

COURSE OBJECTIVES

We believe that all Cedarville University graduates should be **biologically literate**--*i.e.* able to understand biological concepts, and make moral/ethical judgements about biological issues. As you begin this course, consider the objectives below and pray that God will help you to "value" them and strive to achieve them:

KNOWLEDGE ("Your Head"):

1. Explain major principles and concepts of biology which provide a basic understanding of **life** from the perspective of the **ecosystem**, **organism**, and **cell** levels of organization.
2. List the **basic life processes** of living organisms, including nutrition, reproduction, responsiveness, and homeostasis, and explain the associated **structures** and **functions** in representative forms of life.
3. Utilize **taxonomic classification** to highlight both the **unity** and **diversity** among creatures, and to explain the importance of genetic variation and selection in conserving biological diversity.
4. Analyze the **dominant role of humans** in determining the **quality of life** on Earth and articulate a Scriptural perspective on issues of environment, human health, biomedical ethics, and biotechnology.

SKILLS ("Your Head and Hands" -- Observing, Manipulating, Analyzing, Cooperating, etc.):

5. Demonstrate the ability to design an experiment, collect and analyze data, and communicate results.
6. Enhance your skills of observing, listening, analytical reasoning, and respectful exchange of ideas.
7. Continue to develop your skills in retrieving information through **library** holdings and via **internet**.

ATTITUDES ("Your Head, Hands, Heart" -- Responsibility, Reverence, Humility, etc.) (Proverbs 1:7):

8. Contribute as a member of a "**community of learners**" who individually acknowledge **Christ as Lord** of Creation (Col. 1:16-17); and, of their lives (Rom. 12:1); and, who value the needs of classmates (Phil. 2:3-4).
9. Realize God's purpose in enabling humans to launch out into scientific studies of His creation (Gen. 1:26-28; Ps. 19:1-6; Prov. 25:2).

VALUES:

10. Recognize the absolute necessity of **moral and ethical standards** to govern the agenda of biological science and application of its discoveries in society and in your life (Romans 1:20-22; 12:1-2).
11. Enhance your awareness of what it means to be truly "**pro-life**" by exercising **stewardship** of your body (I Cor. 6: 19-20) and of the environment which is to be shared with fellow humans and fellow creatures as intended by the Creator-Sustainer God (Gen. 1:26-28; 2:15; 9:9-10).

SCHEDULE: Lecture: 11 MTWH, ENS 245
Laboratory Sections: ENS 115 -- on the lower level; descend steps just S of front entrance to ENS 245

Section 1 = T 1 pm	Section 3 = W 3 pm	Section 5 = R 3 pm	Section 7 = F 12
Section 2 = W 1 pm	Section 4 = R 1 pm	Section 6 = F 8 am	Section 8 = F 2

TEXT AND LABORATORY MATERIALS:

Silvius, J. E. 2001. *Biology, Principles and Perspectives*, 4th ed. Kendall/Hunt Publ. Co., Dubuque, IA.

Laboratory Packet: A folder containing laboratory investigations and graph paper should be purchased through the bookstore before your first laboratory session. Bring these materials to each lab, and to lectures wherein they are involved.

INDIVIDUAL STEWARDSHIP:

- Commitment** to God, to professor, to your Cooperative Learning Group (CLG), and to our BIO class
CHALLENGE: See Phil. 2:3-4 and Col. 3:23-24. A FRUIT of this commitment is a willingness to share in valuing the course objectives to the point of accepting a personal responsibility to achieve them.
- Responsibility** as an active participant in four settings:
 - Out-of-Class** reading and study will be assigned as an essential preparation for and reinforcement of the laboratory and lecture-discussion learning settings.
CHALLENGE: Personally commit yourself to regular completion of reading/study assignments.
Study individually and in your CLG; begin with prayer for an alert, inquiring mind.
 - Laboratory** will aid your comprehension of lecture material, enhance hands-on and scientific reasoning skills, and foster personal interaction. Dr. Schaffner is responsible for scheduling and evaluation of your laboratory experience, and the "BIOS" Report.
 - Lecture-Discussions** will facilitate your learning by the following activities:
 - > INTEGRATING out-of-class and laboratory learning experiences
 - > REINFORCING learning by oral discussion, interaction, and clarification
 - > MOTIVATING and INSPIRING your best effort toward this part of your educationCHALLENGE: Come to lecture faithfully, on time, prepared to receive and give respectful attention to anyone who is addressing the class. Make good lecture notes; be an active participant in activities involving your Cooperative Learning Group
 - Office Hours** are provided for your additional assistance and counsel.
CHALLENGE: Please come by if I can help academically, or personally; or if you require special note- or exam-taking arrangements. Contact Dr. Schaffner for laboratory needs.

