HISTOLOGY - DEN 5126C - COURSE SYLLABUS - SPRING 2021

Course Faculty
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I. COURSE DESCRIPTION
This course covers the basic cell and tissue biology of the four classic tissues (epithelium, connective tissue, muscle, and nerve), some organ systems, and the oral cavity and teeth. This serves as the foundation for understanding normal structures and functions covered in physiology and pathology.

II. COURSE GOALS
There are three general course goals or learning objectives: (1) describe the basic structure and function of human cells and organelles; (2) explain the organization and function of cells and extracellular matrix (ECM) in human tissues, including the four classic tissues; and (3) discuss the functional relationships of cells and tissues in the oral cavity, including tooth structure and formation, and in the cardiovascular, respiratory, digestive, and endocrine systems.

III. COURSE OVERVIEW
A. Lectures
Lectures are designed to introduce and discuss key concepts. Students may need to consult reference texts for additional details and explanation. Lecture format in most cases is centered on diagrammatic illustrations in didactic presentations and are available as PDF documents.

B. Laboratories
Laboratories are designed to reinforce lecture content in the form of group exercises that promote peer teaching and learning. Labs provide hands-on experiences identifying cell and tissue structure using virtual (electronic) slides. Observing histological sections of human tissues provides the best opportunity to learn spatial aspects of cell and tissue biology in the human body. Laboratories begin with a brief didactic tour of assigned slides. Following this, students work in groups in lab to learn slide content using didactic guides for each laboratory that are available as PDF documents.

C. Clinical Correlations
Examples of clinical correlations are included to demonstrate relevance and application of knowledge.

IV. COURSE MATERIAL
A. Required Textbooks

B. Recommended Textbooks
Molecular Biology of the Cell. Alberts et al. 6th Ed. 2015
Molecular Cell Biology. Lodish et al. 8th Ed. 2016.

C. UF Library Links
Earlier editions of the textbooks above are adequate for most course content. Electronic versions of older editions are available through UF Libraries. Visit https://uf.catalog.fcla.edu/uf.jsp and search with the keyword “histology.” Available eBooks can be browsed at http://guides.uflib.ufl.edu/ebooks.
V. COURSE CONTENT

The course is organized in three sections as follows:

<table>
<thead>
<tr>
<th>Section 1</th>
<th>Section 2</th>
<th>Section 3</th>
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<tbody>
<tr>
<td>Lec 1 Intro &amp; Cells</td>
<td>Lec 6 Cartilage &amp; Bone</td>
<td>Lec 11 Endocrine</td>
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<tr>
<td>Lab 1 Cells</td>
<td>Lab 6 Cartilage &amp; Bone</td>
<td>Lab 11 Endocrine</td>
</tr>
<tr>
<td>Lec 2 Epithelium</td>
<td>Lec 7 Bone Growth</td>
<td>Lec 12 Oral Epithelium</td>
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<tr>
<td>Lab 2 Epithelium</td>
<td>Lab 7 Bone Growth</td>
<td>Lab 12 Oral Epithelium</td>
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<tr>
<td>Lec 3 Connective Tissue</td>
<td>Lec 8 Blood &amp; CV</td>
<td>Lec 13 Tooth 1</td>
</tr>
<tr>
<td>Lab 3 Connective Tissue</td>
<td>Lab 8 Blood &amp; CV</td>
<td>Lab 13 Tooth 1</td>
</tr>
<tr>
<td>Lec 4 Nerve</td>
<td>Lec 9 Respiratory</td>
<td>Lec 14 Tooth 2</td>
</tr>
<tr>
<td>Lab 4 Nerve</td>
<td>Lab 9 Respiratory</td>
<td>Lab 14 Tooth 2</td>
</tr>
<tr>
<td>Lec 5 Muscle</td>
<td>Lec 10 Digestive</td>
<td>Lec 15 Periodontology</td>
</tr>
<tr>
<td>Lab 5 Muscle</td>
<td>Lab 10 Digestive</td>
<td>(3 lectures, no lab)</td>
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<tr>
<td>Optional Review</td>
<td>Optional Review</td>
<td>Optional Review</td>
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<tr>
<td>Exam 1</td>
<td>Exam 2</td>
<td>Exam 3</td>
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VI. COURSE ACTIVITIES OBJECTIVES

Cells
Identify the different cell structures and organelles visible by light and electron microscopy.
Differentiate the functions of the intracellular organelles.

