

**MERCER COUNTY COMMUNITY COLLEGE
DIVISION OF SCIENCE AND HEALTH PROFESSIONS**

**GENERAL BIOLOGY II (BIO 102) – 4 CREDITS
COURSE SYLLABUS**

Professor of Biology – Bruce R. Chorba

DAY AND EVENING CLASSES

Lecture and Discussion: 3 Hours/Week

Laboratory Experiments: 3 Hours/Week

REQUIRED TEXTBOOK:

Biology, Volume II, Custom Edition, 2005
Neil A. Campbell, Jane B. Reece, Bruce R. Chorba
Pearson Custom Publishing

REQUIRED LABORATORY MANUAL:

Explorations in Basic Biology, Tenth Edition, 2005
Stanley E. Gunstream
Pearson Prentice Hall, Inc

CATALOG DESCRIPTION:

Fundamental concepts, theoretical principles and practical applications of modern Biology. An introductory college level biology course with emphasis on genetics, animal diversity, and principles of animal form and function. Laboratory exercises stress the development of skills in basic lab techniques, reinforce lecture topics, and introduce supplemental topics. Experiments involve careful observations, measurements, data collection and analysis.

PREREQUISITE:

General Biology I (BIO 101) with a minimum of a "C" Final Grade.

COREQUISITES:

BIO 102 Lab

Telephone: (609) 570-3370

Fax: (609) 570-3831

Office: Room #117 in the Math-Science Building

Office hours are posted on the bulletin board adjacent to office

E-mail: chorba@mccc.edu

BIO 102 COURSE SYLLABUS

PHILOSOPHY OF THE COURSE:

General Biology II (BIO 102) is intended to provide you with a continued exposure to a broad realm of fundamental concepts in the biological sciences. This course will assist you in attaining a basic understanding of biological principles, and it will help you to develop essential skills in these areas. The lecture presentations and discussions, laboratory experiments and exercises, lab quizzes, lab reports and lab skill tests, textbook reading assignments, detailed focus questions and major tests will provide you with an integrated selection of learning activities which can lead you to success.

I think that it is extremely important to emphasize that you, however, are ultimately responsible for your own level of learning. It is you who will decide and determine how much time and effort will be devoted to this course and consequently how much you will learn from it.

MAJOR TESTS:

All major tests covering the lecture and textbook content will be given in class. You must take these major tests at the times they are normally scheduled as indicated in this course syllabus. It is your responsibility to be present to take and complete all three major tests. Your absence will constitute a zero score on any missed major test. Each major test can be taken one time only and there normally will be no make-ups. If you have an emergency, it is important that someone contact me about your situation as soon as possible. All major test questions will be multiple choice. **The questions will be taken from both your textbook reading assignments and lecture presentations with Very Substantial Emphasis placed on the written Focus Questions that are included in your Custom Textbook.**

GRADING PROCEDURE:

The Final Grades for BIO 102 will be based on the total accumulation of your earned points. All three major tests covering the lecture and textbook material, all laboratory quizzes, lab reports and lab skill tests will contribute to the total number of possible points that are available to you to earn during this semester.

Because the laboratory component is critical towards satisfying the educational requirements of BIO 102, any student missing 3 laboratory sessions will receive an "F" (Failure) final grade for the semester unless the student has already officially withdrawn from the course. There are no exceptions to this policy. Missed laboratory sessions cannot be made up, therefore, any potential concerns should be discussed in advance with your laboratory instructor before they can become an issue. Enjoy the lab as you experience the process of science.

% of Total Points Earned:

93 – 100
90 – 92
87 – 89
83 – 86
80 – 82
77 – 79
70 – 76
60 – 69
0 – 59

Final Course Grade:

A
A-
B+
B
B-
C+
C
D
F

BIO 102 COURSE SYLLABUS

LECTURE TOPICAL OUTLINE AND TEXTBOOK READING ASSIGNMENTS

Chapter 13 Meiosis and Sexual Life Cycles p. 238-250

- I. Offspring Acquire Genes From Parents By Inheriting Chromosomes
- II. Fertilization and Meiosis Alternate In Sexual Life Cycles
- III. Meiosis Reduces The Number Of Chromosome Sets From Diploid To Haploid
- IV. Sources Of Genetic Variation In Sexual Life Cycles

