



COLLEGE OF MEDICAL LABORATORY TECHNOLOGISTS OF MANITOBA

245 Lilac Street
Winnipeg, MB R3M 2S2
www.cmltm.ca

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Medical Laboratory Science Refresher Course List

Approved: January 2023

Courses on this list are approved for members that are eligible to practice in any of the following specialties:

- Biochemistry
- Hematology
- Histology
- Phlebotomy
- Microbiology
- Transfusion Science

Please note: This list is a summary of course information. Applicants should contact the institution offering the course(s) for the most up-to-date detailed information/registration protocols. All courses listed are available by distance education.

All refresher/update courses must have an evaluation component. The transcript **MUST** state the number of course hours.

Other courses will be considered for approval by the Board of Assessors when a request and the course outline are submitted to the CMLTM. Pre-approval is required.

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Institution	Outline	Duration	Cost
CSMLS https://learn.csmls.org/	4658-21 Introduction to Ethics and Professionalism for Medical Laboratory Science	22 hours Apr 1, 2023 July 1, 2023 Oct 1, 2023	\$329

CHEMISTRY

Institution	Outline	Duration	Cost
British Columbia Society of Laboratory Science www.bcsls.net	Back to Basics: Chemistry Module Water and Electrolytes Disorders of Glucose Metabolism Evaluation of Acid Base Status Lipoprotein Metabolism Therapeutic Drug Monitoring & Toxicology Understanding Medical Laboratory Quality Kidney Function Tests, Urinalysis & Urinalysis Case Histories Clinical Enzymology & Biomarkers of Cardiac Injury. Cardiac Markers: Myocardial Infarction. 26 hours, DVD or online video file access, 1.0-hour exam	Continuous registration 26 credit hours 4 months to complete	MLT Provincial Society member: \$399.00 Non-member: \$499.00 International: \$599.00
British Columbia Society of Laboratory Science www.bcsls.net	Back to Basics: Chemistry & Hematology Joint Modules 50 hours, 14 DVDs, two 1 hour exams	50 credit hours	MLT Provincial Society member: \$599.00 Non-member: \$699.00
The Michener Institute http://michener.ca/ce_course/tutorials-clinical-chemistry-online/	CC859 Tutorials in Clinical Chemistry I An excellent review of several basic clinical chemistry topics in the CSMLS competency profile, this correspondence course addresses: Proteins and electrophoresis Liver function and enzyme testing Renal function and urinalysis testing Carbohydrates and lipid testing Acid-base and electrolyte balance testing Readings, graded lesson assignments, and final examination online NOTED: CC859 replaces the former distance education course CC902. Students who have received credit for CC902 cannot receive credit for CC859.	Continuous intake 3.9 CEU	\$450.00 (domestic) \$570.00 (international) plus textbook



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Institution	Outline	Duration	Cost
<p>The Michener Institute http://michener.ca/course/tutorials-clinical-chemistry-ii-online/</p>	<p>CC860 Tutorials in Clinical Chemistry II An excellent review of several clinical chemistry topics in the Medical Laboratory Technology CSMLS competency profile, this correspondence course addresses: Hormones and pituitary function Endocrinology, including: adrenal and thyroid function Parathyroid function and calcium metabolism Therapeutic drug monitoring Toxicology testing</p> <p>Evaluation includes online assignment and final online examination.</p>	<p>Continuous intake 3.9 CEU</p>	<p>\$450.00 (domestic) \$570.00 (international)</p> <p>plus textbook</p>
<p>The Michener Institute http://michener.ca/course/tutorials-clinical-chemistry-iii-online/</p>	<p>CC861 Tutorials in Clinical Chemistry III An excellent review of several advanced chemistry topics in the Medical Laboratory CSMLS competency profile, this correspondence course addresses: photometric measuring systems (including spectrophotometry, atomic absorption photometry, flame photometry, nephelometry, turbidimetry) electrochemical measuring systems (including ion selective electrodes, potentiometric, polarographic, amperometric, and coulometric measurement) partition and absorption chromatography electrophoresis and osmometry immunoassays.</p> <p>Evaluation includes online assignments and final online examination.</p>	<p>Continuous intake 3.9 CEU</p>	<p>\$450.00 (domestic) \$570.00 (international)</p> <p>plus textbook</p>
<p>Northern Alberta Institute of Technology http://www.nait.ca/course_melt504.htm</p> <p>Now online</p>	<p>MELT504 Clinical Chemistry I (Home study) Concern yourself with the analysis of bodily fluids by focusing on the structure, function and metabolism. In a course designed specifically for MLTs and CLXTs, you'll discuss the significance of abnormal levels of chemical constituents and their relation to disease, as well as methodologies used to detect and quantify the components. Major topics covered include carbohydrates, introduction to hepatic function, renal function, electrolytes and enzymes.</p>	<p>50 hours Intake: Mar 1 – July 2023</p>	<p>\$375.00</p>
<p>Northern Alberta Institute of Technology http://www.nait.ca/course_melt507.htm</p> <p>Now online</p>	<p>MELT507 Urinalysis (Home study) This course presents the theory and techniques for chemical testing, microscopic examination and evaluation of physical properties of urine. Correct use and care of the microscope, quality control of procedures, correlation and clinical significance of results are discussed. The last unit covers occult blood and pregnancy screening tests.</p>	<p>30 hours Intake: Mar 1 – June 30, 2023 May 1 – Aug 31, 2023</p>	<p>\$350.00 + text</p>



