MEDICAL LABORATORY TECHNOLOGY

Cascade Campus
Allied Health Admissions
Technology Education Building (TEB), Room 103
971-722-5667
pcc.edu/programs/medical-lab/

CAREER AND PROGRAM DESCRIPTION

A medical laboratory technician performs routine clinical laboratory testing procedures to provide scientific information needed in diagnosis, prognosis and treatment of disease. Technicians use sophisticated instrumentation for these evaluations, which encompass quantitative and qualitative chemical and biological analyses of body specimens. Technicians function under the supervision of a qualified practitioner. The local metropolitan area offers very good employment opportunities and jobs are readily available in smaller communities throughout the country. Opportunities are available in hospitals, independent laboratories, research and industry for graduates of the program.

To successfully participate in the MLT Program and become employable, the student must be able to perform essential functions expected of the profession. Examples of essential functions for the MLT are communication, vision, manual dexterity, physical activity, analytical skills and technical aptitude.

Students are prepared to perform routine clinical laboratory tests under the supervision of a pathologist, medical technologist or physician. The program combines on-campus instruction in fundamental principles with clinical experiences gained through rotation in clinical laboratories. The clinical laboratories affiliated with the MLT Program include Adventist Medical Center, Kaiser Permanente, Legacy Health System, Oregon Health and Sciences University, Providence Health System and Willamette Valley Medical Center.

Because of limited laboratory space and clinical facilities, as well as the delicate balance of job opportunities in medical laboratory science, the MLT Program has a limited enrollment. Applications are accepted once a year for fall entry. The MLT program is competitive and applications are evaluated on a point system. Eligibility for entry into the program is based on successful completion of college courses in biology, chemistry, writing, mathematics and an introductory MLT course. It is strongly recommended that applicants have strong oral communication skills as well. Contact Allied Health Admissions for information on eligibility.

Students in the MLT Program must participate in a department orientation session. Completion within the last 2 years of MLT 110 or equivalent with a "C" or "P" or better.

This is a limited entry program. Students planning to enroll in the MLT Program should contact the Allied Health Admissions Office for specific eligibility requirements.

Academic Requirements

• Completion of WR 121, equivalent or higher with a "C" or "P" or better.
• Completion within the last 7 years of a Biology series (BI 121/122 or BI 231/232/233 or BI 211/212/213 or equivalent or higher) with a "C" or "P" or better.
• Completion within the last 7 years of a Chemistry series (CH 104/105/106 or CH 221/222/223 or equivalent or higher) with a "C" or "P" or better.
• Completion within the last 2 years of MLT 110 or equivalent with a "C" or "P" or better.

Non-Academic Prerequisites

• Completion of introductory MLT course. It is strongly recommended that applicants complete Immunization Requirements, pass a criminal background check and a urine drug screen. Contact the department office for more information.

Non-Academic Requirements

• Students are required to have a health assessment completed by a health provider, before initiating clinical laboratory practice, to confirm health status and ability to perform essential functions required from an MLT. In addition, students are required to complete immunization requirements. Students who have a health, physical or psychological problem which may affect or be affected by the use of the devices or precautions should contact the department prior to entering the program.

MEDICAL LABORATORY TECHNOLOGY AAS DEGREE

Minimum 97 credits. Students must also meet Associate Degree Comprehensive Requirements and Associate of Applied Science Requirements. Students must complete a total of sixteen credits of General Education. Some courses specified within the program may be used as General Education. In addition to required courses in the program of study, students must satisfy MTH 58/65 competency. Students should consult with program advisors for course planning.

COURSE OF STUDY

The coursework listed below is required. Unforeseen changes to the curriculum outline may occur due to program, college and clinical affiliate updates and changes. The following is an example of a term-by-term breakdown.

<table>
<thead>
<tr>
<th>First Term</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MLT 105</td>
<td>Phlebotomy for Medical Laboratory Technicians</td>
</tr>
<tr>
<td>MLT 110</td>
<td>Introduction to Medical Laboratory Technology</td>
</tr>
<tr>
<td>MLT 113</td>
<td>Introduction to Medical Microbiology</td>
</tr>
<tr>
<td>MLT 114</td>
<td>Laboratory Operations and Techniques</td>
</tr>
<tr>
<td>MLT 115</td>
<td>Clinical Laboratory Mathematics</td>
</tr>
</tbody>
</table>
MLT 120  Urinalysis  2
General Education  4

Second Term
MLT 224  Clinical Chemistry I  4
MLT 241  Immunohematology I  3
MLT 251  Hematology I  4
MLT 261  Clinical Bacteriology I  3

Third Term
MLT 225  Clinical Chemistry II  4
MLT 242  Immunohematology II  4
MLT 252  Hematology II  4
MLT 262  Clinical Bacteriology II  4

Fourth Term
HE 113  or Healthcare Provider CPR/AED, First Aid/Bloodborne Pathogens  1
MLT 271  Clinical Laboratory Practice I  2

