

## PRINCIPLES OF BIOLOGY, BIOL 1610, Spring 2015

### INFORMATION and SYLLABUS

*It is the province of knowledge to speak and it is the privilege of wisdom to listen.*

- Oliver Wendell Holmes (1841 – 1935)

Instructor: Marius van der Merwe, Science Building, office no. 203

Email and phone: marius@dixie.edu, (435) 652-7924

Lecture room: SCI 109

Lecture sections: Mon, Tue, Wed, Fri, 12:00-12:50pm

Office hours: Mon 10am-12pm, Wed 10am-12pm, Fri 10am-11am. Or contact me to arrange for a different time.

Text: *Biology* by Campbell et al, 2010 (9<sup>th</sup> ed)

### Course Objectives

**General Education Objectives** (common to all life science courses at DSC):

- Students will explain and apply major concepts of a view of life, the cell, and the genetic basis of life.
- Students will demonstrate knowledge of the process of science including asking testable questions, using inductive and deductive reasoning in forming hypotheses and in making reliable predictions.
- Students will explain the methods of science, and distinguish among the natural sciences, liberal arts (humanities and fine arts, and social and behavioral sciences), and pseudoscience.
- Students will compute ratios, proportions, percentages, decimals, fractions, frequencies, and elementary statistics.

### Specific Course Objectives:

Upon successful completion of the assignments, laboratory, exams, and quizzes in this course, the student will:

- demonstrate the ability to reason scientifically,
- apply scientific methods in problem solving,
- create and critique experimental design,
- distinguish between true science and pseudoscience,
- describe the basic chemical composition of living organisms,
- relate chemical properties to physiological functions in living organisms,
- describe various cellular structures and their functions,
- follow the breakdown of a glucose molecule through metabolic pathways,
- have an understanding of photosynthesis and the production of energy-rich molecules,
- compare energy-acquiring and energy releasing pathways in metabolism,
- describe the movement of chromosomes during cell division (mitosis and meiosis),
- describe patterns of inheritance in Mendelian genetics,
- perform monohybrid and dihybrid genetic crosses,
- solve basic genetics and inheritance problems,
- describe the structure and function of DNA,
- describe the process by which genes are expressed as protein products,
- gain an insight into genetic engineering and associated ethical arguments,
- describe the processes of evolution, having gained a knowledge of basic genetics,
- realize that evolution is more than a powerful theory; evolution is a fact,
- describe the principles of population ecology and community interactions,

- build a strong basic foundation of biological principles in order to support more advanced concepts.

### **Exams**

There will be five exams in addition to a final comprehensive exam. Questions will be multiple choice. Each exam is worth 100 points. The final exam is worth 200 points. Exams will be taken in the class room during normal lecture time. Remember to bring along your own SCANTRON test forms (bluish-green Form No. 882-E) and No. 2 pencils with erasers for exams.

### **Disability Accommodations**

Students with medical, psychological, learning or other disabilities desiring reasonable academic adjustment, accommodations, or auxiliary aids to be successful in this class will need to contact the DISABILITY RESOURCE CENTER Coordinator (Baako Wahabu) for eligibility determination. Proper documentation of impairment is required in order to receive services or accommodations. DRC is located in the North Plaza Building. Visit or call 652-7516 to schedule appointment to discuss the process. DRC Coordinator determines eligibility for and authorizes the provision of services.

### **College resources**

Several college resources are available to help you succeed. Check out the links for each one to get more information.

If you need help understanding the content of your courses, go to the Tutoring Center located on the 4th floor of the Holland Centennial Commons in Room 431. You can visit them online at <http://dsc.dixie.edu/tutoring/>

If you need help writing papers, go to the Writing Center on the fourth floor of the Holland Centennial Commons in room 421. You can also visit them online at [http://new.dixie.edu/english/dsc\\_writing\\_center.php](http://new.dixie.edu/english/dsc_writing_center.php)

If you need to use a computer to do schoolwork on campus, go to the Smith Computer Center or in the Dixie College library on the second, mezzanine, or third floors of the HCC.

