

Biology 122: General Biology II, Spring 2013
Three Rivers Community College, Norwich, CT
Instructor: Sarah B. Selke, Ph.D.

Office Hours (C214): Mondays 11am – 1pm & Wednesdays 2:30 – 3:30pm

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Required Text:

Biology: The Dynamic Science, 2nd edition, Russell, Hertz & McMillan. Published by Brooks/Cole, Cengage Learning.

Course Prerequisites:

Passing grade (“C” or better) in Biology 121 or an equivalent course.

Course Description:

This course is a continuation of Biology 121 and focuses on the diversity of life. Topics to be covered include: Evolution; Classification; Taxonomy; Diversity of life forms; the structures and functions of organismal systems; Ecology; Behavior; and the Environment. This course stresses the diversity and differentiation of life processes common to all organisms, and their strategies for survival. A complete listing of concepts covered is attached. This course meets for three hours of lecture and three hours of lab weekly for a total of four credit hours.

This course is a web-enhanced course, which means that some required activities are conducted online in our Blackboard Learn course shell. The online portion of the course can be accessed through <http://my.commnet.edu/>. There are two course shells associated with this class, one for lab and one for lecture. **All online course information is in the lecture shell.**

Course Objectives:

Upon completion of this course, the student will be able to recognize terminology, specific biological facts, and utilize general principles associated with the structural and functional organization of living things. The student will also obtain a more fully developed series of computer-based skills. This course also stresses critical thinking skills which are designed to allow the student to: develop more meaningful learning beyond rote memorization; extend beyond lower levels of learning (knowledge and comprehension) to higher levels of learning (application, analysis, synthesis and evaluation); apply concepts and principles to real world experience and situations; and enhance problem solving skills.

Attendance Policy:

Attendance at all class sessions is required. If a class is missed due to circumstances beyond your control, please be sure to notify your instructor and make the necessary arrangements **with a classmate** for obtaining the notes. **You will be responsible** for the material.

Electronic devices (cell phones, pagers etc.) will be put in “Silent Mode” or turned off while class is in session.

Grading Overview:

Your grade is based on a 1000-point scale. The following activities will be assigned this semester:

- reading quizzes (see below)
- 3 unit exams
- homework assignments (2-3, Homework #1 due Monday, Feb. 4)
- weekly or every-other-week lab assignments (see below)
- insect collection (due May 14)
- Final Exam (May 21)

No individual extra assignments will be given.

- **Grading for reading (& occasional lab) quizzes**

There is a reading quiz associated with each chapter in the textbook and with the occasional lab. Reading and lab quizzes are conducted online through the course website on Blackboard Learn. Each quiz must be taken **before** coming to class. **Reading and lab quizzes are open-book and time-unlimited.**

- **Grading for Lab Assignments**

Your lab assignment is due at the beginning of the following lab period. Late labs will be penalized 5 points if turned in the following day and 10 points thereafter. You are allowed one late lab with no penalty (your “oops” lab). **No late labs will be accepted once the corrected labs are returned.**

How to calculate your grade:

To determine your grade, I suggest creating 2 columns of scores. The first is the total number of points for each assignment; the second is the points you earned on that assignment. To determine your grade, add up each column and divide **your score** total by the **high score** total.

A partial example:

High score	My score
8	8
40	35
75	70
Total = 123	Total = 113

$$113/123 = 0.92 = 92\% = A-$$

Make-ups:

Make-up exams will be granted on an individual basis only following a conference with the instructor. **All make-up tests must be completed within a week of the original exam date.** Please be aware that the format of any makeup exam is at the discretion of the instructor. The format could be the same, oral, essay or other, depending on the circumstances. It will not be the same exam taken by the rest of the students in the class.

Due to scheduling issues, it is unlikely that a missed lab can be made up. **No credit will be given for a lab write-up if you did not participate in the lab.**

Final Grade:

93.5-100.0 = A	77.5-79.4 = C+
89.5-93.4 = A-	73.5-77.4 = C
87.5-89.4 = B+	69.5-73.4 = C-
83.5-87.4 = B	63.5-69.4 = D+
79.5-83.4 = B-	59.5-63.4 = D
	00.0-59.4 = F

College Withdrawal Policy:

The last day to withdraw is **May 13th**. Students who do not withdraw but stop attending class **will receive** a grade of "F" for the final grade. **Verbal withdrawals cannot be accepted.**

Accommodations for Disabilities:

If you need assistance or modification of class procedure owing to any type of disability, please let me know so that arrangements for accommodation can be made. In order to receive accommodations, you must register with Chris Scarborough, learning specialist at 860-823-2985 or a counselor in the Student Services Development Center.

