

# OMS I

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## **LCOM 1001 Biomedical Foundations of Osteopathic Medicine (BFOM) 7 Credit Hour(s)**

The BFOM course provides students with a foundation upon which to further develop a growing understanding of important structure-function interrelationships that are involved in states of health and disease. The course integrates fundamentals of traditional medical science disciplines within the context of the body's natural ability to maintain homeostasis. A major purpose of the BFOM course is to provide a common medical scientific foundation and to introduce a holistic, osteopathic approach for learning about health and disease by emphasizing foundational principles of biochemistry, cell biology, genetics, immunology, microbiology, pathology, and pharmacology.

**Offered:** Resident

## **LCOM 2008 Human Structure 10 Credit Hour(s)**

Human Structure (HS) builds upon anatomically based coursework and experiences to which entering students may have been exposed prior to entering Liberty University College of Osteopathic Medicine (LUCOM). This course aims to expand students' foundational understanding of human structure with the goal of eventual clinical application. Clinical anatomy is the foundation for clinical practice and physical diagnosis. Principles and concepts introduced and developed in HS may be integrated into the classroom discussions and laboratory experiences of the OMM and PCM courses, as appropriate. Students will study the development and structure of all components of the body, which will prepare them for microscopic structure (histology) and function (physiology) in later courses. This includes most body systems with the neurovascular connections of the somatic body in states of health and disease. Neuroanatomy will be presented as a separate course in the second semester. HS incorporates a combination of didactic lectures, cadaveric dissection, digital technology, ultrasound, imaging, and problem-based learning with emphasis on homeostatic maintenance of health. Students will be introduced to clinical scenarios to demonstrate application of normal human structure.

**Offered:** Resident

## **LCOM 2009 Human Function 11 Credit Hour(s)**

The first part of this course presents the basic principles in biochemistry, molecular/cellular biology, and human genetics as a foundation to clinical medicine. The course introduces transcription and translation, the structure-function relationship of proteins, metabolism, and cell signaling pathways. The second portion of the course covers the structure-function relationship of the body's organ systems, including nervous, muscular, cardiovascular, renal, pulmonary, gastrointestinal, endocrine and reproductive. Emphasis is placed on normal physiological processes while select disease states, environmental stressors, and special situations are used to reinforce the understanding of normal homeostatic processes.

**Offered:** Resident

## **LCOM 2010 Mechanisms of Health, Disease, and Intervention 11 Credit Hour(s)**

The Mechanisms of Health, Disease, and Intervention course includes a focus on microbiology, immunology, pharmacology, pathologic basis of disease, and population based medicine (I). The Microbiology segment teaches the structures and functions of the microorganisms that interact with the human body in terms of the normal human-microbiota relationship and the harmful consequences when the relationship is out of balance. Microbiological concepts and principles are taught in the context of the pathogenesis and diagnosis of infectious diseases and the restoration of the originally designed human-microbe relationship by a holistic understanding and appropriate use of antimicrobial agents. The immunology segment introduces students to the structure and function of the human immune system. Immunologic principles will be presented covering the innate and adaptive and innate systems for the purpose of surveillance and elimination of microbes. This segment will include discussions on the cells and tissues of the immune system and their development, activation, specificity, and effector mechanisms. Topics to be covered include clinical immunology in relation to autoimmunity, secondary immunodeficiency, cancer immunology, hypersensitivity, transplant immunology and clinical laboratory immunology. Osteopathic principles will be highlighted through the utilization of immune mechanisms for patient immunizations and immunotherapy. The Pharmacology segment will introduce students to foundational pharmacological concepts. The topics to be included during this introduction are definitions of common terms used in pharmacology, the concept of pharmacogenomics and individualized drug therapy, the concepts of pharmacokinetics (absorption, distribution, metabolism and elimination) and pharmacodynamics (drug-receptor interactions), the pharmacology of drugs that have their main action on the autonomic nervous system, and the pharmacology of antimicrobial agents. The Pathologic Basis of Disease (PBD) segment highlights the reciprocal interrelatedness of structure and function in the context of disease processes. This segment provides a systematic introduction to the conceptual and mechanistic considerations of disease processes and establishes a foundation and framework for the further systematic study of specific diseases and their processes, including disease epidemiology, etiology, pathogenesis, pathophysiology, and prognosis. A solid understanding of these fundamental aspects of disease contributes to the rational basis of patient care interventions and management decisions. The Population Based Medicine segment includes principles of classical and clinical epidemiology, as well as evidence-guided medical practice. Students consider the role of the osteopathic physician as it is influenced by measures of population and individual health and efforts to improve individual and population health. An introduction to the principles and processes of clinically related research, as well as a basic understanding of parametric and nonparametric biostatistics needed to be able to read and interpret clinical research, provides a context for considering the application of clinical information in the practice of osteopathic medicine. The ability to review and critically evaluate medical literature and diagnostic and therapeutic outcomes is essential to the acquisition of the knowledge required to be competent osteopathic physicians appropriately engaged in life-long learning. This segment presents the basics of these foundational skills and provides the foundation for developing an approach to evidence-guided medical practices.

