

**MERCER COUNTY COMMUNITY COLLEGE
SCIENCE AND ALLIED HEALTH DIVISION**

**ECOLOGY (BIO 204) – 4 CREDITS
COURSE SYLLABUS EVENING VERSION 2005
Professor of Biology – Bruce R. Chorba**

Lectures: 3 Hours/Week
Laboratory 3 Hours/Week
and
Field Trips:

Required Textbook:

Elements of Ecology, Fifth Edition, 2003
Robert L. Smith and Thomas M. Smith
Benjamin Cummings

CATALOG DESCRIPTION:

Fundamental concepts, theoretical principles, and practical applications of modern Ecology. An introductory college level Ecology course with emphasis on the study of the interactions of organisms with each other and with their environment. Laboratory classes involve mostly Field Trip experiences. Included are Field Trips to the New Jersey Pinelands, a Wastewater Treatment Facility, an Electrical Generating Station, Botanical Gardens, Municipal Ecological Facilities, A Wildflower Preserve, and the Trenton/Hamilton Marsh.

PREREQUISITE:

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

College Telephone: (609) 586 – 4800; my extension: 3370

Office: Room #117 in the Math-Science Building

E-mail: chorba@mccc.edu

Web page: www.mccc.edu/~chorba

BIO 204 COURSE SYLLABUS

PHILOSOPHY OF THE COURSE:

BIO 204 is intended to provide you with an initial exposure to a broad realm of fundamental concepts in the science of Ecology. This course will assist you in attaining a basic understanding of Ecological Principles, and it will help you to develop essential skills in these areas. The lecture presentations, classroom discussions, field trip experiences, textbook reading assignments, exams, and other evaluations will provide you with an integrated selection of learning activities which can lead you to success in this course.

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 EXAMINATIONS:

All major exams covering the lecture material 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 major exams. Your absence will constitute a zero score on any missed major test. Each major exam can be taken one time only and there normally will be no make-ups. If you have an emergency it is imperative that someone contact me about your situation as soon as possible. All major exam questions will be multiple choice. The questions will be taken from your textbook reading assignments, lecture presentations, and our classroom discussions with very significant attention being placed on the written focus questions distributed to you throughout the semester.

GRADING PROCEDURE:

The Final Grades for this course will be based on the total accumulation of your earned points. All of the major exams covering the lecture material and textbook reading assignments, all of the field trip quizzes, and all other assignments will contribute to the total number of possible points available to you to be earned during this semester.

Because the Laboratory Field Trip component is so critical towards satisfying the educational requirements of BIO 204, any student missing more than one of the all day Saturday Field Trip experiences will receive an "F" (Failure) Final Grade for this semester unless the student has already officially withdrawn from the course. There are No Exceptions to this policy. Missed Field Trips cannot be made up, therefore, any potential concerns should be discussed well in advance with me before they become an issue. Enjoy the Field Trips as you experience the process of science directly.

% of Total Points:

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 204 COURSE SYLLABUS

LECTURE TOPICAL OUTLINE AND TEXTBOOK READING ASSIGNMENTS

Chapter 1: The Nature of Ecology p. 3 -10

- I. Introduction to The Science of Ecology
- II. Ecologists Use Scientific Methods

Chapter 2: Adaptation and Evolution p. 11 - 33

- I. Natural Selection, Heritability, and Genetic Variation
- II. Morphological, Biological, Sympatric, and Allopatric Species
- III. Speciation and Evolution
- IV. Geographic Variation, Habitat, and Ecological Niches

Chapter 3: Climate p. 37 - 54

- I. Interception of Solar Radiation
- II. Dynamics of The Atmosphere
- III. Atmospheric Moisture, Inversions, and Microclimates

Chapter 4: The Abiotic Environment p. 55 - 77

- I. Visible Light
- II. Structure and Properties of Water, The Water Cycle and Movements
- III. Temperature, Nutrients, pH, O₂, and Salinity

FIRST MAJOR EXAM

Covers the material in Chapters 1, 2, 3, and 4 with emphasis placed on the written Focus Questions for these Chapters. Administered about the 5th week of the term.

Chapter 5: Soil p. 79 – 98

- I. Soil Formation
- II. Physical Properties of Soil
- III. Soil Erosion – Causes, Types, Effects, and Solutions

Chapter 6: Plant Adaptations To The Environment p. 101 - 122

- I. All Life Is Carbon-Based
- II. Terrestrial Plant Adaptations

Chapter 7: Decomposers And Decomposition p. 123 - 135

- I. Processes and Classification of Decomposers
- II. Factors Influencing Decomposition Rates
- III. Decomposition In Aquatic Ecosystems

Chapter 8: Animal Adaptations To The Environment p. 137 – 168

- I. Nutrient Acquisition and Nutritional Needs
- II. Adaptations To Temperature
- III. Adaptations To Arid and Saline Environments
- IV. Biological Clocks – Timekeepers of Physical and Physiological Activities

SECOND MAJOR EXAM

Covers the material in Chapters 5, 6, 7, and 8 with emphasis placed on the written Focus Questions for these Chapters. Administered about the 8th week of the term.

