591. Clinical Craniosacral Manipulative Therapy
Spring. 1 to 3 credits. Approval of department.
Basic concepts of the craniosacral system, clinical applications.

592. Special Problems in Biomechanics
Fall, Winter, Spring, Summer. 1 to 8 credits. May reenroll for a maximum of 32 credits. Approval of department.
Each student will work under direction of a faculty member on an experimental, theoretical or applied problem.

601. Osteopathic Manipulative Medicine Clerkship
Fall, Winter, Spring, Summer. 6 credits. May reenroll for a maximum of 12 credits.
Grade P in all courses offered in terms 1 through 8.
Advanced training in the diagnosis of musculoskeletal dysfunctions and application of osteopathic manipulative techniques in patient care.

620. Directed Studies
Fall, Winter, Spring, Summer. 1 to 6 credits. May reenroll for a maximum of 24 credits. Approval of department.
Individual or group work on special problems related to biomechanics, neuromusculoskeletal system primarily.

680. Special Topics
Fall, Winter, Spring, Summer. 1 to 4 credits. May reenroll for a maximum of 8 credits.
Approval of department.
Independent study in topics of biomechanics.

870. Biokinematics
Fall. 3(3-0) Approval of department.
Motion of the human body including detailed studies of body joint and linkage motion.

871. Biokinetics
Winter. 3(3-0) BIM 810.
Application of Newtonian mechanics to problems of force transmission and related motions in the musculoskeletal system.

872. Theory of Tissue Mechanics
Spring. 3(3-0) Approval of department.
Introduces the concepts of stress and strain in tissue and the dependency of mechanical parameters on biological factors.

880. Research Seminar
Fall, Winter, Spring. 1(1-0) May reenroll for a maximum of 3 credits. Approval of department.
Discussion of current research topics in biomechanics with strong clinical application.

890. Independent Study
Fall, Winter, Spring. Summer. 1 to 8 credits. May reenroll for a maximum of 32 credits. Approval of department.
Individual or group work related to biomechanics and/or neuromusculoskeletal system.

899. Master's Thesis Research
Fall, Winter, Spring, Summer. Variable credit. May reenroll for a maximum of 12 credits. Approval of department.
Conduct research for master's thesis.

BIOENGINEERING

College of Engineering

BME

410. Electronic Instrumentation in Biology and Medicine
Fall. 4(4-0) MTH 112, PHY 335 or approval of instructor.

411. Electric Theory of Nerves
Winter. 4(4-0) MTH 110, PHY 258.

414. Clinical Instrumentation
Winter. 4(4-0) PHY 258.

424. Materials in Biomedical Engineering
Winter. 3(3-0) PSL 340 or PSL 431 or approval of department.

431. Biological Transport Mechanisms
Spring. 3(0) MTH 215.
Mechanisms which govern transport or momentum, heat and mass. Application to mathematical description of transport processes in biological systems and to solution of biomedical problems.

481. Tissue Biomechanics
Fall. 3(3-0) ANT 316 or approval of department.
Fundamentals of continuum mechanics in relation to morphological classification of tissue. Mechanical properties of connective and muscle tissue.

499. Independent Study
Fall, Winter, Spring, Summer. 1 to 4 credits. May reenroll for a maximum of 8 credits.
Approval of instructor.
Individual reading and research under the supervision of a member of the Biomedical Engineering Committee.

BOTANY AND PLANT PATHOLOGY

BOT

College of Agriculture and Natural Resources
College of Natural Science

201. Plants, People and the Environment (N)
Fall, Winter, Spring. 3(3-0)
Relevance of plants to modern society. Basic botanical concepts and socially significant groups of plants. Natural resource exploitation. Plants as they relate to human population growth, food production, and energy resource depletion.

205. Plant Biology
Fall. 3(3-0) High school chemistry and high school algebra.
An introduction to plant science for students seeking a general knowledge of the principles of plant biology as well as for prospective plant science majors.

206. Introduction to Plant Physiology
Winter, Spring. 4(2-4) CEM 141 or CEM 151; CEM 161; BOT 210 or B 210 or B 211.
Introductory organic chemistry recommended.
General principles of plant physiology relating plant structure to function. Topics include cell physiology, water relations, effects of light and temperature, respiration, photosynthesis, mineral nutrition, and hormone action.

301. Introductory Plant Physiology
Winter, Spring. 4(2-4) CEM 141 or CEM 151; CEM 161; BOT 210 or B 210 or B 211.
Introductory organic chemistry recommended.
General principles of plant physiology relating plant structure to function. Topics include cell physiology, water relations, effects of light and temperature, respiration, photosynthesis, mineral nutrition, and hormone action.

302. Introductory Morphology
Fall, Winter. 4(2-4) B S 212 or approval of department.
Structures and life cycles of representative plant groups showing progressive evolutionary developments.

318. Introductory Plant Systematics
Spring. 4(2-4) BOT 302 or B S 212 or approval of department.
Plant diversity with emphasis on identification, classification, nomenclature, and evolutionary relationships of vascular plants.

335. Fossil Plants, Their History and Paleobotany
Spring. 3(3-0)
One course in geology or botany or biology or approval of department. Interdepartmental with and administered by the Department of Geology.
History of plants through geologic time; their form and evolution; how and where found, identified and reconstructed; their use in determining ancient geographic patterns, paleoenvironments, paleoclimates and community structure. Field trip.

336. Economic Plants
Spring. 3(3-0)
Histories, characteristics, and origins of plants used in industrial processes, drug manufacture, and agriculture. Non-technical to broaden student's cultural interest in plants.

400. Aquatic Plants
Fall. 3(3-0) BOT 318 or BOT 320. Students may not receive credit in both BOT 400 and BOT 433.
Aquatic plants, their classification, ecology and economic importance. Relationships to problems in fisheries, in wildlife management, and to role in limnology. Experience for student in plant ecology, aquatic biology, and water sanitation.

A33