

Anatomy and Cell Biology

Mailing Address:

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Contact Information:

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Administration:

Head of the Department: Simon T. Alford
Director of Graduate Studies: Kamal Sharma

Program Codes:

20FS1024MS (MS)
20FS1024PHD (PhD)

The Department of Anatomy and Cell Biology offers work leading to degrees in Anatomy and Cell Biology. Applications are only accepted for doctoral level/PhD. The department does not accept applications for a master's degree. The MS is reserved only for internal candidates. The department also participates in the Medical Scientist Training Program (MD/PhD joint degree program); see the [Medical Scientist Training Program](#) section for more information. Areas of study include neurobiology, cell biology, and developmental biology. There is a strong emphasis on interdisciplinary studies that examine the relationship between structure and function. Research leading to a graduate degree is available in the following areas: neurobiology of the synapse, axonal transport, cytoskeleton, and response to stress; sensory systems; neuroplasticity; Alzheimer's disease, Multiple Sclerosis and myelination, Amyotrophic Lateral Sclerosis and motor neuron disease, Huntington's and Parkinson's disease, neuroblastoma, ion channel regulation, cell motility, connective tissue, neurotoxins and stem cell biology. The Interdepartmental Concentration in Neuroscience is available to doctoral students.

Admission and Degree Requirements

- MS in Anatomy and Cell Biology (See listing for PhD in Anatomy and Cell Biology)
- [PhD in Anatomy and Cell Biology](#)

ANAT 403. Human Neuroanatomy. 3 hours.

Morphological organization of the nervous system. Functional correlations of neural structures. Course Information: Same as NEUS 403. Meets eight weeks of the semester. Prerequisite(s): Graduate standing and consent of the instructor. Must be in a degree program. Class Schedule Information: To be properly registered, students must enroll in one Laboratory and one Lecture.

ANAT 414. Neuroanatomy for Allied Health Program. 3 hours.

Basic Development and gross features of the central nervous system and systems neuroanatomy; motor, sensory and integrative functional areas. Class Schedule Information: To be properly registered, students must enroll in one Laboratory and one Lecture.

ANAT 439. Gross Human Anatomy I. 3 hours.

Gross structure of the adult human thorax, abdomen, pelvis and perineum, emphasizing spatial relationships and functional/clinical relevance. Includes embryology and radiology topics. Course Information: Limited to six (6) students. Prerequisite(s): Graduate standing in a degree-granting program only and consent of the instructor. Class Schedule Information: To be properly registered, students must enroll in one Laboratory and one Lecture-Discussion.

ANAT 440. Gross Human Anatomy II. 4 hours.

Gross structure of the adult human head & neck/deep back and limbs, emphasizing spatial relationships and functional/clinical relevance. Includes embryology and radiology topics. Course Information: Limited to six (6) students. Prerequisite(s): Graduate standing in a degree-granting program only and consent of the instructor. Class Schedule Information: To be properly registered, students must enroll in one Laboratory and one Lecture-Discussion.

ANAT 441. Gross Human Anatomy. 5 hours.

Functional and structural anatomy of the body. Course Information: For allied health students. Prerequisite(s): Graduate standing and consent of the instructor; or enrollment in the Doctor of Physical Therapy program or M.S. in Biomedical Visualization program. Class Schedule Information: To be properly registered, students must enroll in one Laboratory and one Lecture.

ANAT 442. Cell Structure and Human Histology. 5 hours.

Structure and function of cells and fundamental tissues. Function and microscopic anatomy of organs. Course Information: Prerequisite(s): Graduate standing and consent of the instructor. Class Schedule Information: To be properly registered, students must enroll in one Laboratory and one Lecture-Discussion.

ANAT 443. Case Studies in Clinical Anatomy. 3 hours.

Clinical approach to human anatomy by examining a series of case studies. An introduction to clinical medicine using problem based learning to integrate anatomical knowledge with clinical signs and patient symptoms. Course Information: Prerequisite(s): ANAT 441.

ANAT 511. Experimental Foundations of Psychopharmacology. 2 hours.

An introduction to the molecular mechanisms underlying synaptic transmission; review of the principal neurotransmitter systems and the biochemical, anatomical and behavioral methods used to study these systems. Course Information: Same as NEUS 511. Prerequisite(s): Grade of B or better or concurrent registration in NEUS 501 and Grade of B or better or concurrent registration in NEUS 502; or Grade of B or better or concurrent registration in BIOS 484 and Grade of B or better or concurrent registration in BIOS 485; or consent of the instructor.

