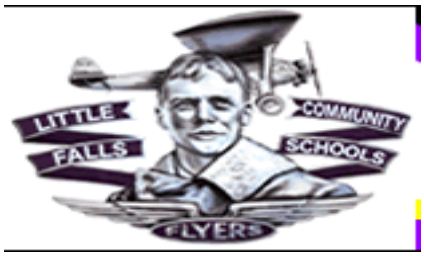
CLC
CENTRAL LAKES
COLLEGE

501 West College Drive
Brainerd, MN 56401

Red = required CLC
Blue = H.S. required
Black = additional info.



Little Falls High School
Street Address
Little Falls, MN

BIOL 1404/Course Syllabus
Human Biology

Instructor:
Office:
Office Hours:

Email:
Office Phone:

Course Information

Course Title: BIOL. 1404 - Human Biology
Credits: 3 semester credits – includes a lab
Term: Spring 2013

Sections:

Prerequisites

In order to be eligible for college credit a student must be a junior with a 3.0 GPA or a senior with a 2.5 GPA. It is HIGHLY RECOMMENDED that students be in or have completed higher algebra. (This is an example of a pre-requisite for one of the high schools.)

Course Description (taken directly from the CLC common course outline)

This course provides an introduction to the structure and function of the human body using an organ systems approach. The organ systems studied include: the integumentary, skeletal, muscular, circulatory, respiratory, digestive, excretory, nervous, endocrine and reproductive systems. Human development and heredity will also be integrated. This course is composed of two hours of lecture and a two-hour lab

Course Purpose

This is an introductory level course in the anatomy and physiology of the human body. It is a general science course for anyone interested in understanding the structure and function of the human body as well as the terminology used to describe and define it. It is an excellent course for the health care consumer to aid them in understanding how their own body functions and in understanding diagnoses and decisions made available to them by their family physician.

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The course is designed for dental assisting, practical nursing and associate degree in nursing, as well as social work and non-science majors. This course fulfills 3 credits of the transfer curriculum goal 3 – Natural Sciences requirement of the Minnesota General Education Transfer Curriculum.

Course-Specific Learning Outcomes

Upon completion of this course the student will be able to:

- Apply scientific methodology to the study of human biology, (anatomy, and physiology)
- Apply basic principles of chemistry to human biology.
- Describe the structure and function of cells and the processes of cell division (mitosis
- and meiosis)
- Identify the major microscopic and macroscopic structural features of the human body
- Provide examples of the relationship between anatomical structures and body functions including identification of the eleven major organ systems and their respective major components and functions, identification and understanding of the structural organization, gross function and levels of integration of the human body with regard to homeostasis
- Describe the fundamental mechanisms of heredity and perform basic genetic calculations
- Describe some commonly encountered pathological and genetic conditions
- Discuss the function of the immune system in health and disease
- Describe how factors such as age, nutrition, drugs, pollutants, injury, disease and stress can affect human health
- Utilize the basic vocabulary common to life science and medical professionals
- Gain a personal inspiration and basis for career selection to generalize or specialize in some area of life science, health care and/or medical practice
- Practice cooperative and professional interaction with colleagues in developing a career subject expertise
- Practice the analytical skills of professional life scientists

College-Wide Learning Outcomes

The students will be measured in their individual ability to:

- Demonstrate a fundamental understanding of the anatomy and physiology of the major organ systems in humans
- Apply the principles of inquiry based scientific method to the writing of a formal laboratory report

Topical Outline (directly from CLC common course outline)

1. Lecture Sessions

Lecture Content Outline
A. Understand Science and Scientific Method
1. Define Science, Biology, Theory
2. Outline and demonstrate Scientific Method as a process for knowledge acquisition
3. List characteristics of Life and Living Organisms
4. Identify the levels of organization of the human body from the chemical level to the organism level and know where humans fit (or belong) in the organizational hierarchy
B. Describe the Chemistry of Life

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1. Define and give examples of Matter, Element, Atom, Molecule, Compound (in the context of Human Biology)
2. List physical and chemical properties of water
3. Understand the relationship of hydrogen ion concentration and pH scale (Acids and Bases)
4. Know the biological polymers (carbohydrates, lipids, proteins, and nucleic acids), and be able to relate their physical and chemical properties to their functions (in humans)

C. Identify Cell Structures and their Functions

1. Describe the structure and function of the cell membrane
2. Understand membrane transport processes
3. Explain cellular respiration – anaerobic and aerobic
4. List and describe the function of organelles

