

FLORIDA ATLANTIC UNIVERSITY™

Graduate Programs—COURSE CHANGE REQUEST

UGPC APPROVAL _____
 UFS APPROVAL _____
 SCNS SUBMITTAL _____
 CONFIRMED _____
 BANNER POSTED _____
 CATALOG _____

DEPARTMENT: N/A	COLLEGE: COLLEGE OF MEDICINE
COURSE PREFIX AND NUMBER: BMS 6031	CURRENT COURSE TITLE: FUNDAMENTALS OF BIOMEDICAL SCIENCE 1
CHANGE(S) ARE TO BE EFFECTIVE (LIST TERM): FALL 2012	_____ TERMINATE COURSE (LIST FINAL ACTIVE TERM):
CHANGE TITLE TO: CHANGE PREFIX FROM: TO: CHANGE COURSE NO. FROM: TO: CHANGE CREDITS FROM: 8 TO: 7 CHANGE GRADING FROM: TO: CHANGE DESCRIPTION TO:	CHANGE PREREQUISITES/MINIMUM GRADES TO*: CHANGE COREQUISITES TO*: CHANGE REGISTRATION CONTROLS TO: <p style="font-size: small;">*Please list both existing and new pre/corequisites, specify AND or OR, and include minimum passing grade.</p>
Attach syllabus for ANY changes to current course information.	
Should the requested change(s) cause this course to overlap any other FAU courses, please list them here.	Departments and/or colleges that might be affected by the change(s) must be consulted and listed here. Please attach comments from each.

Faculty contact, email and complete phone number: Zhongwei Li, Ph.D.: Associate Professor of Biomedical Science
 BC-308: 561 297-3178; zli@fau.edu

Approved by: Department Chair: <u>Sunday Wernon</u> College Curriculum Chair: <u>Angela Davis O'Leary</u> College Dean: <u>Michael</u> UGPC Chair: _____ Graduate College Dean: _____	Date: <u>3/5/12</u> <u>3/5/12</u> <u>3-5-12</u> _____ _____	ATTACHMENT CHECKLIST ♦Syllabus (see guidelines for requirements: http://www.fau.edu/graduate/facultyandstaff/programscommittee/index.php) ♦Written consent from all departments affected by changes
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Email this form and syllabus to UGPC@fau.edu **one week before** the University Graduate Programs Committee meeting so that materials may be viewed on the UGPC website prior to the meeting.

FLORIDA ATLANTIC UNIVERSITY CHARLES E. SCHMIDT COLLEGE OF MEDICINE COURSE SYLLABUS

GENERAL INFORMATION

Course Number: 6031
Online: Blackboard Learning System
Term: Fall 2012
Course Title: Fundamentals of Biomedical Science 1
Course Director: Zhongwei Li, Ph.D.
Office: BC 308
Office Hours: TBA
Telephone: 561-297-3178
E-Mail: zli@fau.edu

Course Support: Ruth Love
Office: COM 135A
Telephone: (561) 297-0988
Email: rlove3@fau.edu

COURSE DESCRIPTION

The FBS 1 course is the first in the series of three fundamentals of basic science courses. It provides an introduction to molecular biology and genetics, biochemistry, cell biology, development and histology, anatomy, and pharmacology. The course will be taught in 7 weeks, and consist of lectures, problem based learning sessions, small group discussions, and laboratory activities.

COURSE OBJECTIVES

After completing this course the student will:

- Understand how the single- and double-stranded forms of DNA and RNA are maintained by stabilizing forces and supercoiling.
- Understand how nucleic sequencing, restriction analysis, PCR amplification and hybridization techniques can be used to map DNA and RNA, detect nucleic mutations and analyze the copy numbers and expression levels of genes.
- Know the enzymes, mechanisms and cellular processes that govern DNA replication in prokaryotes and eucaryotes.
- Understand how genetic recombination, DNA replication, DNA repair processes, chromosomal segregation, insertion sequences and transposons can lead to DNA mutations.
- Understand those processes by which nucleic acid degradation and chromatin inactivation can regulate expression of specific genes.
- Know the basic structural features of genes and how genes are organized in chromosomes.
- Know the basic features of chromosomes including the centromere, the telomere and the names and features of the chromosomal arms.
- Understand the mechanisms that govern genetic exchange processes including genetic transformation, transduction and bacterial conjugation.
- Understand the principals of genetic linkage and how these principles can be applied to assigning phenotypes to specific loci.

