ESF Course Proposal
Committee on Curriculum - ESF Faculty Governance
Office of Instruction & Graduate Studies

This course proposal form should be completed when introducing a new course or a revision of an existing course. The proposal will be reviewed by the Committee on Curriculum, or, in the case of minor revisions, will be approved administratively by the Associate Provost for Instruction.

This Course Proposal must be completed according to the guidelines provided in Course Proposal Form – Instructions and Guidance. Please see the last page of Course Proposal Form – Instructions and Guidance, for instructions on how this Course Proposal should be submitted to the Committee on Curriculum for review.

Date: 02/26/2020

1. Course Information:

1.1 Course Prefix and Number: EFB 462
Course Title: Animal Physiology; Environmental and Ecological
(If a new or renumbered course, please check with the Registrar regarding the use or reuse of the course number)

1.2 □ This is a New Course.
OR
☒ This is a Major Course Revision
OR
□ This is a Minor Course Revision

If this is a Course Revision, please see Course Proposal Form – Instructions and Guidance to determine if your revision is major or minor. Indicate below the reason(s) for the revision.

(Please check all that apply)

□ Course Number/Division ☒ Learning Outcomes ☒ Institutional Resources
□ Title ☒ Concepts, Content ☒ Semester Offered
☒ Credit hours ☒ Catalog Description □ Course Inactivation
□ Pre- or Co-requisite(s) ☒ Instructional Methods □ Course Reactivation
☒ Format □ General Education

1.3 General Education knowledge and skills area (if applicable): If none, check here ☒

□ American History □ Humanities □ Other World Civilizations
□ The Arts □ Mathematics □ Social Sciences
□ Basic Communication □ Natural Sciences □ Western Civilization
2. Proposer Need Statement:

2.1 Describe why this course (or course revision) is needed to meet current or proposed goals and outcomes of the program or College, and, if a revision, provide an explanation of and justification for the revision. This revision was motivated by the need to add a laboratory component to EFB 462 to improve the scientific literacy of the students at ESF.

2.2 List the pre-requisite or co-requisite courses (taught within the home department or taught by another department) and explain their relationship to the proposed course. Pre-requisite: Two semesters of Introductory Biology or equivalent.

2.3 Explain the impact of this course in meeting the goals and outcomes of other Departments/programs (if any). This course fulfills the Anatomy & Physiology requirement for Forest Health; the Prehealth or PreVet requirement for Biotechnology; and the Structure and Function requirement in Environmental Biology, Wildlife Science, and Aquatic & Fisheries Science majors. It is on the list of essential courses for Pre-Health Professions. It is an upper division elective for the Biochemistry major.

2.4 If the proposed course is designed to fulfill SUNY General Education Requirements, the Associate Provost for Instruction must review this proposal to ensure that General Education Requirements will be met for the specified knowledge area (See Instructions and Guidance). Please provide an explanation of how this course fulfills SUNY General Education Requirements.

N/A

2.5 What are the staffing requirements (instructor, TA, Lab tech, etc.) for this course? If a new course, are there new staffing needs or are there adequate staff members already in place? If a revised course, are there additional staffing needs? 1.5 TAs. One TA to help prepare and to teach the two laboratory sections and a 0.5 TA to assist with grading for and to help manage small group activities during the lecture. All TAs will be expected to attend lecture; hold office hours. The TA for the lab will be expected to lead prepare for weekly labs, lead lab activities, and grade assignments associated with the lab. The TA for the lecture will be expected to grade homework, exams, and other assignments, and to help facilitate small group work during the class meetings.

2.6 What Department (or extra-Department) resources are or will be made available to support the course or course revision? David Newman, Interim Provost, has provided $25,000 to purchase equipment and materials for the teaching laboratory, and I have secured $7,438.38 in AER funds to purchase required non-major equipment. Some items required for the lab (e.g., pipettes) can be borrow from other laboratory courses already taught in EFB and EFB has also pledged funds to purchase additional materials.