EVALUATION of your learning will be determined as follows:

Category	Percent of Grade	Points	Letter grades are assigned at the end of the course on a 90%, 80%, etc. basis as Grade A, B, etc. Plus (+) and minus (-) grades will be assigned where total percentage is within 1% <u>below</u> or 1% <u>above</u> the cutoff, respectively. Examples: 903 pts = 90.3% = A-; or 894 pts. = 89.4% = B+. Make-up exams are given only after prior arrangement. If you miss any exam, please contact Dr. Silvius by 1:00 pm on the exam day. Unexcused absences from exams or quizzes will be recorded as zero. Academic dishonesty policy is as stated in the college <i>Faculty Handbook</i> .
Exam I	12%	120	
Exam II	12%	120	
Exam III	12%	120	
Final (Comprehensive)		200	
L.A.P.*	14%	140	
In-Lab Grade	20%	200	
BIOS Report	10%	100	
Total =	100%	1000	

* LAP = Lecture Attendance and Participation: You will earn points for attendance and "Take-at-Home Quizzes" if you are present to present the quiz on the day of the Assignment to which the "Take-at-Home Quiz" is attached or on a later date. You may complete these quizzes individually or by collaborative discussion within your CLG.

BIO 100 Lecture Schedule -- Winter, 2002 *

DATE	TOPIC	PREPARATORY ASSIGNMENT	No.**
PART I: INTRODUCTION / ECOSYSTEMS			
January 3	Course Introduction	Syllabus, Study Strategy	
January 7	Science and Scripture - Ways of Knowing	Chapter 1	1
January 8	Biology and the Nature of Life	Chapter 2	2
January 9	Organization of Life – and Biology Q#1	Chapter 3	3
January 10	<i>No Class</i> (Meet instead on January 11 this week)		
January 11	What Makes Living Matter “Living?”	Chapter 4	4
January 14	Creation’s Life Support System	Chapter 5, pages 77-89	5
January 15	Ecology of Cedar Lake Q#2	Review; Cedar Lake Lab Intro.	6
January 16	Plugging into the Flow of Energy	Chapter 5, pages 90-99	7
Jan 17, 21	<i>Odyssey</i> and Applications of Ecology to Lifestyle	Chapter 6 (in parts); <i>Odyssey</i>	8, 9
January 22	Caring for Creation Q#3	Chapter 8, pages 158-163	10
January 23	EXAM I - Chapters 1 - 6		
PART II: HUMAN ECOLOGY and NUTRITION			
January 24	Populations Multiply and Replenish	Chapter 7, pages 123-133	12
Jan 28, 29	Human Population	Ch 7, p. 135-142; Ch 8, 156-160	13
January 30	Ecology and Stewardship in Action Q#4	Video; Viewing Guide	14
January 31	Mid-Winter Break or Work on BIOS Topic		
Feb. 4, 5	Nutrition I, Nutrition II Q#5 (Feb 4)	Chapter 10 (in two assignments)	16,17
February 6	EXAM II - Chap. 7, 8 (part), 10; some concepts from Ch. 5,		
PART III: REPRODUCTION AND COORDINATION			
February 7	Reproduction – An Introduction	Chapter 11, pages 219-223	19
February 11	Reproduction - Mitosis	Chapter 11, pages 223-231	20
February 12	Reproduction - Meiosis and Sexual Reproduction Q#6	Chapter 11, pages 231-243	21
February 13	Genetics - Mendelian Principles	Chapter 12, pages 247-255	22
February 14	Genetics - Modern Applications	Chapter 12, pages 255-268	23
February 18	Coordination of Life Processes	Chapter 13; See Study Guide	24
February 19	Homeostasis: Selected Examples Q#7	Chapter 14, p. 293; 305-307	25
February 20	Life before Birth	Chapter 14, pages 307-313	26
February 21	Origin of Life: It Matters Where You Start	Chapter 15, pages 323-335	27
February 25	EXAM III - Chapters 11 - 14		
PART IV: LIFE PROCESSES within CELLS			
Feb. 26, 27	Cell Structure and Function	Chapter 16, pages 367-391	28
February 28	How Genes Are Expressed Q#8	Chapter 17, pages 393-401	29
March 4	How Gene Expression Is Controlled	Chapter 17, pages 401-404	30
March 5	Genes and Environment: What Makes Me Like I Am?	Chapter 17, review 393-404	31
March 6, 7	Explaining the Diversity of Life	Chapter 15 (two assignments)	32-33
March 11	Human Defenses Against Disease	Chapter 17, pages 404 - 411	34
March 12	Ethics and Genetics	Ch 14, 310-13, Ch 17, 411 - 417	35
March 15 8am	Final Exam - 50% Ch. 15-17; 50% Comprehensive		

