MEDICINE

College of Human Medicine

590. Special Problems in Medicine
Fall, Winter, Spring. 1 to 6 credits. May re-enroll for a maximum of 12 credits. Graduate Medicine students.
Each student will work under direction of a staff member on an experimental, theoretical or applied problem.

METALLURGY, MECHANICS AND MATERIALS SCIENCE

College of Engineering

205. Mechanics I
Fall, Winter, Spring. 4(4-0) MTH 214 or concurrently.

206. Mechanics II
Fall, Winter, Spring. 4(4-0) MTH 215 or concurrently.
Dynamics of rigid bodies in general motion, plane motion, rotation, statics, variational methods.

211. Mechanics of Deformable Solids
Fall, Winter, Spring, Summer. 4(4-0) MTH 360 or concurrently.
Deformable solids, stress and strain, principal axes, material behavior (elastic, plastic, visco-elastic, temperature dependent). Boundary value problems, tension, beams. Instability, columns.

215. Materials Testing Laboratory
Fall, Winter, Spring, Summer. 1(0-3) 360. Physical properties of engineering materials, resistance to primary types of static loading.

230. Introduction to Materials Science
Fall. 4(4-0) Sophomores. A qualitative survey of the atomic and molecular structure of materials and their related mechanical, thermal, electrical, and magnetic properties.

304. Dynamics
Fall. 4(5-0) MTH 215 or concurrently.
Dynamics of particles and rigid bodies for those students who have had statics.

320. Analytical Mechanics I
Fall. 3(3-0) MTH 289.
Measures of point motion, indivisibility, vector space and time transformations. Newton's, Lagrange's and Hamilton's equations. Motions of point objects; limiting wave forms.

321. Analytical Mechanics II
Winter. 3(3-0) 320.
Schroedinger's equation. Particle motions in various potentials; hydrogen-like atoms and molecules. Continuous models of particle systems, tensor properties, rigid and elastic solids, transfer of heat and electricity, flow relations.

322. Analytical Mechanics III
Spring. 3(3-0) 421.
Quantum and statistical models of particle systems; the Maxwell-Boltzmann, Einstein-Boise and Fermi-Dirac distribution; analysis of ideal atomic, electron and photon gases; properties of dense gases and liquids; thermal, elastic and electrical properties of crystals.

340. Materials Chemistry I
(440.) Fall. 4(4-0) CEM 153.
MMM 340, 341 and 342 present an integrated theory of chemical properties and phase transformations in metals and other engineering materials. Classical thermodynamics and thermomechanics of solids and solid solutions.

341. Materials Chemistry II
(441.) Winter. 4(4-0) 340.
Homogeneous and heterogeneous equilibria in solids; diffusion and solid-state reactions; nucleation phenomena. Metallurgy and electrochemistry. Theory of the periodic relations among the properties of the elements.

342. Materials Chemistry III
(442.) Spring. 4(4-0) 341.
Continuation of 341. The influence of atomic properties in the formation of alloys and solid compounds. Cohesive forces and bonding in solids. Introduction to the statistical theory of the properties of engineering materials.

360. General Metallurgy
Fall. 4(4-0) CEM 153 or approval of department.
Properties of metals, states of heterogeneous equilibrium and non-equilibrium, deformation processes.

361. Physical Metallurgy I
Winter. 4(4-0) 360.
Application of fundamental metallurgical theory to nonferrous metals and alloys.

362. Physical Metallurgy II
Spring. 4(4-0) 360.
Carbon and alloy steels: composition, influence of heat treatments, etc.

370. Metals and Alloys I
Winter. 4(3-0).
Principles of physical metallurgy applied to engineering metals and alloys.

371. Metals and Alloys II
Spring. 3(3-0) 370.
Continuation of 370.

372. Metals and Alloys III
Fall. 3(3-0) 371.
Continuation of 371.

380. Metallurgy Laboratory l
Fall. 1(0-3) 360 or concurrently.
First of an integrated sequence of laboratory courses designed to illustrate the parallel theory courses.

381. Metallurgy Laboratory II
Winter. 1(0-3) 380; 381 concurrently.
Continuation of 380.

382. Metallurgy Laboratory III
Spring. 1(0-2) 381; 382 concurrently.
Continuation of 381.

400. Special Problems
Fall, Winter, Spring, Summer. 1 to 3 credits. May re-enroll for a maximum of 9 credits. Approval of department.
Individualized readings and research for students of high intellectual promise.