Department: Life Sciences (Biology)

Introduction to Biology Fall 2015 Biol 1308 CRN# 76186	
Course location and times:	Online through HCCS Eagle Online 2.0
Course semester credit hours:	3 Semester Credit hours
Course contact hours:	48 hrs lecture
Course length:	16 weeks
Instruction type:	Online

Instructor:	Nicole Ducharme, Ph.D.
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Office location and hours:	By appointment only

COURSE DESCRIPTION:

Topics include basic chemistry, cell morphology and physiology, photosynthesis and respiration, cell division, and classical and molecular genetics.

COURSE PREREQUISITES:

College Level Reading as determined by SAT, ACT, TASP or successfully passing ENGL0305 with "C" or better.

COURSE GOALS:

This course is an introduction to biological chemistry, biological processes, cellular morphology, metabolism, heredity, and molecular genetics.

PROGRAM LEARNING OUTCOMES

Program SLO #1: To recognize, identify, and describe the basic structures and functions associated with most life forms.
Program SLO #2: To develop basic laboratory techniques appropriate to the field of Biology.
Program SLO #3: To develop study skills and habits appropriate for pre-professional students interested in health-related fields.

COURSE STUDENT LEARNING OUTCOMES

1. Describe scientific terminology and learn accurate use of them in living organisms
2. Define principles of living organisms including physical and chemical properties of life.
3. Understand function at the level of molecules and cells, to include biological macromolecules, cellular organization, communication, and cell division.
4. Understand energy transformations and the metabolic reactions associated with cellular activities, such as the processes of glycolysis, fermentation, cellular respiration, and photosynthesis.

5. Explain the molecular sequence of events involved in the flow and expression of genetic information in prokaryotic and eukaryotic cells, with special emphasis on the understanding of DNA replication, RNA transcription, and protein biosynthesis and mutation.
6. Understand basic knowledge of Mendelian genetics, perform and interpret genetic problems. Describe advances made in the understanding of genes and chromosomes since Mendel.
7. Apply scientific method of asking a question, developing and testing hypothesis by experiments, collecting and writing organized reports. Develop critical thinking and distinguish theory from a hypothesis.

LEARNING OBJECTIVES

1. Consistently able to demonstrate knowledge of scientific terminology, and its complete use in living organisms
2. Consistently able to demonstrate knowledge of principles of living organisms and complete knowledge of physical and chemical properties of life.
3. Able to explain the function at the level of molecules and cells, to include biological macromolecules, cellular organization, communication, and cell division.
4. Able to explain and apply the knowledge of energy transformations
5. Able to explain the metabolic reactions associated with cellular activities, such as the processes of glycolysis, fermentation, cellular respiration, and photosynthesis.
6. Consistently able to explain the molecular sequence of events involved in the flow and expression of genetic information in prokaryotic and eukaryotic cells
7. Able to explain the process of DNA replication and RNA transcription, protein biosynthesis and mutation.
8. Consistently demonstrates knowledge of Mendelian genetics
9. 100% proficiency in performing and interpretation of genetic problems.
10. Able to describe advances made in the understanding of genes and chromosomes since Mendel.
11. Consistently differentiates between appropriate and inappropriate experimental design. Takes appropriate steps or explains appropriate steps independently and correctly.
12. Is able to distinguish theory from hypothesis on their own.

INSTRUCTOR SPECIFIC COURSE STUDENT LEARNING OUTCOMES:

After completing this course, students generally will be able to

1. Initiate, understand, assess, and assume responsibility for one's own ongoing learning process.
2. Access, assess and use learning resources effectively.
3. Clarify personal values, purposes and goals
4. Understand and respect differences

After completing this course, students specifically will be able to

5. Analyze how biology class relates to their own personal goals and/or major as well as their personal life
6. Describe the basic components of life including cell structure, function and reproduction, respiration, and photosynthesis.
7. Explain the "central dogma" of cell biology.
8. Solve Mendelian genetics problems and relate the concepts to their own families
9. Summarize how technology is impacting the availability of personal biological data and determine their personal stance on utilizing such information.

Successful completion of this course should provide the student with a good introduction to biological sciences and a grasp of biological principles. This will allow them to function as knowledgeable and

informed citizens in a society that demands a greater sophistication in the modern sciences, particularly as they pertain to molecular technology, forensic and judiciary matters, environmental, and medical issues.

