

BIOL 3301: CELLULAR AND MOLECULAR BIOLOGY

Fall Semester, 2014

Biology Department, Dr. Jacqueline Horn, Department Chair

COURSE DESCRIPTION

This course is required of all biology majors. Topics include; biological chemistry, cellular structure and function, energy transformations, DNA, RNA, and protein synthesis.

COURSE SEQUENCE IN CURRICULUM

This is a required advanced level course in biology and is a prerequisite to all other advanced Biology courses.

PRE-REQUISITE INFORMATION

BIOL 2454, BIOL 2455 and CHEM 2415

INSTRUCTOR INFORMATION

Name: Dr. Jackie Horn
E-mail: jhorn@hbu.edu
Office Phone: 281-649-3497
Office Location: S223
Office Hours: Please email jhorn@hbu.edu to schedule an appointment.
Web Page Address, Web Board, ListServ: Blackboard will be the official means for out-of-class communication. You are expected to access Blackboard at least two times each week. Emails regarding class will be sent through Blackboard. It is important that you forward Blackboard emails to the email address that you most often check so that you will be apprised of assignments and changes to class assignments and activities.

LEARNING RESOURCES

Course Text: *Becker's World of the Cell, Eighth Edition*. Hardin et. al., Pearson (Benjamin Cummings), San Francisco, 2012. ISBN: 978-0-321-71602-6
Laboratory Text: None
Supplementary Text: DVD-ROM study guide for text may be helpful.
Other Required Materials: Additional materials may be required and will be announced on Blackboard and through emails. You are responsible for staying current with these communication modes.

COURSE OBJECTIVES

Purpose of the course:

To provide students with a knowledge of the structure and functions of living cells. Topics include cell structure and function, biochemistry, and energetics. Nucleic acid structure and function will also be discussed.

Aims for the course:

To help students attain a depth of knowledge in biology.

On completion of this course, students should be able to:

1. have an appreciation of the historical development of cell biology
2. know the structure of prokaryotic and eukaryotic cells
3. know the function of all cellular organelles, with particular emphasis on the plasma membrane
4. know the basic structures and functions of the major classes of biological molecules
5. know the energy producing pathways found in plant and animal cells
6. know the details of DNA replication, transcription, translation, and gene regulation
7. know the processes of meiosis and mitosis

RELATION TO DEPARTMENTAL GOALS AND PURPOSES

“The Biology Department will:”

“...prepare students for their careers by offering biology courses with an academically rigorous, contemporary curriculum to support their major requirements or liberal arts education and to encourage a lifetime of learning.”

“...offer experiences for undergraduate research in the biological sciences that provide the opportunity to develop professionalism and skills in experimentation and data analysis, interpretation, and presentation.”

“...provide mentoring and experiences that enable students to graduate in an appropriate time with the appropriate qualifications and professional attitudes required for success and service.”

“...provide a Christian environment in which students, faculty and staff integrate the principles of the biological sciences with their faith.”

RELATION TO COLLEGE GOALS AND PURPOSES

“...to prepare students for careers and further education in the natural sciences and mathematics in a nurturing Christian environment. The College will also serve the HBU community by providing science and mathematics classes that empower HBU students to meet the goals and requirements of their field of study and enrich their liberal arts education.”

RELATION TO THE PURPOSE STATEMENT OF THE UNIVERSITY

University mission and purpose statement from the Houston Baptist University Catalog, 2009-2010: “...to provide a learning experience that instills in students a passion for academic, spiritual, and professional excellence as a result of our central confession, “Jesus Christ is Lord”

“...Committed to providing a responsible and intellectually stimulating environment that:

- fosters spiritual maturity, strength of character, and moral virtue as the foundation for successful living
- develops professional behaviors and personal characteristics for life-long learning and service to God and to the community
- meets the changing needs of the community and society
- remains faithful to the ‘**Nature of the Institution**’ statement”

“...Promotes learning, scholarship, creative endeavor, and service”.

ATTENDANCE

Please see the official Attendance Policy in the HBU Classroom Policy on Blackboard. Students missing more than 25% of the class will be given a failing grade.

ACADEMIC ACCOMODATIONS

Students needing learning accommodations should inform the professor immediately and consult the Academic Accommodations section of the HBU Classroom Policy posted on Blackboard.

COURSE REQUIREMENTS & GRADE SCALE

Course requirements:

Please note: An excused absence should be announced in advance and will be approved for University business only. Attendance will be taken at the beginning of class. Any student who is not in class at the beginning when attendance is taken will be recorded as absent for that day.

The students will be given four lecture examinations and a comprehensive final examination. Students will also complete assignments, quizzes, and/or other assessments.

Grading standards:

Ninety percent (90%) of the final grade will be the average of the five exams. Assignments, quizzes and other assessment (A/Q) will comprise 10% of the final grade.

Exam 1	Sept 18	18%
Exam 2	Oct 14	18%
Exam 3	Nov 6	18%
Exam 4	Dec 4	18%
Final Exam	Dec 9, 10:30 am	18%
A/Q assessments	anytime	10%
		100%

The grading scale is as follows:

A = 90 – 100; B = 80 – 89.99; C = 70 – 79.99; D = 60 – 69.99;
F = below 60.