2.7 Anticipated Enrollment (enter where applicable)

<table>
<thead>
<tr>
<th>Fall Semester:</th>
<th>Spring Semester:</th>
<th>40</th>
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<tbody>
<tr>
<td>Summer Semester:</td>
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Rev 05/09/2016
2.8 Anticipated frequency of class meetings. 3 hrs of lecture and 3 hours of lab. Lecture will meet twice a week for 80 minutes each meeting. Students will be required to attend one 3-hour lab section per week.
3. DETAILED COURSE DESCRIPTION

3.1 COURSE IDENTIFICATION AND FORMAT:

3.1.1 Course Prefix and Number: EFB 462
3.1.2 Course Name: Animal Physiology: Environmental and Ecological
3.1.3 Credit Hours: 4
3.1.4 Semester (check all that apply): Fall ☐ Spring ☒ Summer ☐
3.1.5 Format (check as appropriate): Lecture ☒ Online ☐ Lab ☒ Field ☐ Other ☐ (explain)
3.1.6 Contact hours per week: 6
3.1.7 Prerequisite(s) – if none, please enter "None" (Be specific, as Upper Division courses and Graduate courses will likely have some pre-requisite knowledge) EFB 101/102 and EFB 103/104 or equivalent

3.2 SCOPE:

3.2.1 Level of Instruction (check one, or two if a shared resource course):
   Lower Division ☐ Upper Division ☒
   Beginning Graduate ☐ Advanced Graduate ☐

3.2.2 Relation to curriculum or to other ESF or Syracuse University courses:
   a. Is this a required course? No ☐ Yes ☒.
      If Yes, please list the program(s) for which it is a requirement: Pre-health professionals at ESF
   b. Is this an elective course within your department? No ☐ Yes ☒.
   c. Is enrollment in this course restricted? No ☐ Yes ☒.
      If Yes, please explain: Enrollment is limited by availability of instructional laboratory space.
   d. Are other ESF or SU courses similar or identical to this course? No ☐ Yes ☒.
      If Yes, please identify the courses: There is no identical course at ESF or SU. SU offers General Physiology (Bio 355) and Anatomy & Physiology I & II (Bio 216, 217), Anatomy and Physiology I & II for Biology Majors (Bio 316, 317), Physiology Laboratory (Bio 455), and Quantitative Physiology (BEN 364). All of these courses, except for General Physiology, are focused on human physiology. General Physiology covers some aspects of general physiology for plants and animals, but does not focus on how physiology helps animals' deal with environmental challenges, the focus of EFB 462. All of the courses listed here have an SU course as a prerequisite.
   e. Is this course a shared resource offering (i.e. is there a graduate or undergraduate concurrent offering)? No ☒ Yes ☐.
      If Yes, what is the course number of the concurrent offering?

3.3 STUDENT LEARNING OUTCOMES:

Identify the student learning outcomes associated with this course.

By the end of this course, students should be able to:
1) Explain the animal physiology of energy balance, water balance, respiration and circulation, communication within the body, and immune defenses within a comparative framework with a focus on mammalian physiology and select examples from other animal taxa.

2) Explain the universal principles in animal physiology and apply them to physiological systems.

3) Explain how selected organ systems (see number 1) contribute to the maintenance of homeostasis and help an animal deal with challenges in their environment.

3) Collect and interpret physiological data and use these data to test predictions developed from knowledge of physiology.

4) Apply knowledge of animal physiology to develop and justify hypotheses and predictions about how animals respond physiologically to internal and external perturbations, including changes in their environment and different stages of their life cycle.

5) Make and interpret figures of physiological data and use these figures to test predictions and to justify conclusions about physiological responses.

3.4 MAJOR CONCEPTS, PROCESSES or TOOLS:

Identify the course content and themes (e.g. Table of Contents) consistent with the learning domains and outcomes.

Systems and related concepts: Circulatory system, respiratory system, excretory system (renal system in vertebrate species), immune system, endocrine system, neural system, metabolic rates, metabolism, digestive system, thermogenesis, thermal ecology, energy balance, water and ion balance, communication within the body, principle of allocation, differential acquisition.

