination committee and the program director.

*Neuroscience Core Courses (46 units)*
BIOL 675 - Neurobiology (3 units)
PSY 721 - Advanced Psychophysiology (3 units)
BIO/PSY/SOM - Journal club/ research presentations (4 units)
BIO/PSY/SOM - First year project (6 units)
BIO/PSY/SOM - Second year research (6 units)
BIO/PSY 799 - Dissertation research (24 units)

Additional Course Requirements (8 units)
PSY 706 (or equivalent) - Statistics (3 units)
PSY/CS/BCH - Computing or bioinformatics options (3 units)
PHAR 725 - Ethics and scientific research (2 units)

Electives (18 units)
Note electives must include at least one course from each of the following clusters:
Cognitive Neuroscience (PSY)
PSY 627 - Computer applications (3 units)
PSY 709 - Comparative sensory neuroscience (3 units)
PSY 720 – Perception (3 units)
PSY 729 - Memory (3 units)
PSY 755 - Individual reading (multiple units)
PSY 761-3 - Special topics (multiple units)

Cellular and Molecular Neuroscience (BIO-CMB)
CMB 710 - Molecular cell biology (4 units)
BCH 704 - Molecular genetics (3 units)
BCH 706 - Functional genomics (3 units)
BCH 709 - Introduction to bioinformatics (3 units)
BIOL 677 - Genes, Brain and Behavior (3 units)
BIOL 681 - Principles of animal behavior (3 units)
BIOL 654 - Genomic conflict, epigenetics (3 units)
BIOL 666 - Developmental biology (3 units)
BIOL 691 - Independent Study (3 units)
BIOL 705 - Current topics in cellular and molecular biology (multiple units)
BIOL 711 - Advanced cellular biology (3 units)
PHAR 710 - Molecular Pharmacology (3 units)

Total units: 72

Additional Program Requirements

First year research project
Doctoral students in the Neuroscience program will complete 2 semesters of research in their first year. This is designed to expose students to research methods and questions in the discipline and to aid them in selecting an advisor.
First year fellowship application
All doctoral students will be required to prepare and submit an application for a graduate student fellowship (NSF, NIH or equivalent) by the end of their third semester. The application should be developed in collaboration with their faculty research advisor, and is designed both to build grant writing skills and develop their research program.

Faculty Advisor
Before the third semester in the program, each student must select a research/thesis advisor in consultation with the program directors and the desired faculty member, who must be an affiliate member of the program. The advisor will serve as chair of the student’s advisory/examination committee.

Journal Club
The journal club is designed to expose students to important current work in the field as well as familiarize them with diverse approaches and ongoing research within the program. The club is also an important venue for students to present their own projects and develop their scientific communication skills. Active participation is required.

Annual Research Retreat
The Neuroscience program schedules an annual research retreat for graduate students, faculty, and research fellows. All graduate students are required to attend. Furthermore, students are required to present their research findings at this conference, either as a poster or talk, as determined by the retreat organizing committee. Graduate students who have completed their first or second year of studies may present their findings by either the poster or oral presentation method.

Seminar Series
The program also participates in an ongoing colloquium series hosting speakers from both within and outside the university. Graduate students play an active role in identifying the speakers and scheduling their visits as members of the Colloquium Committee, and are expected to attend the talks as well as additional opportunities to interact with the speakers.

Comprehensive Exam
Doctoral students must pass a comprehensive examination before the end of year 2 in which the student independently proposes a research project in the form of a written research grant proposal. Following acceptance of the written proposal by an examining committee, the proposal must be defended orally before the committee. All doctoral degree candidates must present a public seminar of their thesis research and pass an oral defense of the dissertation.

Continuous Enrollment
Graduate students without an assistantship must enroll for three (3) graduate credits each fall and spring semester until graduation (this includes enrolling in three graduate credits in your
final semester). Graduate students with an assistantship must enroll for six (6) graduate credits each fall and spring semester. Graduate students may also enroll in at least 1 credit during the summer sessions. For non-resident aliens who are not taxed, it is important to enroll in at least 1 credit in two of the three summer sessions to maintain student status and hence non-taxable status.

C. Program Completion Requirements

It is the student’s responsibility to fulfill all requirements in a timely manner, and all courses must be completed with a letter grade of B or higher. Failure to meet these requirements may result in academic probation, loss of funding, or dismissal from the program.

Academic Requirements
Academic requirements as determined by the Graduate School and the Program will be met by all Neuroscience students. Required courses will be chosen from core and elective courses as outlined above. The final decision on courses to be taken is made by each individual student’s advisory/examination committee, and approval by the program directors.