**Offered:** Resident

**LCOM 2011 Population Based Medicine 3.25 Credit Hour(s)**

The Population Based Medicine course includes principles of classical and clinical epidemiology, preventive medicine, public health, population genetics, and evidence-guided medical practice. Students consider the role of the osteopathic physician as it is influenced by measures of population and individual health and efforts to improve individual and population health. An introduction to the principles and processes of clinically related research, as well as a basic understanding of parametric and nonparametric biostatistics needed to be able to read and interpret clinical research, provides a context for considering the application of clinical information in the practice of osteopathic medicine. The roles of public health related strategies in the prevention of disease and its dissemination are discussed. The ability to review and critically evaluate medical literature and diagnostic and therapeutic outcomes is essential to the acquisition of the knowledge required to be competent osteopathic physicians appropriately engaged in life-long learning. This course presents the basics of these foundational skills and provides the foundation for developing an approach to evidence-guided medical practice.

**Offered:** Resident

**LCOM 2021 Patient-Centered Medicine 101 1.75 Credit Hour(s)**

Patient Centered Medicine (PCM) 101 is designed to introduce clinical skills including the art of medical history taking and physical examination. It also introduces the student to the concepts of medical professionalism, and the physician-patient relationship. This course is the first of a series of clinical skills courses. It requires active participation and places an emphasis on the ability to communicate with patients effectively, as well as work collaboratively in a team environment. Instructional methods include lectures, small group case-based learning exercises, clinical laboratory demonstration, standardized patient encounters, and assigned reading.

**Offered:** Resident

**LCOM 2022 Patient-Centered Medicine 102 1.5 Credit Hour(s)**

Patient-Centered Medicine 102 is designed to build upon necessary clinical skills, including the art of medical history taking and physical examination. It continues to expand the concepts of medical professionalism and the physician-patient relationship. This course is the second in a series of clinical skills courses. This course requires active participation and places an emphasis on the ability to communicate with patients effectively, as well as work collaboratively in a team environment. Instructional methods include lectures, small group case-based learning exercises, clinical laboratory demonstration, standardized patient encounters, simulation, and assigned reading.

**Offered:** Resident

**LCOM 2111 Humanities and Medical Ethics I 0.75 Credit Hour(s)**

This course introduces medical students to the historical development of medical ethics and oaths, the foundational principles of medical ethics, explores world views and the right of conscience as they relate to medical ethics and decision-making. Opportunities to analyze ethical situations and discuss ethical principles via case applications and vignettes will be provided. Grades will be pass/fail.

**Offered:** Resident

**LCOM 2112 Humanities and Medical Ethics II 0.5 Credit Hour(s)**

This course continues to lay the foundations for medical ethics and clinical decision-making by addressing ethical issues related to professionalism, duty to report, social media, truth telling and informed consent, research ethics, and health disparities. Opportunities to analyze ethical situations, discuss ethical principles, and practice making ethical decisions will be provided through lecture and interactive case-based applications and discussion. Grades will be pass/fail.

**Offered:** Resident

**LCOM 3001 Cardiovascular, Respiratory, and Hematologic Systems 6.25 Credit Hour(s)**

The Cardiovascular, Respiratory, Hematologic Systems (CVRH) course is designed to enable students to acquire knowledge and understanding of normal structure-function relationships and the biomedical basis for health maintenance involving the cardiovascular, respiratory, blood and lymphatic systems. Principles regarding maintenance of homeostasis in blood formation, cardiac output, blood pressure, blood flow, water and nutrient exchange, ventilation, and gas exchange are explored. Exercise and environmental influences on these factors are studied, as are the underlying bases for pharmacological interventions.

