

Cellular Mechanisms and Integrated Systems I

IBGS 511 Syllabus, Fall Quarter, 2012

Time: M-Th 2:00 – 4:00, {except Sep 24: 2:00 – 3:00, due to Orientation}
Lecture Room: Mortensen Amphitheater, {except Oct 9, Oct 22 & Dec 3: Alumni 138}
Exam Room: Oct 15th, Nov 12th, Dec 10th, 12:00-4:00pm, Mortensen Amphitheater
Study Room: Alumni 138, most afternoons

Course Coordinator: Danilo Boskovic

Instructors:

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Textbooks:

1. Voet and Voet. Biochemistry, 4th Edition, 2011. John Wiley & Sons.
ISBN: 978-0470-57095, 978-0470-91745;
Special! Bundled with solutions manual: 978-047-013-693-5.
A comparable biochemistry textbook is an acceptable alternative.

2. Alberts, Johnson, Lewis, Raff, Roberts and Walter. Molecular Biology of the Cell, 5th Edition, 2008. Garland Science, Taylor and Francis Group. ISBN 0-8153-4105-9
Alberts' Molecular Biology is also used extensively for IBGS512 and IBGS513.

Canvas

The official copy of the syllabus can be found on Canvas (<http://lluonline.llu.edu/>). You should regularly check the Canvas course site for IBGS511 to obtain the latest announcements and electronic versions of lecture presentations.

Important Dates:

September 24 – First day of class
October 15 – Exam 1
November 12 – Exam 2
December 10 – Exam 3

Prerequisites

Undergraduate level general biology, general chemistry, organic chemistry and general physics are required prerequisites. Upper-division course work in chemistry and/or biology courses is also expected and may include biochemistry, cell biology, or analytical chemistry.

Objectives:

This course aims to provide graduate students with the foundation concepts and techniques of biochemistry used in biomedical research. The content will focus on the biochemistry and molecular biology of both prokaryotic and eukaryotic organisms. The faculty will present lectures from the primary literature; these lectures will facilitate student study of the relevant literature as well as provide students insights into current research problems. Students are expected to read the primary literature in addition to their textbooks, attend lectures, and ask questions during lectures when appropriate.

Tests and Grading:

Educational success will be assessed by grades earned in weekly multiple-choice quizzes (35%) and 3 written examinations (65%) (content mastery as well as problem-solving, data analysis and communication skills).

Weekly quizzes will be given at beginning of the Monday class. Three written tests are scheduled: **Test 1 (October 15), Test 2 (November 12) and Test 3 (December 10)**. Each written examination will last 4 hours. Tests will consist of essay/problem solving questions.

The grades for each exam will be worth 21.6% of the final grade. **A final course average of greater than 70% is required to receive a grade "B" or better.**

It is course policy that the questions for examinations are to be returned to the course coordinator following the examination. The questions can be viewed by arrangement with the course coordinator.

Make-up or Missed Exams:

Missed monday quizzes will not be available for makeup. Two lowest quiz scores, however, will be dropped. If one of the three written tests cannot be taken when scheduled due to special circumstances, permission must be obtained from the course coordinator **prior** to that date. Accommodations for sudden illnesses or other unforeseeable events that precluded obtaining prior permission must be presented to the course director with written documentation such as a doctor's note. **If the test is missed without obtaining prior permission, a grade of "0" will be assigned.**

Lifelong Learning:

This course, a requirement for Ph. D. degrees in Anatomy, Biochemistry, Microbiology, Pharmacology and Physiology and MS degrees in Biochemistry, Microbiology, Pharmacology and Physiology, is intended to serve as a gateway into professions based on basic and applied biomedical sciences. Such professions will require continual learning. A number of professional organizations that may be of interest include the American Chemical Society, the American Association for the Advancement of Science, the American Association for Cancer Research, and the American Society for Microbiology. A wide variety of scientific publications, most accessible through PubMed (<http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?db=PubMed>), are also important tools for maintaining professional currency.

Recommended Class Preparation and Follow-up:

Readings from the textbooks or other materials may be assigned for each class, and students will be held responsible for the assigned material before attending class. It is also expected that students, following a class, will specifically look for additional supporting information in textbooks as well as in current scientific literature.

Academic Integrity:

The scientific enterprise is highly dependent on the integrity and reliability of each of its components. Therefore, understanding and practicing scientific and academic integrity is

essential for students at each phase of their education. Acts of dishonesty including theft, plagiarism, giving or obtaining information in examinations or other academic exercises, or knowingly giving false information are unacceptable. With regards to this class, examinations are the responsibility of each individual student, and by turning in such an examination, the student is representing that piece of work as having been completed by himself or herself. If other sources are used for any assignments or examinations, they must be clearly identified by accepted referencing practices. **Substantiated violations will generally result in a score of zero for the affected examination, assignment, etc. and may also result in a failing grade for the entire course. Violations are also taken to the dean for further disciplinary action. Such action may include, but is not limited to, academic probation or dismissal from the program.** To view the Standards of Academic Conduct Policy please visit: <http://www.llu.edu/central/handbook/index.page>.

