

Anatomy and Cell Biology

Chair

- John F. Engelhardt

Professional degree: M.C.A.

Faculty: <https://medicine.uiowa.edu/acb/profile>

Website: <https://medicine.uiowa.edu/acb/>

Courses

Anatomy and Cell Biology Courses

ACB:3110 Principles of Human Anatomy 3 s.h.

Gross and microscopic human anatomy; systemic approach to regional anatomy with emphasis on clinical relevance; optional tutorial sessions. Offered fall semesters. Requirements: pharmacy, pre-nursing, or associated medical sciences major.

ACB:3122 Independent Study in Anatomy and Cell Biology arr.

Projects arranged with department faculty members.

ACB:4156 Scanning Electron Microscopy and X-Ray Microanalysis arr.

Microscopy methods for research; all aspects of research, from sample preparation to imaging to data analysis; when to use a particular microscopy procedure; theory, operation, and application of scanning electron microscopy, scanning probe microscopy, laser scanning microscopy, X-ray microanalysis. Requirements: a physical science course. Same as CBE:4156, EES:4156.

ACB:5108 Human Anatomy 5 s.h.

Regional dissection, lectures, demonstrations; areas important to physical therapists, particularly the upper and lower extremities. Offered fall semesters. Requirements: physical therapy and rehabilitation science enrollment.

ACB:5203 Gross Human Anatomy for Graduate Students 5 s.h.

Regional dissection, lectures, demonstrations, tutorials, discussions, seminars; clinically relevant areas of anatomical radiology, surface anatomy with clinical correlations. Requirements: enrollment in Master of Clinical Anatomy program.

ACB:5206 Graduate Research in Cell and Developmental Biology arr.

Individual laboratory research training in anatomical sciences.

ACB:5210 General Histology Online 3 s.h.

Histology of all tissues of human body starting with basic tissues and working through systems of the body; linked in sequence to ACB:5203 so that students learn about related content at the same time in anatomy and histology; recorded lectures, online modules, and extensive use of Virtual Microscope. Requirements: enrollment in Master of Clinical Anatomy program.

ACB:5218 Microscopy for Biomedical Research arr.

Basic microscopy methods for research including optics, preparation, and analysis of biomedical specimens; light, fluorescence, confocal, transmitting electron, scanning electron, atomic force microscopes, elemental analysis; immunochemistry and stereology techniques; individualized laboratory instruction. Prerequisites: BIOL:2723. Same as BIOL:5218, MICR:5218.

ACB:5224 Graduate Seminar in Cell and Developmental Biology 0-1 s.h.

Current research, literature. Requirements: cell and developmental biology graduate standing.

ACB:6000 Human Anatomy for Advanced Practice 3 s.h.

Integrated study of interrelationships between anatomic structure and physiological function in health and disease at various points in the lifespan; mechanisms governing and supporting cellular, organ, and system function; internal milieu; relationship of study to clinical assessment of functional integrity of individual organ systems utilizing pertinent objective and subjective data; implications of pathophysiology for anesthesia and implications of anesthesia for pathophysiology; foundation for clinical practicums and courses in nurse anesthesia. Requirements: completion of an undergraduate human anatomy and physiology course and admission to anesthesia nursing program. Same as NURS:6000.

ACB:6200 Special Topics in Genetics 1 s.h.

Current research in a selected field of genetics; different topic each year. Companion to a genetics seminar series. Same as GENE:6200.

ACB:6220 Mechanisms of Cellular Organization 3 s.h.

Current understanding of basic cell biological processes; key experiments that led to guiding insights; mechanisms that cells use for compartmentalization and how those mechanisms are regulated; biogenesis of major organelles (e.g., mitochondria, peroxisomes, nucleus, secretory/endocytic membrane system); functions of cytoskeleton in cell motility, organelle motility, and cell division. Prerequisites: BIOC:3130. Same as MMED:6220, MPB:6220.

ACB:6225 Growth Factor Receptor Signaling 1 s.h.

Mechanisms of signaling by growth factors; cytokines and related molecules that regulate cell proliferation, development, differentiation, and survival; emphasis on molecular mechanisms of signaling, relevance of these signaling processes to various human diseases. Same as MMED:6225, MPB:6225, PCOL:6225.

ACB:6226 Cell Cycle Control 1 s.h.

Cell cycle regulation, DNA damage-dependent cell cycle regulation, redox-dependent cell cycle regulation, cellular senescence. Same as MMED:6226, MPB:6226.

ACB:6227 Cell Fate Decisions 1 s.h.

Cellular fate decisions including signal integration, terminal differentiation in development, mechanisms of embryonic stem cell gene regulation/cellular reprogramming, cell death paradigms, and cell death in development and cancer. Same as MMED:6227, MPB:6227.

ACB:6237 Critical Thinking in Biochemistry and Molecular Biology 1 s.h.

How nucleic acids, proteins, lipids, and carbohydrates interact to influence the function of cells and tissues; how molecules drive signaling pathways and cellular processes essential for biological functions; based on research publications.

