

## Department of Biology Course Outline

SC/BIOL 4220 4.00 Histology  
Fall 2015

### Course Description

Structure and function of tissues in vertebrates, with special emphasis on human histology. The laboratory deals with basic histological and histochemical techniques, such as tissue sectioning and staining, and localization of enzymes. Three lecture hours, three laboratory hours. One term. Four credits.

### Prerequisites

SC/BIOL 2020 3.00, SC/BIOL 2021 3.00, SC/BIOL 2070 3.00

### Course Instructors and Contact Information

Course Director - Dr. R. A. Webb

Office - 203A Lumbers

Email – [raw@yorku.ca](mailto:raw@yorku.ca) -(email will be answered, normally within 36 hrs; usually much sooner and possibly within an hour of sending). Responses to email enquiries for materials available in the course outline/lecture schedule will be terse.

Office hours – normally between 12 noon and 1 pm, or by appointment (easily set up with an email request).

### Schedule

Lectures: Tuesday and Thursday – 1:00 pm – 2:30 pm. Room 105 Life Sciences Building  
Labs – see moodle site – dates, locations in lab manual.

### Evaluation

Mid-Term Exam .....	20%
Lab Assignments .....	25%
Lab Exam (Final) .....	10%
Final Exam .....	45%
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TOTAL .....	<u>100%</u>

The final exam is not cumulative, and will focus on all topics covered post-midterm exam.

### Important Dates

See course outline below

NOTE: for additional important dates such as holidays, refer to the "Important Dates" section of the Registrar's Website at <http://www.yorku.ca/yorkweb/cs.htm>

### Resources

*Histology – A Text and Atlas*

Authors: Michael H. Ross and Wojciech Pawlina

Publisher: Lippincott, Williams and Wilkins

Sixth Edition (*available in the York bookstore*)

The 5<sup>th</sup> edition is quite satisfactory should second-hand versions be available.

### Learning Outcomes

Upon successful completion of this course, students should be able to:

1. describe techniques for preserving tissues and preparing for viewing using histochemistry/cytochemistry, autoradiography, immunohistochemistry, in situ hybridization, immunoperoxidase, FISH, etc.
2. describe techniques for viewing tissues with light microscopy – light, fluorescent, confocal, etc., and electron microscopy – TEM, SEM, AFM and interpret the resulting micrographs
3. provide an outline of cell structure including plasma membrane and cell contents
4. identify, draw and provide the general functions of the plasma membrane and associated structures
5. identify, draw and provide details of the structure and function of membrane limited and non-membranous cell organelles
6. classify and provide an overview of tissues
7. provide details of the structure, form and function of epithelial tissue and connective tissue
8. identify, draw and describe details of cell junctions in the lateral zone, apical cell membranes, basal cell membranes and associated structures
9. identify, draw and describe connective tissue cells and extracellular matrix
10. identify, draw and describe loose connective tissue and regular/irregular dense connective tissue
11. define the functions of the various connective tissues and their components
12. classify bones and briefly describe their function
13. identify, draw and describe the macro and micro structure of bones
14. recognize bone in micrographs and note the differences between mature and immature bone
15. identify, draw and describe the different types of bone and their formation

(intramembranous bone and endochondral bone)

16. describe the hormonal regulation of bone formation/ re-modelling/repair
17. identify, draw and describe the structure and function of adipose tissue
18. identify, describe and draw a neuron, supporting (neuroglial) cell and the organization of the Central Nervous System and the Peripheral Nervous System
19. identify, draw and briefly describe the structure and functions of the organs of the digestive system: stomach, small intestine, large Intestine, liver, pancreas and gall bladder
20. identify, and draw the essential elements of the kidney and its various components in relation to the kidney as an excretory organ
21. identify, draw and relate structure to function of the ureter, the urinary bladder and the urethra
22. identify, describe and draw the respiratory system of a human, and answer questions on the structure and function of the respiratory system from a histological viewpoint
23. identify, draw and label the origins, structural components (including the blood supply in general where important in regulating hormone release) of the pituitary gland, the thyroid gland and the adrenal gland; name and identify some of the hormones produced by the various parts of the glands, and relate some aspects of negative feedback mechanisms
24. identify, draw and fully label the male and female reproductive system; relate the origin of the reproductive organs in general terms; draw and describe the structure and function of the organs and tissues, their products and role in reproduction
25. draw and describe some elements of the human eye

**FALL 2015.**

**BIOL 4220 4.0, Histology**

**Lectures - Tues and Thurs 1:00 pm – 2:30 pm 106 LSB**

September 10, 15,	Methods in Histology: Tissues processing, Histochemistry, Microscopy
September 17, 22, 24,	Cell, Tissues: Overview of Tissues - Epithelial Tissue, Connective tissue
September 29, October 1,	Cartilage and Bone
October 6, 8,	Adipose tissue; Neurons, Supporting Cells, Organization of the Central and Peripheral Nervous Systems
October 13,	Nervous system (continued),
<b>October 15,</b>	<b>MID-TERM EXAM</b>
October 20, 22,	Cardiovascular system – heart, vessels and blood
October 27,	Digestive System: Salivary Glands, Stomach
<b>October 29 - November 1. Fall Reading Days</b>	
November 3,	Intestine, Liver, Gall Bladder, Pancreas
November 5,	Respiratory System: Nasal Cavity, Respiratory Tract, Lungs
November 10, 12,	Urinary System: Kidney Structure, Urinary Bladder, Urethra
November 17, 19,	Endocrine System: Pituitary, Thyroid, Adrenal Glands
November 24, 26,	Male and Female Reproductive Systems: Testis, Ovary, Accessory Glands
December 1, 3,	Microscopic Structures of the Eye