Chapter 14 Mendel And The Gene Idea p. 251-273

- I. Mendel Used The Scientific Approach To Identify Two Laws Of Inheritance
- II. Extending Mendelian Genetics For A Single Gene
- III. Extending Mendelian Genetics For Two Or More Genes
- IV. Many Human Traits Follow Mendelian Patterns Of Inheritance
- V. Genetic Testing: Use Of Technology And Mendelian Principles

Chapter 15 The Chromosomal Basis Of Inheritance p. 274-292

- I. Mendelian Inheritance Has Its Physical Basis In The Behavior Of Chromosomes
- II. Linked Genes Are On the Same Chromosome And Tend To Be Inherited Together
- III. Sex-Linked Genes Exhibit Unique Patterns Of Inheritance
- IV. Alterations Of Chromosome Number Or Structure Cause Some Human Genetic Disorders

Chapter 16 The Molecular Basis Of Inheritance p. 293-308

- I. DNA Is The Genetic Material
- II. DNA Replication Is Remarkable In Its Speed And Accuracy
- III. DNA Repair Mechanisms

Chapter 17 From Gene To Protein p. 309-333

- I. Genes Specify Proteins Via Transcription And Translation
- II. Stages Of Transcription: Initiation, Elongation, And Termination
- III. Stages Of Translation: Initiation, Elongation, And Termination
- IV. Point Mutations Can Affect Protein Structure And Function

FIRST MAJOR TEST: Covers the Material in Chapters 13, 14, 15, 16 and 17 with Very Substantial Emphasis placed on the Focus Questions that are included in your Custom Textbook for these Specific Chapters.

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LECTURE TOPICAL OUTLINE AND TEXTBOOK READING ASSIGNMENTS

Chapter 32 An Introduction To Animal Diversity p. 626-637

- I. Characteristics Of Animals
- II. Features Of Animal Body Plans

Chapter 33 Invertebrates p. 638-670

- I. Phyla: Porifera, Cnidaria And Platyhelminthes
- II. Phyla: Rotifera, Nemertea And Mollusca
- III. Phyla: Annelida, Nematoda And Arthropoda
- IV. Phylum Echinodermata

Chapter 34 Vertebrates p. 671-709

- I. Phylum Chordata And Subphylum Vertebrata
- II. Vertebrates: Craniates And Gnathostomes
- III. Vertebrates: Tetrapods And Amniotes
- IV. Mammals, Primates And Humans

Chapter 40 Basic Principles Of Animal Form And Function p. 820-843

- I. Tissue Structure And Function
- II. Bioenergetic Strategies And Metabolic Rates
- III. Mechanisms Of Homeostasis And Thermoregulation

SECOND MAJOR TEST: Covers the Material in Chapters 32, 33, 34 and 40 with Very Substantial Emphasis placed on the Focus Questions that are included in your Custom Textbook for these Specific Chapters.

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LECTURE TOPICAL OUTLINE AND TEXTBOOK READING ASSIGNMENTS

Chapter 41 Animal Nutrition p. 844-866

- I. Main Feeding Mechanisms Of Animals
- II. Nutritional Requirements Of Animals
- III. Main Stages Of Food Processing
- IV. The Mammalian (Human) Digestive System

Chapter 42 Circulation And Gas Exchange p. 867-897

- I. Survey Of Vertebrate Circulation
- II. The Mammalian (Human) Cardiovascular System
- III. Survey of Gas Exchange In Vertebrates
- IV. The Mammalian (Human) Respiratory System

Chapter 43 The Immune System p. 898-921

- I. Innate Immunity: External, Internal Cellular And Chemical Defenses
- II. Acquired Immunity: Lymphocytes Provide Specific Defenses
- III. Humoral And Cell-Mediated Immunity
- IV. Allergies, Autoimmune and Immunodeficiency Diseases

Chapter 45 Hormones And The Endocrine System p. 943-963

- I. The Endocrine System And Nervous System Relationship
- II. Cell Surface And Intracellular Receptors For Hormones
- III. Major Human Endocrine Glands And Their Hormones

Chapter 46 Animal Reproduction p. 964-986

- I. Mechanisms of Asexual And Sexual Reproduction In Animals
- II. Human Female Reproductive Anatomy
- III. Human Male Reproductive Anatomy
- IV. Conception, Embryonic Development And Birth

THIRD MAJOR TEST: Covers the Material in Chapters 41, 42, 43, 45 and 46 with Very Substantial Emphasis placed on the Focus Questions that are included in your Custom Textbook for these Specific Chapters.

