MASTER OF ARTS IN MEDICAL SCIENCES (M.A.)

Purpose
The Master of Arts in Medical Sciences is a 34-hour graduate level program that serves to improve students’ academic preparedness for admission to medical school and other professional programs as well as provide a broad-based advanced training in the basic medical sciences needed to work in the expanding biotechnology and healthcare industries – this is accomplished by these five cognates; Public Health, Health Informatics, Molecular Medicine, Biopsychology and Business Management. The program is delivered in the online format which provides flexibility for students of varying backgrounds and experiences. Courses are taught from a biblical worldview and the program includes a required course in biomedical ethics.

Program Learning Outcomes
The student will be able to:
1. Apply scientific knowledge to problem solving in the medical sciences.
2. Synthesize and interpret information from the medical science literature.
3. Defend ethical decisions in biomedicine based on Biblical principles.

Program Specific Admission Procedures
In addition to the General Admission Procedures outlined in this Catalog, applicants to the Master of Arts in Medical Sciences program must have:
1. An earned baccalaureate degree or its equivalent from an institution accredited by an agency recognized by the U.S. Department of Education (e.g., SACSCOC, TRACS, ABHE, etc.);
2. Official college transcript documenting the minimum GPA requirement and course prerequisites should be submitted. Minimum GPA is 2.75.
   Prerequisite courses include:
   a. two semesters of general biology with lab or two semesters of A&P with lab
   b. two semesters of general chemistry with lab
   c. one semester organic chemistry with residential lab (2 semesters recommended)
3. Accept on caution
   a. For all new online graduate applicants who apply to the M.A. in Medical Sciences program and who do not meet the GPA or test score requirement, a cautionary acceptance can be considered on a case-by-case basis (by the department) for a student who has a GPA between 2.50 – 2.74.

Transfer Credit
Students may transfer up to 15 hours of graduate course work from an accredited institution. In order to be eligible for transfer, course work must have a minimum grade of B-, and must have been completed in the past 10 years. Credits from a prior degree on the same academic level earned through Liberty University are considered transfer credits.

Graduation Requirements
1. Satisfactory completion of 34 hours.
2. A maximum of 50% of the program hours may be transferred if approved and allowable, including credit from an earned degree from Liberty University on the same academic level.
3. 3.00 GPA
4. No grades lower than B- may be applied to the degree.
5. Degree must be completed within 5 years.
6. For information regarding the repeat policy, please refer to “Course Repeat Policy” in the Academic Information and Policies section of this Catalog.
7. Submission of Degree Completion Application must be completed within the last semester of a student's anticipated graduation date.

Programs of Study
Delivery Format: Online Only
- Medical Sciences (M.A.) - Biopsychology
- Medical Sciences (M.A.) - Business Management
- Medical Sciences (M.A.) - Health Informatics
- Medical Sciences (M.A.) - Molecular Medicine
- Medical Sciences (M.A.) - Public Health

Career Opportunities
- Biomedical scientist (may require Ph.D.)
- Clinical research associate
- College lecturer/instructor
- Genetic counselor (requires additional training)
- Grants officer
- Medical affairs consultant
- Medical liaison
- Medical science specialist
- Medical science writer
- Mental health counselor (requires additional training)
- Program officer
- Research analyst
- Research associate
- Research scientist (may require Ph.D.)

Courses
BIOM 500 Introduction to Biomedical Sciences 3 Credit Hour(s)
This course employs the exploration of the molecular, genetic, biochemical and cellular basis of human oncogenesis, tumor metastasis, cancer detection and therapeutic advances as a comprehensive background for understanding and engaging the field of biomedicine. It provides a solid foundation in the basic biomedical principles that serve as the framework for advancing medical science including genetics, cellular anatomy, metabolism and cell signaling.
Offered: Online

BIOM 503 Human Genetics 3 Credit Hour(s)
A study of the molecular causes of human disease with an emphasis on the specific gene perturbations that influence human health. Specific modes of genetic assault (e.g. mutations, epigenetic mechanisms, nutritional factors, and viral infections) will be discussed.
Offered: Resident and Online
BIOM 513  Human Gross Anatomy  5 Credit Hour(s)
This is an intensive course that covers all aspects of human anatomy through lectures, followed by practical application using cadavers. In addition, imaging techniques including CT scans and x-ray radiography are used to introduce the student to the physician’s perspective.
Offered: Resident

BIOM 515  Human Physiology  5 Credit Hour(s)
A concentrated, comprehensive course that provides the student with a high level of understanding of the physiological basis of medicine. The essential concepts of mechanisms of body function are presented at various levels of organization, ranging from cellular and molecular to tissue and organ system levels. Emphasis is placed on understanding the integrated regulation of various body processes among the major systems.
Offered: Resident

BIOM 523  Human Gross Anatomy Lecture  4 Credit Hour(s)
This is an intensive course that covers all aspects of human anatomy through lectures. Students will be shown how imaging techniques including CT scans and x-ray radiography are viewed from the physician’s perspective. This course precedes BIOM 524 Human Human Anatomy Cadaver Lab which includes the use of human cadavers. (BIOM 523 and 524 are equivalent to BIOM 513)
Offered: Online

