Dept

Washington State University
MAJOR CHANGE FORM – REQUIREMENTS

NOTE: If proposing a **new** program (degree) or **extending, moving, consolidating, eliminating or renaming** an existing program (degree), these proposals must first go through the Provost's Office review process. Please do not use this form. Please contact the Provost's Office for directions on processing program (degree) proposals.

SUBMITTING PROPOSAL – Follow the steps on form, then:

- ☐ **Submit one electronic copy of complete packet of signed form/rationale statement/supporting documentation and/or edits** to wsu.curriculum@wsu.edu.
- ☐ Send the **original stapled packet** PLUS **10 stapled copies** of packet to the **Registrar's Office,** campus mail code 1035.

Department Name Integrative Physiology and Neuroscience

1. Check proposed changes:

- ☐ New Plan (Major) *in* _____ CIP#___.____
- ☐ Change name of Plan (Major) *from* _____ *to* _____
- ☐ Revise certification requirements for the Plan (Major) *in* _____
- ☑ Revise Plan (Major) requirements *in* PhD in Neuroscience
- ☐ Drop Plan (Major) *in* _____

- ☐ New Sub-Plan (Option) *in* _____ CIP#___.____
- ☐ Change name of Sub-Plan (Option) from _____ *to* _____
- ☐ Revise requirements for the Sub-Plan (Option) *in* _____
- ☐ Drop Sub-Plan (Option) *in* _____

- ☐ New Minor *in* _____ CIP#___.____
- ☐ Change name of Minor from _____ *to* _____
- ☐ Revise Minor requirements *in* _____
- ☐ Drop Minor *in* _____

- ☐ New Certificate *in* _____ CIP#___.____
- ☐ Change name of Certificate from _____ *to* _____
- ☐ Revise Certificate requirements *in* _____
- ☐ Drop Certificate *in* _____

- ☐ Other _____

2. Effective Date: Fall 2016 (Effective date must be for future fall term.) ***Submission deadline is Oct 1st.***
NOTE: Items received after deadlines may be put to the back of the line or forwarded to the following year. Please submit on time.

Contact: Becky Morton Phone number: 335-6621
Email: bmorton@wsu.edu Campus mail code: 7620

3. PLEASE ATTACH A RATIONALE STATEMENT giving the reasons for each request marked above, and explaining how this impacts other units in Pullman and other campuses (if applicable).

4. PROVIDE SUPPORTING DOCUMENTATION AND/OR CURRENT CATALOG COPY with edit marks showing requested changes.

5. SIGN AND DATE APPROVALS.

Chair Signature/date	Dean Signature/date	CSC Date
7/9/15	7-30-15	

Chair Signature/date	Dean Signature/date	AAC or GSC Date	Senate Date

Changes to the required curriculum for the Ph.D. and M.S. degrees in Neuroscience and Veterinary Science.

Background: This spring (2015) the faculty of the Graduate Program in Neuroscience have voted to adopt several changes in our course requirements for the Ph.D. and M.S. degrees. Since the M.S. and Ph.D. degrees offered in veterinary science through Integrative Physiology and Neuroscience (IPN) are structured with similar requirements to those in the neuroscience program, these changes are also applicable to the IPN Graduate Program in Veterinary Science.

Nature of the Changes: A table of the old and new course requirements are attached. The programmatic changes (indicated in red in the tables) are:

1. The current requirements for Neurosci 520 and Vet_Ph 555 for both the M.S. and Ph.D. are to be dropped (8 cr). In their place we increase the number of credits taken through the Neurosci 540/541/542/543 Special Topics series from 6 cr to 12 cr (note 12 is the sum of core (4) and elective (8) microcourse credits).
2. The current requirements for a biochemistry course (MBios 513 or MBios 301) and a statistics course (Stat 512 or equivalent) are to be changed to two new courses. One course is titled Deconstructing Science (Neurosci 563), which will replace the biochemistry requirement. The other is titled Topics in Biomedical Experimentation (Neurosci 564), which will replace the advanced statistics requirement.
3. The current requirement for a bioethics course (Phil 530) is dropped. This is to be replaced with a professional development series available to the students in the program. Some elements in the professional development series are required in order to work in the lab (e.g., responsible conduct of research) and others are optional (e.g., career opportunities in industry). None of these offerings will be for credit.
4. Under the Ph.D. listing: Other Core Graded Courses - the Neurosci 404 or 430 requirement is dropped.
5. The Neurosci 592 Research Writing and Seminar course listed under non-graded credits for the Ph.D. is now to be listed as a graded credit requirement for both the M.S. and Ph.D. (the change from P/F to grades has already been approved).
6. Within the Special Topics series (Neurosci 540/541/542/543):
    - The courses have already been approved such that a student can registered for variable credits (1-3) in each course. Each course has 3 unique blocks of material (taught sequentially) and a student selects which block(s) they want to take. Individual blocks are referred to as microcourses.
    - Each of the four special topics courses (540/541/542/543) has a 1 credit block (the first block) that are core to the program and do not vary from year to year. All students in the graduate neuroscience program (M.S. and Ph.D.) are required to take these 4 core microcourse credits.
    - The remainder of the special topics credits (8) are elective. These topics change from year to year, and a student can repeatedly register for a particular special topics course number as long as the elective credit they take is for a different microcourse topic.
    - We propose a liberal substitution policy regarding the 8 elective credits. Students can substitute up to 6 credits from other courses taken at WSU or elsewhere, or credits can be waived if the substitution is for a similar rigorous academic exercise (such as attending a workshop at a national lab). All substitutions must be approved by the program Curriculum Committee.

Impact of Changes: With these changes, the Ph.D. and M.S. programs have 13 core credits and 8 elective credits. This fulfills the 21 graded credit requirement for the M.S. degree, and the 15 graded credits for the Ph.D. degree. Within the M.S. program all substitutions must be matched for course credit so the 21 graded course credit requirement can be fulfilled. In the Ph.D. program, a student may request that a non-graded activity count (such as a workshop at a national lab), and an equivalent amount of elective credit will be waived, as long as the student has at least 15 graded graduate level credits in their program.

Impact on Veterinary Science: The Veterinary Science Program is designed for maximum flexibility as topics can range from molecular details of contractile proteins to animal behavior. For the M.S. and Ph.D. degrees the only core course requirements are the Neurosci 563 Deconstructing Science and Neurosci 564 Topics in Biomedical Experimentation, along with the Neurosci 592 Research Writing and Seminar course, as these courses focus on knowledge and skills useful in all biomedical fields. For the remainder of their credits veterinary science students can substitute additional credits from the Special Topics series, or can take other courses as approved by their thesis committee and the program Curriculum Committee to reach their required graded course credits.

Rationale for the Changes: Each change (1-6) has a separate rationale and the numbers below correspond to the numbered elements above:

1. Removal the general survey courses Neurosci 520 and Vet_Ph 555 as core credits (compensated by an increase of 6 Special Topics credits) is driven by the idea that graduate level courses should be more conceptual in nature and less content oriented. The new microcourse structure has at its heart a more conceptually driven agenda (see further discussion below). In the present structure, the presence of content heavy courses in the graduate curriculum delays the inevitable required change in mode of thinking by incoming graduate students. Thus elimination of these courses should force students to learn from day one that graduate education demands a different mode of thinking, and further should help dispel the belief that all the knowledge one needs to know is found within courses. On the other hand, to avoid over specialization of students within a completely elective neuroscience curriculum, we have 4 core special topics credits that essentially serve as a distribution requirement (anatomy, biophysics, cell signaling, and behavior). However, within these core modules the emphasis is still on conceptual thinking and not just content.

2. The new courses (Deconstructing Science and Topics in Biomedical Experimentation) are courses that are the responsibility of three graduate programs housed primarily in the College of Veterinary Medicine (Neuroscience, Molecular Biosciences, and Immunology and Infectious Diseases). This amalgam is hence forth referred to as the Integrative Programs in Biomedical Sciences or iPBS. The rationale for these common core courses are:

    a) Deconstructing Science:

    - Students are presented with a series of research seminars (6 total, 2 from each program), in which the students are guided through a detailed analysis of the underlying assumptions and evidence presented in the seminars, thus illustrating how a scientific argument that exceeds the dimension of a single paper is developed. This is new to the program and currently not covered.
    - This course also serves to develop within our students a broader perspective of biomedical sciences. This is similar to our previous insistence on a biochemistry course, only now, for students in neuroscience, it will expand into some elements in immunology and infectious disease. This cross fertilization of ideas and techniques at an early career stage should lead to more innovative thinking and cross disciplinary graduate thesis projects.
    - Because of the joint sponsorship of the course, it will help build comradery between students (and faculty) in the different programs. This should improve student retention and be helpful in attracting more academically ambitious students.

