

**Descriptions — Medical Technology
of
Courses**

430. Immunohematology
Fall. 3(3-0) MPH 461.

Genetics and immunology pertinent to blood group systems, antibody identification, and compatibility testing. Common practices of transfusion centers. Clinical correlations related to transfusion reactions and to hemolytic disease of the newborn.

431. Immunohematology Laboratory
Fall. 1(0-2) or 2(0-4) M T 430 or concurrently.

Techniques relevant to practice of immunohematology. Special emphasis on blood typing, antibody screening and identification, compatibility testing, prenatal and postnatal testing, quality assurance and problem solving.

440. Clinical Microscopy and Hemostasis
Winter, Summer. 2(2-0) PSL 432, BCH 401.

Renal physiology pertinent to the physical, chemical, and microscopic analysis of urine. The coagulation and fibrinolytic mechanisms including inherited and acquired diseases, laboratory testing and anticoagulant therapy.

441. Clinical Microscopy and Hemostasis Laboratory
Winter. 1(0-2) or 2(0-4) M T 440 concurrently.

Routine urinalysis including the physical, chemical and microscopic examination. Semi-automated procedures for routine coagulation testing including prothrombin times, partial thromboplastin times, and factor assays.

451. Senior Seminar I
Fall. 3(3-0) Clinical Laboratory Sciences majors, approval of Medical Technology Program.

Problem oriented learning approach to develop managerial, scientific and educational leadership for the clinical laboratory. Topics to include clinical chemistry, hematology, immunology, microbiology, hemostasis, quality control, instrumentation.

452. Senior Seminar II
Winter. 3(3-0) M T 451.

Continuation of M T 451. Problems of increasing difficulty and based on additional topics in immunohematology and medical mycology.

453. Senior Seminar III
Spring. 3(3-0) M T 452.

Continuation of M T 452. Problems of increasing difficulty and based on additional topics from medical parasitology.

461. Medical Immunology and Microbiology
Winter. 5(5-0) MPH 301, MPH 302. Students may not receive credit in both MPH 461 and MPH 427. Interdepartmental with and administered by the Department of Microbiology and Public Health.

The immune system, cellular interaction of the in vitro and in vivo reaction, and associated immunopathology. Characterization of infectious agents and their pathogenic processes.

481. Clinical Chemistry
Fall, Winter, Spring, Summer. 6 credits. Clinical Laboratory Sciences majors, approval of Medical Technology Program.

Application of the theory and technical skills of chemistry in a clinical laboratory.

482. Clinical Hematology
Fall, Winter, Spring, Summer. 5 credits. Clinical Laboratory Sciences majors, approval of Medical Technology Program.

Application of the theory and technical skills of hematology in a clinical laboratory.

483. Clinical Immunohematology
Fall, Winter, Spring, Summer. 4 credits. Clinical Laboratory Sciences majors, approval of Medical Technology Program.

Application of the theory and technical skill of immunohematology in a clinical laboratory.

484. Clinical Microbiology
Fall, Winter, Spring, Summer. 6 credits. Clinical Laboratory Sciences majors, approval of Medical Technology Program.

Application of theoretical and technical aspects of clinical microbiology in a clinical laboratory.

485. Clinical Immunology
Fall, Winter, Spring, Summer. 1 credit. Clinical Laboratory Sciences majors, approval of Medical Technology Program.

Application of theoretical and technical aspects of clinical immunology in a clinical laboratory.

486. Clinical Hemostasis
Fall, Winter, Spring, Summer. 1 credit. Clinical Laboratory Sciences majors, approval of Medical Technology Program.

Clinical experience in the area of hemostasis. Structured to achieve proficiency in psychomotor skills, instrumentation, quality assurance, test evaluation and comprehension of concepts and principal in coagulation.

487. Clinical Body Fluid Analysis
Fall, Winter, Spring, Summer. 1 credit. Clinical Laboratory Sciences major, approval of Medical Technology Program.

Application of the theory and technical skills used in the analysis of body fluids in a clinical laboratory.

495. Independent Study
Fall, Winter, Spring, Summer. 1 to 5 credits. May reenroll for a maximum of 10 credits. Approval of department.

Independent study including assigned reading and reviews of appropriate scientific periodicals.

800. Seminar
Fall Winter, Spring. 1(1-0) May reenroll for a maximum of 2 credits. Approval of Medical Technology Program.

Current research topics in the clinical laboratory sciences.

810. Preparation for Research in the Clinical Laboratory Sciences
Winter. 3(2-3) Approval of Medical Technology Program.

Directed reading and discussions related to research methodology, proposal presentations both written and oral, and research funding. Exposure to medical technology research facilities.

820. Advanced Human Hematology
(PTH 820.) Fall of odd-numbered years. 2(2-0) M T 420, M T 421 or approval of department. Interdepartmental with the Department of Pathology.

Selected topics in hematology including the pathogenesis, mechanisms and morphological picture of hemotologic diseases in humans.

840. Advanced Hemostasis
(PTH 840.) Fall of even-numbered years. 2(2-0) M.S. candidates in Clinical Laboratory Science or approval of department. Interdepartmental with the Department of Pathology.

Physiology, pathophysiology and laboratory evaluation of hemostatic disorders.

899. Master's Thesis Research
Fall, Winter, Spring, Summer. Variable credit. Approval of Medical Technology Program.

MEDICINE MED

College of Human Medicine

512. Infectious Diseases
Spring, 4(3-3) MPH 511, or approval of department. Interdepartmental with and administered by the Department of Microbiology and Public Health.

Infectious diseases of humans, including biology of the causative microorganism, epidemiology, pathogenesis, host-parasite relationships, clinical and laboratory diagnosis, and clinical management.

590. Special Problems in Medicine
Fall, Winter, Spring, Summer. 1 to 6 credits. May reenroll for a maximum of 12 credits. Human Medicine students or approval of department.

Each student will work under direction of a staff member on an experimental, theoretical or applied problem.

607. Ambulatory Care Clerkship
Fall, Winter, Spring, Summer. 1 to 3 credits. May reenroll for a maximum of 9 credits. FMP 602. Interdepartmental with the departments of Family Practice, and Pediatrics and Human Development. Administered by the Department of Family Practice.

Outpatient experience, lasting an equivalent of 34 half-days and extending over a minimum of 26 weeks. Continuous and comprehensive patient care under supervision of appropriate physicians.

608. Internal Medicine Clerkship
Fall, Winter, Spring, Summer. 2 to 18 credits. May reenroll for a maximum of 42 credits. FMP 602, approval of department.

Based in community hospitals, this clerkship will stress interviewing skills, history, physical examination, along with problem solving and therapy, and care of the whole patient leading to independence in patient management.

609. Hematology Clerkship
Fall, Winter, Spring, Summer. 2 to 12 credits. May reenroll for a maximum of 12 credits. MED 608.

Development of skills in data collection, problem solving and management related to common hematologic disorders of children and adults.

610. Oncology Clerkship
Fall, Winter, Spring, Summer. 2 to 12 credits. May reenroll for a maximum of 12 credits. MED 608.

Development of skills in data collection, problem solving and management of the more prevalent cancers in children and adults.