Physiological principles and related concepts: Physiology is the product of evolution; physiology conforms to chemical and physical laws; physiological systems are integrated; Regulation and homeostasis, tolerance and avoidance strategies, positive and negative feedback loops, scaling, allometry, the role of temperature, control systems, the role of body size.

Lab: precision, accuracy, summary statistics, sample size, techniques for measuring physiology, visual presentation of data, interpreting figures and data, connecting figures and text to make an argument, writing a prediction, testing a prediction, linking physiological concepts to experimental tests, evidence-based decision making.

3.5 INSTRUCTIONAL METHODS:

Identify the methods used to meet the course outcomes, as well as the principal instructional methods. This course will use lecture, discussion, and laboratory activities to meet the course outcomes. Lecture and discussion will be about course topics, case studies, scientific papers, recent scientific advances, and content from the course textbook. Laboratory exercises will focus on teaching techniques for measuring physiology, hypothesis development, science communication using figures, and evidence-based decision making. The textbook will be Moyer and Schulte, Principles of Animal Physiology, Pearson, or equivalent. Assessment will include 2-3 semester exams, lab worksheets, and reports, and may include individual or group participation during class (including lab), or an online discussion board, quizzes, or group projects.
3.6 CATALOG DESCRIPTION

Provide the course description using the precise format to be included in the ESF catalog (i.e. course number and title; format; brief description; semester(s) offered; and pre-/co-requisites). Please do not exceed 1000 characters.

Three hours of lecture and discussion per week and three hours of laboratory exercises. An introduction to the physiology of adaptation to the physical and biotic environments, including animal energetics, biology of body size and physiological constraints on animal life history. Spring.

3.7 COURSE HISTORY:

Provide the dates of prior approval of this course, and its revision history. This revision was motivated by the need to add a laboratory component to EFB 462 to improve the scientific literacy of the students at ESF. EFB 462 was motivated by a need to offer animal physiology in a context appropriate to ESF, namely the physiology of how animals interact with the environment. Much of the course material was previously covered in a summer course at Cranberry Lake, EFB 496-03 Environmental Physiology. In recent years the instructional methods were increasingly limited to an on-line format without laboratory instruction. On occasions, in recent years, Animal Physiology lab was offered only as a study-abroad course, which limited student accessibility. EFB faculty voted to reinstate in-person instruction with an emphasis on laboratory instruction.

3.7.1 Relationship to current ESF courses

This course is replacing a current ESF course □ YES □ NO

If NO, then proceed to section 4 below.

If YES, then provide below the number and name of the course to be deactivated and removed from the catalog once this course proposal has been approved:

Course Number (of the course to be replaced)
Course Name (of the course to be replaced)

If the course to be replaced is used by departments other than the department sponsoring this proposal, please indicate below which departments are affected and the date they were notified about the course replacement.

Department:  Date of Notification:
Department:  Date of Notification:
Department:  Date of Notification:
Department:  Date of Notification:
4. Institutional Impacts:

This section pertains to forecasting institutional resource needs to support the course or course revision. Provide clear statements regarding the needs and current availability (or absence) of resources. Note that, if this is a course revision, only the impacts of the revision should be included.

**Staffing needs:**
1.5 full-time TA. TAs will help with grading, laboratory preparation and instruction, and help facilitate small group work during class.

**Classroom resources (e.g. physical facilities in a laboratory, lecture hall, flexible space, academic computing):**
For lecture: lecture hall or a classroom with tables that can be rearranged for group work.
For lab: a laboratory that can accommodate 20 students working individually or in small groups. Illick 242 has been identified as the classroom for the lab.

**Technology Resources:**
Lecture and laboratory: Computer and projection capabilities.

**Computing Resources (software licensing, hardware, access):**
Lecture and laboratory: Powerpoint and internet connection.

**Library Resources (subscriptions, services):**
A reserved copy of the textbook. Access to articles from the journals Journal of Experimental Biology, Integrative and Comparative Biology, Journal of Experimental Zoology

**Transportation Requirements (budget, fees, fleet vehicles):**
N/A

**Forest Properties or Field Practicum Facilities:**
N/A
5. Health and Safety Considerations:

Will any of the conditions or situations outlined below be present in association with the course?  

