929. Master's Thesis Research
Fall, Spring, Summer. 1 to 6 credits. A student may earn a maximum of 24 credits in all enrollments for this course.

930. Random Vibrations of Structural and Mechanical Systems
Spring of odd numbered years. 3(3-0) Interdisciplinary program with Civil Engineering, Materials Science and Mechanics. Administered by Civil Engineering.
P: CE 810 or ME 860; CE 810
Probabilistic modeling of random excitations (e.g., earthquake, aerodynamic, and ocean wave loadings). Response of single and multiple degree-of-freedom systems to random excitation. Designing against failure. Nonstationary and nonlinear problems.

931. Advanced Heat Conduction
Fall of even numbered years. 3(3-0)
Inverse and ill-posed problems in heat transfer: function estimation, regularization, and adjoint methods in conduction.

932. Selected Topics in Fluid Mechanics
Fall. 1 to 3 credits. A student may earn a maximum of 6 credits in all enrollments for this course.
P: ME 830
Current topics in fluid mechanics will be presented.

933. Application of Turbulence Fundamentals
Spring. 3(3-0)
P: ME 834
Fundamental physics of turbulence from dimensional analysis approach. Classical and coherent structure analysis.

934. Selected Topics in Thermal Science
Spring. 1 to 3 credits. A student may earn a maximum of 12 credits in all enrollments for this course.
P: ME 812, ME 814, ME 816; R: Open only to Mechanical Engineering majors.

935. Advanced Control Systems
Fall. 3(3-0)
P: ME 852
Current topics in control theory with potential for improving mechanical systems design.

936. Selected Topics in Vibrations
Fall. 1 to 3 credits. A student may earn a maximum of 9 credits in all enrollments for this course.
P: ME 865
Current topics of interest to the student and faculty.

937. Wave Phenomena
Spring of even numbered years. 3(3-0)
R: Approval of department.

938. Intelligent Materials and Smart Structures: Applications
Fall of odd numbered years. 3(3-0)
P: ME 873

939. Independent Study in Mechanical Engineering
Fall, Spring, Summer. 1 to 6 credits. A student may earn a maximum of 8 credits in all enrollments for this course.
Individualized study of a current problem in mechanical engineering.

940. Doctoral Dissertation Research
Fall, Spring, Summer. 1 to 12 credits. A student may earn a maximum of 72 credits in all enrollments for this course.

MEDICAL TECHNOLOGY MT

Medical Technology Program
College of Natural Science

212. Fundamentals of Laboratory Analysis
Fall. 3(3-0)
P: MTH 108 or MTH 116; CRM 141 and CRM 161
Chemical, biological and instrumental laboratory analyses: method evaluation, quality assurance, and predictive value theories.

213. Application of Clinical Laboratory Principles
Fall. 1(0-3)
C: MT 212. R: Open only to students in Clinical Laboratory Sciences, and Medical Technology.

214. Clinical Chemistry and Body Fluids Laboratory
Spring. 4(4-0)
P: BCH 401, MTH 212, PSL 250; STT 200 or STT 201
Analytical methods in clinical chemistry and urinalysis. Correlation of laboratory test results with physiology and diseases of renal, hepatic and cardiac systems.

215. Clinical Chemistry and Body Fluids Laboratory
Spring. 1(0-3)
P: MT 213. C: MT 414; R: Open only to Clinical Laboratory Sciences majors.
Qualitative analysis of blood and body fluids. Spectrophotometry, electrophoresis, chromatography, enzymatic assays, and immunoassays.

216. Clinical Chemistry
Fall. 4(4-0)
P: MT 212, BCH 401.
Analytical techniques in clinical chemistry. Correlation of laboratory test results with physiology and diseases of the endocrine system, pregnancy, and cancer. Therapeutic drug monitoring and automation.

217. Hematology and Hemostasis
Fall. 4(4-0)
P: MT 212, BCH 401 or concurrently.
Structure and function of normal blood cells with changes seen in benign and malignant diseases and in acquired and hereditary diseases.

218. Hematology and Hemostasis Laboratory
Fall. 1(0-3)
P: MT 213. C: MT 422; R: Open only to Clinical Laboratory Sciences majors.
Diagnostic assessment of blood cells and hemostatic function.

219. Clinical Immunology and Immunohematology
Spring. 5(5-0)
P: MT 212
Cellular and humoral immunity, diseases of immunity. Clinical immunology, blood group serology, and transfusion practices.

