

Program Handbook

University of Rochester Medical Center Clinical/Medical Laboratory Technology Advanced Certificate Program



SCHOOL OF MEDICINE & DENTISTRY

**UR MEDICINE LABS, DEPARTMENT OF
PATHOLOGY & LABORATORY MEDICINE**

STRONG MEMORIAL HOSPITAL



PROGRAM HANDBOOK

I. THE INSTITUTION

The University of Rochester, founded in 1850, has developed into one of the country's leading private research universities, classified as a doctoral university – highest research activity. The University is a small but highly complex institution composed of six schools: the College of Arts, Sciences, and Engineering, the Margaret Warner Graduate School of Education and Human Development, the William E. Simon Business School, the Eastman School of Music, the School of Medicine and Dentistry (SMD), and the School of Nursing as well as a number of world-class facilities such as the Laboratory for Laser Energetics, the Mees Observatory, and the Memorial Art Gallery, which support the University's educational, research, and service agendas. The University has enjoyed continuous accreditation by the Middle States Commission on Higher Education since 1921, and was last re-affirmed in 2019. In addition to University-wide accreditation, each professional school regularly undergoes its own specialized review and accreditation.

The University currently enrolls approximately over 12,000 part-time undergraduate and graduate students, and has over 1000 faculty. The Advanced Certificate Program in Clinical/Medical Laboratory Technology operates within the University of Rochester Medical Center (URMC). URMC is part of the University of Rochester and includes the operation of the School of Medicine and Dentistry, Strong Memorial Hospital, Golisano Children's Hospital at Strong, and Eastman Dental Center. With staff and affiliates numbering over 30,000 the University has become the Rochester area's single largest employer.

The School of Medicine and Dentistry offers graduate level programs, including: medical doctorates; residency programs; fellowships; Ph.D. programs; master's degree programs; and advanced certificate programs. Graduate Education is a division within the School of Medicine and Dentistry and is responsible for overseeing the following processes within the program: applications, admissions, enrollment, course registration, records retention, tuition remittance, student services and graduation.

Strong Memorial Hospital (SMH) is a level one trauma center with 886 beds. In addition to routine care, SMH also specializes in: organ transplant, trauma and burn care, neonatal intensive care, comprehensive neuro-medicine, complex cardiology and cancer services.

The Department of Pathology and Laboratory Medicine (also referred to as UR Medicine Labs) is a division of URMC that provides clinical laboratory services to Strong Memorial Hospital and its affiliates. UR Medicine Labs is the largest medical laboratory in the region with 1200 members including: pathologists, research faculty, licensed laboratory professionals, and over 400 employees in pre-analytic operations and support staff. The department encompasses: 28 clinical laboratories, 16 research laboratories, 5 satellite laboratories for the Wilmot Cancer Center, a Pathology Residency Program and a PhD program in Pathology. In 2022 the department billed 9.5 million tests and reported out 174,000 anatomic pathology cases.

The Department of Pathology & Laboratory Medicine, UR Medicine Labs is made up of 157,000 square feet of clinical and research laboratories, office spaces and conference rooms. The labs are located at two sites; the Core Labs are located at Strong Memorial Hospital, 601 Elmwood Avenue and the Central Labs are located at 211 Bailey Road, W. Henrietta, NY. UR Medicine Labs provides the personnel, faculty, lecture space, clinical training space, support personnel, finances, laboratory equipment, tools, and supplies necessary to support the program mission.

Each entity at the University of Rochester fulfills a critical role and all work together to ensure the successfulness of the Advanced Certificate Program in Clinical/Medical Laboratory Technology.

II. ABOUT THE PROGRAM

Clinical and didactic faculty are members of the Department of Pathology and Laboratory Medicine, including: associate and assistant professors of the School of Medicine and Dentistry, administrative directors, clinical laboratory supervisors, and appropriately licensed and certified laboratory technologists. There is also 0.6 FTE of dedicated support position for the program. The administrative assistant covers functions including: processing financial requests, record retention, creation of recruitment material, entering program materials into learning management systems, scheduling meetings, transcribing outcome data, etc. The program website is found here:

<https://www.urmc.rochester.edu/education/graduate/certificate/clinical-medical-technology-certificate.aspx>

Graduate student learning activities occur in person unless scheduling changes are indicated by the Program Director. Didactic and clinical courses are provided at two UR Medicine Labs Locations: UR Medicine Labs, Strong Memorial Hospital (SMH), 601 Elmwood Avenue, Rochester, NY 14642; and UR Medicine Central Lab (BR), 211 Bailey Road, W. Henrietta, NY 14586. The course locations are indicated in section V., *Course Descriptions*.

III. PROGRAM DETAILS

The program is designed to provide graduates with the entry level competencies required to succeed in the Clinical Laboratory. Students gain understandings of clinical laboratory science by correlating diagnostic findings with diagnosis, prognosis, and disease management of patients in the clinical setting.

Students grasp in depth concepts in the following core areas: clinical chemistry, clinical hematology and hemostasis, immunohematology, microbiology, and urinalysis and body fluids.

Graduates must pass the American Society of Clinical Pathology Board examination and achieve a state license to practice the profession of Clinical Laboratory Technology in the state of New York State.

LENGTH: 2 semesters/ 35.5 credits

FALL SEMESTER SCHEDULE: 18 weeks of instruction beginning the third full week in August through the end of the third full week in December. Thanksgiving Day and the following Friday are vacation days.

SPRING SEMESTER SCHEDULE: 18 weeks of instruction beginning the first full week in January with a week of vacation during spring break. Commencement is on the last week of the semester.

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IV. PROGRAM MISSION AND GOALS

Our Mission-The Advanced Certificate Program in Clinical/Medical Technology at the University of Rochester strives to educate future clinical laboratory technologists who are committed, dedicated, skilled and innovative in their work. We seek to achieve this goal by utilizing educational experiences that emphasize patient care in the cultivation of excellence, competency, teamwork, and integrity in all aspects of laboratory science.

Program Goals-Upon completing the Advanced Certificate Program in Clinical/Medical Laboratory Technology, graduates will:

- a. Have knowledge of and adhere to institutional, regional, national and international safety regulations in the clinical laboratory setting.
- b. Achieve the full range of competencies as entry level clinical laboratory technologists in the following domains: clinical chemistry; hematology/hemostasis, urinalysis, & body fluids; immunohematology/transfusion medicine; immunology; microbiology; and laboratory management & operations.
- c. Accurately correlate laboratory findings to the diagnosis, prognosis, and disease management in the clinical and/or research setting.
- d. Effectively troubleshoot outcomes that do not conform to prescribed protocols or outcomes.
- e. Demonstrate leadership capabilities. Have knowledge of the basic principles of management, education, regulatory oversight, quality management, continuous process improvement, and operations in the clinical laboratory setting.
- f. Meet the licensure requirements in practice of Clinical Laboratory Technology in the state of New York.
- g. Be eligible for certification by the ASCP as Medical Laboratory Scientists (when the program has reached “serious applicant status” in the NAACLS accreditation process).

V. COURSE DESCRIPTIONS

CMT 401: ESSENTIALS OF CLINICAL LABORATORY SCIENCE (3 cr.) Fall Semester

This course is offered in the first 4 weeks of the program beginning in the Fall semester and the schedule is Monday through Friday; 8:30am-4pm. The learning model is wrap around lecture followed by hands on laboratory experiences. The total number of hours including lecture and lab experiences is 142.5. The methods used are laboratory exercises designed to prepare students for the clinical practicum. Didactic time is limited to the practical knowledge required for students to competently engage in laboratory activities. All students participate in this course at the same time in the same location.

- a. Overview (located at BR):
 - Orientation-Program Overview; Review of Student Handbook and Policies: ½ day
 - Phlebotomy: ½ day
 - Clinical Laboratory Safety; Infection Control; Universal Precautions; Ethics and Data Integrity. Pre-analytic Techniques and Patient Safety Goals are integrated in homework assignments, clinical instruction and hands on clinical laboratory exercises.
- b. Basic Laboratory Techniques in the content areas listed below (with approximate number of days spent on each subject indicated).
 - Clinical Chemistry: 3 days (located at BR)
 - Clinical Hematology: 4 days (located at SMH)
 - Immunohematology and Transfusion Medicine: 5 days (located at SMH)
 - Clinical Microbiology & Serologic Techniques: 5 days (located at BR)
 - Renal Physiology and Urinalysis: 1 days (located at BR)

CMT 402: CLINICAL PRACTICUM I (7 cr.) Fall Semester

The clinical practicum begins immediately following CMT 401 and occurs Monday Through Friday from 8am to 1pm for a total of 13 weeks (325 hours) of clinical training.

This course is entirely composed of supervised clinical experiences scheduled in the following disciplines: Blood Bank and Transfusion Medicine, Clinical Chemistry, Clinical Hematology & Hemostasis, Clinical Microbiology, Urinalysis, Immunology/Serology, and Histopathology. Theory is delivered on the bench and content is limited to the practical knowledge required for students to meet targeted learning outcomes and to achieve competency in the clinical laboratory procedures and protocols as assigned. Students are supervised throughout these experiences by a NYS Licensed Clinical Laboratory Technologist.

The class is split into three groups of 4-5 students. Over the course of the fall and spring semester these small groups complete 30 weeks of clinical training in Clinical Practicums I & II (CMT 402 & 403 respectively) on varying schedules to ensure that the instructor to student ratio and availability of space provide for the best learning outcomes. The total number of weeks and site locations are as follows:

- Clinical Chemistry: 8 weeks (learning activities scheduled between SMH and BR-schedule to be announced)
- Clinical Hematology: 5 weeks (located at SMH)
- Immunohematology and Transfusion Medicine: 5 weeks (located at SMH)
- Clinical Microbiology & Serologic Techniques: 9 weeks (located at BR)
- Renal Physiology and Urinalysis: 1 week (located at BR)
- Histopathology: 1 week (located at SMH)
- Laboratory Operations: 1 week (independent study with a tracer audit scheduled at either SMH or BR-schedule to be announced)

Grading and assessment of learning is determined by evaluation of graduate student performance through instructor observations, laboratory practicals, and quizzes/ exams. Graduate students receive a grade for each week of the clinical practicum.

CMT 403: CLINICAL PRACTICUM II (8.5 cr.) Spring Semester

The clinical practicum occurs Monday Through Friday from 8am to 1pm for 17 weeks that begin spring semester after return from winter vacation. This course totals 425 hours of clinical training.

This course is entirely composed of supervised clinical experiences scheduled in the following disciplines: Blood Bank and Transfusion Medicine, Clinical Chemistry, Clinical Hematology & Hemostasis, Clinical Microbiology, Urinalysis, Immunology/Serology, Histopathology, and Laboratory Management and Operations. Didactic time is limited to the practical knowledge required for students to meet targeted learning outcomes and to achieve competency in the clinical laboratory procedures and protocols as assigned. Students are supervised throughout these experiences by a NYS Licensed Clinical Laboratory Technologist.

The three groups of 4-5 students established in fall semester continue to be scheduled together throughout this course. Over the course of the fall and spring semester these small groups complete the remainder of required weeks of clinical training to total 30 weeks combined between CMT 402 and CMT 403. The total number of weeks throughout both courses with site locations are provided below:

- Clinical Chemistry: 8 weeks (learning activities scheduled between SMH and BR-schedule to be announced)
- Clinical Hematology: 5 weeks (located at SMH)
- Immunohematology and Transfusion Medicine: 5 weeks (located at SMH)
- Clinical Microbiology & Serologic Techniques: 9 weeks (located at BR)
- Renal Physiology and Urinalysis: 1 week (located at BR)
- Histopathology: 1 week (located at SMH)
- Laboratory Operations: 1 week (independent study with a tracer audit scheduled at either SMH or BR-schedule to be announced)

Grading and assessment of learning is determined by evaluation of graduate student performance through instructor observations, laboratory practicals, and quizzes/ exams. Graduate students receive a grade for each week of the clinical practicum.