Academic Misconduct:

Academic dishonesty and plagiarism will not be tolerated. Plagiarism, cheating, or any form of academic dishonesty is **prohibited**. Plagiarism includes any instance of copying words or ideas from another person (ie. another student, author of a book, internet resource etc.) without properly acknowledging the source. Students guilty of academic dishonesty directly or indirectly will receive a **zero** for an exercise or exam and may receive an **F** for the course in addition to other possible disciplinary sanctions that maybe imposed through the regular institutional procedures.

Blackboard Learn & your TRCC email address:

Your Blackboard Learn courses are automatically connected to your college-provided email account. For more information about this email account, visit the college home page and click the "New student email button." This email account is the only official electronic means that the college will communicate course and non-emergency information to you. Make sure that you check it weekly at a minimum. Another option is to set up to forward your email from the college address to your preferred address. **Important class information is frequently communicated through the Blackboard Learn email function.**

myCommNet Alert:

myCommNet Alert is a system that sends text messages and emails to anyone signed up in the event of a campus emergency. Additionally, TRCC sends messages when the college is delayed or closed due to weather. All students are encouraged to sign up for myCommNet Alert. A tutorial is available on the Educational Technology and Distance Learning Students page of the web site.

http://www.trcc.comnet.edu/div_it/educationaltechnology/Tutorials/myCommNetAlert/MIR3.html

BIO 122 Spring 2013 Class Schedule**/Selke

Date	Topic	Russell Chapter	Exams	Lab
M 1/28	Introduction & Darwin	1, 19		Evidences of Evolution
W 1/30	Microevolution	20		
M 2/4	Speciation	21		Genetic Variation/Hardy-Weinberg
W 2/6	Paleobiology/Macroevolution	22		
M 2/11	Origin of Life	24		Phylogenies, Chapter 23
W 2/13	Prokaryotes	25		
M 2/18	NO CLASS (Presidents Day)			Bacteriology I
W 2/20			Exam 1 (19 – 24)	
M 2/25	Protists	26		Bacteriology II
W 2/27	Protists	26		
M 3/4	Plants	27		Protists & Fungi I
W 3/6	Plants	27		
M 3/11	Fungi	28		Protists & Fungi II
W 3/13	Fungi	28		
M 3/18 & W 3/20	SPRING BREAK			
M 3/25	Catch-up/Introduction to Animals	29*		Non-vascular plants
W 3/27			Exam 2 (25 – 28)	
M 4/1	Invertebrates	29		Vascular plants (includes chapters 31 & 34)
W 4/3	Invertebrates	29		
M 4/8	Invertebrates	29		Animals I
W 4/10	Vertebrates	30*		
M 4/15	Vertebrates	30		Animals I
W 4/17	Vertebrates	30		
M 4/22	Hominids	30		Animals II
W 4/24	Ecology & the Biosphere	49		
M 4/29			Exam 3 (29 – 30*)	Animals II
W 5/1	Ecology & the Biosphere	49		
M 5/6	Population Ecology	50	Exam 3 (29 – 30*)	Insect collection
W 5/8	Population Ecology	50		
M 5/13	Community Ecology	51		TBA Insect collection due
W 5/15	Community Ecology	51		
M 5/20	Catch-up/Wrap-up			
T 5/21	Final Exam (cumulative) IN LAB		Final Exam (cumulative)	Final Exam (cumulative)

* Chapters 29 & 30 will be supplemented with additional materials from Chapters 38, 39, 41, 42, 44, 45, 46, & 47.

