

GENETICS, CELL BIOLOGY & ANATOMY (GCBA)

GCBA 801 ETHICS IN NEUROSCIENCE 3 Credit Hours

This course uses lectures and interactive activities to prepare the student to evaluate research design with particular attention to ethical considerations and make decisions that exhibit high standards of professional integrity. Major topics to be covered include experimental design, animal and human experimentation, and the ethics of clinical practice.

Typically Offered: FALL/SPR

GCBA 802 CELL AND MOLECULAR BIOLOGY OF THE NERVOUS SYSTEM 3 Credit Hours

This course uses lectures, assignments and interactive activities to introduce students to the fundamental concepts in cell and molecular biology as applied to the field of neuroscience. Major topics to be covered include mechanisms of action potentials and cell signaling, protein homeostasis, and the functions of each cell type in the nervous system. Emphasis will be on how these mechanisms are disrupted in common neurological diseases.

Typically Offered: FALL

GCBA 804 GROSS ANATOMY OF THE HUMAN NERVOUS SYSTEM 3 Credit Hours

This course uses lectures, assignments and interactive activities to introduce students to the gross anatomy of the nervous system. Students will learn the names, locations and basic functions of different parts of the nervous system including: peripheral and cranial nerves; the spinal cord, the medulla; the pons; the cerebellum; the midbrain; the thalamus; the hypothalamus; the basal ganglia and the cerebral cortex. The nervous system vascular and ventricular systems will be described and related to each of these areas. A select subset of possible lesions/diseases will be studied and discussed to facilitate an understanding of the function of the human nervous system.

Instructor: Robert Norgren, Matthew Vilburn, Megan Perry

Typically Offered: FALL/SP/SU

GCBA 805 SENSORY SYSTEMS OF THE NERVOUS SYSTEM 3 Credit Hours

This course uses lectures, assignments and interactive activities to introduce students to the sensory systems of the human nervous system. Students will learn the pathways and function of sensory systems including the: somatosensory; gustatory; olfactory; auditory and visual systems. Students will also learn about diseases and lesions which can affect these sensory systems in patients.

Prerequisite: GCBA 804

Typically Offered: SPRING

GCBA 807 MOTOR SYSTEMS OF THE HUMAN NERVOUS SYSTEM 3 Credit Hours

This course uses lectures, assignments and interactive activities to introduce students to the motor systems of the human nervous system. Students will learn the pathways and function of motor systems including: the neuromuscular synapse; lower motor neurons; reflexes; upper motor neurons; secondary motor cortices; control of eye movements; basal ganglia; and cerebellum. Students will also learn about diseases and lesions which can affect these motor systems in patients.

Prerequisite: GCBA 804

Typically Offered: SPRING

GCBA 808 LIMBIC SYSTEM, HYPOTHALAMUS AND CONTROL OF THE AUTONOMIC NERVOUS SYSTEM 3 Credit Hours

This course uses lectures, assignments and interactive activities to instruct the students in the limbic system, hypothalamus and autonomic nervous system. Students will learn the pathways and function of the limbic system, hypothalamus and autonomic nervous system including: the prefrontal cerebral cortex; the cingulate gyrus; the hippocampal formation; the Papez circuit; the nucleus accumbens; the amygdala; the supraoptic and paraventricular nuclei; and the mammillary bodies. In addition, students will learn the function of the: hypothalamic-pituitary-gonadal axis; hypothalamic-pituitary-adrenal axis; growth hormone axis. The student will learn about abnormal functioning these systems including: feeding disorders, stress and dysautonomia.

Prerequisite: GCBA 804

Typically Offered: SPRING

GCBA 809 HIGHER CORTICAL FUNCTION AND BEHAVIORAL NEUROSCIENCE 3 Credit Hours

This course uses lectures, assignments and interactive activities to introduce students to the gross anatomy of the nervous system. Students will learn the names, locations and basic functions of parts of the nervous system, including the spinal cord, medulla, pons, cerebellum, midbrain, thalamus, hypothalamus, basal ganglia, cerebral cortex, and peripheral and cranial nerves. The nervous system vascular and ventricular systems will be described and related to each of these areas. A select subset of possible lesions/diseases will be studied and discussed to facilitate an understanding of the function of the human nervous system.

