COURSE CODE: BIOL3867
COURSE TITLE: Animal Behaviour
NO. OF CREDITS: 3
LEVEL: Undergraduate – Level 3
PRE-REQUISITES: BIOL1263 Living Organisms II or BIOL1261 Diversity of Organisms or (BIOL1065 Diversity of Plants and Animals and AGRI1012 Microbiology) and either BIOL 2XXX Physiology of Animals or BIOL2862 Animal Physiology
ANTI-REQUISITE: BIOL3861 Animal Behaviour
ENROLMENT: Maximum 70 students

COURSE DESCRIPTION:
This terminal course examines the several complementary approaches (ontogeny, phylogeny, function, and causation) that have been used in the study of animal behaviour and the major ideas that have been developed, many of which have spread to other areas of biology. This course builds on previous offerings of the Department in ecology and zoology, to complete the study of animal biology for students taking the Zoology option at level III. An introduction is given to social behaviour, which is expanded on in other level III courses in the zoology option, on humans and insects. A solid background in the structure and function of the nervous, sensory, and endocrine systems in vertebrates and invertebrates is required to understand the mechanisms of animal behaviour. In addition, students should have a basic understanding of animal ecology, for example from the introductory course BIOL1462 General Ecology and Biometry or BIOL2xxx Fundamentals of Ecology, particularly in evolution, energetics, and population ecology. The course is organised into lectures and tutorials covering general and specific concepts in animal behaviour. In tutorials students are expected to prepare, participate and perform in an active way in order to engage with the content. Assessment will be based on a research essay, practical reports, and a final theory exam.

COURSE RATIONALE:
This is a core course for the Zoology option in the Department of Life Sciences and is an essential area in the study of animal biology. Animals are the most complex objects in the known universe, and behaviour is their major emergent feature. At the end of the course, students are expected to have an understanding of the principles sufficient to pursue
research in animal behaviour or associated subjects such as biodiversity, conservation, or animal welfare.

INSTRUCTOR INFORMATION:
Name of instructor: Dr A. Hailey
Office address and phone: Room 226, Zoology Section, New Wing, Natural Sciences Building. Phone ext 82206
Email address: adrian.hailey@sta.uwi.edu
Office hours: Monday, Wednesday, Thursday, 11-12 a.m., other times by appointment
Preferred methods of contact: Email or myelearning Academic Forum
Communication policy: Matters concerning the individual student should be raised by email, from the student’s UWI email account. Matters of interest to the class should be raised as Academic Forum postings on myelearning. In either case students can expect a response within 48 hours. DO NOT use myelearning messaging, which is only supported via email and after some delay.

CONTENT:

General aspects of animal behaviour
- Approaches to animal behaviour
- History of the study of animal behaviour
- Methods of studying animal behaviour
- Evolution of behaviour

Physiological behaviour
- Perception
- Processing
- Organization of behaviour

Ecological behaviour
- Feeding
- Defence
- Territory and social behaviour

Learning and ontogeny
- Instinct and learning
- Types of learning
- Learning and the development of behaviour

Communication
- Communication and signals
- Evolution of signals
- Complex communication - language

Reproductive behaviour
- Reproductive strategies
- Mating systems
- Parental care

GOALS/AIMS:
This course aims to
- Introduce students to the major subject and growth areas of animal behaviour
- Relate animal behaviour to other aspects of animal biology, especially ecology, physiology, and diversity
- Give students a sound grasp of the scientific method, sufficient to begin to develop and test hypotheses in animal behaviour

LEARNING OUTCOMES:
Lectures are grouped into six major subject areas of animal behaviour, at the end of which the student should be able to

1. Plan and carry out a study of animal behaviour, as stand-alone work or as part of a broader biological enquiry (General)
2. Describe how physiological mechanisms produce behaviour in the individual (Physiological behaviour)
3. Use the principles of animal behaviour to investigate the function of animals in their environment, including an introduction to social behaviour (Ecological behaviour)
4. Evaluate the complementary approaches of instinct and different types of learning to the acquisition of behaviour by the individual (Learning and ontogeny)
5. Describe the principles of communication between individuals of the same and different species (Communication)
6. Evaluate behavioural strategies as components of reproduction and associated activities of animals (Reproduction)

