**Sample syllabus for the Special Topics series in Neuroscience**

* **Neuro 540: Special Topics in Integrative Neuroscience** (to be taught in fall)
* **Neuro 541: Special Topics in Cellular and Molecular Neuroscience** (to be taught in fall)
* **Neuro 542: Special Topics in Interdisciplinary Neuroscience** (to be taught in spring)
* **Neuro 543: Special Topics in Behavioral/Clinical Neuroscience** (to be taught in spring)

**Course Faculty:**

Faculty email phone office

TBD (faculty rotate depending on topic) [xxxxxxxx@vetmed.wsu.edu](mailto:xxxxxxxx@vetmed.wsu.edu) 335-XXXX XXXX VBRB

**Course Descriptions:** The Neuro 54X series (540, 541, 542, and 543; variable credit (1-3)) are the advanced literature review courses for the gradu­ate neuroscience program. They are focused on current concepts and controversies in the neuroscience literature with focused discussions/critiques on readings from the primary literature. Because the materials in the courses focus on the latest work in the field, the specific materials under discussion change every time one of the specific courses is taught. Thus these courses may be repeated for credit. Completing at least two special topics courses (6 credits) is a requirement of the PhD program.

**Course Structure:** Each course is divided into 3 blocks and students are allowed to take 1, 2, or all 3 blocks (students will be notified if blocks are linked and should be taken sequentially, but in most cases blocks are independent and students may independently register for anyone of the blocks). Each block lasts for 5 weeks (3 h/wk) and ends with a com­pleted set of graded activities. Thus a student will receive a grade for each block in the course, and the final course grade will be the average of the grades for the blocks that the student participates in.

**Learning Objectives:** These coursesrepresent the core courses associated with the neuroscience graduate degree. The primary objectives of the courses are to provide essential background information that enables the student to be­come familiar with and comfortable evaluating a variety of different topics and approaches in neuro­science re­search and contemporary thinking within neuroscience. The selection of topics is not meant to be comprehen­sive; rather they are selective topics that are explored in some detail. Within topics, not only is there didactic materials that provide a theoretical frame of reference, but also discussions of technical approaches, some problem solving exercises, and review/dis­cus­sion of work from the primary literature. The goal is to help the student learn how theoretical materials are applied to specific research problems and issues. By the end of each section of the course students should:

1. Be able to critically evaluate primary literature regar­ding the topic.
2. Understand the technical approaches used in investigating the topic.
3. Apply their knowledge such that they can interpret results, identify weaknesses, and suggest new avenues of investigation.
4. Finally, through discussion sessions and presentations, students should improve their ability to be conversant in describing both theoretical concepts and technical details in neuroscience research.

**Reading Materials:** As assigned from the primary literature (access through WSU Library). A reading list will be provided by the course instructors.

**Neuro 540/542 Course Meetings (Fall/Spring) Neuro 541/543 Course Meetings (Fall/Spring)**

Mondays 8:10 – 9:00 am VBRB 201 Mondays 10:10 – 11:00 am VBRB 201

Wednesdays 8:10 – 9:00 am VBRB 201 Wednesdays 10:10 – 1100 am VBRB 201

Fridays 8:10 – 9:00 am VBRB 201 Fridays 10:10 – 11:00 am VBRB 201

**Course Grade**

**Graded activities:** The course is divided into a series of blocks which end as indicated in the schedule by **Exams**. The mix of lectures/ dis­cus­sions is set by the individual topics. Lectures provide necessary backgrounds whereas discussions are review of readings assigned from the primary literature. Graded activities are set within each block and will consist of a mixture of:

* Class participation (25% of grade) – does the student contribute to discussions of assigned papers
* Homework assignments (brief essays or problem sets, 25% of grade) – these may be numeric problems associated with sample data analysis or thought problems depending on the specific nature of the topic
* Assigned presentation (25% of grade) – students are assigned to give a 10 min research talk and answer questions from the class
* Final block exam (a take home exam, 25% of grade) – typically this would either be a broad question regarding the topic or could be interpretation of results or propose a new direction to investigate. This exam is due the following week (thus in the 3rd block does not violate Dead Week policies).

