

M: Course Objectives / Learning Outcomes

Upon completion of Biology 1103, the student will be able to:

1. Use a compound microscope, and describe and identify cell and tissue types in the body.
2. Describe the chemistry and properties of water, and the structure and biological significance of carbohydrates, lipids, proteins and nucleic acids.
3. Describe the basic principles of homeostasis and negative feedback systems, and provide at least one example of a homeostatic mechanism.
4. Describe anatomical structures using appropriate terminology, and specify the locations of various organs and systems.
5. Describe the components and functions of the integumentary system.
6. Identify the components of the human skeleton, and describe the structure and growth of long bones.
7. Describe the types and range of movements of skeletal articulations.
8. Describe the basic principles of biomechanics.
9. Describe the location, structure, and functions of the major muscles of the body.
10. Describe the gross anatomy of muscles and the microanatomy of muscle tissue.
11. Describe the physiology of muscle contraction.
12. Describe the structure and functions of the cardiovascular and lymphatic systems.
13. Describe the origin, composition, and functions of blood.
14. Describe the basis of the ABO blood groups and explain the significance of this to blood transfusions.
15. Describe the mechanism of blood clotting.
16. Describe the basic organization of the immune system, and distinguish between nonspecific and specific resistance, and distinguish between cellular and humoral specific immunity.
17. Describe the structure and function of the respiratory system and describe the transport of gases in the blood.

Core Competencies (General Academic Expectations of Students)

Students successfully participating in this course will be expected, in addition to specific course objectives, to demonstrate competency in the following:

1. Oral, Written and Interpersonal Communications.
In-classroom assignments, weekly written tests, mid-term and final examinations in this course will include writing. Students will work in groups on in-classroom assignments.
2. Independent Learning and Information Literacy.
Students will use computer technology to access study guide materials provided by the textbook producer and will also utilize computer technology for self assessment.
3. Critical and Creative Thinking.
This is a science based course which will require a critical analysis of data and conclusions derived from observations and experiments. Students will be required to think critically as they apply theory learned in the course to everyday situations and problems.

- 4 Computational and Information Technology Skills.
This is a lab based course and students will be required to take measurements and make various calculations in a laboratory setting. They will be required to make calculations on weekly tests, theory examinations and practical laboratory examinations.
- 5 Teamwork.
Students will be required to demonstrate the ability to cooperate with other students in problem solving exercises in class and in some laboratory experiments.

Academic Signature:

This course will contain the following elements of the college's academic signature:

1. Applied Skills and Abilities

This is a laboratory course which requires students to develop practical skills and knowledge on a regular basis throughout the course. Students will also be required to demonstrate these skills and abilities on a practical laboratory examination.

Interdisciplinary Studies

Students will be expected to learn and/or apply basic mathematics and chemistry to the study of human anatomy and physiology.

2. Ethical Behaviour and Social Responsibility - Effective Citizenship

Students will discuss the political and ethical implications of biological research and discoveries and will be expected to demonstrate an understanding of the relevance of biological knowledge to society.

3. Intercultural, International, and Global Perspective

Biological knowledge gained in this course will be considered in the context of its international and global implications. For example, issues such as the implications of intensive use of antibiotics, the significance of adequate nutrition, and availability of clean water, and the spread of disease have cultural and global significance and will be among topics discussed in the course.

N: Course Content:

The major topics in the course include the following:

1. The structure and function of cells:
 - The structure and function of cell membranes and various cytoplasmic and nuclear components.
 - The preparation of and examination (using a compound microscope) of human buccal and onion epidermal cells.
 - An explanation of the major cellular processes and their significance to the cell.
2. Introduction to biochemistry
 - chemistry of water
 - chemistry of carbohydrates, lipids, proteins and nucleic acids
3. Homeostasis:
 - The definition of the term **homeostasis**, its importance, and the conditions required to fulfill homeostasis.
 - The definitions of the terms **internal environment**, **stress**, **positive feedback system** and **negative feedback system**, and their roles in homeostasis.
 - Examples of homeostatic mechanisms, including negative and positive feedback systems.

4. The organization of the human body beyond the cellular level:
 - The structure and function of the four tissue types.
 - The major body systems, their major organs, and the general function of each organ.
 - Directional terms as they relate to the human body.
 - The body cavities and their organs.
5. The integumentary system:
 - The identification and description of the components of the epidermis and the dermis.
 - Specialized cells, structures, and glands.
6. The skeletal system:
 - The basic structure, histology, and components of the human skeleton.
 - The structure, physiology, and function of bone.
 - The changes in skeletal structure during growth and development (ossification).
 - Articulations (joints) with respect to their structures and types of movement allowed.
 - The basic mechanical principles of movement as they relate to joints (biomechanics).
7. The muscular system:
 - The types of movements found in humans as a result of skeletal muscle contraction.
 - The identification of the principal muscles and muscle groups and their movements.
 - The gross anatomy of muscles and microscopic anatomy of muscle tissue.
 - The physiology of muscle contraction.
8. The circulatory system:
 - A description of the human circulatory and lymphatic systems.
 - The composition and properties of blood.
 - The types, characteristics and functions of white blood cells.
 - The ABO blood groups and the Rh factor.
 - The tissues related to the heart.
 - The heart conduction system.
 - Major arteries and veins.
 - Blood pressure and pulse.
 - Major blood reservoirs in the body.
 - The mechanism of blood clotting.
9. Resistance and Immunity:
 - Nonspecific versus specific resistance.
 - The nature and roles of cellular and humoral specific immunity.
10. The respiratory system:
 - The major components of the human respiratory system and their functions.
 - The mechanism and types of ventilation.
 - How oxygen and carbon dioxide are transported in the blood.
 - The nervous control of breathing.

O: Methods of Instruction

This course involves three hours per week of classroom instruction and two hours per week of laboratory activity. Classroom work will consist of two hours of lectures per week and one hour of group work (with instructor assistance) per week.

P: Textbooks and Materials to be Purchased by Students

Tortora, G.J. and Derrickson, B. *Principles of Anatomy and Physiology*. New York: John Wiley and Sons, Inc.

Douglas College produced manual: **Biology 1103: Human Anatomy and Physiology I.**

Q: Means of Assessment

TYPE OF EVALUATION	POINTS
Class Tests and Assignments	20
Laboratory Experiments and Activities (see Note 1 below)	(up to –20)
Laboratory Examination - final	15
Comprehensive Examinations - midterm	30
- final	35
TOTAL	100

Grades:	A+ 95-100,	A 90-94,	A- 85-89,	B+ 80-84,	B 75-79,	B- 70-74,
	C+ 65-69,	C 60-64,	C- 55-59,	P 50-54,	F 0-49.	

Notes:1. **Laboratory Experiments and Activities:**

Laboratory work will be assigned each week. The laboratory work must be completed in the week it is assigned. If more than one lab assignment is not completed, two percentage points will be deducted for each lab assignment (in excess of the one permitted without penalty). **Laboratory experiments and assignments are a compulsory component of this course. A minimum of 50% of the laboratory experiments and assignments must be completed to receive a P or better grade in the course.**

2. **Examinations:**

There will be one midterm and one final examination. The final examination will cover the entire course. If the student achieves a better grade on the final exam than on the midterm examination, the midterm grade will be raised to equal that achieved on the final examination.

R: Prior Learning Assessment and Recognition: specify whether course is open for PLAR

There is no provision for PLAR, other than that normally done by examining transcripts and comparing course outlines of human biology courses taken within the last five years elsewhere to the Douglas College Biology 1103 course content.

 Course Designer(s)

 Education Council / Curriculum Committee Representative

 Dean / Director

 Registrar