ASSIGNMENTS:
Practicals
1. Readings in animal behaviour, and formulation of hypotheses (video/library)
2. Chemoreception, vision and orientation (laboratory)
3. Foraging behaviour in ants (outdoor, UWI)
4. Describing behaviour: Captive land vertebrates (zoo)
5. Social facilitation in chicks (laboratory)

Research Essay
A species behaviour account for the Online Guide to the Animals of Trinidad and Tobago (OGATT) (http://sta.uwi.edu/fst/lifesciences/ogatt.asp). Submitted through myelearning, with a limit of 3% similarity as determined by Turnitin (excluding references). Students may submit drafts to Turnitin from week 3 up to the deadline (end of week 11) and view
their Turnitin reports to correct any similarity in excess of this value. The final version remaining at the submission deadline will be marked.

**COURSE ASSESSMENT:**

- **Coursework practical:** 25%, based on the best 4 of the 5 practical marks from the written reports and marks for participation. Due 7 days after the class.
- **Coursework theory:** 25%, from the research essay. Instructions given in weeks 2 and 3, final essay due at the end of week 11 through Turnitin on myelearning.
- **Final examination:** 50%. The examination is of 2 hours duration. It is based on essay questions, with any two (2) questions to be completed from a choice of five (5).

**EVALUATION:**

- Feedback on the course will be obtained informally from students on an ongoing basis by regular interactions and meetings among students, demonstrators, teaching assistants and the Course Coordinator in practicals and tutorials.
- Formal feedback will be via election of Class Representatives who sit on the Departmental Student-Staff Liaison Committee meetings held twice during the semester. Class reps will channel both concerns and commendations to the meeting as guided by the Department’s Standard Operating Procedures.
- Formal evaluation of the entire course will be accomplished via a UWI Course Evaluation questionnaire administered anonymously and confidentially at the end of the semester.
- All feedback will be considered on an ongoing basis and corrective action or adjustments made or discussed with students promptly or incorporated the following year.

**TEACHING STRATEGIES:**

| Credits: | 3 |
| Lectures: | 18 hours |
| Tutorials: | 6 hours |
| Practicals: | 24 hours |

Lectures and tutorials are given to the whole class, and practicals are usually delivered to the students in two (2) streams. The course outline, objectives, readings, practical schedules, and instructions for the research essay are available on myelearning, together with the opportunity for feedback through the Academic Forum. Lecture materials are reduced to promote understanding of principles rather than transmission of facts, in particular with diagrams simplified to the essentials. Practicals build in sequence from initial observation and hypothesis formulation, laboratory experiments in physiological behaviour, through observational studies in a zoo setting and in the field, to the design of group experiments to test original hypotheses on campus. Practical schedules are available before the class to maximise usefulness of the class time.
RESOURCES:

Texts:

Search engine:
http://scholar.google.com/ is given as the preferred source of references for the research essay, as it accesses academic papers rather than web sites.

READINGS:

Notice to the student: These readings have been selected as background material for the course. Each corresponds to a numbered lecture, and should be read before the relevant lecture for greatest usefulness. Where possible, primary sources (i.e. research papers) have been given, to show the type of material that you should be using as references in your own work (lab reports, and particularly the research essay). You should also use the same format for referencing (without giving notes). The notes also show which readings are used by one of the recommended texts, so you can compare the form in which information reaches the textbooks with the original sources: Alcock (A) or Manning & Dawkins (MD).

   The classic paper on approaches to animal behaviour. A, MD
   A short summary review, focusing on domesticated animals, of a subject on which the author (Lehner, 1979, in literature cited) and others (Martin and Bateson, 1986) have written books.
   A short but difficult theoretical paper, the first use of game theory in animal behavior. MD
   A recent paper on perception that relies on good experimental design rather than on advanced techniques or statistics.
The primary literature on neural processing in behaviour is specialized, so a secondary source is used: part of a chapter in Ewert’s monograph, describing his own work on toads. MD


A fairly accessible paper on the effects of optic lobe lesions on the circadian rhythm of a cockroach.