Intro Bio Tentative Course Calendar (FALL 2015):
All items are due at 11:55PM unless otherwise noted

Week	Chapter/Due date	Related Activities	Points
0	**Syllabus Quiz Must be passed to access course!**		8
1	**Chapter 1: Introduction**	Plagiarism Quiz	12
	August 30	Introduction	10
		Chapter quiz	10
2	**Chapter 2: Chemistry**	Chapter quiz	10
	September 6	Electron Orbitals	15
		Chemical Bonds	15
3	**Chapter 3: Molecules of Life**	Chapter quiz	10
	September 13	Biological Molecules	16
	Exam 1 (ch 1-3) Due	**September 16**	60
4	**Chapter 4: Tour of the cell**	Chapter quiz	10
	September 20	Cell Simile	36
5	**Chapter 5: Working cell (Energy, enzymes and membranes)**	Chapter quiz	10
	September 27	Enzymes	40
6	**Chapter 6: Cellular Respiration**	Chapter quiz	10
	October 4		
7	**Chapter 7: Photosynthesis**	Chapter quiz	10
	October 11	Website	20
	Exam 2 (ch 4-7) Due	**October 14**	70
8	**Chapter 8: Mitosis and Meiosis**	Chapter quiz	10
	October 18	Website	20
9	**Chapter 9: Inheritance (Mendel, linked, sex)**	Chapter quiz	10
	October 25	Genetics Modules	60
	Last day to withdraw	**October 30**	
10	**Chapter 10: Structure and Function of DNA**	Chapter quiz	10
	November 1	Module	15
	Exam 3 (ch 8-10) Due	**November 4**	60
11	**Chapter 11: Gene Regulation (and cancer)**	Chapter quiz	10
	November 8	HeLa Cells	32
		Faroe Islands	30

12	**Chapter 12: DNA Technology** **November 15**	Chapter quiz Virtual Labs Genetic Profile	10 30 30
13	**Chapter 13: Evolution** **November 22**	Chapter quiz Evolution in TX What do I believe	10 40
13	**Thanksgiving Week November 23-**	**November 29**	
14	**Exam 4 (ch 11-13) Due**	**December 2**	60
15	**December 4 - December 6**	Final Exam	200
			1001

Note that your instructor reserves the right to change the schedule as needed at any point during the course.

INSTRUCTION METHODS:

HCCS Eagle Online will be utilized this course and students are expected to log onto Eagle at least weekly. Students will read assigned pages in textbook and view available Animations/videos.

Student Assignments:	Students are required to read assigned chapters, participate in discussions, complete assignments and complete chapter quizzes.
Student Assessments:	Students will be assessed via substantive participation in discussions, completion of assignments, chapter quizzes, lecture exams and a comprehensive final.

INSTRUCTOR REQUIREMENTS

You are spending a good deal of time, energy and money on this course – please, make the most of your investment! It takes approximately **3 hours of study time for each hour of class time to master the material**. This class will have the equivalent of 48 lecture hours (3 hr. credit)

The **class and study time necessary to succeed in this class will be around 192 hours (12 hours per week for a regular start course)!**

Attendance Policy

HCCS instructors are required to submit attendance. For DE classes, one report is submitted on the day of record. If I do not receive any kind of contact through Eagle from you either by submitting the first assignment, participating in the first discussion or taking the first quiz, you will be counted absent and you will be automatically dropped from the class. **After that you can still be dropped if you miss two weeks' worth of work with no communication.**

HCC Policy Statement: Internet Outage Policy

If your professor experiences an Internet service outage or a power outage that significantly affects the timing of distributing on-line assignments, or in any way appreciably hinders the professor in communicating with students, adjustments to due dates and/or grades will be made appropriately. If there is any official notification from HCCS concerning downtime of the Eagle Internet course server that

would affect distributing assignments, or in any way appreciably hinders the professor in communicating with students, adjustments to due dates and/or grades will be made appropriately. This policy pertains only to the professor's INTERNET SERVICE or to HCCS's Internet course servers, not the students' computers or Internet access. No one at HCCS can monitor or verify outages at student sites and student access is not the responsibility of HCCS. Students are responsible for making sure that they have continuous, reliable Internet access in order to complete this course.

DEPARTMENT GUIDELINES:

Students are expected to conduct themselves as adults. This includes courteous and respectful behavior towards instructor and classmates. Disruptive behavior or any behavior that interferes with any educational activity being performed by the instructor will not be allowed. Additionally, no student may interfere with his/her fellow students' right to pursue their academic goals to the fullest in an atmosphere appropriate to a community of scholars. Disruptive behavior may result in removal from the class.