b) Topics in Biomedical Experimentation
   - This course addresses application of experimental design and statistical analysis in a biomedical context. This course is also to be taught in a modular form (like Special Topics) with the first module required and the student selects two additional modules from a menu of choices. An often heard complaint among our faculty is that students take advanced statistics course (indeed, almost all have had some statistics before their arrival), but they are not particularly adept at applying the statistics to the experimental designs within their thesis or they could use more training that focuses specifically on experimental techniques. In this course the philosophy of experimental design used in biomedical fields, the strategy used to select the most appropriate statistics for analysis, and technical approaches used in specific techniques are emphasized. In other words, it is an applied course that assumes fundamental knowledge. This is a much better match to the skills and deficits of our incoming students than our current requirement. Note that an advanced statistics course (>300 level) is a pre-requisite for this course (must be taken if student has not taken such a course before matriculation to the program).

3. There are two primary reasons for the proposed change in the bioethics course requirement for the program, both driven by sound theoretical arguments appropriately pushed by NIH through their recommended structure for a professional development series within training grant programs.
   - A single course in bioethics is not as impactful as a program in which students constantly engage throughout their program in the ethics of research.
   - Such training should not be confined to discussions of ethics in research, but should also contain other elements important for professional development.
   - In response to this we have elected to drop the Phil 530 requirement and are working on developing a series that can engage students over years, and be a mix of research ethics, as well best practices for professional development.
4. The requirement for either Neurosci 404 or Neurosci 430 is to be dropped. Because these courses are 400 level, they cannot count as graded credit towards the Ph.D. degree. This requirements was present to force students into courses they would TA in their second year. We are now revising TA requirements in the program and assigning these courses as part of the graduate curriculum is no longer needed.
5. The Neurosci 592 requirement was changed from non-graded credit to graded credit last year. In addition, it is now added to the M.S. program. The grading change was to force more engagement by the students, and extension of the course to the M.S. degree acknowledges that excellent writing and communication skills are also important for M.S. students.
6. Microcourses. The microcourse concept is driven by the following considerations:
   - Graduate education should emphasize how to think about a topic rather than what is known about a topic. This doesn't dismiss the importance of content, for without content one's thoughts are mostly empty and naïve, but rather puts the onus on the student to develop their own content knowledge.
   - Most faculty have obtained the advanced content knowledge they have from activities they engage in (reading, reviewing, writing, teaching, etc.) rather than from course work. Graduate students need to be exposed to this mode of educating themselves rather than relying on the survey course.
   - Most detailed content taught in survey courses is soon forgotten, but the patterns of thinking remain. Class time should be used to emphasize the thinking with a few well selected examples, rather than focus on an exhaustive review of examples to make sure every base is covered.

- The constraints imposed by the microcourse structure (15 contact hours per course) also forces the faculty member to think and plan with more discipline. The faculty member must plan how to transmit the most core concepts in a field in a very short time and cannot let content bury the essential lessons, a crutch that can happen in a more unconstrained venue.

PROGRAM REQUIREMENTS

Consult the *Graduate Bulletin* or Graduate School web page (http://gradschool.wsu.edu/) for general requirements for the M.S. or Ph.D. degree. A non-thesis M.S. or Ph.D. program is not available in Neuroscience or Veterinary Science.

CURRICULAR REQUIREMENTS: M.S. DEGREE IN NEUROSCIENCE (❖VETERINARY SCIENCE)

- ***Graded Credits***

COURSE NO.	COURSE TITLE	CREDITS
REQUIRED **CORE GRADED COURSES:**		
• Neurosci 540-543	Special Topics in Neuroscience (4 core required microcourses)[1]	4 cr
• Neurosci 563	Deconstructing Research	3 cr
• Neurosci 564	Topics in Biomedical Experimentation[1,2]	3 cr
• Neurosci 592	Research Writing and Seminar	3 cr
	Total Graded Credits:	13 cr
OTHER ELECTIVE GRADED CREDITS (REQUIRED UNLESS SUBSTITUTED OR WAIVED BY PETITION)[3]:		
• Neurosci 540-543	Special Topics in Neuroscience (8 elective microcourses)[4]	8 cr
	Total Elective Graded Credits:	8 cr
	Total Graded Credits:[5]	21 cr