** Tentative schedule. Any announcements made in class supercede this schedule.

Course Objectives: BIO 122 - General Biology II

1. The student will be able to name the Kingdoms of the life forms and the main traits of each Kingdom.
2. The student will be able to name the major taxonomical units these Kingdoms.
3. The student will be able to explain the criteria used to distinguish the phyla of these Kingdoms.
4. The student will be able to explain the criteria that are used for grouping plants.
5. The student will be able to explain the characteristics used to place single-celled organisms into a classification system.
6. The student will be able to give examples and state unique characteristics of various Prokaryotae, Protista and Fungi.
7. The student will be able to give the characteristics of the main groups of plants.
8. The student will be able to demonstrate the life cycle of mosses and ferns.
9. The student will be able to demonstrate the basic life cycles in plants.
10. The student will be able to distinguish between perfect and imperfect flowers.
11. The student will be able to list the parts of a flower and state the function of each part.
12. The student will be able to list in sequence the major events in the reproductive portion of the life cycle of a flowering plant.
13. The student will be able to explain germination in both monocots and dicots.
14. The student will be able to identify and use the following criteria in the classification of the Kingdom Animalia:
 - a. Shape (symmetry)
 - b. Skeletons
 - c. Body layers (germ layers)
 - d. Body cavities
 - e. Systems
 - f. Embryonic development
 - g. Segmentation
15. The student will be able to classify the animals by phyla.
16. The student will be able to identify the characteristics of each animal group with emphasis on distinguishing characteristics for each particular phyla.
17. The student will be able to review in detail the anatomy of one or more animals within each taxonomic group.
18. The student will be able to summarize the various systems characteristic of each phyla. These will include the digestive, circulatory, excretory, respiratory and reproductive systems.
19. The student will be able to define predation.
20. The student will be able to explain the relationship and interaction between the predator and prey.
21. The student will be able to define symbiosis and describe the different symbiotic relationships.
22. The student will be able to recognize the various tropic levels of energy and the characteristics of the various organisms in each level.
23. The student will be able to identify a food chain, food web, and the pyramid of energy.
24. The student will be able to recognize the living and non-living factors and their interaction within an Ecosystem.
25. The student will be able to define pollution and identify the types of pollution and their effects on the ecosystem.
26. The student will be able to define Biosphere.
27. The student will be able to define biomes, list and give the characteristics of the different types of biomes.
28. The student will be able to gain knowledge of the modern concept of Evolution

TOPICAL OUTLINE - Biology 122 General Biology II

UNIT I

1. Evolution: Introduction and Historical Background
2. Evidence
 - A. Fossil Record
 - B. Biogeography
 - C. Comparative Anatomy
 - D. Embryological Development
 - E. Molecular Data
3. The modern concepts of evolution
 - A. Microevolution
 1. Population Genetics
 2. Mutation
 3. Genetic Drift
 4. Gene Flow
 5. Selective Pressures
 - a. Natural Selection
 - b. Sexual Selection
 - B. Macroevolution
 1. Speciation: Gradualism and Punctuated Equilibrium
 - a. Sympatric
 - b. Allopatric
 - c. Parapatric
 2. Reproductive Isolation
 - a. Pre-zygotic
 - b. Post-zygotic
 3. Geographic Isolation
 - a. Abrupt
 - b. Clines
 - C. Chemical Evolution
4. Primate Evolution
5. Evolution vs. Creation

UNIT II

- 1. Taxonomy: Introduction**
 - A. Phylogony
 - B. Cladistic Analysis
 - C. Phenetic Analysis
- 2. Viruses**
 - A. Bacteriophages
 - B. Lytic
 1. DNA based
 2. RNA based
 - C. Temperate
 - D. New Forms

3. Kingdom Prokaryotae

- A. Bacteria: Archaeobacteria vs. Eubacteria
 - 1. Characteristics of Classification
 - 2. Basic Morphological Characteristics
 - 3. Basic Physiological Characteristics
- B. Cyanobacteria
 - 1. Morphological Characteristics
 - 2. Physiological Characteristics

4. Kingdom Protista

- A. Algae and Plant Like
 - 1. Morphological and Physiological Characteristics

PHYLUM

- a. green algae: Chlorophyta
- b. red algae: Rhodophyta
- c. brown algae: Phaeophyta
- d. dinoflagellates: Dinoflagellata
- e. diatoms: Bacillariophyta
- f. euglenoids: Euglenophyta
- B. Protozoa and Animal Like
 - 1. Morphological and Physiological Characteristics

PHYLUM

- a. flagellates: Zoomastigina
- b. ciliates: Ciliophora
- c. amoebas: Rhizopoda
- d. sporozoans: Apicomplexa
- e. foraminiferans: Foraminifera
- f. actinopods: Actinopoda
- C. Fungal Like

1. Morphological and Physiological Characteristics

- a. slime molds

PHYLUM

- I. plasmodial: Myxomycota
- II. cellular: Acrasiomycota
 - b. water molds: Phylum Oomycota

5. Kingdom Fungi

- A. Basic Characteristics
 - 1. Morphological
 - 2. Physiological
- B. Classification

PHYLUM

1. zygomycetes: Zygomycota
2. sac fungi: Ascomycota
3. club fungi: Basidiomycota
4. imperfect fungi: Deutromycota

6. Kingdom Plantae

A. Characteristics of Classification by PHYLUM

B. Non-vascular Plants

1. Mosses: Bryophyta
 - a. morphology
 - b. physiology
 - c. reproduction (life cycles)
2. Liverworts: Hepatophyta
 - a. morphology
 - b. physiology
 - c. reproduction (life cycles)
3. Hornworts: Anthoceroophyta
 - a. morphology
 - b. physiology
 - c. reproduction (life cycles)