BASIC REQUIREMENTS

HCC Grading Scale:	A = 100 – 90	4 points per semester hour
	B = 89 – 80	3 points per semester hour
	C = 79 – 70	2 points per semester hour
	D = 69 – 60	1 point per semester hour
	59 and below = F	0 points per semester hour
	IP (In Progress)	0 points per semester hour
	W(Withdrawn)	0 points per semester hour
	I (Incomplete)	0 points per semester hour
	AUD (Audit)	0 points per semester hour
	IP (In Progress) is given only in certain developmental courses. The student must re-enroll to receive credit. COM (Completed) is given in non-credit and continuing education courses. To compute grade point average (GPA), divide the total grade points by the total number of semester hours attempted. The grades "IP," "COM" and "I" do not affect GPA.	

GRADE CALCULATION

Chapter quizzes (10 pts/chapter * 13 chapters)	130
Discussions/Assignments	420
Chapter Exams	250
Final Exam	200
Extra Credit	Up to 50 points
Final Score	1000

CHAPTER QUIZZES

Quizzes will be posted on Eagle and occur as posted in the schedule. They will serve as a way to ensure that you are learning the material and keeping up with the course content.

CLASS DISCUSSIONS

Most chapters will have an associated discussion topic. Students are required to post their answers for the group to see. Often, you will be asked to comment on the work of others.

ASSIGNMENTS

Often, the best way to learn something is to apply it to your own life. Therefore, we will have a variety of assignments that ask you to think about how the topics we are studying impact your life.

UNIT EXAMS

There will be five unit exams that ask you to apply what we have learned. Most often, this will take the form of applying what we have learned to experimental designs and critical thinking.

FINAL EXAM

A comprehensive departmental final examination will be given.

EXTRA CREDIT

Opportunities for extra credit will be available throughout the semester to boost your grade up to half of a letter grade (50 points).

Instructional Materials:	Textbook: Essential Biology with Physiology by Simon, 3rd edition, 2010, Custom Edition for HCC Web resources: Eagle Online

DISTANCE EDUCATION RESOURCES

The Distance Education Student Handbook contains policies and procedures unique to the DE student. Students should have reviewed the handbook as part of the mandatory orientation. It is the student's responsibility to be familiar with the handbook's contents. The handbook contains valuable information, answers, and resources, such as DE contacts, policies and procedures (how to drop, attendance requirements, etc.), student services (ADA, financial aid, degree planning, etc.), course information, testing procedures, technical support, and academic calendars. Refer to the DE Student Handbook by visiting this link: http://de.hccs.edu/de/de-student-handbook

VIRTUAL CLASSROOM CONDUCT

As with on-campus classes, all students in HCC Distance Education courses are required to follow all HCC Policies & Procedures, the Student Code of Conduct, the Student Handbook, and relevant sections of the Texas Education Code when interacting and communicating in a virtual classroom with your professor and fellow students. Students who violate these policies and guidelines will be subject to disciplinary action that could include denial of access to course-related email, discussion groups, and chat rooms or even removal from the class.

The following Student Learning Outcomes with their associated assessment criteria are not meant to be all inclusive, and are meant to be used along with all other course learning outcomes and assessment devices, listed under Course Objectives, in the determination of the student's final course grade. Completion of the specific Student Learning Outcomes listed below, at any assessment grading level, does NOT and will NOT guarantee the student that final course grade at the end of the semester!

ASSESSMENT RUBRICS
INTRODUCTORY BIOLOGY I - BIOLOGY 1308

Performance Factors	Rating Scale				
	F	D	C	B	A
1. Describe scientific terminology and learn accurate use of them in living organisms	Unable to demonstrate knowledge of scientific terminology and its use in living organisms.	Occasionally able to demonstrate knowledge of scientific terminology, unable to demonstrate its use in living organisms.	Occasionally able to demonstrate knowledge of scientific terminology, and its partial use in living organisms.	Consistently able to demonstrate knowledge of scientific terminology, and its partial use in living organisms	Consistently able to demonstrate knowledge of scientific terminology, and its complete use in living organisms
2. Define principles of living organisms including physical and chemical properties of life.	Unable to demonstrate knowledge of principles of living organisms including physical and chemical properties of life.	Occasionally able to demonstrate knowledge of principles of living organisms, unable to demonstrate physical and chemical properties of life.	Occasionally able to demonstrate knowledge of principles of living organisms and physical and chemical properties of life.	Consistently able to demonstrate knowledge of principles of living organisms and partial knowledge of physical and chemical properties of life.	Consistently able to demonstrate knowledge of principles of living organisms and complete knowledge of physical and chemical properties of life.
3. Understand function at the level of molecules and cells, to include biological macromolecules, cellular organization, communication, and cell division. Understand energy transformations and the metabolic reactions associated with cellular activities, such as the processes of	Unable to explain function at the level of biological macromolecule and cell. Unable to understand energy transformations and the metabolic reactions associated with cellular activities.	Able to explain function at the level of biological macromolecule, Able to explain the cellular organization , but not function Unable to explain cell division. Unable to explain energy transformations Unable to explain the	Able to explain function at the level of biological macromolecule, Able to explain the cellular organization and function of cell components Able to explain cell division. Unable to explain energy	Able to explain the function at the level of molecules and cells, to include biological macromolecules, cellular organization, communication, and cell division. Able to explain energy transformations. Unable to explain the metabolic reactions associated with cellular	Able to explain the function at the level of molecules and cells, to include biological macromolecules, cellular organization, communication, and cell division. Able to explain and apply the knowledge of energy transformations Able to explain the metabolic reactions