Epithelium
Identify, differentiate, and classify the different types of epithelium.
Correlate the structure of a specific epithelium with its function, including glandular epithelium.

Connective Tissue
Identify and explain the functions of different types of connective tissue and their cells, including resident and transient CT cells and extracellular matrix (ECM) components and functions.

Nerve
Identify nerves, nerve cell bodies, and nerve endings with both light and electron microscopy.
Describe the structure of myelin, its formation, and its role in nerve impulse transmission.
Define how the synapse functions in impulse transmission between cells.

Muscle
Identify, differentiate, and classify the three types of muscle tissue.
Describe molecular and cellular mechanisms responsible for contraction and force generation.
Relate the morphology and function of sarcoplasmic reticulum and T-tubules in striated muscle.
Explain the function of calcium ions in striated and smooth muscle contraction.

Cartilage and Bone
Identify, differentiate, and classify the different types of cartilage.
Describe the composition of cartilage and bone tissues.
Identify and explain the functions of bone cells.

Bone Growth
Compare and contrast endochondral and intramembranous ossification.
Describe the origins and functions of all bone cells.
Describe mechanisms of internal and external bone remodeling.

Cardiovascular System
Describe the structure and function of blood cells and non-cellular components.
Describe the structure and function of different types of blood and lymphatic vessels.
Identify and differentiate cardiac muscle from other types of muscle.

Respiratory System
Identify the different portions of the conducting and respiratory portions of the lung.
Describe the histological structure of the trachea, bronchi, and the various bronchioles.
Relate the structure of the alveolar wall to its function in gas exchange.
Describe the structure and function of the cells of the respiratory system.

**Digestive System**
Describe the histological structure of the wall of the alimentary canal.
Describe the structure and function of the cells and associated glands of the digestive track.
Compare and contrast the histology of the mucous, submucosa, muscularis externa, and serosa.
Diagram the organization and function of the major salivary glands, including their ducts.
Describe the difference between serous, mucous, and mixed acini.
Understand the section and flow of bile in the liver.
Understand the process of secretion and flow of enzymes from the pancreas to the intestine.

**Endocrine System**
Classify hormones and signaling molecules with respect to structure and function.
Correlate hormone structure and function with regulation of synthesis and secretion.
Explain the synthesis and functions of the primary hormones from the pituitary, pineal, thyroid, parathyroid, adrenal glands, and the endocrine pancreas.

**Oral Epithelium**
Describe the histological features of the various regions of the gingiva.
Compare and contrast regional differences in the oral epithelium including the lips and tongue.
Compare papillae of the tongue and explain the function of taste buds, if present.

**Tooth I and II**
Describe the structure and function of cells and ECM associated with the periodontal ligament.
Describe the histological characteristics of the alveolar process, alveolar bone, and cementum.
Describe the tissue structure of the tooth, including both hard and soft tissues.
Explain the development of the tooth, including formation of both hard and soft tissues.
Describe the different methods of preparing histological sections of teeth and their advantages.

**VII. EVALUATION**

**A. Exams**
Three exams are given. Each exam consists of 60 questions (usually 6 per lecture plus 6 per lab).

**B. Lab Quizzes**
Fourteen lab quizzes are given (1 per lab). Each lab quiz consists of 5 questions and is worth 3 points. Possible scores are 0, 1, 2, or 3 points. Missing three questions will result in a score of 2 points, and so forth. Thus, 2 questions may be answered incorrectly for full credit on lab quizzes.

