

Calendar Description:

The concepts in this course include nervous and endocrine systems; human reproduction and development; cell division, genetics and molecular biology; population and community dynamics.

Delivery Mode(s):

BI0130 is lecture-based. Furthermore, the course has a lab component. The course is supplemented with resource material offered on Blackboard.

Credit/Contact Hours:

Bi0130 is a 5-credit course including 5 hours of class, and 1.5 hours of lab per week.

Session Details:

September 5, 2008 – December 8, 2008

A final exam is scheduled by the Registrar's office and could be scheduled anytime, up to and including December 19, 2008.

Course Schedule: Dates for quizzes, tests, exams, labs, and assignments will be announced in class and entered into the calendar in Blackboard

Lecture Schedule: M, T: 8:30am – 9:20am, Room TBA
W, F: 8:30am – 9:50am, Room: TBA

Lab Schedule: Thursday, 8:00am – 9:50pm, Room: TBA
or

Thursday, 11:30am – 1:20pm TBA

Note: Labs are not held each week, however, when scheduled they each require 2 hours.

Objectives:

The course is divided into 4 units

- Unit 1:*** The Nervous and Endocrine Systems
- Unit 2:*** Reproduction and Development
- Unit 3:*** Cell Division, Genetics, and Molecular Biology
- Unit 4:*** Population and Community Dynamics

A detailed course syllabus, which lists all the course objectives, is provided as a separate document.

Transferability:

This course is equivalent to the Alberta Learning Biology 30 curriculum, and is listed as such in the Alberta Transfer Guide.

Grading Criteria:

Dates for tests, exams, labs, and assignments will be announced in class and entered on the calendar in Blackboard.

Evaluation:

Tests:

- Unit 1 10%
- Unit 2 5%
- Unit 3 10%
- Unit 4 5%

- Quizzes:. 10%
- Labs 10%
- Assignments..... 5%
- Midterm 20%
- Final 25%

Quizzes: There are 5 quizzes. Each quiz is worth 2%. There are absolutely no make-up opportunities for missed quizzes.

Exams: A **midterm exam** will be written at the end of Unit 2. It will cover the content discussed in Units 1 & 2. A **final exam** will be scheduled during the final exam time. It will cover the content discussed in Units 3 and 4.

Assignments and Lab Reports:

Final assignment and lab grades are calculated using raw scores.

If you are late for a lab, you might not be permitted to do the lab as important safety concerns are always addressed at the beginning of each lab period. If you miss a lab, you will not have the opportunity for a make-up lab. You automatically receive a grade of 0 for that lab.

Statement on Plagiarism and Cheating:

The instructor reserves the right to use electronic plagiarism detection services. Although you work together in pairs in the lab, you are to write separate reports, which are your own work. Electronic devices, other than simple calculators, are not allowed into tests or exams.

Grades will be assigned on the Letter Grading System.

(I also provide the Registrar's office with your percentage grade. Contact the Registrar's office if you need the percentage grade for admittance to another institution.)

Academic Upgrading Department

Grading Conversion Chart

Alpha Grade	4-point Equivalent	Percentage Guidelines	Designation
A⁺	4	90 – 100	EXCELLENT
A	4	85 – 89	
A⁻	3.7	80 – 84	FIRST CLASS STANDING
B⁺	3.3	76 – 79	
B	3	73 – 75	GOOD
B⁻	2.7	70 – 72	
C⁺	2.3	67 – 69	SATISFACTORY
C	2	64 – 66	
C⁻	1.7	60 – 63	
D⁺	1.3	55 – 59	MINIMAL PASS
D	1	50 – 54	
F	0	0 – 49	FAIL

Classroom Department:

AUD STUDENT CLASSROOM DEPARTMENT GUIDELINES

Philosophy: This is an adult education environment; students are expected to show respect for others. Students are also learning skills to prepare them for the work environment.

Preamble: Even though the department is empathetic to the needs of our students, we have determined over the years that certain activities are not conducive to an atmosphere of learning. Therefore, we ask the cooperation of all of our students in several areas of classroom department.

The following guidelines assist all of us in maintaining an adult learning environment with “respect for the rights of other members of the College community” (from the Student Rights and Responsibilities of the College calendar).