C. Vascular Plants: Tracheophyta

1. Ferns: Pterophyta
 - a. morphology
 - b. physiology
 - c. reproduction (life cycles)
2. Wiskferns: Psilophyta
 - a. morphology
 - b. physiology
 - c. reproduction (life cycles)
3. Horsetails: Sphenophyta
 - a. morphology
 - b. physiology
 - c. reproduction (life cycles)
4. Club Mosses: Lycophyta
 - a. morphology
 - b. physiology
 - c. reproduction (life cycles)

D. Seed Plants

1. Gymnosperms: naked seed plants

- a. Conifers: Coniferophyta
 - I. morphology
 - II. physiology
 - III. reproduction (life cycles)
- b. Cycads: Cycadophyta
 - I. morphology
 - II. physiology
 - III. reproduction (life cycles)

- c. Ginkos: Ginkophyta
 - I. morphology
 - II. physiology
 - III. reproduction (life cycles)
- d. Gnetophytes: Gnetophyta
 - I. morphology
 - II. physiology
 - III. reproduction (life cycles)

2. Angiosperms: covered seed plants

- a. Anthophyta: Monocots vs. Dicots
 - I. morphology
 - II. physiology
 - III. reproduction (life cycles)

UNIT III

- 1. Kingdom Animalia
 - A. Reasons for studying zoology
 - B. Basis for animal classification

INVERTEBRATES

- C. Phylum Porifera (Characteristics)- sponges

CLASS

- 1. Calcaria- calcium carbonate
- 2. Hexactinallida- silica
- 3. Demospongiae- spongin
- D. Phylum Cnidaria (Coelenterata) (Characteristics)- jellies

CLASS

- 1. Hydrozoa- hydroids
- 2. Scyphozoa- jellies
- 3. Anthozoa- corals and anemones
- E. Phylum Ctenophora (Characteristics)- comb jellies

*** ACOELOMATES ***

- F. Phylum Platyhelminthes (Characteristics)- flatworms

CLASS

- 1. Turbellaria- free living
- 2. Trematoda- flukes
- 3. Monogenea- parasites
- 4. Cestoda- tapeworms
- G. Phylum Nemertea (Characteristics)- proboscis worms

*** PSEUDOCOELOMATES ***

- H. Phylum Nematoda (Characteristics)- roundworms
- I. Phylum Rotifera (Characteristics)- wheel animals

*** COELOMATES ***

!! PROTOSTOMES !!

J. Phylum Annelida (Characteristics)- segmented worms

CLASS

1. Polychaeta- sandworms
2. Oligochaeta- earthworms
3. Hirudinea- leeches
- K. Phylum Mollusca (Characteristics)- mollusks

CLASS

1. Polyplacophora- chitons
2. Gastropoda- snails and slugs
3. Bivalvia- bivalves
4. Cephalopoda- squids and octipods
- L. Phylum Arthropoda (Characteristics)- arthropods
 1. Subphylum Crustacea (Characteristics)-crustaceans
 - a. Class Malacotraca- seafood
 - I. Order Decopoda- decopods
 2. Subphylum Uniramia (Characteristics)- unbranched arthropods

CLASS

- a. Chilopoda- centipedes
- b. Diplopoda- millipedes
- c. Insecta- insects

ORDER

- I. Thysanaura- silver fish
- II. Odonata- dragonflies
- III. Orthoptera- crickets and grasshoppers
- IV. Blattodea- cockroaches
- V. Isoptera- termites
- VI. Anoplura- lice
- VII. Hemiptera- bugs
- VIII. Homoptera- aphids and scales
- IX. Lepidoptera- butterflies
- X. Diptera- flies
- XI. Siphonaptera- fleas
- XII. Coleoptera- weevils
- XII. Hymenoptera- bees and wasps
3. Subphylum Chelicerata (Characteristics)

CLASS

- a. Arachnida- spiders
- b. Merostomata- horseshoe crabs

!! DUETEROSTOMES !!

