

General Biology II (w/Lab) Syllabus

BIO K122 (M01), Four sem. hrs. credits

CRN: 10694

BIO K122 (M1A)

CRN: 10695

Web page: http://www.trcc.commnet.edu/Prog_Study/Sciences/dopirak/index.htm

Spring 2010

Three Rivers Community/Technical College

Mohegan Campus

Norwich, CT 06360

Instructor: Bill Dopirak

860.892.5758

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Office Hrs.

Office location: C-130

Office Hrs.

M: 4-5pm; T: 5-6pm

R: 4:30-5:30pm

(Or by appointment)

Required Texts:

Starr, C. and Taggart, R. 2006. Evolution of Life, Biology 11th edition. Thomson, Brooks, Cole Publishing. ISBN # 0-495-12579-2

Starr, C. and Taggart, R. 2006. Diversity of Life, Biology 11th edition. Thomson, Brooks, Cole Publishing. ISBN # 0-495-12577-6

Optional Texts:

Borror, D.J. 1960. Dictionary of Word Roots and Combining Forms. Mayfield Publishing

Pechenik, J.A. 2004. A short guide to writing about biology, 5th ed. Pearson/Longman Publishers

Starr, C. and Taggart, R. 2006. Ecology and Behavior, Biology 11th edition. Thomson, Brooks, Cole Publishing. ISBN # 0-495-12574-1

Catalog Description:

Prerequisite: BIO K121 with a "C" grade or better or permission of the instructor.*

Co-requisite: None required; CHE K122 is recommended.*

This course is a continuation of General Biology I, topics to be covered include taxonomy, the diversity of life forms from the microbes to the animals, the structures and functions of both plant and animal systems, as well as ecology, ecosystems and evolution. (For transfer credit, student should take both BIO K121 and BIO K122.) Three-hour lecture; one three-hour laboratory period.

Attendance Policy:

Students are expected to attend class and laboratory sessions regularly. If a class or lab is missed due to circumstances beyond your control, **please**, be sure to notify your instructor and make the necessary arrangements for obtaining the lecture notes. **You will be responsible** for the material.

Grade Evaluation:

There will be three unit examinations, three laboratory practicum's. There will be eleven quizzes. The lowest quiz grade will be dropped. Exam and quiz questions will consist of multiple choice and/or short answers. Lab journals: For each Phylum we cover in lab, you must pick three species (of your choosing) to systematically place in the respective taxa, and a brief summary of that species (natural history ect.).

Add/Drop Procedures:

Please consult the school catalog for this policy.

Suggestions for the course:

To gain a better understanding be sure to read the required reading sections **before** coming to class. Also, be prepared to participate in classroom discussions.

Grading:

Final grade will based on the following:

Semester Grade*	-----50%
Laboratory Grade [£]	-----50%
	100%

*Semester grade = 300 points (Unit tests) + 200 points (quizzes) = 500 points total

[£]Laboratory grade = 300 points (Lab practicum's) + 200 points (Lab manuals) = 500 points total

Final Grade:

100.0-99.0= A+	79.4-77.5= C+
98.9-93.5= A	77.4-72.5= C
93.4-90.5= A-	72.4-69.5= C-
90.4-87.5= B+	69.4-63.5= D+
87.4-84.5= B	63.4-59.5= D
84.4-79.5= B-	59.4-00.0= F

College Withdrawal Policy:

A student who finds it necessary to discontinue a course once class has met must provide written notice to the registrar. **See Registrar for dates.** After that period, a student wishing to withdraw must obtain written authorization of the instructor to receive a "W" grade on their academic record, non-punitive grade indicating termination of class participation. Students who do not withdraw, but stop attending **will receive** a grade of "F" for the final grade. **Verbal withdrawals cannot be accepted.**

Academic and Classroom Misconduct:

The instructor has the primary responsibility for control over classroom behavior and maintenance of academic integrity, and can order the temporary removal or exclusion from the classroom, and/or laboratory, of any student engaged in conduct violative of the general rules and regulation of the institution. Plagiarism, cheating, or any form of academic dishonesty is **prohibited**. 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. Any student that believes he or she has been erroneously accused may appeal the case through the appropriate institutional procedures if their grade was affected.

Disabilities Statement: If you have a hidden or visible disability that may require classroom or test-taking modifications, please see me as soon as possible.