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<p>Southern Alberta Institute of Technology http://www.sait.ca/programs-and-courses/continuing-education/courses/chem/clinical-chemistry-theory-refresher</p>	<p>CHEM-104 Clinical Chemistry Theory Refresher Get back to the basics of metabolism and function of carbohydrates, proteins, lipids, electrolytes and enzymes present in serum, urine, and other body fluids. An emphasis is placed on the clinical significance in relation to abnormal amounts in disease states.</p> <p>Modules plus examination</p>	<p>80 hours 38 weeks Intake: Mar 1 – Oct 24, 2023 Apr 4 – Nov 27, 2023 May 2 – Dec 25, 2023</p>	<p>\$475.00 + text</p>
<p>Southern Alberta Institute of Technology http://www.sait.ca/programs-and-courses/continuing-education/courses/uanl/urinalysis-theory</p>	<p>UNAL-101 Urinalysis Theory This course covers the anatomy and physiology of the urinary system, as well as chemical and microscopic identification procedures used in performing routine urinalysis.</p>	<p>18 hours Feb 6 – Aug 6, 2023 Mar 6 – Sep 3, 2023 Apr 3 – Oct 1, 2023 May 1 – Oct 20, 2023 June 15 – Dec 3, 2023</p>	<p>\$335.00</p>
<p>Southern Alberta Institute of Technology http://www.sait.ca/programs-and-courses/continuing-education/courses/chem/analytical-chemistry-theory</p>	<p>CHEM-102 Analytical Chemistry Theory Exposure to various laboratory analytical principles used to analyze specimens in the clinical laboratory including spectrophotometry, reflectance photometry, chromatography, osmometry, electrophoresis, immunochemistry, general electricity, electrodes and basic automation.</p>	<p>48 hours 26 weeks Feb 6- Aug 6, 2023 May 6 – Sep 3, 2023 Apr 3 – Oct 1, 2023 May 1 – Oct 29, 2023 Jun 5 – Dec 3, 2023</p>	<p>\$360.00</p>



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MICROBIOLOGY

Institution	Outline	Duration	Cost
<p>The Michener Institute http://michener.ca/ce_courses/tutorials-microbiology-online/ Online</p>	<p>MI905 Tutorials in Microbiology Designed for technologists seeking microbiology certification and those working in a multidisciplinary environment, this correspondence course provides a comprehensive review of medical microbiology. Course objectives:</p> <ul style="list-style-type: none"> • Identify commonly isolated bacterial pathogens found in the majority of clinical specimens • Review basic microbiological and bacterial physiology • Understand the theory and use of gram staining • Discuss the correct use of various media • Differentiate and identify commonly isolated bacterial pathogens <p>Online assignments plus final online examination</p>	<p>Continuous intake 5 CEU</p>	<p>\$715.00 (domestic) \$929.00 (international)</p>
<p>Southern Alberta Institute of Technology http://www.sait.ca/programs-and-courses/continuing-education/courses/mbio/clinical-microbiology</p>	<p>MBIO-102 Clinical Microbiology Theory Refresher This course reviews the basic concepts of bacterial anatomy and physiology followed by detailed methods of staining and identification by culture. Areas of clinical significance studied are: normal flora and the most common pathogens isolated from the urogenital tract, respiratory tract, gastrointestinal tract, eye/ear, cardiovascular and central nervous systems, and skin/wound/soft tissue sites. Emphasis will be on isolation and identification of clinically significant microorganisms. There will also be an introduction to mycology, parasitology, and antimicrobial susceptibility testing including the spectrum of the major drug groups and their pathophysiology; commonly isolated anaerobes and their clinical significance; and miscellaneous uncommon pathogens and their clinical significance.</p> <p>Modules plus examination.</p>	<p>88 hours 32 weeks Intake: Mar 1 – Oct 10, 2023 Apr 4 – Nov 8, 2023 May 2 – Dec 25, 2023 Jun 6, 2023 – Jan 1, 2024</p>	<p>\$475.00</p>