- Understand the basic structures and mechanistic features of plasmids and bacteriophages.
- Describe mechanisms and enzymatic reactions of RNA synthesis, processing and degradation
- Relate the structure of tRNA and ribosome to their function in protein synthesis
- Analyze the structure of mRNA and the process the genetic code is translated into peptide sequence
- Explain how gene expression is regulated at the level of RNA metabolism and describe the following specific terms and processes: cis-regulatory elements, transcription factors, enhancers, promoters, silencers, repressants, splicing
- Explain how gene expression is regulated during protein synthesis
- List some of the major types of post-translational modification of proteins and their roles in protein structure, stability, activity and regulation.
- Relate the mechanism through which proteins are targeted for degradation within the cell and in the circulation and how this is regulated.
- Explain the spontaneous process through which a polypeptide chain folds to its active native structure and the interactions that stabilize that structure.
- Discuss the mechanisms through which enzymes enhance the rates of chemical reactions and how the rates are affected by the concentrations of substrate and enzyme.
- Relate how different types of inhibitors, posttranslational modifications, and the interactions with regulatory proteins and non-substrate molecules can modulate the activities of enzymes.
- Summarize and compare the major metabolic pathways for energy production from carbohydrates, fatty acids, and amino acids
- Summarize and compare the major metabolic pathways for synthesis of carbohydrates, fatty acids, and amino acids
- Analyze the regulatory mechanisms for coordination of catabolic and anabolic pathways
- Explain the thermodynamic laws governing metabolic reactions and the role of ATP in energy transfer
- Describe the metabolic differences among different organs and tissues.
- Explain the metabolic imbalances that can result from diabetes, starvation, and inherited defects of metabolism
- Understand the structure and basic function of subcellular organelles (eg, endoplasmic reticulum, Golgi complex, mitochondria, lysosome, peroxidase, endosome, microtubule, plasma membrane, cytosol, nucleus, cytoskeleton,)
- Understand the basic concept and building blocks of signal transduction (including basic principles, receptors and channels, second messengers, signal transduction pathways)
- Familiar with the concepts and biological function of cell-cell and cell-matrix adhesion
- Understand the biological events associated with cell motility
- Understand the network of intracellular sorting (eg, trafficking, endo- and exocytosis)
- Understand the cellular homeostasis (eg, turnover, proteasome)
- Describe the general mechanism and stepwise process of cell cycle (eg, mitosis, structure of spindle apparatus, cell cycle regulation)
- Identify and differentiate intracellular accumulations (e.g., pigments, fats, proteins, carbohydrates, minerals, inclusions, vacuoles)
- Describe the structure and function of basic tissue components (including epithelial cells, connective tissue cells, muscle cells, nerve cells, and extracellular matrix)
- Describe embryogenesis, including identifying the role of programmed gene expression, homeotic genes, and developmental regulation of gene expression, as well as demonstrating an understanding of the order of tissue differentiation and morphogenesis
- Recognize congenital abnormalities, and describe their principles, patterns, and underlying reasons behind dysmorphogenesis
- Describe the macroscopic structures of the autonomic nervous system, back and spinal cord, shoulder and axilla, arm and forearm, hand and joints of the upper extremity, thoracic wall, mediastinum, lungs and heart
- Define and differentiate the terms Pharmacokinetics and Pharmacodynamics
- Identify the types of chemical bonds involved in drug-receptor interaction
- Describe the quantitative relationship between drug dose, concentration and effect

- Recognize the different components of pharmacokinetics: absorption, distribution, metabolism, and excretion, and identify the factors that influence these components
- Define the terms EC_{50} , ED_{50} and TD_{50} , and calculate the therapeutic index of a drug
- Recognize the types of agonists and antagonists and explain their actions
- Explain the parameters that affect dose scheduling for chronically administered drugs
- Identify individual factors that alter pharmacokinetics and pharmacodynamics (eg, age, gender, disease, tolerance, compliance, body weight, metabolic proficiency, pharmacogenetics)
- Calculate the volume of distribution for different drugs and explain its significance
- Recognize the differences between zero order and first order elimination
- Predict the time that will take to get to a stable drug serum level, as well as, to get rid of an effective drug concentration
- Describe the major type of drug metabolism in the liver
- Review the general principles of autonomic pharmacology (ANS)

EVALUATION

Summative Assessment (Grading): FBS 1 will be graded S (Satisfactory) or U (Unsatisfactory).