If you are assigned to take a test in the Testing Center, go to the North Plaza. You can get information on their website at <http://new.dixie.edu/testing/>

The Library has all kinds of information and resources. Visit the Dixie State College Library on the 2<sup>nd</sup>, and 3<sup>rd</sup> floors of the Holland Centennial Commons, or go to the library website at <http://library.dixie.edu/>

### **Attendance:**

Regular and prompt attendance in classes and laboratory sessions is expected of every Dixie State College student. Attendance requirements are established by each instructor and such requirements are enforced by the College. No absence excuses a student from completing work missed. It is the student's responsibility to find out which assignments will be missed. Attendance will be taken regularly. If you know that you must miss a class, it is your responsibility to discuss the matter with the instructor prior to that absence.

### **Classroom behavior policies:**

You are expected to be polite in the classroom, both to the instructor and your fellow classmates. Please refrain from unnecessary conversations with your neighbors. If you are observed to be disturbing your classmates, you will be asked to leave the room for the day.

The use of any form of electronic communication device (including but not limited to cell phones, pagers, and MP3 players) is strictly forbidden during class lectures, quizzes, and exams. In the event of a personal emergency that requires the use of such devices, you must get personal permission from the

instructor, keep all settings in silent mode (including keeping a vibrating phone or pager off of hard surfaces) and you must arrange to sit next to an aisle so that you may leave to take any incoming calls or messages.

Food or drink is allowed in lecture as long as it can be consumed quietly (ie. chips are probably a bad idea). If you leave any garbage behind, this privilege will immediately be rescinded for the entire class and points will be deducted from the responsible student's grade.

DSC policy prohibits bringing children to class as they are a disruption to the other students. Please try to find other arrangements.

**Academic Integrity (Cheating and Plagiarism):**

There is a zero-tolerance policy toward any form of cheating or plagiarism. If any student is observed cheating on any examination or quiz, the time and event will be noted and the student will receive no credit for that assignment. Please make things easier for you and the instructor and keep your eyes to yourself during exams and quizzes. If a second offense is committed by a student, s/he will be subjected to further disciplinary action (See "Code of Conduct," DSC Catalog or Student Handbook).

**DSC policy regarding Academic Discipline (policy #3-34):**

34.1 Cheating: Academic dishonesty in any form will not be tolerated at Dixie State College, including but not limited to plagiarism on written assignments, submitting other person's work as one's own, and cheating on exams or quizzes. Teachers at Dixie State College may discipline students proven guilty of academic dishonesty by:

34.1.1 Giving a failing grade on the specific assignment where dishonesty occurred,

34.1.2 Failing the student in the entire course,

34.1.3 Immediately dismissing and removing the student from the course, and/or

34.1.4 Referring the student to Student Affairs, a committee which may reprimand, place on probation, suspend, and/or expel the student.

34.2 Disruptive Behavior: Teachers at Dixie State College have the right to manage the classroom environment to ensure a good learning climate. Toward this end, teachers (or college security) may dismiss and remove disruptive students from individual class activities. If a student's behavior continues to disrupt class activities, the teacher may dismiss and cause the removal of disruptive students from their course.

34.3 Student Appeals: Students who believe themselves wrongfully disciplined may appeal those disciplinary actions through the standard grievance procedure. (Policy 5-35)

**Succeeding in this class:**

There is a great deal of material covered in this course for which you will be responsible. Because both concepts and vocabulary are important there are several tactics I tend to suggest to students. Flash cards can help with vocabulary (even the process of determining appropriate terms and making the cards helps) but are not sufficient to excel in the class. I strongly recommend that you read each chapter (before the topic is covered in lecture is ideal) and write a summary or outline of the information covered. I am more than happy to meet with you during office hours to go over any such summary you may have created in the week following the lectures on the chapter covered by your summary. When preparing for tests and exams make sure you start several days in advance and focus on the material as outlined in the PowerPoint lecture notes. Use your textbook when you need more detailed information and please come and see me during office hours for any additional help. PowerPoint files covering the lectures will be available on Canvas for printing.

