

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

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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:
 tuerculosis, 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

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- 616*. Allergy 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 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, 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 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 Diseases Clerkship**
Fall, Spring, Summer. 2 to 13 credits.
May reenroll for a maximum of 12 credits.
P: MED 608 R: Grad Professional Students in College of Human Medicine
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, 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
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 & Rehabilitation Clerkship**
Fall, Spring, Summer. 2 to 13 credits.
May reenroll for a maximum of 12 credits.
P: MED 608 R: Grad Professional Students in College of Human Medicine
Experience in prescription writing for physical medicine procedures, occupational therapy and rehabilitation skills
- 627*. Rheumatology 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
Combined office and hospital consultative clerkship which develops diagnostic skills in areas of rheumatic diseases
- 628*. Advanced Internal Medicine**
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
Clinical experiences which refine diagnostic and management skills in general internal medicine
- 630*. Emergency Medicine 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
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
- 632*. Occupational Medicine 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
Overview of health problems of chemicals and mineral dusts. Occupational history taking. Occupational differential diagnosis of common conditions seen in primary care
- METALLURGY, MECHANICS, AND MATERIALS SCIENCE MMM**
- 160. Engineering Communications**
Fall, Spring. 3(2-3)
P: MTH 116 or concurrently.
Computer-aided design and drafting. Freehand sketching. Two and three dimensional visualization. Preparation of spread sheets and technical reports.
- 205. Statics**
Fall, Spring. 3(3-0)
P: MTH 132.
Vector description of forces and moments. Two and three dimensional equilibrium of particles and rigid bodies. Analysis of trusses, frames and machines. Coulomb friction.
QP: MTH 215 QA: MMM 205
- 211. Mechanics of Deformable Solids**
Fall, Spring. 3(3-2)
P: MMM 205, MTH 133 or concurrently.
Tension compression and shear stresses. Axially loaded bars. Torsion of circular shafts. Beam theory. Combined stresses. Mohr's circles. Columns.
QP: MMM 205 MTH 310 MMM 215 QA: MMM 211 MMM 215
- 250. Materials Science and Engineering I**
Fall, Spring. 3(3-2)
P: CEM 141, MTH 133.
Structure of metals, ceramics and polymers. Phase diagrams, thermomechanical treatments, physical and mechanical properties, diffusion, microstructure studies, environmental effects.
QP: CEM 141 MTH 113 QA: MMM 250 MMM 230
- 306. Dynamics**
Fall, Spring. 3(3-0)
P: MMM 205, MTH 235. R: Open only to College of Engineering students.
Kinematics of motion. Mass moments of inertia. Kinetics of particles and rigid bodies. Energy and momentum principles.
QP: MMM 205 MTH 310 QA: MMM 306
- 351. Thermochemistry of Materials**
Fall. 3(3-0)
P: CEM 152, MTH 224. R: Open only to Materials Science and Engineering majors. Not open to students with credit in CHE 311 or ME 201.
State variables, laws of thermodynamics, phase and chemical equilibria. Gas and condensed phase relationships, solutions, interfaces, point defects, electrochemistry.
QP: CEM 152 MTH 215 QA: MMM 330
- 352. Diffusion in Solids**
Spring. 3(3-0)
P: MMM 250, MMM 351. R: Open only to Materials Science and Engineering majors.
Diffusion and mass transport. Kinetics of diffusion-controlled processes. Point defects, nucleation and growth, interface motion.
QP: MMM 330 QA: MMM 452
- 355. Mechanical Behavior of Materials**
Fall. 3(3-0)
P: MMM 211, MMM 250. C: MMM 375
R: Open only to Materials Science and Engineering, Mechanical Engineering majors.
Stress and strain, crystal elasticity, anelasticity and viscoelasticity. Mechanical properties in tension and torsion. Crystallographic aspects of plasticity.
QP: MMM 211 MMM 250 QA: MMM 350 MMM 351
- 356*. Deformation Mechanisms**
Spring. 3(3-0)
P: MMM 355. R: Open only to Materials Science and Engineering majors.
Elementary dislocation theory, slip and twinning. Deformation of single and polycrystals. Temperature and strain rate effects. Work hardening, solution and particle strengthening. Creep, fatigue and fracture in metals, ceramics and polymers.
QP: MMM 350 MMM 351 QA: MMM 351 MMM 456
- 365. Physical Metallurgy I**
Fall. 3(3-0)
P: MMM 250, MMM 351 or concurrently.
C: MMM 375 R: Open only to Materials Science and Engineering majors.
Complex binary and ternary phase diagrams. Solidification. Recovery, recrystallization and grain growth. Phase transformations.
QP: MMM 250 MMM 330 MMM 360 QA: MMM 360 MMM 361
- 366. Physical Metallurgy II**
Spring. 3(3-0)
P: MMM 365. C: MMM 376 R: Open only to Materials Science and Engineering majors.
Theory of alloy phases. Surfaces and interfaces. Diffusion controlled phase transformations in ferrous and non-ferrous alloys. Martensitic transformation. Amorphous structures.
QP: MMM 360 MMM 330 QA: MMM 453 MMM 361
- 375*. Materials Science Laboratory I**
Fall. 1(0-3)
P: MMM 355; C: MMM 365 R: Open only to Materials Science and Engineering majors.
Phase transformations. Recrystallization. Precipitation and aging. Microscopy. Structure-property relations.
QP: MMM 350 MMM 360 QA: MMM 352 MMM 362
- 376*. Materials Science Laboratory II**
Spring. 1(0-3)
P: MMM 356 or concurrently. R: Open only to Materials Science and Engineering majors.
Strengthening. Yield, creep, and fracture. Plasticity. Thermal activation. Damping. Martensite and shape memory.
QP: MMM 350 MMM 360 QA: MMM 352 MMM 362
- 380. Polymeric Materials**
Spring. 3(3-0)
P: CEM 152. R: Open only to Materials Science and Engineering majors.
Polymers and engineering plastics. Chemical, physical and mechanical properties. Environmental effects on polymers. Manufacturing processes. Coatings.
QP: CEM 152