

SEMESTER AT SEA COURSE SYLLABUS
University of Virginia, Academic Sponsor

Voyage: Summer 2014
Discipline: Biology
BIOL 3559: Hormones and Health
Upper Division
Faculty Name: Emilie Rissman
Credit Hours: 3; Contact Hours: 38

Pre-requisites: Either introductory biology at the college level, or AP credits in biology.

COURSE DESCRIPTION

This course is designed for students with an introductory level background in biology. The first part of the course will be devoted to the basics of hormone functions with a focus on reproduction. We will cover sexual reproduction, puberty, adult reproductive function, development of male and female germ cells, hormones and feedback systems between the brain, pituitary and the gonads. With this background A few examples of the contemporary topics we will cover are: 1) the biology of sex differences, 2) how parenting shapes adult behavior and physiology 3) actions of man-made endocrine disrupting compounds, and 4) steroid abuse by athletes. Each topic will start off with lectures and then we will move into group projects and presentations on a topic. Topics will be mutually decided on by the student and the instructor.

COURSE OBJECTIVES

The objectives of this course are to provide the students with enough facts to form intelligent opinions on current controversial topics in reproduction.

REQUIRED TEXTBOOKS

AUTHOR: MH Johnson
TITLE: Essential Reproduction
PUBLISHER: Wiley-Blackwell
ISBN #: 978-1-444335750
DATE/EDITION: 2013 7th ed.

AUTHOR: T Colborn, D Dumanoski, JP Myers
TITLE: Our Stolen Future
PUBLISHER: Plume
ISBN #: 0-452-27414-1
DATE/EDITION: 1997

TOPICAL OUTLINE OF COURSE

Date	Topic	Assignments
June 18 C1	Introduction	
June 19 C2	Methods in Animal Behavior : Overview of animal behavior, experimental design and statistics	http://sib.illinois.edu/SkillGuidelines/BasicStatistics.html and StatView
June 20 C3	Methods in Animal Behavior : Preparation for the field trip to the Lisbon Zoo	<u>Curr Protoc Toxicol.</u> 2005: Chapter 13: Scoring of social interactions and play in mice during adolescence. Terranova ML, Laviola G.
June 21- 24	Lisbon	<i>Jardim Zoologico (the Lisbon zoo),</i>
June 25 C4	<i>Work on projects, statistics, data analysis and interpretations</i>	
June 26 C5	<i>Class Presentations</i>	
June 27- 30	Bilbao	
July 1 C6	Reproduction: What is reproduction?	Chapter 1 from Johnson: Essential Reproduction pages 4-16
July 2 C7	Reproduction: Hormones <i>Science</i> podcast Jan. 18, 2013: <i>Oxytocin</i>	Chapter 1 from Johnson: Essential Reproduction pages 16-31 <i>Science</i> Jan 18, 2013 pages 267- 269.
July 3 C8	<i>In class quiz</i> Reproduction: Differentiation	Chapter 2 from Johnson: Essential Reproduction pages 36-49
July 4 C9	Sex Differences: Introduction Watch: National Geographic Video: <i>Sex, Lies and Gender</i>	Brain Gender by Melissa Hines pages 21-43. Cahill, L. His brain, her brain. 2005 <i>Scientific American</i> pages 1-9.
July 5-8	Glasgow	
July 9 C10	Sex Differences: Brain and behavior	Brain Gender by Melissa Hines Chapter 1 pages 65-82.
July 10- 13	Dublin	
July 14 C11	Sex Differences: Group <i>Projects/presentations</i>	
July 15 C12	Epigenetics: Video: <i>Science</i> podcast July 2, 2010: <i>Epigenetics</i> and Nov. 4, 2011: <i>Social structure and brain function</i>	<i>Science</i> July 2, 2010 pages 24-27 and <i>Science</i> Nov. 4, 2011 pages 578-9. Nestler, E. Hidden switches in the mind. 2011 <i>Scientific American</i>

		pages 78-83.
July 16 C13	Epigenetics: Roles for development	Perspectives on Psychological Science 2010 pages 564-573.
July 17-20	Bergen/Oslo	
July 21 C14	<i>Class presentations on Epigenetics</i>	
July 22	No class	
July 23 C15	Puberty: Hormones and their roles	Chapter 2 from Johnson: Essential Reproduction pages 36-49
July 24-28	St. Petersburg	
July 29 C16	Endocrine disrupting compounds: <i>Nova Video: Silent Spring</i>	Chapter 3 from Johnson: Essential Reproduction pages 51-68
July 30 C17	Endocrine disrupting compounds: Shifting the balance.	Our Stolen Future by Theo Colborn, Dianne Dumanoski and John Peter Myers pages 1-28
July 31- August 3	Stockholm	
Aug 4 C18	Endocrine disrupting compounds: <i>PPC Video: Living Downstream</i>	Our Stolen Future by Theo Colborn, Dianne Dumanoski and John Peter Myers pages 28-46
Aug 5 C19	Endocrine disrupting compounds: Similarities and differences from hormones	Our Stolen Future by Theo Colborn, Dianne Dumanoski and John Peter Myers pages 47-67
Aug 6-9	Helsinki	
Aug 10 C20	Endocrine disrupting compounds: <i>PPC Video: Living Downstream</i>	Our Stolen Future by Theo Colborn, Dianne Dumanoski and John Peter Myers pages 68-86
Aug 11 C21	Endocrine disrupting compounds: Where do we go from here? <i>Student presentations</i>	Slow Death by Rubber Duck: the secret danger of everyday things, Rick Smith and Bruce Lourie pages 254-275
Aug 12-15	Gdansk	
Aug 16 C22	Steroid Abuse: The nuts and bolts	Frontiers in Neuroendocrinology 2008 pages 490–506
Aug 17 C23	Steroid Abuse: Behavioral changes	Psychosomatics 2005 pages 285-290
Aug 18	Work day	
Aug 19 C24	Papers due	
Aug 20	Packing	
Aug 21	Southampton	