1. Please refrain from unnecessary talking in class (“visiting”, social discussions).
Please ask your instructor for information or clarification when you have a question. Other students do not necessarily have the correct information.
2. Turn off your cell phone during class time and other electronic equipment during class time. That is, your electronic device(s) should not ring, vibrate, send you a text message, play music for you, or perform other distracting functions!
3. Do not bring children to class with you. This is an adult learning environment and it is not an appropriate setting for children.
4. Eating, drinking coffee, etc are allowed only on a limited basis and if the following are observed:
 - If you must bring food or drink to class, purchase it during your break so that you are coming to class on time and staying for the duration of the class
 - Clean up all garbage, crumbs, etc. from the area where you were eating/drinking
 - Your eating or drinking should not disrupt your learning activities and progress or the learning activities and progress of others in the class
5. As per the student responsibilities section in the College Calendar, you are expected to “arrive on time and remain for the duration of scheduled classes and related activities.”

AUD EXAM/ATTENDANCE POLICIES

As per the College calendar, students are responsible to “write tests and final examinations at the times scheduled by the instructor or the Office of the Registrar”.

Attendance

Attendance will be recorded each day at the beginning of class. If you miss a significant number of classes your grade will likely suffer. You are responsible for getting the notes and handouts for material missed from your fellow classmates.

LATE EXAMS / TESTS / ASSIGNMENTS / LABS

- 1. In order to be given the opportunity to write an exam/test after the due date or to submit an assignment or lab at a later date, the student must phone or email the instructor on the morning of the absence and be given permission to write the test or submit the assignment or lab at a later date. If the instructor is unavailable, the student should leave his/her home phone number or the number where the instructor can reach the student. Doctor certificates will be required. Any exceptions will be dealt with on a case-by-case basis.**
2. Once a test/lab/assignment has been handed back to the class, there is no opportunity for a late write or hand-in. The student will be assigned a grade of '0' for that test/lab/assignment. Late assignments or labs will receive a -10% per day late penalty. Any exceptions will be dealt with on a case-by case basis.

Electronic Devices:

No unspecified electronic devices will be allowed in exams.

Biology 0130

Course Syllabus 2008/2009

PART I

Introduction: (1 day)

1. Outline the hierarchy of life, and define each of the levels.
2. Review cell structures and functions: cell membrane, cell wall, nucleus, nuclear envelope, nucleolus, cytoplasm, ribosome, mitochondria, chromatin, chromosome, centrioles, cytoskeleton, Golgi apparatus, vacuoles, vesicles, chloroplasts, smooth and rough endoplasmic reticulum
3. Review cellular transport: osmosis, diffusion, facilitated diffusion, and active transport.
4. Review cellular respiration and ATP as the currency of biological systems.

Unit 1: The Nervous and Endocrine Systems (4 weeks)

The human organism regulates physiological process, using electrochemical control systems.

1. Define homeostasis. State why mechanisms that regulate homeostasis are important. Relate the concepts of homeostasis to all hierarchy levels.
Reading: Page 366
2. Summarize the functions of the nervous system.
Reading: Page 366 - 367
3. Map an organization chart of the nervous system and identify the functions of each of the parts.
Reading: Page 367
Resources: Overhead
Handout for Students –blank chart
4. Draw a neuron, and indicate the following parts: axon, soma, nucleus, dendrite, axon bulbs, myelin sheath, glial cells, Schwann cells and nodes of Ranvier. State the functions of each of the parts.
Reading: Pages 368 and 372

5. Define a nerve. Differentiate between a neuron and a nerve.
Reading: Page 368

6. Explain the mechanism of a nerve impulse by defining action potential in terms of its component parts: resting stage; depolarized stage; repolarized stage; and refractory period. Define the following: correct “stimulus”; the “all-or-none response”; saltatory conduction; and threshold potential.
Reading : Pages 372 – 378
Resources: Web Link: action potential animation
Web Link: sodium and potassium voltage gates animation
Web Link: sodium and potassium pump animation
Exercise: Matching exercise

7. Discuss the transmission of a nerve impulse across a synapse. Differentiate between excitatory and inhibitory neurotransmitters and how they work. Include in your discussion the names of the neurotransmitters, their functions, the enzymes that destroy those neurotransmitters and effects of abnormal production. Explore the effect of drugs on the synapse.
Reading: Pages 376 – 382
Resources: Web Link: synapse animation

8. State the importance of the reflex arc and trace the pathway of a nerve impulse through the reflex arc. State the functions of each of the following: sensory receptor, sensory neuron, interneuron, motor neuron, and effector(s). Explain the functions of the spinal cord and label a diagram of the cord.
Reading: Page 369 -370
Resources: Overhead
Handout of diagram of reflex arc and spinal cord to label
Web Link: reflex arc animation
Exercise: Worksheet questions on the reflex arc