220. Clinical Immunology and Immunohematology Laboratory
Spring. 1(0-3)
P: MT 213. C: MT 432; R: Open only to majors in Clinical Laboratory Sciences.
Immunologic methods for disease detection. Methods of blood typing and pre-transfusion testing.

221. Education and Management in the Clinical Laboratory
Fall. 3(3-0)
R: Open only to majors in Clinical Laboratory Sciences.

222. Problem Solving Across Clinical Laboratory Disciplines (W)
Spring. 4(4-0)
P: MT 212, MT 213, MT 414, MT 415, MT 416, MT 422, MT 423, MT 432, MT 433, MTH 463, MTH 464; R: Open only to seniors in Clinical Laboratory Sciences. Completion of Tier I writing requirement.
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.

223. Integrating Clinical Laboratory Science Discipline (W)
Spring. 2(2-0)
P: MT 414, MT 415, MT 422, MT 432, MTH 463; R: Open only to seniors in Medical Technology. Completion of Tier I writing requirement.
Problem-oriented approach integrates topics from Medical Technology courses with emphasis on writing experience in the major and on critical thinking skills.

224. Advanced Clinical Chemistry Laboratory
Fall, Spring, Summer. 3 credits.
C: MT 472; R: Open only to seniors in Clinical Laboratory Sciences. Application and integration of theory and technical skills of chemistry and biochemistry.

225. Advanced Clinical Chemistry Laboratory
Fall, Spring, Summer. 1 credit.
C: MT 471; R: Open only to seniors in Clinical Laboratory Sciences.
Theoretical aspects of clinical chemistry. Chemical and biochemical reactions. Statistical analysis, pathophysiologic relationships, and methodologies.