The course grade consists of two components (exams & quizzes, and PBL). **In order to pass the course with S grade, the student will be required to pass both components.**

Component 1

Exam 1	20%
Exam 2	30%
Exam 3	20%
Anatomy Exam & Quizzes	30%
Total	100%

Exam 1, 2 and 3 are multiple choice tests covering objectives in lectures, PBL cases and problem sessions. The passing grade for this component (exams and quizzes) is $\geq 75\%$ of total points possible.

Component 2

The second component is PBL. Grading for PBL will consist of a narrative facilitator assessment at the end of the course, and will be given by the facilitators as "satisfactory" (S) and "unsatisfactory" (U) without assigned numerical points. The facilitators will provide notations as to whether the student's academic and professional performance is on the level of S or U based on the student's performance the following areas:

- Research skills;
- Reasoning;
- Professionalism: interpersonal skills;
- Professionalism: work habit.

Formative Assessment (not graded): Students will receive narrative feedback from their facilitator and the other students in their PBL group mid-course, and narrative feedback from the other students in both PBL and their Anatomy Dissection Group at the end of the course. Each student is expected to complete feedback forms for his/her peers.

COURSE INFORMATION

Attendance Policy

In accordance with Student Handbook, students are accountable and personally responsible for attending all scheduled educational activities for FBS 1 arriving on time and prepared. It is mandatory for students to attend all PBL sessions, clinical case or problem sessions, labs, and examinations. Students are expected to attend all didactic sessions, and are required to arrive in the classroom on time and to stay to the end of the session. In general, makeups will not be provided to non-assessment activities. Makeup assessments will be provided to students only in the case of a true emergency.

If a student has an emergency that prevents him/her from attending a scheduled activity, he/she is to follow emergency notification procedure (http://med.fau.edu/medicine/student_affairs/pdfs/Student_Handbook.pdf). If possible, the student should also call and leave a message with the course director or group facilitator. Attendance, including tardiness, is part of the evaluation for professionalism in FBS 1. Poor evaluations may result in decreased grades and, in severe cases, referral to the Medical Students Promotions & Professional Standards Committee.

FAU COM Policy for the Provision of Health Care Services to Students

Faculty members and residents or fellows with academic assessment/evaluation responsibilities for students are precluded from evaluating any students who are also their patients, because of dual-relationship and conflict of interest issues. The conflict created by this dual role could affect both the quality of medical care and the content of such evaluations in the following way:

- A student-patient might be less likely to report a sensitive medical issue (e.g., drug abuse) to his/her physician if that physician will be providing an evaluation or grade for the student; and
- A faculty member's evaluation or grade (which could include some subjective elements) could potentially be, despite the evaluator's commitment to neutrality, positively or negatively affected as a result of the therapeutic relationship.

In instances of pre-existing doctor-patient/student relationships, the physician must discuss with the student the potential for a dual relationship and inform the student that he/she will recuse him- or herself from any situation in which a formal evaluation is required.

In emergent situations or other instances in which an appropriate referral is not available, a student can seek the care of any faculty member or resident. In this circumstance as well, the physician must discuss with the student the potential for a dual relationship and recuse him or herself from any situation in which a formal evaluation is required.

At the beginning of each course or clerkship, the Curriculum Office provides students and clinical faculty with small group assignments as a routine part of the scheduling process. The Office will notify the students and faculty that they should report any potential conflict of interest with each other that might necessitate a change in small group assignments. The type of conflict will generally not be disclosed, in the interest of privacy. The course administrator(s) will be instructed to facilitate such requests without inquiring as to the nature of the conflict of interest.

Regarding the psychiatry clerkship, information about potential teacher/physician dual relationship will be provided to the medical students on the first day. Students are told that if they have seen a clinician at the facility as a patient, they should notify the curriculum coordinator who will modify the schedule to avoid activities with the clinician in question, without alerting the site director as to the purpose of the schedule change.

Religious Observance (Adapted from the FAU Policy)

The College of Medicine recognizes that students, faculty and staff observe a variety of religious faiths and practices. Although many religious holidays are observed with time off, a few of the religious days of observance may be part of the academic calendar. The College respects the religious beliefs and practices of its students and seeks to accommodate them within the requirements of the academic schedule. As a result, a student who must be absent from a class requirement will not be penalized. Students who anticipate absence should notify the OSA and the supervising faculty in advance. The instructor will provide a reasonable opportunity to make up such excused absences. Any student who feels aggrieved regarding religious accommodations may present a grievance to the Director of Equal Opportunity Programs. Any such grievances will follow Florida Atlantic University's established grievance procedure regarding alleged discrimination. The College will follow the established FAU policy regarding absences due to personal observances of religious holidays.

