ANATOMY AND CELL BIOLOGY

The Department of Anatomy and Cell Biology offers two pre-medicine academic enhancer programs for candidates interested in applying to medical schools, physician assistant programs, or biomedical sciences doctoral programs: the graduate certificate in anatomical and translational sciences (GCATS) and master of science in the field of anatomical and translational sciences (M-ATS), a pre-med special master’s program. Both programs are designed to enhance a graduate’s competitiveness when applying to medical school or physician assistant programs, or to transition to an advanced graduate degree in the biomedical sciences. Applicants select a program based on their level of readiness for admission to a health professional school.

Visit the [Department of Anatomy and Cell Biology](http://gsehd.gwu.edu/programs/museum-education) website for additional information.

**GRADUATE**

**Master's program**
- Master of Science in the field of anatomical and translational sciences [https://bulletin.gwu.edu/arts-sciences/anatomy/ms-anatomical-translational-sciences](https://bulletin.gwu.edu/arts-sciences/anatomy/ms-anatomical-translational-sciences)

**CERTIFICATE**

**Certificate Program**
- Graduate certificate in anatomical and translational sciences [https://bulletin.gwu.edu/arts-sciences/anatomy/certificate-anatomical-translational-sciences](https://bulletin.gwu.edu/arts-sciences/anatomy/certificate-anatomical-translational-sciences)

**COURSES**

**Explanation of Course Numbers**
- Courses in the 1000s are primarily introductory undergraduate courses
- Those in the 2000s to 4000s are upper-division undergraduate courses that can also be taken for graduate credit with permission and additional work
- Those in the 6000s and 8000s are for master’s, doctoral, and professional-level students
- The 6000s are open to advanced undergraduate students with approval of the instructor and the dean or advising office

ANAT 2130. Human Embryology. 3 Credits.
Development of the basic organ systems; molecular control of development, congenital birth defects, and assisted reproductive technologies.

ANAT 2150. Human Microscopic Anatomy. 3 Credits.
Normal histological structure of cells, tissues, and organs. Structural-functional correlates; the relationship between histological structure-function and the etiology of disease states.

ANAT 2160. Human Functional Neuroanatomy. 3 Credits.
The central and peripheral nervous systems; diseases and injuries with impact on the normal structural-functional relationship. Two of the following courses must be completed prior to enrollment: BISC 2202, BISC 2214, BISC 2322.

ANAT 2181. Human Gross Anatomy. 3 Credits.
Covers the structural and functional organization of the human body, focusing on regional and organ systems-based functions. Clinical applications are used to demonstrate the importance of anatomical relationships and their interplay with regional and functional systems. Prerequisites: BISC 1115 and 1125; and BISC 1116 and 1126; or by permission of the course director. (Same as BISC 2581).

ANAT 6130. Clinically Oriented Human Embryology. 3 Credits.

ANAT 6150. Clinically Oriented Human Microscopic Anatomy. 4 Credits.
The normal histological structure of cells, tissues, and organs of the human body with emphasis on clinical relevance; structural/functional correlates at both the light and electron microscopic levels; alterations in normal histology through disease or injury and the etiology of various disease states; integration of histological concepts with clinical correlates. Restricted to students in the graduate certificate in anatomical and translational sciences (GCATS) or master’s in anatomical and translational sciences (M-ATS) programs. Prerequisites: BISC 1115 and BISC 1125; and BISC 2202.

ANAT 6150. Clinically Oriented Human Functional Neuroanatomy. 3 Credits.
Structure and function of the human central and peripheral nervous system, with an emphasis on identifying brain structures and pathways and the effects of lesions; neuroanatomy at the gross and microscopic level, embryology, neurophysiology, and pathology due to disease or injury to the brain, spinal cord, and peripheral nerves. Restricted to students in the anatomical and translational sciences graduate certificate and Institute for Biomedical Sciences PhD programs or with the permission of the course director. Prerequisites: prior completion of an introductory biology course for science or non-science majors.
ANAT 6181. Clinically Oriented Human Gross Anatomy. 4 Credits.
Structural organization of the human body and the relationship of the organization to regional and systems-related functions; application of normal anatomical structure/function relationships to understand clinical implications of disease or injury. The laboratory is used for cadaveric dissection to learn anatomical relationships and basic knowledge of radiographic imaging. Restricted to students in the graduate certificate and master's programs in anatomical and translational sciences and other graduate students with the permission of the course director. Recommended background: Completion of higher-level science courses during the student's undergraduate degree program.

ANAT 6182. Fundamentals of Translational Science. 4 Credits.
Fundamentals of organ development and study; how molecular defects during development can lead to disease. Restricted to students in the graduate certificate in anatomical and translational sciences program.