Fifth Term
MLT 230  Body Fluids  2
MLT 253  Hemostasis  2
MLT 265  Clinical Mycology and Parasitology  3
MLT 266  Immunology and Infectious Serology  2
MLT 272  Clinical Laboratory Practice II  2

General Education  4
Sixth Term
MLT 273  Clinical Laboratory Practice III  9
MLT 282  Clinical Seminar I  2
General Education  4
Seventh Term
MLT 274  Clinical Laboratory Practice IV  9
MLT 283  Clinical Seminar II  2
General Education  4

Total Credits  97

MLT 100. Medical Office Laboratory Orientation. 3 Credits.
Introduces clinical laboratory principles and procedures commonly performed in the physician’s office setting, including specimen collection and handling, urinalysis, basic hematology, chemistry, serology, microbiology and quality control. Prerequisites: MP 111 and BI 55 or BI 122 or BI 233. Audit available.

MLT 105. Phlebotomy for Medical Laboratory Technicians. 1 Credit.
Introduces basic laboratory skills to collect and process high quality blood specimens for clinical laboratory analysis. Includes laboratory safety measures, professionalism, communication and interpersonal skills in the healthcare setting. Prerequisites: Acceptance into the Medical Laboratory Technology Program. Audit available.

MLT 110. Introduction to Medical Laboratory Technology. 4 Credits.
Introduces the field of clinical laboratory science. Includes an introduction to the use and care of laboratory equipment and supplies. Provides basic concepts and technical skills in the clinical laboratory field including safety, quality control, laboratory testing and communication. Prerequisites: CH 104 or CH 221, BI 121 or BI 233 or higher, MTH 95 or higher, and WR 121 or higher.

MLT 113. Introduction to Medical Microbiology. 3 Credits.
Introduces clinical bacteriology and the taxonomic approach to major human pathogens. Presents an overview of the organization and function of the clinical microbiology laboratory. Introduces basic practices of specimen processing, handling, and work-up. Develops basic skills necessary to work in the microbiology laboratory. Prerequisite: Acceptance into the Medical Laboratory Technology Program. Audit available.

MLT 114. Laboratory Operations and Techniques. 4 Credits.
Introduces the field of clinical laboratory sciences, including an introduction to laboratory organization, laboratory safety, quality assurance and laboratory regulation. Reviews utilization of basic laboratory equipment, point of care testing and laboratory information system. Covers professionalism in the healthcare setting. Includes documentation and communication according to laboratory protocols. Prerequisite: Acceptance into the Medical Laboratory Technology Program. Audit available.

MLT 115. Clinical Laboratory Mathematics. 1 Credit.
Provides a review of arithmetic, algebra, scientific notation, rounding and figure significance, measurement systems and conversions, solutions and concentrations, dilutions, titers and other mathematical calculations commonly used in the clinical laboratory setting. Prerequisite: Acceptance into the Medical Laboratory Technology Program. Audit available.

MLT 120. Urinalysis. 2 Credits.
Reviews anatomy and physiology associated with production of urine. Introduces urine composition, urinalysis testing principles and procedures, and the clinical correlation of results with disease conditions. Prerequisites: Acceptance into the Medical Laboratory Technology Program. Audit available.

MLT 224. Clinical Chemistry I. 4 Credits.
Introduces theory, general laboratory principles, methodologies, instrumentation and practical concepts associated with testing procedures used in the clinical chemistry laboratory. Includes important characteristics and clinical significance of carbohydrates, proteins, lipids, electrolytes, non-protein nitrogenous waste (creatinine, BUN and uric acid) and cardiac markers. Prerequisites: Acceptance into the Medical Laboratory Technology Program. Audit available.

MLT 225. Clinical Chemistry II. 4 Credits.
Introduces pathophysiology, diagnosis, and monitoring of selected human diseases on an organ system basis. Includes enzymology, acid-base balance, endocrinology, liver function, pancreatic function, toxicology and therapeutic drug monitoring. Prerequisites: Acceptance into the Medical Laboratory Technology Program, and MLT 224. Audit available.

MLT 230. Body Fluids. 2 Credits.
Introduces the composition, testing procedures, and the clinical correlation of results for cerebrospinal, synovial, pleural, peritoneal, pericardial, seminal, and amniotic fluids. Prerequisite: Acceptance into the Medical Laboratory Technology Program. Audit available.

MLT 241. Immunohematology I. 3 Credits.
Introduces basic immunology and the various antigen-antibody reactions with emphasis on agglutination reactions. Develops knowledge and skills in ABO and Rh blood group testing. Prerequisite: Acceptance into the Medical Laboratory Technology Program. Audit available.

MLT 242. Immunohematology II. 4 Credits.
Presents blood group systems other than ABO and Rh, pre- and post-transfusion testing methods, hemolytic disease of the newborn, donor selection, blood components, anticoagulants, and transfusion reactions. Prerequisites: Acceptance into the Medical Laboratory Technology Program and MLT 241. Audit available.

