

# PCB: Process Biology: Cell/Molecular/Ecology/ Genetics/Physiology Courses

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## Courses

PCB 2905 Directed Study

1-12 sh (may be repeated indefinitely for credit)

PCB 3063C Genetics

4 sh (may not be repeated for credit)

Prerequisite: BSC 2010/L AND BSC 2011/L

Origin, development and principles of modern genetics and genetic manipulations. Material and supply fee will be assessed for corresponding lab. Two academic terms of introductory biology are required prior to taking this course.

PCB 3097 Introduction to Human Anatomy

3 sh (may not be repeated for credit)

Prerequisite: BSC 2011/L

Co-requisite: PCB 3097L

Introduction to Human Anatomy is a comprehensive examination of human anatomy. The relationship between structure and function forms a continuing theme within both lecture and laboratory. This course is designed for students who intend to pursue a professional degree in health related fields.

PCB 3097L Introduction to Human Anatomy Laboratory

1 sh (may not be repeated for credit)

Prerequisite: PCB 3097\*

Co-requisite: PCB 3097

Introduction to Human Anatomy is a comprehensive examination of human anatomy. The relationship between structure and function forms a continuing theme within both lecture and laboratory. This course is designed for students who intend to pursue a professional degree in health related fields.

PCB 3103 Cell Biology

3 sh (may not be repeated for credit)

Prerequisite: BSC 2010/L AND BSC 2011/L

Cell biology is the study of the structure and function of eukaryotic cells. The course will cover the basics of cellular function and biochemical foundations, cellular genetics and molecular biology, cell structure and function, cell signaling, and cytoskeletal organization and regulation. Relevant current topics in the news and disease case studies will also be used to more broadly apply the topics learned throughout the course to real-world situations.

PCB 3103L Cell Biology Laboratory

1 sh (may not be repeated for credit)

Prerequisite: PCB 3103\*

Cell biology Laboratory is designed to provide the fundamental training in the current techniques and methodologies used in research laboratories. The laboratory is to complement the cell biology lecture, however can be taken independently. The experiments are associated with the following topics: microscopy (bright-field and fluorescence), the scientific method, biochemistry, cellular organization, structure and function relationships, cellular energetics, biotechnology, forensic investigations, and the immunology of the wound response.

PCB 3253 Developmental Biology

3 sh (may not be repeated for credit)

Prerequisite: BSC 2011/L

Co-requisite: PCB 3253L

Development from molecular, cellular and multicellular aspect; information flow, morphogenesis and differentiation in multicellular animals and plants. Material and supply fee will be assessed for corresponding lab.

PCB 3253L Developmental Biology Lab

1 sh (may not be repeated for credit)

Co-requisite: PCB 3253

Corresponding lab for Developmental Biology.

PCB 3905 Directed Study

1-12 sh (may be repeated indefinitely for credit)

PCB 3930 Biology Seminar Series

1 sh (may not be repeated for credit)

Seminar topics from a diverse spectrum of current biological research will be presented by a variety of speakers from UWF, national and international academic research instructors and agencies. Offered concurrently with PCB4922 and PCB5924; graduate students will be assigned additional work.

PCB 4043 Ecology

3 sh (may not be repeated for credit)

Prerequisite: (BOT 2010/L AND CHM 2046/L AND STA 2023) OR BSC 2011/L

Co-requisite: PCB 4043L

Interactions of microorganisms, plants, and animals with abiotic and biotic factors in the environment are examined as determinants of the distribution and abundance of species, population dynamics and ecosystem function. General concepts and methodologies of ecological science are discussed at individual, population, community and ecosystem levels of organization. Material and Supply Fee will be assessed for corresponding lab.

PCB 4043L Ecology Lab

1 sh (may not be repeated for credit)

Co-requisite: PCB 4043

Corresponding lab for Ecology.

**PCB 4048C Coastal Marine Ecology**

4 sh (may not be repeated for credit)

Prerequisite: CHM 2046/L AND PCB 4043

The study of nearshore coastal environments, particularly bays and estuaries emphasizing interactions among biotic communities, physical, geological and chemical processes. The influence of human activities on and management of these ecosystems is discussed. Offered concurrently with PCB 5445C; graduate students will be assigned additional work. Material and supply fees will be assessed for corresponding lab.

**PCB 4098 Concepts in Human Physiology**

3 sh (may not be repeated for credit)

Prerequisite: BSC 2011/L AND PCB 4098L\*

Concepts in Human Physiology is a 3 credit lecture and 1 credit lab course for students interested in areas related to human physiology. It covers physiological mechanisms of the human body. Emphasis is placed on mechanisms designed to maintain homeostatic conditions, membrane dynamics and cell signaling including endocrine and nervous signals, as well as other vital physiologic mechanisms necessary to homeostasis.

