

**MECHANICAL ENGINEERING**

**930\*.** **Selected Topics in Fluid Mechanics**  
Fall. 1 to 3 credits. May reenroll for a maximum of 6 credits.  
P: ME 830

Current topics in Fluid Mechanics will be presented.  
QP: ME 841 QA: NONE

**940\*.** **Advanced Topics in Thermal Science**  
Spring. 3(3-0) May reenroll for a maximum of 12 credits.  
P: ME 813, ME 814 or ME 817, or approval of department R: Mechanical Engineering

Advanced topics in thermal sciences, eg., conduction, convection, radiation, phase change and interactive combined modes of heat transfer; mass transfer; irreversible thermodynamics.  
QP: ME 813 ME 814 ME 817 QA: ME 980

**952\*.** **Advanced Control Systems**  
Fall. 3(3-0)  
P: ME 852 R: Graduate

Investigate areas of current interest in control theory that hold promise for improving the design of mechanical systems.  
QP: ME 852

**955\*.** **Nonlinear Dynamical Systems and Chaos**  
Fall of even-numbered years. 3(3-0)  
P: ME 863 or equivalent R: Graduate

**Students**  
Qualitative theory of dynamical systems applied to physical system models. Bifurcation theory for continuous and discrete time systems, chaos, the Smale horseshoe, and Melnikov's method.  
QP: ME 825 EE 827 QA: ME 853

**960\*.** **Selected Topics in Vibrations**  
Fall. 1 to 3 credits. May reenroll for a maximum of 6 credits.  
P: ME 860

Current topics of interest to the student and faculty.  
QP: ME 823

**963\*.** **Wave Phenomena**  
Spring of even-numbered years. 3(3-0)  
P: Approval of instructor.

Linear and non-linear waves in bounded and unbounded media. Reflection, refraction, diffraction. Dispersion. Shock and acceleration waves. Waveguides. Acoustical and optical analogies. Fluid and solid continua.  
QP: ME 870 QA: ME 870

**971\*.** **Intelligent Materials and Smart Structures: Applications**  
Fall of odd-numbered years. 3(3-0)  
P: ME 873 R: Graduate

Design-for-Manufacture issues in smart materials: Biomimetics, nanotechnology, electro-rheological fluids, shape memory alloys, piezoelectric materials, fiberoptics, neural networks.  
QP: NONE QA: NONE

**990\*.** **Special Problems in Mechanical Engineering**  
Fall, Spring, Summer. 1 to 3 credits. May reenroll for a maximum of 6 credits.  
R: Graduate

Individualized study of a current problem in mechanical engineering  
QA: ME 925

**999\*.** **Doctoral Dissertation Research**  
Fall, Spring, Summer. 1 to 12 credits. May reenroll for a maximum of 0 credits.  
R: Graduate-PhD

Doctoral dissertation research.  
QA: ME 999

**MEDICAL TECHNOLOGY MT**

**212\*.** **Fundamentals of Laboratory Analysis**  
Spring. 3(3-0)  
P: CEM 142; MTH 116 or MTH 120; C: MT 213

Chemical, biological and instrumental laboratory analyses: method evaluation, quality assurance, and predictive value theories.  
QP: MTH 109 ORMTH 111 AND CEM 142 QA: MT 210

**213\*.** **Application of Clinical Laboratory Principles**  
Spring. 1(0-3)  
C: MT 212

Microscopy, pipetting, Specimen collection, handling and processing. Laboratory safety, quality control, and method evaluation.  
QA: MT 211

**414\*.** **Clinical Chemistry and Body Fluid Analysis**  
Spring. 4(4-0)  
P: BCH 401, MT 212, PSL 250.

Analytical methods in clinical chemistry and urinalysis. Correlation of laboratory test results with physiology and diseases of renal, hepatic and cardiac systems.  
QP: PSL 241 AND MT 210 AND BCH 401 QA: MT 412 MT 410 MT 300 MT 440

**415\*.** **Clinical Chemistry and Body Fluid Analysis Laboratory**  
Spring. 1(0-2)  
P: MT 213; C: MT 414 R: Open only to Clinical Laboratory Science majors.

Quantitative analysis of blood and body fluids. Spectrophotometry, electrophoresis, chromatography, enzymatic assays, and immunoassays.  
QA: MT 401 MT 441

**416\*.** **Clinical Chemistry**  
Fall. 4(5-0)  
P: MT 213.

Analytical methods in clinical chemistry. Correlation of laboratory test results with physiology and diseases of the endocrine system, pregnancy, and cancer. Therapeutic drug monitoring and automation.  
QA: MT 412 MT 300 MT 410

**422\*.** **Hematology and Hemostasis**  
Fall. 4(4-0)  
P: MT 212.

Structure and function of normal blood cells with changes seen in benign and malignant diseases, and in acquired and hereditary diseases.  
QP: MT 210 QA: MT 420 MT 440

**423\*.** **Hematology and Hemostasis Laboratory**  
Fall. 1(0-2)  
P: MT 213; C: MT 422 R: Open only to Clinical Laboratory Science majors.