BIO K122 General Biology II

Tentative Schedule

Spring 2010

Lecture: 6:30pm-9:30pm M Room D-206

Laboratory: 6:30pm-9:30pm W Room A-215

Date	Topic
01/25	BIO I review, Principles of evolution
01/28	LAB - Orientation
02/02	Quiz 1- Prokaryota - Dinoflagellates
02/04	LAB- Kingdoms Archaeobacteria & Eubacteria
02/09	Quiz 2- Diatoms – Chromists (algae)
02/11	LAB Protista Algae
02/15	Quiz 3- Algae
02/17	Lab Practicum I
02/22	Quiz 4- Kingdom Fungi
02/24	LAB Kingdom Fungi
03/01	UNIT EXAM I
03/03	LAB Kingdom Plantae
03/08	<u>SPRING BREAK</u>
03/10	<u>NO CLASSES</u>
03/15	Quiz 5 - Kingdom Plantae
03/17	LAB Kingdom Plantae (cont.)
03/22	Quiz 6 – Poriferans - Platyhelminthes
03/24	LAB Poriferans - Platyhelminthes
03/29	Quiz 7 – Minor invertebrates - Annelids
03/31	LAB - Minor invertebrates - Annelids
04/05	Quiz 8 – Arthropods
04/07	LAB Arthropods
04/12	Quiz 9 Arthropods (cont.)
04/14	LAB Arthropods (cont.)
04/19	UNIT EXAM II
04/21	LAB Echinoderms - Amphibians
04/26	Quiz 10 Echinoderms
04/28	LAB Reptiles
05/03	Quiz 11 Reptiles
05/05	LAB Reptiles - Birds
05/10	Quiz 12 Aves – Mammalia
05/12	LAB Mammals
05/17	LAB PRACTICAL III
05/19	UNIT EXAM III

Syllabus Revisions:

This schedule may be subject to change as the instructor sees fit. Any changes will be announced by the instructor in advance.

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 understand the role of the skeletal and muscular systems in support and movement.
20. The student will be able to demonstrate knowledge of the heart and vessel structure and function.
21. The student will be able to demonstrate knowledge of the structure and function of the lymphatic system.
22. The student will be able to demonstrate knowledge of the composition and circulation of human lymphatic fluid.
23. The student will be able to demonstrate knowledge of the composition and function of blood.
24. The student will be able to explain the phases of the respiratory process.
25. The student will be able to demonstrate knowledge of the structure and function of the respiratory passageways.

26. The student will be able to name, describe the location and give the general functions of each of the digestive organs.
27. The student will be able to list the various digestive enzymes secreted by the digestive glands and describe the function of each.
28. The student will be able to define nutrition, nutrients and essential nutrients.
29. The student will be able to list and give the general function of the major vitamins.
30. The student will be able to define excretion and identify all of the systems involved in the process.
31. The student will be able to demonstrate knowledge of the structure, location and function of the excretory organs such as the kidneys, ureters, bladder and urethra.
32. The student will be able to demonstrate knowledge of the physiology of excrement formation.
33. The student will be able to demonstrate knowledge of cell types found in nervous systems.
34. The student will be able to demonstrate knowledge of the electrochemical changes associated with impulse transmission and synaptic transmission.
35. The student will be able to demonstrate knowledge of the structure, organization and function of the brain.
36. The student will be able to demonstrate knowledge of the structure, organization and function of the spinal cord.
37. The student will be able to demonstrate knowledge of the structure, organization and function of the autonomic nervous system.
38. The student will be able to demonstrate knowledge of the structure and function of the specialized sensory receptors and organs.
39. The student will be able to demonstrate knowledge of the structure and function the sensory receptors and organs.
40. The student will be able to identify, give the location and secretion of the various endocrine glands.
41. The student will be able to demonstrate knowledge of the identity, source and function of the hormones.
42. The student will be able to demonstrate knowledge of the regulation of hormone secretion.
43. The student will be able to demonstrate knowledge of the structure, location and function of the reproductive anatomy.
44. The student will be able to demonstrate knowledge of the physiological changes relative to the reproductive cycles.
45. The student will be able to demonstrate knowledge of the process of gametogenesis.
46. The student will be able to demonstrate knowledge of fertilization and embryonic development.
47. The student will be able to define predation.
48. The student will be able to explain the relationship and interaction between the predator and prey.
49. The student will be able to define symbiosis and describe the different symbiotic relationships.
50. The student will be able to recognize the various trophic levels of energy and the characteristics of the various organisms in each level.
51. The student will be able to identify a food chain, food web, and the pyramid of energy.
52. The student will be able to recognize the living and non-living factors and their interaction within an Ecosystem.
53. The student will be able to define pollution and identify the types of pollution and their effects on the ecosystem.