**Labs - Tues, Weds, Thurs, 2:30 pm - 5:30 pm Farq 204.**

**Note: Last day to drop course – November 9.**

**Last date to submit term work - December 7.**

**Final Exam – Date, time and location to be announced by the Registrar's office (exam period starts December 9, ends December 23).**

## Experiential Education and E-Learning

Lab work, experience in working first hand /hands on with techniques, processes, instrumentation, etc.

## Other Information

### **Lab attendance is mandatory.**

**THE LAB COMPONENT IS VERY HEAVY AND REQUIRES SELF-DIRECTED INDEPENDENT WORK OUTSIDE THE REGULAR LAB HOURS.**

**NOTE:** You must bring a safety glass and a lab coat to all lab sessions or you will not be allowed into the lab.

**In no circumstance may prepared slides and electron micrographs be removed from the lab.**

## Course Policies

**Late lab submissions-** will be penalized accordingly – at least 10% per day late.

**Missed Tests/Exams:** Students with a documented reason for missing a course test/mid-term exam, such as illness, compassionate grounds, etc., which is confirmed by supporting documentation (e.g., fully detailed physician's letter) may request accommodation from the Course Instructor. Submission of documentation does not mean accommodation will automatically be provided.

Further requests for accommodation may require students to submit a formal petition to the Faculty.

## University Policies

### **Academic Honesty and Integrity**

York students are required to maintain the highest standards of academic honesty and they are subject to the Senate Policy on Academic Honesty (<http://secretariat-policies.info.yorku.ca/policies/academic-honesty-senate-policy-on/>). The Policy affirms the responsibility of faculty members to foster acceptable standards of academic conduct and of the student to abide by such standards.

There is also an academic integrity website with comprehensive information about academic honesty and how to find resources at York to help improve students' research and writing skills, and cope with University life. Students are expected to review the materials on the Academic Integrity website at - <http://www.yorku.ca/academicintegrity/>

### **Access/Disability**

York University is committed to principles of respect, inclusion and equality of all persons with disabilities across campus. The University provides services for students with disabilities (including physical, medical, learning and psychiatric disabilities) needing accommodation related to teaching and evaluation methods/materials. These services are made available to students in all Faculties and programs at York University.

Student's in need of these services are asked to register with disability services as early as possible to

ensure that appropriate academic accommodation can be provided with advance notice. You are encouraged to schedule a time early in the term to meet with each professor to discuss your accommodation needs. Please note that registering with disabilities services and discussing your needs with your professors is necessary to avoid any impediment to receiving the necessary academic accommodations to meet your needs.

Additional information is available at the following websites:

Counselling & Disability Services - <http://cds.info.yorku.ca/>

Counselling & Disability Services at Glendon - <http://www.glendon.yorku.ca/counselling/personal.html>

York Accessibility Hub - <http://accessibilityhub.info.yorku.ca/>

### **Ethics Review Process**

York students are subject to the York University *Policy for the Ethics Review Process for Research Involving Human Participants*. In particular, students proposing to undertake research involving human participants (e.g., interviewing the director of a company or government agency, having students complete a questionnaire, etc.) are required to submit an *Application for Ethical Approval of Research Involving Human Participants* at least one month before you plan to begin the research. If you are in doubt as to whether this requirement applies to you, contact your Course Director immediately.

### **Religious Observance Accommodation**

York University is committed to respecting the religious beliefs and practices of all members of the community, and making accommodations for observances of special significance to adherents. Should any of the dates specified in this syllabus for an in-class test or examination pose such a conflict for you, contact the Course Director within the first three weeks of class. Similarly, should an assignment to be completed in a lab, practicum placement, workshop, etc., scheduled later in the term pose such a conflict, contact the Course director immediately. Please note that to arrange an alternative date or time for an examination scheduled in the formal examination periods (December and April/May), students must complete an Examination Accommodation Form, which can be obtained from Student Client Services, Student Services Centre or online at

[http://www.registrar.yorku.ca/pdf/exam\\_accommodation.pdf](http://www.registrar.yorku.ca/pdf/exam_accommodation.pdf) (PDF)

### **Student Conduct in Academic Situations**

Students and instructors are expected to maintain a professional relationship characterized by courtesy and mutual respect. Moreover, it is the responsibility of the instructor to maintain an appropriate academic atmosphere in the classroom and other academic settings, and the responsibility of the student to cooperate in that endeavour. Further, the instructor is the best person to decide, in the first instance, whether such an atmosphere is present in the class. The policy and procedures governing disruptive and/or harassing behaviour by students in academic situations is available at - <http://secretariat-policies.info.yorku.ca/policies/disruptive-and-or-harassing-behaviour-in-academic-situations-senate-policy/>