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;
imunochemistry 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.
<table>
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<tr>
<th>Course Code</th>
<th>Title</th>
<th>Credits</th>
<th>Description</th>
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<tbody>
<tr>
<td>ACB:6238</td>
<td>Critical Thinking in Genetics</td>
<td>1 s.h.</td>
<td>Current topics in molecular and classical genetics; emphasis on genetic underpinnings of disease; based on primary research publications.</td>
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<tr>
<td>ACB:6239</td>
<td>Critical Thinking in Cell Biology</td>
<td>1 s.h.</td>
<td>Understanding subcellular organization and intercellular communication; emphasis on critical thinking and primary research publications.</td>
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<tr>
<td>ACB:6248</td>
<td>Critical Thinking in Development</td>
<td>1 s.h.</td>
<td>Current topics in molecular basis of vertebrate development; based on primary research publications.</td>
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<tr>
<td>ACB:6249</td>
<td>Critical Thinking in Cellular Physiology</td>
<td>1 s.h.</td>
<td>Control of physiological systems at the cellular level; emphasis on regulation by molecular signaling pathways; literature based.</td>
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<tr>
<td>ACB:6250</td>
<td>Critical Thinking in Scientific Writing</td>
<td>1 s.h.</td>
<td>Scientific grant writing, particularly specific aims development, and oral presentations. Requirements: second-year standing in cell and developmental biology graduate program.</td>
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<tr>
<td>ACB:6252</td>
<td>Functional Neuroanatomy</td>
<td>arr.</td>
<td>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.</td>
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<tr>
<td>ACB:6265</td>
<td>Neuroscience Seminar</td>
<td>0-1 s.h.</td>
<td>Research presentations. Same as BIOL:6265, MPB:6265, NSCI:6265, PSY:6265.</td>
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<td>ACB:7001</td>
<td>Teaching and Learning in the Anatomical</td>
<td>2 s.h.</td>
<td>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.</td>
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<tr>
<td>ACB:7002</td>
<td>Seminar in Anatomical Sciences</td>
<td>1 s.h.</td>
<td>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.</td>
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<tr>
<td>ACB:7010</td>
<td>Anatomy Through Imaging</td>
<td>2 s.h.</td>
<td>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.</td>
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<tr>
<td>ACB:7020</td>
<td>Human Embryology Online</td>
<td>2 s.h.</td>
<td>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.</td>
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<tr>
<td>ACB:7227</td>
<td>Anatomic Study for Teaching</td>
<td>2-3 s.h.</td>
<td>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.</td>
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<td>ACB:7400</td>
<td>Practicum in College Teaching for Master</td>
<td>1-4 s.h.</td>
<td>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.</td>
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<tr>
<td>ACB:8101</td>
<td>Medical Gross Human Anatomy</td>
<td>5 s.h.</td>
<td>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.</td>
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<tr>
<td>ACB:8120</td>
<td>Human Gross Anatomy for Dental Students</td>
<td>6 s.h.</td>
<td>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.</td>
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<tr>
<td>ACB:8121</td>
<td>General Histology for Dental Students</td>
<td>4 s.h.</td>
<td>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.</td>
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<td>ACB:8401</td>
<td>Advanced Human Anatomy</td>
<td>arr.</td>
<td>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.</td>
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<tr>
<td>ACB:8402</td>
<td>Teaching Elective in Regional Anatomy</td>
<td>2,4 s.h.</td>
<td>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.</td>
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<tr>
<td>ACB:8405</td>
<td>Advanced Clinical Neuroanatomy</td>
<td>2 s.h.</td>
<td>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.</td>
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ACB:8498 Special Study On Campus
Anatomy research on campus; individually arranged.
Requirements: M.D. enrollment.