- 54. The student will be able to define Biosphere.
- 55. The student will be able to define biomes, list and give the characteristics of the different types of biomes.
- 56. The student will be able to gain knowledge of the modern concept of Evolution

TOPICAL OUTLINE - Biology 122 General Biology II

- 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

Domain (Superkingdom) Prokaryota

Two kingdoms:

Kingdom Archaeobacteria

Division Mendosicutes

Class Euryarchaeota – (methanogens)

Group Halobacteriales – (salt-loving)

Group Archaeoglobales – (sulfate-reducing)

Class Crenarchaeota – (thermoacidophils)

Kingdom Eubacteria

Division Firmicutes – (Gram positive bacteria)

Division Gracilicutes – (Gram negative bacteria)

Division Tenericutes – (lack cell walls)

Domain (Superkingdom) Eukaryota

Four Kingdoms

Kingdom Protista

Fungus like protistans:

Phylum Oomycota - Watermolds (downy mildews)

Phyla Acrasiomycota and Myxomycota - Slime Molds

Amoeboid protozoans

Phylum Sarcodina – Foraminiferans & Heliozoans

Ciliated protozoans

Phylum Ciliophora - *Paramecium* spp.

Flagellated protozoans

Phylum Mastigophora

Euglenoids

Phylum Euglenophyta - *Euglena* spp.

Dinoflagellates

Phylum Pyrrophyta

Diatoms

Phylum Bacillariophyta – diatoms

Radiolarians

Phylum Actinopoda

Zoomastigota

Phylum Zoomastigina

Algae – (Chromists)

Phylum Chrysophyta – Golden algae

Phylum Haptophyta - Coccoliths

Phylum Rhodophyta - Red algae

Phylum Xanthophyta – Yellow algae

Phylum Phaeophyta - Brown algae

Phylum Chlorophyta - Green algae

Kingdom Fungi

Phylum Ascomycota - Sac Fungi

Class Ascomycetes

Class Pneumocystidomycetes

Class Schizosaccharomycetes - yeasts

Class Taphrinomycetes

Phylum Basidiomycota - Club Fungi

Class Basidiomycetes – true mushrooms

Class Urediniomycetes – rusts

Class Ustilaginomycetes - smut

Class Wallemiomycetes - xerophilic fungi

Phylum Zygomycota – zygosporangium

Class Trichomycetes

Class Zygomycetes

Phylum Deuteromycota (Imperfect fungi) -ringworm

Subphylum Chytridiomycota

Subphylum Glomeromycota

Kingdom Plantae

Avascular seedless plants:

Phylum Anthocerotophyta - hornworts

Phylum Hepatophyta – liverworts

Phylum Bryophyta – mosses

Class Andreaeopsida

Class Sphagnopsida

Seedless vascular plants:

Phylum Lycophyta - club mosses

Phylum Psilophyta - whisk ferns

Phylum Sphenophyta – horsetails

Phylum Pterophyta – true ferns

Class Filicopsida

Order Hydropteridales

Order Marattiales

Order Ophioglossales

Order Polypodiales

Kingdom Plantae (cont.)

Seed bearing plants:

Gymnosperms

Phylum Cycadophyta – cycads

Phylum Ginkgophyta – ginkgo

Phylum Gnetophyta – gnets

Phylum Coniferophyta (Pinophyta) - conifers

Order Coniferales:

Family Pineaceae

Family Abies (Fir)

Family Cedrus (Cedar)

Family Picea (Spruce)

Family Pinus (Pine)

Family Tsuga (Hemlock)

Family Sequoia (sequoia)

Family Juniperus (Juniper)

Seed bearing plants

Angiosperms

Phylum Magnoliophyta (Anthophyta) - flowering plants

Subclass Magnoliidae

Class Magnoliopsida –Dicotyledons

Order Amborella – amboerellas

Order Nymphaeales – water lily family

Order Illiciales – star anise

Order Papaverales - poppy family

Order Caryophyllales - cacti

Order Celastrales – bittersweet

Order Cornales - dogwood family

Order Magnoliales – magnolias, tulip trees, nutmeg

Order Laureles - laurel trees & shrubs, cinnamon

Order Piperales- black & white pepper

Order Fagales – oaks, chestnuts, beeches

Order Aristolochiales – birthwort

Order Gentianales –coffee family

Order Geraniales – geranium family

Order Haloragales – water milfoil

Order Euphorbiales – boxwood family

Order Rosales – rose family

Order Fabales – milkweed

Order Ranunculales - buttercup family

Order Capparales – mustard family

Order Apiales – carrot family

Order Nepenthales – pitcher plants

Order Hamamelidales – witch hazel

Order Trochodendrales – wheel trees

Order Scrophulariales – olive family

Order Theales – tea family

Kingdom Plantae (cont.)