Comprehensive Examination Proposal
The Comprehensive Examination consists of the student independently proposing a research project on a topic. The topic cannot be a project conducted in a faculty member’s laboratory or proposed in a grant application by any faculty member. The preparation for this exam may be done as an independent study course. Following approval of the project, by the student’s advisory committee, the student will write a research grant proposal in the form of an extramural grant application to an agency currently funding such research (e.g. NIH, NSF, etc.). The Examination committee will specify the sections and length of the proposal. These will generally consist of sections for Specific Aims, Background and Significance, Experimental Plan, and Literature cited.

When the proposal is completed the student will submit it to his or her advisory-examining committee. Each committee member must approve the written proposal. Within two weeks of approval of the proposal, the student will defend it before the CEC members and faculty sponsor. The student must demonstrate in the oral exam a clear outline of experiments to investigate the chosen topic, and must thoroughly understand all techniques and concepts directly or indirectly associated with this proposal. The oral examination will normally take no more than two hours, and the student must be notified that day as to his or her proficiency.

Any student not passing this examination may revise and resubmit the proposal or select a new topic at the discretion of the committee. A student must pass this second exam within an additional period determined by the committee. Any student failing this revised comprehensive exam may not continue in the Neuroscience Ph.D. program.
Comprehensive Examination Schedule
Each matriculated Neuroscience student must submit to his or her committee a written proposal before the student can register for Semester V (exclusive of summer sessions). The Comprehensive Examination must be successfully completed and written notice of such, signed by each member of the CEC, must be submitted to the NEUROSCIENCE office prior to registration for Semester V. Registration and stipends (both research and teaching assistantships) will be blocked until written notice is provided. The fulfillment of this requirement is strictly the student’s responsibility.

Dissertation and Final Examination Requirements
If a student has first author publications accepted in refereed journals at the time they have completed work, they may submit the publications to their thesis committee and petition to write an introduction to the work and have the dissertation consist of this introduction and the papers. The committee may decide that additional chapters be required along with the published papers. Prior to formally choosing a date for the final oral examination, graduate students must submit a copy of their final dissertation for review by their examining committee. The dissertation does not have to be in its final form, e.g. thoroughly referenced, perfect grammar, etc., but must contain sufficient information to allow their committee to make an informed decision about the state of completion of their studies. The purpose of the review is to discern whether a student has sufficiently completed their studies to announce a date for their final examination.

Following acceptance of the dissertation by the advisory/examination committee, all doctoral candidates in the Neuroscience program will schedule and present a research seminar on their dissertation research, which will be open to the general public. This seminar will constitute part of the final examination and must be presented while the candidate is still in residence. This seminar requirement is in addition to the final examination requirement of the Graduate School. Following the public portion of this seminar, the advisory/examination committee, expanded to include all appointed Graduate School representatives, will conduct a final oral examination in closed session. This oral examination will be so conducted as to meet all relevant examination requirements of the Graduate School. Doctoral candidates may register for one credit of Graduate Seminar during the semester in which this seminar is presented.

D. Graduate Student Performance Standards
All graduate students in the Neuroscience program are considered full-time scientists, and as such are expected to adhere to high standards of professional and personal behavior. Following are standards that are required of students, and disciplinary actions that may be taken if a student fails to measure up to these standards.

Ethics
All Neuroscience students are required to adhere to the scientific misconduct policy of the University of Nevada, Reno (Ethical Standards in the Conduct of Research). Failure to adhere to
these standards may be grounds for removal from the program, at the discretion of the Program Directors.

**Disciplinary Actions**
In the event of a potential breach of ethics, evaluation of a student’s performance will be determined by the Student Advisory Committee (SAC). The SAC may receive input from individual faculty and students. After preliminary considerations, the committee will inform the student of areas of concern, and may suggest disciplinary action. These can include i) probationary status, which may include loss of financial support and/or non-registration; ii) permanent expulsion from the program, which may be implemented without a probation period.
MASTER OF SCIENCE DEGREE

A. Program Entrance Requirements

An applicant to the program at the masters level must meet all requirements established by the Graduate School. Students admitted to the program will be expected to have obtained at least a 3.0 undergraduate grade point average (4 point system), and a combined GRE score of 300 (2012 scoring system). Course preparation for the program will be determined on an individual basis. However, all students will be expected to have a basic background in science including a minimum of 3 semester credits each in Calculus, Physics, Chemistry, and Biology. Students lacking this background may be admitted with the provision that appropriate remedial coursework is completed.

B. Program Requirements

Academic requirements as determined by the Graduate School and the Program must be met by all program students. Required and elective courses must be chosen from the program curriculum outlined below, and the plan of study requires approval of the student’s advisor/examination committee and the program directors.