**Offered:** Resident

**LCOM 3002 Integument and Musculoskeletal System 6.75 Credit Hour(s)**

The Integument and Musculoskeletal System course builds upon the BFOM course and aims to expand the student's foundational understanding of human structure and function in both normal and pathologic states. Students have the opportunity to study the development as well as the structure and function of the skin, skeleton, joints, the associated muscles and soft tissues, and the neurovascular connections of the somatic body in states of health and disease, but the emphasis is on the homeostatic maintenance of health. Students will be introduced to pathologic conditions affecting the somatic body and general considerations important to clinical decision-making, including the biological basis for generating differential diagnoses and approaches to rational patient care. Osteopathic principles and concepts will be discussed, integrated, and applied along with the interdisciplinary dialogue and application of traditional biomedical sciences. The sciences will include molecular and cellular biology, biochemistry, embryology, anatomy, histology, physiology, microbiology and immunology, pathology, and pharmacology.

**Offered:** Resident

**LCOM 3003 Nervous System/Head and Neck 7 Credit Hour(s)**

The Nervous System/Head and Neck course is designed to facilitate the student acquiring knowledge related to the healthy central nervous system's structure and function. In addition, the student should learn the anatomy and physiology of the normal head and neck musculature, skeleton, innervation and vasculature. The link between head and neck anatomy and nervous system anatomy will be reinforced by studying the pathways and functions of the cranial nerves, as these nerves connect many of the central nervous system topics with those of the head and neck. Students study and discuss the biomedical basis for common clinical presentations related to pathologic states involving the nervous system. Students will be asked to correlate neurological, motor and sensory symptoms with lesions in the central nervous system. This course will also emphasize the connections between the nervous system and multiple other systems and regions, which reinforces the osteopathic principle of the body being a single unit.

**Offered:** Resident

**LCOM 3005 Urinary System 4.25 Credit Hour(s)**

The Urinary System course is designed for the student to acquire knowledge related to the normal structure and function of the urinary system and to develop the ability to apply this knowledge to the prevention, diagnosis, and treatment of pathological conditions affecting this system. The gross and microscopic structure and organization of the kidneys, ureters, bladder, urethra, and associated structures are correlated with normal functions of the body, including the maintenance of acid-base balance, electrolyte balance, body fluid balance, blood pressure, and the elimination of metabolic wastes and drug agents. The pharmacology of antihypertensive and antimicrobial agents is also introduced in this course with a focus on the pharmacokinetics, pharmacodynamics, and potential side effects on each class of drugs. Students study and discuss the biomedical basis for common clinical presentations related to pathologic states involving the urinary system and the rationale for approaches of prevention and therapeutic intervention. The utilization of common laboratory tests used to assess urinary system function as well as the application of such test results in the clinical decision-making process is explored and applied to clinical scenarios.

**Offered:** Resident

**LCOM 3006 Gastrointestinal System and Nutrition 5 Credit Hour(s)**

The Gastrointestinal System and Nutrition course is structured to enable the student to acquire knowledge related to the normal structure and function of the gastrointestinal system and be able to develop and apply this knowledge to the prevention, diagnosis, and treatment of pathological conditions affecting this system. Students will explore the autonomic and neurohormonal regulation of the GI system and apply this understanding to somatovisceral and viscerosomatic dysfunction and the clinical recognition of and approach to the treatment of GI disorders. The study of the molecular and cellular level structure and function of normal healthy states provides a basis for explaining the pharmacologic approaches to patient care. Students will examine the organization and role of accessory organs of digestion: salivary glands, liver, gall bladder, and pancreas. This course expects students to recognize and describe common pathologic conditions of these organs and the effect that these abnormalities have on digestion and nutritional status and how such abnormalities typically present clinically. The acquisition, metabolism, and utilization of nutrients required for maintenance of health will be explored and contrasted with the abnormalities in structure and function characteristic of disease states that arise from inadequacies in nutrient sources or processing. In addition, the nutritional basis of dieting and weight management will be surveyed in relation to stages of the life cycle. The mental and physical components of obesity and eating disorders will be examined.