- ***Non-Graded Credits***

COURSE NO.	COURSE TITLE	CREDITS
• Neurosci 590 (S/F)	Seminar [4 semesters x 1 cr]	4 cr
	Total Non-Graded Credits:	4 cr

- ***Research Credits***

COURSE NO.	COURSE TITLE	CREDITS
• Neurosci 700	Thesis Research [minimum of 4 cr required]	5 cr
	Total Research Credits:	5 cr
	TOTAL (minimum of 30 cr required; 21 cr must be graded):	**30 cr**

❖ For an **M.S. in Veterinary Science** the Mentor/Thesis Committee may designate substitutes for the Special Topics series, but Deconstructing Science, Topics in Biomedical Experimentation, and Research Writing and Seminar are all required.

For notes 1-4 see listings under Requirements for the Ph.D. Degree in Neuroscience

[5] M.S. degree requires a minimum of 21 graded credits (WSU Graduate School requirement). Any waived courses must be replaced by graded substitutes. M.S. degree may include up to a maximum of six (6) credits of undergraduate (300-400 level) graded course work.

CURRICULAR REQUIREMENTS: Ph.D. DEGREE IN NEUROSCIENCE (❖VETERINARY SCIENCE)

- ***Graded Credits***

COURSE NO.	COURSE TITLE	CREDITS
REQUIRED CORE GRADED COURSES:		
• Neurosci 540-543	Special Topics in Neuroscience (4 core required microcourses)[1]	4 cr
• Neurosci 563	Deconstructing Research	3 cr
• Neurosci 564	Topics in Biomedical Experimentation[1,2]	3 cr
• Neurosci 592	Research Writing and Seminar	3 cr
	Total Core Graded Credits:	13 cr
OTHER ELECTIVE GRADED CREDITS (REQUIRED UNLESS SUBSTITUTED OR WAIVED BY PETITION)[3]:		
• Neurosci 540-543	Special Topics in Neuroscience (8 elective microcourses)[4]	2 - 8 cr
	Total Elective Graded Credits:	2 - 8 cr
	Total Graded Credits:[5]	15 - 21 cr

- ***Non-Graded Credits***

COURSE NO.	COURSE TITLE	CREDITS
REQUIRED NON-GRADED COURSES:		
• Neurosci 531 (S/F)	Laboratory Rotations [1-2 semester x 1 cr][6]	1-2 cr
• Neurosci 590 (S/F)	Seminar [minimum of 4 semesters x 1 cr, maximum of 7 cr]	4-7 cr
	Total Non-Graded Credits:	5-9 cr

- ***Research Credits***

COURSE NO.	COURSE TITLE	CREDITS
• Neurosci 800	Thesis Research [minimum of 20 cr required]	variable
	TOTAL:	**Minimum of 72**

❖ For a **Ph.D. in Veterinary Science** the Mentor/Thesis Committee may designate substitutes for the Special Topics series, but Deconstructing Science, Topics in Experimental Design, and Research Writing and Seminar are all required.

[1] Each course number (Neurosci 540-543, 564) includes one required core 1-credit topic microcourse, taught annually, and a selection of elective microcourse topics. Students must take the core topic for each course number, and these core topics cannot be repeated for credit.

[2] Students must take two 1-credit elective Topics in Biomedical Experimentation (Neurosci 564) microcourses in addition to the core topic microcourse. Students can register for multiple 1-credit Neurosci 564 microcourses on different topics in a single semester. Neurosci 564 can be repeated for credit as long as the repeated credits are associated with unique microcourse topics.

[3] Substitutions for elective credits: students, in consultation with their thesis committee, can petition for up to 6 credits of substitution for the elective Special Topics credits. These substitutions can be other course credits at WSU, or credits from institutions other than WSU.

[4] In addition to the core topic microcourses, students must take several elective topic microcourses taught under the Special Topics series (Neurosci 540-543), 1 credit each. Elective microcourses are typically taught every other year and specific topics may change as new developments and focuses emerge (please check with Program Director for current list of elective microcourses). Students are required to select a minimum of 2 - 8 credits within this system unless they petition for substitutions (see footnote 3). Students can repeat specific Special Topics course numbers as long as the repeated credits are associated with unique microcourse topics.