ANAT 6203. Human Developmental Anatomy. 1 Credit.
ANAT 6204. Neuroanatomy. 2 Credits.

ANAT 6212. Neurobiology. 3 Credits.
Same as IDIS 212.

ANAT 6213. Microscopic Anatomy. 4 Credits.
Required for medical students.

ANAT 6215. Anatomy for Physician Assistant Students. 3 Credits.
Lecture and student examination of prosected cadavers. Provides foundational anatomical knowledge for future courses in the physician assistant curriculum. Restricted to students enrolled in the physician assistant program.

ANAT 6216. Cellular Anatomy and Histology. 2 Credits.

ANAT 6219. Biomedical Ethics for Translational Sciences. 2 Credits.
Ethical issues relevant to the practice of medicine and biomedical research involving human subjects. Permission of the instructor required prior to enrollment. Restricted to graduate students. Recommended background: ANAT 6130, ANAT 6150, ANAT 6160, ANAT 6181 and ANAT 6292.

ANAT 6221. Special Topics in Stem Cell Biology. 1-3 Credits.

ANAT 6222. Special Topics in Stem Cell Biology. 1-3 Credits.

ANAT 6223. Special Topics in Regenerative Medicine. 2 Credits.
Students attend seminars given by invited lecturers to present their research findings and breakthroughs on topics of regenerative medicine. Seminars can be sponsored by the Department of Anatomy and Regenerative Biology, the Stem Cell Interest Group Journal and Data Club, the Molecular Medicine Graduate Program (MMED 8214), and the GW Institute for Neuroscience. Restricted to Graduate Certificate in Anatomical and Translational Sciences only. Prerequisites: Introductory Biology for Science or non-Science Majors.

ANAT 6249. Introduction to Anatomical Research. 1 Credit.

ANAT 6252. Human Variation. 1 Credit.

ANAT 6253. Developmental Neurobiology. 3 Credits.
ANAT 6260. Developmental Genetics. 2 Credits.

ANAT 6262. Gross Anatomy of Upper and Lower Extremities. 2 Credits.

ANAT 6264. Gross Anatomy of Head and Neck. 2 Credits.

ANAT 6266. Gross Anatomy of Thorax and Abdomen. 2 Credits.

ANAT 6268. Gross Anatomy of Pelvis, Perineum, and Lower Extremities. 2 Credits.

ANAT 6275. Advanced Studies in Translational Sciences. 3 Credits.
Semester long rotation in a research laboratory conducting translational researching and applying fundamental concepts learned in didactic courses and developing versatility with new technologies. Students must have completed an introductory course in biology for science or non-science majors prior to enrollment. Restricted to students in the graduate certificate and master of science in anatomical and translational sciences programs.

ANAT 6276. Advanced Studies in Anatomy. 1 Credit.
Detailed study of an anatomic topic tailored to the needs of the individual student. Restricted to graduate students who are in the Graduate Certificate in Anatomical and Translational Sciences program or who have permission of the program director and medical students.

ANAT 6277. Special Topics in Neurobiology. 1-3 Credits.
ANAT 6279. Applied Regional Anatomy. 1-5 Credits.
Regional dissection, guided readings.

ANAT 6284. Applied Surface Anatomy and Radiology. 5 Credits.
ANAT 6288. Surface Anatomy and Radiology. 1 Credit.

ANAT 6291. Special Projects in Anatomy. 1-12 Credits.
Independent study on any aspect of gross anatomy.

ANAT 6292. Projects in Anatomical Sciences: Introduction to Neuroradiology. 1 Credit.
Various imaging techniques and approaches to visualize normal neuroanatomy toward development and application of skills in teamwork, presentation, discussion, and literature searches. Restricted to students in the graduate certificate in anatomical and translational sciences program.

ANAT 6295. Research. 1-12 Credits.

ANAT 8120. Graduate Human Gross Anatomy. 5 Credits.
An in-depth introduction to human gross anatomy with cadaveric dissection. The structural organization of the human body, including its regional and systems-related functions. The relationship between normal human anatomical variation in structure and function and how disease and/or injury affect these relationships. Permission of the instructor is required prior to enrollment. Offered spring semester in even years. Restricted to doctoral students with permission of the instructor. Recommended background: Prior coursework in the biological sciences or anthropology.

ANAT 8501. Didactic Anatomy. 3 Credits.
Development of a didactic program to include human developmental anatomy, microscopic anatomy, gross anatomy, and/or neuroanatomy. May also include interdepartmental study.

ANAT 8800. Summer Remedial: Gross Anatomy. 6 Credits.
ANAT 8802. Summer Remedial: Human Developmental Anatomy. 1 Credit.