**Offered:** Resident

**LCOM 3007 Disease and Intervention I: Neuroscience, Hematology/Oncology 6.5 Credit Hour(s)**

The Neuroscience segment is designed for the Osteopathic Medical Curriculum as an introduction to the structure and function of the human nervous system. This segment will include a multidisciplinary approach to the physiology and gross anatomy of the human nervous system. Aspects of brain energy metabolism, neurotransmitter synthesis and degradation, external and internal features of the nervous system, clinical correlations of CNS pathology will be presented. This segment integrates anatomical and physiological material to assist the student in understanding common neurological disease processes. Laboratory exercises will provide slides and dissection of the human brain, spinal cord, and relevant structures. The student will be introduced to modern methods of neuroimaging, including CT scans and MRI, in the course. The Hematology/Oncology segment is designed to provide the student with an expanding foundation in the general principles and considerations of neoplastic conditions - their pathologies, presentations, and rational basis for therapeutic interventions. This segment also provides a systematic overview and consideration of the most common diseases related to the hemolymphoid tissues and blood elements - their risks, pathogenesis, pathophysiology, clinical presentations, and prognosis as well as considerations for therapeutic interventions.

**Offered:** Resident

**LCOM 3008 Endocrine and Reproductive Systems 4.5 Credit Hour(s)**

The Endocrine-Reproductive System course provides a study of the normal structure and function of the traditional endocrine organs (i.e. hypothalamus, pituitary, thyroid, parathyroid, adrenal, pancreas, testis and ovary) and their related hormones within the endocrine system along with reproductive, pelvic and perineal anatomy and physiology. Hormones from non-traditional endocrine organs (e.g., heart, kidney, stomach, duodenum) will be presented in other courses but students will recognize many overlapping features of structure and function within all the body's hormones. The ENDREP course will establish a basis for understanding the disorders of the endocrine/reproductive systems. The microscopic and macroscopic structure of the endocrine organs as well as non-endocrine reproductive, pelvic and perineal anatomy, will be presented in lecture and laboratory. The following seven aspects of each hormone will be presented in lecture: (1) site of synthesis; (2) stimulus for release and transport; (3) cellular mechanism of action; (4) physiological effect(s); (5) feedback regulation; (6) elimination, degradation, half-life; and (7) clinical examples and case studies. Students are expected to apply their understanding of normal and abnormal structure-function of the endocrine/reproductive/pelvic/perineal systems to explain the basis for both the clinical presentations of common endocrine/reproductive/pelvic/perineal disorders and the general approaches to diagnosis. Additionally, this course offers an introduction to the biomedical basis of common approaches to laboratory testing and pharmacotherapeutics.

**Offered:** Resident

**LCOM 4021 Osteopathic Manipulative Medicine 101 2 Credit Hour(s)**

This introductory Osteopathic Manipulative Medicine course is designed to provide the student with a fundamental understanding of the history, principles, and philosophies of osteopathic medicine. The student will be introduced to the lexicon that is foundational to the profession and will gain a basic understanding of the development and maintenance of somatic dysfunction. Department faculty work in conjunction with other departments to complement and integrate the knowledge received from the basic science and clinical medicine courses. Curriculum is delivered primarily via mandatory lecture and laboratory sessions. The student will be trained in tactile skills necessary for diagnostic palpation of the patient. The student will learn how to approach the patient with respect and professional touch. The student will be incrementally instructed in the following competencies: osteopathic screening, structural evaluation, diagnosis of somatic dysfunction, and osteopathic manipulative treatment (OMT). The student will be introduced to indications for and contraindications to OMT. The student will develop a basic level of skill in osteopathic diagnosis and treatment of some body regions as defined by the International Classification of Diseases - Tenth Revision (ICD-10) by course completion.

**Offered:** Resident

**LCOM 4022 Osteopathic Manipulative Medicine 102 1.75 Credit Hour(s)**

In this second Osteopathic Manipulative Medicine course (OMM 102), the student will build upon the foundational knowledge gained in the OMM 101 course. Osteopathic principles and practices introduced in OMM 101 will be reinforced, and new osteopathic principles and practices will be imparted. Department faculty work in conjunction with other departments to complement and integrate the knowledge received from the basic science and clinical medicine courses. By the end of this course, the student will have been introduced to diagnostic palpation and osteopathic treatment for all ten regions of the body as defined by the International Classification of Diseases - Tenth Revision (ICD-10). The student's knowledge of the development and maintenance of somatic dysfunction will be enhanced. The student will continue to develop an understanding of indications for and contraindications to osteopathic manipulative techniques. The student will be introduced to the diagnosis and treatment of Chapman's reflexes. By the end of the course, the student will be ready to enter the OMM 201 course with a basic understanding of how to approach somatic dysfunction affecting the musculoskeletal, respiratory, circulatory, neurologic, gastrointestinal, and lymphatic systems.

**Offered:** Resident