[5] A minimum of 15 graded credits from WSU in courses at the 500 level or above are required (WSU Graduate School requirement). Any exceptions (if possible) must be approved by the Graduate Program Curriculum Committee.

[6] Students should have at 2-3 rotation experiences (3 are preferred, 2 are a minimum). One can be in the 1st summer session, and the other two in the first fall semester. Students may have a spring semester rotation if they miss the prior summer session, or they have not finalized selection of a mentor at the end of the fall semester. Students with prior post-baccalaureate experience at an accredited institution (e.g., prior advanced degree or prior enrollment in a graduate program) are permitted to waive the rotation requirement if they have selected a mentor prior to starting the program, and the mentor agrees to accept the student and not require a rotation. No more than 2 credits of rotation can apply to the degree.

SUGGESTED SCHEDULE

MASTER OF SCIENCE DEGREE (NEUROSCIENCE AND VETERINARY SCIENCE❖)

YEAR 1

FALL SEMESTER	TITLE	HOURS
Neurosci 563	Deconstructing Research	3
Neurosci 540/542	Special Topics[1]	2-4
Neurosci 590	Seminar[3]	1
Neurosci 700	Master's Research	2-5
	TOTAL	**10-12**

SPRING SEMESTER	TITLE	HOURS
Neurosci 564	Topics in Biomedical Experimentation	3
Neurosci 541/543	Special Topics[1]	2-4
Neurosci 590	Seminar[3]	1
Neurosci 700	Master's Research	2-5
	TOTAL	**10-12**

YEAR 2

FALL SEMESTER	TITLE	HOURS
Neurosci 540/542	Special Topics[2]	2-4
Neurosci 592	Research Writing	3
Neurosci 590	Seminar[3]	1
Neurosci 700	Master's Research	2-5
	TOTAL	**10-12**

SPRING SEMESTER	TITLE	HOURS
Neurosci 541/543	Special Topics[2]	2-4
Neurosci 590	Seminar[3]	1
Neurosci 700	Master's Research	5-8
	TOTAL	**10-12**

- **Prepare and defend thesis[4]**

NOTES:

[1] In each semester of Year 1 there are 2 required core microcourses (Neurosci 540-543), 1 credit each. Students select up to 2 additional elective micro topics under either course number (Neurosci 540-543) offered that semester.

[2] In each semester of Year 2 students may select up to 4 elective microcourses (core microcourses cannot be repeated for credit).

[3] All M.S. students **must** sign up for Neurosci 590 all semesters.

[4] The student **must** have completed, or be enrolled in, all the required course work and be registered for a minimum of two (2) credits of 700 for the semester or summer session in which the Final Examination is to be taken.

• General note: M.S. degrees require 21 graded credits. Other graded courses can substitute for up to 6 credits of Special Topics.

❖**For Veterinary Science please consult with thesis committee for appropriate elective substitutes.**

SUGGESTED SCHEDULE

DOCTOR OF PHILOSOPHY DEGREE (NEUROSCIENCE OR VETERINARY SCIENCE❖)

YEAR 1

FALL SEMESTER	TITLE	HOURS
Neurosci 563	Deconstructing Research	3
Neurosci 540/542	Special Topics[1]	2-4
Neurosci 531	Lab Rotation	1
Neurosci 590	Seminar	1
Neurosci 800	Doctoral Research	2-4
	TOTAL	**10-12**

SPRING SEMESTER	TITLE	HOURS
Neurosci 564	Topics in Biomedical Experimentation	3
Neurosci 541/543	Special Topics[1]	2-4
Neurosci 590	Seminar	1
Neurosci 800	Doctoral Research	3-5
	TOTAL	**10-12**

Year 2[3]

FALL SEMESTER	TITLE	HOURS
Neurosci 540/542	Special Topics[2]	2-4
Neurosci 592	Research Writing	3
Neurosci 590	Seminar	1
Neurosci 800	Doctoral Research	4-6
	TOTAL	**10-12**

SPRING SEMESTER[4]	TITLE	HOURS
Neurosci 541/543	Special Topics[2]	2-4
Neurosci 590	Seminar	1
Neurosci 800	Doctoral Research	7-10
	TOTAL	**10-12**