9. Explain the role of the peripheral nervous system in regulating the somatic (voluntary) and autonomic (involuntary) systems.
Reading: Pages 396 -398

10. Compare the functions of the sympathetic and the parasympathetic divisions of the autonomic system. Relate these concepts to cellular respiration. Differentiate between the neurotransmitters of the two systems.
Reading: Pages 396 – 398
Resources: Handout of hypothalamus and autonomic nervous system
PowerPoint presentation

11. State the functions of each of the following brain parts, and label on a diagram: medulla oblongata, pons, cerebellum, hypothalamus, thalamus, cerebrum, pituitary gland, parietal lobe, frontal lobe, occipital lobe, temporal lobe, meninges, corpus callosum. Discuss the structure and function of the blood-brain barrier.

Reading: Pages 376 – 382

Resources: Overhead of brain
Handout of diagram of brain to label
PowerPoint Presentation
Models of Brain

Exercise: Matching Exercise

The human organism has sensory organs to relay external environmental information to the organism.

1. For each of the following receptors state their stimulus, and the information provided: chemo receptors, mechanoreceptors, proprioceptors, thermo receptors and photoreceptors.

Reading: Pages 407 - 409

Resources: LearnAlberta video – Tactile and Chemo receptors (approx 30 minutes)

Worksheet to go with video
Blinking Reflexes Demo

2. Label the following parts on a diagram of the eye: sclera, choroid, retina, vitreous humor, aqueous humor, cornea, lens, iris, fovea centralis, pupil, ciliary body, and optic nerve. State the functions of each of the parts.

Reading: Pages 410 – 411

Resources: Diagram of eye, handout and overhead
PowerPoint Presentation
Model of Eye

3. Define the following: adaptation, glaucoma, accommodation, cataracts, astigmatism, myopia and hyperopia.

Reading: Pages 412 – 413

Resources: PowerPoint presentation

4. Label the following parts of the ear: outer ear consisting of the pinna and auditory canal; the middle ear consisting of the tympanic membrane, malleus, incus, stapes, Eustachian tube, and oval window; and the inner ear consisting of the auditory tube, vestibule, cochlea (organ of Corti), auditory nerve, and semicircular canal. State the functions of each part. Differentiate between static and dynamic equilibrium.

Reading: Pages 419 – 421

Resources: Diagram of ear and overhead
PowerPoint Presentation
Model of Ear
Internet Jeopardy for Brain, Eye and Ear

5. Suggest reasons for hearing loss.

Reading: Pages 423 - 424

The human organism regulates physiological process, using chemical control systems.

1. Differentiate between endocrine and exocrine glands.
2. Illustrate and explain models of negative feedback mechanisms, and positive feedback mechanisms.
Reading: Pages 440 - 441
3. Illustrate and explain models of action of protein hormones, and steroid hormones.
Reading: Pages 439 - 441
Resources: Overheads
Diagrams posted on Bb
4. Label the following glands on a diagram of a human body: hypothalamus, pituitary, thyroid, pancreas, parathyroid glands, adrenal glands, thymus, testis, and ovary
Reading: Page 439
Resources: Overhead anatomy of endocrine glands
Handout : Diagram of endocrine glands to label
5. Indicate where each of the following hormones are produced; their target tissues; full names and abbreviations. Furthermore state their functions and how they are controlled. These include: TSH, thyroxine, ACTH, cortisol, glucagon, insulin, hGH , ADH, prolactin, oxytocin, epinephrine and parathyroid hormone.
Reading: Pages 440, and 444 - 471
Resources: Demonstration of hypothalamus, anterior pituitary gland and thyroid gland complex using separatory flasks and coloured water.
Matching exercise
6. Identify where insulin and glucagon are produced. Compare the antagonistic functions of insulin and glucagon and illustrate how these two hormones regulate blood sugar levels.
7. Discuss the causes and symptoms of the following disorders: goiter, cretism, gigantism, cushings, Graves, acromegaly, diabetes insipidus, diabetes type I and diabetes type II.
Reading: Pages 444 - 471
Resources: PowerPoint presentation
8. Compare the endocrine and the nervous systems, and indicate how they function together especially in dealing with stressful situations. Relate these functions to the concepts of cellular respiration.
Reading: Page 437

Unit 1: Evaluation Activities		
Activity	Date	Grade
Quiz: Nervous System		
Quiz: Brain, Eye, Ear		
Nervous System Lab		
Unit 1 Test		

Unit 2: Reproduction and Development (2 weeks)

Humans and other organisms have complex reproductive systems that ensure the survival of the species.