Prerequisite: GCBA 804

Instructor: Robert Norgren; Megan Perry; Matthew Vilburn

Typically Offered: SPRING

GCBA 810 DEVELOPMENT OF THE NERVOUS SYSTEM AND NEUROGENETICS 3 Credit Hours

This course uses lectures and interactive activities to introduce students to the development of the nervous system (including its initial formation; neuronal migration; axon pathfinding and environmental influences) and analyze neurogenetic diseases (including neurocutaneous; metabolic; neurodegenerative; cognitive and psychiatric).

Typically Offered: FALL

GCBA 811 LESIONS AND DISEASES OF THE NERVOUS SYSTEM - CASE BASED APPROACH 3 Credit Hours

This course uses lectures and interactive activities to analyze neurological and psychiatric diseases in a case based approach. Students will learn to dissect clinical vignettes to determine the location and type of lesion or disease that is causing a patient's symptoms.

This course will utilize the knowledge the students have built up from their previous neuroanatomical pathway courses to solve diverse case presentations of symptoms including: nerve lesions; well known syndromes of the spinal cord, medulla, pons, cerebellum and midbrain; and diseases involving the hypothalamus, thalamus and cerebral cortex.

Typically Offered: SUMMER

GCBA 813 NEUROANATOMY LECTURE 3 Credit Hours

This course is designed to provide foundational knowledge about the anatomy, functional organization, and physiology of the human nervous system. The course will focus on the organization of the neural systems in the brain and spinal cord that mediate sensation, movement, and higher-order signal integration as they relate to memory, emotion, and cognition. The course will also provide the foundation for understanding impairments of the nervous system due to age, injury, or disease.

Prerequisite: GCBA 908 and GCBA 909.

Corequisite: GCBA 814

Instructor: M. Vilburn, M. Perry

Typically Offered: SUM/SPRING

GCBA 814 NEUROANATOMY LAB 2 Credit Hours

This course is designed to equip students with an anatomical understanding of the central nervous system. Students will use anatomical-donor tissues to study the gross anatomy, spatial relationships, and functions of the human brain and spinal cord, and myelin-stained sections of the central nervous system to visualize the major tracts and nuclei of the brain and brainstem. Additional topics to be covered include introduction to neurological clinical imaging and predicted deficits in neurologic function as related to injury or disease.

Prerequisite: GCBA 908 and 909

Corequisite: GCBA 813

Instructor: M. Vilburn, M. Perry

Typically Offered: SUM/SPRING

GCBA 823 FUNDAMENTALS IN GENETICS AND GENOMICS 2 Credit Hours

This course will introduce basic concepts in classical and modern molecular genetics as well as state of the art genomic analysis.

Crosslisted: MGCB 823

Typically Offered: SPRING

GCBA 825 HUMAN HISTOLOGY 5 Credit Hours

A study of cells, fundamental tissues, organ systems at both the light and ultramicroscopic level. Include section on tissue cell fixational and processing for light and advanced microscopy.

Typically Offered: SPRING

GCBA 830 FUND OF ELECTRON MICRO 2 Credit Hours

The general theory and techniques of electron microscopy, including special methods involved in the fixation, embedding, sectioning, and staining of specimens.

Prerequisite: CBA 826 and permission of instructor.

Typically Offered: SPRING

GCBA 845 CLINICALLY ORIENTATED HUMAN ANATOMY I 3 Credit Hours

This is the first semester of a 2 semester clinically-oriented human anatomy course. The content of the two courses includes human anatomy presented in a systems approach the utilizes a wide variety of imaging modalities and clinical correlations to understand gross anatomy with cell biology, histology, embryology and neuroanatomy followed by a review applying the information to anatomic regions of the human body. The sequence of the units correlates with CAHP 445.

Typically Offered: FALL

GCBA 846 CLINICALLY ORIENTATED HUMAN ANATOMY II 2 Credit Hours

This is the second semester of a 2 semester clinically-oriented human anatomy course. The content of the two courses includes human anatomy presented in a systems approach that utilizes a wide variety of imaging modalities and clinical correlations to understand gross anatomy with cell biology, histology, embryology and neuroanatomy followed by a review applying the information to anatomic regions of the human body.

The sequence of the units correlates with the CAHP 446.

