

BIO 102

General Biology II

COURSE OUTLINE

Prerequisites:

A passing grade in BIO 101 or equivalent

Course Description:

Focuses on diversity of life, anatomy and physiology of organisms, and ecosystem organization and processes in an evolutionary context. Explores the core concepts of evolution; structure and function; information flow, storage and exchange; pathways and transformations of energy and matter; and systems biology. Emphasizes process of science, interdisciplinary approach, and relevance of biology to society.

Semester Credits: 4 Lecture Hours: 3 Lab/Recitation Hours: 3

Course Outcomes

At the completion of this course, the student should be able to:

- Demonstrate and understanding of the diversity of animal life, both invertebrate and vertebrate.
- Demonstrate a knowledge of the basic morphology, physiology, and evolution of the organ systems of animals, with emphasis on human anatomy and physiology.
- Demonstrate a basic understanding of ecological concepts, such as biomes, population ecology, communities, ecosystems, and behavior.
- Have an appreciation for ecosystem energetics and man's impact on ecosystems.
- Have knowledge of the concepts of Darwin and Neodarwinism.

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Textbooks:

Campbell Biology in Focus. Urry, Cain, Wasserman, Minorsky, & Reece. 2nd Edition. Pearson Publishing. ISBN: 9780134433769

Exploring Biology in the Laboratory Core Concepts. Pendarvis & Crawley. Custom Edition. Morton Publishing. ISBN: 9781617316371

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Topical Description:

<u>Topics</u>	<u>Chapter</u>
<u>Animal Diversity</u>	
The Evolution of Invertebrate Diversity	18
What is an Animal?	
Phylum Porifera	
Phylum Cnidaria	
Phylum Platyhelminthes	
Phylum Nematoda	
Phylum Mollusca	
Phylum Annelida	
Phylum Arthropoda and Echinodermata	
The Evolution of Vertebrate Diversity	19
Phylum Chordata and Chordate Characteristics	
Vertebrate Characteristics	
Class Agnatha	
Class Chondrichthyes	
Class Osteichthyes	
Class Amphibia	
Class Reptilia	
Class Aves	
Class Mammalia	

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<u>Topics</u>	<u>Chapter</u>
<u>Animal Organs and Organ Systems</u>	
Unifying Concepts of Animal Structure and Function	20
Animal Tissues	
Epithelial Tissue	
Squamous, Cuboidal, Columnar, Simple Versus Stratified	
Connective Tissue (Cells, Fibers, Extracellular Matrix)	
Blood, Adipose, Dense Fibrous (Ligaments and Tendons),	
Hyaline Cartilage, Bone	
Muscle Tissue	
Skeletal, Cardiac, and Smooth (Visceral)	
Nervous Tissue	
Nutrition and Digestion	21
Obtaining and Processing Food	
Human Digestive System	
Comparisons among Animals	
Gas Exchange	22
Mechanisms of Gas Exchange	
Comparison among Animals	
Transport of Gases in the Human Body	
Circulation	23
Mechanisms of Internal Transport	
The Human Cardiovascular System	
Blood Vessels - Arteries, Veins, and Capillaries	
Blood Pressure	
Cardiovascular Disease	
Structure and Function of Blood	



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<u>Topics</u>	<u>Chapter</u>
The Immune System	24
Innate Defenses against Infection	
Intact Skin and Phagocytes	
Acquired Immunity	
Antigens	
Cell Mediated Immunity	
Immunological Memory (Vaccines)	
AIDS	
Disorders of the Immune System	
Control of Body Temperature and Water Balance	25
Thermoregulation	
Excretory System	
Comparisons among Animals	
The Vertebrate Kidney	
Hormones and the Endocrine System	26
The Nature of Chemical Regulation	
The Vertebrate Endocrine System	
Hormones and Homeostasis	
Reproduction and Embryonic Development	27
Diversity in Reproductive Systems	
Human Male Anatomy	
Human Female Anatomy	
Endocrine Control Systems	
Fertilization	
Stages of Embryonic Development	
Nervous System	28
Nervous System Structure and Function	
Nerve Signals and Their Transmission	



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<u>Topics</u>	<u>Chapter</u>
<u>Ecology</u>	
Biosphere: An Introduction to Earth's Diverse Environments	34
Levels of Organization in Ecology; Population, Community, Ecosystem, Abiotic Factors in the Ecosystem	
Terrestrial Biomes; Tropical Rain Forest, Savanna, Desert, Chaparral, Temperate Grassland, Temperate Forest, Boreal Forest, Tundra	
Aquatic Communities; Freshwater Lakes and Ponds, Rivers and Streams	
Marine Communities, Estuaries	
Behavioral Adaptations to the Environment	35
Population Ecology	36
Density and Dispersion	
Estimates of Population Size, Age, and Sex Structure	
Natality, Mortality	
Migration In and Out of the Geographic Area Carrying Capacity	
Regulation of Populations; Density Dependent and Independent Factors	
Human Population Growth	
Communities and Ecosystems	37
Communities	
Interspecific Competition	
Predation and Defenses Against It	
Ecological Niches of Species	
Symbiosis; Mutualism, Commensalism, Parasitism	
Succession	
Ecosystems	
Trophic Structure and Food Webs	
Energy Flow	
Chemical Cycling of Carbon, Nitrogen, Phosphorus, and Water	



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<u>Topics</u>	<u>Chapter</u>
Conservation Biology The Biodiversity Crisis Human Intrusions such as Accelerated Eutrophication, Habitat Destruction, Biological Magnification, Global Warming, Acid Rain Conservation Biology and Restoration	38
Concepts of Evolution How Populations Evolve The Origin of Species Tracing Evolutionary History	13-15

Notes to Instructors

1. Departmental policy dictates that instructors do not allow students to keep tests.
2. A comprehensive final exam counting 15% - 20% of the total grade will be given at the end of the semester.
3. Syllabus should state what the course grade will be based on, such as tests, quizzes, a comprehensive final exam, and any other assignments made by the instructor.
4. The VWCC Biology Department uses a 10 point grading scale.
5. Comprehensive study of the listed topics is beyond the reasonable expectations of a 15-week Biology 102 course. It is up to the discretion of the instructor to choose which topics are more detailed but each topic should be adequately covered.



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BIO 102 Lab Schedule

<u>Week</u>	<u>Lab</u>	<u>Lab Exercises</u>
1	Animal Diversity Week #1	26 & 27
2	Animal Diversity Week #2	28 & 29
3	Animal Diversity Week #3	30 & 31
4	Lab Practical #1	
5	Fetal Pig Week #1 Human Circulation	34.1 and 35 40
6	Fetal Pig Week #2	36.1-2
7	Fetal Pig Week #3	36.1-2
8	Lab Practical #2 Human Skeletal System	39.1
9	Animal Organization	33.1
10	Animal Development	42 & 43
11	Lab Practical #3	
12	Field Trip – Forest Ecology	45
13	Field Trip – Crystal Spring Filtration Plant	
14	Field Trip – Stream Ecology	46
15	Field Trip – Wastewater Treatment Plant	

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