

955. Plant Physiology and Biochemistry II
Winter of even-numbered years. 3(3-0)
Approval of department. Interdepartmental with the Botany and Plant Pathology Department.
 Metabolic pathways of unique significance to plants.

960. Selected Topics in Biochemistry
Fall, Winter, Spring, Summer. 1(1-0) or 2(2-0) May re-enroll for a maximum of 6 credits if a different topic is taken. Approval of department.

Topics will be selected from the areas of biochemical genetics, biochemistry of development, biochemical evolution, complex proteins, lipid metabolism, immunochemistry, hormones, control mechanisms and structure of biological macromolecules.

961. Selected Topics in Biochemistry
Fall, Winter, Spring, Summer. 1(1-0) or 2(2-0) May re-enroll for a maximum of 6 credits if a different topic is taken. Approval of department.

Topics will be selected from the areas of bioenergetics, bioinstrumentation, complex carbohydrates, mechanisms of enzyme action, natural products, carbohydrate metabolism, mass spectrometry and biochemistry of isoprenoid compounds.

978. Seminar in Biochemistry
Fall, Winter, Spring. 0 or 1(1-0)
 Presentation and discussion of reports by graduate students on biochemical topics of current interest.

999. Research
Fall, Winter, Spring, Summer. Variable credit. Approval of department.

BIOLOGICAL SCIENCE B S

College of Natural Science

200. Studies in Contemporary Biological Science
Spring. 3(3-0) 12 credits in a Department of Natural Science sequence.
 Biological topics relating directly to contemporary problems of world society are presented after an introduction to the uses and limitations of science and to the world of biology.

200L. Contemporary Biology Laboratory
Spring. 1(0-3) 200 or concurrently.
 Students practice processes and procedures of science in the laboratory, design and carry out a self-selected laboratory investigation of a biological topic, report and evaluate reports of scientific work.

202. Biological Science for Elementary Teachers
Fall, Winter, Spring. 4(3-3)
 Fundamental principles of biology which provide background appropriate for preparation for elementary education teaching.

***210. General Biology**
Fall, Spring. 4(4-2) Not open to students with credit in LBC 141.
 Concepts relating to basic attributes and diversity of living things.

*For prerequisite purposes, the introductory biology sequence in Lyman Briggs College, LBC, 140, 141, 242, may be used instead of this sequence.

***211. General Biology**
Fall, Winter. 4(4-2) CEM 130 or high school chemistry. Not open to students with credit in LBC 242.

The structure and behavior of cells and their subunits, interactions of tissues, genetics, and the development, history and relations of organisms.

***212. General Biology**
Winter, Spring. 4(4-2) Not open to students with credit in LBC 140.
 Continuation of 211.

400. Biological Science for Teachers
Fall, Winter, Spring, Summer. 3 to 4 credits. May re-enroll for a maximum of 12 credits. Teacher certification with science major or minor.

A course for in-service teachers, topics will be selected from actual classroom problems of the participants. Stress will be placed on field, laboratory and inquiry teaching.

408. Freshwater Ecology
(413.) Summer. 6 credits. 212 or approval of department. Given at W. K. Kellogg Biological Station. Interdepartmental with the departments of Zoology and Botany and Plant Pathology.

The ecology of freshwater ecosystems, their biotic structure, and the functional interrelationships of environmental variables regulating population dynamics, productivity and community structure. Extensive field investigations.

410. Terrestrial Ecology
Summer. 6 credits. 212 or approval of department. Given at W. K. Kellogg Biological Station. Interdepartmental with the departments of Botany and Plant Pathology and Zoology.

Factors determining distribution and abundance. Interrelationship of plants, animals, and environment. Extensive field investigations of several types of terrestrial communities in light of current theory.

420. Seminar in Recent Advances in Biological Science
Fall, Winter, Spring, Summer. 3(3-0) May re-enroll for a maximum of 6 credits if different topic is taken. Approval of department.

A series of lectures by senior faculty of topics on the history, development, the most recent advances and the possible future and limits of the Biological Sciences.

430. Introduction to Environmental Science
Fall, Winter. 3(3-0)

Environmental approaches appropriate for teaching kindergarten - 12. Course will not emphasize teaching specific technical skills, but will cover many areas of environmental sciences. Awareness, understanding and implementation will be stressed with classroom applications.

431. Environmental Science for Teachers I
Winter, Spring. 4(3-3) 430.

Techniques of using equipment to collect data about the environment such as air, water and soil samples. Also the scientific methods used by professional environmental scientists.

432. Environmental Science for Teachers II
Fall, Spring. 4(3-3) 431.

Continuation of 431. Implementation of the techniques learned in 431 into the school program.

*For prerequisite purposes, the introductory biology sequence in Lyman Briggs College, LBC, 140, 141, 242, may be used instead of this sequence.

440. Man and Environment Workshop for Teachers
Summer. 3 Credits. Approval of department. Given at W. K. Kellogg Biological Station.

Discussions and practical work sessions concerning the development of ideas and activities for environmental studies in and outside the classroom. Designed for intermediate and secondary inservice teachers.

450. Outdoor Environmental Studies
Summer. 3 credits. May re-enroll for a maximum of 9 credits when new topics are given. Teaching experience or approval of department. 451 must be taken same summer. Given at W. K. Kellogg Biological Station.
 Emphasis on environmental understanding. Planning and developing interdisciplinary program for elementary and intermediate children.

451. Outdoor Environmental Studies: Laboratory
Summer. 5 credits. May re-enroll for a maximum of 15 credits when new topics are given. Teaching experience, 450. Given at W. K. Kellogg Biological Station.

Perfecting lesson plans and materials developed in 450, while interacting with elementary and intermediate children in four week outdoor activity oriented programs. Emphasis on environmental understanding.

499. Research
Fall, Winter, Spring. 2 to 4 credits. May re-enroll for a maximum of 12 credits. Approval of director of biological science program and student's adviser.

Undergraduates are invited on an individual basis into research laboratories of faculty in biological departments of the college. After three terms of research, a presentation in thesis form is produced and defended.

800. Problems in Biological Science
Fall, Winter, Spring. Variable credit. B.S. degree in biological science.

999. Research
Fall, Winter, Spring. Variable credit. M.S. degree in biological science or equivalent.
 Research in some phase of biological science, data to form the basis for the thesis required for the doctoral degree in biological science.

BIOMECHANICS* BIM

College of Osteopathic Medicine

580. Introduction to Athletic Medicine
Fall, Winter. 3(3-0) Approval of department.

Health care of student athlete. Examination and evaluation of physical training sequences for high school athletes. Analyze functional role of musculoskeletal systems; illustrated in various high school sports.

620. Directed Studies
Fall, Winter, Spring, Summer. 1 to 6 credits. May re-enroll for a maximum of 24 credits. Approval of department.

Individual or group work on special problems related to biomechanics, neuromusculoskeletal system primarily.

*Established July 1, 1972.