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Canadian Society for Medical Laboratory Science https://learn.csmls.org/topclass/browse.do?c=1385 1-800-263-8277	4920-14 Microbiology Refresher 1: Basic Principles of Microbiology Refresh your theory and knowledge of key principles and procedures in microbiology. 23 PEP hours, on-line, exam	Intake Jan 2023 12 Weeks	\$329.00
Canadian Society for Medical Laboratory Science https://learn.csmls.org/topclass/browse.do?c=1385 1-800-263-8277	4921-15 Microbiology Refresher 2: Microbial Identification and Susceptibility Testing Refresh your theory and knowledge of key principles and procedures in microbiology. 23 PEP hours, on-line, exam	Intake - Sept. 1, 2023 12 Weeks Continuation of course 4920-14	\$329.00



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HEMATOLOGY

Institution	Outline	Duration	Cost
British Columbia Society of Laboratory Science www.bcsls.net	Back to Basics: Hematology Module White Blood Cells Red Blood Cells Coagulation Body Fluids Platelets and Miscellaneous Tests Quality Assurance Online video or 6 DVDs. 1.0 hour exam	24 credit hours 4 months to complete	MLT Provincial Society member: \$399.00 Non-member: \$499.00
British Columbia Society of Laboratory Science www.bcsls.net	Back to Basics: Chemistry & Hematology Joint Modules 14 DVDs, two 1.0-hour exams	50 hours	MLT Provincial Society member: \$599.00 Non-member: \$699.00
Southern Alberta Institute of Technology	HEMA-001 Hematology Hematology provides an introduction to the composition and function of blood cells, hematopoiesis, erythrocyte and leukocyte metabolism, production and destruction, classification of anemias and leukemias, etiology and laboratory findings. Mechanisms and tests of hemostasis in normal versus patients with hemorrhagic or thrombotic diseases are also studied.	80 hours 34 weeks Apr – Dec 2023	\$475.00
The Michener Institute http://michener.ca/ce_courses/tutorials-hematology-coagulation-online/	HE837 Tutorials in Hematology & Coagulation Refresher course in hematology Hemostasis and an introduction to thrombosis Introduction to thrombosis and anticoagulant therapy Disorders of plasma clotting factors Quantitative and qualitative platelet disorders and vascular disorders Chronic myeloproliferative disorders Chronic leukemia and related lymphoproliferative disorders Myelodysplastic syndromes Hemolytic anemias Laboratory techniques related to clinical hematology and coagulation Online tests, final online exam	Continuous enrollment 5.5 CEU	\$715.00 (domestic) \$929.00 (international) plus textbook



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HISTOTECHNOLOGY

Institution	Outline	Duration	Cost
CSMLS https://learn.csmls.org/topclass/browse.do?c=1382	Paraffin Tissue Processing 9822-08 Meticulous embedding of tissues ensures sections are accurate representations and directly impacts the examination and interpretation of specimens. You will review the basics on the theory and mechanisms of paraffin tissue processing, including dehydration, clearing, infiltration, decalcification and general processing. Improve your problem solving skills as you learn to detect and correct processing errors and deal with disposal of clearing agents and hazards of clearing agents.	Continuous registration. Work at your own pace; must complete course within 12 months of registration. 10 PEP Hours	\$99.00
The Michener Institute http://michener.ca/ce_courses/tutorials-histology-online/	HI901 Tutorials in Histology An excellent review of all aspects of histotechnology theory, this course covers: <ul style="list-style-type: none"> • Microanatomy • Routine tissue preparation techniques • General principles of staining • Special techniques and staining methods Online assignments plus online examination	Continuous intake 5.5 CEU	\$715.00 (domestic) \$929.00 (international) plus textbook
<u>Southern Alberta Institute of Technology</u>	MEDL-102 – Histology Histology is the study of the microscopic structure of tissues. This course will reinforce your knowledge of preparing tissue sections from clinical specimens including gross dissection, fixation, decalcification, processing, embedding, microtomy and cryotomy. Histology learning and discussion topics include general staining techniques used to demonstrate cellular and non-cellular components in tissue sections; the functional classification of cells and tissue arrangements; and a description of the microanatomical structure of the major organs of the body.	48 hours 26 weeks Apr 4 – Oct 2, 2023 May 2 – Oct 30, 2023 Jun 6 – Dec 4, 2023 July 14 – Jan 1, 2024	\$475.00