BIOM 524  Human Anatomy Cadaver Lab  1-2 Credit Hour(s)
A laboratory study of the structure and function of the human body using a regional approach with emphasis on the detailed osteology, musculature, vasculature, and innervation of each region along with an understanding of the interrelationship between organ systems. This course follows BIOM 523 Human Gross Anatomy Lecture. (BIOM 523 and 524 are equivalent to BIOM 513).
Offered: Resident and Online

BIOM 525  Human Physiology Lecture  4 Credit Hour(s)
This is a concentrated, comprehensive course that provides the student with a high level of understanding of the physiological basis of medicine. The essential concepts of physiology and mechanisms of body function are presented at various levels of organization ranging from cellular and molecular to tissue and organ system levels. Emphasis is placed on understanding the integrated regulation of various body processes among the major systems. This course precedes BIOM 526 Human Physiology Lab. (BIOM 525 and 526 are equivalent to BIOM 515).
Offered: Online

BIOM 526  Human Physiology Lab  1 Credit Hour(s)
Human physiology is the study of the functions of the body and how it maintains homeostasis. This lab course practically examines systemic functions using human subjects and simulated case studies. It also allows students to independently develop and test hypotheses about homeostatic control mechanisms in health and disease. Special attention is placed on medically vital systems including the nervous, cardiovascular, respiratory, digestive, endocrine systems and the effects of exercise, altitude and depth on these. (BIOM 525 and 526 are equivalent to BIOM 515).
Offered: Resident and Online

BIOM 600  Biomedical Ethics  3 Credit Hour(s)
An in-depth ethical analysis and evaluation of present and emerging biomedical technologies in the 21st century. While not ignoring other ethical schools of thought, the focus of this course will be on the Hippocratic and Judeo-Christian traditions with their emphasis on the inherent dignity and worth of humanity as a whole, as well as the individual patient. This ethical foundation will serve as the primary framework for discussing medical decision making and practice.
Offered: Resident and Online

BIOM 610  Human Neurology and Neuroanatomy  3 Credit Hour(s)
This course will provide an introduction to the structural and functional features of the nervous system. Topics covered will include the gross anatomy of the brain and spinal cord, cellular and molecular neurobiology, sensory and motor systems, the major neurotransmitter systems, and brain regulation of behavior and body physiology.
Offered: Resident and Online

BIOM 613  Human Gross Anatomy II  3 Credit Hour(s)
Prerequisite: BIOM 513
A continuation of BIOM 513 with additional and more advanced dissections of human cadavers.
Offered: Resident

BIOM 615  Advanced Cell Biology  4 Credit Hour(s)
Advanced study on the structure, function and organization of the cell. Major topics include structure and function of cellular organelles, the cytoskeleton and extracellular matrix; cell signaling; membrane transport; protein targeting, vesicular transport, and cell division.
Offered: Resident and Online

BIOM 620  Advanced Immunology  3 Credit Hour(s)
A detailed study of the cells and molecules that result from an immune response to disease. The course will include antigen presentation, cytokine networks, vaccines and vaccine development, immunodeficiency diseases, tumor immunity, tolerance, autoimmunity and contemporary topics in immunology.
Offered: Resident and Online

BIOM 623  Human Developmental Biology  3 Credit Hour(s)
Prerequisite: BIOM 513 and BIOM 515
Advanced study of the major events of normal and abnormal human embryonic development. Major topics include gametogenesis, fertilization, axis formation, molecular pathways involved in tissue formation, and development of organ systems.
Offered: Resident

BIOM 625  Microbial Pathogenesis and Virology  3 Credit Hour(s)
A comprehensive study of the viruses that cause human disease and the basic principles of microbial pathogenesis, including the molecular basis of infectious disease, how microbes establish infections, gain nutrients, cause damage to the host and disease, evade host defense mechanisms. The course will also include case studies.
Offered: Resident and Online

BIOM 630  Principles of Pathology  3 Credit Hour(s)
This course reviews basic pathology principles including: Inflammation, Infection, Repair, Thrombosis, Hemostasis, Hyperplasia, Hypertrophy, Neoplasia, and Apoptosis. In addition, the pathophysiology of disease applied to various organ systems is covered in depth. Correlations with appropriate laboratory results and physical findings will elucidate the basis for signs and symptoms of various common diseases. Both diagnostic features of diseases and critical thinking skills will be stressed.
Offered: Resident and Online
BIOM 633  Advanced Histology  4 Credit Hour(s)
Prerequisite: BIOM 513
This course provides a detailed orientation to the structure and organization of cells and tissues. Students will learn a variety of techniques involved in the preparation of histological slides (including use of the microtome, vibratome, and cryostat) and staining specimens. Students will assist undergraduate students in tissue preparation.
Offered: Resident