BIO 102 COURSE SYLLABUS

LABORATORY GUIDELINES AND SAFETY PROCEDURES

During the first laboratory class, your lab instructor will call your attention to the safety procedures to be followed in the General Biology II Laboratory. Be sure you become familiar with the location and proper use of each of the following basic safety equipment:

Eyewash	Fire Extinguishers
Fire Blanket	Emergency Electric Power Shut-Off Switch
Faucets and Sinks	Soap and Paper Towels
Electrical Outlets	Natural Gas Connections
Room Exits	Trash Cans
Biohazards Container	Broken Glass Container

The following are the general guidelines and procedures which should be followed during each of your laboratory classes:

- Please use the Amphyll (disinfectant) solution on the lab work-tables both before you begin and after you have completed your lab class.
- Please be certain to wear latex, plastic, or rubber gloves as well as safety glasses when appropriate. Please stay alert and attentive during the entire lab class.
- Please be careful not to cut yourself or your partner with any instruments. **Never Cut Toward Yourself** and put the instruments down when not in use. Your lab instructor will demonstrate the proper handling and use of any appropriate laboratory equipment.
- In the event of a cut or injury of any kind, please notify your laboratory instructor immediately.
- Please be certain to **Wash Your Hands Well** with soap and water prior to leaving the lab for any reason. Also, please do not smoke, eat, drink or bite your nails while in the laboratory.
- Please be certain that you read and understand the details in those sections on preparing for the laboratory, working in the laboratory, and laboratory safety and housekeeping that are included in the required lab manual for the course.
- Please note that although dangerous chemicals may occasionally have to be utilized in the laboratory, always read the labels on the containers and follow all of the instructions carefully.
- Please turn off your cell phone before entering the lab.

BIO 102 COURSE SYLLABUS

SCHEDULE OF LAB EXPERIMENTS AND EXERCISES

Week of Semester	Title of Laboratory and Type of Evaluation	Lab Manual Exercise Number	Lab Manual Page Numbers
1	<u>Heredity</u>	34	413 – 421
	<u>Cell Division</u>	9	103 – 109
2	<u>Molecular and Chromosomal Genetics</u>	35	429 – 435
	<u>DNA Fingerprinting</u>	36	443 – 448
	Lab Quiz or Lab Report #1 on Heredity and Cell Division		
3	<u>Normal Hemoglobin, Sickle Cell Trait, and Sickle Cell Disease – Electrophoresis</u>		Handout
	Lab Quiz or Lab Report #2 on Molecular and Chromosomal Genetics and DNA Fingerprinting		
4	<u>Simple Animals</u>	14	169 – 179
	Lab Quiz or Lab Report #3 on Normal Hemoglobin, Sickle Cell Trait, and Sickle Cell Disease – Electrophoresis		
5	<u>Mollusks, Segmented Worms, and Arthropods</u>	15	185 – 194
	Lab Quiz or Lab Report #4 on Simple Animals		
6	<u>Echinoderms and Chordates</u>	16	199 – 206
	Lab Quiz or Lab Report #5 on Mollusks, Segmented Worms, and Arthropods		
7	<u>Dissection of The Fetal Pig</u>	18	221 – 238
	Lab Quiz or Lab Report #6 on Echinoderms and Chordates		
	AND Review of Previous Lab Experiments and Exercises for the First Lab Skills Test		
8	<u>FIRST LAB SKILLS TEST</u> Covers the Material on the Labs Conducted from Weeks # 1 to 7		

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SCHEDULE OF LAB EXPERIMENTS AND EXERCISES

Week of Semester	Title of Laboratory and Type of Evaluation	Lab Manual Exercise Number	Lab Manual Page Numbers
9	<u>Digestion</u>	21	267 - 273
10	<u>Blood and Circulation</u>	19	239 – 252
	<u>Gas Exchange</u>	20	257 – 263
	Lab Quiz or Lab Report #7 on Digestion		
11	<u>Reproduction In Vertebrates</u>	28	345 – 352
	<u>Fertilization And Development</u>	29	357 – 363
	Lab Quiz or Lab Report #8 on Blood and Circulation, and Gas Exchange		
12	<u>Excretion</u>	22	277 – 281
	<u>Neural Control</u>	23	287 – 297
	Lab Quiz or Lab Report #9 on Reproduction In Vertebrates And Fertilization and Development		
13	<u>Sensory Perception In Humans</u>	24	303 – 312
	<u>Animal Behavior</u>	41	501 – 503
	Lab Quiz or Lab Report #10 on Excretion and Neural Control		
14	<u>Ecological Relationships</u>	39	481 – 487
	Lab Quiz or Lab Report #11 on Sensory Perception In Humans and Animal Behavior AND Review of Previous Lab Experiments and Exercises for the Second Lab Skills Test		
15	<u>SECOND LAB SKILLS TEST: Covers the Material on the Labs Conducted from Weeks # 9 to 14</u>		