CMT 404: SPECIAL TOPICS IN CLINICAL LABORATORY SCIENCE (0.5 cr.) Spring Semester at BR conference room, location to be announced

This is a seminar course that includes 7.5 hours of traditional didactic material. Topics are presented by faculty and technologists with expertise in the following areas: Tissue Typing-HLA, Advanced Molecular Diagnostic Studies, Cytogenetics and Micro-Array.

Readings and lectures are designed to provide students with basic understandings of the diagnostic tests provided by these departments and the scientific principles of the methodologies. Students will also make correlations between test results and diagnosis, prognosis and disease management. Learning is assessed through homework assignments, quizzes and a final exam.

CMT 405: LABORATORY MANAGEMENT AND OPERATIONS (0.5 cr.) Spring Semester at BR conference room, location to be announced

This is a seminar course that includes 7.5 hours of traditional didactic material and 25 hours observing real world operational and management initiatives in the department of pathology. Topics are presented by administrative directors of the department. Learning outcomes are evaluated by assessing project work either in groups or independently.

This course provides learning experiences in the following topics: operations, laboratory informatics, finance, education, licensure, leadership and professional development, quality systems management including inspection readiness and laboratory compliance. The following principles are also included: LEAN in the clinical pathology practice, instrument/assay validation, staff competencies and preparedness, patient safety, and compliance. Topics are presented in lecture format. Students are provided with a list of required out of class assignments including researching an ongoing authentic project in the laboratory and presenting their findings to the class and administrative directors.

CMT 411: CLINICAL CHEMISTRY I (2 cr.) Fall Semester at BR conference room, location to be announced This is a 30-hour didactic course that provides the cognitive foundation required for students to competently apply clinical chemistry principles to the practice of clinical laboratory science. This is the first course in a series of two clinical chemistry courses in the program.

Clinical and analytical correlations are organized by analyte, including: hypothalamic and pituitary functions; adrenal functions; gonadal functions; the thyroid gland; calcium hemostasis and hormonal

regulation; amino acids and proteins; non-protein nitrogen compounds; enzymes, liver enzymes and hepatitis; pancreatic function, GI, carbohydrates and diabetes; lipids and lipoproteins; and electrolytes, and blood gases, pH, and buffer systems. The chemical principles of each analyte are presented in a situational learning model that makes correlations: to disease states, interpretations of data, problem solving, and quality assurance in addition to other real world aspects of the clinical chemistry laboratory.

CMT 412: CLINICAL HEMATOLOGY I (1.5 cr.) Fall Semester, at SMH conference room, location to be announced

This is a 22.5-hour didactic course that provides the cognitive foundation required for students to competently apply clinical hematology principles to the practice of clinical laboratory science. This is the first course in a series of two clinical hematology courses in the program.

Course content: This course picks up where MT 401 leaves off on the topic of clinical and analytical correlations to the complete blood count and peripheral blood smear examination. From there the course covers in depth discussions on hematologic disorders, including: anemia and hemolytic anemia; additional types of anemia; etiology, pathophysiology, clinical findings, laboratory findings, and therapy. The next unit covers: nonmalignant disorders of leukocytes; hematopoietic neoplasms; classification, terminology, pathophysiology of neoplasms; and the laboratory's role in diagnosis and therapy. The final unit is on: stem cell therapy; molecular studies of neoplastic disorders; flow cytometry; and cytogenetics. Interpretations of data, problem solving, and quality assurance in addition to other real world aspects of the clinical hematology laboratory are woven throughout the course.

CMT 413: PRINCIPLES OF IMMUNOHEMATOLOGY I (1.5 cr.) Fall Semester, at SMH conference room, location to be announced

This is a 22.5-hour didactic course that provides the cognitive foundation required for students to competently apply clinical immunohematology principles to the practice of clinical laboratory science. This is the first course in a series of two immunohematology courses in the program.

This course picks up where MT 401 leaves off on the fundamental concepts of immuno-hematology and leads into the concepts of molecular biology as they relate to: red cell genotyping; the genetic basis of blood groups including blood group polymorphisms; the ABO blood group system; and serologic testing. The Rh blood group system is the next topic in this unit covering the detection of Rh antibodies and antigens and clinical considerations. The Landsteiner Wiener Blood Group systems are also studied. The second unit covers the antiglobulin test including: the biochemical composition of antihuman globulin (AHG) reagents and differentiation between polyspecific and monospecific reagents and their purpose; principles of the indirect antiglobulin test and the direct antiglobulin test; and factors affecting the antiglobulin test including sources of error, modification techniques. The third unit is on blood group terminology and other blood groups. Interpretations of data, problem solving, and quality assurance in addition to other real world aspects of the clinical blood bank and transfusion laboratory are woven throughout the course.

CMT 414: CLINICAL LABORATORY MICROBIOLOGY I (2.5 cr.) Fall Semester, at BR conference room, location to be announced

This is a 37.5-hour didactic course that provides the cognitive foundation required for students to competently apply the principles of clinical microbiology to the practice of clinical laboratory science. This is the first course in a series of two clinical microbiology courses in the program.

Course principles are presented in a situational learning model correlating clinical pathological findings with interpretations of data, problem solving, and quality assurance in addition to other real world aspects of the clinical microbiology laboratory. This course is a continuation of MT 401 and begins with the general principles of clinical bacteriology as they relate to: identification of gram positive and gram negative cocci; gram positive bacilli; gram negative bacilli and coccobacilli; gram negative cocci; anaerobic bacteriology. Correlations will be made to pathophysiology and diagnosis by organ systems, such as infections of the: bloodstream; lower respiratory system; upper respiratory tract; meninges, encephalitis and other central nervous system infections; urinary tract; genital tract; gastrointestinal tract; skin, soft tissue and wounds; otherwise sterile body fluids, bone marrow and solid tissues.