Class Liliopsida - Monocotyledons

Order Arales – Duckweed

Order Commelinales – Spiderwort

Order Zingiberaceae– banana, ginger

Order Arecanae – palms

Order Commelinanae – grasses & sedges

Order Araneae – skunk cabbage, Jack-in-the-pulpit

Order Alismatales – agave, aloe, yucca

Order Poales – pineapple plant

Order Asparagales – onion, garlic, orchids

Order Liliales – lilies, tulips

Kingdom Animalia

Invertebrate Animals

Phylum Placozoa – simplest of the animals

Phylum Porifera – Sponges

Class Calcarea – calcified sponge

Class Hexactinellida – glass sponge

Class Desmospongiae – commercial sponge

Class Sclerospongiae –coralline sponge

Radiate Animals

Phylum Ctenophores - Comb jellies

Phylum Cnidaria

Class scyphozoa – jellyfish

Class anthozoa - anemones and corals

Class hydrozoa – hydrozoans

Animals with bilateral symmetry

Acoelomate animals

Phylum Nemertea - ribbon worms

Phylum Gnathostomulida - jaw worms

Phylum Aschelminthes

Class Nematoda – round worms

Phylum Platyhelminthes - flatworms

Class Turbellaria – planarians

Class Monogenea - parasitic flukes

Class Trematoda - flukes

Class Cestoda – tapeworms

Pseudocoelomates

Phylum Gastrotricha

Phylum Kinorhyncha

Phylum Loricifera

Phylum Priapulida

Phylum Entoprocta – bryozoans

Phylum Acanthocephala – thorny-headed worms

Phylum Rotifera

Kingdom Animalia: Invertebrate Animals: (cont.)

Coelomate animals

Protostome coelomates:

Phylum Mollusca - snails, bivalves, squid

Class Gastropoda - snails, slugs, nudibranchs

Class Bivalvia - clams, mussels, & oysters

Class Cephalopoda-squid, octopuses, nautilus, & cuttlefish

Class Polyplacophora - marine chiton

Phylum Annelida - segmented worms

Class Polychaeta - bristled worms

Class Oligochaeta - earthworms

Class Hirunidea- leeches

Class Pogonophora - bearded worms

Phylum Sipuncula - peanut worms

Phylum Echiura - spoon worms

Phylum Tardigrada - water bears

Phylum Arthropoda - insects, crustaceans

Class Onychophora - velvet worms

Class Pauropoda - pauropods

Class Diplopoda - millipedes

Class Chilopoda - centipedes

Class Insecta - uniramians

Order Anoplura- sucking lice

Order Coleoptera - weevils & beetles

Order Collembola - springtails

Order Dermaptera - the earwigs

Order Thysanoptera - thrips

Order Diplura - jawed bristle-tails

Order Ephemeroptera - mayflies

Order Odonata - dragonflies

Order Plecoptera - stoneflies

Order Grylloblattodea - ice bugs

Order Orthoptera - grasshoppers & crickets

Order Phasmids - stick insects

Order Embioptera - web-spinners

Order Dictyoptera - roaches & mantids

Order Isoptera - termites

Order Psocoptera - book lice

Order Mallophaga - biting lice

Order Hemiptera - true bugs

Order Neuroptera - lacewings, dobsonflies, antlions

Order Mecoptera - scorpion flies

Order Lepidoptera - Butterflies & moths

Order Trichoptera - caddisflies

Order Homoptera - cicadas, hoppers, & aphids

Order Diptera - true flies

Order Siphonoptera - fleas

Order Hymenoptera - bees, wasps, and ants

Kingdom Animalia - Phylum Arthropoda: (cont.)

