Eastern Illinois University
New Course Proposal
BIO 5434, Neurobiology

CGS Agenda Item: 17-100
Effective Fall 2018

Banner/Catalog Information (Coversheet)

1. **X New Course or _____Revision of Existing Course**
2. **Course prefix and number:** BIO 5434
3. **Short title:** Neurobiology
4. **Long title:** Neurobiology
5. **Hours per week:** 3 Class 0 Lab 3 Credit
6. **Terms:** X Fall Spring Summer ___ On demand
7. **Initial term**: X Fall Spring ___ Summer Year: 2018
8. **Catalog course description:** A study of the structure and function of neurons, the principal cells of the nervous system, at the molecular and cellular level. This course will emphasize neurobiological aspects of learning, memory, and behavior.
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 4834 (Neurobiology)

    a. Are students allowed to take equivalent course(s) for credit? ___ Yes X No
13. **Prerequisite(s):** BIO 3120 (Molecular and Cell Biology) or permission of the instructor.
    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: None

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, even if the content is judged to be equivalent.

<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 4834 (Neurobiology) as BIO 5434 (Neurobiology) would allow graduate students to fulfill the required minimum of 22 hours of 5000-level courses.

Students in BIO 5434 will be held to higher performance standards in all facets of the course. Additional requirements for students in BIO 5434 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 4834. (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 5434 will be assigned to lead in-class discussions. (5) BIO 5434 students will work with the instructor to develop a grant proposal on an open-ended problem in Neurobiology.

Rationale for proposal: In this course students will learn the structure and function of neurons, the principal cells of the nervous system, at the molecular and cellular level. This course will emphasize neurobiological aspects of learning, memory, and behavior. 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.

2. **Justifications for (answer N/A if not applicable)**

   Similarity to other courses: BIO 4834 (Neurobiology)

   Prerequisites: BIO 3100

   Co-requisites: None

   Enrollment restrictions: None

   Writing active, intensive, centered: N/A

3. **General education assurances (answer N/A if not applicable)**

   General education component: N/A

   Curriculum: N/A

   Instruction: N/A

   Assessment: N/A

4. **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 5434, Neurobiology, 3-0-3

2. **Catalog Description**
   This course will cover the structure and function of neurons, the principal cells of the nervous system, at the molecular and cellular level. It will emphasize neurobiological aspects of learning, memory, and behavior.

3. **Learning Objectives (Goals)**
   a. Integrate anatomical structure and physiological function of neurons (CT 1-5, GLG 1-2).
   b. Apply knowledge of neuronal morphology, physiology, and molecular cellular biology to interpret results, formulate hypotheses, predict the results and discuss and summarize the key neurobiological findings (CT 6, WR 1-7, RC 1-4, GLG 2-4).
   c. Apply acquired knowledge on molecular and cellular neurobiology 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: Overview of the nervous system

   Week 2: Cellular and molecular biology of neural signaling

   Week 3: Physiology of synaptic transmission

   Week 4: Molecular signaling within neurons

   Week 5: Synaptic plasticity

   Week 6: Ion channels and transporters

   Week 7: Neurobiology of pain processing

   Week 8: Neural circuit and molecular pathways involved in vision

   Week 9: Central visual pathways

   Week 10: Neurobiology of auditory system

   Week 11: Neurobiology of the vestibular system

   Week 12: Taste processing

   Week 13: Trigeminal chemosensory system

   Week 14: Neurobiology of olfactory system

   Week 15: Proprioception.

   Week 16: Final Exam

6. Evaluation

Tests	200 points
Homework	50
In Class Discussions	50
Term Papers	100 (BIO 4834), 50 (BIO 5434)
Grant Proposal	None (BIO 4834), 50 (BIO 5434)
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 neurons (CT 1-5, GLG 1-2)	X	X	X
Apply knowledge of neuronal morphology, physiology, and molecular cellular biology to interpret results, formulate hypotheses, predict the results and discuss and summarize the key neurobiological findings (CT 6, WR 1-7, RC 1-4, GLG 2-4)	X	X	X
Apply acquired knowledge on molecular and cellular neurobiology 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: