212. General Biology
Winter, Spring, Summer. 4(4-2) Not open to students with credit in LBS 140.
Principles of biological diversity; taxonomy and systematical approaches to practical and biological problems.

400. Biological Science for Teachers
Fall, Winter, Spring, Summer. 1 to 6 credits. May reenroll for a maximum of 12 credits. Teacher certification with science major or minor.
Course for inservice teachers. Topics will be selected from actual classroom problems of the participants. Stress will be placed on field laboratory and inquiry teaching.

405. Topics in Biological Science
Fall, Winter, Spring, Summer. 1 to 4 credits. May reenroll for a maximum of 8 credits if different topic is taken. Approval of department.
Presentation of single topics from the biological sciences by senior faculty and guest lecturers. Topics are selected to facilitate development of strong biological science programs in schools.

415. Field Biology for Teachers
Fall, Winter, Spring, Summer. 4 credits. Biology course or approval of department.
Field investigation and interpretation of prairie, dune, forest and wetland communities. An ecosystem approach to ecological concepts. Natural history and identification of key species. Field trips required.

420. Seminar in Recent Advances in Biological Science
Fall, Winter, Spring, Summer. 1 to 3 credits. May reenroll for a maximum of 6 credits if different topic is taken. Approval of department.
A series of lectures by senior faculty on topics on the history, development, the most recent advances and the possible future and limits of the Biological Sciences.

460. Ornithology for Teachers
Summer. 3 credits. A course in biology or approval of department. Not open to Zoology majors. Given at W. K. Kellogg Biological Station.
Interdepartmental with and administered by the Department of Zoology.
Distribution, breeding cycles, migration, food and feeding habits, voice and other important areas of avian biology. Emphasis on field identification and natural history.

499. Research
Fall, Winter, Spring. 2 to 4 credits. May reenroll for a maximum of 12 credits. Approval of director of biological science program and student's advisor.
Undergraduate research is open to those with a minimum of 12 credits. Emphasis on original research and the development of research ability and responsibility.

800. Problems in Biological Science
Fall, Winter, Spring, Summer. 1 to 6 credits. May reenroll for a maximum of 18 credits. B.S. degree in biological science.

805. Outdoor Environmental Studies
Fall, Winter, Spring, Summer. 1 to 4 credits. May reenroll for a maximum of 9 credits if different topics are taken. B.S 418 or ZOL 490 or approval of department.
Emphasis on environmental understanding. Development of educational materials through team research and testing. Trials of materials with elementary, middle, secondary school or college students.

899. Master's Thesis Research
Fall, Winter, Spring. Variable credit. Approval of department.

BIOMECHANICS

College of Osteopathic Medicine

500. Basic Concepts in Biomechanics
Winter. 2(2-0) Admission to a college of medicine or approval of department. Interdepartmental with the College of Osteopathic Medicine.
Basic concepts of biomechanics and their relationship to functional anatomy and osteopathic manipulative therapy.

590. 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 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.

900. Special Topics
Fall, Winter, Spring, Summer. 1 to 4 credits. May reenroll for a maximum of 9 credits. Approval of department.
Independent study in topics of biomechanics.

810. Biomechanics
Fall, Winter, Spring. 3(3-0) Approval of department. Motion of the human body including detailed studies of body joint and linkage motion.

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

812. 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.

850. 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.

BIOMEDICAL ENGINEERING

College of Engineering

410. Electronic Instrumentation in Biology and Medicine
Fall. 4(4-0) MTH 112, PHY 238 or approval of instructor.

411. Electric Theory of Nerves
Winter of odd-numbered years. 4(4-0) MTH 310, PHY 288.

414. Clinical Instrumentation
Winter of even-numbered years. 3(3-0)
BME 410.

424. Materials in Biomedical Engineering
Fall, Winter. 4(4-0) PSL 240 or PSL 431 or approval of department.

431. Biological Transport Mechanisms
Spring. 3(3-0) MTH 215.
Mechanisms which govern transport or movement, 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.