- 611. Cardiology Clerkship**
Fall, Winter, Spring, Summer. 2 to 12 credits. May reenroll for a maximum of 12 credits. MED 608.
A clinical clerkship in which students evaluate in depth patients with cardiac diseases. This includes experiences with special diagnostic procedures including cardiac cuticularization, phonocardiography, echocardiography and electrocardiography.
- 612. Nephrology Clerkship**
Fall, Winter, Spring, Summer. 2 to 12 credits. May reenroll for a maximum of 12 credits. MED 608.
Integrated concepts of renal physiology and pathophysiology of renal disease. Clinical experience.
- 613. Dermatology Clerkship**
Fall, Winter, Spring, Summer. 2 to 12 credits. May reenroll for a maximum of 12 credits. MED 608.
Office based experience with a dermatologist to learn clinical skills in dermatology and develop observational and diagnostic skills in skin disease.
- 614. Medical Chest Clerkship**
Fall, Winter, Spring, Summer. 2 to 12 credits. May reenroll for a maximum of 12 credits. MED 608.
A clerkship covering four aspects of chest diseases: tuberculosis, diagnosis, pulmonary function, and physiology. The student works with medical residents, utilizing outpatient and hospital facilities.
- 615. Gastroenterology Clerkship**
Fall, Winter, Spring, Summer. 2 to 12 credits. May reenroll for a maximum of 12 credits. MED 608.
Referred patients with gastrointestinal problems are seen as either inpatients or outpatients. Many long term problems are followed. Patients with psychosocial problems are seen conjointly with Social Service.
- 616. Allergy Clerkship**
Fall, Winter, Spring, Summer. 2 to 12 credits. May reenroll for a maximum of 12 credits. MED 608.
Office and hospital based experience to learn and develop diagnostic skills in allergy with a review of basic therapeutics as they relate to allergic diseases.
- 617. Neurology Clerkship**
Fall, Winter, Spring, Summer. 2 to 12 credits. May reenroll for a maximum of 12 credits. MED 608.
A combined office and inpatient experience that will provide the student with an opportunity to learn the concepts of evaluation and management of neurological disease.
- 618. Infectious Disease Clerkship**
Fall, Winter, Spring, Summer. 2 to 12 credits. May reenroll for a maximum of 12 credits. MED 608.
The clerkship emphasizes acquisition in depth of knowledge and skills essential in solution of clinical problems in infectious and immunologic diseases. Integrated basic science input is afforded through relevant seminars.
- 620. Endocrinology and Metabolism Clerkship**
Fall, Winter, Spring, Summer. 2 to 12 credits. May reenroll for a maximum of 12 credits. MED 608.
Clinical and/or clinical-research clerkship to allow the student to work closely with patients having endocrine diseases, electrolyte abnormalities, endocrine hypertension or diabetes mellitus.
- 626. Physical Medicine and Rehabilitation Clerkship**
Fall, Winter, Spring, Summer. 2 to 12 credits. May reenroll for a maximum of 12 credits. MED 608.
Experience in prescription writing for physical medicine procedures, occupational therapy and rehabilitation skills.
- 627. Rheumatology Clerkship**
Fall, Winter, Spring, Summer. 2 to 12 credits. May reenroll for a maximum of 12 credits. MED 608.
Combined office and hospital consultative clerkship which develops diagnostic skills in areas of rheumatic diseases.
- 628. Advanced Internal Medicine Clerkship**
Fall, Winter, Spring, Summer. 2 to 18 credits. May reenroll for a maximum of 30 credits. MED 608.
Clinical experiences which refine diagnostic and management skills in general internal medicine.
- 630. Emergency Medicine Clerkship**
Fall, Winter, Spring, Summer. 2 to 18 credits. May reenroll for a maximum of 18 credits. MED 608.
Pathophysiology and other basic concepts will be used to explain the development of emergent conditions. Clinical diagnosis and treatment of emergencies seen in community emergency departments will be discussed.
- 625. Solid Mechanics Laboratory**
Fall, Winter, Spring, Summer. 1(0-2) MMM 211 concurrently.
Instrumentation, physical properties of materials, comparison of experiment and theory.
- 230. Introduction to Materials Science**
Spring. 4(4-0) Non-Materials Science majors only.
A qualitative survey of metals, ceramics, and polymers, and the relationship of electronic, molecular, and crystal structure to the physical, mechanical, thermal, electrical and magnetic properties.
- 250. Introduction to Metallurgy**
Fall, Winter, Summer. 4(3-3) CEM 141A, MTH 113.
Structure-property relationship in metals and alloys. Mechanical properties, crystal structure, phase diagrams, iron-carbon system. Laboratory includes mechanical property tests, heat-treatment, microstructural observations.
- 270. Computer Graphics**
Fall. 3(3-0) MMM 160, CPS 120 or approval of department.
Use of computer controlled display systems for the solution of multidimensional problems.
- 306. Mechanics II**
Fall, Winter, Spring, Summer. 4(4-0) MMM 205, MTH 310.
Dynamics of particles and particle systems. Energy and momentum principles. Two and three dimensional rigid body dynamics.
- 330. Metallurgical Thermochemistry**
Fall. 3(3-0) CEM 152 or approval of department.
Laws of thermodynamics. Free energy of heterogeneous reactions. Gibb's phase rule. Solutions. Quasichemical theory of solutions. Thermodynamics of surfaces and interfaces. Thermodynamics of defects.
- 350. Mechanical Properties of Materials I**
Fall. 3(3-0) MMM 211, MMM 250.
Concepts of stress and strain. Crystal elasticity. Anelasticity and viscoelasticity. Mechanical properties in tension and torsion. Hardness. Creep and stress rupture. Fracture. Fatigue.
- 351. Mechanical Properties of Materials II**
Winter. 3(3-0) MMM 350.
Crystallography of slip and twinning. Plastic deformation of single crystals. Deformation geometry in polycrystals. Elementary dislocation theory.
- 352. Mechanical Property Laboratory**
Spring. 1(0-3) MMM 350.
Laboratory experiments related to the topics covered in MMM 350.
- 360. Physical Metallurgy I**
Winter. 3(3-0) MMM 250.
Complex binary and ternary phase diagrams. Solidification structures, precipitation, clustering, order-disorder transformation. Recovery, recrystallization and grain growth.
- 361. Physical Metallurgy II**
Spring. 3(3-0) MMM 360.
Structure and theory of metallic phases. Diffusion in metals and alloys. Martensitic transformation, spinodal decomposition. Role of defects in physical metallurgy. Surfaces and interfaces.

**METALLURGY, MECHANICS,
AND MATERIALS
SCIENCE** **MMM**

College of Engineering

- 160. Engineering Communications**
Fall, Winter, Spring. 4(3-3) MTH 108 or MTH 111 or concurrently.
Engineering graphics, descriptive geometry, freehand sketching, graphical, numerical and computer problem solutions. Written technical reports and oral technical presentations.
- 201. Introduction to Engineering Mechanics**
Fall. 4(4-0) PHY 237.
Laws of mechanics governing the behavior of rigid and deformable bodies emphasizing how these laws influence engineering design. Extensive use of demonstrations.
- 205. Mechanics I**
Fall, Winter, Spring, Summer. 4(4-0) MTH 215 or concurrently.
Vector description of forces and moments. Two and three dimensional equilibrium problems. Statics of frames and machines. Friction. Shear and moments in beams and shafts. Centroids and moments of inertia.
- 211. Mechanics of Deformable Solids I**
Fall, Winter, Spring, Summer. 4(4-0) MMM 205; MTH 310 concurrently, MMM 215 concurrently.
Tension, compression, and shear. Axially loaded members. Torsion. Beam theory (stress and deflections). Stress and strain (Mohr's Circles). Columns.