

## **COURSE PROPOSAL**

### **Course title & description**

#### **APBI 490 (3) THE BIOLOGY OF STRESS IN ANIMALS**

*Examining how animals respond to various stressors in their lives and the impact on their overall biology, including health. How knowledge of how to manage stress on animals (farm, companion, zoo and animals used in research) can improve their health and productivity.*

### **Overview**

The course will seek to explain how animals respond to stress within the context of their natural lives. The focus will be on understanding stress at the whole animal level. Students in this course will learn the types of challenges and sources of stress that animals kept by people (farm, companion, zoo and research animals) encounter in their lives, and how these can be understood in terms of the animals' evolutionary background. The behavioural, cognitive and physiological responses of animals to stress will be described and explained as attempts at an integrated, adaptive response to the specific stressor. The long term impact of these responses on the animals' overall biological functioning (e.g. growth, reproduction, health) will be examined. Students will learn to identify some of the more common indicators that animals are under stress and how these can be used to assess the degree to which the animals are coping with stress. Finally, they will learn how the way that animals are bred, housed and managed by people can result in stress and how practical improvements can help them avoid or respond to the negative impacts of stress.

### **Course Structure and Operation**

The course is proposed as a 3-credit, one-session course that students will normally take in their fourth year. It is designed especially for Applied Biology students who have an interest in Applied Animal Biology. The envisioned class size is approximately 25 students.

It is proposed that the course consist of two 1.5 h classes per week. The classes will include a combination of presentations (by instructors, guests and students), in-class exercises, and group discussions (whole-class and small-group).

Time table and lab requirements: The course would require a mid-sized room suitable for group discussions in or near the MacMillan Building.

*Teaching load/assignments:* It is proposed that Dr. Jeffrey Rushen (adjunct professor in Faculty of Land and Food Systems) lead the course with participation of other researchers and students working in this area.

*Teaching assistant requirements:* A teaching assistant is requested to help facilitate group discussions and assist in marking student assignments and essays.

## **Learning Outcomes**

Upon completion of this course students will be able to:

- Understand the types of situations that animals may find stressful, particularly those that result from the way that people house and manage animals, and how these stressors can be understood within the context of the animals' natural lives;
- Identify the successful and unsuccessful responses animal make in response to stress and how scientific measurement of these responses can be used to assess how well the animals are coping with a stressor;
- Understand how improvements in the way animals are housed, fed and managed can improve their ability to deal with stress and promote good biological functioning and
- Use this information to analyse, critique, interpret, summarize and communicate findings about the sources of stress for domestic, companion, zoo and research animals.

## **Grading System and Assessment Strategies**

Evaluation emphasizes comprehension of the concepts, critical thinking, and independent research as evidenced by three short one-page written assignments based on critical reading of scientific articles spread evenly over the term (35%), in-class participation (15%), a 3-5 page term paper testing the student's ability to synthesise and evaluate research on a topic covered in the calss (25%), and oral presentations to the class testing the student's ability to debate and defend a particular view point on a topic in stress and respond to questions (25%).

## **Pre-requisite;**

Third year standing or higher; basic physiology; basic animal behaviour recommended. APBI 315 is strongly recommended.

## **Relationship to Faculty and University Priorities;**

This course will expand course offerings for Applied Animal Biology that currently are focused on animal physiology and farm animal welfare. This course will be especially valuable to students interested in pursuing careers in veterinary medicine, or other careers dealing with companion, farm, zoo or research animals.

This course will also attract animal-oriented students in Biology. By attracting students from other faculties, this course will also respond to the 2002 External Review that suggested that the Faculty improve teaching efficiency by taking on courses that more broadly serve the university and undergraduate community. This course will also provide an excellent fit with the popular 3<sup>rd</sup> and 4<sup>th</sup> year courses APBI 314, APBI 315, APBI 398 and APBI 415.

## **Library**

No additional library resources are required

For further information contact:  
Jeff Rushen ([rushenj@mail.ubc.ca](mailto:rushenj@mail.ubc.ca))

**Proposed topics to be covered:**

- Concepts of stress, scientific measurement and scientific thinking about how domestic animals respond to acute and chronic stress
- Stress in humans; including animal models of stress
- The evolutionary background of animals used by people and how this influences what animals perceive as a stressor and how they respond
- Animals' behavioural, physiological and immune responses to stress and how these can be understood as an integrated adaptive response
- Measurement of stress responses and how they can be used to assess the degree to which animals are coping with stress
- The animals' cognitive mechanisms underlying responses to stress
- Long term effects of chronic stress on animals' overall biology (e.g. growth, production, reproduction and health)
- Stress arising from how animals are bred, housed and handled by people.
- Providing environments that help animals deal with stress

Each class will include a student discussion of a recent scientific paper on some topic in animal stress.

**Budget Impact;** Adjunct Professor Jeff Rushen's stipend will be covered by LFS.

**Library Impact;** Assigned readings will be drawn from the on-line literature available from the UBC library or provided by the instructor. This course will have a negligible impact on the library.

**Reading Assignments;**

There will be no assigned textbook. Instead students will be assigned specific readings from the primary literature, review articles, and book chapters.

**Consultation With Other Academic Units;** [Consultation with other academic units will be provided before the new course description is submitted to Senate.]

***Statement of Academic Integrity:***

***NOTE: All instructors have been asked to include the following type of statement of Academic Integrity in their course outlines distributed to students.***

*The academic enterprise is founded on honesty, civility, and integrity. As members of this enterprise, all students are expected to know, understand, and follow the codes of conduct regarding academic integrity. At the most basic level, this means submitting only original work done by you and acknowledging all*

*sources of information or ideas and attributing them to others as required. This also means you should not cheat, copy, or mislead others about what is your work. Violations of academic integrity (i.e., misconduct) lead to the breakdown of the academic enterprise, and therefore serious consequences arise and harsh sanctions are imposed. For example, incidences of plagiarism or cheating may result in a mark of zero on the assignment or exam and more serious consequences may apply if the matter is referred to the President's Advisory Committee on Student Discipline. Careful records are kept in order to monitor and prevent recurrences.*