- ACB:6238 Critical Thinking in Genetics** 1 s.h.
Current topics in molecular and classical genetics; emphasis on genetic underpinnings of disease; based on primary research publications.
- ACB:6239 Critical Thinking in Cell Biology** 1 s.h.
Understanding subcellular organization and intercellular communication; emphasis on critical thinking and primary research publications.
- ACB:6248 Critical Thinking in Development** 1 s.h.
Current topics in molecular basis of vertebrate development; based on primary research publications.
- ACB:6249 Critical Thinking in Cellular Physiology** 1 s.h.
Control of physiological systems at the cellular level; emphasis on regulation by molecular signaling pathways; literature based.
- ACB:6250 Critical Thinking in Scientific Writing and Presentations** 1 s.h.
Scientific grant writing, particularly specific aims development, and oral presentations. Requirements: second-year standing in cell and developmental biology graduate program.
- ACB:6252 Functional Neuroanatomy** arr.
Basic principles of neuroanatomy and neurophysiology; emphasis on human central nervous system; laboratory emphasis on anatomical study of spinal cord and brain. Offered spring semesters. Requirements: physical therapy and rehabilitation science enrollment or graduate standing. Same as PTRS:6253.
- ACB:6265 Neuroscience Seminar** 0-1 s.h.
Research presentations. Same as BIOL:6265, MPB:6265, NSCI:6265, PSY:6265.
- ACB:7001 Teaching and Learning in the Anatomical Sciences** 2 s.h.
Strategies involved in anatomical sciences education including interactive lecturing, dissection, peer teaching/learning, plastination, virtual microscopy, simulation, case presentation, and assessment techniques; recorded lectures and online modules. Requirements: enrollment in Master of Clinical Anatomy program.
- ACB:7002 Seminar in Anatomical Sciences** 1 s.h.
Opportunity to discuss peer-reviewed anatomical, clinical, and education research articles as related to issues of teaching in anatomical sciences; student- and/or faculty-led presentations prompt further discussion of various in-depth studies that focus on bringing current information into the classroom. Requirements: enrollment in Master of Clinical Anatomy program.
- ACB:7010 Anatomy Through Imaging** 2 s.h.
Exploration of anatomy through basic imaging techniques; online modules and in-class activities; focus on identification of normal structures through application of anatomical concepts. Requirements: enrollment in Master of Clinical Anatomy program.
- ACB:7020 Human Embryology Online** 2 s.h.
Major events of embryologic development in humans; more of a morphologic focus than a molecular focus, including important molecular concepts of development; backstory of adult human anatomy and how various birth defects occur. Offered spring semesters. Prerequisites: ACB:5203 or ACB:8101 or ACB:5108. Requirements: enrollment in Master of Clinical Anatomy program.
- ACB:7227 Anatomic Study for Teaching** 2-3 s.h.
Experience completing a detailed dissection of a region of the human body; opportunity to create models depicting anatomical concepts. Requirements: enrollment in Master of Clinical Anatomy program.
- ACB:7400 Practicum in College Teaching for Master of Clinical Anatomy** 1-4 s.h.
Supervised college teaching experience; teaching in collaboration with faculty, observation and critiques of teaching, participation in course planning and evaluation procedures; ethical and multicultural considerations. Recommendations: enrollment in Master of Clinical Anatomy program.
- ACB:8101 Medical Gross Human Anatomy** 5 s.h.
Complete dissection of the body with regional emphasis stressing relationships to the living system; clinically relevant areas of radiologic imaging, surface anatomy, embryology, and clinical correlations; anatomical knowledge through lectures, small group work, independent activities. Offered fall semesters. Requirements: M.D. or M.P.A.S. enrollment.
- ACB:8120 Human Gross Anatomy for Dental Students** 6 s.h.
Exploration of gross anatomy of human body including thorax, abdomen, and upper limb; extensive focus on head, neck, and neuroanatomy; regional and systemic approaches; course sequence and assessment blended with general histology for dental students; cadaveric dissections closely follow lecture sequence; emphasis on correlations to dental practice. Offered spring semesters. Requirements: D.D.S. enrollment.
- ACB:8121 General Histology for Dental Students** 4 s.h.
Microscopic study of cells, fundamental tissues, and organ systems; emphasis on tooth-related structures. Offered spring semesters. Requirements: D.D.S. enrollment or anatomy and cell biology graduate standing.
- ACB:8401 Advanced Human Anatomy** arr.
Regional dissection of the body with emphasis on systems relevant to student's specialty interests; discussion, reading, clinically relevant imaging, embryology. Offered spring semesters. Requirements: fourth-year M.D. enrollment or graduate standing.
- ACB:8402 Teaching Elective in Regional Anatomy** 2,4 s.h.
Students expand knowledge and experience in medical education; investigation of educational pedagogy in a laboratory setting coupled with self-directed learning of anatomical content relevant to professional development; preparation, design, and implementation of four teaching interactions with year one medical, dental, and physician assistant (M1/D1/PA1) students; designing a classroom exercise (e.g., interactive lecture, learning activity, computer-based study module) that helps bridge the basic science content with clinical procedure. Requirements: M.D. standing and enrollment in teaching distinction track.
- ACB:8405 Advanced Clinical Neuroanatomy** 2 s.h.
Focused training in interpretation of cross-sectional neuroanatomy at a level far exceeding what is currently taught in preclinical curriculum; builds on prior training in diagnostic neuroimaging of the human brain during first and second phases of the medical curriculum, producing postgraduate year one (PGY-1) level of readiness interpreting structural brain images; core knowledge and skills of neurological examination applied within context of clinical problems. Requirements: M.D. enrollment.

ACB:8498 Special Study On Campus

Anatomy research on campus; individually arranged.
Requirements: M.D. enrollment.

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