

# BSC-2011, Honors Biological Science II, Spring 2017

Lecture: Tues & Thurs, 12:30-1:45, BIO 0307

Help session: Wed, 5:15-6:15, BIO 0307

**Instructor:** Dr. Leithen M'Gonigle

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Office Location: KIN 4019

Office Hours: Tues, 2:30-3:30pm & by appointment

<http://www.bio.fsu.edu/~lmgonigle>

**Course Description:** This is the second part of a two-semester introductory biology course designed for those interested in pursuing a career in life sciences. This course provides an overview of the processes underlying animal embryonic development, inheritance genetics, evolution, and ecology. The diversity of knowledge gained in BSC 2011 will aid understanding in more advanced biology classes..

## Course Objectives:

At the end of the semester, students will be able to:

- **Unit I:** identify and describe the set of processes that allow a linear sequence of information contained in DNA to direct the embryonic development of a complex multicellular eukaryotic organism from a single cell
- **Unit II:** explain the mechanisms that govern the patterns by which traits are inherited by offspring from parents and solve problems based on Mendelian inheritance
- **Unit III:** list types of evidence for evolution; describe and compare the various mechanisms that result in changes in populations of organisms over evolutionary time; contrast micro- and macroevolution; explain the Hardy-Weinberg principle and apply this to solve problems in population genetics; explain the role of reproductive isolation in speciation and the various means by which populations may become reproductively isolated; contrast allopatric and sympatric modes of speciation; and interpret phylogenetic trees
- **Unit IV:** describe interactions among organisms at different ecological levels; explain how interactions between organisms and their physical environment determine patterns of distribution and abundance of organisms on Earth; describe threats to earths biodiversity; and recognize the importance of conserving biodiversity

**The Liberal Studies for the 21st Century Program at Florida State University builds an educational foundation that will enable FSU graduates to thrive both intellectually and materially and to support themselves, their families, and their communities through a broad and critical engagement with the world in which they live and work. Liberal Studies thus offers a transformative experience.**

**This course has been approved for the Liberal Studies disciplinary requirement of Natural Science and thus is designed to help students become critical appraisers of the theories of natural science and the facts that support them. Therefore, at the end of the semester, students will also be able to:**

1. think critically and cogently about causal relationships with scientific reasoning

2. assess previous experimentation and published scientific results (i.e., analysis of existing work)
3. critically examine and evaluate scientific observation, hypothesis or model construction
4. articulate a variety of issues created by the complex interactions among science, technology, and society
5. use scientific perspectives to evaluate contemporary problems facing society

**Please note: Five questions assessing each competency will be included in each of the four Unit Exams given throughout the semester.**

**This course (in conjunction with BSC2011-L) has also been approved as meeting the requirements for Scholarship in Practice and thus is designed to help you become a flexible thinker; a productive member of society; and an independent learner. Therefore, at the end of the semester, students in BSC2011 will also be able to:**

**Competency 3:** critique existing applications of scholarship in order to learn from past processes and failures. (SIP competencies 1 and 2 will be assessed while students are enrolled in BSC2011-l, the lab component of this Scholarship in Practice two-course sequence.)

### **Course materials**

**Textbook:** Biology by Campbell and Reece, 10<sup>th</sup> Edition

**Attendance:** Students are expected to attend lecture and are responsible for all lecture content. Attendance at the weekly Help session is vountary, but be aware that valuable information and assistance that is not available in class may be presented at the help session.

**Course web site:** Blackboard (<http://campus.fsu.edu>). Students will find grades, lecture slide sets, handouts, assignment materials and instructions, problem sets, and announcements posted in various folders on the course website. *Please refer to the course website and check your FSU e-mail frequently to receive updated information.*

**i>clickers:** Students are required to purchase an i>clicker polling device for this course (any model of i>clicker will suffice). Please have your i>clicker purchased and registered (instructions on Blackboard) by the second week of class. i>clicker questions will be used during every class meeting to assess your understanding and to monitor attendance for up to 2% extra-credit.

**Please note:** Students caught operating any clicker other than their own will forfeit their opportunity to earn any extra-credit for the entire semester. The same penalty will apply to the absent student(s) who permitted another student to operate their “clicker.” Each offense will also be prosecuted as a violation of FSU’s Academic Honor Policy.

## Grade Distribution:

Unit I Exam	14%
Unit II Exam	14%
Unit III Exam	14%
Final Exam	
Part 1: Unit IV Exam	14%
Part 2: Comprehensive Exam	12%
Best four of five quizzes	14% (3.5% each)
Homework assignments	16%
Clicker	2%

## General:

- Attached to the end of this document is a detailed course schedule.
- Exams are closed book, closed notes, unless instructed otherwise.
- No makeup assignments or exams will be given.

## Letter Grade Distribution:

$\leq 59.99$	60	67	70	73	77	80	83	87	90	93
F	D	D+	C-	C	C+	B-	B	B+	A-	A

Final grades may be curved in a fair and impartial manner, with distribution reflecting the performance and effort of the class.

