MLSCI 466 – Applied Toxicology

Overview / General information

The course covers the basic principles and protocols as they apply to the different fields of toxicology: analytical, employment related, sports doping, environmental toxicology, forensic and clinical toxicology, including therapeutic drug monitoring. Each topic is presented by an expert with working knowledge and experience in that particular field of toxicology.

Prerequisites: BIOCH 200 and 330 or consent of Division.

The University of Alberta is committed to the highest standards of academic integrity and honesty. Students are expected to be familiar with these standards regarding academic honesty and to uphold the policies of the University in this respect. Students are particularly urged to familiarize themselves with the provisions of the Code of Student Behaviour (online at www.governance.ualberta.ca) and avoid any behaviour which could potentially result in suspicions of cheating, plagiarism, misrepresentation of facts and/or participation in an offence. Academic dishonesty is a serious offence and can result in suspension or expulsion from the University.

Audio or video recording of lectures, labs, seminars or any other teaching environment by students is allowed only with the prior written consent of the instructor or as a part of an approved accommodation plan. Recorded material is to be used solely for personal study, and is not to be used or distributed for any other purpose without prior written consent from the instructor.

Policy about course outlines can be found in Course Requirements, Evaluation Procedures and Grading of the University Calendar. http://calendar.ualberta.ca/content.php?catoid=6&navoid=806#course-requirements,-evaluation-procedures-and-grading-a

Course Coordinators

Dr. Penny Colbourne
Laboratory Medicine & Pathology
4B4.27 WMC
Ph: 780-407-4729
penny.colbourne@albertahealthservices.ca

Dr. David Kinniburgh
Laboratory Medicine & Pathology
Alberta Centre for Toxicology
Ph: 403-220-5762
dkinnibu@ucalgary.ca

Course Competencies

Being initially well grounded in the knowledge of biological and chemical sciences, the student on the completion of this course will:

A. Understand the major instruments and protocols of analytical toxicology as they apply to the identification and quantification of drugs and toxins. Specifically, these procedures are: gas chromatography, high performance liquid chromatography, mass spectrometry and atomic absorption spectrometry.

B. Understand and cite examples of the practical importance of pharmacokinetics and pharmacogenetics in clinical toxicology and therapeutic drug monitoring.

C. Have an understanding of the appropriate aspects of therapeutic drug monitoring as they relate to the following 'classes' of drugs: cardiac, anticonvulsant, antibacterial, immunosuppressant.

D. Know the importance of trace metal toxicology in general and specifically the relative toxicity of different forms of the same element.

E. Describe how biological markers can be used in toxicology.

F. Be familiar with quality control and assurance issues from a toxicology perspective.

G. Develop an understanding of the adverse effects of drugs, and be acquainted with the laboratory investigation and antidotal management of the most common poisonings.

H. Understand the role of forensic toxicology in the investigation of death and crime, how it differs from clinical toxicology, the types and reasons for analyzing various types of specimens, and the analytical techniques used for both drugs and alcohol.

I. Understand the scope and logistics of drug testing in sports, the types of drugs abused, including designer drug
purported reasons and side effects, problems associated with the detection of specific categories of drugs including anabolic steroids and selected biomolecules.

J. Understand the technical and legal aspects of employment related drug testing – an application of forensic toxicology. Topics include the history of employment related drug testing, who is tested, what drugs are tested for, how the sample collection and testing is performed, how results are interpreted, and legal challenges.

K. Become apprised of the expanding role of the field of toxicology, including the significance of toxicant exposures and persistent pollutants, in the field of clinical medicine.’

Methods of Instruction
Lectures, Instrument demonstrations, Laboratory tours

Evaluation
Examinations (two midterms and a final): non-cumulative

Distribution of Marks and Examination Schedule

Note: Exams are non-cumulative.

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<thead>
<tr>
<th>Lecture</th>
<th>100%</th>
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<tbody>
<tr>
<td>Midterm Exam 1</td>
<td>35%</td>
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<tr>
<td>Midterm Exam 2</td>
<td>35%</td>
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<tr>
<td>Final Exam</td>
<td>30%</td>
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- covers lectures Sept 6 – Oct 2 inclusive
- covers lectures Oct 6 – Nov 3 inclusive
- covers lectures Nov 8 – Dec 8 inclusive
Excerpt from Code of Student Behaviour –

30.3.2 Inappropriate Academic Behaviour

30.3.2(1) Plagiarism
No Student shall submit the words, ideas, images or data of another person as the Student’s own in any academic writing, essay, thesis, project, assignment, presentation or poster in a course or program of study.

30.3.2(2) Cheating
30.3.2(2) a No Student shall in the course of an examination or other similar activity, obtain or attempt to obtain information from another Student or other unauthorized source, give or attempt to give information to another Student, or use, attempt to use or possess for the purposes of use any unauthorized material.

30.3.2(2) b No Student shall represent or attempt to represent him or herself as another or have or attempt to have himself or herself represented by another in the taking of an examination, preparation of a paper or other similar activity. See also misrepresentation in 30.3.6 (4).

30.3.2(2) c No Student shall represent another’s substantial editorial or compositional assistance on an assignment as the Student’s own work.

30.3.2(2) d No Student shall submit in any course or program of study, without the written approval of the course Instructor, all or a substantial portion of any academic writing, essay, thesis, research report, project, assignment, presentation or poster for which credit has previously been obtained by the Student or which has been or is being submitted by the Student in another course or program of study in the University or elsewhere.

30.3.2(2) e No Student shall submit in any course or program of study any academic writing, essay, thesis, report, project, assignment, presentation or poster containing a statement of fact known by the Student to be false or a reference to a source the Student knows to contain fabricated claims (unless acknowledged by the Student), or a fabricated reference to a source.

30.3.2(3) Misuse of Confidential Materials
No Student shall procure, distribute, or receive any confidential academic material such as pending examinations, laboratory results or the contents thereof from any source without prior and express consent of the Instructor.

30.3.2(4) Research and Scholarship Misconduct
30.3.2(4) a No Student shall violate the University of Alberta Research and Scholarship Integrity Policy, as set out in § 96.2 of the GFC Policy Manual or any other University regulation concerning academic matters.

30.3.2(4) b Where a Student is charged with the academic offence of research and scholarship misconduct, the special requirements for communication and documentation imposed by § 96.2 of the GFC Policy Manual shall constitute part of the procedures outlined below.