

## **BSC 426 Histology**

**Spring, 2014**

Prerequisites: BSC 1406, 1407, and 2402

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**Lectures:** MWF 10:00-10:50 AM  
Jan 13-May 9, 2014

**Location:** Science Building (STC), Room 228

**Office Hours:** MW 11:00-12:00; 1:30-3:00  
or by appointment

### **Course Overview:**

Histology is a discipline which examines the structure and correlating functions of tissues and cells using light microscopy, electron microscopy and other specialized microscopic methods. The course will involve a study of general tissue characteristics and will explore histologically and ultrastructurally the different tissue types in the body including epithelial, connective, skeletal, blood/vascular, muscular, and neurological tissues as well as the various organ systems including cardiovascular, lymphatic, integumentary (skin), digestive, respiratory, urinary, endocrine, male and female reproductive, and special senses (eye and ear). While the course's emphasis will be a study of the appearance of normal cells and tissues, selected abnormal/diseased tissues will be examined as well (e.g., bone osteoporosis, heart myocardial infarctions, neurological diseases, etc.) and functional correlations will be made.

### **Student Learning Outcomes (SLO):**

Upon completing the course, students will be able to:

1. Demonstrate proficiency and expertise in the proper use of the light microscope in examining histological specimens on glass slides.
2. Understand the basic concepts of tissue fixation, dehydration, embedding, sectioning, staining and mounting of slides for histological examination, immunofluorescent staining and electron microscopy.
3. Recognize, identify and describe the characteristic structures of cells, tissues and organ systems of the body at the light microscope histologic level, and for selected tissues, at the electron microscopic ultrastructural level.

4. Know and understand the characteristics of tissues of the body (epithelium, connective, muscle, nerve) and their relationships in the various organ system of the human body.
5. Understand the basic functions of cells and cellular organelles, tissues and organ systems of the body as correlated with their histological structures.
6. Identify and understand the histological features of selected tissues/organ systems resulting from disease processes (e.g., atherosclerosis, osteoporosis, pulmonary pneumonia, etc).

**Textbook: Histology-A Text and Atlas (sixth edition)**  
**By Michael M. Ross and Wojciech Pawlina**

The lectures/discussions/microscopy observations will be related to materials covered in the Ross and Pawlina Text/Atlas. Chapters or parts of chapters will be assigned. The reading will be helpful in understanding and supplementing the materials covered in class.

### **Class Policies:**

#### **Attendance:**

Attendance is expected at all classes. Attendance will be taken.

#### **Class Participation:**

Portions of some classes will be spent examining histological specimens using the light microscopes along with formal lecture material. It will be important to interact with instructors and other students and to participate in class discussions and share information noted on the various histological specimens.

#### **Lectures:**

PowerPoint slides will be used for most of the lectures. The lectures and class discussions will not totally replace the information you will need to learn and study from reading in your textbook and your studies of glass slides under the light microscope, but will certainly illustrate and emphasize the overall important concepts for the course.

#### **Reading Assignments:**

Specific reading assignments will be given for the textbook (Ross and Pawlina). Due to the very detailed and comprehensive nature of this excellent textbook and atlas, materials covered in lecture will not always cover all aspects of a given chapter, but rather portions of chapters that have the most important information you need to know pertinent to the learning objectives for the course. It should be noted that the order of topics discussed in lecture for the most part will follow the order of the material presented in the text. It will be important for the student to determine the most important components of the reading that will be helpful to master the course content based upon the lecture materials, microscopic work, and class discussions. Consultation with the instructor is encouraged should there be difficulty in determining what portions of the text need to be read/studied.

#### **Examinations/Quizzes/Essay**

1. Unit Examination: There will be three unit examinations. Each unit examination will count 200 points with a total of 600 points for the three unit examinations given during the semester. Each unit examination will have two components: Part I will be a 50 minute written

examination during a full class period; Part II will be a 25 minute examination identifying histologically-relevant images under the microscope during the first half of the next class period.

2. A comprehensive final examination will be administered during the regular examination week. A combined final written examination and practical examination will count 200 points, 100 points each.
3. Quizzes: A total of 10 quizzes will be given over the span of the semester, each is worth 10 points or 100 points total.
4. Essay and Oral Presentation: A required 2-3 page typed (double spaced) essay will count 100 points. Such activities as writing an essay on some histological concept, doing an in depth literature search on a disease process that is relevant to histology, writing a detailed description of a specialized histological technique and its use in research (e.g., immunofluorescent antibody staining; laser confocal microscopy; immunoelectron microscopy etc.), an essay on work done to develop a certain histological concept, the use of a selected histological technique(s) to analyze a clinical or research problem (e.g., how histology may be used to detect certain kinds of cancers or how histology is used to determine where specific proteins or nucleic acids are located in cells and tissues, etc.). A five minute oral presentation based on this essay will be made to the class followed by questions from the class. Please consult with the Course Director, Dr. Lemanski, to receive advice and/or gain approval of your project topic by Wednesday, April 2, 2014.

#### **Grading System:**

3 examinations (200 points each)	=	600 points	(60%)
Final examination	=	200 points	(20%)
10 quizzes (10 points each)	=	100 points	(10%)
Essay/oral presentation (100 points)	=	<u>100 points</u>	<u>(10%)</u>
		1000 points	(100%)

#### **Grading:**

A	900-1000	(90-100%)
B	800-899	(80-89%)
C	700-799	(70-79%)
D	600-699	(60-69%)
F	0-599	(0-59%)

#### **Academic Integrity:**

A Texas A&M University-Commerce student does not lie, cheat, steal, and does not tolerate those who do. A violation of the Texas A&M honor code and academic integrity involves any of the following offenses: cheating, fabrication, falsification, multiple submissions, plagiarism, and complicity in any of these offenses. The first instance of cheating will result in a "ZERO" on the examination and/or on the assignment. The second instance of cheating will result in a "ZERO" for the course. Cheating involves copying information from another student, non-allowable materials or source and plagiarism. Once again, violations of academic integrity will not be tolerated. This class will be conducted in strict observance of the Honor Code. Refer to your Student Handbook for details.