Preliminary Exam[5]

YEAR 3[6]

FALL SEMESTER	TITLE	HOURS
Neurosci 590[7]	Seminar	1
Neurosci 800	Doctoral Research	9-11
	TOTAL	**10-12**

SPRING SEMESTER	TITLE	HOURS
Neurosci 800	Doctoral Research	10-12
	TOTAL	**10-12**

Years 4 and beyond

FALL SEMESTER	TITLE	HOURS
Neurosci 800	Doctoral Research	10-12
	TOTAL	**10-12**

SPRING SEMESTER	TITLE	HOURS
Neurosci 800	Doctoral Research	10-12
	TOTAL	**10-12**

Final Exam[8]

NOTES:

[1] In each semester of Year 1 there are 2 required core microcourses (Neurosci 540-543), 1 credit each. Students select up to 2 additional elective micro topics under either course number (Neurosci 540-543) offered that semester.

[2] In each semester of Year 2 students may select up to 4 elective microcourses (core microcourses cannot be repeated for credit).

[3] All students, unless on a training grant, must complete 2 semester of TA assignments (typically in Year 2).

[4] Students are required to take their written/oral qualifying exam in January of the 2nd year.

[5] Students should defend their thesis proposal (**Preliminary Exam**) before the start of the 5th semester. Students who fail to pass the Preliminary Exam by the end of their 3rd year may be dropped from the program.

[6] Additional electives may be taken in Years 3 and beyond (i.e., satisfying elective requirements count does not have to be completed by end of Year 2).

[7] Neuro 590 can be repeated for credit up to a maximum of 7 credits.

[8] The final thesis defense (**Final Exam**) should occur within 3 years of the Preliminary Exam. If not completed within this time window the student must petition the Graduate School for an exception to policy.

❖**For Veterinary Science please consult with thesis committee for appropriate elective substitutes.**

STUDENT PROGRAM REQUIREMENTS

NEUROSCIENCE CURRICULUM

Consult the *Graduate Bulletin* or Graduate School web page (http://gradschool.wsu.edu/) for general requirements for the M.S. or Ph.D. degree. A non-thesis M.S. or Ph.D. program is not available in Neuroscience or Veterinary Science.

REQUIREMENTS FOR THE M.S. DEGREE IN NEUROSCIENCE❖

- ***Graded Credits***

COURSE NO.	COURSE TITLE	CREDITS
REQUIRED CORE COURSES (NO EXCEPTIONS):		
• Neurosci 520	Foundations of Neuroscience	4 cr
• Phil 530	Bioethics	2 cr
• Neurosci 540-543	Special Topics in Neuroscience [2 course x 3 cr]	6 cr
• Vet_Ph 555	General and Cellular Physiology	4 cr
	Total Graded Credits:	16 cr
CORE, BUT POSSIBLE SUBSTITUTIONS OR PETITION EXCEPTIONS[1]:		
• MBios 303* or 513	Biochemistry (or equivalent)	3 cr
• Stat 412* or 512 or Psych 511	Analysis of Variance of Designed Experiments (or equivalent)	3 cr
	Total Other Graded Credits:	6 cr

- ***Non-Graded Credits***

COURSE NO.	COURSE TITLE	CREDITS
• Neurosci 590 (S/F)	Seminar [4 semesters x 1 cr]	4 cr
	Total Non-Graded Credits:	4 cr

- ***Research Credits***

COURSE NO.	COURSE TITLE	CREDITS
• Neurosci 700	Thesis Research [minimum of 4 cr required]	4 cr
	Total Research Credits:	4 cr
	TOTAL (minimum of 30 cr required; 21 cr must be graded):	**30 cr**

❖ For M.S. in Vet Science.. see page 16 NOTES

* M.S. degree may include up to a maximum of six (6) of Undergraduate (300-400 level) graded course work.

[1] M.S. degree requires a minimum of 21 graded credits. If a student petitions out of the Biochemistry or Statistics requirement, they **must** find additional graded electives to fulfill this requirement.