**PCB 4098L Concepts in Human Physiology Laboratory**

1 sh (may not be repeated for credit)

Prerequisite: PCB 4098\*

Concepts in Human Physiology is a 3 credit lecture and 1 credit laboratory course for students interested in areas related to human physiology. The laboratory portion will consist of laboratory exercises design to reinforce concepts learned in lecture. Laboratory exercises include modeling cellular activities and metabolic reactions, as well as measurements and experiments related to organ system function.

**PCB 4233 Immunology**

3 sh (may not be repeated for credit)

Prerequisite: MCB 3020 OR (CHM 2210 AND PCB 3103)

Co-requisite: PCB 4233L

Basic principles of immunology to include humeral and cell-mediated immune mechanisms, the complement system and the inflammatory response. Offered concurrently with PCB 5235; graduate students will be assigned additional work.

**PCB 4233L Immunology Laboratory**

1 sh (may not be repeated for credit)

Prerequisite: PCB 4233\*

Selected experiments in immunology. Special permission required. Permission granted on the basis of fulfilling prerequisite. Material and Supply Fee will be assessed. Offered concurrently with PCB 5235L; graduate students will be assigned additional work.

**PCB 4364 Marine Ecological Physiology**

3 sh (may not be repeated for credit)

Interdisciplinary approach to understanding and interpreting interrelationships between adaptation and environment in marine animals. Examines life history strategies and tactics unique to organisms found living in or around marine habitats. Specific behavioral and physiological responses of marine animals exposed to feeding, metabolic, osmotic, and thermal challenges are discussed. Offered concurrently with PCB 5319; graduate students will be assigned additional work.

**PCB 4364L Marine Ecological Physiology Laboratory**

1 sh (may not be repeated for credit)

Prerequisite: PCB 4364\*

Field techniques for quantifying physiological adaptations of marine organisms to their abiotic environment. Students will characterize marine habitats and assess feeding, metabolic, osmotic, thermal and osmoregulatory strategies used by vertebrates and invertebrates living in these habitats. Material and Supply Fee will be assessed. Offered concurrently with PCB 5319L; graduate students will be assigned additional work.

**PCB 4374 Tropical Ecology/Op Wall**

3 sh (may not be repeated for credit)

1-6 week course culminating in an expedition with Op Wall to study coral reefs, mangrove forests, as well as tropical dry, rain and cloud forests. Students will attend a lecture series discussing selected topics in tropical ecology prior to the expedition. A series of slides featuring plants and animals common to the area will be shown to familiarize students with the local flora and fauna and to give them a greater appreciation for tropical ecology. Offered concurrently with PCB 5344; graduate students will be assigned additional work. Permission is required.

**PCB 4461 Molecular Ecology**

3 sh (may not be repeated for credit)

Prerequisite: (ZOO 1010 OR BOT 2010) AND (PCB 2131 OR (BSC 2010 AND BSC 2011))

Overall, the aim of this course is as an introduction to how developments in modern genetic techniques are used to improve our understanding of evolutionary and ecological processes. We will explore the biology of populations and communities of organisms using molecular data. Students will create, practice, and write a grant proposal in an area of their choosing as if it were submitted for external funding. Further, you will learn how these techniques can be applied to conservation and biodiversity issues.

**PCB 4524 Molecular Biology**

3 sh (may not be repeated for credit)

Prerequisite: BCH 3033/L

Co-requisite: PCB 4524L

Study of the molecular level of the principles governing DNA replication, repair, RNA transcription, and protein synthesis in both prokaryotes and eukaryotes. Surveys molecular processing, and recombinant DNA technology. Offered concurrently with PCB 5527; graduate students are required to write a research paper and present it to the class. Material and supply fee will be assessed to corresponding lab. A grade of "C" or higher is required in prerequisite courses.

**PCB 4524L Molecular Biology Lab**

1 sh (may not be repeated for credit)

Co-requisite: PCB 4524

Corresponding lab for Molecular Biology.

**PCB 4673 Principles of Evolution**

3 sh (may not be repeated for credit)

Prerequisite: BSC 2011/L

A survey of modern evolutionary biology, including the evidence that supports the theory of evolution, the natural processes that cause evolution, patterns and mechanisms of speciation, and methods for estimating evolutionary relationships. Offered concurrently with PCB 5675; graduate students will be assigned additional work.

PCB 4703 Human Physiology  
3 sh (may not be repeated for credit)

Physiological mechanisms of various organ systems in the human body. Emphasis on transport mechanisms, renal function, hormones, respiration, cardiac function, muscle physiology, digestion, and immune systems.

PCB 4723 Comparative Animal Physiology  
3 sh (may not be repeated for credit)  
Prerequisite: BSC 2011/L

General and comparative animal physiology. Study of complex structures, phenomena, and concepts involved in regulation physiological processes employed by different groups of animals. Material and Supply Fee will be assessed for corresponding lab. Offered concurrently with PCB 5727; graduate students will be assigned additional work.

PCB 4723L Comparative Animal Physiology Laboratory  
1 sh (may not be repeated for credit)  
Prerequisite: PCB 4723\*

General and comparative animal physiology. Complex structures, phenomena, and concepts involved in regulation of a variety of physiological mechanisms. Material and Supply Fee and Equipment Fee will be assessed. Offered concurrently with PCB 5727L; graduate students will be assigned additional work.

PCB 4905 Directed Study  
1-12 sh (may be repeated indefinitely for credit)

PCB 4922 Biology Seminar  
1 sh (may not be repeated for credit)

Seminar topics from a diverse spectrum of current biological research will be presented by a variety of speakers from UWF, national and international academic research instructors and agencies. Offered concurrently with PCB5924 and PCB3930 (Biology Seminar); graduate students will be assigned additional work.

PCB 5235 Immunology  
3 sh (may not be repeated for credit)  
Co-requisite: PCB 5235L

The basic principles of immunology will be addressed. Immune-mediated disease processes will be discussed. Offered concurrently with PCB 4233; graduate students will be assigned additional work.

PCB 5235L Immunology Laboratory  
1 sh (may not be repeated for credit)

Selected experiments in immunology. Permission is required. Permission granted on the basis of fulfilling prerequisite or co-requisite. Material and supply fee will be assessed. Offered concurrently with PCB 4233L; graduate students will be assigned additional work.

PCB 5319 Marine Ecological Physiology  
3 sh (may not be repeated for credit)  
Co-requisite: PCB 5319L

Interdisciplinary approach to understanding and interpreting interrelationships between adaptation and environment in marine animals. Examines life history strategies and tactics unique to organisms found living in or around marine habitats. Specific behavioral and physiological responses of marine animals exposed to feeding, metabolic, osmotic and thermal challenges are discussed. Offered concurrently with PCB 4364; graduate students will be assigned additional work.

PCB 5319L Marine Ecological Physiology Laboratory  
1 sh (may not be repeated for credit)  
Co-requisite: PCB 5319

Field techniques for quantifying physiological adaptations of marine organisms to their abiotic environment. Students will characterize marine habitats and assess feeding, metabolic, osmotic, thermal and osmoregulatory strategies used by vertebrates and invertebrates living in these habitats. Material and supply fee will be assessed. Offered concurrently with PCB 4364L; graduate students will be assigned additional work.

PCB 5445C Coastal Marine Ecology  
4 sh (may not be repeated for credit)

The study of nearshore coastal environments, particularly bays and estuaries emphasizing interactions among biotic communities, physical, geological and chemical processes. The influence of human activities on and management of these ecosystems is discussed. Offered concurrently with PCB 4048C; graduate students will be assigned additional work. Material and supply fees will be assessed for corresponding lab.

PCB 5527 Molecular Biology  
3 sh (may not be repeated for credit)  
Co-requisite: PCB 5527L

Study of the molecular level of the principles governing DNA replication, repair, RNA transcription, and protein synthesis in both prokaryotes and eukaryotes. Surveys molecular processing, and recombinant DNA technology. Offered concurrently with PCB 4524; graduate students are required to write a research paper and present it to the class. Material and supply fee will be assessed to corresponding lab. A grade of "C" or higher is required in prerequisite courses.

PCB 5527L Molecular Biology Lab  
1 sh (may not be repeated for credit)  
Co-requisite: PCB 5527

Corresponding lab for Molecular Biology.

PCB 5675 Principles of Evolution  
3 sh (may not be repeated for credit)

A survey of modern evolutionary biology, including the evidence that supports the theory of evolution, the natural processes that cause evolution, patterns and mechanisms of speciation, and methods for estimating evolutionary relationships. Offered concurrently with PCB 4673; graduate students will be assigned additional work.

PCB 5727 Comparative Animal Physiology  
3 sh (may not be repeated for credit)

General and comparative animal physiology. Study of complex structures, phenomena, and concepts involved in regulation physiological processes employed by different groups of animals. Material and Supply Fee will be assessed for corresponding lab. Offered concurrently with PCB 4723; graduate students will be assigned additional work.

PCB 5905 Water Quality  
1-12 sh (may be repeated indefinitely for credit)

PCB 5924 Biology Seminar

1 sh (may not be repeated for credit)

Seminar topics from a diverse spectrum of current biological research will be presented by a variety of speakers from UWF, national and international academic research instructors and agencies. Offered concurrently with PCB 4922; graduate students will be assigned additional work.

PCB 6074 Experimental Design in Biology

3 sh (may not be repeated for credit)

Covers experimental design in relation to the analysis of biological data. Topics include sources of error, variation in biological systems, replication and pseudoreplication, controls, multiplicity, sample size and randomization. The physical layout of biological experiments in the field and laboratory will be discussed in relation to basic parametric data analysis techniques.

PCB 6905 Directed Study

1-12 sh (may be repeated indefinitely for credit)

PCB 6971 Thesis

1-6 sh (may be repeated for up to 12 sh of credit)

Graded on satisfactory / unsatisfactory basis only. Permission is required.

\* This course may be taken prior to or during the same term.