PROFICIENCIES:

Technology component:

On occasion, students will be asked to access internet sites to read about current events in science. Students will also use HBU's Blackboard site to receive information concerning this course and to access and deliver assignments. Additional materials will be announced on Blackboard and through emails. The student is responsible for staying current with these communication modes.

Designated essay/writing component:

Blackboard assignments and exams will include short discussion questions.

Reading component:

Students are expected to read the textbook in order to supplement, reinforce, and review the lecture material.

Oral communication component:

Students are expected to discuss topics and ask questions to clarify topics.

Mathematics component:

Students will interpret tables and graphs.

Critical thinking component:

Assignments and exam questions will rely on critical thinking skills.

LATE WORK & TEST POLICY

Late work:

Missing a class will be the responsibility of the student. The student must get notes from other students or arrange to have the lecture recorded. Ten points are subtracted if the assignment is 1 minute to 24 hours late. Ten points is subtracted for each 24 hours that an assignment is late. Remember, an in-class A/Q assessment can NOT be made-up; you must be in class to participate in these “Unscheduled” grading opportunities.

Missed tests:

A make-up exam will be given to those with an excused absence because of university obligations or a medical absence where documentation is required from a physician. The instructor is the sole determiner of an acceptable excuse. Only one make-up exam will be given per student. Other missed exams will be recorded as a zero.

EVALUATION

Method of student appraisal of faculty:

Students will be given an opportunity to appraise the professor by completing the IDEA Faculty Evaluation Questionnaire, and/or the COSM course evaluation at the end of the semester. The instructor, the department chairman and dean will review the responses of the students after the completion of the course.

Method of evaluating student response to course:

Students will be given an opportunity to describe their response to the course by completing the IDEA Faculty Evaluation Questionnaire and/or the COSM course Evaluation at the end of the course. The instructor, the department chairman and dean will review the responses of the students after the completion of the course.

LABORATORY DRESS CODE

Students may be asked in advance to wear closed-toed shoes and long pants during certain experimental procedures.

LABORATORY CONDUCT AND SAFETY

There is no laboratory section of this course as part of course requirements at this time.

TOPICAL OUTLINE - include table, calendar, or topical outline with dates

Lecture Outline:

	Date	Lecture Topic	Text Chapter(s)
Week 1	Aug	Chemistry of the Cell	2
	26, 28	Biomolecules	3
		Protein Structure	3
Week 2	Sept	Bacteria and Archaea Cells	4
	2, 4	Eukaryotic Cells	4
		Chemical Nature of DNA	18
Week 3	Sept 1	LABOR DAY	NO CLASS
	Sept	DNA Structure and Organization and Packaging	18
	9, 11	Nucleus	18
Week 4	Sept 16	Cell Cycle	19
	Sept 18	EXAM 1	2,3,4,18
Week 5	Sept	Mitosis, Meiosis	19, 20
	23, 25, 30	DNA Replication	19
		DNA Damage and Repair, Apoptosis	19
Week 6	Oct	DNA Transcription	21
	2, 7	Protein Synthesis	22
		Posttranslational Modifications	22
Week 7	Oct	Bacterial Gene Regulation	23
	9	Eukaryotic Gene Expression	23
		Eukaryotic Gene Expression	23
Week 8			
	Oct 14	EXAM 2	19,20,21,22,23
	Oct 16	Bioenergetics	5
Week 9	Oct	Enzymes	6
	21, 23	Chemotrophic Energy Metabolism	9
		Glycolysis and Fermentation	9
Week 10	Oct	Aerobic Respiration:TCA Cycle	10
	28, 30	Aerobic Respiration:Electron Transport System	10
		Chloroplasts and Light Harvesting	11

Last Date to Drop with a "W" is 11/1				
Week 11		Nov 4	NADPH Synthesis and ATP Synthesis	11
			Calvin Cycle and Carbohydrate Synthesis	11
Week 12		Nov 6	EXAM 3	5,6,9,10,11
			Membrane Function	7
			Membrane Structure	7
Week 13		Nov	Cells and Transport Process and Simple Diffusion	8
		11, 13	Cell Transport	8
			Cell Transport	8
Week 14		Nov 18, 20, 25	G Protein-Linked Receptors	14
			Protein Kinase-Associated Receptors	14
		Nov 27	THANKSGIVING	NO CLASS
Week 15		Dec 2	Cytoskeleton	15
			Cell-Cell Junctions/ECM	17
		Dec 4	EXAM 4	7,8,14,15,17
COMPREHENSIVE FINAL EXAM ????? Dec 9,10:30 am??? tentative				

The content of this outline and the attached schedule are subject to change at the discretion of the professor.

Student Signature – I have read and understand the syllabus for this class. I understand that the content of this syllabus and the topical outline are subject to change at the discretion of the professor. I have read and understand the HBU Classroom Policy posted on Black Board. **I promise to uphold the Code of Academic Integrity at Houston Baptist University and will not tolerate its violation by others.**