Subphylum Crustacea – “insects of the sea”

Subclass Cephalocarida - horseshoe shrimp

Subclass Branchiopoda

Order Anostraca – brine shrimp

Order Notostraca – tadpole shrimp

Order Conchostraca – clam shrimp

Order Cladocera - water fleas

Subclass Mystacocarida- mustache shrimp

Subclass Copepoda - copepods

Order Calanoida

Order Cyclopoida

Order Harpacticoida

Subclass Branchiura - fish lice

Subclass Ostracoda - seed shrimp

Subclass Cirripedia – barnacles

Subclass Malacostraca

Order Mysidacea - opossum shrimp

Order Isopoda – pill bugs

Order Amphipoda – scud

Order Cumacea – hooded shrimp

Order Euphausiacea – krill

Order Decapoda

Suborder Dendrobranchiata - prawn

Suborder Pleocyemata– shrimp, lobsters & crabs

Subphylum Chelicerata

Class Arachnida

Order Acari – mites & ticks

Order Opiliones – daddy long-legs

Order Uropygi – whip scorpion

Order Pseudoscorpiones – pseudoscorpion

Order Scorpiones – scorpion

Order Araneae – spiders

Class Merostomata – horseshoe crab

Class Pycongonida – sea spiders

Deuterostome Animals

Phylum Echinodermata

Class Asteroidea – sea stars

Class Ophiuroidea – brittle stars

Suborder Euryalida – basket stars

Class Echinoidea – sea urchins

Class Holothuroidea – sea cumpers

Class Crinoidea – sea lilies & feather stars

Phylum Chordata

Subphylum Hemichordata – acorn worms

Subphylum Urochordata – tunicates (sea squirts, salps)

Subphylum Cephalochordata – lancelets

Kingdom Animalia - Phylum Chordata: (cont.)

Subphylum Vertebrata

Superclass Agnatha – jawless fish

Class Cephalaspidomorphi – lamprey eel

Class Pteraspidomorphi – hagfish

Superclass Gnathostomata – jawed fish

Class Chondrichthyes – sharks & rays

Class Osteichthyes – bony fishes

Class Amphibia

Order Apoda – Caecilians

Order Caudata – salamanders

Order Anura – frogs

Class Reptilia

Order Rhynchocephalia – beaked reptiles

Order Testudines – tortoises & turtles

Order Crocodylia

Family Gavialidae – caimans

Family Crocodylidae – crocodiles

Family Alligatoridae – alligators

Order Squamata – lizards

Order Serpentes – snakes

Class Aves

Order Struthioniformes – ostriches

Order Sphenisciformes – penguins

Order Procellariiformes – albatrosses, petrels

Order Ciconiiformes – herons, storks

Order Anseriformes – swan, geese, ducks

Order Falconiformes – eagles, hawks, falcons, vultures

Order Galliformes – turkeys

Order Columbiformes – pigeons, doves

Order Strigiformes – owls

Order Apodiformes – hummingbird, swift

Order Piciformes – woodpeckers, toucans

Order Psittaciformes – parrots, cockatoos, macaws

Order Passeriformes – sparrows, finches, jays, crows,
robins, wrens, starlings

Class Mammalia

Subclass Prototheria – egg-laying mammals

Subclass Metatheria – pouched mammals

Subclass Eutheria – placental mammals

Order Edentata – ant-eaters, armadillos, sloths

Order Insectivora – shrews, moles, hedgehogs

Order Chiroptera – bats

Kingdom Animalia - Phylum Chordata: (cont.)

Order Lagomorpha – rabbits, hares, pikas

Order Rodentia - most gnawing animals (squirrels, rats, mice, porcupines, beavers, ect.)

Order Carnivora – wolves, cats, bears, otters, mink, ect.

Order Pinnipedia – seals, walruses, sea lions

Order Proboscidea – elephant

Order Sirenia – sea cows (manatees, dugongs)

Order Perissodactyla – odd-toed ungulates (rhinos, horses)

Order Artiodactyla – even-toed ungulates (camels, deer, bison, sheep, goats, antelopes, giraffes)

Order Tubulidentata – aardvarks

Order Cetacea – whales, dolphins, porpoises

Order Primates

Suborder Strepsirhini – lemurs

Suborder Haplorhini

Infraorder Tarsiiformes – tarsiers

Infraorder Platyrrhini – new world monkeys

Family Cebidae – spider monkeys, howler monkeys

Infraorder Catarrhini – old world monkeys, hominoids

Superfamily Cercopithecoidea – baboons, macaques

Superfamily Hominoidea – apes, humans

Family Hylobatidae – gibbon

Family Pongidae – chimpanzees, gorillas, orangutans

Family Hominidae – extinct & extant human species