

# HUMAN ANAT. AND CELL SCIENCE (ANAT)

## ANAT 7012 Advanced Brain Imaging Methods 1.5 cr

Basic concepts and theories behind advanced brain imaging methods will be introduced, which includes multivariate pattern analysis and machine learning. Then, students will run the learned analyses using sample data in class and in homework.

**PR/CR: A minimum grade of C is required unless otherwise indicated.**

Prerequisite: IMED 7004.

## ANAT 7014 Functional Human Anatomy 2 cr

This course is an overview of human anatomy from a functional perspective. The students will be introduced to the structure and function of neuromuscular system. The course is specifically designed for students enrolled in programs in which a background in biology and /or anatomy is not a prerequisite (e.g. biomedical engineering). May not be held with the former BME 7014.

**Equiv To:** BME 7014

## ANAT 7060 Advanced Human Macroscopic (Gross) Anatomy 6 cr

Dissection, with special emphasis on regions relative to the research projects and interests of students concerned. Both terms.

## ANAT 7250 Experimental Teratology 3 cr

Basic principles of experimental teratology in lectures, seminars, and practical work. The causes, embryological basis, and mechanisms of developmental defects will be covered.

## ANAT 7320 Introduction to Scanning and Transmission Electron Microscopy 3 cr

Designed to provide general theoretical aspects of electron microscopy and practical knowledge of electron microscopic laboratory procedures. 3 hours lecture/lab per week, one term. Minimum enrollment: 5 students.

**PR/CR: A minimum grade of C is required unless otherwise indicated.**

Prerequisite: written consent of instructors.

## ANAT 7322 Ultrastructural Anatomy of the Cell 3 cr

This course provides students with an overview of the most recent knowledge on sub-cellular structures present in human cells, including organelles, membranes, and the cytoskeleton, along with their function under homeostasis and selected pathology. With this advanced knowledge, students will learn how these different sub-cellular structures communicate with one another intracellularly, and between cells, and how the activity of these structures become specialized to fulfill the needs of diverse tissue types of the human body. Throughout the course, common cellular and molecular laboratory techniques will be introduced to students during lectures and discussion that include how to visualize sub-cellular structures or track their dynamic activity. Students from outside of HACS require the course leaders'/instructor's permission.

## ANAT 7330 Readings in Anatomy 3 cr

Regular tutorials on selected topics in Anatomy and research related to student's research work. The tutorials will be incorporated into the Department's seminar program.

## ANAT 7380 Human Developmental Anatomy (Embryology) 3 cr

Human development as it is of practical application to medical subjects.

## ANAT 7392 Human Neuroanatomy 3 cr

(Laboratory required). The objective of this course is to provide an introduction to the structure and function of the nervous system from an anatomical perspective. It is intended primarily for graduate students registered in the Department of Human Anatomy and Cell Science. The course consists of a combination of lectures and laboratory sessions. The lectures will provide an introduction to the basic structure and function of the nervous system. Disorders of the nervous system will be discussed to highlight the function of different components of the nervous system. Laboratory sessions will be scheduled at regular intervals to provide students the opportunity to examine the three-dimensional structure of the nervous system.

## ANAT 7400 Morphological Techniques 3 cr

The objective of this three credit hour course is to provide an overview of the basic techniques for morphological studies of cells and tissues. It is intended for graduate students interested in protein detection and protein localization in cells and tissues. In particular it is for students who want a deeper understanding of histological staining methods of tissues and immunodetection-based protein visualization in subcellular compartments. The course introduces to the principles antibody-based immunodetection methods in cells and tissues and provides a basic introduction to brightfield and fluorescence microscopy. The course consists of lectures, microscopy demonstrations, and student led tutorials. The lectures will introduce to principle methods of histology staining and immunodetection methods. Tutorial sessions will provide a forum for student presentations and to discuss key considerations for the decisions for the use of antibodies, chemicals and fluorophores for cell- and tissue analyses. Microscopy sessions will provide a basic insight into considerations for image acquisition and basic image analysis.

## ANAT 7460 Human Histology: Basic Tissues 1.5 cr

A lecture and lab course that examines the histological features of the 4 basic tissue types found within the human body. The microscopic structure will be correlated to function in each of the basic tissues of the human body. The clinical significance of structural and functional changes at the histological level will also be presented. May not be held with ANAT 7360.

**Mutually Exclusive:** ANAT 7360

## ANAT 7468 Human Histology: Basic Tissues and Organ Systems 3 cr

This graduate level course commences by introducing students to the histological features of the four basic tissues composing the human body (epithelium, connective tissue, muscle, and nervous tissue). With an understanding of these fundamentals, this course next examines in depth the specialized cells composing the gastrointestinal, endocrine, circulatory, respiratory, reproductive, and urinary systems of the human body. This course is appropriate for students studying human tissues in their thesis research or students interested in building their background in the anatomical sciences for teaching purposes. May not be held with ANAT 7460, ANAT 7462, ANAT 7464, or ANAT 7466.

## ANAT 7478 Human Gross Anatomy: Musculoskeletal 3 cr

This dissection-based human gross anatomy course will provide a detailed understanding of the musculoskeletal (MSK) system of the human body. Students will learn about the anatomical complexities of bones, joints, ligaments, tendons, muscles, nerves and blood vessels of the upper extremity, lower extremity, and spine regions. Common MSK disorders will also be discussed using clinical cases to highlight the relation between anatomical structures and normal human function. May not be held with ANAT 7470 or ANAT 7472.

**ANAT 7480 Human Gross Anatomy: Trunk (Thorax, Abdomen, Pelvis) 3**

**cr**

This course will provide an introduction to the structure and function of the trunk (thorax, abdomen, and pelvis) from an anatomical perspective. Using a combination of lectures, seminars, and dissection-based gross anatomy laboratory sessions, students will learn about thoracic wall anatomy and thoracic cavity contents including the heart and lung; abdominal wall anatomy and abdominal cavity contents including intestines and accessory digestive organs (liver, pancreas, and gallbladder), and spleen; and the pelvic wall and cavity anatomy in both males and females. May not be held with ANAT 7470 or ANAT 7476.

**ANAT 7482 Human Gross Anatomy: Head and Neck 3 cr**

This dissection-based course will provide a detailed understanding of the anatomy of the head and neck region. Students will learn about the skull and cranial cavity, muscles of the neck and face, general aspects of the brain and cranial nerves, eyes and ears, nasal and oral cavities, pharynx and larynx, glands and blood vessels of the head and neck. Common head and neck disorders will be discussed to highlight the relation between anatomical structures and normal human function. Upon completion, students will receive letter grades. May not be held with ANAT 7470 or ANAT 7476.