To review the policy, access the Leave of Absence Policy: http://www.fau.edu/policies/files/PM76_OCR.pdf

Disability Support Services

In compliance with the Americans with Disabilities Act (ADA), students who require special accommodations due to a disability to properly execute coursework must register with the Office for Students with Disabilities (OSD) located in Boca Raton – SU133 (561-297-3880 and follow all OSD procedures.

Honor Code

Students at Florida Atlantic University are expected to maintain the highest ethical standards. Academic dishonesty, including cheating and plagiarism, is considered a serious breach of these ethical standards, because it interferes with the University mission to provide a high quality education in which no student enjoys an unfair advantage over any other. Academic dishonesty is also destructive of the University community, which is grounded in a system of mutual trust and places high value on personal integrity and individual responsibility. Harsh penalties are associated with academic dishonesty. For more information, see:

1. *The Policy on Academic, Professional and Behavioral Requirements and Standards governing the College of Medicine*
2. *Oath of Academic and Professional Conduct for Students in the College of Medicine*
3. http://www.fau.edu/regulations/chapter4/4.001_Honor_Code.pdf.

REQUIRED TEXT/READINGS

Title	Author(s)	Publisher
Thompson & Thompson Genetics in Medicine 7 th Edition	Nussbaum, McInnes and Willard	Saunders Elsevier
Biochemistry: Lippincott's Illustrated Reviews 4 th Edition	Champe, Harvey and Ferrier	Lippincott, Williams and Wilkins
Basic and Clinical Pharmacology 11 th Edition	Katzung	McGraw Hill
Langman's Medical Embryology 11 th Edition	Sadler	Lippincott, Williams and Wilkins
Histology: a Text and Atlas 6 th Edition	Ross and Pawlina	Lippincott, Williams and Wilkins
Essential Clinical Anatomy 4 th Edition	Moore, Agur and Dalley	Lippincott, Williams and Wilkins
Atlas of Human Anatomy 5 th Edition	Netter	Elsevier
Imaging Atlas of Human Anatomy 4 th Edition	Weir, Abrahams, Spratt & Salkowski	Elsevier

INSTRUCTORS

Dr. Azzarolo, Ana Maria. Ph.D., Rm 337, 7-0207, aazzarol@fau.edu
Dr. Brew, Keith. Ph.D., Rm 341, 7-0407, kbrew@fau.edu
Dr. Cunningham, Deborah L. Ph.D., Rm 209, 7-2302, dcunni11@fau.edu
Dr. Kantorow, Marc. Ph.D., Rm 207, 7-2910, mkantoro@fau.edu
Dr. Li, Zhongwei. Ph.D., Rm 308, 7-3178, zli@fau.edu
Dr. Louda, Deborah W. Ph.D., Rm 140A, 7-3622, dlouda@fau.edu
Dr. Lu, Michael. Ph.D., Rm 329, 7-0892, mlu3@fau.edu
Dr. Paull, Willis K. Ph.D., Rm 241, 7-1024, wpaul@fau.edu
Dr. Schmidt-Kastner, Rainald. M.D., Rm 307, 7-1360, schmidtk@fau.edu

PBL FACILITATORS

Dr. Azzarolo, Ana Maria. Ph.D., Rm 337, 7-0207, aazzarol@fau.edu
Dr. Blanks, Robert. Ph.D., Rm 122, 7-2143, rhblanks@fau.edu
Dr. Cunningham, Deborah L. Ph.D., Rm 209, 7-2302, dcunni11@fau.edu
Dr. Henson, Lindsey. M.D., Ph.D., Rm 148, 7-2093, Lindsey.Henson@fau.edu
Dr. Louda, Deborah W. Ph.D., Rm 140A, 7-3622, dlouda@fau.edu
Dr. Rose, Gary. M.D., Rm 119, 7-0675, grose@fau.edu
Dr. Schmidt-Kastner, Rainald. M.D., Rm 307, 7-1360, schmidtk@fau.edu
Dr. Wei, Jianning. Ph.D., Rm 210, 7-0002, jwei@fau.edu
Dr. Joanna Drowos. Trauma Simulation Center 108, 7-1442, jdrowos@fau.edu

Backup Facilitators:

Dr. Li, Zhongwei. Ph.D., Rm 308, 7-3178, zli@fau.edu
Dr. Levitt, Morton. M.D., Rm 338, 7-0911, mlevitt3@fau.edu
Dr. Linger, Barry. Ed.D., Rm 136, 7-0913, blinger@fau.edu
Dr. Paull, Willis K. Ph.D., Rm 241, 7-1024, wpaul@fau.edu

