Biology 3431 – Microanatomy
Fall 2012 – Trinity University

Vital Statistics:
Lecture @ MWF 10:30 to 11:20 am in CSI 246
Lab @ T 6 to 8:50 pm in CSI 246
Instructor  R. Blystone, Ph.D., Professor of Biology. Office @ 130 Oakmont first floor
Office Hours: MTWR 1 to 2:30 pm and by appointment.
Contact information:  @ X7243,  rbleston@trinity.edu  or Skype trinitybiology
Resources: TLearn and Facebook; Lab TA: Sophia Bacon

Disclaimers:
Attendance, participation, and readings are expected with each class meeting.  Recitation may occur with every class session.  Assignments are due at the beginning of the class on the date assigned or at the end of a laboratory.  Make-ups for exams and assignments must be requested in writing in advance of the due time.  Some course materials and some assignments will be distributed by electric delivery.  The Academic Integrity Policy and Honor Policy will be followed.

Materials:
Course text:  Anthony Mescher
Lab text:  Michael Leboffe

Image Analysis:  Image J (NIH Image) – http://rsbweb.nih.gov/ij  The current version is 1.46r.  The software is in the public domain (free) and is platform independent.

Web resources:
Webanatomy - http://webanatomy.net/histology/histology.htm  metasite
The Virtual Slide Box - http://webanatomy.net/histology/histology.htm  an interesting metaphor
Another metasite -

Course conduct:
The lab has five bench tables each of which seat from 4 to 6 students.  Frequently you will work in table groups.  Each table has a desk computer.  I recommend that you bring your wireless portable computers as well.  There will be both group and individual work.  Assume group work unless I specifically state it is to be individual work.  There is to be no eating or drinking in the lab.  It is wise to wear close toed shoes in lab.
Important dates:

Assignment Description and Dates (approximate)

1. Three one-hour exams: Sept. 14, Oct. 15, and Nov. 09. Each hour exam will cover material not previously tested. Each hour exam will have a take-home component due at the beginning of the exam. 25% of the course grade

2. Final exam: Dec. 13 – 8:30 to 11:30 am. This is a comprehensive exam, including identifications, with no take-home component. 20% of course grade

3. Pacing exercises: One each week of the course: pop-quiz, identity quiz, or assignment. 15 for a total of 15% of course grade.

4. Projection Practical: Tuesday, November 27 during lab. 15% of course grade

5. Lab Exercises: Various assignments based on lab work, announced weekly. 15% of course grade

6. Term Project: Working in groups, students will examine a phenomenon based on some histological variable. The paper must be illustrated, referenced, and no longer than 10 pages. Due Nov. 22. 10% of course grade

Assessment Strategies:
First and foremost this is an anatomy course; anatomy seen through the microscope. Its goal is for you to recognize cells and tissues. The projected practical on Nov. 27 will indicate if you have achieved this goal. If you do not score above a 79 on this exam, it will be impossible to earn an “A” in the course. Thus this exam is quite important.

The three one-hour exams serve to explore the context of microanatomy. There are some realities of structure that you must appreciate.
1) Animal cells are typically 20 or so microns in size. There are physical and chemical factors that make this so. You must appreciate these factors.
2) Cells in a multicellular organism are generally never more than 100 microns from a capillary source or similar. Given this emphasis, one must understand circulatory patterns associated with tissue. Circulation and diffusion go hand in hand.
3) Adult organs do not appear de novo. The tissue of an organ must grow into its final shape. As a student of microanatomy you must appreciate this process.
4) Cells and tissues occupy three-dimensional space and do so through time (in other words, they are four-dimensional). One must appreciate structure as a four-dimensional process.
5) The biochemistry and biophysics of cells and tissues define functional anatomy.
6) Visualization of structure requires extensive use of technology. That technology in many ways becomes part of the visualized anatomy. You must appreciate that.

As you look and ponder structure through the microscope or through a recorded image, these six principles must cycle through your thoughts. The written exams will explore your ability to grasp these principles.

The pacing exercises are just that; they serve to provide learning discipline. The amount of memorization for this course is extreme. There are at least 1,000 vocabulary terms laced with visual organization. To use a metaphor, it is one thing to look at a sunset but altogether different trying to describe that sunset. Of a related nature, the lab exercises also are intended to work you through the histological structures, especially from an analysis viewpoint.
The term project is to allow a deeper interpretation of some facet of histology, of microanatomy.

**Commentary:**
I have been teaching histology for many years now (since 1974). I had histology as a student in 1962. To look at a section of spleen with the microscope still causes me to ask why: why does it stain the way it does, why are the cells organized as they are, why the tissue changed the way it did in death? Histology posses a great paradox: through the study of preserved tissue, one gains an understanding of life. Each time I teach the course a journey is undertaken. I want to share this intellectual journey with you.

This year I intend to embrace the tissue view of the subject for much longer than I have in the past. As you already know mammalian histology can be organized into four great tissue groups.
1) Epithelium
2) Connective Tissue
3) Muscle
4) Nervous
Histology textbooks begin with a description of these four groups and then switch focus to organ structure at the microanatomical level. I intend to hold the tissue approach for much longer than the organ approach to microstructures. I also intend to do something else. Depth is my goal rather than coverage. Easy to say, but hard to accomplish.

There is a parable to recount. A mother cat found it necessary to remove her three young kittens to the other side of the mountain. She decided to ask the wise owl what would be the best way to accomplish this task. The owl said “Go as fast as the slowest.” Not understanding the intent of the owl's words, the cat gathered her kittens early one morning and set about on her journey. She was so intent on getting to the other side of the mountain by days light she did not notice the kittens falling behind one after another. As the sun set, she reached the other side to find no kittens behind her. During the night she had to discover each tired and lost kitten and had to repeat her journey by going as fast as the slowest.

**Syllabus:**
August 23 to September 12. Connective Tissue – Chapters 5, 6, 7, 8, 12, 13.

September 17 to October 10. Epithelium – Chapters 1, 2, 3, 4, 11, 18, 20.

October 15 to November 7. Muscle and Nervous Tissue – Chapters 9, 10, 20, 23.

November 12 to December 5. Organs – Chapters 15, 16, 17, 19.

The lab schedule will complement the lecture topics schedule as indicated above.