

i. SYLLABUS, Spring 2008  
Histology, Biology 309

**INSTRUCTOR:** George Shinn

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**OFFICE HOURS:** Monday-Friday: 1:30-2:30

At these times, I will be in my office or research lab to help you in any way that I can. Make an appointment to meet with me at other times. Or, come in if my office door is open!

**REQUIRED TEXT & SUPPLIES:**

***Histology, A Text and Atlas, 5th edition***, by Michael Ross and Wojciech Pawlina  
ISBN 0-7817-5056-3

**A three-ring binder** (2" thick) will help you keep track of the many laboratory handouts that I provide. **Unlined paper, pencil, and an eraser** will all be useful for making sketches of what you see during class. Making sketches will help you understand and remember what you are seeing in lab, but you will not be asked to turn in a laboratory notebook for a grade.

**BRIEF INTRODUCTION TO HISTOLOGY:**

Histology explores the microscopic anatomy of animals. Although it emphasizes structure, the ultimate goal of histological research is to understand how a body functions. Histologists use microscopes to study functional morphology—how structure enables function.

Histologists analyze functional morphology from the perspective of cells and tissues (vs. the perspective of gross anatomy). We typically want to resolve the following types of questions about an animal's body parts (e.g., organs):

1. What tissue types are present and how are they arranged?
2. Within each tissue, how many cell types are present and how is each cell type distinctive with respect to its size, shape, cytoplasmic contents, and relative position?
3. For each cell- and tissue-type present, how do unique aspects of its structure and arrangement contribute distinctive functions to the entire organ and organism?

This histology class will provide you (a) basic microscopy skills, (b) a "conceptual framework" for understanding the structure of multicellular animals, and (c) lots of opportunity to explore the many ways that the conceptual framework is expressed in diverse mammalian organs. Your goal should be to develop a conceptual understanding of the organs, tissues and cell types that we study so that you can correctly analyze (make sense of) specimens you have never seen before and make predictions about the functioning of their parts.

We will build our understanding of animal function around four very general concepts that it took microscopists a century or more to develop:

1. Animal tissues and organs are composed of eukaryotic cells and extra-cellular materials produced by those cells.
2. Within organs, similar cells are grouped into functional assemblages called tissues.
3. Most vertebrate organs contain four general tissue types: epithelial, connective, muscle, and nervous tissues.
4. Organ-specific functions are the result of organ-specific expressions of the four general tissue types.

At the beginning of this class, you can expect to be unfamiliar and, therefore, uncomfortable with the concepts of histology, how to interpret microscopical images, and how to study and think about form. Most students have experienced vertebrate structure mainly through dissections, and not very extensively at that! One of the great things about this class is that you will learn a lot of new stuff. **You will come to understand animal bodies in a new and more sophisticated way.** Fear not and savor the experience! By the end of the class, you will appreciate how far you have come. Keep in mind that our bodies contain a limited number of organs, tissue types, and cell types—you can take comfort in the fact that histology has bounds!

#### **DAY-TO-DAY OPERATION OF COURSE & EXPECTATIONS:**

\* You can expect me to come to each class well-prepared and with enthusiasm; to return quizzes and exams within one week; and to treat you and grade you fairly. I hope that you will tell me (e.g., anonymously) if you feel that these expectations are not being met!

\* I operate under the assumption that all students attend all class meetings. You are individually responsible for all information and assignments given during class meetings. It is your responsibility to keep informed of announced changes to the class schedule (e.g., changes in exam times if this becomes necessary; upcoming quizzes, etc.).

\* Class meets for two hours on Mondays and Wednesdays and for one hour on Fridays. Most class meetings will consist of both lecture-style presentation of information and laboratory-style, light-microscopic study of histological sections. Some entire sessions may be devoted to lectures, individual study of specimens, discussions, reviews, 35mm slide shows, quizzes, major exams, etc.

\* You will be assigned a microscope slide box for your exclusive use during lab hours. Each slide box and the microscopes will be shared with another student in another section of the course, however. Slide boxes must not be taken from the room and should be kept in the locked cabinet when not in use.

\* Slides in the box should be consecutively numbered on the upper left corner of the slide label; numbers correspond to the list pasted into the door of the slide box. Please keep the slides in proper numerical order, so that they are easy to locate. Please do not exchange slides between boxes.

\* Bring your textbook to every class meeting. It contains many illustrations that you will want to refer to during class. Also, the class schedule includes reading assignments.

\* Read relevant lab handouts and scan relevant illustrations in the text prior to coming to class. These contain a lot of very useful information that you will be expected to know and that may not be covered explicitly during introductory lectures. *Your goal is to arrive in class with some tentative knowledge of the subject that you can make real during class by relating it to actual biological specimens.*

\* To do well in histology, you will probably need to spend some extra time in the lab studying you slides. You can check out keys from me for letting yourself into the room and slide and microscope cabinets. When you are finished studying, you will need to lock the cabinets and the room, and immediately return the keys to beneath my office door. If you pass the keys on to another histology student, be sure to record their name and phone number and to deputize them to be responsible for locking up and returning the keys to beneath my office door.

\* **ACADEMIC INTEGRITY** is the standard set for this course. Academic dishonesty in any form will not be tolerated. You are expected to work alone on exams and quizzes without the use of any outside resources. For example, you cannot look at other student's tests, nor talk about the test with other students, nor use cheat sheets of any sort. You are expected to complete all written assignments using your own original words and ideas and to properly quote and cite the words and ideas of others, when you draw upon them. I also expect you to be honest in your interactions with me.