D. Describe how major body systems function to achieve homeostasis

1. Define homeostasis
2. Give examples of positive and negative feedback loops

D. Classify tissue types

1. Connective: describe their appearance, functions and give examples of where they're found in the body
2. Muscular: describe their appearance & functions and give examples of where they're found in the body
3. Nervous: describe their appearance, functions and give examples of where they're found in the body
4. Epithelial: describe their appearance, functions and give examples of where they're found in the body

E. Know the structure and function of the Skin and Integumentary System

1. Describe the histology of the skin
2. List the functions of the Integumentary System and relate it to the structures in the skin

F. Know the structure and function of the Heart and Blood Vessels

1. Explain the overall function of the cardiovascular system
2. Describe the anatomy of the heart as a four- chambered pump
3. Explain the cardiac cycle and its control; the conduction pathway and its relationship to an ECG
4. Distinguish the pulmonary and systemic circuits
5. Distinguish the types of blood vessels
6. Describe capillary exchange

G. Distinguish the Elements of Blood

1. Describe the composition of plasma
2. List and describe the formed elements: erythrocytes, leukocytes, and platelets
3. Relate the functions of blood to the structures/composition
4. Discuss the role of stem cells
5. ABO blood typing system, including Rh factor

H. Understand the structures of the Lymphatic System and their relationship to Immunity

1. Know the tissues and organs of the lymphatic system
2. Distinguish Innate Defenses and Acquired Defenses
3. Understand the ways Immunity is acquired

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I. Identify the organs of the Digestive System and understand their functions

1. Describe the organs of the gastrointestinal tract and their anatomical relationship
2. Explain the histology of the GI organs and note their functional significance
3. Understand the processes of chemical and mechanical digestion
4. Understand the role and relationship of the accessory organs: (liver, gallbladder, pancreas, salivary glands)

J. Identify the organs of the Respiratory System and understand their functions

1. Describe the structures of the respiratory system and their anatomical relationship
2. Review the exchange of gases between the lungs and blood (the pulmonary circuit)
3. Understand breathing mechanics, and the relationship between atmospheric and alveolar pressure in ventilation
4. Define Tidal Volume, Vital Capacity, Residual Volume, Inspiratory Reserve Volume, Expiratory Reserve Volume, and know how to determine these values on a spirogram

K. Identify the organs of the Urinary System and understand their functions

1. List and describe the organs of the urinary system and their anatomical relationship
2. Understand nephron structure, and types
3. Understand the relationship between vascular and tubular components of the kidney in urine production
4. Explain the processes of filtration, tubular reabsorption and tubular secretion in urine formation
5. Understand how the kidneys maintain water and salt balance

L. Identify the bones and tissues of the Skeletal System and understand their functions

1. Distinguish the bones of the axial and appendicular skeletons
2. Distinguish the structure, function and location of compact vs. spongy bone
3. Describe the development and remodeling of bone, types of cells involved and types of ossification
4. Discuss types of fractures and the physiology of bone repair

M. Identify the tissues and muscles of the Muscular System and understand their functions

1. Describe the structure of skeletal muscle
2. Explain the sliding filament model, its parts, and how it functions to produce movement
3. Recognize the stages of a muscle twitch and its “all-or-none” property

N. Identify the organs of the Nervous System and understand their functions

1. Distinguish the CNS vs. PNS
2. Describe the major regions of the brain and their responsibilities
3. Know the structure of the spinal cord and the components and path of a spinal reflex arc
4. Distinguish the Somatic vs. Autonomic Nervous System
5. Distinguish the sympathetic and parasympathetic divisions of the Autonomic Nervous System

O. Identify the Sensory Organs and understand their functions

1. Know the different types of receptors
2. Identify the components of a sensory pathway
3. Know the general structures and receptors involved in touch, taste, vision, olfaction and hearing.

P. Identify the organs of the Endocrine System and understand their functions.

1. Know the anatomical location of the main endocrine glands: pituitary (anterior and posterior), pineal, thymus, thyroid, parathyroid, adrenal (cortex and medulla),

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pancreas, testes, and ovaries 2. List the hormones produced by each gland, describe their target organ and functions
Q. Identify the organs of the male and female Reproductive Systems and understand their functions
1. Understand where and how gametes are formed 2. Explain the hormonal events of the ovarian and uterine cycles
R. Development
1. Understand where and how fertilization, pre-embryonic development and implantation occur
2. Describe and distinguish embryonic and fetal development
3. Describe the anatomical & physiological changes in the female during pregnancy, labor and delivery
S. Patterns of Inheritance
1. Compare mitosis and meiosis
2. Define (homologous) chromosomes; Distinguish autosomes, sex chromosomes 3. Discuss inheritance