Yes / No

5.1. Will substances with any of the following properties be used during instruction: flammability, toxicity, corrosivity, reactivity, registered pesticide, legally controlled, or other characteristics with the potential to cause harm or injury?  

☐ / ☐

5.2. Will any physical hazards be present during instruction? (e.g., machines that need safety guards; razor blades or syringes; compressed gases, etc.).  

☐ / ☐

5.3. Will any biological hazards be present during instruction? (e.g., handling animals (rabies or hantavirus); cultures or stocks of infectious agents (fungal spores, viruses, bacteria, etc.).  

☐ / ☐

5.4. Will any radiation hazards be present during instruction? (e.g., radioisotopes, X-rays, ultraviolet rays, lasers, etc.).

☐ / ☒

5.5. Will any electrical equipment that, due to its design, location, or method of use, pose any threat to safety during instruction? (Give considerable thought to electrical use outdoors, or any potentially wet location.).

☐ / ☒

5.6. Will there be any personal safety issues related to the class? (e.g., due to time of day or location, at the end of any organized class exercise, will students be in danger of physical assault, etc.).

☐ / ☒

5.7. Will any students be driving official state or research sponsored land or water vehicles during any class or instructional exercise?

☐ / ☒

5.8. Will any type of personal protective equipment be necessary during class exercises? (e.g., hard-hats, eye/face protection, hearing protection, hand/foot protection, lab coat, visibility clothing, etc.)

☐ / ☒

If the answer was “Yes” to any of the HEALTH AND SAFETY questions, please explain: Students will be working with insect models during the lab; using flammable chemicals (including alcohols) and corrosive chemicals (acids) during assays; and using hot plates, syringes and scalpels as part of lab activities. Students might use attenuated Escherichia coli in some procedures. Students will be asked to run and walk during some activities, and these activities pose a chance of physical injury. Students will need access to eye goggles and lab coats when working with corrosive and flammable materials. They will need access to an eye-wash station and a safety shower.

For lab and field courses to which all answers are "no", you should explain that here, also. Normally, we would expect some safety precautions for such courses.
6. Coordination and Consultation

Emails/letters, as noted below and attached to this proposal, or signatures below, indicate that the affected departments, programs or units have been notified of this proposal and have had an opportunity to assess the impact of the proposal on their respective units.

**Affected Academic Department(s) or Program(s) – other than the sponsoring department:**

Chemistry

Department/Program 1

Chair Signature

Name of Chair/Program Director

Date Or letter attached □

Department/Program 2

Chair Signature

Name of Chair/Program Director

Date Or letter attached □

Department/Program 3

Chair Signature

Name of Chair/Program Director

Date Or letter attached □

(if more than three Departments/Programs, please continue on a separate page)

**Other Units:**

Associate Provost for Instruction & Dean of the Graduate School (for Gen Ed courses only)

Date Or letter attached □

Registrar

Date Or letter attached □

Library Director

Date Or letter attached □

Computing and Network Services

Date Or letter attached □

Physical Plant

Date Or letter attached □

Forest Properties

Date Or letter attached □

Environmental Health and Safety

Date Or letter attached □
7. Proposer Information and Sponsoring Department Chair Affirmation:

Contact Person:
Name:Cynthia Downs ____________________________ Department: Environmental and Forest Biology
Email:cjdowns@esf.edu ____________________________ Phone: 315-470-6806

This proposal has been reviewed and approved by the sponsoring Department. Affected departments have been notified and given the opportunity to provide feedback. Department resources are or will be made available to support the course, or a plan is in place to meet the resource needs as identified in the Institutional Impacts section of this proposal (see Section 4, above).

Name: Melissa Fierke ____________________________
Date: ____________________________
Signature: ____________________________
Department Chair (or designated curriculum representative)
Or letter attached ☐
Department Chair (or designated curriculum representative)

8. Approvals:

Curriculum Committee ____________________________ Date ____________________________

Faculty Governance ____________________________ Date ____________________________

Provost ____________________________ Date ____________________________