**Grading Scale:**

A: >= 90% A-: 85 – 89.9% B+: 80 – 84.9% B: 75 – 79.9% B-: 70 – 74.9

C+: 65 – 69.9% C: 60 – 64.9% C-: 55 – 59.9% D: 50 – 54.9% F: <50%

**Attendance Policy:** If a student misses a literature discussion session they will be asked to write a review of the papers that were discussed at the session. Students cannot miss their student presentations except for unanticipated emergencies. Anticipation of missing such a class session should be discussed in advance with the instructor to make alternative plans. An unexcused absence will result in no credit.

**Late assignments:**  Late assignments will be discounted 10% of their value for every day late.

**Cheating:** Academic integrity is the cornerstone of the university. You assume full responsibility for the content and integrity of the academic work you submit. You may collaborate with classmates on assignments, with the instructor's permission. However the guiding principle of academic integrity shall be that your submitted work, examinations, reports, and projects must be your own work. Any student who violates the University's standard of conduct relating to academic integrity will be referred to the Office of Student Conduct and may fail the assignment or the course. You can learn more about Academic Integrity on your campus using the URL listed in the Academic Regulations section or to [http://conduct.wsu.edu/academic-integrity-policies-and-resources](http://conduct.wsu.edu/academic-integrity-policies-and-resources/). Please use these resources to ensure that you don’t inadvertently violate WSU's standard of conduct. In this course, cheating during an exam or quiz is defined as utilizing information from any source not authorized by the instruc­tor or offering unauthorized information to any­­one during an exam or quiz. For written assignments, plagiarizing other sour­ces, published or un­pub­lished, will be considered cheating.

**Students with Disabilities**:   We are committed to providing assistance to help you be successful in this course.  Reasonable accommodations are available for students with a documented disability. If you have a disability and need accommodations to fully participate in this class, please either visit or call the Access Center (Washington Building 217; 509-335-3417) to schedule an appointment with an Access Advisor. All accommo­da­tions MUST be approved through the Access Center.

**Campus Safety:** Washington State University is committed to enhancing the safety of the students, faculty, staff, and visitors. It is highly recommended that you review the Campus Safety Plan (<http://safetyplan.wsu.edu/>) and visit the Office of Emergency Management web site (<http://oem.wsu.edu/>) for a comprehensive listing of university policies, procedures, statistics, and information related to campus safety, emergency management, and the health and welfare of the campus community.

**If you have any concerns not addressed in this syllabus, please contact the course director.** Our goal is to make the course as engaging and intellectually satisfying as it can be. We are here to help you learn. By all means ask questions, get clarifications on points you don’t fully understand, engage in discussions, and challenge our inter­preta­tions. We want to be challenged and we enjoy the discussion, otherwise we wouldn’t be here. But it is impor­tant that *this is done in a respectful and polite manner (and this goes both ways: student to faculty and faculty to student)*. Let us know if we are not meeting our standards.