CMT 421: CLINICAL CHEMISTRY II (2 cr.) Spring Semester, at BR conference room, location to be announced

This is a 30-hour didactic course that provides the cognitive foundation required for students to competently apply clinical chemistry principles to the practice of clinical laboratory science. This is the second course in a series of two clinical chemistry courses in the program.

Clinical and analytical correlations are organized by organ system, including: the immune system, innate and adaptive immunity, antibody structure, immunologic and serologic procedures, immune disorders; cardiac function and laboratory markers for cardiac disease; the renal system; toxicology, methods, drug monitoring and drugs of abuse; and trace and toxic elements (including the spectrometry, atomic absorption spectroscopy, and alternative analytical techniques). The chemical principles of for assessment of organ systems functions are presented in a situational learning model that makes correlations: to disease states, interpretations of data, problem solving, and quality assurance in addition to other real world aspects of the clinical chemistry laboratory.

CMT 422: CLINICAL HEMATOLOGY II (2 cr.) Spring Semester, at SMH conference room, location to be announced

This is a 30-hour didactic course that provides the cognitive foundation required for students to competently apply clinical hematology principles to the practice of clinical laboratory science. This is the second course in a series of two clinical hematology courses in the program.

The first unit of this course provides an in depth study of morphologic analysis of body fluids from a hematologic perspective, including: urine, serous, synovial, cerebral spinal fluid, semen analysis, and joint fluids.

The second unit covers primary hemostasis with discussions of the vascular system and platelets in hemostasis. Secondary hemostasis is also covered and includes an in-depth discussion of: the coagulation mechanism; procoagulant factors; the coagulation cascade; fibrinolytic system; and the control mechanisms of hemostasis.

The final unit for this course covers the disorders of primary hemostasis, including the following topics: diagnosis of bleeding disorders; disorders of the vascular system; and platelet disorders. Interpretations of data, problem solving, and quality assurance in addition to other real world aspects of the clinical hematology laboratory are integrated throughout the course content.

CMT 423: PRINCIPLES OF IMMUNOHEMATOLOGY II (2 cr.) Spring Semester, at SMH conference room, location to be announced

This is a 30-hour didactic course that provides the cognitive foundation required for students to competently apply the scientific principles of immunohematology to the practice of clinical laboratory science. This is the second course in a series of two immunohematology courses in the program.

The first unit of this course begins with blood group terminology and leads into the detection and identification of antibodies in the clinical setting, including: the antibody screen; antibody detection; additional techniques for resolving antibody identification; direct antiglobulin techniques and elution methods; antibody titration and providing compatible blood products. Pre-transfusion testing is also covered in relation to: compatibility testing protocols; selection of appropriate donor units; crossmatch testing; and pre-transfusion testing in special circumstances.

The next unit is on donor screening and component preparation technique including: governing agencies; donor screening; whole blood collection; donor reactions; donor records and processing; component preparation; plasma derivatives; and transfusion practices of packed red blood cells and blood products.

Unit three is on the adverse effects of blood transfusion and covers: the risks of transfusion; regulations; acute transfusion reactions; delayed transfusion reactions; transfusion related adverse events in special patient scenarios including neonatal transfusions. Hemolytic disease of the fetus and newborn; the HLA system and autoimmune hemolytic anemias are also covered here. Interpretations of data, problem solving, and quality assurance in addition to other real world aspects of the blood bank and transfusion medicine laboratory are integrated throughout the course content.

CMT 424: CLINICAL LABORATORY MICROBIOLOGY II (2.5 cr.) Spring Semester, at BR conference room, location to be announced

This is a 37.5-hour didactic course that provides the cognitive foundation required for students to competently apply the principles of clinical microbiology to the practice of clinical laboratory science. This is the second course in a series of two clinical microbiology courses in the program.

This course begins with the general principles of clinical microbiology as they relate to laboratory techniques in the identification: of mycobacteria; parasitology; mycology; virology and other obligate intracellular and non-culturable bacterial agents; cell wall-deficient bacteria; spirochetes; serology of noninfectious clinical disorders; and serology of infectious clinical disorders. Correlations are made to pathophysiology and diagnosis by organ systems, such as infections of the: bloodstream; lower respiratory system; upper respiratory tract; meninges, encephalitis and other central nervous system infections; urinary tract; genital tract; gastrointestinal tract; skin, soft tissue and wounds; otherwise sterile body fluids, bone marrow and solid tissues.

VI. PROGRAM FACULTY: <https://www.urmc.rochester.edu/education/graduate/certificate/clinical-medical-technology-certificate/faculty.aspx>

Medical Director: Audrey Jajosky, M.D., Ph.D., Assistant Professor, Associate Director of the Molecular Diagnostics Laboratory, Department of Pathology and Laboratory Medicine, School of Medicine and Dentistry, University of Rochester

Program Director: Vicki L. Roberts, MS, MT (ASCP), Associate Professor and Director of Education, Department of Pathology and Laboratory Medicine, School of Medicine and Dentistry, University of Rochester

Didactic Course Directors

Clinical Chemistry: Y. Victoria Zhang, Ph.D., MBA, Professor, Director-Clinical Mass Spectrometry and Toxicology Lab, Director-Clinical Chemistry, Department of Pathology and Laboratory Medicine, School of Medicine and Dentistry, University of Rochester

Clinical Hematology: W. Richard Burack, M.D., Ph.D., Professor, Director-Hematopathology Unit, Vice Chair for Clinical Operations, Department of Pathology and Laboratory Medicine, School of Medicine and Dentistry, University of Rochester

Clinical Laboratory Microbiology: Dwight J. Hardy, Ph.D., Professor, Department of Microbiology and Immunology, Director of Clinical Microbiology, Pathology and Laboratory Medicine, School of Medicine and Dentistry, University of Rochester