**Neuroscience Core Courses (16 units)**
- BIOL 675 - Neurobiology (3 units)
- PSY 721 - Advanced Psychophysiology (3 units)
- BIO/PSY/SOM - Journal club/ research presentations (4 units)
- BIO/PSY 797 - Thesis research (6 units)

**Additional Course Requirements (8 units)**
- PSY 706 (or equivalent) - Statistics (3 units)
- PSY/CS/BCH - Computing or bioinformatics options (3 units)
- PHAR 725 - Ethics and scientific research (2 units)

**Electives (6 units)**
*Note all electives cannot be taken from the cluster below:*
- Cognitive Neuroscience (PSY)
  - PSY 627 - Computer applications (3 units)
  - PSY 709 - Comparative sensory neuroscience (3 units)
  - PSY 720 – Perception (3 units)
  - PSY 729 - Memory (3 units)
  - PSY 755 - Individual reading (multiple units)
  - PSY 761-3 - Special topics (multiple units)

- Cellular and Molecular Neuroscience (BIO-CMB)
  - CMB 710 - Molecular cell biology (4 units)
  - BCH 704 - Molecular genetics (3 units)
BCH 706 - Functional genomics (3 units)
BCH 709 - Introduction to bioinformatics (3 units)
BIOL 677 - Genes, Brain and Behavior (3 units)
BIOL 681 - Principles of animal behavior (3 units)
BIOL 654 - Genomic conflict, epigenetics (3 units)
BIOL 666 - Developmental biology (3 units)
BIOL 691 - Independent Study (3 units)
BIOL 705 - Current topics in cellular and molecular biology (multiple units)
BIOL 711 - Advanced cellular biology (3 units)
PHAR 710 - Molecular Pharmacology (3 units)

Total Units = 30

Additional Program Requirements

Thesis Research

Students in the Neuroscience MS program will complete 2 semesters of thesis research during their second year. In the first year, they have the option of earning elective credits for additional research in their first year, or substituting these credits with elective courses. MS students must complete a thesis based on an independent research project. The thesis must be defended orally before their examining committee.

Faculty Advisor

Before the third semester in the program, each student must select a research/thesis advisor in consultation with the program director and the desired faculty member, who must be an affiliate member of the program. The advisor will serve as chair of the student’s advisory/examination committee.

Journal Club

The journal club is designed to expose students to important current work in the field as well as familiarize them with diverse approaches and ongoing research within the program. The club is also an important venue for students to present their own projects and develop their scientific communication skills. Active participation is required.

Annual Research Retreat

The Neuroscience program schedules an annual research retreat for graduate students, faculty, and research fellows. All graduate students are required to attend. Furthermore, students are required to present their research findings at this conference, either as a poster or talk, as determined by the retreat organizing committee. Graduate students who have completed their first or second year of studies may present their findings by either the poster or oral presentation method.
Seminar Series
The program also participates in an ongoing colloquium series hosting speakers from both within and outside the university. Graduate students play an active role in identifying the speakers and scheduling their visits as members of the Colloquium Committee, and are expected to attend the talks as well as additional opportunities to interact with the speakers.

Continuous Enrollment
Graduate students without an assistantship must enroll for three (3) graduate credits each fall and spring semester until graduation (this includes enrolling in three graduate credits in your final semester). Graduate students with an assistantship must enroll for six (6) graduate credits each fall and spring semester. Graduate students may also enroll in at least 1 credit during the summer sessions. For non-resident aliens who are not taxed, it is important to enroll in at least 1 credit in two of the three summer sessions to maintain student status and hence non-taxable status.

C. Program Completion Requirements

It is the student’s responsibility to fulfill all requirements in a timely manner, and all courses must be completed with a letter grade of B or higher. Failure to meet these requirements may result in academic probation, loss of funding, or dismissal from the program.

Academic Requirements
Academic requirements as determined by the Graduate School and the Program will be met by all Neuroscience students. Required courses will be chosen from core and elective courses as outlined above. The final decision on courses to be taken is made by each individual student’s advisory/examination committee, and approval by the program directors.

General Procedures and Examination Requirements
During the second semester of residence in the Neuroscience program, each MS student must select, in consultation with the program directors and the desired faculty member, a research/thesis advisor from among the program faculty. Selection depends on a mutual agreement between the student and the desired advisor, and the program cannot guarantee the availability of any particular advisor. This advisor will serve as chair of the student’s advisory/examination committee.