Diagnostic assessment of blood cells and hemostatic function.  
QA: MT 421 MT 441

**432\*.** **Clinical Immunology and Immunohematology**  
Fall. 5(5-0)  
P: MT 212.

Cellular and humoral immunity, diseases of immunity. Clinical serology and immunology, blood group serology, and transfusion practices.  
QP: MT 210 QA: MT 430 MPH 427

**454\*.** **Problem Solving Across Clinical Laboratory Disciplines**  
Spring. 3(3-0)  
P: MT 415, MT 416, MT 423, MT 432, MT 433, MPH 463. R: Open only to Clinical Laboratory Science majors.

Problem-oriented approach integrates topics from previous courses in clinical laboratory sciences, social sciences, and humanities. Emphasis on published primary research literature and its critical appraisal.  
QA: MT 451 MT 452

**471\*.** **Advanced Clinical Chemistry Laboratory**  
Fall, Spring, Summer. 3(-)  
C: MT 472 R: Open only to seniors in Clinical Laboratory Science majors. Approval of Medical Technology Program.

Application and integration of theory and technical skills of chemistry and biochemistry.  
QA: MT 481

**472\*.** **Advanced Clinical Chemistry**  
Fall, Spring, Summer. 1(-)  
C: MT 471 R: Open only to seniors in Clinical Laboratory Science. Approval of Medical Technology Program.

Theoretical aspects of clinical chemistry. Chemical and biochemical reactions. Statistical analysis, pathophysiological relationships, and methodologies.  
QA: MT 481

**473\*.** **Advanced Clinical Hematology and Body Fluids Laboratory**  
Fall, Spring, Summer. 4(-)  
C: MT 474 R: Open only to seniors in Clinical Laboratory Science. Approval of Medical Technology Program.

Application of the theory of hematology, hemostasis, and body fluid analysis.  
QA: MT 482 MT 486 MT 487

**474\*.** **Advanced Clinical Hematology and Body Fluids**  
Fall, Spring, Summer. 1(-)  
C: MT 473 R: Open only to seniors in Clinical Laboratory Science. Approval of Medical Technology Program.

Theoretical aspects of advanced hematology, hemostasis and body fluid analysis. Integration of cognitive material with test results.  
QA: MT 482 MT 486 MT 487

**475\*.** **Advanced Clinical Immunology and Immunohematology Laboratory**  
Fall, Spring, Summer. 2(-)  
C: MT 476 R: Open only to seniors in Clinical Laboratory Science. Approval of Medical Technology Program.

Application of immunology and immunohematology principles.  
QA: MT 483 MT 485

**476\*.** **Advanced Clinical Immunology and Immunohematology**  
Fall, Spring, Summer. 1(-)  
C: MT 475 R: Open only to seniors in Clinical Laboratory Science. Approval of Medical Technology Program.

Theory of immunology and immunohematology. Integration of cognitive material with test results.  
QA: MT 483 MT 485

**477\*.** **Advanced Clinical Microbiology Laboratory**  
Fall, Spring, Summer. 3(-)  
C: MT 478 R: Open only to seniors in Clinical Laboratory Science. Approval of Medical Technology Program.

Application of clinical microbiology.  
QA: MT 484

**MEDICAL TECHNOLOGY**

**478\*.** **Advanced Clinical Microbiology**  
 Fall, Spring, Summer. 1(-)  
 C: MT 477 R: Open only to seniors in Clinical Laboratory Science. Approval of Medical Technology Program.  
 Theory of clinical microbiology. Integration of cognitive material with laboratory results.  
 QA: MT 484

**495\*.** **Directed Study**  
 Fall, Spring, Summer. 1 to 3 credits.  
 May reenroll for a maximum of 6 credits.  
 R: Open only to Clinical Laboratory Science and Medical Technology majors.  
 Faculty directed study including assigned readings, reviews of appropriate scientific periodicals, and research laboratory experience.  
 QA: MT 495

**801\*.** **Medical Technology Seminar**  
 Spring. 1(1-0)  
 R: Open only to graduate students in Clinical Laboratory Science  
 Current research topics in the clinical laboratory sciences.  
 QA: MT 800

**810\*.** **Research Planning in the Clinical Laboratory Sciences**  
 Fall of odd-numbered years. 2(2-0)  
 R: Open only to graduate students in Clinical Laboratory Science  
 Directed reading and discussions related to research methodology, proposal presentations both written and oral, and research funding.  
 QA: MT 810

**812\*.** **Advanced Clinical Chemistry**  
 Spring of even-numbered years. 2(2-0)  
 Interdepartmental with the Department(s) of Pathology.  
 P: BCH 462, MT414, MT 416 R: 6  
 Biochemical basis of selected pathologic conditions including inborn errors of metabolism, endocrine and other genetic disorders. Emphasis on current diagnostic techniques.