Immunohematology: MT(ASCP), SBB, Chief Supervisor of Blood Bank and Transfusion Medicine, Department of Pathology and Laboratory Medicine, School of Medicine and Dentistry, University of Rochester

Clinical Instructors-Education Coordinators, Medical Technologist Specialists

Clinical Chemistry: Stephen Bunal, MLS^{CM}(ASCP), B.S., Technologist Specialist-Chemistry, NYS Licensed Clinical Laboratory Technologist, UR Medicine Labs, Department of Pathology and Laboratory Medicine, Strong Memorial Hospital, University of Rochester

Clinical Hematology: Kaleigh Maywalt (Reid), MLS (ASCP), Technologist Specialist-Hematology, NYS Licensed Clinical Laboratory Technologist, UR Medicine Labs, Department of Pathology and Laboratory Medicine, Strong Memorial Hospital, University of Rochester

Clinical Laboratory Microbiology: Nichole Mulyca, MLS^{CM} (ASCP), B.S., Technologist Specialist-Microbiology, NYS Licensed Clinical Laboratory Technologist, UR Medicine Labs, Department of Pathology and Laboratory Medicine, Strong Memorial Hospital, University of Rochester

Histology- Lorelee McMahon HLT (ASCP), MS, Chief Supervisor-Anatomic Pathology Department, NYS Licensed Clinical Laboratory Technologist, UR Medicine Labs, Department of Pathology and Laboratory Medicine, Strong Memorial Hospital, University of Rochester

Immunohematology: Heather Sassone, MT (ASCP), B.S., Technologist Specialist-Blood Bank and Transfusion Services, NYS Licensed Clinical Laboratory Technologist, UR Medicine Labs, Department of Pathology and Laboratory Medicine, Strong Memorial Hospital, University of Rochester

VII. ADMISSIONS REQUIREMENTS

- a. Students must have completed a Bachelor's degree in the biological, chemical or physical sciences with successful completion of the following courses and subject areas that include laboratory content:
 - inorganic chemistry
 - analytic chemistry and/or biochemistry
 - physiology, with anatomy content
 - molecular biology and diagnostics
 - microbiology
- b. The following courses are also required:
 - organic chemistry
 - statistics
 - immunology
- c. Applicants must have a minimum overall GPA of 3.0 with a minimum Math/Science GPA of 2.8.

VIII. APPLICATION REQUIREMENTS

- a. Fulfill online application requirements
- b. Copy of Transcript/s (official transcript will be required after the interview)
- c. 2 Letters of Recommendation
- d. CV, resume or personal statement
- e. \$60 application fee

IX. RESTRICTIONS

- a. The courses are restricted to students matriculated in the Clinical/Medical Laboratory Technology Advanced Certificate Program unless prior approval is granted by the program director.
- b. The program minimum number of students is 1 and the maximum number is 16.
- c. Students that do not meet learning outcomes and targeted competencies as described in Section VII. must obtain approval from the program director to continue in the program.

- X. TEXTBOOKS AND RESOURCES:** Details will be made available on the syllabi prior to the start of the semester.

XI. ASSESSMENT OF STUDENT PERFORMANCE

- a. Courses are not offered on a pass/fail basis.
- b. To be in good academic standing students must maintain a weighted average of 75% in each course.
- c. Students must attain a 70% minimum score on the quizzes and projects. Any student achieving less than a 70% will have an opportunity to remediate and take the quiz a second time to provide evidence that they have achieved the learning objectives targeted by the exam. Students will also be provided an opportunity to resubmit projects that are initially below the 70% minimum. The initial grade stands.
- d. The final grade determination for each course is a letter grade and calculated as follows:

Grades are calculated out to a tenth of a percentage point and equal to or above 0.5% will be rounded up to the nearest whole number whereas “equal to or below” 0.4% is rounded down to the nearest whole number.

A = 95, 96, 97, 98, 99, 100 (Excellent)
A- = 90, 91, 92, 93, 94
B+ = 85, 86, 87, 88, 89
B = 80, 81, 82, 83, 84 (Good)
B- = 75, 76, 77, 78, 79
C = 70, 71, 72, 73, 74 (Poor)
E is less than or equal to 69 (Failing)

XII. EVALUATION METHODS

- a. Student learning is evaluated in the cognitive, psychomotor and affective domains. Assessments and learning objectives are provided in the course syllabi. Successfulness of learning outcomes will be evaluated based on the class performance in clinical rotations, quizzes and projects. Improvements will be implemented on a continuous basis as gaps are identified. Students will also be evaluated on their professional behaviors and clinical competency. Advisement meetings occur mid-semester in the fall and spring.
- b. Educators will use turning technology to anonymously gauge the in class learning outcomes by incorporating assessment checkpoints into presentations; modifying instruction as needed.
- c. Anonymous course evaluations will be implemented at the conclusion of the course to provide insights into the students’ perception of the experiences; i.e. the laboratory resources, instructors’ abilities, textbooks, learning activities, and alignment of learning objectives to learning experiences.
- d. The Program Director meets with students that are not meeting program expectation to provide advisement and support. Action plans to enhance learning outcomes will be implemented as required. Tutoring services are available.
- e. Student performance and information is kept strictly confidential.

XIII. CONTINUOUS PROCESS IMPROVEMENT PLAN

RESPONSIBLE INDIVIDUAL/S: The Program Director and education coordinators are responsible for monitoring and assessing program effectiveness. Opportunities for improvement are shared with one or all of the following depending on the situation and the appropriate department: Deans Office, Pathology Department Leadership, Faculty, Education Coordinators and/or the Advisory Committee.

Solutions are identified in team settings with action plans designated to the appropriate parties as determined by the team. Successfulness is monitored by the Program Director and shared back to the groups involved. Should further improvements be warranted, the process begins again and may escalate to a higher level of leadership as necessary.