MLT 251. Hematology I. 4 Credits.
Introduces hematopoiesis, the origin and maturation of the various types of blood cell lines with emphasis on the red and white blood cells. Includes study and analysis of hemoglobin, hematocrit, erythrocytic sedimentation rate and blood cell counts. Emphasizes cell identification, cell differentiation and blood cell morphology. Presents anemias and their classifications based on red blood cell morphology and etiology. Prerequisites: Acceptance into the Medical Laboratory Technology Program. Audit available.

MLT 252. Hemostasis. 2 Credits.
Introduces human hematological disorders associated with white cell abnormalities and anomalies. Emphasizes cell identification, cell differentiation and cell morphology evaluation procedures. Allows for practice of hematology analytical skills and correlation of laboratory findings with patient symptoms and clinical history. Presents principles of automated instrumentation and application of flow cytometry to clinical hematology. Prerequisites: Acceptance into the Medical Laboratory Technology Program, and MLT 251. Audit available.

MLT 253. Hemostasis. 2 Credits.
Provides an overview of theory and practical application of hemostasis (coagulation), as it relates to the medical laboratory. Presents coagulation laboratory principles and correlates results with disease states. Prerequisites: Acceptance into the Medical Laboratory Technology Program. Audit available.

MLT 261. Clinical Bacteriology I. 3 Credits.
Introduces basic practices and principles of clinical bacteriology, focusing on pathogenic bacteria encountered in the blood, central nervous system, and genitourinary tract. Includes application of common algorithms for identification of clinically significant pathogens. Introduces principles and procedures of molecular diagnostic techniques and their applicability to the clinical laboratory. Prerequisite: Acceptance into the Medical Laboratory Technology Program. Audit available.
MLT 262. Clinical Bacteriology II. 4 Credits.
Covers practices and principles of clinical bacteriology, focusing on pathogenic bacteria encountered in the gastrointestinal and respiratory tracts, soft and solid tissues, and infections of special patient populations. Includes application of common algorithms for identification of clinically significant pathogens. Introduces current molecular techniques used for identification and expands on concepts of antimicrobial testing and therapy. Prerequisite: Acceptance into the Medical Laboratory Technology Program and MLT 261. Audit available.

MLT 265. Clinical Mycology and Parasitology. 3 Credits.
Introduces the fields of medical mycology and medical parasitology. Focuses on the clinical significant fungi and covers specimen processing and diagnostic procedures for the cultivation and identification of fungal pathogens. Identifies characteristics, life cycles, pathogenicity and testing methods for selected relevant parasites. Prerequisites: Acceptance into the Medical Laboratory Technology Program. Audit available.

MLT 266. Immunology and Infectious Serology. 2 Credits.
Provides an introduction to human immunity. Presents clinical laboratory diagnosis of infectious disease utilizing serological test methods. Prerequisites: Acceptance into the Medical Laboratory Technology Program. Audit available.

MLT 271. Clinical Laboratory Practice I. 2 Credits.
Provides a simulated clinical laboratory setting to become familiar with the daily organization and operations in the departments of hematology, urinalysis, basic level bloodbank and basic level microbiology. Prerequisite: Acceptance into the second year of the MLT Program. Audit available.

MLT 272. Clinical Laboratory Practice II. 2 Credits.
Provides a simulated clinical laboratory setting to become familiar with the daily organization and operations in the departments of coagulation, body fluids, advanced level bloodbank and advanced level microbiology. Prerequisite: Acceptance into the second year of the MLT Program and MLT 271. Audit available.

MLT 273. Clinical Laboratory Practice III. 9 Credits.
Provides practicum experience in various clinical sites to become familiar with the organization and operation of the clinical laboratory setting. Provides an opportunity to gain insight into how the clinical laboratory practitioner relates to the entire medical team and to the community, and provides opportunity to gain experience in dealing with patients and in performing procedures required of a laboratory technician. The clinical experience will be done under the direct supervision of assigned trainer(s) at the clinical site. Prerequisite: Acceptance into the second year of the MLT Program and MLT 272. Audit available.

MLT 274. Clinical Laboratory Practice IV. 9 Credits.
Provides practicum experience in various clinical sites to refine skills necessary for the organization and operation of the clinical laboratory setting. Provides an opportunity to gain insight into how the clinical laboratory practitioner relates to the entire medical team and to the community, and provides opportunity to gain further experience in dealing with patients and in performing procedures required of a laboratory technician. The clinical experience will be conducted under progressively less laboratory personnel supervision. Prerequisite: Acceptance into the second year of the MLT Program and MLT 273. Audit available.

MLT 282. Clinical Seminar I. 2 Credits.
Introduces new and advanced concepts in clinical laboratory medicine and healthcare profession. Explores techniques for writing standard operational procedures. Provides opportunity for sharing and discussing practicum experiences. Covers professional resume writing and job application techniques. Prerequisites: Acceptance into the Medical Laboratory Technology Program. Audit available.

MLT 283. Clinical Seminar II. 2 Credits.
Provides opportunity for sharing and discussing continuing education experiences and to prepare for certification exams. Prerequisites: Acceptance into the Medical Laboratory Technology Program and MLT 282. Audit available.