I strongly recommend forming a study group that meets at regular hours. Asking questions and giving explanations in the context of a study group are both very valuable for an understanding and

retention of the material. It also provides a great opportunity to interact and socialize with your fellow students.

I know this is hard to do, but PLEASE do not wait until the last month of class if you are having problems with the material (or the day before the exam). Not only will you likely be competing with many of your classmates for my attention, but improving your grade in the class takes a semester of hard work.

Dixie State College has both a Tutoring and a Writing Center and I strongly encourage you to make use of these facilities (both are located in the Browning Learning Resource Center). For the **Tutoring Center** the hours are Mon-Thurs 9:00 am to 8:00 pm and Friday 9:00 am to 5:00 pm. The hours for the **Writing Center** are Mon-Fri 9:00 am to 5:00 pm daily.

### **Grades**

Grades are assigned based on the *test and exam scores*. The following percentage scale will be used:

93-100% = A (4.0)	73-76% = C (2.0)
90-92% = A- (3.7)	70-72% = C- (1.7)
87-89% = B+ (3.4)	67-69% = D+ (1.4)
83-86% = B (3.0)	63-66% = D (1.0)
80-82% = B- (2.7)	60-62% = D- (0.7)
77-79% = C+ (2.4)	59% or less = F (0)

***Grades are never curved.***

### **Extra credit**

There will be extra credit points built into each exam including the final. HOWEVER, there will be NO OTHER EXTRA CREDIT ALLOWED. This is to keep the course fair for all students and to not benefit those who might ask for additional assignments. Please do not ask me for additional extra credit as the answer will always be NO.

## Semester Schedule

Note: dates for lecture topics are tentative and subject to change, but **exam dates are set in stone.**

<b>Date</b>	<b>Day</b>	<b>Topic</b>	<b>Chapter Reading</b>
12 Jan	M	Syllabus and Course Introduction	
13 Jan	T	An Overview of Biology	Chapter 1
14 Jan	W	An Overview of Biology	Chapter 1
16 Jan	F	Biological Inquiry	Chapter 1
19 Jan	M	<b><i>Martin Luther King Day</i></b>	
20 Jan	T	<b>TBA</b>	
21 Jan	W	Biological Inquiry	Chapter 1
23 Jan	F	Basic Chemistry	Chapter 2
26 Jan	M	Basic Chemistry	Chapter 2
27 Jan	T	Water and pH	Chapter 2
28 Jan	W	Water and pH	Chapter 2
30 Jan	F	<b>Exam 1</b>	
2 Feb	M	Organic molecules	Chapter 3
3 Feb	T	Organic Molecules	Chapter 3
4 Feb	W	The Cell	Chapter 4
6 Feb	F	The Cell	Chapter 4
9 Feb	M	The Cell	Chapter 4
10 Feb	T	Membrane Structure and Function	Chapter 5
11 Feb	W	Membrane Structure and Function	Chapter 5
13 Feb	F	Membrane Structure and Function	Chapter 5
16 Feb	M	<b><i>President's Day</i></b>	
17 Feb	T	<b>TBA</b>	
18 Feb	W	<b>Exam 2</b>	
20 Feb	F	Energy and Metabolism	Chapter 6
23 Feb	M	Energy and Metabolism	Chapter 6
24 Feb	T	Energy and Metabolism	Chapter 6
25 Feb	W	Cellular Respiration	Chapter 7
27 Feb	F	Cellular Respiration	Chapter 7
2 Mar	M	Photosynthesis	Chapter 8
3 Mar	T	Photosynthesis	Chapter 8
4 Mar	W	<b>Exam 3</b>	
6 Mar	F	The Cell Cycle	Chapter 10
9 Mar	M	<b><i>Semester Break</i></b>	
10 Mar	T	<b><i>Semester Break</i></b>	
11 Mar	W	<b><i>Semester Break</i></b>	
13 Mar	F	<b><i>Semester Break</i></b>	
16 Mar	M	The Cell Cycle	Chapter 10
17 Mar	T	<b>TBA</b>	
18 Mar	W	Meiosis and Sexual Reproduction	Chapter 11
20 Mar	F	Meiosis and Sexual Reproduction	Chapter 11
23 Mar	M	Mendelian Inheritance	Chapter 12
24 Mar	T	Mendelian Inheritance	Chapter 12
25 Mar	W	<b>Exam 4</b>	
27 Mar	F	The Molecular Basis of Inheritance	Chapter 14
30 Mar	M	The Molecular Basis of Inheritance	Chapter 14
31 Mar	T	From Gene to Protein	Chapter 15
1 Apr	W	From Gene to Protein	Chapter 15
3 Apr	F	DNA Technology and Genomics	Chapters 17 & 18