REQUIREMENTS FOR THE Ph.D. DEGREE IN NEUROSCIENCE – EFFECTIVE FALL 2013

- ***Graded Credits***

COURSE NO.	COURSE TITLE	CREDITS
REQUIRED CORE GRADED COURSES:		
• Neurosci 520	Foundations of Neuroscience	4 cr
• Phil 530	Bioethics	2 cr
• Neurosci 540-543	Special Topics in Neuroscience[1] [2 course x 3 cr]	6 cr
• Vet_Ph 555	General and Cellular Physiology	4 cr
	Total Graded Credits:	16 cr
OTHER CORE GRADED COURSES (REQUIRED UNLESS SUBSTITUTED OR WAIVED BY PETITION):		
• Neurosci 404[2] or 430[2]	*Either* Neuroanatomy or Neurophysiology	
• MBios 303 or 513	Biochemistry (or equivalent)	
• Stat 412 or 512 or Stat 507* or 523* or Psych 511 or Nurs 528 (Spokane)	Analysis of Variance of Designed Experiments (or equivalent) *University of Idaho: Experimental Design	
	Total Other Graded Credits:	variable

- ***Non-Graded Credits***

COURSE NO.	COURSE TITLE	CREDITS
REQUIRED NON-GRADED COURSES:		
• Neurosci 531 (S/F)	Laboratory Rotations [2 semesters x 1 cr] (2 rotations are usually required, but exceptions can be granted)	1-3 cr
• Neurosci 590 (S/F)	Seminar [minimum 4 semesters x 1 cr; maximum of 7]	4 cr
• Neurosci 592 (S/F)	Research, Writing, and Seminar	3 cr
	Total Non-Graded Credits:	8-11 cr

- ***Research Credits***

COURSE NO.	COURSE TITLE	CREDITS
• Neurosci 800	Thesis Research [minimum of 20 cr required]	variable
	TOTAL[3]:	**Minimum of 72**

[1] At least 2 Special Topics courses are required; however, more than 2 can be taken (additional courses treated as Core Graded Electives).

[2] Graduate students take either Neuroanatomy (404) or Neurophysiology (430) in their 1st year to prepare for being the course TA in their 2nd year.

[3] NOTE: 44-47 cr are prescribed as illustrated above (Required Core Graded Courses: 16, Core Non-Graded Courses: 8-11, and Research Courses: 20; other credits to total at least 72 are obtained from Other Core Graded Courses, Non-Graded Courses (only additional semesters of Neurosci 590 beyond those listed), or additional Research Credits. NO MORE than 9 cr below the 500-level can count toward the 72 credit minimum.

In addition to fulfilling the required courses, students are allowed to develop an academic program that best relates to their scholarly and research needs by taking elective courses offered by a variety of academic programs at WSU.

Elective courses may be selected from the following list (SEE NEXT PAGE). The student may also petition the Neuroscience Curriculum Committee to substitute additional appropriate courses from other departments. In selecting elective courses, the student and Advisor should consider the student's area of emphasis in the Program and seek the advice of his/her Thesis Committee for a program of study in that area. The student must obtain written approval from his/her research committee and the Neuroscience Curriculum Committee to substitute courses (see "Petition Instructions", page 26). This will ensure that the proper forms are completed and recorded in the student's graduate file.

REQUIREMENTS FOR THE Ph.D. DEGREE IN VETERINARY SCIENCE – EFFECTIVE FALL 2015

- *Graded Credits*

COURSE NO.	COURSE TITLE	CREDITS
REQUIRED CORE GRADED COURSES:		
• Vet_Ph 555	General and Cellular Physiology	4 cr
• Phil 530	Bioethics	2 cr
	TOTAL REQUIRED GRADED CREDITS:	**6 cr**
SUGGESTED CORE GRADED COURSES (MUST PETITION FOR EXCEPTIONS):		
• Stat 412 or 512 or Stat 507* or Psych 511	Analysis of Variance of Designed Experiments (or equivalent) *University of Idaho: Experimental Design	
	TOTAL SUGGESTED GRADED CREDITS:	**variable**
OTHER GRADED ELECTIVES:		
• Variable	Selected in consultation with Thesis Committee	variable
❖ Total of GRADED CREDITS must include at least 15 cr of 500-level classes ❖ Up to 9 cr at 300- or 400-level classes may count toward FINAL TOTAL CREDITS.	*TOTAL GRADED CREDITS:*	**≥ 15 cr**

