

211. Introduction to the Clinical Laboratory
Fall. 1(0-2) M T 210 or concurrently.

Basic laboratory techniques in clinical microbiology, immunohematology, hematology, hemostasis, clinical chemistry and clinical microscopy.

300. Foundations of Laboratory Practices
Fall. 3(3-0) Clinical Laboratory Sciences majors.

Quality assurance of clinical laboratory analysis.

400. Clinical Laboratory Sciences Educational Practices

Fall. 2(2-0) Clinical Laboratory Sciences majors, approval of Medical Technology Program.

Development and implementation of educational programs for clinical laboratory personnel. Includes scope of CLS education, administration of programs and accreditation standards.

410. General Pathology
(PTH 404., M T 404.) Spring. 3(3-0)

ANT 316; PSL 432 or concurrently. Interdepartmental with the Department of Pathology.

Features of lethal and sublethal cell injury and inflammation and repair process. Definition of the major causes of pathologic change with a consideration of specific associated diseases.

411. Basic Histopathology

Spring. 2(1-2) ANT 420, PSL 432; M T 410 or concurrently. Interdepartmental with the Department of Pathology.

Microscopic examination of cell injury and death, inflammation and tissue repair. Pathologic tissue changes in diseases resulting from degenerative changes, abnormal metabolism, neoplasia, immunologic processes, infection, mechanical trauma and malnutrition.

420. Hematology

Spring, Summer. 3(3-0) BCH 401, PSL 432.

Physiology, pathophysiology and laboratory assessment of hematological states.

421. Hematology Laboratory

Spring, Summer. 1(0-2) or 2(0-4) M T 420 or concurrently.

Laboratory techniques in hematology. Normal and abnormal blood cell morphology.

430. Immunohematology

Fall, Spring. 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. 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.

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.

**Descriptions — Medicine
of
Courses**

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. Interdepartmental with the Department of Microbiology and Public Health.

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.

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

College of Engineering

160. Engineering Communications
(EGR 160.) Fall, Winter, Spring. 4(3-4) 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.

211. Mechanics of Deformable Solids I
Fall, Winter, Spring, Summer. 4(4-0) MMM 205; MTH 310 concurrently, MMM 215 concurrently.

Deformable solids, stress and strain, principal axes, material behavior (elastic, plastic, viscoelastic, temperature dependent). Boundary value problems, torsion, beams. Instability, columns.

215. 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
(370.) 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
(EGR 270.) Fall. 3(3-0) MMM 160, CPS 120 or approval of department. Use of computer controlled display systems for the solution of multidimensional problems.

280. Manufacturing Processes
Fall, Spring. 3(2-3)

An introduction to the materials and processes used in manufacturing, to convert ideas into products, machines, and structures for the use of people. Extensive use is made of audiovisual techniques. Field trips required. Approved through Winter 1986.

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.

340. Computer Aided Manufacturing
(M E 341.) Spring. 4(3-2) CPS 115 or CPS 120 or CPS 251 or LBS 124. Interdepartmental with the Department of Computer Science.

APT and COMPACT numerical control languages. Group technology and computer-aided process planning. Introduction to manufacturing robotics.

Approved through Winter 1986.