glycolysis, fermentation, cellular respiration, and photosynthesis.		metabolic reactions associated with cellular activities.	transformations Unable to explain the metabolic reactions associated with cellular activities.	activities, such as the processes of glycolysis, fermentation, cellular respiration, and photosynthesis.	associated with cellular activities, such as the processes of glycolysis, fermentation, cellular respiration, and photosynthesis.
4. Explain the molecular sequence of events involved in the flow and expression of genetic information in prokaryotic and eukaryotic cells, with special emphasis on the understanding of DNA replication, RNA transcription, protein biosynthesis and mutation.	Unable to explain the molecular sequence of events involved in the flow and expression of genetic information in prokaryotic and eukaryotic cells, with special emphasis on the understanding of DNA replication, RNA transcription, protein biosynthesis and mutation.	Able to explain the molecular sequence of events involved in the flow and expression of genetic information in prokaryotic and eukaryotic cells Able to explain the process of DNA replication Unable to explain RNA transcription, protein biosynthesis and mutation.	Able to explain the molecular sequence of events involved in the flow and expression of genetic information in prokaryotic and eukaryotic cells Able to explain the process of DNA replication and RNA transcription. Unable to demonstrate protein biosynthesis and mutation.	Able to explain the molecular sequence of events involved in the flow and expression of genetic information in prokaryotic and eukaryotic cells Able to explain the process of DNA replication and RNA transcription Able to demonstrate partial knowledge of protein biosynthesis and mutation.	Consistently able to explain the molecular sequence of events involved in the flow and expression of genetic information in prokaryotic and eukaryotic cells Able to explain the process of DNA replication and RNA transcription, protein biosynthesis and mutation.
5. Understand basic knowledge of Mendelian genetics, perform and interpret genetic problems. Describe advances made in the understanding of genes and chromosomes since Mendel.	Unable to demonstrate basic knowledge of Mendelian genetics, Unable to perform and interpret genetic problems. Unable to describe advances made in the understanding of genes and chromosomes since	Able to demonstrate basic knowledge of Mendelian genetics, Unable to perform and interpret genetic problems. Unable to describe advances made in the understanding of genes and chromosomes since	Able to demonstrate basic knowledge of Mendelian genetics, Less than 50% proficiency in performing and interpretation of genetic problems. Able to describe advances made in the	Consistently demonstrates knowledge of Mendelian genetics, 80% proficiency in performing and interpretation of genetic problems. Able to describe advances made in the	Consistently demonstrates knowledge of Mendelian genetics, 100% proficiency in performing and interpretation of genetic problems. Able to describe advances made in the understanding of genes and

	Mendel.	Mendel.	understanding of genes and chromosomes since Mendel.	understanding of genes and chromosomes since Mendel.	chromosomes since Mendel.
6. Apply scientific method of asking a question, developing and testing hypothesis by experiments, collecting and writing organized reports. Develop critical thinking and distinguish theory from a hypothesis.	Consistently cannot differentiate between appropriate and inappropriate experimental design, in practice or by scenario.	Occasionally differentiates between appropriate and inappropriate experimental design, but needs direction to proceed to next step.	Consistently differentiates between appropriate and inappropriate experimental design, but needs direction to proceed to next step.	Consistently differentiates between appropriate and inappropriate experimental design. Attempts to perform some appropriate corrective action or explain some appropriate action; needs some assistance from instructor.	Consistently differentiates between appropriate and inappropriate experimental design. Takes appropriate steps or explains appropriate steps independently and correctly. Is able to distinguish theory from hypothesis on their own.