**Sample Schedules** (each 5 week block is an example of a block that may be offered)

**Neuro 541 Special Topics in Cellular/Molecular Neuroscience (block on Membrane Biophysics):**

**Week 1 Week 2**

Mon: Electricity/Ohm’s Law Mon: Passive Membrane Properties

Wed: Resting Membrane Potential Wed: Action potentials

Fri: Electrophysiological Techniques Fri: Literature Discussion

**Week 3**  **Week 4**

Mon: Ion Channels: Voltage-dependent Mon: Synaptic actions: presynaptic

Wed: Ion channels: Ligand-gated Wed: Synaptic actions: postsynaptic

Fri: Literature Discussion Fri: Literature Discussion

**Week 5**

Mon: Synaptic Integration

Wed: Student Presentations I

Fri: Student Presentations II; **Final Block Exam** distributed

**Neuro 542 Special Topics in Interdisciplinary Neuroscience (block on Sensory/Motor Systems):**

**Week 1 Week 2**

Mon: Sensory Systems Overview Mon: Sensory Systems: Auditory/Vestibular

Wed: Sensory Systems: Vision Wed: Sensory Systems: Somatosensory

Fri: Literature Discussion Fri: Literature Discussion

**Week 3**  **Week 4**

Mon: Sensory Systems: Chemical Senses Taste/Smell Mon: Motor Systems: Motor Unit/Spinal Circuits

Wed: Sensory Systems: Pain Wed: Motor Systems: Central Processing - cerebellum

Fri: Literature Discussion Fri: Literature Discussion

**Week 5**

Mon: Motor Systems: Central Processing - cortex

Wed: Student Presentations I

Fri: Student Presentations II; **Final Block Exam** distributed

**Neuro 543 Special Topics in Behavioral/Clinical Neuroscience (block on Addiction):**

**Week 1 Week 2**

Mon: Addiction: Definitions and Theory Mon: Literature Discussion

Wed: Addiction: Neuro-circuits that underlie addiction Wed: Stimulants

Fri: Animal Measurements of addictive behavior Fri: Literature Discussion

**Week 3**  **Week 4**

Mon: Opiates Mon: Literature Discussion

Wed: Literature Discussion Wed: Hallucinogens and other compounds

Fri: Alcohol Fri: Literature Discussion

**Week 5**

Mon: Addiction: Behavior or Disease

Wed: Student Presentations I

Fri: Student Presentations II; **Final Block Exam** distributed

**Student Learning Objectives and Assessment:**

1. Student Learning Objective: Critically evaluate primary literature regar­ding the topic.
   1. Topics to address this outcome: 1) reading and in class discussions of primary literature; 2) student presentations on contemporary topics (see schedules).
   2. Outcome will be assessed by: 1) in class discussion of primary literature; 2) intermediate homework essay when the essay questions asks about a reading; 3) student presentation when students needs to rely on primary literature to fully explain their presentation; and 4) final block exam when the question asks the student to comment on a study that was discussed.
2. Student Learning Objective: Understand the technical approaches used in investigating the topic.
   1. Topics to address this outcome: 1) reading and discussions of primary literature; 2) lectures on technical approaches in the field; and 3) student presentations on contemporary topics (see schedules).
   2. Outcome will be assessed by: 1) the discussion of primary literature; 2) intermediate homework essay when the homework requires the student to analyze data; 3) student presentation when students needs to rely on application of a technique to address a problem; and 4) final block exam when the question asks the student to evaluate the technical approaches used in a study that was reviewed.
3. Student Learning Objective: Apply their knowledge such that the student can interpret results, identify weaknesses, and suggest new avenues of investigation.
   1. Topics to address this outcome: 1) reading and discussions of primary literature; and 2) student presentations on contemporary topics (see schedules).
   2. Outcome will be assessed by: 1) the discussion of primary literature; 2) intermediate homework essay when the homework requires the student to analyze data; 3) student presentation when students needs to rely on application of a technique to address a problem; and 4) final block exam when the question asks the student to evaluate the technical approaches used in a study that was reviewed.
4. Student Learning Objective: Improve their ability to be conversant in describing both theoretical concepts and technical details in neuroscience research.
   1. Topics to address this outcome: 1) reading and discussions of primary literature; 2) student presentations on contemporary topics (see schedules).
   2. Outcome will be assessed by: 1) the discussion of primary literature; 2) intermediate homework essay when the homework requires the student to analyze data; 3) student presentation when students needs to rely on application of a technique to address a problem; and 4) final block exam when the question asks the student to evaluate the significance of a study that was reviewed.