



## Exeter College Summer Programme

### The Behavioural Ecology of Animals

#### Course Description

Have you ever watched an animal and wondered why it was exhibiting certain behaviours? Or how animals decide when and whom to mate with, when to hibernate for the winter or wean their offspring? These questions lie on the interface between animal behaviour and its interactions with the external environment – their behavioural ecology.

In this course we will explore the wonders of animal behaviour and how the interaction between behaviour and ecology has been shaped by natural selection. We will be using examples of a wide range of behaviours, from simple innate responses to complex decision-making, while at the same time getting a comprehensive introduction to evolutionary thinking.

We will consider how animals solve problems to ensure their own survival; how to find food, avoid predation and choose a mate. Using evolutionary framework, we will endeavour to explain some perplexing behaviours across the animal kingdom. Why do honeybees work for the queen and forgo their own reproduction? How did exaggerated and dangerous mating displays evolve? Why do some species look after their offspring while others don't? To answer these and other questions we will draw from a variety of scientific frameworks. We will examine how comparisons made between different species can shed light on the evolution of behaviours and acknowledge the limitations and pitfalls of the comparative method. We will outline how mathematical modelling can shed light on the costs and benefits of behaviours and how experimental studies can be used to refine and inform such models. Through a mixture of lectures, in-depth seminar discussions and small group tutorials you will develop skills in critical thinking and employing the scientific method in academic discourse. You will have an opportunity to practice your skill to present a reasoned argument, both verbally in the classroom and in writing through essays, as well as hone your presentation skills through an academic poster presentation.

#### Prerequisites

There are no prerequisites, and no previous knowledge of ecology is necessary. This course will suit anyone with an interest in understanding why animals behave the way in which they do.

#### Teaching Methods and Assessment

- 12 x 1.25hr Lectures (15hrs)
- 6 x 1.25hr Seminar Problem classes (7.5hrs)
- 4 x 1.25hrs Tutorials (5hrs)

**Final Assessment:** an essay of no more than 3,000-words (30%), a final 3-hour written examination (30%), a poster presentation (20%), and participation in seminar discussions (20%).

## **Core reading**

Course textbook:

Davies, Krebs, West. 2012. An Introduction to Behavioural Ecology. 4<sup>th</sup> ed. Wiley-Blackwell

Additional reading of peer-reviewed papers will be supplied by the tutor

## **Lecture Schedule**

1. Natural Selection, Ecology, and Behaviour
2. Research Approaches in Behavioural Ecology
3. “Have the cake? Eat the cake?” Foraging Strategies
4. The Cat and Mouse Game: Predator/Prey Interactions
5. Competition for Resources
6. Living in Groups
7. Why be nice? Evolution of Cooperation
8. Social Behaviours: from Altruism to Spite
9. Reproduction and Mating Systems
10. Battle of the Sexes? Sexual Selection and Sexual Conflict
11. Parental Care and Family conflicts
12. Boy or Girl? Sex Allocation