BIO 102 COURSE SYLLABUS

INDIVIDUAL EFFORT:

Please keep in mind that General Biology II (BIO 102) is a college level course for those students who are willing to work diligently to improve their level of biological knowledge. We can accomplish a great deal together, but only if you make a personal commitment to the course and plan on giving it your best efforts for the entire semester.

ACADEMIC INTEGRITY STATEMENT:

Any student who: (a) knowingly represents the work of others as his/her own; (b) uses or obtains unauthorized assistance in the execution of any academic work; or (c) gives fraudulent assistance to another student is guilty of cheating. Violators will be penalized in accordance with established college regulations, policies, and procedures. You are encouraged to obtain a copy of the college's "Student Calendar/ Handbook Rights & Responsibilities" and read this document carefully.

CLASSROOM CONDUCT:

It is your responsibility to attend all class sessions. If you miss a class for any reason, you are responsible for all content that was covered, for any announcements that may have been made and for acquiring any materials or documents that may have been distributed. It is expected that you will be punctual for all the classes. If occasionally you enter the class after it has started, it is courteous to select a seat close to where you entered the room so that you do not disrupt the class.

COMMON COURTESY:

You are expected to follow what are considered ordinary rules of common courtesy during all class sessions. For example, engaging in private conversations during class time is distracting to other students as well as to your instructor. Leaving class early without having informed your instructor prior to the beginning of the class is inappropriate. Leaving class and then returning while the class is in session is not acceptable behavior either. Disruptive behavior of any type will not be tolerated. **Also, please turn off any cell phones, beepers, pagers, or similar electronic devices at the beginning of each class session.** This will prevent other students as well as your instructor from being distracted by these devices.

PERSONAL NOTE:

With these understandings I welcome you into a college environment in which a sense of community, pride, and mutual respect will be sustained. We are here to collaborate and to work cooperatively and learn together. Good luck in your study of Biology during its golden age. I sincerely hope that you enjoy your overall classroom experiences in General Biology II.

Lastly, I reserve the right to modify and alter this course syllabus at any time during the semester as may be professionally necessary and appropriate.

BIO 102 COURSE SYLLABUS

DETERMINING YOUR GRADE: When you receive the results of each graded major test, laboratory quiz, lab skills test, or lab report, please write these points below on the line under the appropriate heading. **In this way, you will be able to objectively determine your Grade at any time during the semester including your Final Grade.**

THREE MAJOR TESTS:

- (1) First Major Test: Maximum of 70 points available – Your earned points = _____
(2) Second Major Test: Maximum of 70 points available – Your earned points = _____
(3) Third Major Test: Maximum of 70 points available – Your earned points = _____

210 Total Major Test Points Available – Your Total Earned Test Points = _____

ELEVEN LABORATORY QUIZZES OR LAB REPORTS: VALUE 15 POINTS EACH

Your Earned Points For Each Quiz or Lab Report:

- | | |
|----------|-----------|
| 1. _____ | 7. _____ |
| 2. _____ | 8. _____ |
| 3. _____ | 9. _____ |
| 4. _____ | 10. _____ |
| 5. _____ | 11. _____ |
| 6. _____ | |

165 Total Lab Quiz and Lab Report Points available – Your Total Earned Points = _____

TWO LABORATORY SKILLS TESTS: VALUE 30 POINTS EACH

Your Earned Points For Each Lab Skills Test:

1. _____ 2. _____

60 Total Lab Skills Test Points available – Your Total Earned Points = _____

Your Total Earned Points in the Course = _____, Divided by the Total Points Available in the Course: 435, Then Multiplied by 100 = _____%.

YOUR GRADE OR FINAL GRADE IN BIO 102 = _____.