1. State the functions of each of the following male reproductive structures: testes, epididymis, vas deferens, seminal vesicles, prostate gland, Cowper's gland, seminiferous tubules (Sertoli cells, and interstitial cells) and urethra.
Reading: Pages 478 – 481
Resources: PowerPoint presentation
2. Label the above parts of the male anatomy on a diagram.
Reading: Page 479
Resources: Overhead – male anatomy
Handout – diagram to label male anatomy
3. Outline where and how sperm are produced and the journey they travel to the outside environment, including the composition of semen.
Reading: Page 480
4. State the site of production, the target organ(s) and the functions of each of the following male hormones: testosterone, luteinizing hormone, follicle stimulating hormone and inhibin. Interpret a flow diagram illustrating hormonal regulation of male reproductive system. State their effects on primary and secondary sexual characteristics.
Reading: Page 492 – 495
Resources: Overhead – hormonal control
Handout – hormonal control

5. State the functions of each of the following female reproductive structures: myometrium, perimetrium, and endometrium, ovaries, fallopian tubes, uterus, cervix, and vagina.
Reading: Pages 481 – 483
6. Label the above parts of the female anatomy on a diagram.
Reading: Page 481
Resources: Overhead – female anatomy
Handout – diagram to label female anatomy
7. Outline where and how eggs are produced, and their journey to the uterus.
Reading: Pages 481 – 484
Resources: PowerPoint presentation
8. State the site of production, the target organ(s) and the functions of each of the following female hormones: estrogen, progesterone, luteinizing hormone, follicle stimulating hormone, prolactin, and oxytocin. Interpret a negative feedback loop illustrating the control mechanism of female hormones. State their effects on primary and secondary sexual characteristics.
Reading: Pages 495 – 498
Resources: Overhead of female hormonal regulation
Handout of female hormonal regulation
Internet animation of female reproductive system
9. Given a graph illustrating the fluctuations of female hormones through a normal cycle interpret the graph as to the physiological events that are occurring. Differentiate between the ovarian and uterine cycles.
Reading: Page 500
Resources: Overhead of hormones, developing follicles, hormones, and endometrial changes
10. Discuss the impact of natural aging on the male and female reproductive systems.
Reading: Page 495 and 498
11. Identify the risks that sexually transmitted infections (STIs) such as HIV/AIDS, hepatitis, genital herpes, HPV, Chlamydia, gonorrhea, and syphilis have on general health and reproductive success
Reading: Page 486 – 491
Assignment: Select one STI and write a one-page report which answers the following questions: 1) What is the cause of the STI? 2) What is the effect of the STI on the general health of the individual or on the reproductive success for that individual? 3) How is the spread of this STI controlled? 4) Is there a cure, or at the least a control of symptoms for this STI?

Cell differentiation and development in the human organism are regulated by a combination of genetic, endocrine and environmental influences.

1. Outline the changes that occur during the embryonic period of development from fertilization to cleavage, to the development of the morula and blastocyst., gastrulation, neurulation and organogenesis. State the organ development from each of the three germ layers.
Reading: Pages 508 – 513
PowerPoint Presentation:
Miracle of Life Streaming Video and PBS
2. Name the three extraembryonic cell membranes that arise from the developing blastocyst and state each of their functions. Name the three germ layers formed by gastrulation, and indicate the role of each of these layers.
Reading: Page 513
PowerPoint Presentation
Overhead of developing embryo
Handouts of diagram of developing embryo
3. Outline the changes that occur during each of the trimesters.
Reading: Pages 520 – 521
Miracle of Life and Streaming Video
4. State the purpose of the placenta and the umbilical cord.
Reading: Pages 515 – 517
5. State the roles of the following pregnancy and post pregnancy hormones: HCG, progesterone, relaxin, prostaglandins, oxytocin and prolactin
Reading: Pages 512 and 523 - 526
6. Define teratogen. Give 3 teratogens and state their effects on the developing fetus.
Reading: Pages 520 – 523
7. Make a personal decision regarding embryonic stem cell research and its value.
Reading: Page 527
Video: Stem cell debate – PBS, streaming video
8. Give technologies that enhance reproductive potential, and reduce reproductive potential.
Reading: 529 - 534

Unit 2: Evaluation Activities		
Activity	Date	Grade
Fetal Pig Lab		
STI Assignment		
Unit 2 Test		

MIDTERM EXAM

PART II:

Introduction: (1 day)

1. Review the parts of the microscope and state their functions. Identify steps to use, and store the microscope in a safe manner.
2. Calculate both macroscopic and microscopic drawing magnifications.

