

421. Seminar on Man, "The Human Organism"

Fall, Winter, Spring, Summer. 3(3-0)
Approval of department.

The importance of new discoveries in biology for our understanding of the human organism with emphasis from the fields of genetics, molecular biology, behavior, developmental biology, physiology, and ecology.

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.

BIOPHYSICS

BPY

College of Human Medicine
College of Natural Science
College of Osteopathic Medicine

402. Introduction to Biophysics

Spring. 5(5-0) PHY 259, MTH 113,
1 year organic chemistry and 1 year biology.

Salient features of biophysics, methods and principles. Structure and organization of biological materials, bioenergetics, radiation biophysics, bioelectric phenomena, biomechanics and psychophysics.

499. Independent Study

Fall, Winter, Spring, Summer. 1 to 5 credits. May re-enroll for a maximum of 15 credits. Approval of department.

Undergraduate research under one of our faculty.

804. Experimental Biophysics

Fall of odd-numbered years. 3 credits.
Approval of department.

Neuro-electric properties of cells, organs and animals, and methods of processing information in humans.

805. Experimental Biophysics

Winter of even-numbered years. 3 credits. Approval of department.

Electrical and physical properties of significant biological molecules and structures.

806. Experimental Biophysics

Spring of even-numbered years. 3 credits. Approval of department.

Interaction of protons and high energy particles with biological molecules and structures.

821. Molecular Biophysics

Fall of odd-numbered years. 5(3-4)
Approval of department.

Theoretical/experimental methods for determination of electronic structure, excited states and spectroscopy of biological systems. Biological energy transfer. Quantum processes in photosynthesis. Exciton effects in photoreceptors and pigments. Conformational changes.

822. Charge Transport and Solid State Processes

Winter of even-numbered years. 4(3-2)
Approval of department.

Fundamental electrical properties, dielectric properties and photoconductivity effects and their relevance to the biological functioning of these molecules.

823. Radiation Biophysics

Spring of even-numbered years. 3(2-2)
Approval of department.

Effects of various types of ionizing radiation and ultraviolet and visible light on proteins, nucleic acids, viruses and plant and animal cells. Damage and repair mechanisms at the molecular level.

824. Membrane Biophysics

Fall of even-numbered years. 4(3-2)
Approval of department.

Membrane Biophysics will cover interfacial phenomena in biology and chemistry; structure and function, theoretical and experimental models for biological membranes; membrane biochemistry. Labs will emphasize bimolecular lipid membrane (BLM) techniques.

825. Basic Neurobiology

Winter of odd-numbered years. 4(3-2)
Approval of department.

A comparative survey of fundamental principles of nervous organization will be undertaken in lectures. Laboratory will emphasize examination of prepared neuroanatomical material and a demonstration of important neurophysiological phenomena.

826. Biophysics of Perception and Learning

Spring. 4(3-2) Approval of department.

Lectures will consider sensory systems, including transduction, coding and information processing. Muscle contraction, muscle control, learned and unlearned behavior will be considered. Laboratory will include neural recording and behavioral observations.

880. Special Topics in Biophysics

Fall, Winter, Spring, Summer. Variable credit. May re-enroll for a maximum of 15 credits.

Special topics within the five subdivisions of biophysics: structure, organization and function of biological phenomena, sensory perception, and psychophysics and biomechanics.

890. Readings in Biophysics

Fall, Winter, Spring. 3 to 6 credits.
Approval of department.

Reading course in special topics adapted to the individual preparation and needs of the student.

899. Research

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

990. Biophysics Seminar

Fall, Winter, Spring, Summer. 1 credit. May re-enroll for a maximum of 3 credits. Approval of department.

999. Research

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

**BOTANY AND
PLANT PATHOLOGY**

BOT

College of Natural Science

200. Resource Ecology and Man

For course description, see Interdisciplinary Courses.

201. Plants and Man

(304.) Winter, Spring. 3(3-0)

The relevance of plants to modern society with emphasis on those plants which supply drugs, food, fuel and oxygen, and those which have historical or esthetic importance.

205. Plant Biology

Winter. 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.

301. Introductory Plant Physiology

Fall, Spring. 4(2-4) CEM 131 or 141; 161; B S 211 and introductory organic chemistry recommended.

General principles of plant physiology relating plant function to structure.

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.

305. Poisonous Plants

Spring. 2(0-4) Three terms of Natural Science. Primarily for Veterinary Medicine students.

Plants poisonous to livestock and human beings, particularly those occurring in Michigan.

318. Introductory Plant Systematics

Spring. 4(2-3) 302 or B S 212 or approval of department.

Plant diversity with emphasis on identification, classification, nomenclature, and evolutionary relationships of vascular plants.

336. Economic Plants

Fall. 3(3-0)

Histories, characteristics, and origins of plants used in industrial processes, drug manufacture, and agriculture. Nontechnical to broaden student's cultural interest in plants.

400. Aquatic Plants

Spring. 3(1-4) One year of botany and zoology or approval of department.

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.

400H. Honors Work

Fall, Winter, Spring. 3(0-6) Approval of department; Seniors.

401. Special Problems

Fall, Winter, Spring, Summer. 1 to 4 credits. May re-enroll for a maximum of 16 credits. 302, Seniors, approval of department.

Students with special ability may carry on laboratory research or study of published literature on a selected topic.

402. Introductory Mycology

Fall, Winter. 4(2-6) B S 212 or approval of department.

Survey of the fungi, a background course for students taking plant pathology or other courses in mycology.

405. Introductory Plant Pathology

Fall. 4(2-4) 302 or B S 212 or approval of department. Students may not receive credit in both 405 and 407.

General principles of plant pathology including detailed study of selected diseases as examples of important groups.