Principles of Biology Lab

Class code  BIOL-UA 9123 (Lab)

Instructors Details
Dr. Matthew Brandley
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Oliver Manlik
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Consultations by Appointment
Please allow at least 24 hours for your instructors to respond to your emails.

Class Details
Spring 2015

Principles of Biology Lab

Thursday 9:00 – 12:00pm (Lab)
February 5 to May 14
University of Technology Sydney (UTS) Science Lab CB04.03.26
Building 4, 745 Harris Street, Ultimo, NSW 2007

Prerequisites
Principles of Biology I

Class Description
The lab is organized into several modules, each with one or more experiments that cover different biological fields (see the syllabus for a detailed explanation and presentation of the lab structure, time-line, rules and grade breakdown). Some experiments run for multiple meetings over the course of several weeks, while other experiments stand-alone -- beginning and finishing in one meeting. Some experiments have a hypothesis-based component, while other experiments are observational. During the course of the semester there are various assignments and tests to prep you for the lab.

Desired Outcomes
Biology is quickly advancing and evolving. It is important that we keep up with changes and stay at the forefront. New discoveries and technologies in molecular biology and genomics are transforming biological research so that now we can do more than look at the phenotype of an organism or a community, but we can also examine the genes that regulate the way an organism looks or behaves or even how it has evolved.

At the same time we also pay homage to the traditional approaches in biology, whether that
means looking at fixed samples on a slide in the microscope or examining preserved or living specimens. This approach is expansive, yet designed to give you experience with biological techniques that are fundamental to contemporary research labs. 

Our hope is that every student who takes this introductory biology course leaves with a sense of the potentials in biology today.

### Assessment Components

**Ten Online Homework Assignments (20% or 2% each) due dates in Weekly Schedule**
There are four questions for each assignment. Each question is worth 0.5 points.

**Ten Post-lab Assignments (25% or 2.5% each) due dates in Weekly Schedule**
There are five questions for each lab. Each question is worth 0.5 points.

**Three Practical Quizzes (15% or 5% each) in Sessions 6, 8, 11 (15 minutes each)**
There are five two-part questions for each quiz practical. Each question is worth 0.5 points.

**Writing Assignment (15%) in three parts**
- Introduction and Materials and Methods (5%): due Session 5
- Results and Discussion (5%): due Session 7
- Introduction, Materials & Methods, Results and Discussion, (5% edited and unified into one document): due Session 9

**Lab Practical Exam (20%) Session 13, Thu 7 May (1 hour)**
There are 20 two-part questions in the final exam. Each is worth 0.5 points.

**Lab Participation (5%)**

*Failure to submit or fulfill any required course component will result in failure of the class.*

### Assessment Expectations

**Grade A:** Excellent work showing a thorough knowledge and understanding of the topics, with excellent use of scientific language, detailed analysis and clear logical explanations, showing insight, independent, original thought and reasoning.

**Grade B:** Good work with good general knowledge and understanding of the topics, accurate use of scientific language, good general analysis and coherent explanations showing some independent reasoning, reading and research.

**Grade C:** Satisfactory work, broadly correct both factually and analytically, with some explanation and reasoning: the work will typically demonstrate a basic understanding of the topic.

**Grade D:** Passable work, showing a general, superficial knowledge and understanding of the topic, lacking satisfactory use of scientific language or adequate analysis.

**Grade F:** Unsatisfactory work in all criteria.
A grading rubric will be provided and distributed in class.

Written work due in class must be submitted to your instructor during class time.

Late work should be submitted in person to the Academic Coordinator during regular office hours (9:00am-5:00pm, Monday-Friday). In the absence of the Academic Coordinator, another member of the administrative staff can accept the work in person. The NYUS staff will mark down the date and time of submission in the presence of the student. Students must also submit an electronic copy of late written work to Turn-It-In within 24 hours.

Work submitted after the submission time without an agreed extension receives a penalty of 2 points on the 100-point scale (for the assignment) for each day the work is late.

Written work submitted beyond five (5) weekdays after the submission date without an agreed extension fails and is given a zero.

The academic standards of New York University apply to all coursework at NYU Sydney. NYU Sydney policies are in accordance with New York University’s plagiarism policy. The presentation of another person’s words, ideas, judgment, images or data as though they were your own, whether intentionally or unintentionally, constitutes an act of plagiarism.