Typically Offered: FALL

GCBA 853 HUMAN EMBRYOLOGY 1 Credit Hour

Cross List: GCBA 513

Typically Offered: SUMMER

GCBA 891 ANATOMICAL SCIENCES TEACHING PRACTICUM-HIGH SCHOOL ALLIANCE 1 Credit Hour

This course is designed to help each student understand how to "name, claim, and aim" their natural execution, relationship building, influence, and strategic thinking talents while they assist in teaching High School Alliance students in their anatomy course. Major learning topics include the 34 CliftonStrengths themes, how to use those strengths effectively for individual achievement and in group dynamics, and how to apply their strengths to common responsibilities and challenges associated with administering a medical anatomy course. The course exercises will teach students how to enhance their strengths to propel them personally and professionally beyond teaching medical anatomy in this course. The majority of this 1 credit course intentionally entails experience-based and in-class learning with only a small amount of time spent on "out-of-class" preparation or studying.

Prerequisite: GCBA 908 and 909

Instructor: Ethan Snow

Typically Offered: SPRING

Capacity: 20

GCBA 892 INTRODUCTORY MEDICAL ANATOMY RESEARCH PRACTICUM 1 Credit Hour

This course is designed to prepare the graduate student to understand the scientific method and demonstrate their understanding by designing an anatomical science-based research project. Major topics to be covered include 1) the scientific method, 2) research study design, and 3) scientific writing/reporting.

Instructor: Travis McCumber

Typically Offered: FALL/SPR

GCBA 893 MEDICAL ANATOMY RESEARCH PRACTICUM 1 Credit Hour

This course is designed to prepare the graduate student to apply the scientific method to an anatomical science-based research project. Students will engage in the scientific method, data collection, data analysis, data interpretation, and scientific writing/reporting. Students will work with a faculty advisor on their research project and will share their research project goals, approach and findings through an oral presentation and a written report.

Prerequisite: GCBA892

Corequisite: GCBA 892

Instructor: McCumber

Typically Offered: SPRING

GCBA 894 OBSERVATIONAL LEARNING AND ANATOMY IN THE HEALTHCARE ENVIRONMENT 2 Credit Hours

The purpose of this course is to provide MS students in the Medical Anatomy program with opportunities to observe and experience different healthcare careers. During this course, students will shadow healthcare professionals in various roles and disciplines. These experiences will also allow students to see first-hand how the knowledge of anatomy is utilized and applied in various clinical settings. Students must log a total of 48 hrs of shadowing.

Instructor: Karen Gould

Typically Offered: FALL

GCBA 896 RSCH OTHER THAN THESIS 1-9 Credit Hours

Student research that is clearly distinct from ongoing or planned thesis/dissertation work, or research/lab rotations performed prior to selecting a permanent advisor or supervisor.

Typically Offered: FALL/SP/SU

GCBA 899 MASTERS THESIS 1-9 Credit Hours

Independent student research related to the masters thesis.

Typically Offered: FALL/SP/SU

GCBA 902 SPECIAL TOPICS 1-3 Credit Hours

Current problems, techniques, and literature pertaining to the major subdivisions of the field of anatomy. The student may participate in selected research topics, under the supervision of a selected instructor.

Prerequisite: Permission of instructor.

Typically Offered: FALL/SP/SU

GCBA 903 JOURNAL CLUB 1 Credit Hour

Typically Offered: FALL/SPR

GCBA 904 ANATOMICAL SCIENCES JOURNAL CLUB 1 Credit Hour

Typically Offered: FALL

GCBA 905 PHYSIOLOGY AND PATHOPHYSIOLOGY OF THE MUSCULOSKELETAL SYSTEM 1-2 Credit Hours

This course is designed to prepare the graduate student to explain the fundamental principles of physiology and pathophysiology of the musculoskeletal system and to apply their understanding of these principles and their knowledge of anatomy and/or histology to develop clinical case studies that provide the opportunity to interpret and evaluate physiologic, histopathologic, and pathophysiologic findings in a clinical context.

Prerequisite: GCBA 908/909

Corequisite: GCBA 908/909

Instructor: Karen Gould, Travis McCumber, Robert Norgren, Matt Vilburn

Typically Offered: FALL/SP/SU

GCBA 906 TEACHING THEORY & APPLICATION 2 Credit Hours

This course is targeted to graduate/professional students or anyone in interested in expanding their knowledge of teaching theory. This course blends research on learning principles, effective classroom teaching and the skill of application to improve their foundation of teaching.