If these expectations are not upheld, the Dean of Student Affairs Office and the Vice President for Academic Affairs will be notified. For clarification of the Truman conduct code and penalties consult the *General/Graduate Catalog*. If you become aware of any acts of academic misconduct I urge you bring them to my attention.

## GENERAL ADVICE

**Get to class on time.** Most classes will begin with important introductory information. Pay attention to my board talks *and* slide shows. I will expect you to know the information I present. Take good notes; copy pictures that I draw on the board; label your copies carefully and thoroughly!

**During class, use the lab handouts I provide to guide your explorations of microscopic anatomy.** The PROCEDURES section of each handout will indicate which slides you should examine and will lead you through the slides, describing what to look for and what you should understand about those slides. **Use labeled pictures in the textbook to help you identify parts of your slides.**

**When questions arise, get help from a qualified expert (teacher, TA, or reference text).** Call out my name if I seem to be day-dreaming and don't notice your raised hand. **While waiting for help, don't stop working.** Ask your colleagues in the class for help, search your photo atlas or text book for answers, or, press on to the next thing, keeping track of your questions for when you do get expert assistance.

**Eavesdrop as I answer questions for other students.** Take advantage of relevant information that you hear. If you think that I am working with someone else on the same question, get in on the lesson!!!

**Learn to be patience and persistent.** Take a break if you need one, but then get back to work. I hope that you will work closely with your colleagues in the class, but try not to waste a lot of class time talking about *irrelevant* things.

**GRADING:** Final grades will be assigned according to the following scale.

A: 90% +    B: 80-89.9%    C: 65-79.9%    D: 55-64.9%    F: 0-54.9%

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CLASS STUDIES. During most classes you will be introduced to general histological subjects through lectures and formal laboratory exercises.

Exams: 3 x 150 pts 450

Exams will last two hours. During one hour, you will be asked to identify specific structures on slides from the box assigned to you. During the other hour, you will be asked to provide a written interpretation of one or more mystery slides, and to describe some histological concepts, or answer questions, or make labeled sketches to show your understanding of various structures.

Quizzes: 8 x 25 pts 200

To help you keep up with your course work and to give you feedback about how well you are learning histology, we will have nine quizzes during the semester. These will involve short-answer questions, questions about 35mm projector-slide images of histological sections, or both.

I will drop your lowest quiz score. Except for official absences, quizzes cannot be made up. The first quiz you miss will be the "lowest score" that gets dropped, other missed quizzes will count as zero.

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MODERN HISTOLOGICAL RESEARCH. Write a brief but informative paper (5-7 pages) about the research of a person who is currently using imaging techniques to conduct research about histological topics (see separate instructions). 100

You should chose your person and assemble the citations for their recent publications by the fourth week of class (5 pts of 100 pts.)

An informative outline with citations incorporated into the text and a properly formatted References Cited section is due during the seventh week of class (worth 25 of the 100 total pts).

You may be asked to provide a brief summary of your research to the entire class towards the end of the semester.

**No two students will be allowed to work on the same specific topic or person's work.** So, be sure to get your topic approved by the instructor in advance of doing extensive work on your project.

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TOTAL 750

## **PROTOCOL FOR HISTOLOGY EXAMS:**

- \* GET TO CLASS ON TIME. The test will take two hours and certain parts of the exam are timed.
- \* When you come into the room, place your belongings (backpacks, books, coats, etc.) on the benches at the edges of the rooms. You will need a pencil and or pen. TURN OFF CELL PHONES.
  - \* You are not allowed to have a cell phone, digital camera, or any other potential recording device with you when taking the exam.
- \* Have your slide box ready and make sure that the microscope is functional. Make sure that your microscope lenses are clean and that the eye-pieces are adjusted for your own eyes.
- \* I will divide the class into two groups: half of you will do the identification part first, the other half will do the short answer & mystery slides first.

### **1. Identifications:**

- a. You will have 50 minutes to complete this part of the test.
- b. You can show me structures in any order that you like. Keep track of what you have shown me by checking off each item as you do them (spaces provided on ID list).
- c. The tip of the pointer should be just touching the item you are identifying. (Not pointing towards it, not covering it).
- d. I will look over your right shoulder into the right eyepiece (where the pointer is located.). Do not be alarmed or distressed if I change the magnification to get my bearings, or if I ask you to show me the same thing at a higher or lower magnification, or if I ask you to show me another example of a structure, or to move the pointer to one side or the other of what I say is an ambiguous location.
- e. It is a good idea to re-check your scope after I have looked into it to make sure that the pointer is still on the intended part of the slide.
- f. Show me the best example that you can for each item that you are asked to show.
- g. I will not tell you whether you are right or wrong while you are taking the test. You will get this information when I return exams in one week
- h. Once you show me an item, you cannot show me another "better" example later.
- i. If you have a hard time finding something, move on to another item, return to this one later (don't waste all of your exam time looking for a single item on the list!).
- j. It is OK to work on the short-answer part of the test while you are waiting for me to look in your scope, but remember that your main obligation during this part of the test is to finish all of your IDs during this 50 minute period.

### **2. Mystery slides:**

- a. You will have 25 minutes to work on this part of the exam—you will NOT be able to return to these slides later during the exam period.
- b. Your slide box must be closed and you may not refer to any slides in it.
- c. I will collect answer sheets at the end of the 25-minute mystery slide period. You can NOT continue to work on the answers after this time.

### **3. Short answers:**

Answer questions as directly as you can, provide the most sophisticated answer that you can; use appropriate technical terminology