THE UNIVERSITYOF ROCHESTER MEDICAL CENTER
DEPARTMENT OF PATHOLOGY AND LABORATORY MEDICINE
ADVANCED CERTIFICATE PROGRAM-CLINICAL/MEDICAL TECHNOLOGY

PROGRAM LENGTH: 2 semesters/ 35.5 credits

FALL SEMESTER SCHEDULE: 18 weeks of instruction beginning the mid-August through the last full week before December, 25th. Thanksgiving Day and the following Friday are vacation days.

SPRING SEMESTER SCHEDULE: 18 weeks of instruction that includes one review/finals week beginning the second week in January through mid-May with one week of vacation. Commencement immediately follows the last week of instruction.

Course	Short Description	Credits	Semester	Length of Time for Lecture Schedule*
CMT 401 Essentials of Clinical Laboratory Science	Basic laboratory techniques in all disciplines (Clinical Chemistry, Hematology, Immunohematology, Microbiology and Urinalysis) including pre-analytic techniques, and phlebotomy; ethics, quality assurance, etc. Wrap around with lecture and laboratory experiences.	3	Fall	37.5 contact hours of didactic time scheduled over a 4 week period. This is a wraparound lecture/lab learning model.
CMT 402 Clinical Practicum I*	Practicum experiences in the clinical laboratories as scheduled by the program director. The clinical hours are scheduled on an individual or small group basis.	7	Fall	A total of 325 hours of supervised clinical experiences over 13 weeks
CMT 411 Principles of Clinical Chemistry I	Lecture series on the clinical chemistry analytic techniques; 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.	2.0	Fall	30 hours of lecture*
CMT 412 Principles of Hematology I	Lecture series on morphologic analysis of body fluids from a hematologic perspective, including: urine, serous, synovial, cerebral spinal fluid, and semen analysis.. From there instruction begins on the function of hematopoietic organs, hematopoiesis, and the structure and function of the erythrocyte and hemoglobin.	1.5	Fall	22.5 hours of lecture*
CMT 413 Principles of Immuno-hematology I	Lecture series on genetics and immunology of blood groups and serologic testing including the antiglobulin test, the ABO & Rh Blood Groups systems, anti-human globulin testing-indirect and direct, and blood group terminology and other blood groups, the significance of pretransfusion testing, immediate spin and full cross matching. Detection and identification of antibodies and blood preservation.	1.5	Fall	22.5 hours of lecture*
CMT 414 Clinical Laboratory Microbiology I	Bacteriology as it relates to the 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 the laboratory diagnosis and clinical management of infectious diseases.	2.5	Fall	37.5 hours of lecture*
	Total Credits	17.5	Fall	13 weeks*

***The didactic courses and clinical practicum don't begin until after the 4 weeks of "CMT 401 course-Essentials of Clinical Laboratory Science" is complete.**

THE UNIVERSITYOF ROCHESTER MEDICAL CENTER
DEPARTMENT OF PATHOLOGY AND LABORATORY MEDICINE
ADVANCED CERTIFICATE PROGRAM-CLINICAL/MEDICAL TECHNOLOGY

