

MED 802: Introduction to Medical Sciences (IMS)

Autumn 2017

Mondays, Tuesdays & Fridays
8:00 a.m. to 12:00 p.m. & 1:00 to 5:00 p.m.
1001 Shadow Lane

Course Chair:
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Course Description and Learning Objectives:

This course introduces the foundational principles of biomedical science that are relevant to the study of human medicine. The first three weeks of the course is devoted to the basic principles of biochemistry, molecular biology, cellular biology, genetics, embryology, and epidemiology. The remaining three weeks focus on the underpinnings of pharmacology, basic concepts of histology and pathology, and concludes with an exploration of essential concepts in immunology.

- Describe foundational concepts in human biology and medicine related to the disciplines of biochemistry, molecular biology, cellular biology, genetics, embryology, epidemiology, pharmacology, pathology, and immunology.
- Determine how epidemiologic, socioeconomic, behavioral, sociocultural, and community factors may impact the care of patients.
- Recognize bioethical issues germane to the medical care of patients.
- Develop pertinent clinical questions related to the diagnosis and/or treatment of human illness, and utilize appropriate resources to answer those questions in a self-directed fashion.

Required and Recommended Textbooks:

Required

- Abbas, A. K., & Lichtman, A. H. (2014). *Basic Immunology: Functions and Disorders*. 4th ed. Elsevier Saunders.
- Bickley, L. (2012). *Bates' Guide to Physical Examination and History Taking*. 11th ed. Wolters Kluwer.
- Moore, K. L., Persaud, T. V. N., Torchia, M. G. (2016). *Before we are Born: Essentials of Embryology and Birth Defects*. 9th ed. Elsevier Saunders.
- Fletcher, R., & Fletcher, S. (2013). *Clinical Epidemiology: The Essentials*. 5th ed. Wolters Kluwer.
- Gladwin, M., & Trattler, W. (2015). *Clinical Microbiology Made Ridiculously Simple*. 6th ed. MedMaster Publishing Co.

Recommended

To be determined at the onset and throughout the duration of the course to aid/facilitate learning objectives.

Course Schedule & Weekly Objectives:

Week 1 – September 5-8, 2017 – Biochemistry and Molecular Biology

Topics include:

- Basic molecular components of human cells (including nucleic acids, proteins, fatty acids, and carbohydrates)

- Gene transcription and translation (including key regulatory elements)
- Protein folding and the acquisition of tertiary and quaternary structure
- Enzymes and the general characteristics of enzymatic reactions (including kinetic properties)
- General features of cellular pathways used to synthesize ATP, beginning with carbohydrate, fatty acid, and amino acid substrates
- Biochemical features of selected small molecules (including amino acids, purines, pyrimidines, lipids, sugars, and certain alcohols), and selected disorders associated with deficiencies in these molecules
- Biochemical features of selected macromolecules (including complex carbohydrates, glycoproteins, and proteoglycans), and selected disorders associated with deficiencies in these molecules
- Fundamental concepts of measurement relevant to human medicine (including prevalence, incidence, sensitivity, specificity, and predictive value)

Assigned Readings & Review Materials:

Week 2 – September 11-15, 2017 – Cellular Biology

Topics include:

- Basic structure and organization of major cellular components (including the plasma membrane, cytosol, nucleus, and cytoskeleton)
- Structure, distribution, and essential function(s) of organelles (including the mitochondrion, Golgi complex, endoplasmic reticulum, and lysosome)
- Mechanisms of prototypic signal transduction pathways
- Structure and function of proteins that are necessary for cell adhesion and motility (*e.g.* cilia)
- General features of intracellular sorting and the key processes by which cells maintain homeostasis
- General features of the cell cycle, including its major regulatory points
- Key histologic features of basic tissue types

Assigned Readings & Review Materials:

EXAM 1: September 18, 2017

Week 3 – September 18-22, 2017 – Genetics and Embryology

Topics include:

- Major elements of human embryogenesis through gastrulation
- Significant patterns of human dysmorphogenesis
- Principles of pedigree analysis to delineate patterns of inheritance and risk
- Key principles of population genetics (including the Hardy-Weinberg equilibrium and founder effect)
- Key mechanisms by which chromosomal abnormalities occur (including translocation, deletion, and duplication)
- Central elements of Mendelian inheritance
- General aspects of clinical genetics, including types of genetic testing, issues related to perinatal testing, and genetic counseling
- Goals and promise of gene therapy, and the limitations to current therapeutic approaches

Week 4 – September 25-29, 2017 – Pharmacology and Pathology*Topics include:*

- Basic principles of pharmacokinetics (including drug absorption, distribution, metabolism, excretion, and dosage intervals)
- Structure-function relationship of various pharmacologic agents that underlie their respective mechanisms of action
- Concepts of efficacy and potency
- Major classes of agonists and antagonists
- How individual factors (*e.g.* age, gender, body weight, disease state, pharmacogenetics, etc.) influence the pharmacokinetics and pharmacodynamics of various pharmacologic agents
- Adaptive cellular responses to nonlethal stress
- Recognize common intracellular accumulations and describe their significance
- Mechanisms and outcomes of cell death
- Cells, mediators, and general sequence of events for an acute inflammatory response and repair of damaged tissue
- General process by which chronic inflammation perpetuates

*Assigned Readings & Review Materials:***EXAM 2: October 2, 2017****Weeks 5 & 6 – October 2-13, 2017 – Immunology***Topics include:*

- General features of the innate and adaptive arms of the immune system
- Describe the functions of the main cells of the immune system (including granulocytes, macrophages, and lymphocytes)
- Essential features of various components of the immune system (including antigens, antibodies, MHC proteins, and the complements system)
- Basic processes by which the adaptive immune system responds to intracellular and extracellular microbes
- Major types of congenital immunodeficiencies
- Essential features of types I-IV hypersensitivity reactions
- Immunologic principles underlying diagnostic laboratory tests
- Major pharmacologic therapies capable of altering the immune response

FINAL EXAM: October 16, 2017**Course Requirements & Evaluation:**

Three (3) summative National Board of Medical Examiners (NBME) exams will be administered throughout the duration of the course, in addition to quizzes and written assignments. Active participation is an integral part of this course. Students must engage in individual, small groups, and class discussions to effectively contribute to all active learning activities as well as offer and receive constructive feedback and assessment.

Students are expected to arrive on time to all course sessions and prepared to participate actively and engage in all learning and small group activities. Additionally, students are expected to be respectful, take responsibility and accountability for their own choices, actions, and/or decision. This includes the demonstration of personal and professional integrity.

Grading:

A pass/fail (P/F) grade is based upon satisfactory participation in small group activities, the timely completion of written assignments and exercises, and successful passage on the summative NBME exams.

Dress Code:

Students represent not only themselves, but also the medical profession to those with whom they have contact. Appropriate and professional attire should be worn, especially when students are in patient care settings or when contact with patients is anticipated. Students should be aware that personal appearance may serve to inspire or hinder the establishment of the trust and confidence that are essential in the doctor-patient relationship. Jeans, sandals, and shorts (and other casual attire) are not considered professional dress. Scrubs are worn in the operating room, in the anatomy lab or in other clinical circumstances to protect the operator's clothing from soilage. Scrubs, in general, should not be worn outside of the lab or hospital, and scrubs worn in the operating room should not be worn outside of the operating room. *(Please refer to Section 6: Professionalism in the UNLV SOM Student Handbook for guidelines pertaining specifically to dress and deportment.)*

University Expectations and Resources:

Academic Misconduct – Academic integrity is a legitimate concern for every member of the campus community; all share in upholding the fundamental values of honesty, trust, respect, fairness, responsibility and professionalism. By choosing to join the UNLV community, students accept the expectations of the Academic Misconduct Policy and are encouraged when faced with choices to always take the ethical path. Students enrolling in UNLV assume the obligation to conduct themselves in a manner compatible with UNLV's function as an educational institution. An example of academic misconduct is plagiarism. Plagiarism is using the words or ideas of another, from the Internet or any source, without proper citation of the sources. See the Student Academic Misconduct Policy (approved December 9, 2005) located at: <http://studentconduct.unlv.edu/misconduct/policy.html>.