ANAT 520. Concepts of Synaptic Function and Morphology. 2 hours.

Overview of current and classical methods employed in the study of synapses. A review of some of the most interesting aspects of synaptic function, such as sources of synaptic vesicles, synaptic patterns, synaptic plasticity, and synaptic specificity. Course Information: Prerequisite(s): Consent of the instructor.

ANAT 521. Plasticity in the Nervous System. 2 hours.

Neural plasticity is the ability to adaptively modify neural structure or function. Topics range from developmental plasticity to aging, including response to injury and neurodegenerative diseases, trophic factors, learning and memory, and neural transplantation. Course Information: Prerequisite(s): ANAT 403 or consent of instructor.

ANAT 523. Biology of MicroRNAs and other Small RNAs. 2 hours.

History, overview and biology of small RNA pathways, including microRNAs, siRNAs, RNA interference, roles in various biological processes, implication in disease pathophysiology, and potential therapies. Course Information: Same as BIOS 523. Prerequisite(s): Consent of the instructor.

ANAT 525. Molecular and Cellular Mechanisms of Neurodegenerative Diseases. 2 hours.

Molecular, cellular and physiological mechanisms underlying neuropathology in neurodegenerative diseases and trauma to the central and peripheral nervous system of humans. Course Information: Same as NEUS 525. Recommended background: A basic course in neuroscience.

ANAT 527. Cellular and Systems Neurobiology. 3 hours.

Molecular and cellular properties of ion channels in neurons and sensory cells and their relationship to brain and sensory systems. Course Information: Same as BIOS 527 and NEUS 527. Prerequisite(s): Credit in one neuroscience course or consent of the instructor.

ANAT 544. Advanced Craniofacial Anatomy. 3 hours.

Functional and clinical aspects of head and neck anatomy. Includes laboratory dissection and readings from the anatomical, clinical and other literature. Course Information: Same as OSCI 544. Specimen provision by sponsoring department required. Prerequisite(s): DDS or MD degrees, a course in human head and neck anatomy. Class Schedule Information: To be properly registered, students must enroll in one Laboratory-Discussion and one Lecture-Discussion.

ANAT 554. Neuroendocrinology. 2 hours.

Survey of neuroendocrine integration including neuroendocrine regulation of development, homeostasis, reproduction, and behavior. The hypothalamohypophyseal axis receives special attention from both morphologic and functional viewpoints. Course Information: Prerequisite(s): ANAT 403 or the equivalent.

ANAT 560. Practicum in the Teaching of Anatomy. 1 hour.

Provides an opportunity for supervised discussion and evaluation of materials and methods in teaching the basic anatomical sciences. Course Information: Satisfactory/Unsatisfactory grading only. May be repeated. No graduation credit. For anatomy and cell biology teaching assistants. Prerequisite(s): Consent of the instructor.

ANAT 585. Cell Biology. 4 hours.

Functional and structural organization of the cell with emphasis on the cellular basis of physiological activity. Course Information: Same as MIM 585 and PHYB 585.

ANAT 586. Cell and Molecular Neurobiology. 3 hours.

Structure and function of voltage-dependent and neurotransmitter-gated ion channels; the role of these ion channels in synaptic transmission, synaptic modification, and neuromodulation. Course Information: Same as BIOS 586. Prerequisite(s): BIOS 442 or consent of the instructor.

ANAT 594. Special Topics in Anatomy and Cell Biology. 1-4 hours.

Topics may include cell biology, molecular biology, neuronal cell biology, neuroscience, cancer biology and other topics of current significance in anatomy and cell biology. Course Information: May be repeated if topics vary. Students may register in more than one section per term. Prerequisite(s): Consent of the instructor.

ANAT 595. Department Seminar. 1 hour.

Oral presentations are made by students each session on timely journal articles, followed by in-depth discussions of the reported research. Presentation of research by invited lecturers. Course Information: Satisfactory/Unsatisfactory grading only.

ANAT 596. Independent Study. 1-4 hours.

Independent study under the direction of a faculty member.

ANAT 598. Master's Thesis Research. 0-16 hours.

Thesis research under the direction of a faculty member. Course Information: Satisfactory/Unsatisfactory grading only.

ANAT 599. Research in Anatomy. 0-16 hours.

Independent research, directed by a faculty member. Course Information: Satisfactory/Unsatisfactory grading only.