**820\*.** **Advanced Human Hematology**  
 Fall of even-numbered years. 2(2-0)  
 Interdepartmental with the Department(s) of Pathology.  
 P: MT 422 R: 6  
 Selected topics in hematology including the pathogenesis, mechanism and morphological picture of hematological diseases in humans. Emphasis on laboratory tests and interpretation of test results.  
 QP: MT 420 QA: MT 820

**830\*.** **Concepts in Molecular Biology**  
 Spring. 2(2-0) Interdepartmental with the Department(s) of Pathology.  
 P: Current course in Biochemistry C: Current course in Biochemistry R: 6  
 Inform students of techniques and theories of molecular biology, nucleic acid synthesis & isolation, enzymatic digestion & modification, electrophoresis, hybridization, amplification, library construction & cloning; covered in lectures & student forum

**840\*.** **Advanced Hemostasis**  
 Fall of odd-numbered years. 2(2-0)  
 Interdepartmental with the Department(s) of Pathology.  
 P: BCH 462, MT 422 R: 6  
 Physiology, pathophysiology and laboratory evaluation of hemostatic disorders.  
 QP: MT 440 QA: MT 840

**860\*.** **Clinical Laboratory Diagnosis of Infectious Diseases**  
 Spring of even-numbered years. 2(2-0)  
 Interdepartmental with the Department(s) of Pathology.  
 P: MPH 451, MPH 463, MPH 464 R: 6  
 Current methods in laboratory investigation of infectious disease in humans. Emphasis on differential diagnosis and correlation of microbiological results with serology, hematology and clinical chemistry.  
 QP: MPH 301 MPH 302MPH 406

**890\*.** **Selected Topics in Clinical Laboratory Sciences**  
 Fall, Spring, Summer. 1 to 6 credits.  
 R: Open only to graduate students in Clinical Laboratory Science  
 Recent advances in laboratory medicine. Special projects for students in non-thesis research, Plan B Masters.

**899\*.** **Master's Thesis Research**  
 Fall, Spring, Summer. 1 to 10 credits.  
 May reenroll for a maximum of 24 credits.  
 R: Open only to graduate students in Clinical Laboratory Science  
 Master's thesis research for Plan A Master's degree.  
 QA: MT 899

**MEDICINE MED**

**512\*.** **Infectious Diseases**  
 Spring. 4(-) Interdepartmental with the Department(s) of Microbiology and Public Health.  
 P: MPH 511 or approval of department  
 R: Grad Professional Students in College of Human Medicine  
 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, Spring, Summer. 1 to 6 credits.  
 May reenroll for a maximum of 12 credits.  
 P: CHM Students or approval of department R: Grad Professional Students in College of Human Medicine  
 Each student will work under direction of a staff member on an experimental, theoretical, or applied problem

**607\*.** **Ambulatory Care Clerkship**  
 Fall, Spring, Summer. 1 to 3 credits.  
 May reenroll for a maximum of 9 credits. Interdepartmental with the Department(s) of Family Practice, Pediatrics and Human Development.  
 P: FMP 602 R: Grad Professional Students in the College of Human Medicine  
 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, Spring, Summer. 2 to 18 credits.  
 May reenroll for a maximum of 42 credits.  
 P: FMP 602 R: Grad Professional Students in the College of Human Medicine  
 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, Spring, Summer. 2 to 12 credits.  
 May reenroll for a maximum of 12 credits.  
 P: MED 608 R: Grad professional students in College of Human Medicine  
 Development of skills in data collection, problem solving, and management related to common hematologic disorders of children and adults

**610\*.** **Oncology Clerkship**  
 Fall, Spring, Summer. 2 to 12 credits.  
 May reenroll for a maximum of 12 credits.  
 P: MED 608 R: Grad Professional Students in College of Human Medicine  
 Development of skills in data collection, problem solving and management of the more prevalent cancers in children and adults

**611\*.** **Cardiology Clerkship**  
 Fall, Spring, Summer. 2 to 12 credits.  
 May reenroll for a maximum of 12 credits.  
 P: MED 608 R: Grad Professional Students in College of Human Medicine  
 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, Spring, Summer. 2 to 12 credits.  
 May reenroll for a maximum of 12 credits.  
 P: MED 608 R: Grad Professional Students in the College of Human Medicine  
 Integrated concepts of renal physiology and pathophysiology of renal disease. Clinical experience.

**613\*.** **Dermatology Clerkship**  
 Fall, Spring, Summer. 2 to 12 credits.  
 May reenroll for a maximum of 12 credits.  
 P: MED 608 R: Grad professional students in College of Human Medicine  
 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, Spring, Summer. 2 to 12 credits.  
 May reenroll for a maximum of 12 credits.  
 P: MED 608 R: Grad Professional Students in College of Human Medicine  
 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, Spring, Summer. 2 to 12 credits.  
 May reenroll for a maximum of 12 credits.  
 P: MED 608 R: Grad Professional Students in College of Human Medicine  
 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