Typically Offered: SUM/FALL

GCBA 907 TEACHING AND RESEARCH PRESENTATION SKILLS 2 Credit Hours

This is a required course for PhD seeking students. This course focuses on the development of the fundamental skills required for making effective presentations in both a classroom and research context.

Prerequisite: Permission of instructor.

Typically Offered: SPRING

GCBA 908 GROSS ANATOMY LECTURE 5 Credit Hours

This course is a comprehensive study of human anatomy with clinical correlations. Taken as a companion to the GCBA 909 course, which involves a full body dissection.

Prerequisite: GCBA 909 (or concurrent registration)

Typically Offered: FALL

GCBA 909 GROSS ANATOMY LABORATORY 6 Credit Hours

This course allows hands-on application of anatomical concepts and relationships through whole body dissection in small groups. Taken as a companion to the GCBA 908 course.

Prerequisite: GCBA 908 (or concurrent enrollment).

Typically Offered: FALL

GCBA 912 MODERN APPROACHES IN CELL BIOLOGY & MOLECULAR GENETICS 3 Credit Hours

This advanced-level course will focus on current techniques and concepts in cell biology and genetics. This course includes a didactic component as well as discussion section where the students will be asked to present their interpretations and ideas on cutting edge research. Hands on workshops and demonstrations are also conducted weekly.

Prerequisite: Permission of instructor.

Typically Offered: SPRING

GCBA 913 ADVANCED GROSS ANATOMY & DISSECTION 4 Credit Hours

This course provides foundational knowledge about structures and processes in the nervous system. Consequences of use, disuse, age, pathology, and injury will be addressed as they relate to sensorimotor impairment, disability, and/or handicap.

Prerequisite: GCBA 908 and GCBA 909

Typically Offered: SUMMER

GCBA 940 TEACHING PRACTICUM: HUMAN GROSS ANATOMY 2 Credit Hours

A series of courses designed to provide an opportunity for students to develop and apply the skills requisite for effective teaching in the anatomical sciences.

Prerequisite: Appropriate GCBA course(s) or equivalent, GCBA 806, GCBA 910, GCBA 920 and permission of instructor.

Typically Offered: SUM/FALL

GCBA 942 TEACHING PRACTICUM: HUMAN NEUROANATOMY 1 Credit Hour

A series of courses designed to provide an opportunity for students to develop and apply the skills requisite for effective teaching in the anatomical sciences.

Prerequisite: Appropriate GCBA course(s) or equivalent, GCBA 907, GCBA 908, GCBA 909 and permission of instructor.

Typically Offered: SPRING

GCBA 945 STEM CELL AND DEVELOPMENTAL BIOLOGY 2 Credit Hours

An in depth study of the basic science of stem cell biology and the application of tissue engineering principles to generate stem cell-based solutions to significant clinical problems. Special emphasis is placed on embryonic stem cells, adult stem cells, and stem cell plasticity and the interaction between stem cells and the microenvironment.

Prerequisite: IPBS 801-803

Typically Offered: SUMMER

GCBA 949 TEACHING PRACTICUM: HUMAN HISTOLOGY 2 Credit Hours

A series of courses designed to provide an opportunity for students to develop and apply the skills requisite for effective teaching in the anatomical sciences.

Prerequisite: Appropriate GCBA course(s) or equivalent, GCBA 806, GCBA 910, GCBA 920 and permission of instructor.

Typically Offered: FALL/SPR

GCBA 970 SEMINAR 1 Credit Hour

Attendance at weekly seminars offered by the department/program, or other activities specific to the degree program (contact the program director for more information).

Typically Offered: FALL/SPR

GCBA 971 PROFESSIONAL OPPORTUNITIES SEMINAR 1 Credit Hour

In this course students will shadow a series of physicians of healthcare professionals from participating units. Through the course of these shadowing experiences, student will have the opportunity to see first hand how knowledge of human anatomy is utilized on a day to day basis in clinical practice.

Typically Offered: FALL

GCBA 999 DOCTORAL DISSERTATION 1-15 Credit Hours

Independent student research related to the PhD dissertation. This course may be utilized before or after successful completion of the comprehensive exam.

Typically Offered: FALL/SP/SU