FIELD WORK

Field lab attendance is mandatory for all students enrolled in this course. Please do not book individual travel plans or a Semester at Sea sponsored trip on the day of our field lab.

I. Field Lab:

- Date **June 24, 2014**
- Addresses of Destination(s) or Site(s) : *Jardim Zoologico (the Lisbon zoo)*, Estrada de Benfica, 158-160, 1549-004 Lisboa
- Number of Projected Participants : My class and myself, perhaps Dan Burke will join us (my husband and an instructor on the ship).
- Duration of lab: June 17-20 will be spent getting ready. I estimate this will take 16 hours on the ship before the trip plus 12 hours on the ship after the field trip and 8 hours off the ship for the field trip.
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II. In-Country Faculty/Contact

- Name: Maria Antonieta Costa, PhD
- Title: Head of Educational Department
- University Affiliation/Organization : Lisbon Zoo
- Contact Information (e-mail address and mobile phone number) Tel: 217232960 - Fax: 217232961 email: **pedagogico@zoo.pt**

III. Academic Objectives:

1. Collect data from observation of animal behavior.
2. Understand the purpose of animal enrichment and reintroduction programs.
3. Understand and appreciate challenges of breeding endangered animals in captivity.

IV. Field Lab Description:

Before we get to the port we will spend our first two class meetings discussing how behavioral data are obtained and analyzed. Because many of the topics we are covering in the course rely on data from animals which are extrapolated to humans this topic is a core one for the class. I will give each student team an assigned exhibit that they will be doing behavioral observations on and we will draw up "ethograms" based on the species behavioral repertoire. We will leave the ship to arrive at the Zoo by 10am. We spend the first 3 hours doing behavioral observations. We will have lunch and after that meet with the reproductive biologists running the endangered species breeding programs. We will be back by 5pm.

V. Associated Assignments: (Please list the assignments that students are expected to complete based on the field lab experiences. **Note:** Not all field assignments listed in your syllabus should be based on the field lab. They can span multiple countries and

varied in-port experiences.)

Each student team will be assigned a different group of animals for their observation (3 hours). Back on the ship they will write up their data, including performing statistics and will give a power point presentation on their methods and results.

VI. Logistics: (Please indicate the anticipated logistical support you will require.)

- Transportation Bus
- Interpreter not sure if this will be needed
- Meals lunch
- Other

METHODS OF EVALUATION / GRADING RUBRIC

Participation: 10%

Presentation of field trip data: 20%

Other presentations in class: 15% each (Sex differences, Epigenetics, Endocrine disruptors)

Quiz: 5%

Final paper: 20%

RESERVE LIBRARY LIST

AUTHOR: R Smith and B Lourie

TITLE: Slow Death by Rubber Duck: the secret danger of everyday things

PUBLISHER: Counterpoint

ISBN #: 978-1-58243-702-6

DATE/EDITION: 2009

AUTHOR: S LeVay

TITLE: Gay, Straight and the Reason Why

PUBLISHER: Oxford

ISBN #: 978-0-19-993158-3

DATE/EDITION: 2011

AUTHOR: M. Hines

TITLE: Brain Gender

PUBLISHER: Oxford

ISBN #: 13:978-0-19-508410-8

DATE/EDITION: 2004

AUTHOR: S. Assael

TITLE: Steroid Nation

PUBLISHER: ESPN books

ISBN #: 978-1-933060-37-8

DATE/EDITION: 2007

ADDITIONAL RESOURCES

1. National Geographic Video: *Sex, Lies and Gender*
2. Nova Video: *Silent Spring*
3. Living Downstream
<http://www.theppcinc.com/projects/livingdownstream/index.html>

HONOR CODE

Semester at Sea students enroll in an academic program administered by the University of Virginia, and thus bind themselves to the University's honor code. The code prohibits all acts of lying, cheating, and stealing. Please consult the Voyager's Handbook for further explanation of what constitutes an honor offense.

Each written assignment for this course must be pledged by the student as follows: "On my honor as a student, I pledge that I have neither given nor received aid on this assignment." The pledge must be signed, or, in the case of an electronic file, signed "[signed]."