PERFORMANCE AND OUTCOME MEASURES INCLUDE:

- Academic performance on lecture exams and projects; final grades
- Clinical rotation competencies and professional behavior/affective domain assessments, quizzes and assignments;
- Surveys of current and former students;
- Faculty feedback;
- Board of registry scores;
- And graduate placements

OUTCOME GOALS OF THE PROGRAM:

- Graduation Rate: 85%
- ASCP Certification MLS Exam Pass Rate within a year after graduation: 85%
- Graduation Rate/Second Half of the Program (January 1st): 90%
- Employment/Graduate School/Placement Rate of Graduates (of those that remain in contact): 85%

XIV. PROGRAM POLICIES

- a. Graduate students are expected to be on site at the medical center from 8am to 4:30pm Monday through Friday (with the exception of the first 4 weeks when instruction begins at 8:30am and ends at 4pm) unless otherwise indicated by program leadership. This schedule is carefully configured to meet state and national requirements for both clinical and lecture hours.

Three weeks of vacation are built into the schedule. Two weeks occur just prior to the start of spring semesters and one week falls in the middle of spring semester. Graduate students are permitted to take up to 16 hours (or 2 days) of personal time per semester in hourly increments with advance notice. The written request must be made two weeks prior to the requested date/ time and must be made to the program director AND the clinical instructor. Advance notice provides adequate opportunities to schedule make-up experiences. Request forms are provided in the appendix.

Students missing more than 2 days in a row due to illness or other unplanned critical events are required to:

Submit a written explanation as to the program director that includes: the anticipated date of return; a list of missed experiences; and the approved make up schedule for those experiences (clinical instructor approval required).

Submit a doctor's excuse for absences due to illness for more than 2 consecutive days that provides the date the graduate student is medically cleared to resume normal activity (and return to the program).

In the event of a prolonged absence graduate students must adhere to the leave of absence policies found in the current Graduate Studies Bulletin entitled: [Regulations and University Policies Concerning Graduate Studies](#).

Noncompliance may result in dismissal from the program. A sample evaluation form is provided in the appendix.

Unscheduled absences (those that occur without prior advance notice) will be monitored. Absenteeism and a history of repeated requests to leave early without proper approval will result in remediation and may lead to dismissal from the program.

Graduate students must inform clinical instructors or the program director if they are unable to attend clinical rotations and/or lectures prior to the beginning of the shift. It is the expectation of the department that the graduate student reports their absence directly to a departmental representative. Although it may be helpful to leave a voice mail or send an email, key instructors may not receive the message in a timely fashion. In some cases, instruction to other students may be delayed until everyone is present.

Missed exams must be made up immediately upon the graduate student's return to the program.

Alerts for program closings due to dangerous travel conditions, power outages, or unexpected utility failures will be made directly to students as soon as the information becomes available.

- b. Attendance is mandatory. Students are permitted 2 sick days per semester and must make up practicums and exams within a reasonable time frame when they return to class. In the event that additional days are missed the student must:
 - Submit a written explanation within 2 days to the program director explaining the reason for the extended absence that includes an anticipated date of return with an approved (by the appropriate instructor) action plan detailing the makeup schedule for missed practicums and/or exams.
 - Submit a doctor's excuse for absences over 3 consecutive days with written approval to return to normal activities.
 - Submit a doctor's excuse for leave of absences due to a medical condition with a written statement that the student cannot return to the program for medical reasons.
 - Students that do not comply with these policies will be placed on academic probation or dismissed from the program at the discretion of the program director.
- c. Withdraws from the program will follow the University policy for tuition and fee refunds. The tuition refund policy can be viewed at the following URL:
<https://www.urmc.rochester.edu/education/graduate/home/forms/refund-schedule.aspx>
- d. Grades of B- or better are required for satisfactory performance in the graduate program. One grade below B- in any course requires that the program director and graduate student meet to review overall performance to create a documented plan intended to enable that the graduate student successfully completes the graduate program. This plan will be formally submitted to the Office of Graduate Education and Postdoctoral Affairs (GEPA) and a copy will be placed in the student's academic file. A second grade below B- will require that the graduate student meet with the Senior Associate Dean for Graduate Education and Program Director to evaluate their standing in the program and may result in disciplinary action. In all instances, the graduate student will receive a formal letter from GEPA notifying them of the final determination. Complete details of this policy are found at the following link: :
<https://www.urmc.rochester.edu/education/graduate/trainee-handbook/policies-benefits/c-or-below-grade-policy.aspx>

- e. Evaluations of student performance are provided in a fair and consistent manner. One on one advisement meetings between the program director and students occur mid semester in fall and spring. The program director is also available for additional meetings at the student's request. In addition, the program director schedules advisement meetings as needed when a student is identified at risk and in need of advising for academic, behavioral or emotional concerns.

The [Care Network](#) is a university resource that offers students support. Students may engage independently or be referred by a member of the university. The CARE Network strives to maintain students' privacy as much as possible, but when there are instances related to sexual misconduct (Title IX issues) or self-harm/harm to others, CARE staff are mandated to report information to the appropriate campus resources. Care referrals have no impact on the student's academic standing or records.

The program adheres to the University of Rochester Policy on Confidentiality:

<https://www.rochester.edu/policies/policy/confidentiality/>.

- f. Grade appeals must be submitted in writing with a full explanation of the reason for dispute; a copy of the graded assessment; and references to course materials to support the claim. Appeals will be reviewed by the Medical Director and Program Director. The outcome of the appeals will be returned within 2 weeks of submission of the required documents.
- g. As per the *University of Rochester Regulations and University Policies Concerning Graduate Studies*, academic honesty is taken very seriously and a central responsibility for all students. Suspected breaches are reported to the department chair and associate dean of graduate studies. Claims of academic misconduct will be reviewed by department leadership and if a breach is confirmed will result in penalties. Ignorance of this policy is not considered a valid excuse or defense. The full policy can be viewed at the following URL; on page 19:
<http://www.rochester.edu/GradBulletin/PDFbulletin/Regulations.pdf>.
- h. Should a student drop out of the program and wish to return the following academic year they will need to reapply to the program. If accepted to the program the student will need to pay the going flat tuition rate for the academic year that they are scheduled to return.
- i. In the event that the student must retake a course, they will need to pay for the course again at a pro-rated, per credit hour cost.
- j. The entire Graduate Education Trainee Handbook is provided at this URL:
<https://www.urmc.rochester.edu/education/graduate/trainee-handbook.aspx>.