Course	Short Description	Credits	Semester	Length of Time for Lecture Schedule
CMT 403 Clinical Practicum II*	Practicum experiences in the clinical laboratories as scheduled by the program director. The clinical hours are scheduled on an individual or small group basis. This course is a continuation of CMT 402.	8.5	Spring	A total of 400 clinical practicum hours over a 16 week period
CMT 421 Principles of Clinical Chemistry II	Lecture series on the clinical chemistry analytic techniques and relation to 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).	2	Spring	30 hours of lecture
CMT 422 Principles of Hematology & Hemostasis II	Lecture series on granulocytes and monocytes, lymphocytes and platelets, nonmalignant lymphocytic disorders, hematopoietic neoplasms, myeloproliferative neoplasms, myelodysplastic syndromes, acute myeloid leukemias, precursor lymphoid neoplasms, and mature lymphoid neoplasms. Primary hemostasis & secondary hemostasis: the coagulation mechanism; procoagulant factors; the coagulation cascade; fibrinolytic system; and the control mechanisms of hemostasis. Diagnosis of bleeding disorders; disorders of the vascular system; and platelet disorders are also covered.	2	Spring	30 hours of lecture
CMT 423 Principles of Immunohematology II	Lecture series on donor screening and component preparation, apheresis, types of blood components, transfusion therapy (pros and cons), adverse effects of blood transfusion, cellular therapy, hemolytic disease of the fetus and newborn, procedure for neonatal transfusions, autoimmune hemolytic anemias, transfusion transmitted diseases, transfusion safety, regulatory requirements, quality management and quality assurance in the Blood Bank.	2	Spring	30 hours of lecture
CMT 424 Clinical Laboratory Microbiology II	Lecture series on: laboratory techniques in the identification of mycobacteria; parasitology; mycology; virology and other obligate intracellular and nonculturable bacterial agents; cell wall-deficient bacteria; spirochetes; serology of noninfectious clinical disorders; and serology of infectious clinical disorders. Correlations will be made to the laboratory diagnosis and clinical management of infectious diseases.	2.5	Spring	37.5 hours of lecture
CMT 404 Special Topics in Clin Lab Science	Lectures on the basic principles of HLA/Tissue Typing, Advanced Molecular Diagnostics, Micro-Array, Cytogenetics	0.5	Spring	7.5 hours of lecture
CMT 405 Laboratory Management and Operations	Independent Study of Laboratory Management including: operations, finance, education, licensure, leadership and professional development, quality systems management, inspection readiness and laboratory compliance. This experience includes 25 hours of direct observation.	0.5	Spring	7.5 hours of lecture includes 25 hours of clinical experiences
	Total Credits	18	Spring	17 weeks

THE UNIVERSITYOF ROCHESTER MEDICAL CENTER
DEPARTMENT OF PATHOLOGY AND LABORATORY MEDICINE
ADVANCED CERTIFICATE PROGRAM-CLINICAL/MEDICAL TECHNOLOGY

* The clinical practicum is 750 hours (CMT 402, CMT 403 and CMT 404 are scheduled over 2 semesters) with a combined total of 30 weeks and 16 credits of direct observation, instruction and supervised training in the following laboratory areas:

Clinical Microbiology:	9 weeks	Clinical Hematology & Hemostasis:	5 weeks
Clinical Chemistry:	7 weeks	Blood Bank & Transfusion Services:	5 weeks
Urinalysis:	1 week	Histopathology:	1 week
Lab Specialty Areas:	1 week	Laboratory Management/Operations	1 week

PROGRAM STRUCTURE:

The schedule is 37.5 hours per week (generally 8am-4pm). The first 4 weeks of fall semester are devoted to CMT 401-the Essentials of Clinical Laboratory Science. The course design is a wraparound model of didactic instruction followed by complementary laboratory experiences. The curriculum is composed of basic principles in each core content area with additional topics in quality assurance, data integrity, professional ethics, infection control, and clinical laboratory safety. This course provides students of diverse backgrounds with the opportunity to reach a common level of understanding in the basic principles and practices of clinical laboratory science and to gain the entry level competencies required to succeed in the clinical practicums.

CMT 402-Clinical Practicum I is 13 weeks in the fall semester and begins after CMT 401 is completed. CMT 403-Clinical Practicum II is offered in the spring semester for 16 additional weeks. In combination with CMT 405, Laboratory Management and Operations, these courses provide a total of 750 hours of direct observation (minimum of 25 hours/week), supervised training and instruction giving students real world experiences in each clinical laboratory domain. Students learn to connect theory to the practice by correlating laboratory findings to diagnosis, prognosis, treatment, and monitoring the successfulness of treatment and care management.

While students are in Clinical Practicums I and II they also engage in traditional lecture Monday through Thursday each week to complete the didactic requirements in CMT 411 and CMT 421-Clinical Chemistry I & II; CMT 412 and CMT 422-Hematology, Hemostasis and Urinalysis & Body Fluids I & II; CMT 413 and CMT 423-Immunohematology I & II; and CMT 414 and CMT 424-Clinical Laboratory Microbiology I & II. Fridays are devoted to the clinical practicums unless otherwise indicated. Part I of these courses is offered in the fall semester and part II is offered in the spring semester.

The spring semester also includes CMT 404-a Seminar Series covering topics in the specialty areas of Clinical Laboratory Science (Tissue Typing-HLA, Advanced Molecular Diagnostic Studies, Cytogenetics and Micro-Array) as well as CMT 405-Laboratory Management & Operations which includes learning experiences in the following topics: operations, finance, education, licensure, leadership and professional development, quality systems management including inspection readiness and laboratory compliance.

The last week is review week with comprehensive mock board examination. Commencement is scheduled on or soon after the last day of review week.