Attendance Policy:

Attendance is expected. Students will be responsible for all material covered in the lectures as well as any reading material assigned. It is the responsibility of students to be aware of any announcements that may be made in class as well as to obtain any handouts that are distributed during class.

Americans with Disabilities Act (ADA) Policy:

If you are an individual with a certifiable disability and need to make a request for reasonable accommodation to fully participate in this class, please visit the Dean's Office of the School of Medicine. To view the Disability Accommodation Policy please go to: <http://www.llu.edu/central/handbook/index.page>. **Students with learning difficulties requesting modifications to the standard testing outlined in this syllabus must submit written approval for the requested accommodations to the course director a minimum of 1 week prior to the first examination.**

Protected Health Information:

The purpose of the Protected Health Information (PHI) policy is to provide guidance and establish clear expectations for students regarding the appropriate access to and use of PHI during course studies and related program activities. Under the Health Insurance Portability and Accountability Act (HIPAA), patient health information is protected. For further information, please go to: <http://www.llu.edu/central/students/index.page>.

Flexibility:

The course syllabus provides a general plan for the course; deviations may be necessary. If it becomes necessary to alter the dates for the exams or the material covered in these exams, the changes will be announced in class as early as possible. **The course director is the final arbiter and reserves the right to make the final decision when situations not described in this syllabus arise.** Students are strongly advised to contact the course director for clarification before unusual circumstances occur.

Course and Lecturer Evaluation:

Each student will be given the opportunity to anonymously evaluate the course as well as the lecturer(s). An honest evaluation is expected. Evaluations will be collected digitally so please watch for a link through Canvas or your LLU email account and complete all evaluations in a timely manner. Your input is valuable in maintaining a quality learning experience. Please treat such evaluations with the professional consideration they deserve.

IBGS511 2012 Lecture Schedule

Date	Lecture Title	Lecturer
	Biochemistry of Proteins and membranes	
9/24	Introduction to Cellular and Molecular Integrated Systems	Boskovic
9/25	The Living World	Boskovic
9/26	Water, pH Determinations, Henderson-Hasselbach	Boskovic
9/27	Amino Acids, Peptides, Protein Chemistry	Boskovic
10/01	Protein Sequence	Boskovic
10/02	Thermodynamics & Equilibria	Boskovic
10/03	Kinetics and Mechanisms of Enzyme Action	Boskovic
10/04	Kinetics and Mechanisms II	Boskovic
10/08	Hemoglobin Function	Boskovic
10/09	No lecture – time to study for Test 1	
10/10	Membrane structure and properties	Johnson
10/11	Membrane transport	Johnson
10/15	Examination I	
10/16	Protein Purification	Boskovic
10/17	Hemostasis and Fibrinolysis I	Boskovic
10/18	Hemostasis and Fibrinolysis II	Boskovic
10/22	Protein Transport I	Soto
10/23	Protein Transport II	Soto
	Cellular Metabolism	
10/24	Thermodynamics and Kinetics of Metabolism	Boskovic
10/25	Metabolic Energy	Boskovic
10/29	Regulation of carbohydrate metabolism	Wilcox
10/30	Regulation of blood glucose	Wilcox
10/31	Regulation of lipid metabolism and energy storage	Wilcox
11/01	Cholesterol and the Steroid Hormones	Wilcox
11/05	Amino Acid and Ammonia Metabolism	Boskovic
11/06	Phase I & II Drug Metabolism	Brantley
11/07	Nucleic acid metabolism	Neidigh
11/08	No lecture – time to study for Test 2	
11/12	Examination II	

	DNA Structure and Modification	
11/13	Structure and replication of DNA	Soto
11/14	PCR	Soto
11/15	Cloning, Genetic Knockouts/Knockins	Soto
11/19	DNA Damage - mechanisms	Boskovic
11/20	DNA Damage – repair pathways	Boskovic
11/21	Thanksgiving Break	
11/22	Thanksgiving Break	
	Cellular Protein Synthesis	
11/26	Introduction to Transcription	Wall
11/27	RNA Processing and splicing	Wall
11/28	Inhibitory RNAs	Wall
11/29	Protein synthesis (Translation Mechanisms)	Casiano
12/03	Protein Degradation/Disposal	D-Hughes
12/04	Drugs to modify protein synthesis/degradation	Brantley
12/05	The Human Genome	Boskovic
12/06	Review and Course Evaluation	Boskovic
12/10	Examination III	