- **University Attendance Policy:** Excused absences include documented illness, deaths in the family and other documented crises, call to active military duty or jury duty, religious holy days, and official University activities. These absences will be accommodated in a way that does not arbitrarily penalize students who have a valid excuse. Consideration will also be given to students whose dependent children experience serious illness. Students must provide advance notice of absences (when possible) as well as relevant documentation regarding absences to the instructor as soon as possible following the illness or event that led to an absence. Regardless of whether an absence is excused or unexcused, the student is responsible for making up all work that is missed.
- **Academic Honor Policy:** The Florida State University Academic Honor Policy outlines the University's expectations for the integrity of students' academic work, the procedures for resolving alleged violations of those expectations, and the rights and responsibilities of students and faculty members throughout the process. Students are responsible for reading the Academic Honor Policy and for living up to their pledge to "... be honest and truthful and ... [to] strive for personal and institutional integrity at Florida State University." (Florida State University Academic Honor Policy, found at <http://fda.fsu.edu/Academics/Academic-Honor-Policy/>.)
- **Americans With Disabilities Act:** Students with disabilities needing academic accommodation should: (1) register with and provide documentation to the Student Disability Resource Center; and (2) bring a letter to the instructor indicating the need for accommodation and what type. This should be done during the first week of class. This syllabus and

other class materials are available in alternative format upon request. For more information about services available to FSU students with disabilities, contact the: Student Disability Resource Center 874 Traditions Way 108 Student Services Building Florida State University Tallahassee, FL 32306-4167 (850) 644-9566 (voice) (850) 644-8504 (TDD) [sdrc@admin.fsu.edu](mailto:sdrc@admin.fsu.edu) <http://www.disabilitycenter.fsu.edu/>.

- **Free Tutoring from FSU:** For tutoring and writing help in any course at Florida State University, visit the Academic Center for Excellence (ACE) Tutoring Services comprehensive list of tutoring options - see <http://ace.fsu.edu/tutoring> or contact [tutor@fsu.edu](mailto:tutor@fsu.edu) for more information. High-quality tutoring is available by appointment and on a walk-in basis. These services are offered by tutors trained to encourage the highest level of individual academic success while upholding personal academic integrity.
- **Sexual harassment policy:** It is the policy of the University that its employees and students neither commit nor condone sexual harassment in any form. [http://registrar.fsu.edu/bulletin/grad/info/university\\_notices.htm](http://registrar.fsu.edu/bulletin/grad/info/university_notices.htm)
- **Student eligibility for a incomplete grade:** Incomplete grades will not be assigned except in the case of exceptional unforeseen circumstances as determined by the instructor.
- **Liberal studies for the 21st century:** The Liberal Studies for the 21st Century Program at Florida State University builds an educational foundation that will enable FSU graduates to thrive both intellectually and materially and to support themselves, their families, and their communities through a broad and critical engagement with the world in which they live and work. Liberal Studies thus offers a transformative experience. This course has been approved as meeting the requirements for the E-Series and thus is designed to help you become an interdisciplinary and flexible thinker; a lifelong learner; and a team builder. In addition, this course has been approved for the Liberal Studies disciplinary requirement of Natural Science and thus is designed to help you become a critical appraiser of the theories of natural science and the facts that support them.
- **Syllabus Change Policy:** Except for changes that substantially affect implementation of the evaluation (grading) statement, this syllabus is a guide for the course and is subject to change with advance notice.

As a recipient of Federal financial assistance for education activities, FSU is required by Title IX of the Education Amendments of 1972 to ensure that all of its education programs and activities are free from discrimination on the basis of sex. Sexual discrimination includes sexual misconduct (sexual violence, stalking, intimate partner violence, gender based animosity and gender based stereotyping). If you have questions about Title IX or wish to file a Title IX complaint, please visit the FSU Title IX website: [www.titleix.fsu.edu](http://www.titleix.fsu.edu) or call Jennifer Broomfield, Title IX Director 850-644-6271. Please note that as Responsible Employees, all faculty are required to report any incidents of sexual misconduct to the Title IX Office.

For information about the confidential on-campus Victim Advocate Program, please visit <https://dos.fsu.edu/vap/>.

## Tentative Course Outline:

The weekly coverage might change as it depends on the progress of the class.

Date	Content	Reading
<b>Unit I: Genetics &amp; Development</b>		
Jan 10	Introduction / Cell division: mitosis (review)	12
Jan 12	Cell division: mitosis (cont...) / Gene expression (review)	12, 17
Jan 17	Gene regulation	18
Jan 19	Animal development	47
Jan 24	Animal development (fertilization/cleavage)	47
Jan 26	Animal development (gastrulation)	47
Jan 31	Animal development (morphogenesis)	47
Feb 2	<b>Unit I Exam</b>	
<b>Unit II: Patterns of Inheritance</b>		
Feb 7	Sexual reproduction & meiosis / Theories of Inheritance	13, 14.1
Feb 9	Hybrid crosses / Predicting patterns of inheritance	14.2, 14.3
Feb 14	Multilocus inheritance / Sex chromosomes	14.4, 15.1
Feb 16	Linkage and crossover / Chromosome mapping	15.2, 15.3
Feb 21	Mutation / Unit review	15.4,15.5
Feb 23	<b>Unit II Exam</b>	
<b>Unit III: Evolution</b>		
Feb 28	Evolution before Darwin / Darwin's Evidence	22.1-22.3
Mar 2	Population Genetics (Hardy-Weinberg equilibrium)	23.1, 23.2
Mar 7	Mechanisms of Evolution	23.3
Mar 9	Natural selection, Sexual selection	23.4
Mar 14	<b>Spring Break!</b>	
Mar 16	<b>Spring Break!</b>	
Mar 21	Maintenance of genetic variation / Population variation	23.4
Mar 23	Species concepts	24.1
Mar 28	Reproductive isolation / Speciation: mechanism and pattern	24.1-24.3
Mar 30	Speciation: mode and tempo	24.4
Apr 4	Macroevolution	26.1-26.3
Apr 6	<b>Unit III Exam</b>	
<b>Unit IV: Ecology</b>		
Apr 11	Introduction to Ecology	52
Apr 13	Demography / Populations	53
Apr 18	Population growth, Species interactions	53, 54
Apr 20	Species interactions, Communities	54
Apr 25	Trophic structure, Energy flow	54, 55
Apr 27	Conservation biology	56
May 5	<b>Unit IV Exam + Final (7:30am)</b>	