MLSCI 262/264 – Clinical Biochemistry

Overview / General Information

The lecture component of this course considers how the analysis of samples from the body for various constituents can give insight into pathological processes. Included are the principles for tests routinely carried out in a clinical biochemistry laboratory, as well as the biological understanding of test results. Specific subjects considered are carbohydrates, renal function, blood proteins and electrolytes, and acid--base balance.

The lab component of this course allows the student to observe and perform numerous manual procedures. Manual methods allow the student to observe chemical reactions that are not visible in automated methods and practice technical skills such as organization, preparation, pipetting, measuring, and trouble---shooting. One of the main goals is to help the student become technically proficient with an emphasis on the validity and analysis of results.

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](http://calendar.ualberta.ca/content.php?catoid=6&navoid=806#course-requirements,-evaluation-procedures-and-grading-a)

Course Instructors

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Course Competencies:

A. An appreciation of diagnostic laboratory testing and biological variation, as well as the principles of quality control and quality assurance in the clinical chemistry laboratory (2.05, 3.24.01, 4.01---4.03, 5.03---5.04, 5.08).

B. An understanding of renal function and the mechanisms by which the human body maintains homeostasis for body water, electrolytes, glucose, protein, and acid--base balance.

C. A good understanding of the biochemistry and pathophysiology associated with many tests routinely performed in a clinical biochemistry laboratory. (3.12---3.12.01, 3.13, 3.14---3.14.01, 4.01---4.05, 6.03, 6.06)

D. A good knowledge of the physical chemistry and chemistry behind most of the tests routinely performed in a clinical chemistry laboratory. (3.03, 3.04, 3.05, 3.06, 3.07, 3.07.01, 3.12---3.12.01)

E. An insight into the integration of the knowledge acquired in all disciplines of laboratory medicine, through discussion of appropriate case reports. (4.01, 4.03, 6.03)

F. Skills to work and learn together in small groups to assess and investigate problems. (4.01, 4.03, 6.03, 6.06, 6.08, 7.01, 8.10)

G. The ability to perform specific manual clinical chemical tests with:
   a. precision, accuracy and efficiency, with recognition for safety and quality control (1.01---1.10, 1.12, 2.05---2.06, 3.24.01, 4.01---4.03, 5.01---5.04, 6.05)
   b. appropriate scientific vocabulary, laboratory mathematic and communication skills, as well as an introduction to the concept of professionalism (7.01, 8.01, 8.06, 8.10, 8.12)
   c. proper reagent and instrumentation use as well as proper collection of samples. (2.02---2.03.04, 2.05---2.06, 3.03---3.05.02, 3.07---3.07.02, 3.10---3.12.01, 3.24)
H. A basic understanding of the principles and components of several types of instrumentation used in the clinical chemistry laboratory. (3.01, 3.03, 3.04, 3.05, 3.06, 3.07, 3.07.02, 3.24)

Distribution of Marks

Laboratory work is an integral part of the coursework and accounts for 40% of the final grade. **Students must obtain a mark of 60% in the laboratory component to pass.**

**MLSCI 262:**

Lecture
- Midterm Exam 20%
- Final Lecture Exam 35%
- Final Lab Mark 40%
- Student Participation 5%

Laboratory
- Quiz 1 10%
- Quiz 2 10%
- Lab Templates 5%
- Skills Assessment 25%
- Comprehensive Written Exam 45%
- Professionalism 5%

**MLSCI 264:**

- Midterm Exam 40%
- Student Participation 10%
- Final Exam 50%

Attendance:

Attendance in laboratory sessions is compulsory. Unexcused absences may result in a student being refused permission to write the final examinations (see University of Alberta Calendar, University Regulations and Information for Students, 23.5.6 – Absence from Exams). Should illness or significant personal difficulties prevent lab attendance, notifying the MLS office and lab instructor is MANDATORY. Arrangements for covering the missed labs will be made, as appropriate. Failure to notify the instructor may result in the denial for any requests for makeup assignments, quizzes, or examinations.

Academic Integrity and Professionalism:

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.

The knowledge, skills and attitudes developed in the MLS program are transferable between each MLSCI course; as such there is the expectation that professional habits developed in the program are practiced in every course. During phase 1 you learn many aspects of professionalism and the expectations of MLS faculty. Your final professionalism grade in MLSCI 200 is a reflection of your professional behavior in every MLSCI course. This means that a professionalism violation in any MLSCI course will result in a decrease of your MLSCI 200 grade. Examples of violations that would result in a professionalism grade reduction include but are not limited to: punctuality (this includes routinely being only a few minutes late for lecture or lab), inappropriate cell phone/electronic device usage in the classroom, any cell phone usage in the phase 1 lab and inappropriate lab attire.
Audio or video recording, digital or otherwise, 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. Student or instructor content, digital or otherwise, created and/or used within the context of the course 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 content author(s).