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LECTURE TOPICAL OUTLINE AND TEXTBOOK READING ASSIGNMENTS

Chapter 9: Properties of Populations p. 171 – 184

- I. Characteristics of Populations
- II. Sampling Populations
- III. Age Structure

Chapter 10: Population Growth p. 185 – 201

- I. Life Tables – Mortality and Survivorship
- II. Exponential Growth, Logistic Growth, and Population Fluctuations
- III. Extinction of Populations

Chapter 11: Intraspecific Population Regulation p. 203 – 217

- I. Types of Intraspecific Competition
- II. Density – Dependent Mechanisms of Regulating Animal Populations

Chapter 12: Life History Patterns p. 219 – 238

- I. Sexual Reproduction: Characteristics, Forms, Mating Systems
- II. Sexual Selection
- III. Reproductive Effort and Parental Care

THIRD MAJOR EXAM

Covers the material in Chapters 9, 10, 11, and 12 with emphasis placed on the written Focus Questions for these Chapters. Administered about the 12th week of the term.

Chapter 13: Community Structure p. 241 – 267

- I. Biological Structure of Communities
- II. Physical Structure of Communities
- III. Zonation and Succession

Chapter 14: Interspecific Competition p. 269 – 288

- I. Types of Interspecific Competition Interactions
- II. Nonresource Factors, Multiple Resources, and Resource Partitioning
- III. The Niche Concept

Chapter 15: Predation p. 289 – 308

- I. Forms, Functional and Numerical Responses in Predation
- II. Prey Defenses Against Predators
- III. Plant Defenses Against Herbivores
- IV. Predator Offenses

FOURTH MAJOR EXAM

Covers the material in Chapters 13, 14, and 15 with emphasis placed on the written Focus Questions for these Chapters. Administered on or about the last day of classes for the term.

BIO 204 COURSE SYLLABUS

TENTATIVE FIELD TRIP SCHEDULE

Methods of Flood Control

Saturday 9:00 am – 5:00 pm April 16, 2005	Morning:	Detention/Retention/Infiltration Basins Floodplain Site Stream Channelization Site Active and Passive Dam Sites
	Afternoon:	Harry Bonacci Ecological Facility Sayen Botanical Gardens
Saturday 9:00 am – 5:00 pm April 23, 2005	Morning:	Princeton Plasma Physics Laboratory
	Afternoon:	Mercer Generating Station
Saturday 9:00 am – 5:00 pm April 30, 2005	Morning:	Trenton/Hamilton Marsh
	Afternoon:	Bowman's State Wildflower Preserve

New Jersey Pinelands

Saturday 9:00 am – 5:00 pm May 7, 2005	Morning:	Greenwood Cedar Swamp Pygmy Forest Site
	Afternoon:	Brendan Byrne State Forest Whitesbog

BIO 204 COURSE SYLLABUS

GENERAL GUIDELINES CONCERNING OUR FIELD TRIP EXPERIENCES

Transportation:

Our means of Transportation to all off campus sites will be a College Van. We will arrive at our destination as a group. We may need someone to volunteer to drive their own motor vehicle to help transport a few members of the class if the Van is unable to accommodate everyone.

Punctuality:

The College Van will leave from the side of the College's Security Office promptly at 9 a.m., so be on time and ready to go. If you miss the College Van please do not attempt to follow it, catch up, nor meet the class at our pre-determined destination. No one is to be left behind at any of our Field Trip Sites.

Attire:

Dress appropriately. Please consider both the nature of the scheduled sites to be visited and the Weather Conditions.

Participants:

Only students who are Officially Enrolled and Registered for the course are able to go on our Field Trips. This means that brothers, sisters, mothers, fathers, grandparents, cousins, friends, and significant others cannot join us.

Behavior:

We are Guests at all off campus sites. Inappropriate Behavior and Language will not be tolerated. We represent the college. Yes, we want to enjoy ourselves, but we also want to be welcomed back again.

Notebooks:

You are Responsible for Learning during our Field Trips. Please bring a Notebook and a writing instrument and use them. Cameras and tape-recorders are usually permitted.

Expectations:

You are expected to be friendly, polite to each other, talk on the van, ask thoughtful and relevant questions when appropriate, and most of all **Enjoy The Experience.**

BIO 204 COURSE SYLLABUS

INDIVIDUAL EFFORT:

Please keep in mind that Ecology (BIO 204) is a serious college level course for students who are willing to work diligently to improve their level of knowledge in this discipline. 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 effort 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 strongly 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 of your Classes. If you miss a class for any reason, you are Responsible for all Content that is covered, for any Announcements that are made and for acquiring any Materials that may have been distributed. It is expected that you will be punctual for all of your classes. If on occasion you need to walk into a class after it has begun, it is courteous to select a seat close to where you entered the room so that you do not disrupt the entire class.

COMMON COURTESY:

You are expected to follow ordinary rules of Common Courtesy during all class sessions. 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 not appropriate. Unless there is an emergency, leaving class and returning while the class is in session is not acceptable behavior. Disruptive behavior of any type will not be tolerated. Also, Please Turn Off any cellular 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 undesirable noises.

PERSONAL NOTE:

With this understanding I Welcome you into a College Environment in which a sense of Community, Pride, and Mutual Respect will be sustained. We are here to work cooperatively and to learn together. Good Luck in your study of Ecology and I sincerely hope that you Enjoy your overall Classroom and Field Trip Experiences this semester.

Lastly, I reserve the right to modify and alter this course syllabus at any time during the semester.