Resources: PowerPoint Presentation on Blackboard
 Lab Manual
 Assignment

Unit 3: Cell Division, Genetics, and Molecular Biology (4 weeks)

Cells divide to increase in number but must reduce their chromosome number before combining at fertilization.

1. Define the following terms: chromatin, chromosome, histones, gene, allele, haploid, diploid, gamete, somatic cell, autosome, sex-chromosome, ploidy, locus, paternal and maternal chromosomes, homologous chromosomes, and karyotype.

Reading: Pages 550 – 553 and 565

Resources: Pipe cleaner chromosomes
 Overhead of chromosome
 Poster of chromosome
 Kayotypes and LearnAlberta
 PowerPoint

2. Outline, illustrate, and discuss the steps of the cell cycle (mitosis) using a thin-slice onion tip mount. Include: interphase,(G1, S, G2); prophase; metaphase; anaphase; telophase; and cytokinesis.

Reading: Pages 553 – 561

Resources: Handout of cell cycle
Animation of cell cycle on Bb
Animation of cell cycle on LearnAlberta Site
Animation of mitosis on LearnAlberta Site
PowerPoint of cell cycle (See Unit3)
PowerPoint of mitosis
Pipe cleaners
Prelab: Identify the stages of mitosis- External Link Bb
Lab: Mitosis

3. Differentiate between plant and animal mitosis.

4. Infer why regulation of the cell cycle is important.

Reading: Pages 560 - 561

5. Outline and discuss the steps of meiosis including meiosis I and meiosis II.

Reading: Pages 563- 565

Resources: Animation: Stages of meiosis on LearnAlberta Site
Animation: Unique Features of Meiosis on LearnAlberta Site

6. Define germ cells, synapsis, tetrad and asymmetrical cytokinesis.

Reading: Pages 563, 564, 565, and 570.

7. Illustrate and discuss how crossing over and independent assortment can lead to genetic variation.

Reading: Pages 565 – 566

Resources: Random Alignment of Chromosomes on LearnAlberta Site

8. Compare the processes spermatogenesis and oogenesis

Reading: Pages 569 – 570

Resources: Overheads of spermatogenesis and oogenesis

9. Define non-disjunction. Give the chromosomal abnormalities and physical manifestations for each of the following: Downs, Turners, and Klinefelters.

Reading: Page 567

10. Compare and contrast mitosis and meiosis.

Resources: Learn Alberta: Comparison of Mitosis and Meiosis

Laws can explain how traits are handed down from one generation to the next.

1. State and explain the principle of dominance and Mendel's two laws of heredity. Outline his experiments including parental and filial (progeny) generations.

Reading: Pages 588 - 593

2. Define each of the following genetic terms: gene, dominant, recessive, complete dominance, genotype, phenotype, homozygous, heterozygous, alleles.
Reading: Pages 588 – 593
3. Given genotypes, determine all possible gametes.
4. Predict the offspring and determine the probability of inheritance resulting from monohybrid and test crosses by using Punnett squares.
Reading: Pages 590 - 591
5. Predict the offspring and determine the probability of inheritance resulting from dihybrid crosses by using Punnett squares.
Reading: Page 593
6. Predict the offspring from the following types of crosses: co-dominance, and incomplete dominance.
Reading: Page 594
7. Differentiate between linked and non-linked genes.
Reading: Page 599
8. Given data, identify the recombinant and parental types to determine crossing over frequencies and use these frequencies to map chromosomes.
Reading: Pages 599 – 601
9. Predict the offspring and determine the probability of inheritance resulting from sex-linked crosses by using Punnett squares.
Reading: Pages 601 – 603
10. Predict the offspring and determine the probability of inheritance resulting from multiple alleles of the same gene.
Reading: Pages 604 – 605.
11. Draw and interpret pedigree charts.
Reading: Pages 611 - 621

Classical genetics can be explained at the molecular level.

1. Discuss the historical findings of the structure of DNA by Franklin, Watson and Crick.
Reading: Pages 625 – 627
Resources: PowerPoint – Classical Genetics can be explained at the molecular level
2. Label a diagram of a DNA model.
Reading: Pages 627 -628
3. Outline the steps of DNA replication and state where and when it occurs.

