SEMESTER AT SEA COURSE SYLLABUS

Voyage: Summer 2014
Discipline: Biology
BIOL 3559: Contemporary Topics in Reproduction and Behavior
Division: Upper
Faculty Name: Emilie Rissman

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 few lectures will be devoted to the basics of reproduction. We will cover puberty, adult reproductive function, pregnancy, lactation, development of male and female germ cells, hormones and feedback systems between the brain, pituitary and the gonads. A few examples of the contemporary topics we will cover are: 1) the biology of sex differences; 2) biological bases for homosexuality; 3) actions of man-made endocrine disrupting compounds; 4) how parenting shapes adult behavior and physiology. 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 Meyers
TITLE: Our Stolen Future
PUBLISHER: Plume
ISBN #: 0-452-27414-1
DATE/EDITION: 1997

AUTHOR: M. Hines
TITLE: Brain Gender
PUBLISHER: Oxford University Press
ISBN#: 978-0-19-518836-3
DATE/EDITION: 2004

TOPICAL OUTLINE OF COURSE

Date	Topic	Assignments
June 18 C1	Introduction	
June 19 C2	Overview experimental design	
June 20 C3	Methods in Animal Behavior Preparation for the field trip to the Lisbon Zoo	Curr Protoc Toxicol. 2005;Chapter 13: Scoring of social interactions and play in mice during adolescence. Terranova ML, Laviola G.
June21-24	**Lisbon**	Field Trip
June 25 C4	Statistics, data analysis and interpretations	http://sib.illinois.edu/SkillGuidelines/BasicStatistics.html and StatView
June 26 C5	*Class Presentations*	
June 27-30	**Bilbao**	
July 1 C6	Reproduction: What is reproduction?	Chapter 1 from Johnson: Essential Reproduction pages 1-33
July 2 C7	Reproduction: Sex	Chapter 2 from Johnson: Essential Reproduction pages 33-50
July 3 C8	Reproduction: Maturation	Chapters 3 from Johnson: Essential Reproduction pages. 50-69
July 4-7	**Glasgow**	
July 8 C9	Reproduction: Men and Women	Chapters 7 and 9 from Johnson: Essential Reproduction pgs. 122-133 and 151-173
July 9 C10	Introduction to Sex Differences Watch: National Geographic Video: Sex, Lies and Gender	Brain Gender by Melissa Hines pages 1-21. Cahill, L. His brain, her brain. 2005 Scientific American pages 1-9.
July 10-13	**Dublin**	
July 14 C11	Sex Differences: Sexual Animal	Brain Gender by Melissa Hines pages 45-65
July 15 C12	Sex Differences: Brain	Brain Gender by Melissa Hines Chapter 1 pages 65-83
July 16 C13	Sex Differences: Sex and hormones	Brain Gender by Melissa Hines Chapter 1 pages 83-109.
July 17-20	**Bergen/Oslo**	
July 21 C14	Sex Differences: Sex and the human brain	Brain Gender by Melissa Hines pages 183-212
July 22	No class	

July 23 C15	Sex Differences, where, when, how *Student presentations*	
July 24-28	**St. Petersburg**	
July 29 C16	Endocrine disrupting compounds, shifting the balance. Movie: Silent Spring	
July 30 C17	Endocrine disrupting compounds, shifting the balance.	Our Stolen Future by Theo Colborn, Dianne Dumanoski and John Peter Meyers pages 1-28 Nova Video: Silent Spring
July 31-August 3	**Stockholm**	
Aug 4 C18	Endocrine disrupting compounds, shifting the balance.	Our Stolen Future by Theo Colborn, Dianne Dumanoski and John Peter Meyers pages 28-46
Aug 5 C19	Endocrine disrupting compounds, shifting the balance.	Our Stolen Future by Theo Colborn, Dianne Dumanoski and John Peter Meyers pages 47-67
Aug 6-9	**Helsinki**	
Aug 10 C20	Endocrine disrupting compounds, shifting the balance.	Our Stolen Future by Theo Colborn, Dianne Dumanoski and John Peter Meyers pages 68-86
Aug 11 C21	Endocrine disrupting compounds, shifting the balance. PPC Video: Living Downstream	
Aug 12-15	**Gdansk**	
Aug 16 C22	Endocrine disrupting compounds, shifting the balance. Evaluation of articles written for the public	
Aug 17 C23	*Student presentations*	
Aug 18	Study Day	
Aug 19 C24	Exams	
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:

- Title Animal behavior, sex differences and reproduction
- Port Lisbon
- Date (First or Last Day in Port) first day in port June 21
- Destination(s) The Lisbon Zoo
- Number of Projected Participants 35 (my class)
- Duration (hours) of lab: all day

II. In-Country Faculty/Contact (Do not list tour operators or agencies. Please list potential contacts at universities or other organizations that may assist you in the development of the lab.) I have a colleague in Lisbon and I have written to him to see if he knows people at the zoo.

- Name: Rui Oliveria
- Title: Professor
- University Affiliation/Organization: ISPA Instituto Universitario

III. Academic Objectives:

1. Introduce the students to scientific methods for observation, recording and analysis of natural animal behaviors

2. Identification of sex differences in behaviors will be the focus of the exercise.

3. The zoo has several breeding programs. I will make contact with the scientists at the zoo and get us into the back door to see how they do the artificial insemination and we will have a scientist explain the special challenges of captive breeding for various species.

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: 20%
Presentation of field trip data: 20%
Presentations in class: 40% (two of these each worth 20%)
Final exam: 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: R Carson
TITLE: Silent Spring
PUBLISHER: Houghton Mifflin Harcourt
ISBN #: 0-618-24906-0
DATE/EDITION: original 1962, 2002, 4th edition

AUTHOR: S LeVay
TITLE: Gay, Straight and the Reason Why
PUBLISHER: Oxford
ISBN #: 978-0-19-993158-3
DATE/EDITION: 2011

ELECTRONIC COURSE MATERIALS

Cahill, L. His brain, her brain. 2005 Scientific American pages 1-9.

ADDITIONAL RESOURCES

I have two DVDs I will show the class

I would like to get and show "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]."