Testing the predictions of an optimal foraging model. A


Group-living may also function as a defence against predation. A


The classic study of reciprocal altruism. A, MD


Sexual differences in (spatial) learning ability in small mammals are associated with differences in brain anatomy; the size of the hippocampus. A


A paper from comparative psychology directly comparing chimpanzees and children. Chimpanzees show insight learning, but do not go the further step of theorizing, which is restricted to man.


Song development in birds as a specialized form of learning. Note the small sample sizes and lack of statistics in this old but classic paper. A, MD


Experiments on the function of long tails as signals in male birds. A, MD


Nestling begging calls are related to the risk of predation among 24 species of forest birds. A


Vervet monkey alarm calls as a form of language. MD


Competition among females for males in species with sex role reversal. A
Both hotshot and hot-spot models of lek formation may operate simultaneously. A

Female infanticide in a bird with sex role reversal. MD

**COURSE CALENDAR:**

| Week | Lectures and Tutorials | Practicals | Assignments due |
|------|------------------------|------------|----------------|----------------|
| 1    | • Introduction to course (Tutorial)  
       • Approaches to animal behaviour | | | |
| 2    | • Methods of studying animal behaviour  
       • History of the study of animal behaviour (Tutorial) | | | |
| 3    | • Evolution of behaviour  
       • Discussion of research essay (Tutorial) | Readings in animal behaviour | | |
| 4    | • Perception  
       • Processing | | Practical 1 | |
| 5    | • Organization of behaviour  
       • Tutorial | Chemoreception | | |
| 6    | • Feeding  
       • Defence | | Practical 2 | |
| 7    | • Territory and social behaviour  
       • Instinct and learning | Foraging behaviour | | |
| 8    | • Types of learning  
       • Learning and the development of behaviour | | Practical 3 | |
| 9    | • Tutorial  
       • Communication and signals | Captive land vertebrates | | |
| 10   | • Evolution of signals  
       • Complex communication - language | | Practical 4 | |
| 11   | • Reproductive strategies  
       • Mating systems | Social facilitation | Research Essay | |
### ADDITIONAL INFORMATION:

- Students are reminded that they must attend a minimum of 75% of the practical sessions and tutorials. Failure to do so will result in debarment from the final examination.
- As a general principle, medicals or other excuses may only excuse a student’s presence at an assigned time. Students must still complete the assigned work (make-up lab report or make-up test) in order to obtain the marks for that item of coursework. The student is responsible for liaising with the Course Coordinator or Teaching Assistants to ensure the assigned make-up is completed.
- Students are hereby informed that plagiarism is forbidden and all unsupervised coursework items must be accompanied by a Coursework Accountability Statement in order to be assessed. Specific items may require submission through Turnitin on myeLearning. Refer to ‘University Regulations on Plagiarism’ available from [http://sta.uwi.edu/resources/documents/Exam_Regulations_Plagiarism.pdf](http://sta.uwi.edu/resources/documents/Exam_Regulations_Plagiarism.pdf).

### HOW TO STUDY FOR THIS COURSE:

- Attendance is mandatory for lectures, tutorials and practicals. Prior preparation is strongly advised to be able to fully participate in activities and obtain the full value of the sessions.
- Thorough use should be made of the resources provided and students are strongly advised to become familiar with them and start utilising them from the first week. Regular updates on course progress and materials are also highly recommended and you should be checking into myeLearning on a frequent regular basis to review materials, assignments and activities.
- Students are advised to read more than one of the many texts in animal behaviour available in the Alma Jordan Library and the campus bookshop. The approaches of authors to the subject vary widely, from the mechanistic (Ryan and Wilczynski is the latest of several) to the ecological (e.g. Alcock) and the zoological/ethological (e.g. Manning and Dawkins). Students will learn best by comparing these approaches and learning the important ideas in animal behaviour by reinforcement, while seeing a range of examples and viewpoints, rather than cramming from a single source.