6 Apr	M	DNA Technology and Genomics	Chapters 17 & 18
7 Apr	T	DNA Technology and Genomics	Chapters 17 & 18
8 Apr	W	<b>Exam 5</b>	
10 Apr	F	Descent with Modification: a Darwinian View of Life	Chapter 21
13 Apr	M	Descent with Modification: a Darwinian View of Life	Chapter 21
14 Apr	T	Descent with Modification: a Darwinian View of Life	Chapter 21
15 Apr	W	The Evolution of Populations	Chapter 20
17 Apr	F	The Evolution of Populations	Chapter 20
20 Apr	M	Speciation	Chapter 22
21 Apr	T	<b>TBA</b>	
22 Apr	W	Speciation	Chapter 22
24 Apr	F	Speciation	Chapter 22
27 Apr	M	An Introduction to Ecology and the Biosphere	Chapter 59
28 Apr	T	An Introduction to Ecology and the Biosphere	Chapter 59
29 Apr	W	An Introduction to Ecology and the Biosphere	Chapter 59
<b>Final Exam Wed, 6 May 12:30-2:30pm</b>		<b>Final Exams.</b> Penalty for missing the final exam is course failure. Final exams may not be taken early without permission from the dean of the college.	

**Important dates:**

Mon, Jan 12	Classes begin
Thurs, Jan 15	Last day for waitlist
Fri, Jan 16	Last day to add classes online
Mon, Jan 19	Martin Luther King Jr. Day (no classes)
Thurs, Jan 22	Drop/Audit fee begins (\$10 per class)
Thurs, Jan 22	Residency Application deadline
Tue, Jan 27	\$50 Late registration/payment fee
Mon, Feb 2	Spring 2015 Associate's Degree Graduation Application Deadline
Mon, Feb 2	Last day for refund
Mon, Feb 2	Pell Grant Census
Mon, Feb 2	Last day to drop without a "W" grade
Wed, Feb 4	Classes dropped for nonpayment
Fri, Feb 6	Last day to add/audit classes
Mon, Feb 16	President's Day (no classes)
<i>Tues, Feb 17</i>	<i>Spring Block classes start</i>
Mon, Mar 2	Summer 2015 Bachelor's Degree Graduation Application Deadline
Mon, Mar 2	Midterm grades due
Fri, Mar 6	Last day to drop individual classes
Mon-Fri Mar 9-13	Spring break (no classes)
Mon, Mar 23	Fall 2015 class schedule available online
Mon-Thurs Mar 23-26	Summer Registration Opens (seniors, juniors, sophomores, all students)
Wed, Apr 1	Fall 2015 Bachelor's Degree Graduation Application Deadline
Fri, Apr 10	Last day for complete withdrawal
Mon-Thurs, Apr 14-17	Fall Registration Opens (seniors, juniors, sophomores, all students)
Wed, Apr 29	Last day of classes
Thurs, Apr 30	Reading Day (no classes)
Fri, May 1	Summer 2015 Associate's Degree Graduation Application Deadline
Fri-Thurs May 1-7	Final Exams
Fri, May 8	Commencement
Mon-Fri, Dec 15-19	Final exams