#### **Conduct Policy:**

As per the Texas A&M Universities Student's Guide Handbook, Policies and Procedures, Conduct, all students enrolled at the University shall follow the tenets of common decency and acceptable behavior conducive to a positive learning environment.

**Cell Phones, Laptop Computers and other Electronic Devices:**

Please turn your cell phone (and other electronic devices) off during class. If you are anticipating an urgent call or if you must be on an important call, please place your cell phone on vibration mode and if you get such a call, step into the hallway to attend to the phone conversation.

If you utilize a laptop in class to take notes, please be aware of potentially distracting others in class. It is not acceptable to use your computer to do outside work, surf the web, or carry on personal communications while in class. Texting is prohibited.

While recordings of this class may be made for personal use with **prior permission**, recordings may not be sold or distributed to others. You may make copies of these notes for your personal use; copies of these notes may not be distributed to anyone other than persons who are currently enrolled in the class nor may any copies be sold.

**Students with Disabilities/Reasonable Accommodation:** The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities.

If you have a disability requiring an accommodation, please contact:

Office of Student Disability Resources and Services

Texas A&M University- Commerce

Gee Library, Room 132

Phone: 903-886-5150 or 903-886-5835

Fax: 903-468-8148

[StudentDisabilityServices@tamuc.edu](mailto:StudentDisabilityServices@tamuc.edu)

**Plagiarism:**

Plagiarism is a criminal activity. You must cite all sources of information. Unreferenced copying of material, whether parts of sentences, whole sentences, paragraphs, or entire articles can result in a score of zero for your assignment and may result in further disciplinary action.

**Important Dates, Days, and Times (Approximate and Subject to change)**

Lecture #	Date	Subject
1	Jan 13	Methods: Overview of histology, tissue preparation, staining, proper use of light microscope
2	Jan 15	Methods: Overview of histology, tissue preparation, staining, proper use of light microscope
3	Jan 17	Cell Cytoplasm: Cell Structure and Function
4	Jan 22	Cell Nucleus: Cell Structure and Function
5	Jan 24	Tissues
6	Jan 27	Epithelial Tissue and Glands I
7	Jan 29	Epithelial Tissue and Glands II
8	Jan 31	Review for Unit Examination I

9	Feb 3	Unit Examination I (written portion)
10	Feb 5	Unit Examination I (practical portion)
11	Feb 7	Connective Tissue
12	Feb 10	Cartilage
13	Feb 12	Bone
14	Feb 14	Adipose
15	Feb 17	Blood and Hematopoiesis
16	Feb 19	Muscle Tissue I
17	Feb 21	Muscle Tissue II
18	Feb 24	Nerve Tissue I
19	Feb 26	Nerve Tissue II
20	Feb 28	Integumentary System
21	Mar 3	Unit II Pre-Examination Review
22	Mar 5	Unit II Examination (written portion)
23	Mar 7	Unit II Examination (practical portion)
SPRING BREAK (Mar 10-Mar 14)		
24	Mar 17	Cardiovascular System I
25	Mar 19	Cardiovascular System II
26	Mar 21	Cardiovascular System III
27	Mar 24	Lymphatic System
28	Mar 26	Digestive System I—Oral cavity
29	Mar 28	Digestive System II—Gastrointestinal tract
30	Mar 31	Digestive System III—Liver, gall bladder and pancreas
31	Apr 2	Respiratory System
32	Apr 4	Urinary System
33	Apr 7	Endocrine Organs
34	Apr 9	Male Reproductive System
35	Apr 11	Female Reproductive System
36	Apr 14	Eye
37	Apr 16	Ear
38	Apr 18	Review for Unit III Examination
39	Apr 21	Unit III Examination (written)
40	Apr 23	Unit III Examination (practical)
41	Apr 25	Oral Presentations on Essay Topic
42	Apr 28	Oral Presentations on Essay Topic
43	Apr 30	Oral Presentations on Essay Topic/Review for Final Exam
44	May 2	Review for Final Exam
45	May 3-9	Finals Week (Comprehensive written and practical examinations)
46	May 10	Commencement

### Reading Assignments

Reading assignments in Histology-A Text and Atlas (sixth edition) by Michael M. Ross and Wojciech Pawlina

Chapter #	Pages
1. Methods	1-21
2. Cell cytoplasm	22-26; 56-74
3. Cell nucleus	75; 86-87

4. Tissues	98-104
5. Epithelial tissues	105-118; 120; 146-157
6. Connective tissues	158-163; 165-166; 171-173; 178; 192-197
7. Cartilage	198-217
8. Bone	218-253
9. Adipose tissue	254-267
10. Blood	268-278; 280-286; 289-290; 293-309
11. Muscle tissue	310-351
12. Nerve tissue	352-399
13. Cardiovascular system	400-439
14. Lymphatic system	440-441; 453-487
15. Integumentary system	488-525
16. Digestive system I	526-534; 545-567
17. Digestive system II	569-579; 584-627
18. Digestive system III	628-663
19. Respiratory system	664-697
20. Urinary system	698-739
21. Endocrine organs	740-783
22. Male reproductive system	784-829
23. Female reproductive system	830-895
24. Eye	896-927
25. Ear	928-949