**MASTER OF SCIENCE IN BIOMEDICAL SCIENCES (MBS)**

**MBS 1B02. Introduction to Research. (2 Credit Hours)**
The course is designed to provide students with standard best practices for laboratory safety in biomedical research and an introduction to research opportunities and mentors in the MSBS program. Students will complete three laboratory rotations, in addition to completing biomedical safety and procedural education. The rotations will result in identification of a thesis mentor that will serve as the student's advisor for the remainder of the program.

**MBS 1B03. Responsible Conduct Biomedical Research. (1 Credit Hour)**
This course provides an in-depth review of the core RCR topics including authorship, collaborative research, conflicts of interest, human subjects, and research misconduct. Case studies and discussions are used to supplement key concepts. All major sponsoring organizations require certain categories of researchers to receive RCR training. RCR is increasingly viewed as an essential component of training, regardless of the individual's training program.

**MBS 1B05. Special Topics in Physiology & Pharm. (1 Credit Hour)**
This course will introduce specific topics in physiology with focus on associated disease processes and relevant pharmacological treatments. Students will continue their studies in advanced concepts of physiology, including pathophysiology, as well as basic principles of five specialized areas of pharmacology (autonomic and cardiovascular, respiratory, renal, endocrine, and neuropharmacology).

Prerequisite: Consent of Instructor

**MBS 1B06. Intro to Biostatistics and Data Analysis. (2 Credit Hours)**
This is an introductory course that exposes the student to the use of statistical techniques for research data analysis. Topics covered include research design, data acquisition, types of data, univariate and bivariate data summarization techniques, tabular and graphical data presentation, inferential techniques using different theoretical distributions and the use of multivariate statistical techniques.

**MBS 1B07. Microbiology and Immunology. (6 Credit Hours)**
Basic principles and clinical relevance of immune mechanisms and fundamentals of host-pathogen interactions are presented. In addition, the course offers an introduction to the various subspecialties of microbiology, with emphasis on facts and principles pertinent to the broad requirements for understanding infectious diseases. Bacterial, mycotic, parasitic and viral pathogens are considered, with major emphasis on clinical presentation and pathogenic mechanisms. Laboratory integration focuses on the common diagnostic modalities pertinent to the various infectious agents. Exercises that link course content to research laboratory applications will be provided throughout the course.

**MBS 1B08. Major Organ Physiology. (3.5 Credit Hours)**
This course introduces basic principles of medical physiology starting at the cellular level and progressing to the organ systems. Emphasis is placed on regulatory control interactions that are necessary to understand body homeostasis and pathophysiology and conceptualization of disease processes and rationales for therapeutic interventions. Understanding physiology is the foundation for pharmacology, pathology and clinical medicine disciplines. A firm background in anatomy and biochemistry is essential for mastery of physiology.

**MBS 1B11. Special Topics Microbiology & Immunology. (1.5 Credit Hours)**
An advanced class in microbiology and immunology using a combination of lectures and primary literature to develop a sense of history, depth and emerging concepts in the field.

Prerequisite: Consent of Instructor

**MBS 1B12A. Frontiers in Biomedical Research A. (1.5 Credit Hours)**
The Frontiers in Biomedical Research course consists of two parts (A and B). Frontier A is offered in the fall term. The course is designed as a MSBS core course to provide students information on modern biomedical research with an emphasis on research process and techniques. The course format includes lectures, small group discussions, and short oral presentations.

**MBS 1B12B. Frontiers in Biomedical Research B. (1 Credit Hour)**
Frontiers B is offered in the spring semester. The course is designed as an MSBS core course to provide students information on modern biomedical research with an emphasis on research process and techniques. The course format includes lectures, small group discussions, and short oral presentations. Prerequisite: MBS 1B12A - Required Prerequisite

Prerequisite: undefined MBS 1B12A - Required Prerequisite

**MBS 1B15. Intro to Research & Compliance. (2.5 Credit Hours)**
Introduction to Research and Compliance

**MBS 2B04. Presentation of Scientific Information. (1 Credit Hour)**
The course is designed to provide students with a basic understanding of the components necessary to prepare and deliver an effective oral scientific presentation. Through didactic instruction, individualized mentoring, and practical experience, students will be provided insight and the tools necessary to improve their presentation skills. This is a required course for students enrolled in the Biomedical Sciences Program in the College of Osteopathic Medicine.

**MBS 2B05. Scientific Communications. (1 Credit Hour)**
Students will improve oral and written communications skills in biomedical research. They will learn fundamentals of scientific writing and publishing by developing a scientific manuscript based on their research results. The manuscript will be reviewed by faculty and peers, revised by the student, and incorporated into the Journal of Biomedical Student Research, which is disseminated to MSBS students and faculty. In addition, students will present their project to the public as an oral presentation during the University-wide research seminar series.

**MBS 2B10. Research. (0.5-10 Credit Hours)**
Bench research under the supervision of thesis mentor/advisor and thesis committee. (15.5 credit hours)

Prerequisite: Consent of the Instructor

**MBS 2B12. Thesis. (1-5 Credit Hours)**
All M.S.B.S. students are required to complete a thesis. The thesis is the culmination of the student’s research as well as their knowledge developed over their entire program. This course provides instruction on thesis development and progress, as well as career guidance opportunities.(9.0 credit hours total required)