XV. PUBLIC DISCLOSURES

UNIVERSITY NONDISCRIMINATION STATEMENT

” The University of Rochester prohibits and will not engage in discrimination and harassment on the basis of age, color, disability, domestic violence victim status, ethnicity, gender identity or expression, genetic information, marital status, familial status or an individual’s reproductive health decision making, military/veteran status, national origin, race (including hair style), religion/creed (including religious attire and facial hair), sex, sexual orientation, citizenship status, or any other status protected by law (anyone individually, a “Protected Class”). Discrimination or harassment (including hostile work environment harassment) based on protected status is illegal, will not be tolerated, and is considered misconduct that will be subject to discipline.

The University complies with all federal and state laws that prohibit discrimination based on the protected categories listed above, including Title IX of the Education Amendments of 1972, which prohibits sex discrimination (including sexual harassment and violence based on sex) in the University’s educational programs and activities, and Section 504 of the Rehabilitation Act of 1973, which prohibits discrimination on the basis of disability.”

More information, including information about resources that support the University’s commitment to equal opportunity, can be found at [Equal Opportunity at Rochester](#).

STUDENT LIFE

Publications on residential life and housing services are found here:
<https://www.rochester.edu/graduate-education/student-life/>

SCHOOL OF MEDICINE AND DENTISTRY, GRADUATE EDUCATION, ORIENTATION AND THE STUDENT HANDBOOK

<https://www.urmc.rochester.edu/education/graduate/trainee-handbook/graduate-students.aspx>

GRADUATE STUDIES OFFICIAL PUBLICATIONS:

<http://www.rochester.edu/gradstudies/publications.html>

- UNIVERSITY OF ROCHESTER GRADUATE BULLETIN-contact information and academic schedules
- REGULATIONS AND UNIVERSITY POLICIES CONCERNING GRADUATE STUDIES
 - Student Conduct –pp. 15
 - Affirmative Action, Equal Opportunity, and Antidiscrimination-pp. 15-18
 - An inclusive Community
 - Affirmative Action and Equal Employment Opportunity
 - Discrimination and Harassment
 - Sex-Based Discrimination and Harassment
 - Sexual Misconduct and Assault
 - Disability Accommodation
 - Disability Accommodation for Students
 - Jurisdiction and Responsibility for Academic and Nonacademic Misconduct
 - Academic Honesty Policy
 - Judicial Process for Academic Misconduct

SEXUAL MISCONDUCT:

Policies, resources and instructions on reporting an incident with the contact information for the Title IX Coordinators is provided here: <https://www.rochester.edu/sexualmisconduct/>

DIVERSITY: <https://www.urmc.rochester.edu/education/graduate/trainee-handbook/diversity.aspx>

Reasonable Request for Accommodations Form

University Wide Diversity Resources

Affinity and Networking Groups

Annual Diversity Conference

Diversity Website

Other Diversity Events

Office for Faculty Development and Diversity

Statement of Educational Philosophy

Susan B. Anthony Institute

University of Rochester Veterans Alliance

School of Medicine and Dentistry Resources

Graduate Women in Science

Graduate Students of Color

The Spectrum Group List Serve (LGBT)

A list of National Organizations and Conferences

XVI. ADDITIONAL POLICIES

- a. DRESS CODE: the dress code is business casual or scrubs in good condition. Footwear must have closed toes and in good condition. Lab coats must be worn at all times in clinical areas.
- b. CELL PHONE use is prohibited in clinical areas.
- c. STUDENTS must complete *Blood Borne Pathogen Training* as assigned by the Program Director.
- d. STUDENTS must have university issued ID badges at all times while on the medical campus.
- e. STUDENTS must adhere to the vaccination policies and occupational health policies.
- f. CLINICAL ASSIGNMENTS are guaranteed in this program upon admission. All students complete clinical training and education in UR Medicine Labs locations.
- g. SERVICE WORK No student will perform or be expected to perform the duties of paid employees or instructors while engaging in the learning experiences required for completion of the program. Voluntary paid positions in the laboratory are strictly noncompulsory and must be completed outside of regular program hours and within the provisions set forth by the university policies. Students are not expected to pass an external board or certification examination in order to receive the certificate of completion for advanced study.

- h. PROGRAM CLOSURES in the event of short-term school closures (usually weather related) the student body will be alerted through the university emergency management system; public radio or communication from the program director. If the institute were to close for in person instruction on a short term basis, electronic delivery of didactic and clinical instruction would continue through University approved online applications such as the BlackBoard Learning Management System. Hands on clinical laboratory experiences would be made up upon the return of learners to campus.

In the event of a long term program or permanent program closure, the program teach-out plan would be guided by the *Teach Out Plans and Agreements Procedures* published by our regional accreditor, the Middle States Commission on Higher Education (MSCHE): <file:///C:/Users/vroberts/Downloads/teach-out-plans-and-agreements-procedures.pdf>. The Program Director would inform NAACLS within 30 days of the closure with specific details on how the teach out plan would be implemented.

- i. SUPERVISION Under the advisement and direction of the Program Director each clinical course (includes CMT 401; CMT 402 and CMT 403) is managed by an expert Medical Technologist Specialist in each clinical content area. Psychomotor objectives are delivered in clinical settings under the supervision of New York State Licensed Clinical Laboratory Technologists. The clinical hours and students' schedules are assigned by the Program Director.

XVII. ESSENTIAL FUNCTIONS

All students and applicants sign a waiver stating that they meet the technical standards and essential functions of the profession. This document provided in the appendix.

