

## **Course Outline Toxicological Pathology (TOX\*4100) Winter 2013**

### **Coordinator**

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### **Other Instructors:**

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### **Course Description:**

The course is primarily directed towards B.Sc. Hons students in biomedical toxicology or biomedical sciences. The first part of the course covers basic mechanisms of tissue responses to toxic chemicals. The second part of the course is a systematic review of important toxic conditions of the major organ systems.

### **Prerequisites:**

Principles of Disease (PATH\*3610) or equivalent.

### **Objectives:**

The course will provide students with a basic understanding of the major tissue responses to chemical injury, and a physiological basis from which to explain how chemicals can cause injury and pathology. Students will become familiar with basic technical approaches used in anatomic, clinical, and experimental toxicological pathology. Students will learn major mechanisms of tissue injury and responses involved in homeostasis, adaptation, degeneration, inflammation, tissue repair, immunity, teratogenesis and neoplasia. Students will have the opportunity to consider the functional consequences of severe toxic injury to major target organs and physiological systems, especially the gastrointestinal, respiratory, circulatory, excretory, locomotor, sensory, endocrine, hematopoietic and immune defence systems. Students will have an opportunity for gross and microscopic examination of selected examples of diseased tissues that illustrate key mechanisms and functional consequences of tissue injury. Some microscopy experience will be obtained, but students are not expected to recognize and interpret tissue lesions.

### **Evaluation:**

Laboratory assignment 10% (see details below)

Midterm examination 30% (Wed Feb 15, Room 1812 PAHL)

Final examination 60% (Monday April 15, Room 1813 PAHL)

### **Reference sources:**

The following textbooks (on reserve) may be useful on some topics. None are required.

Haschek WM., Rousseaux CG, Wallig MA. "Fundamentals of Toxicologic Pathology". 2nd Edition, Academic Press, 2009.

Kumar V, Abbas A, Fausto N, Mitchell RN. "Robbins Basic Pathology." 8th Ed. 2007. OR  
Kumar V et al., "*Robbins and Cotran Pathologic Basis of Disease.*" 8th Ed, 2009.

Klaassen CD, Watkins JB. "*Casarett and Doull's Essential Toxicology*" 2nd Edition, 2010; OR  
Klaassen, CD. "*Casarett and Doull's Toxicology. The Basic Science of Poisons*". 7th Ed, 2008.

### **Course evaluations:**

Students will be asked to complete a questionnaire on instructors' teaching competence during the last two weeks of classes. This is part of the information required by the University to evaluate faculty performance for purposes of Tenure and Promotion. These evaluations are administered by the Department Chair and will be not be delivered to the instructor until after the final grades have been submitted to the Registrar's Office.

### **Safety:**

Within the laboratory setting, serious accidents can occur if students do not act responsibly or fail to follow the appropriate procedures. To ensure the safety of all participants, students must at all times abide by the directions given by the instructors or assistants. Failure to do so could result in being dismissed from the lab, and given a grade of zero for that component of the course.

### **Course materials:**

Information and images used in presentations and printed notes are restricted to students registered in the course, and may not be copied or distributed further without permission of the course coordinator. While much effort has been made to ensure reliability and authenticity of the information provided, there may be some errors or omissions. Information on procedures is provided on the understanding that only competent and trained investigators will use them according to accepted and safe procedures. None of this information is provided as professional medical or veterinary advice; readers are advised to consult qualified professionals in relation to medical application of information considered in this course. Neither the instructors nor the University of Guelph accept any liability for the use or misuse of the information in the course material, for any errors in them, or for any loss resulting from use or misuse of the information in these pages. We do not accept liability for any malicious act, or failure of any part of the communications system that affects the display and distribution of the course material.

## **Guidelines for Completion of Assignments**

### **Objectives**

1. Evaluate selected literature that explains pathogenesis and/or functional impact of an important disease or an investigative approach relevant to toxicological pathology.
2. Prepare concise summaries of key findings and conclusions that relate to these issues.
3. Contribute to discussion of the topics in tutorial periods.

### **Case discussions in laboratory/tutorial sessions on Wednesday afternoons**

- Each week, various themes will be considered during lab/tutorial sessions. Each of these themes will be discussed using several topics or case studies described in a laboratory handout that will be available one week before the session.
- At the beginning of the course, students organize into groups of three via a signup sheet in the lab or on CourseLink. These groups should work together in the lab/tutorial periods, and on one written assignment.
- For each of the assignment topics, there may be background reading, illustrations, references and discussion questions. In the lab/tutorial session, there may be some histological sections or scanned images to illustrate some specific alterations.
- During a lab/tutorial period, all students work collaboratively through the cases and questions on the handout. The instructor will then lead the discussion in which all students can participate. Students who have been given an assignment related to the topic should be better prepared to participate in the discussion as “consultants” (see below).
- Material from lab discussions will not be posted.
- All material covered in the laboratory handouts is examinable.

### **Assignment reports**

- Each assignment topic will be assigned randomly to one group of three students, starting in week 4. Each student is thus assigned one topic during the course. Team members will be given the topic by email one week before the lab when the laboratory handouts are posted. Students prepare for the class session by reading, by attempting to develop answers to some questions and by writing a report on a related topic (see below).
- The team of three works jointly and co-authors a written report that addresses the major principles and issues relating to toxicology and pathology.
- The report should be approximately 1000 words not including references or diagrams.
- The writing should be concise. Ideally, it should include a brief introductory paragraph of the disease or problem and the scope of the review and report. This should be followed by a series of relevant aspects, some of which could be directly related to the questions posed in the laboratory notes. It should end with a brief summary of main conclusions.
- The completed report should be submitted as a word processor or PDF file, either by email to the instructor or by the drop box on the course site. Only one copy is required. It is due at 10:00 on the morning of the lab period in which the topic is discussed. Late submissions are penalized 2 marks per day late.
- The written assignments will be graded and returned as soon as possible after the laboratory. The written part of the assignment will count for 10% of the course grade. Each member of the team will get the same grade. Participation in class discussions and verbal answers to the laboratory questions will not be assessed.