* Subject to change; see Home Page-linked “Course Schedule and Study Aids” from which you can print Study Guides.

** No. = Study Guide Assignment Number to complete before the lecture date in this table row

STRATEGIES FOR SUCCESS

BIOLOGICAL LITERACY:

The aim of BIO 100 Principles of Biology is to help you to advance in developing “biological literacy.”

BIOLOGICAL LITERACY: The quality of being able to understand biological concepts, make moral and ethical judgements about biological issues, and solve real-world problems that involve biological issues.

Mastery of biological concepts requires that you advance "upward" through a series of levels of biological literacy as defined below.

Table 1. Biological Literacy Begins with Nominal Literacy and Works ‘Upward.’

LITERACY LEVEL	DESCRIPTION	DEMONSTRATED BEHAVIOR
MULTIDIMENSIONAL LITERACY ↑	Applies knowledge to solve real-world problems ↑	How should my wife and I deal with our apparent infertility? ↑
STRUCTURAL LITERACY ↑	Constructs appropriate meaning of concept based upon his/he own understanding/experiences ↑	"ZYGOTE" is the beginning of a new generation of life in sexually reproducing species. ↑
FUNCTIONAL LITERACY ↑	<i>Defines</i> or <i>describes</i> a term from memory ↑	"ZYGOTE" = cell formed by union of sperm and egg ↑
NOMINAL LITERACY	<i>Recognizes</i> a term as "biological"	Associates "ZYGOTE" with BIOLOGY

STUDY STRATEGY:

A "Study Strategy" designed to assist you in achieving meaningful learning in BIO 100 is obtainable via the BIO 100 home page at <http://www.cedarville.edu/dept/sm/silvius/100/100main.htm>. Here, click on “Course Schedule and Study Aids” and then click on “Study Strategy” in the row representing the first day of class. This resource includes the following parts:

1. A STRATEGY FOR DEVELOPING BIOLOGICAL LITERACY: to aid your learning in biology.
2. VISUALIZING STRUCTURES AND PROCESSES: Biology is a highly visual science. Suggestions are given for your use of visuals in your text and on the Internet to aid learning.
3. NOTE-TAKING SUGGESTIONS: How to continue to develop good note-taking skills.
4. COOPERATIVE LEARNING: Details about how this approach will be used. See summary below.

COOPERATIVE LEARNING:

During the first meeting of your laboratory section, you will become a member of a Cooperative Learning Group. Within this group, you will develop close friendships and seek to spur one another on as you work together in laboratory and in lecture. In addition, you will fulfill several course requirements by functioning as a contributor within the Cooperative Learning Group. For details see “Study Strategy” above.