2. Laboratory/Studio Sessions

Lab/Studio Content Outline
A. The Chemistry of Life
1. Investigate substrate/end-product chemical reactions
B. Cell Structures and their Functions
1. Care and use of the compound light microscope 2. Microscopic observation of (human) cells
C. Tissue Types
1. Microscopic observations of representative human body tissues 2. Identify tissues and features on models and diagrams
C. The Integumentary System
1. Microscopic observations of skin and accessory structures (sweat glands, sebaceous glands, hair follicles, nails) 2. Identify features of the skin on models and diagrams
D. The Cardiovascular system
1. Identify the chambers, valves and vessels of the heart on models, diagrams and the fetal pig 2. Identify systemic blood vessels on models, diagrams and the fetal pig
E. The Elements of Blood
1. Microscopic observation of erythrocytes, basophils, neutrophils, eosinophils, monocytes, lymphocytes and platelets to be able to identify and know the functions of each
F. The Digestive System
1. Identify the organs on models, diagrams and the fetal pig and understand their functions
2. Collect and interpret data for a Diet & Exercise (Energy Intake and Energy Requirements) analysis. Prepare a summary.
G. The Respiratory System
1. Identify the organs of the respiratory system on models, diagram, and a fetal pig and understand their functions

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2. Perform pulmonary function tests
H. The Urinary System
1. Identify the organs of the Urinary System on models, diagrams, and a fetal pig and understand their functions
I. The Skeletal System
1. Identify the boney tissues of the Skeletal System on models and diagrams & understand their functions 2. Identify the bones of the human skeleton on both articulated and disarticulated skeletons
3. Classify bone types, articulations and movement
J. Muscular System
1. Identify the major muscles of on diagrams and models and understand their actions
2 Know how muscles are named
K. The Nervous System
1. Identify the organs of the Nervous System in diagrams and models and understand their functions 2. Identify brain regions on models, diagrams and a sheep dissection 3. Microscopic observation of spinal cord, nerves and nervous tissue
L. Sensory Organs
1. Identify the Sensory Organs (Eyes and Ears) in diagrams and models and understand their functions
M. Identify the organs of the Endocrine System in diagrams, models, and the fetal pig and understand their functions
N. Identify the organs of the male and female Reproductive Systems in diagrams, models, and a fetal pig and understand their functions
O. Gametogenesis
1. Use a simulation (pop-beads, felt board, etc.), models and /or diagrams to demonstrate the processes of cell division (mitosis and meiosis)
P. Fertilization and Development
1. Microscopic or gross observations of whitefish, star fish, or sea urchins
2. Identify the stages of early human development on models and diagrams

Required/Recommended Textbooks, Materials/Supplies

Required Text:

Human Biology, 12th edition by Sylvia Mader. McGraw Hill Publishing Co., 2008. (10th can be used if necessary)

Human Biology, Laboratory Manual by Sylvia Mader, 12th edition, McGraw Hill, 2008.

Optional Texts:

Anatomy & Physiology Coloring Workbook & Study Guide, 9th edition by Elaine Marieb, Pearson,

Benjaming

Cummings Publishers, 2009.

Student Study Guide for Human Biology, by Sylvia Mader, McGraw Hill Co. 2008.

**See CLC Bookstore for more optional texts.

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Web Resources

- CLC uses a course delivery software called Desire 2 Learn (D2L). The instructor will post the current course syllabus, tentative class schedule, outlines, video links, assignments and study guides in D2L content. The site is updated regularly to provide links to current course materials.
- The NEWS area in D2L will be used to update schedule changes, weather related issues etc. Students will want to check the D2L homepage for the course routinely to keep informed.

Grading Criteria/Course Evaluation

Student Requirements

Lab Etiquette

The biology staff and the next lab section would appreciate your cooperation with the following procedures:

1) Please cleanup your station before you leave.
2) Clean and return equipment, prepared slides, dissecting tools and other materials to their proper places.
3) Throw garbage in the wastebasket.
4) Observe lab safety rules.
5) Replace chairs under benches.

Academic Integrity

Academic integrity is one of the most important values in higher education. This principle requires that each student's work represents his or her own personal efforts and that the student acknowledges the intellectual contributions of others. The foundation for this principle is student academic honesty.

