Eastern Illinois University
New Course Proposal
BIO 5435, Advanced Neurobiology

CGS Agenda Item: 17-101
Effective Spring 2018

Banner/Catalog Information (Coversheet)

1. **X New Course or _____Revision of Existing Course**
2. **Course prefix and number:** BIO 5435
3. **Short title:** Advanced Neurobiology
4. **Long title:** Advanced Neurobiology
5. **Hours per week:** 3 Class 0 Lab 3 Credit
6. **Terms:** Fall X Spring Summer ___ On demand
7. **Initial term**: ___ Fall X Spring ___ Summer Year: 2018
8. **Catalog course description:** This course will cover advanced topics on molecular, cellular and physiological aspects of brain structure and function during health and diseases.
9. **Course attributes:**

   General education component: N/A

   ___ Cultural diversity ___ Honors ___ Writing centered ___ Writing intensive ___Writing active
10. **Instructional delivery**
    Type of Course:

    X Lecture ___ Lab ___ Lecture/lab combined ___ Independent study/research

    ___ Internship ___ Performance __ Practicum/clinical ___ Other, specify: _____

    Mode(s) of Delivery:

    X Face to Face ___ Online ___ Study Abroad

    ___ Hybrid, specify approximate amount of on-line and face-to-face instruction_____
11. **Course(s) to be deleted from the catalog once this course is approved.** None
12. **Equivalent course(s):** BIO 4835 (Advanced Neurobiology)

    a. Are students allowed to take equivalent course(s) for credit? ___ Yes X No
13. **Prerequisite(s):** BIO 4834 (Neurobiology) or BIO 5434 (Neurobiology)

    a. Can prerequisite be taken concurrently? ___ Yes X No

    b. Minimum grade required for the prerequisite course(s)? C

    c. Use Banner coding to enforce prerequisite course(s)? ___ Yes X No

d. Who may waive prerequisite(s)?

___ No one X Chair X Instructor ___ Advisor ___ Other (specify)

14. Co-requisite(s): None

15. Enrollment restrictions

a. Degrees, colleges, majors, levels, classes which <u>may</u> take the course: All

b. Degrees, colleges, majors, levels, classes which may <u>not</u> take the course: May not have previously taken BIO5460H-001 (CRN#33735) or BIO3960A-003 (CRN#32704). The proposed course is currently being offered as a special topic course for graduate (BIO5460H-001) or undergraduate (BIO3960A-003) credit.

16. Repeat status: X May not be repeated ___ May be repeated once with credit

17. Enter the limit, if any, on hours which may be applied to a major or minor: ___

18. Grading methods: X Standard ___ CR/NC __ Audit ___ ABC/NC

19. Special grading provisions: N/A

___ Grade for course will <u>not</u> count in a student's grade point average.
___ Grade for course will <u>not</u> count in hours toward graduation.
___ Grade for course will be removed from GPA if student already has credit for or is registered in:
___ Credit hours for course will be removed from student's hours toward graduation if student already has credit for or is registered in: _____

20. Additional costs to students:
Supplemental Materials or Software_____

Course Fee X No ___Yes, Explain if yes_____

21. Community college transfer:

___ A community college course may be judged equivalent.

X A community college may <u>not</u> be judged equivalent.

Note: Upper division credit (3000+) will <u>not</u> be granted for a community college course.

<u>Rationale, Justifications, and Assurances (Part I)</u>

1. ___Course is required for the major(s) of _____

___Course is required for the minor(s) of _____

___Course is required for the certificate program(s) of _____

X Graduate students in Biological Sciences are required to take a minimum of 22 hours of courses numbered 5000 and above. Due to faculty attrition, we offer fewer courses at 5000 and above. Concurrently listing the existing BIO 4835 (Advanced Neurobiology) as BIO 5435 (Advanced Neurobiology) would allow graduate students to fulfill the required minimum of 22 hours of 5000-level courses.

Students in BIO 5435 will be held to higher performance standards in all facets of the course. Additional requirements for students in BIO 5435 will include: (1) Homework will contain higher level analytical questions requiring primary literature review. (2) Term paper assignment requires 12 pages of substantive analysis, which is greater than the 6 pages required for students in BIO 4835. (3) Term paper will also be held to a higher standard for their research analysis, literature review, writing style and maturity of thought. (4) Students in BIO 5435 will be assigned to lead in-class discussions. (5) BIO 5435 students will work with the instructor to develop a grant proposal on an open-ended problem in Neurobiology.