**C. Grading**
Final grades are based on performance on three exams and fourteen lab quizzes. A final cumulative average score of at least 65% is necessary to earn a passing grade. The relative weight of each exam is ~27%. The relative weight of each lab quiz is ~1.4%. All 3 exams equal ~81% of the final grade. All 14 lab quizzes equal ~19% of the final grade. Scores are rounded up for grading.

<table>
<thead>
<tr>
<th>Grade</th>
<th>% Range</th>
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<tbody>
<tr>
<td>A</td>
<td>95 - 100</td>
<td>B</td>
<td>85 - 89</td>
<td>B-</td>
<td>75 - 79</td>
<td>C</td>
<td>65 - 69</td>
</tr>
<tr>
<td>A-</td>
<td>90 - 94</td>
<td>B</td>
<td>80 - 84</td>
<td>C+</td>
<td>70 - 74</td>
<td>E</td>
<td>0 - 64</td>
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**D. Clarifications**
Students are responsible for monitoring the results of the scoring process for exams. Students are encouraged to discuss exam questions with course faculty (e.g., if you think more than one answer is correct). Clarifications of exam questions may be requested by email within seven days of an exam. Clarification emails must (1) be sent to the course director, (2) refer to a specific question, (3) concisely summarize your viewpoint, and (4) cite a reliable source of information (e.g., not Wikipedia).
E. Discrepancies
Students may uncover discrepancies between information presented in (1) required textbooks, (2) lecture and laboratory presentations, (3) other textbooks, (4) online content, and/or (5) personal communications. In these instances, please notify the course director. For the purposes of examinations, such discrepancies in course content will be resolved by the course director.

F. Remediation
Students who fail the course must meet in person with the course director to plan their remediation. Remediation typically consists of individual study followed by taking written remediation exams. Students are only required to remediate failed exams. If a student fails more than one exam, then all failed exams must be remediated. Successful remediation is achieved by earning a passing score on remediation exam(s) using the same passing cutoff described above (65%). Remediation is available only once; students cannot remediate a failed remediation exam. Students who pass the course, but fail an exam, do not have the option to remediate the failed exam.

VIII. ADMINISTRATIVE PRACTICES

The UFCD Student Handbook is available at the following link:

For policies pertaining to this course, consult the UFCD Student Handbook and Office of Academic Affairs (https://dental.ufl.edu/education/dmd-program/), including the following: attendance, dress code, email policy, professional behavior, student responsibilities in the classroom, academic honesty and student honor code, tutoring, Americans with Disabilities Act (ADA) and student accommodations, post-examination review, grading, remediation, student evaluation of instruction, complaint process, UF counseling services and mental health services, electronic course material and social media.

Academic Honesty - All students must adhere to the UF academic honesty policy and to understand what constitutes a policy violation (http://www.dso.ufl.edu/scrr/process/student-conduct-honor-code). Students are bound by the UF Honor Pledge: We, members of the UF community, pledge to hold ourselves and our peers to the highest standards of honor and integrity by abiding by the Honor Code. For all assessments and work submitted for credit, the following pledge is either required or implied: On my honor, I have neither given nor received unauthorized aid in doing this assignment.

Accommodations - Students with disabilities requesting accommodations should first register with the Disability Resource Center (352-392-8565, https://disability.ufl.edu/). Once registered, students will receive an accommodation letter which must be presented to the course director.

Grading - See https://catalog.ufl.edu/UGRD/academic-regulations/grades-grading-policies/.

Counseling and Wellness Center - Services are available at 392-1575 or www.counseling.ufl.edu. The Student Health Care Center can be reached 24/7 at 352-392-1161 or http://shcc.ufl.edu/.

U Matter, We Care: If you or someone you know is in distress, please contact 352-392-1575 or umatter@ufl.edu or visit http://umatter.ufl.edu to refer or report a concern.

UF Health Shands Emergency Room: For immediate medical care call 352-733-0111 or go to the emergency room at 1515 SW Archer Road, Gainesville (see http://ufhealth.org/emergency-room).

The University of Florida Police Department can be reached at 392-1111 or 9-1-1 for emergencies.