

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, fiber optics, 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 cogni-
 tive 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 Sci-
 ence 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 Scienc
 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 Scienc
 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 diagnos-
 tic 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 pathogen-
 esis, mechanism and morphological picture of hemato-
 logical 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 molecu-
 lar biology, nucleic acid synthesis & isolation, enzy-
 matic digestion & modification, electrophoresis, hy-
 bridization, 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 infec-
 tious 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 Scienc
 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 Scienc
 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, pathogen-
 esis, host-parasite relationships, clinical and laborato-
 ry 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 depart-
 ment 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 Stu-
 dents 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 Stu-
 dents in the College of Human Medicine
 Based in community hospitals, this clerkship will
 stress interviewing skills, history, physical examina-
 tion, 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 hemato-
 logic 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 Stu-
 dents in College of Human Medicine
 Development of skills in data collection, problem
 solving and management of the more prevalent can-
 cers 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 Stu-
 dents 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 includ-
 ing 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 Stu-
 dents in the College of Human Medicine
 Integrated concepts of renal physiology and patho-
 physiology 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 observa-
 tional 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 Stu-
 dents in College of Human Medicine
 A clerkship covering four aspects of chest diseases:
 tuberculosis, diagnosis, pulmonary function , and
 physiology. The student works with medical resi-
 dents, 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 Stu-
 dents 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 psychoso-
 cial problems are seen conjointly with Social Service