- *Non-Graded Credits*

COURSE NO.	COURSE TITLE	CREDITS
NON-GRADED COURSES:		
• Neurosci 590 or similar (e.g.: AS 500)	Seminar [minimum 4 semesters x 1 cr, maximum of 7]	4 cr
• Neurosci 592 (S/F)	Research, Writing, and Seminar	3 cr
	TOTAL NON-GRADED CREDITS:	**≥ 7 cr**

- *Research Credits*

COURSE NO.	COURSE TITLE	CREDITS
• Vet_Ph 800	Thesis Research [minimum of 20 cr required]	variable
	TOTAL RESEARCH CREDITS:	**≥ 20 cr**

- *TOTAL CREDITS*

TOTAL CREDITS:	MINIMUM OF **72 cr**

SUGGESTED SCHEDULE

MASTER OF SCIENCE DEGREE

YEAR 1

FALL SEMESTER	TITLE	HOURS
MBios 303 or 513	Biochemistry	4/3
Vet_Ph 555	General & Cell Physiology	4
Neurosci 520	Foundations of Neuroscience	4
Neurosci 590	Seminar	1
Neurosci 700	Master's Research	2/3
	TOTAL	15

SPRING SEMESTER	TITLE	HOURS
Stat 412 or 512	Analysis of Variance	3
Neurosci 541/542	Special Topics	3
Neurosci 590	Seminar	1
Neurosci 700	Master's Research	8
	TOTAL	15

YEAR 2

FALL SEMESTER	TITLE	HOURS
Phil 530	Bioethics	2
Neurosci 540/543	Special Topics	3
Neurosci 590	Seminar	1
Neurosci 700	Master's Research	9
	TOTAL	15

SPRING SEMESTER*	TITLE	HOURS
Neurosci 590	Seminar	1
Neurosci 700	Master's Research	14
	TOTAL	15

NOTE:
- **Prepare and defend thesis**

NOTE:
- If Vet Sci M.S. candidate, student and Mentor will write the student's Program of Study. Student needs 21 graded core credits and 2 Neurosci 540 series courses.
- All M.S. students **must** sign up for Neurosci 590 all semesters.
- The student **must** have completed, or be enrolled in, all the required course work and be registered for a minimum of two (2) credits of 700 for the semester or summer session in which the Final Examination is to be taken.

SUGGESTED SCHEDULE

DOCTOR OF PHILOSOPHY DEGREE

YEAR 1

FALL SEMESTER	TITLE	HOURS
MBios 303 or 513	Biochemistry	4/3
Vet_Ph 555	General & Cell Physiology	4
Neurosci 531	Lab Rotation	1
Neurosci 520	Foundations of Neuroscience	4
Neurosci 590	Seminar	1
Neurosci 800	Doctoral Research	1/2
	TOTAL	15

SPRING SEMESTER	TITLE	HOURS
Neurosci 531	Lab Rotation	1
Neurosci 541/542	Special Topics	3
Neurosci 404 or 430	Anatomy or Physiology	4
Neurosci 590	Seminar	1
Neurosci 800	Doctoral Research	6
	TOTAL	15

Year 2*

FALL SEMESTER	TITLE	HOURS
Phil 530	Bioethics	2
Neurosci 540/543	Special Topics	3
Neurosci 590	Seminar	1
Neurosci 800	Doctoral Research	9
	TOTAL	15

SPRING SEMESTER	TITLE	HOURS
Stat 412 or 512	Analysis of Variance	3
Neurosci 592	Research, Writing & Seminar	3
Neurosci 800	Doctoral Research	9
	TOTAL	15

* TA a course each semester

YEAR 3

FALL SEMESTER	TITLE	HOURS
Neurosci 590	Seminar	1
Neurosci 800	Doctoral Research	14
	TOTAL	15

NOTE:
- **Complete Oral Preliminary Examination by** end of 5th semester

SPRING SEMESTER*	TITLE	HOURS
Neurosci 590	Seminar	1
Neurosci 800	Doctoral Research	14
	TOTAL	15

Year 4

FALL SEMESTER	TITLE	HOURS
Neurosci 590	Seminar	1
Neurosci 800	Doctoral Research	14
	TOTAL	15

SPRING SEMESTER*	TITLE	HOURS
Neurosci 590	Seminar	1
Neurosci 800	Doctoral Research	14
	TOTAL	15

NOTE:
- **Prepare for Final Defense (complete within three (3) years of Preliminary Examination)**

NOTE:
- Complete Written Qualifying Examination in June.