Copyright – The University requires all members of the University Community to familiarize themselves and to follow copyright and fair use requirements. You are individually and solely responsible for violations of copyright and fair use laws. The university will neither protect nor defend you nor assume any responsibility for employee or student violations of fair use laws. Violations of copyright laws could subject you to federal and state civil penalties and criminal liability, as well as disciplinary action under University policies. Additional information can be found at: <http://www.unlv.edu/provost/copyright>.

Disability Resource Center (DRC) – The UNLV Disability Resource Center (SSC-A 143, <http://drc.unlv.edu/>, 702-895-0866) provides resources for students with disabilities. If you feel that you have a disability, please make an appointment with UNLV SOM's Senior Associate Dean for Student Affairs, as well as a Disabilities Specialist at the DRC to discuss appropriate options.

If you are registered with the UNLV Disability Resource Center, please submit your Academic Accommodation Plan from the DRC to UNLV SOM's Office of Student Affairs to develop strategies for implementing an accommodations plan that meets both your needs and UNLV SOM requirements. Any information provided is private and confidential. To maintain confidentiality, please do not approach course chairs or instructors before or after class to discuss accommodation needs.

Religious Holidays Policy – Any student missing class quizzes, examinations, or any other class or lab work because of observance of religious holidays shall be given an opportunity during that semester to make up missed work. The make-up will apply to the religious holiday absence only. It shall be the responsibility of the student to notify the Senior Associate Dean for Student Affairs and the course chair or faculty preceptor no later than the end of the first two weeks of classes, January 31, of his or her intention to participate in religious holidays which do not fall on state holidays or periods of class recess. This policy shall not apply in the event that administering the test or examination at an alternate time would impose an undue hardship on the instructor or the university that could not have reasonably been avoided. For additional information, please visit: <http://catalog.unlv.edu/content.php?catoid=6&navoid=531>.

Incomplete Grades – Course or clerkship/elective faculty share responsibility with individual students to monitor their performance in the curriculum. The Student Progress Committee (SPC) follows student performance throughout the curriculum, and is responsible for approving all remediation plans once students have been assigned an insufficient grade, such as an ‘Incomplete’ or ‘Fail.’

Remediation plans are developed by individual course directors, based upon individual student’s identified academic and professional deficits, and tailored by both the course director and the SPC. The SPC determines deadlines for the adequate remediation of the course and provides final approval of the remediation plan. Students have the option, upon request, to appear before the SPC when plans for remediation are being considered.

Please note: In Phase 3 of the curriculum, any remediation of elective or advanced clerkship deficits must be completed prior to April 1 to meet the School of Medicine’s graduation requirements. Students are not permitted to remediate more than two (2) course grades of ‘Incomplete’ during a single academic year. Students who receive more than two incomplete grades must be reviewed by the SPC. *(Please refer to Section 7: Academic Policies in the UNLVSOM Student Handbook for guidelines pertaining specifically to academic progress and actions.)*

Tutoring & Academic Resources – The Academic Skills Team (AST) provides academic assistance for all UNLVSOM students taking UNLVSOM courses. Students are encouraged to stop by the AST to utilize a variety of academic services, including test-tasking skills and strategies, coping with test anxiety, and improving self-study skills in preparation for USMLE and board exams. The AST is located at: 2040 West Charleston Boulevard, 89102.

UNLV E-mail – By policy, faculty and staff should e-mail students’ UNLV e-mail accounts only. All UNLV students receive a Rebelmail account after they have been admitted to the university. It is one of the primary ways students receive official university communication such as information about deadlines, major campus events, and announcements. Students’ e-mail prefixes are listed on class rosters, and the suffix is: @unlv.nevada.edu.