Central Lakes College expects all students to uphold the highest standards of academic integrity and acts of dishonesty will not be tolerated. See the student handbook for more detailed information

- **Professional** Conduct and Communication are expected.
  Formal and professional conduct is expected of you at all times in lecture, lab and on campus. Your practice of study, communication, politic, inter-personal and group interaction skills, generally accepted and expected of a medical-professional, begins and / or continuously improves in this class. Pro-actively shared, cooperative assistance is highly valued in the professional setting because it is a critical factor in providing quality health care and quality science. Because unprofessional, disruptive, and / or rude behavior demonstrated by you is harmful to the quality of health care in the professional setting to which you aspire, its demonstration in this educational setting toward anyone, including me, is unacceptable and will result in your immediate discharge from the classroom / lab. Your grade and your continued membership in the course will be negatively affected based upon the severity of the offense.

- **Cheating / Plagiarism** - *Cheating / Plagiarism are not tolerated in any form.*
  Cheating defined:

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- Copying, in part or in whole, from another's test or other evaluation instrument or obtaining answers from another person during the test.
- Submitting work previously presented in another course, if contrary to the rules of either course.
- Using or consulting, sources or materials not authorized by the instructor during an examination
- Altering or interfering with grading or grading instruction.
- Sitting for an examination by a surrogate, or as a surrogate
- Any other act committed by a student in the course of his or her academic work, which defrauds or misrepresents, including aiding or abetting in any of the actions defined above
- Talking or consulting during the test with another person
- Giving / providing in any way, information to other students that allows the student an undeserved advantage on an exam or quiz, such as telling a peer what to expect on a make-up exam or prepping a student for a test in another section of the same class.

- **Plagiarism defined**:
  - The act of incorporating the ideas, words, sentences, paragraphs or parts thereof, or the specific substance of another's work, without giving appropriate credit, and representing the product as one's own work
  - Representing another's artistic/scholarly or similar works as one's own
  - Plagiarism may either be deliberate or unintentional, but it must be avoided with all due diligence.

- **Consequences of academic dishonesty**, un-acceptable behavior**:**
  Upon the first infraction of academic dishonesty, the instructor may do one or more of the following:
  - Give a lower or failing grade on the assignment or exam
  - Give a lower or Fail grade in the course
  - Refer the student to the Vice President of Student Services for student disciplinary action.

  In the event of a second infraction, upon consultation with the division chair, the instructor may do one or more of the following:
  - Fail the student from the course
  - Refer the student to the Vice President of Student Services for student disciplinary action

Statement of Accomodation – ADA

As an affirmative action, equal opportunity employer and educator, Central Lakes College is committed to a policy of nondiscrimination in employment and education opportunity and works to provide reasonable accommodations for all persons with disabilities. Accommodations are provided on an individualized, as-needed basis, determined through appropriate documentation of need. The accommodations authorized in your plan should be discussed with your instructor. All discussions will remain confidential.

For details specific to CLC, please contact Andria Belisle, Disability Coordinator, abelisle@clcmn.edu or 218-855-8175, office E138.

Affirmative Action Statement

Central Lakes College is committed to a policy of nondiscrimination in employment and education opportunity. No person shall be discriminated against in the terms and conditions of employment,

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personnel practices, or access to and participation in programs, services, and activities with regard to race, sex, color, creed, religion, age, national origin, disability, marital status, status with regard to public assistance, or sexual orientation.

Emergency Procedures

Emergency information and procedures can be found in each classroom. Please take time to review these procedures.

Important Dates

- AUG 26TH Last day to drop a class without receiving a "W" and without financial obligation.
- AUG 26TH Last day to request Credit/No Credit grading
- *NOV 29 TH Last day to drop a class with a "W" appearing on transcript.

- *Note: A letter grade must be assigned for any class not dropped by this date. It is the student's responsibility to drop a class through the registration office.
- NOTE: **It is the student's responsibility** to fill out the appropriate forms in order to be dropped from the course. Do not assume that the instructor will drop you from the course if you stop attending class. If you stop attending the class, and if you fail to officially drop the course by filing for *drop* within the appropriate period, and with the Records Office, you will receive a grade of **Fail** in the course.

School Closings

The school calendar located on-line and inside of the CLC course schedule lists days the college is officially closed. In the event of inclement weather or an emergency, closings will be listed on the CLC web homepage and broadcast over local radio stations.

Academic Standards

This course is part of the College in the Schools program through CLC. If you are taking this course for college credit you are required to meet CLC's academic standards. This means that you must maintain a 2.0 GPA and complete 67% of the college courses that you enroll in or you will be placed on academic probation.

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