Student records acknowledging that they have read and understand these policies in captured in the BlackBoard Learning Management System during orientation and in CMT 401.

APPENDIX A-PROFESSIONAL CONDUCT/AFFECTIVE OBJECTIVES FORM

APPENDIX B-VACATION REQUEST FORM

APPENDIX C-ESSENTIAL FUNCTIONS DOCUMENT

UR MEDICINE CLINICAL/MEDICAL TECHNOLOGY PROGRAM
CLINICAL ROTATION-PROFESSIONAL CONDUCT/AFFECTIVE OBJECTIVES



Laboratory Section: _____ Date Range: _____
 Student: _____ Preceptor: _____

RATING KEY: point values combined to calculate final grade for professional conduct. Y=Yes (Always to Majority of the Time); S=(Majority of Time to Adequate); N=No (Minimally or Not at All)	Y 2pts	S 1.5pts	N 0pts
INTERPERSONAL SKILLS			
Communicates effectively and encourages team work.			
Gives and receives feedback constructively.			
Prioritizes individual and team goals appropriately.			
PROFESSIONALISM			
Reports to program lectures and clinical trainings on time as scheduled.			
Submits assignments on time.			
Exhibits respectful behaviors toward other graduate students, clinical instructors and leaders of the program. Uses appropriate language. Demonstrates nonbiased sensitivity to diverse populations; all genders; and all cultures.			
Adheres to program policies without prompting. This includes but is not limited to: the dress code; the attendance policy (reporting absences & vacation/sick time requests); and privacy/confidentiality laws and regulations (HIPAA + FERPA).			
COMPETENCY			
Competently completes all tasks as instructed, from the mundane to the complex in an organized manner.			
Is self-motivated and self-aware; knows their limitations and the appropriate time to ask for assistance.			
Demonstrates appropriate care for resources: including but not limited to equipment, patient samples, reagents and technology. Follows applicable quality control/assurance procedures.			
Follows safety protocols without prompting (includes building, cyber security, infection prevention & COVID policies). Disinfects work spaces.			
INTEGRITY & ACCOUNTABILITY			
Adheres to the academic honesty policies. Demonstrates integrity by being honest, reliable and accountable for their actions.			
TOTAL PONTS ACHIEVED			
TOTAL POINTS POSSIBLE		24	
GRADE (%)			

☐ Mid-Course or Mid-Rotation Evaluation
☐ End of Course or End of Rotation Evaluation

Instructor (Sign): _____
 Student (Sign): _____
 Program Director (Sign): _____
 Comments: _____

Instructor Date: _____
 Student Date: _____
 PD Date: _____

NOTE: A passing grade of 75% in Professional Conduct is achieved with a minimum rating of "S" in each category. "N" Ratings require remediation with an action plan (must include a reasonable target date) that is acceptable to the program director, course instructor and the student. Should "N" ratings persist, graduate students may be dismissed from the program.

**UNIVERSITY OF ROCHESTER SCHOOL OF
MEDICINE AND DENTISTRY
ADVANCED CERTIFICATE PROGRAM CLINICAL/MEDICAL
LABORATORY TECHNOLOGY**

GRADUTATE STUDENT VACATION REQUEST FORM

GRADUATE STUDENT: _____

DATE/S REQUESTED: _____

DATE REQUEST SUBMITTED*: _____

LIST THE CLINICAL ASSIGNMENTS AND LECTURES IMPACTED BELOW:

PLEASE CIRCLE THE APPROPRIATE RESPONSE TO THE STATEMENTS BELOW

YES OR NO: I have discussed my request with the instructors of the areas of impact listed above.

YES OR NO: If the answer to the above statement is "YES" a plan has been approved to make up missed work. The plan is as follows: _____

THE FINAL DETERMINATION FOR THIS REQUEST IS:

APPROVED _____ NOT APPROVED _____

COMMENTS: _____

PROGRAM DIRECTOR SIGNATURE _____

DATE RETURNED TO GRADUATE STUDENT _____

(*The policy requires a minimum of 2 weeks prior to the dates requested)

Advanced Certificate Program in Clinical/Medical Technology
School of Medicine and Dentistry
University of Rochester Medical Center

TECHNICAL STANDARDS/ESSENTIAL FUNCTIONS

Description: All candidates for the Advanced Certificate Degree in Clinical/Medical Technology must possess essential skills and abilities necessary to complete the program curriculum successfully either with or without reasonable accommodations for any disabilities the individual may have. Note: The use of an intermediary that would in effect require a student to rely on someone else's power of selection, detection and observation will not be permitted.

The technical standards/essential functions for this program are as follows: All Applicants are expected to competently:

- Read and interpret graphs, charts, labels and written text on print outs and computer monitors.
- Discriminate colors, hues, shading or intensity/clarity.
- Read microscopic materials and record results.
- Communicate effectively; appropriately assess nonverbal cues; follow verbal or written communications.
- Carry out diagnostic procedures using fine and gross motor skills (for example pipetting accurately, manipulate specimens and reagents, aliquot liquid materials, inoculate biological materials, operate instrumentation, keyboarding, etc.) with speed and accuracy without endangering others.
- Maintain concentration in a fast paced, distracting and noisy environment.
- Maintain prolonged sitting and standing positions with ease.
- Utilize cognitive abilities to perform complex interpretive reasoning to calculate, interpret and synthesize information.
- Demonstrate a professional attitude and appearance on a consistent basis.
- Practice ethical behaviors; maintaining honesty and patient confidentiality at all times.
- Demonstrate personal responsibility to maintain emotional, physical and mental health.

These accommodations are posted on the program website and will be made available in the student handbook. Future applicants will be reminded of these requirements during the interview.

Students are required to review the essential functions and to sign below certifying that they have read, understand and are able to meet the standards with or without reasonable accommodations.

Student Name (Print):		
Student Signature:		Date:
Program Director Signature:		Date: