

Price Hall, Room 216  
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[www.biol.andrews.edu](http://www.biol.andrews.edu)

professional journals. Corequisite: PSYC434.  
 Prerequisite: BHSC230 and PSYC432.

**SOCI434** ? (3)  
**Community Needs Assessment & Capacity Building**

Assessing community needs and addressing those needs. A study on advanced parametric and non-parametric techniques such as two-way ANOVA, regression, and chi-square.

**SOCI435** (2)  
**Program Planning: The Budgeting of Programs and Services**

Building professional journals and reporting, the with an emphasis on the statistical planning and budgeting and Corequisite: PSYC434. Prerequisite: experience BHSC230 and PSYC432.

**SOCI436** (2)  
**Program Planning: The Budgeting of Programs and Services**

Building professional journals and reporting, the with an emphasis on the statistical planning and budgeting and Corequisite: PSYC434. Prerequisite: experience BHSC230 and PSYC432.

**SOCI440** ? (3)  
**Sociology of the Family**

The family and its implementation and evolution and cultural factors that mediate its function. Review of various methods and changing structure and function.

**SOCI445** (2)  
**Family and Intergenerational and Evolution**

The intersecting of marriage and parenting in some disorganizing factor development in contemporary society examined.

**SOCI446** (1)  
**Minor in Community Development Leadership**

Death and grief in cultural and social contexts. The sociological and anthropological perspectives on death and personal and interpersonal dynamics of death and dying relations, managing volunteers, program evaluation. Offered over 2 semesters.

**SOCI470** ? (3)  
**Demography**

Overview of the world's population; spatial dimensions of human population. Community development, trends, levels, and explanations; mortality and migration; population structures, life chances; population growth, economic development, and the environment.

**SOCI474** ? (3)  
**Social Thought and Theory**

The roots of self-conscious social thought and the rise of sociology and anthropology as scientific disciplines in the 19th century. Major theoretical orientations in their fields, proponents, and impact on present-day sociology and anthropology are reviewed. Normally offered odd years.

**SOCI480** (1-8)  
**Field Experience**

Supervised field placement in a human services setting is approved in advance by the department chair. A minimum of 30 hours of fieldwork is required for each credit. Open only to departmental majors. Repeatable 3 times until 9 credits have been accumulated.

**SOCI488** V (3)  
**The City in the Industrialized World**

Distance education course. The structure and development of the modern urban community with emphasis on ecological and demographic features of urban life. Normally offered even years.

**SOCI495** (1-3)  
**Independent Study/Readings/Research/Project in Sociology**

Individual assignments and/or reports and/or individualized research in sociology are set up on a contract basis with no more than 3 credits per semester. Students may repeat or take any combination of departmental independent study courses for up to 6 credits. Consult staff before registering.

**SOCI450** (2)

**Faculty**

- David A. Steen, *Chair*
- Gordon J. Atkins
- Bill Chobotar
- H. Thomas Goodwin
- James L. Hayward
- Timothy G. Standish
- John F. Stout
- Dennis W. Woodland
- Robert E. Zdor

**Academic Programs**

Academic Programs	Credits
BS: Biology	41
Biomedical	41
Botany	45
Molecular Biology	39-40
Neurobiology	41
Special	45
Zoology	45
Minor in Biology	22
MS: Biology	30
MAT in Biology	

Each degree offered by the Biology Department includes a common core curriculum and additional courses tailored to students' special needs.

Highly motivated students may compete for the Biology Undergraduate Research Traineeship (BURT) program. For full details, consult the Biology Department.

# Undergraduate Programs

## Bachelor of Science

All biology majors must complete the following core and cognate courses:

- Biology Core—24**  
 BIOL165, 166, 348, 371, 372, 449, 451, 452.

- Cognate Core—24 or 26**  
 CHEM131, 132, 231, 232, 241, 242;  
 PHYS141, 142 or 241, 242, 271, 272.

**General Education Cognates**  
 RELT340, PSYC101.  
 Students must complete the biology core, the cognate core, and the requirements for one of the emphases listed below.

## Botany Emphasis—21

Upper-division biology courses; must include a botany course (BOT prefix) drawn from each of the environmental, morphological, and functional groups of courses listed below. In addition, one zoological course (ZOOL prefix) must be included.

**Zoology Emphasis—21**

Upper-division biology courses; must include a zoology course (ZOOL prefix) drawn from each of the environmental, morphological, and functional groups of courses listed below. In addition, one botany course (BOT prefix) must be included.

**Biomedical Emphasis—17**

Must include ZOOL315, 464, 465, BIOL475; PHTH 417 and 427. BCHM421 must be included in the *cognate core*.

**Molecular Biology Emphasis—15-**

**16**

Must include BIOL418, 419, 445, 447, and two

in the collection and analysis of quantitative data about cells. Prerequisite: BIOL166, and completion of or simultaneous enrollment in CHEM132. *Spring*

**BIOL449** (3)  
***Historical and Philosophical Biology***  
Examination of biological, paleontological, and geological concepts central to the study of historical events in biological systems. Considers the interactions of data, theories, and extra scientific concepts in historical biology, within the particular context of a biblical world view. Weekly: 2 lectures and 1 lab. Prerequisite: BIOL166. *Spring*

**BIOL451, 452** (1,1)  
**(merges BIOL461, 462, 463)**  
***Questions in Biology: Analysis, Evaluation and Answers***  
Lectures, discussions, and individual work centered around asking and answering important questions in the life sciences: research in biology, discussions on important issues in origins; discussions on major topics in bioethics. Attendance at monthly research seminars required. Open to senior Biology majors. BIOL451: *Fall*; BIOL452: *Spring*

## ELECTIVES

(Elective courses offered at the Marine Biological Station may be included under these electives.)

### Group A: Environmental Biology

**BIOL479** ? (3.5)  
***Marine Ecology***  
**(offered only at Marine Station)**  
A study of interspecific, intraspecific, and community relationships demonstrated by marine organisms. *Summer*

**BIOL487** \$ ? (4)  
***Biogeography***  
The distribution of plants and animals in relation to their environment, including consideration of major biogeographic regions of the world and the role of distribution in adaptive change and diversification of life in the past and present. Weekly: 3 lectures and 1 conference period. *Spring*

**BOT450** \$ ? (4)  
***Medical Botany***  
Designed as an interface between botany, medicine, anthropology and pharmacology to define the impact plants have with the remedial, harmful or psychoactive health of humans. Weekly: 3 lectures & 1 lab. Prerequisites: BIOL112. *Spring*

**BOT468** ? (3.5)  
***Marine Botany***  
**(offered only at Marine Station)**  
A systematic study of marine plants found in Puget Sound, with a survey of marine plants from other areas. *Summer*

**BOT475** \$ Alt ? (4)  
**(merges BOT435, 474)**  
***Biodiversity of Vascular Plants***  
A taxonomic and morphological study of vascular plants emphasizing the plants found in the Great Lakes area. Field trips. Weekly: 3 lectures and 1 lab. Open to non-science majors. *Fall*

**ZOOL454** \$ ? (3-4)  
***Vertebrate Zoology***  
Covers the various specialties of vertebrate biology, including herpetology, ornithology, and mammalogy. Repeatable in the different specialized areas. Open to non-science majors. Weekly: 2 lectures and 1 or 2 labs. *Vertebrate Zoology: Mammology* and *ZOOL454 Vertebrate Zoology: Ornithology* both qualify as "S" courses for General Education Service Learning. *Fall* or *Spring*

**ZOOL458** ? (3.5)  
***Marine Invertebrates***  
**(offered only at Marine Station)**  
Biology of invertebrates studied in the marine environment of Puget Sound. A survey of the various phyla is conducted by studying the living animals in the field, and by tide pool observation, dredging, and scuba diving. A project on a specific group or species is required. *Summer*

**ZOOL459** \$ ? (3-4)  
***Entomology***  
Study of the fundamental aspects of insect biology. Weekly: 2 lectures and 1-2 labs. *As scheduled*

propagating tissues in the research lab. Topics include sterile techniques, nutrition, media preparation, establishment and maintenance of primary and secondary cultures, enumeration, and analysis. Weekly: 2 lectures and 1 lab. Prerequisite: BIOL166. Pre- or corequisite: CHEM231. *Spring*

**BIOL475** \$ ? (3)

***Biology of Bacteria***

Study of the properties of bacteria that illustrate their function and relationship to other living systems. Topics include structure and function, classification, and interaction with the environment. Weekly: 2 lectures and two 2-hour labs. Prerequisites: BIOL166. Organic Chemistry background recommended. *Fall*

**ZOOL425** \$ ? (3)

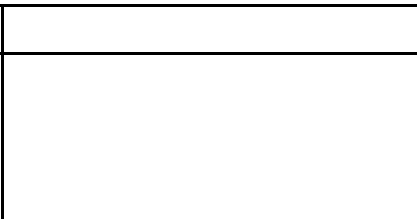
***Parasitology***

Emphasis on better known parasites of humans and animals. Attention given to ecological factors concerned with host-parasite contact, pathogenicity and pathology, and treatment and effect on parasitized populations. Weekly: 2 lectures and 1 lab. Prerequisites: BIOL166. *Fall*

**ZOOL475** \$ ? (3)

***Neurobiology***

The neural basis of behavior, with some emphasis on the human nervous system, including cellular and molecular approaches to neuron function, development of neurons and circuits, and neuroendocrine mechanisms. Labs develop skills in electrophysiology and neuroanatomy. Weekly: 2 lectures and 1 lab. Prerequisite: BIOL166. *Fall*



**RESEARCH AND SPECIALIZED STUDIES**

**BIOL405** (1-4)

***Topics in \_\_\_\_\_***

Investigates various specialties of biology. Repeatable in different areas. *Fall, Spring, Summer*

**BIOL495** (1-4)

***Independent Readings/Research***

Independent readings or research in biology under the direction of the instructor. Consent of instructor required. *Fall, Spring, Summer*

**GRADUATE**

**BIOL516** (4)

***Behavior of Marine Organisms (offered only at Marine Station)***

Study of inter- and intra-specific behavior of marine animals and their behavioral response to the physical environment. Involves lab experience, field observation, and a research project. Instructor's permission required. *Summer*

**BIOL550** (3)

***Issues in Origins and Speciation***

A comparative survey of the assumptions, attitudes, methods, and conclusions of science and religion in the handling of data. Attention is given to current scientific data and their relationship to an understanding of earth history and the present diversity of life. *Spring*

**BOT515** \$ Alt (3)

***Plant Cell Biology***

Functional activities of plant tissues provide the basis for this study of the ultrastructure of a