Reading: Pages 630 – 632
Resources: Animation: DNA Replication Fork, LearnAlberta
 PowerPoint: DNA Replication

4. Compare DNA and RNA.

5. Discuss protein synthesis and the role of transcription and translation. Predict the mRNA strands, anticodons (including initiator and terminator) and amino acid sequences.

Reading: Pages 636 – 642

Resources: Animation: Protein Synthesis, LearnAlberta (This is animation of translation.)
 PowerPoint: Gene Expression and Protein synthesis

6. Define mutation. Distinguish between different types of mutations and state causes of mutations.

Reading: Pages 643 - 645

7. Define genome, genomics, recombinant DNA, genetic engineering and DNA fingerprint.

Reading: Pages 633; 640; 647; and 660

Resources: Cracking the Code of Life, First two streaming videos

8. Discuss how lineage can be traced through mtDNA.

Reading: Page 647

9. Debate the benefits and the drawbacks of genetic research.

Reading: Pages 652 – 661

Resources: PBS Streaming Video Cracking the Code of Life, One Wrong Letter and Tay Sachs Disease

Unit 3: Evaluation Activities		
Activity	Date	Grade
Microscope Assignment		
Three Genetics Problems Assignments		
Molecular Genetics Assignment		
Mitosis Lab (2 lab periods)		
Mendelian Genetics Lab		
Quiz: Mitosis and Meiosis		
Two Quizzes: Genetics Problems, Chromosome mapping and pedigree charts		
Unit 3 Test		

Unit 4: Population and Community Dynamics (10 days)

Communities are made up of populations that consist of pools of genes from the individuals of a species.

1. Define population and gene pool.
Reading: Page 679
2. Define evolution. List five conditions that must exist for maintaining a stable population.
Reading: Page 681
3. Describe in words, and by its equation the Hardy-Weinberg principle. Apply quantitatively the Hardy - Weinberg principle to published data.
Reading: Pages 680 – 685
Resources: Video, The Hardy-Weinberg Principle, LearnAlberta
4. Define genetic diversity and explain the contributions of mutations, gene flow, non-random mating, genetic drift including founder effect and bottleneck effect, and natural selection.
Reading: Pages 689 – 695
Resources: Video, Gene Frequencies, Natural Selection and Speciation, LearnAlberta
5. Explain how human activities have impacted genetic diversity.
Reading: Page 695

Population numbers change over time.

1. Explain how mortality, natality, immigration, and emigration influence population growth.
Reading: Pages 707 -708
2. Differentiate between the three theoretical distribution patterns: uniform, random and clumped.
Reading: Page 705 and 706
3. Perform calculations including: density, percent change in density, change in population size, percent change in population size, growth rate, and per capita growth rate.
Reading: Pages 704, 708 – 711
4. Define biotic potential, lag phase, exponential growth phase, and carrying capacity, and blowout. Graph and interpret the following growth patterns: exponential and logistic
Reading: Pages 708 – 711
Resources: Video, Patterns of Population Growth and Management, LearnAlberta

5. Define and classify density-dependent and density -independent factors affecting populations.

Reading: Page 712

6. Differentiate between K-selected, and r-selected populations.

Reading: Pages 712 & 713

There is interaction between members of a population and between members of other populations.

1. Give examples of predator/prey relationships, and interpret predator/prey graphs.

Reading: Pages 719 -722

2. List and give examples of defense mechanisms

Reading: Pages 722 - 723

3. Define the following terms: symbiosis, commensalism, mutualism, parasitism, intraspecific competition, and interspecific competition.

Reading: Pages 723 – 725

Resources: Video, Interactions and Relationships, LearnAlberta
PowerPoint: Interactions within and between populations.

Population types change over time

Reading: Pages 725 - 728

1. Define the following terms: succession, primary succession, secondary succession and climax communities.

2. Outline the stages including pioneer species, seral communities and climax species in both primary and secondary succession.

Resources: Video, Succession, LearnAlberta

3. Compare primary and secondary succession.

4. Define sustainability

Reading: Page 731

5. Describe the advantages and disadvantages of introducing a foreign species to an environment.

Reading: Page 732

6. Discuss human population growth and interpret age pyramids.

Reading: Pages 733 - 735

Unit 4: Evaluation Activities		
Activity	Date	Grade
Hardy-Weinberg Assignment		
Population Assignment		
Breeding Bunnies Lab		
Yeast Population Lab		
Unit 4 Test		

FINAL EXAM (Units 3 and 4 only)