226. Advanced Clinical Hematology and Body Fluids Laboratory
Fall, Spring, Summer. 4 credits.
C: MT 474; R: Open only to seniors in Clinical Laboratory Sciences. Application of the theory of hematology, hemostasis, and body fluid analysis.
474. Advanced Clinical Hematology and Body Fluids
Fall, Spring, Summer. 1 credit.
C: MT 473: R: Open only to seniors in Clinical Laboratory Sciences.
Concepts in molecular biology, spring of odd-numbered years. 2 credits.
475. Advanced Clinical Immunology and Immunohematology Laboratory
Fall, Spring, Summer. 2 credits.
C: MT 477: R: Open only to seniors in Clinical Laboratory Sciences.
476. Advanced Clinical Immunology and Immunohematology
Fall, Spring, Summer. 1 credit.
C: MT 478: R: Open only to seniors in Clinical Laboratory Sciences.
477. Advanced Clinical Microbiology Laboratory
Fall, Spring, Summer. 3 credits.
C: MT 479: R: Open only to seniors in Clinical Laboratory Sciences.
478. Advanced Clinical Microbiology
Fall, Spring, Summer. 1 credit.
C: MT 477: R: Open only to seniors in Clinical Laboratory Sciences.
Theory of clinical microbiology. Integration of cognitive material with laboratory results.
495. Directed Study
Fall, Spring, Summer. 1 to 3 credits.
R: Open only to Clinical Laboratory Science and Medical Technology majors.
Faculty directed study including assigned readings, review of appropriate scientific periodicals, and research laboratory experience.
801. Medical Technology Seminar
Spring. 1-1-0: A student may earn a maximum of 2 credits in all enrollments for this course.
1-0: A student may earn a maximum of 6 credits in all enrollments for this course.
R: Open only to students in Clinical Laboratory Sciences.
Current research topics in clinical laboratory sciences.
810. Research Planning in the Clinical Laboratory Sciences
Fall of odd-numbered years. 2-2-0: Open only to graduate students in Clinical Laboratory Sciences.
Directed reading and discussions on research methodology and research funding. Written and oral proposal presentations.
812. Advanced Clinical Chemistry
Spring of even-numbered years. 2-2-0: Interdepartmental with Pathology.
P: BCH 462, MT 414, MT 418. 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 Pathology.
P: MT 402. Selected topics in hematology including pathogenesis, mechanisms and morphological pictures. Emphasis on laboratory tests and interpretation of results.
830. Concepts in Molecular Biology
Spring of odd-numbered years. 2-2-0: Interdepartmental with Pathology.
P: One course in Biochemistry or concurrently. Techniques and theories of molecular biology, nucleic acid synthesis and isolation, enzymatic digestion and modification, electrophoresis, hybridization, amplification, library construction, and cloning.
840. Advanced Hematology
Fall of odd-numbered years. 2-2-0: Interdepartmental with Pathology.
P: BCH 462, MT 422. Physiology, pathophysiology, and laboratory evaluation of hematologic disorders.
860. Clinical Laboratory Diagnosis of Infectious Diseases
Spring of even-numbered years. 2-2-0: Interdepartmental with Pathology.
890. Research in Clinical Laboratory Science
Fall, Spring, Summer. 1 to 6 credits. A student may earn a maximum of 12 credits in all enrollments for this course.
R: Open only to graduate students in Clinical Laboratory Sciences.
Non-thesis research for Plan B master's students.
899. Master's Thesis Research
Fall, Spring, Summer. 1 to 6 credits. A student may earn a maximum of 24 credits in all enrollments for this course.
R: Open only to graduate students in Clinical Laboratory Sciences.
880. Advanced Clinical Immunology and Immunohematology Laboratory
Fall, Spring, Summer. 2 credits.
C: MT 477: R: Open only to seniors in Clinical Laboratory Sciences.
Application of immunology and immunohematology principles.
Department of Medicine College of Human Medicine
450. Cancer Biology
Spring. 3-3-0: Interdepartmental with Zoology. Administered by Zoology.
512. Infectious Diseases
Spring. 4 credits. Interdepartmental with Microbiology.
P: MIC 511 or approval of department. R: Open only to graduate-professional students in College of Human Medicine. Infectious diseases of humans. Biology of the causative microorganisms, epidemiology, pathogenesis, host-parasite relationships. Clinical and laboratory diagnosis, and clinical management.
590. Special Problems in Medicine
Fall, Spring, Summer. 1 to 6 credits. A student may earn a maximum of 12 credits in all enrollments for this course.
R: Open only to graduate-professional students in College of Human Medicine. Supervised work on an experimental, theoretical, or applied problem.
608. Internal Medicine Clerkship
Fall, Spring, Summer. 2 to 12 credits. A student may earn a maximum of 42 credits in all enrollments for this course.
P: MPM 602: R: Open only to graduate-professional students in College of Human Medicine. Community hospital clerkship. Interviewing skills, history, physical examination. Problem solving and therapy. Care of the whole patient leading to independence in patient management.
609. Hematology Clerkship
Fall, Spring, Summer. 2 to 12 credits. A student may earn a maximum of 12 credits in all enrollments for this course.
P: MED 608: R: Open only to graduate-professional students in College of Human Medicine. 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. A student may earn a maximum of 12 credits in all enrollments for this course.
P: MED 608: R: Open only to graduate-professional students in College of Human Medicine. Data collection, problem solving and management of prevalent cancers in children and adults.
611. Cardiology Clerkship
Fall, Spring, Summer. 2 to 12 credits. A student may earn a maximum of 12 credits in all enrollments for this course.
P: MED 608: R: Open only to graduate-professional students in College of Human Medicine. Evaluation of patients with cardiac diseases. Special diagnostic procedures including cardiac catheterization, phonocardiography, echocardiography, and electrocardiography.
612. Nephrology Clerkship
Fall, Spring, Summer. 2 to 12 credits. A student may earn a maximum of 12 credits in all enrollments for this course.
P: MED 608: R: Open only to graduate-professional students in 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. A student may earn a maximum of 12 credits in all enrollments for this course.
P: MED 608: R: Open only to graduate-professional students in College of Human Medicine. Experience in a dermatologist's office to develop clinical, observational, and diagnostic skills in dermatology.
614. Pulmonary Clerkship
Fall, Spring, Summer. 2 to 12 credits. A student may earn a maximum of 12 credits in all enrollments for this course.
P: MED 608: R: Open only to graduate-professional students in College of Human Medicine. Pulmonary physiology. Evaluation of pulmonary function. Diagnosis and treatment of common pulmonary diseases.
615. Gastroenterology Clerkship
Fall, Spring, Summer. 2 to 12 credits. A student may earn a maximum of 12 credits in all enrollments for this course.
P: MED 608: R: Open only to graduate-professional students in College of Human Medicine. Experience with gastrointestinal problems in ambulatory and hospital settings. Emphasis on continuity and comprehensive care.