2. **Rationale for proposal**: In Advanced Neurobiology course, students will explore more deeply into complex topics in neurobiology including movement and its central control, nervous system plasticity, and neurobiology of complex brain functions. The main goal of this course is to prepare students for graduate studies in neurobiology or related fields, professional studies in medical sciences, and careers in the biotechnology, pharmaceuticals, and health care industries.
3. **Justifications for (answer N/A if not applicable)**

   Similarity to other courses: BIO 4835 (Advanced Neurobiology)

   Prerequisites: BIO 4834/BIO 5434 (Neurobiology) so that students understand the fundamentals of neurobiology.

   Co-requisites: None

   Enrollment restrictions: May not have previously taken BIO5460H-001 (CRN#33735) or BIO3960A-003 (CRN#32704). The proposed course is currently being offered as a special topic course for graduate (BIO5460H-001) or undergraduate (BIO3960A-003) credit.

   Writing active, intensive, centered: N/A
4. **General education assurances (answer N/A if not applicable)**

   General education component: N/A

   Curriculum: N/A

   Instruction: N/A

   Assessment: N/A
5. **Online/Hybrid delivery justification & assurances (answer N/A if not applicable)**

   Online or hybrid delivery justification: N/A

   Instruction: N/A

   Integrity: N/A

   Interaction: N/A

Model Syllabus (Part II)

1. **Course Number, Title, Credit Hours**
   BIO 5435, Advanced Neurobiology, 3-0-3

2. **Catalog Description**
   This course will cover advanced topics on molecular, cellular and physiological aspects of brain structure and function during health and diseases.

3. **Learning Objectives (Goals)**
   a. Integrate anatomical structure and physiological function of the nervous system (CT 1-5, GLG 1-2).
   b. Apply knowledge of neuroanatomy and neurophysiology to interpret results, formulate hypotheses, predict the results and discuss and summarize the key neurological findings (CT 6, WR 1-7, RC 1-4, GLG 2-4).
   c. Apply acquired knowledge on the neuroanatomy and neurophysiology in health and diseases (CT 1-6, WR 1-7, QR 1-6, GLG 2-4).

4. **Course Materials**

   Textbook: Purves, D., *et al.*, 2012. Neuroscience, 5th edition, Sinauer Publishers.

5. **Weekly Outline of Content**

   Week 1: Lower motor neuron circuits and motor control.

   Week 2: Upper motor neuron control of the brainstem and spinal cord.

   Week 3: Modulation of movement by the basal ganglia.

   Week 4: Modulation of movement by the cerebellum.

   Week 5: Eye movements and sensory motor integration.

   Week 6: The visceral motor system.

   Week 7: Early brain development.

   Week 8: Construction of neural circuits.

   Week 9: Modification of neural circuits as a result of experience.

   Week 10: Repair and regeneration in the nervous system.

   Week 11: Association cortex.

   Week 12: Neurobiology of learning and memory.

   Week 13: Neurobiological regulation of Sleep and wakefulness.

   Week 14: Neurological basis of emotions.

   Week 15: Neurobiology of sex and sexuality.

   Week 16: Final Exam

6. Evaluation

Tests	200 points
Homework	50
In Class Discussions	50
Term Papers	100 (BIO 4835), 50 (BIO 5435)
Grant Proposal	None (BIO 4835), 50 (BIO 5435)
Final Exam	100
Total	**500**

7. Grading Scale

90% or more = A; 80-89% = B; 70-79% = C, 60-69% = D; <60% = F

8. Correlation of learning objectives to assignments and evaluation

Learning Objectives	**Tests, homework, class discussion (60%)**	**Final Exam (20%)**	**Term Papers and Grant Proposal (20%)**
Integrate anatomical structure and physiological function of the nervous system (CT 1-5, GLG 1-2).	X	X	X
Apply knowledge of neuroanatomy and neurophysiology to interpret results, formulate hypotheses, predict the results and discuss and summarize the key neurological findings (CT 6, WR 1-7, RC 1-4, GLG 2-4).	X	X	X
Apply acquired knowledge on the neuroanatomy and neurophysiology in health and diseases (CT 1-6, WR 1-7, QR 1-6, GLG 2-4).	X	X	X

Date approved by the department or school:

Date approved by the college curriculum committee:

Date approved by the Honors Council *(if this is an honors course):*

Date approved by CAA:

Date approved by CGS: