NATIONAL UNIVERSITY VIRTUAL HIGH SCHOOL
AN AFFILIATE OF THE NATIONAL UNIVERSITY SYSTEM

Course Syllabus

Biology B Syllabus

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Text:

Holt *Biology* (2004) by George Johnson and Peter Raven

Student Text ISBN 003066473X (Optional)

Enhanced online edition ISBN: 0030371538

Course Description:

This course is designed to acquaint students with topics in biology, chemistry of life, cell structure, cells and their environments, photosynthesis and cellular respiration, chromosomes and cell reproduction, meiosis and sexual reproduction, Mendel and heredity, DNA, how proteins are made, gene technology, history of life on earth, Evolution, classification of organisms, populations, ecosystems, biological communities, environments, kingdoms of life, viruses and bacteria, protists, fungi, plants, plant reproduction, plant structure and function, plant growth and development, animals, simple invertebrates, mollusks and annelids, arthropods, echinoderms and invertebrate chordates, vertebrates, fishes and amphibians, reptiles and birds, mammals, animal behavior, human body structure, circulatory and respiratory systems, digestive and excretory systems, body defenses, nervous system, hormones and the endocrine system, reproduction and development. Class activities will include discussion, on-site labs, online lab simulations and other interactive activities, lab reports, and an exploration project. **Prerequisites: Algebra**

Learning Outcomes:

At the completion of Biology B, the student will be able to

1. develop and design scientific experiments and interpret experimental results.
2. classify organisms according to six-Kingdom and three-Domain classification systems.
3. describe how biodiversity relates to evolutionary relationships.
4. explain the role of variation and natural selection in the evolution of living organisms.
5. explain the role of heredity in reproduction and evolution.
6. describe differences and similarities in major groups of microorganisms, fungi, plants, and animals.
7. describe the relation of form, function, and regulation of internal environments in representative plants and animals.

8. describe the structure and explain the function of human body systems.
9. describe mechanisms that living organisms use to combat disease.
10. describe the historical development of major ideas in biology.

Description of Course Methodology:

This is a project- and inquiry-based course where you will be allowed to generate knowledge about biology via textbook and online readings, synchronous and asynchronous discussion with other students and with the teacher, interaction with online tutorials and animations, participation in online and hands-on inquiry-based simulations and activities, and development of a semester project.

Your teacher will be a guide for the journey, a facilitator, an events planner, and a resource advisor.

Always remember, you are the learner here! You are the one who needs to actively construct and acquire knowledge and this can be achieved by participation and completion of all readings and activities. This course requires your ACTIVE participation!

Both formal and informal assessments methods will be used in the course. Informal assessment will include an evaluation of the quality and timeliness of participation in class activities. Formal assessment will involve multiple-choice quizzes, lab reports, and written assignments. A final exam will be given at the end of unit 8.

Time Management:

Typically, NUVHS students complete this full semester course in eight weeks; this means you should expect to spend 12-15 hours per week on the readings, assignments, discussions (synchronous and asynchronous), quizzes, lab simulations and at home labs (explorations), and tests. For those of you who are taking the course on a different schedule, be sure to plan accordingly. The most important factor: KEEP A REGULAR SCHEDULE!

Assignment Submittal:

Responses to **Discussion Questions** will be posted in the **Discussion Board** area

Methods Assignments will be submitted as assignments in the **Assignments** area. These assignments will include instructions and templates that can be downloaded, completed, and then uploaded for instructor review.

OnLine Lab Assignments will be submitted as assignments in the **Assignments** area. These assignments will include instructions and templates that can be downloaded, completed, and then uploaded for instructor review.

Components of the **Exploration Project** will be submitted in the **Exploration Forum** in the **Discussion Board** area.

Assessment:

Students will be graded on the following criteria:

Unit Quizzes

(10 points each unit for a total of 80 points)

Participation in online discussion forums

(5 points each unit for a total of 40 points)

Methods Assignments

(5 points each unit for a total of 35points)
(Note: there is No Methods assignment for Unit 8)

OnLine Lab Assignments

(5 points each unit for a total of 40 points)

Exploration Project

(5 points each unit for a total of 45 points)

(Note: the presentation part of the Exploration Project is worth 10 points)

Final exam

(60 points)

Grading Scale

Letter Grade	Percentage Earned
A	95%+
A-	90% - 94.9%
B+	87% - 89.9%
B	84% - 86.9%
B-	80% - 83.9%
C+	77% - 79.9%
C	74% - 76.9%
C-	70% - 73.9%
D+	67% - 69.9%
D	64% - 66.9%
D -	60% - 63.9%
F	59% and lower

Course Outline

Unit	Topics	Activities

1	Exploring Plants	• Learning Outcomes • Reading: Chapter 23 and Chapter 24 (Optional) • Lecture: Introduction to Plants • Lecture: Plant Reproduction • Presentations • Transpiration • Plant Reproduction: Methods of Pollination • Plant Reproduction: Asexual Reproduction • Plant Reproduction: Plant Fertilization • Plant Reproduction: The Pine Tree • Food for Trees • Assignment: Characteristics of Plants • Lab: The Last Straw • Discussion • Unit Quiz • Project
2	Exploring Plants (Continued)	• Learning Outcomes • Reading: Chapter 25 and Chapter 26 (Optional) • Lecture: Plant Structure and Function • Lecture: Plant Growth and Development • Lecture: Tissue Organization in Angiosperms • Lecture: Plant Growth • Lecture: Primary Growth in the Root • lecture: Dicot Roots • Lecture: Monocot Roots • Lecture: Primary Growth of Shoots • Presentations • The Structure of Plants: Roots • The Structure of Plants: Stems • The Structure of Plants: Leaves • Assignment: Plant Structure and Function pt1 • Assignment: Plant Structure and Function pt2 • Assignment: Plant Structure and Function pt3 • Lab: Comparing Bean and Corn Seedlings • Discussion • Unit Quiz • Project
3	Exploring Invertebrates	• Learning Outcomes • Reading: Chapters 27 - 29 (Optional)

		• Lecture: Introduction to Animals • Lecture: Simple Invertebrates • Lecture: Mollusks and Annelids • Presentations • The World of Animals: Characteristics of Animals • The World of Animals: The Worm Phyla • The World of Animals: Phylum Porifera • The World of Animals: Phylum Cnideria • The World of Animals: Phylum Mollusca • Exploring Invertebrates: The Biology of Annelids • Assignment: Characteristics of Invertebrates • Lab: Leech Lab • Discussion • Unit Quiz • Project
4	Exploring Invertebrates (Continued)	• Learning Outcomes • Reading: Chapter 30 and Chapter 31 (Optional) • Lecture: Arthropods • Lecture: Echinoderms and Invertebrate Chordates • Presentations • The World of Animals: Phylum Arthropoda • Three Features of Arthropods • Characteristics of Insects • Insects and How They Live: Body Structure of an Insect • Insects and How They Live: Reproduction and Growth • Insects and How They Live: Reasons for Success • Characteristics of Crustaceans • Amazing Arachnids: Mexican Red Kneed Spider • The Life Cycle of Insects • The Biology of Echinoderms • Lecture: Scorpions • Pelagic Tunicates Roam the World's Oceans • Assignment: Grasshopper Research • Lab: Pill Bug Lab • Discussion • Unit Quiz • Project • Midterm

5	Exploring Vertebrates	• Learning Outcomes • Reading: Chapters 32 - 34 (Optional) • Lecture: Introduction to Vertebrates • Lecture: Comparative Vertebrate Anatomy • Lecture: Vertebrate Beginnings • Lecture: Phylum Chordata • Lecture: Class Chondrichthyes • Lecture: Class Osteichthyes • Lecture: Class Amphibia • Lecture: Fishes and Amphibians • Lecture: Class Reptilia • Lecture: Class Aves • Lecture: Reptiles and Birds • Presentations • Biology: the Science of Life The World of Animals • Water Vertebrates • The World of Animals: Phylum Chordata • Animals with Backbones: Five Major Groups • Our Primate Cousins • Fossil Fish • 18 Million Year Old Living Fossil • Walking with Dinosaurs: New Blood • Walking with Dinosaurs: The Cruel Sea • Walking with Dinosaurs: Giants of the Skies • Evolution: Everybody's Changing • Walking with Cavemen: Robert Winston Meets Lucy • Hominid Evolution: The Genus Homo • Assignment: Characteristics of Vertebrates • Lab: Evolution of the Heart • Discussion • Unit Quiz • Project
6	Exploring Vertebrates (Continued)	• Learning Outcomes • Reading: Chapter 35 and Chapter 36 (Optional) • Lecture: Mammals • Lecture: Animal Behavior • Presentations • Characteristics of Mammals • Mammals Power Point • Animal Behavior of the Australian Bowerbird

		• The Life of Mammals with David Attenboro • Assignment: Bowerbird Matching • Lab: Time to Think • Discussion • Unit Quiz • Project
7	Exploring Human Biology	• Learning Outcomes • Reading: Chapters 37 - 39 (Optional) • Lecture: Introduction to Body Structure • Lecture: Circulatory and Respiratory Systems • Lecture: Digestive and Excretory Systems • Presentations • Levels of Structural Organization • The Basics of Biology: The Human Body's Organ Systems • Human Body Systems: The Skeletal System • Systems of the Human Body: The Muscular System • The Heart and the Circulatory System • Pumping Life: A Review of the Circulatory System • The Human Respiratory System • Introduction to the Digestive System • The Digestive System: A Closer Look • The Digestive System: Understanding Digestion • An Introduction to the Excretory System • Assignment: Operation Heart Transplant • Lab • Discussion • Unit Quiz • Project
8	Exploring Human Biology (Continued)	• Learning Outcomes • Reading: Chapters 40 - 43 (Optional) • Lecture: The Body's Defenses • Lecture: Nervous System • Lecture: Hormones and the Endocrine System • Lecture: Reproduction and Development • Presentations • The Body's Defense Against Disease • Assignment: Science News Activity • Interactive Activity: The Blackout Syndrome

		• Interactive Activity: Replication of Herpes Simplex Virus • Interactive Activity: Arctica Mystery • Interactive Activity: How to Investigate an Outbreak • Lab: Immunology Lab • Discussion • Unit Quiz • Project • Final Exam

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NUVHS Expected Schoolwide Learning Results (ESLRs)

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It is anticipated that NUVHS students will be:

Engaged Learners

1. Demonstrate self-directed learning skills such as time management, and personal responsibility through the completion of course requirements
2. Develop an understanding of their own preferred learning styles to enhance their overall academic potential
3. Incorporate effective and relevant internet and multimedia resources in their learning process to broaden their knowledge base

Critical Thinkers

1. Effectively analyze and articulate sound opinions on a variety of complex concepts
2. Illustrate a variety of problem-solving strategies that strengthen college preparation and workforce readiness
3. Formulate a framework for applying a variety of technology and internet-based research to enhance information literacy and collaborative thinking

Effective Communicators

1. Demonstrate awareness and sensitivity to tone and voice in multiple forms of communication
2. Express concepts and ideas in a variety of forms
3. Enhance communiccation skills through the use of media rich or other technology resources

Global Citizens

1. Appreciate the value of diversity
2. Understand the range of local and international issues facing today's global community
3. Demonstrate awareness of the importance of cultural sensitivity and social responsibility in the 21st century