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TRANSFUSION SCIENCE/IMMUNOHEMATOLOGY

Institution	Outline	Duration	Cost
Canadian Society for Medical Laboratory Science https://learn.csmls.org/ and search title of course	Transfusion Medicine Refresher Course 4336-20 Build upon your initial education in immunohematology and to explore the concepts of immunology, serology and hematology which relate to transfusion practice. You will use a self-directed learning approach, which is the natural learning process for adults, as you achieve the clear objectives set down in this course and make use of the many assembled resources to support your studies.	45 Weeks 45 PEP hours Mar 2023 Sept 2023	\$524.00
The Michener Institute http://michener.ca/ce_courses/tutorials-transfusion-science-online/	IH903 Tutorials in Transfusion Science This online course consists of self-study modules, covering all aspects of Transfusion Science theory including: Immunology Major blood group systems Antibody investigation Compatibility testing Blood component therapy Transfusion hazards Quality control Hemolytic disorders (HDN, WAIHA, CHD, DIHA) Online assignments, final online exam	Online course Continuous intake 5 CEU	\$715.00 (domestic) \$929.00 (international)
Northern Alberta Institute of Technology http://www.nait.ca/course_melt521.htm Now Online	MELT521; Immunology Introduces the student to the concepts of immunity and the immune response. Discover mechanisms that the body uses to defend against infectious agents as well as immune responses in hypersensitivity, autoimmunity, transplantation and tumor growth.	24 Hours	\$325.00
Southern Alberta Institute of Technology	MEDL - 104 Transfusion Medicine Theory Refresher Transfusion Medicine provides the theory required to perform basic techniques to detect antigen-antibody reactions, ABO forward and reverse grouping and Rh phenotyping, antiglobulin testing and antibody identification. Topics covered also include quality systems implemented in the blood bank and how to problem-solve ABO discrepancies. 16 lecture modules + 2 lab modules 3 examinations	48 hours 26 weeks Continuous Registration	\$475.00



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<p>Northern Alberta Institute of Technology https://www.nait.ca/nait/continuing-education/courses/tram101-transfusion-medicine</p>	<p>TRAM101 – Fundamentals of Blood Product Management Selecting, tagging and issuing blood components or products for transfusion can save a patient’s life, that is, when it is the correct product administered to the correct recipient. Examine how blood group systems and processes used in transfusion medicine impact the process, which starts with a collection of a suitable specimen for pretransfusion testing and ends with transfusion of the best product for optimal benefit. Explore adverse reactions to transfusion, including causes of hemolytic transfusion reactions (HTR) and identify immediate responses for patient care. Discuss basic concepts pertaining to Hemolytic Disease of the Fetus and Newborn (HDFN).</p>	<p>Online Course Intake May 9 – July 17, 2023</p>	<p>\$475.00 plus textbook</p>
<p>Northern Alberta Institute of Technology https://www.nait.ca/nait/continuing-education/courses/tram201-pretransfusion-testing-and-basic-investi</p>	<p>TRAM201 – Pretransfusion Testing and Basic Investigative Techniques <i>Prerequisite: TRAM101</i> This course builds on TRAM101, using the foundations of ABO and Rh blood group systems to interpret pretransfusion test results and select appropriate donor red cells for transfusion. You will examine how other blood group systems may influence pretransfusion test results and donor selection, as well as methodologies used to perform serological testing. Discuss investigative techniques and procedures pertaining to pre and postnatal care, Hemolytic Disease of the Fetus and Newborn (HDFN) and Hemolytic Transfusion Reactions.</p>	<p>Online Course Intake May 9 – July 17, 2023</p>	<p>\$475.00</p>