After having selected a research advisor, the student will arrange for one additional Neuroscience group faculty member to serve as an advisory/examination committee. At least one additional faculty will be appointed, representing the University at large, to meet Graduate School requirements. These additional appointments will be subject to approval of the committee chairperson (research/thesis advisor). Permanent constitution of the committee will be subject to the approval of the program directors. This committee will approve the final
thesis, conduct the formal oral part of the thesis defense, and serve in an advisory capacity to
the student during his or her tenure in the program.

**Thesis Examination Requirements**

Prior to formally choosing a date for the final oral examination, graduate students must submit
a copy of their final thesis for review by their examining committee. The thesis does not need to
be in its final form, e.g. thoroughly referenced, perfect grammar, etc., but must contain
sufficient information to allow their committee to make an informed decision about the state
of completion of their studies. The purpose of the review is to discern whether a student has
sufficiently completed their studies to announce a date for their final examination. After
acceptance of the thesis (see Doctoral section for nature of thesis) by the advisory/examination
committee, all MS candidates will schedule and present a research seminar on their thesis
research which will be open to the public. This seminar will constitute part of the final
examination and must be presented while the candidate is still in residence. Following the
public portion of this seminar, the advisory/examination committee, expanded to include all
appointed Graduate School representatives, will conduct, in closed session, a final oral
examination, which will be so conducted as to meet all relevant examination requirements of
the Graduate School.

**Comprehensive Examination Proposal**

The Comprehensive Examination consists of the student independently proposing a research
project on a topic. The topic cannot be a project conducted in a faculty member's laboratory or
proposed in a grant application by any faculty member. The preparation for this exam may be
done as an independent study course. Following approval of the project, by the student’s
advisory committee, the student will write a research grant proposal in the form of an
extramural grant application to an agency currently funding such research (e.g. NIH, NSF, etc.).
The Examination committee will specify the sections and length of the proposal. These will
generally consist of sections for Specific Aims, Background and Significance, Experimental Plan,
and Literature cited.

When the proposal is completed the student will submit it to his or her advisory-examining
committee. Each committee member must approve the written proposal. Within two weeks of
approval of the proposal, the student will defend it before the CEC members and faculty
sponsor. The student must demonstrate in the oral exam a clear outline of experiments to
investigate the chosen topic, and must thoroughly understand all techniques and concepts
directly or indirectly associated with this proposal. The oral examination will normally take no
more than two hours, and the student must be notified that day as to his or her proficiency.

Any student not passing this examination may revise and resubmit the proposal or select a new
topic at the discretion of the committee. A student must pass this second exam within an
additional period determined by the committee. Any student failing this revised comprehensive
exam may not continue in the Neuroscience program.
D. Graduate Student Performance Standards

All graduate students in the Neuroscience program are considered full-time scientists, and as such are expected to adhere to high standards of professional and personal behavior. Following are standards that are required of students, and disciplinary actions that may be taken if a student fails to measure up to these standards.

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All Neuroscience students are required to adhere to the scientific misconduct policy of the University of Nevada, Reno (Ethical Standards in the Conduct of Research). Failure to adhere to these standards may be grounds for removal from the program, at the discretion of the Program Directors.

Disciplinary Actions
In the event of a potential breach of ethics, evaluation of a student’s performance will be determined by the Student Advisory Committee (SAC). The SAC may receive input from individual faculty and students. After preliminary considerations, the committee will inform the student of areas of concern, and may suggest disciplinary action. These can include i) probationary status, which may include loss of financial support and/or non-registration; ii) permanent expulsion from the program, which may be implemented without a probation period.

GRADUATE SCHOOL FORMS

You will need to become familiar with a set of forms from the Graduate School. They can be obtained from this website: [http://www.unr.edu/grad/forms/](http://www.unr.edu/grad/forms/)

As you progress through the program:
- Graduate Credit Transfer Evaluation Request Form
- Program of Study Requirements (instructions & form)
- Change in program of Study
- Change of Advisory Committee
- Doctoral Degree Admission to Candidacy/Comprehensive Examination Report
- Application for Leave of Absence

For PhD graduation:
- Doctoral Committee Approval page (5 committee members)
- Doctoral Committee Approval page (6 committee members)
- Doctoral Microfilming Agreement (Only if you are submitting paper, print this)
- Doctoral Complete Microfilming Agreement (see online form)
- Doctoral Degree Notice of Completion
- Doctoral Final Review Approval transmittal
- Survey of Earned Doctorates (see online form)
- Exit Survey
For MS graduation:
Master's Committee Approval page (3 committee members)
Master's Committee Approval page (4 committee members)
Master's Microfilming Agreement (Only if you are submitting paper print this)
Master's Complete Microfilming Agreement (see online form)
Master's Degree - Notice of Completion
Master's Final Review Approval transmittal
Exit Survey