Penalties for confirmed cases of plagiarism are severe and are dealt with by the Director, NYU Sydney, not your instructor. Your home school will be notified and you will be dealt with according to the standards of that school. The codes of conduct and academic standards for NYU’s various schools and colleges are outlined in the respective school’s academic resources.

Study abroad at Global Academic Centres is an academically intensive and immersive experience, in which students from a wide range of backgrounds exchange ideas in discussion-based seminars. Learning in such an environment depends on the active participation of all students. And since classes typically meet once or twice a week, even a single absence can cause a student to miss a significant portion of a course. **To ensure the integrity of this academic experience, class attendance at the centres is mandatory, and unexcused absences will be penalised with a two percent deduction from the student’s final course grade for every week of classes missed.**

The class roster will be marked in the first five minutes of class and anyone who arrives after this time will be considered absent. Students are responsible for making up any work missed due to absence. Repeated absences will result in harsher penalties, including failure.
This is a seminar subject and requires the active participation of all students. It also requires engaged discussion, including listening to and respecting other points of view. Your behaviour in class should respect your classmates’ desire to learn. It is important for you to focus your full attention on the class, for the entire class period.

- Arrive to class on time.
- Once you are in class, you are expected to stay until class ends. Leaving to make or take phone calls, to meet with classmates, or to go to an interview, is not acceptable behaviour.
- Phones, digital music players, and any other communications or sound devices are not to be used during class. That means no phone calls, no texting, no social media, no email, and no internet browsing at any time during class.
- Laptop computers and tablets are not to be used during class except in rare instances for specific class-related activity expressly approved by your instructor.
- The only material you should be reading in class is material assigned for that class. Reading anything else, such as newspapers or magazines, or doing work from another class, is not acceptable.
- Class may not be recorded in any fashion – audio, video, or otherwise – without permission in writing from the instructor.

**Required Texts**

- Custom NYU Lab Manual: From Genomes to Biomes (Provided by NYU Sydney)

**Other required equipment**

- Lab book – unlined paper
- Calculator
- Lab Coat and Safety Glasses

**Your Instructors**

Dr. Matthew C. Brandley (Ph.D., University of California – Berkeley) is a DECRA Postdoctoral Fellow at the University of Sydney. Matthew studies the phylogenetics and morphological evolution of vertebrate animals, especially lizards and snakes.

Matt also received his BS in 2001 (University of Oklahoma) and MS in 2005 (San Diego State University). Prior to moving to the University of Sydney, he completed a postdoctoral fellowship at the Department of Ecology and Evolutionary Biology at Yale University. He is particularly interested in how complex structures and unique body plans convergently evolve, and he studies these phenomena using a...
combination of genomic, gene expression, anatomical, and phylogenetic tools with data collected in the field or from museums. Matt also studies how predator-prey relationships affect the evolution of lizard and snake phenotypes and life history traits on the Japanese Izu Island Archipelago. He maintains international collaborations with research groups in China, India, Japan, Mexico, and the U.S.


Oliver Manlik (M.S., Federal Institute of Technology ETH Zurich), is a Ph.D. candidate at the University of New South Wales, where he investigates the relationship between fitness traits and immune gene variation in dolphins. His primary research interest is in various aspects of ecological theory and conservation biology, especially conservation genetics & population dynamics of large vertebrates. Before joining NYU, he has taught various laboratory classes (genetics, conservation biology and molecular biology) at the University of New South Wales and has previously worked as a science teacher at a private high school in Japan.

Oliver’s Ph.D. research is on population viability and genetics of two bottlenose dolphin populations with the aim to guide wildlife management. A major part of the project is to identify immune gene variants of the ‘major histocompatibility complex’ that may be important for reproductive success and survival of the dolphins. Essentially his research is a search for gene variants that matter for conservation of dolphins and other vertebrate populations (http://www.bees.unsw.edu.au/oliver-manlik). Oliver is also a co-founder of the Sydney Society of Conservation Biology, a local chapter of the Society of Conservation Biology (SCB).
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<td>Orientation and Safety in the Lab + Micropipetting</td>
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<td>Session 2, Thursday 12 Feb</td>
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<td>The tree of life: Animal Phylogenetics (A)</td>
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<td>Session 3, Thursday 19 Feb</td>
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<td>The tree of life: Animal Phylogenetics (C)</td>
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<td>Session 7, Thursday 26 Mar</td>
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<td>Presentations: Your Tree of Life</td>
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<td>Genotype to Phenotype: PTC Analysis (A)</td>
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