M. Phylum Lophophora (Characteristics)- lophophores

CLASS

1. Phoronida- tube worms
2. Ectoprocta- bryozoans
3. Brachiopoda- lampshells
- N. Phylum Echinodermata (Characteristics)- echinoderms

CLASS

1. Chrinoidea- feather stars and sea lilies
2. Asteroidea- sea stars
3. Ophiuroidea- brittle stars
4. Echinoidea- sea urchins
5. Holothuroidea- sea cucumbers
- O. Phylum Chaetognatha (Characteristics)- arrow worms
- P. Phylum Hemichordata (Characteristics)- acorn worms
- Q. Phylum Chordata (Characteristics)- chordates
 1. Subphylum Urochordata- tunicates
 2. Subphylum Cephalochordata- lancets

VERTEBRATES

3. Subphylum Vertebrata- vertebrates
 - a. Super class Pisces- fish

CLASS

1. Agnatha- jawless
2. Chondrichthyes- cartilaginous finned
3. Osteichthyes- bony finned

ORDER

- I. Actinopterygians- ray finned
- II. Sarcopterygians- lobed finned
 - b. Superclass Tetrapoda- limbed

CLASS

1. Amphibia- amphibians

ORDER

- I. Urodela- salamanders
- II. Anura- frogs and toads
- III. Apoda- caecilians

CLASS

2. Reptilia- reptiles

ORDER

- I. Chelonia- turtles
- II. Squamata- snakes and lizards
- III. Crocodylia- crocodiles and alligators

CLASS

3. Aves- birds
4. Mammalia- mammals

SUBCLASS

- I. Prototheria (Monotremes)- platypus
- II. Metatheria (Marsupials)- kangaroos and wallabies
- III. Eutheria (Placentals)- having a placenta

ORDER

- a. Insectivora- moles
- b. Chiroptera- bats
- c. Carnivora- carnivores
- d. Edentata- sloths
- e. Rodentia- rodents
- f. Lagomorpha- bunnies
- g. Perissodactyla- horses and rhinos
- h. Artiodactyla- cattle and giraffes
- i. Proboscidea- elephants
- j. Sirenea- manatees and sea cows
- k. Cetacea- whales and dolphins
- l. Pinnipedia- seals and sea lions
- m. Primates- apes and monkeys

1. Suborder Prosimii- prosimians

FAMILY

- I. Cherogallidae- dwarf lemurs
- II. Lemuridae- lemurs
- III. Indriidae- indris
- IV. Daubentoniidae- aye-eyes
- V. Lorisidae- bush babies
- VI. Tarsiidae- tarsiers
2. Suborder Antropoidea- anthropoids

FAMILY

- I. Callitrichidae- marmosets
- II. Cebidae- new world monkeys
- III. Cercopithecidae- old world monkeys
- IV. Hylobatidae- gibbons
- V. Pongidae- great apes
- VI. Hominidae- humans
 - a. Genus Australopithecus- ancient humans

SPECIES

1. ramidus- root
2. afarensis- lucy
3. africanus- africa

- b. Genus Homo- modern humans

SPECIES

1. habilis- handy
2. erectus- peking/java
3. robustus- robust
4. neandertalis
4. sapien- us

Unit IV

1. Behavior
 - A. Cycles
 - B. Innate
 - C. Learned
 1. Classical Conditioning
 2. Operant Conditioning
 3. Imprinting
 4. Habituation
 5. Insight

D. Social Behavior and Communication

1. Hierarchies
2. Defense
 - a. Active
 - b. Passive
3. Sexual
4. Selective Behaviors
5. Competition, Predation and Parasitism
 - a. intraspecific
 - b. interspecific
6. Symbiosis
 - a. Commensalism
 - b. Mutualism
 - c. Altruism
7. Play

Unit V

1. Ecology
 - A. Energy Flow and Chemical Cycling
 1. Carbon
 2. Nitrogen
 3. Phosphorus
 4. Sulfur
 5. Water
 - B. Food Chains and Webs
 1. Niche vs. Habitat
 2. Trophic Levels

- 3. Productivity
- C. Population Ecology
 - 1. Biotic Potential
 - 2. Environmental Resistance
 - a. Density Dependent
 - b. Density Independent
 - 3. Food and Populations
 - 4. Human Populations
- D. The Biosphere (Ecosystems)
 - 1. Community
 - 2. Biomes
 - a. Land
 - I. Tundra
 - II. Taiga
 - III. Temperate Forest
 - A. rain
 - B. deciduous
 - IV. Grasslands
 - V. Chaparral
 - VI. Desert
 - VII. Tropical Forest
 - b. Freshwater
 - I. Standing Water
 - II. Running Water
 - c. Transitional Aquatic
 - I. Wetlands
 - II. Estuaries
 - III. Marshes
 - d. Marine
 - I. Intertidal
 - II. Neritic
 - III. Oceanic
 - IV. Benthic
 - 3. Changes in an ecosystem
 - 4. Pollution and the ecosystem