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SAULT COLLEGE OF APPLIED ARTS & TECHNOLOGY

SAULT STE. MARIE, ONTARIO

COURSE OUTLINE

COURSE TITLE: HUMAN BIOLOGY

CODE NO: BIO 104 SEMESTER: ONE

PROGRAM: NURSING ASSISTANT

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DATE: SEPTEMBER, 1991 PREVIOUS OUTLINE DATED: FEB/90

APPROVED: _____ June 24/91
DEAN DATE

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RNA 100 — COURSE NUMBER

TOTAL CREDIT HOURS: 60

PREREQUISITE(S): Acceptance into the Nursing Assistant Programme

I. PHILOSOPHY/GOALS:

The Human Biology course deals with the structure and function of the human. It includes common stimuli which affect the structure and function of man as well as man's adaptive responses, which enable him to maintain a relatively constant state. Understanding the human body and how it reacts to various stimuli will enable the student to relate this knowledge to the theory and practice of nursing.

II. STUDENT PERFORMANCE OBJECTIVES:

Upon successful completion of this course the student will:

1. Describe biological adaptation in relation to the structure and function of the human body.

   a) Describe the structure of the human body.
   b) Describe the function of the human body.
   c) Describe the relationship of function to structure in the human body.
   d) Describe the changes that occur in structure and function throughout the life cycle from conception to death.

2. Explain the concept of biological adaptation.

   a) Describe the biological stimuli that impinge upon man.
   b) Explain the concept of adaptation using examples from biological mode.
   c) Describe the variables that influence biological responses.
   d) Illustrate adaptive and/or ineffective biological responses.
   e) Describe how an individual maintains and promotes biological adaptation.

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III. TOPICS TO BE COVERED:

1.	Terminology overview	4 hours
2.	Cells, Tissues	4 hours
3.	Integumentary System	2 hours
4.	Musculoskeletal System	4 hours
5.	Nervous System	6 hours
6.	Special Senses	3 hours
7.	Endocrine System	3 hours
8.	Circulatory and Lymphatic Systems	6 hours
9.	Respiratory System	3 hours
10.	Urinary System	3 hours
11.	Gastrointestinal System	3 hours
12.	Reproductive System	4 hours
13.	Microbiology	7 hours
	TESTS	8 hours
		60 hours

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IV. LEARNING OBJECTIVES	REQUIRED RESOURCES
I. INTRODUCTORY OVERVIEW	Text & Study Guide
A. Terminology	Thibodeau, A. and Swisher, L.
1. Define the terms used to describe parts of the human body. a) planes b) regions c) cavities d) general terms as listed in the worksheet e) specific terms as listed in the worksheet	Thibodeau, A. Chapters 1 & 3
2. Describe locations and parts of the human body using these terms.	
3. Identify a general description of each of the following systems. a) Integumentary b) Musculoskeletal c) Nervous d) Endocrine e) Special Senses f) Circulatory g) Respiratory h) Urinary i) Gastrointestinal j) Reproductive	
II. THE SMALLEST UNIT (CELL)	
A. Protoplasm	Thibodeau: Chapter 2
1. Describe the elements & compounds of protoplasm. 2. Describe inorganic & organic constituents of protoplasm. 3. Describe the functions of water, proteins, fats & carbohydrates in protoplasm.	

LEARNING OBJECTIVES **REQUIRED RESOURCES**

B. The Cell

1. Describe the functions of the component parts of the cell.

   a) cell membrane
   b) layers and pores
   c) cytoplasm & cytoplasmic organelles
   d) nucleus
   e) nucleolus
   f) chromosomes
   g) genes
   h) D.N.A.
   i) R.N.A.

2. Define selective permeability.

3. Explain 2 general functions of all cells.

4. Explain how the structures contribute to the function of the cell as a whole.

5. Cell Division

   a) describe 2 methods of cell division.
   b) state an example for each method.

6. Embryonic Life

   a) explain the origin & destiny of the primary germ layers.
   b) explain the development of the embryonic membrane.

C. Movement Through Membranes

1. Define homeostasis, interstitial fluid, intracellular fluid, extracellular fluids & internal environment.

2. Explain the role of the circulatory system in supporting adaption of the internal environment.

LEARNING OBJECTIVES **REQUIRED RESOURCES**

3. Define & state 1 example from the human body of the following processes:

   a) diffusion
   b) facilitated diffusion
   c) active transport
   d) ingestion
   e) filtration
   f) osmosis

4. Define semi-permeability.

5. Define filtration pressure.

6. Define osmotic pressure.

D. Organization of Cells

1. Define "tissue".

2. List the 4 primary tissue types.

3. List the functions for each of the primary tissue types.

4. Review the definition of organ and systems.

III. BIOLOGICAL REGULATORS & SUPPORT SYSTEMS

A. The Integumentary System — Thibodeau: Chapter 4

a) Describe the basic structures & functions of the skin & mucous membrane.

b) Identify & locate the major structures of the skin.

c) Identify & locate the major structures of the mucous membrane.

d) List & locate the areas of the body where there is mucous membrane.

e) Identify how each structure supports the general functions.

LEARNING OBJECTIVES	REQUIRED RESOURCES
f) Describe the role of the integumentary system in supporting adaptation.	
B. Musculoskeletal	
a) Describe the basic functions of the Musculoskeletal system.	Thibodeau, A. Chapters 5 & 6
b) Identify & locate the basic structures of the skeletal system.	
c) Identify & locate the basic structures of the muscular system.	
d) On diagrams of muscle/bone units, name the structures indicated & explain how these facilitate movement.	
e) On diagrams of muscle groups, name the structures indicated & explain how these facilitate protection.	
f) On diagrams of bone groups, name the structures indicated & explain how these facilitate protection.	
g) Describe 3 types of articulations.	
h) Describe the movements possible at each type of articulations.	
i) Describe the role of the Musculoskeletal system in supporting adaptation.	
C. The Nervous System	
a) Identify the major structures of the nervous system.	Thibodeau, A. Chapters 7 & 8
b) List the structures required for effective impulse transmission which results in a desired response.	Dissection of the Brain

LEARNING OBJECTIVES	REQUIRED RESOURCES

c) List the differences between the:

i) somatic nervous system
ii) visceral nervous system

d) State the 2 general functions of and locate the major:

i) somatic nerves
ii) visceral nerves

e) Describe the role of the nervous system in supporting adaptation.

D. The Special Senses

a) Identify & locate the receptors for each of the special senses.

i) ear
ii) nose
iii) tongue
iv) skin

Thibodeau, A. p. 181-189

Dissection of the Eye

b) State the function for each receptor.

c) Describe the role of the special senses in supporting adaptation.

E. The Endocrine System

a) Identify & locate the major endocrine glands.

Thibodeau: Chapter 9

b) State the general function of an endocrine gland.

c) State the general function of hormones.

d) Describe the role of the endocrine system in supporting adaptation.

e) Relationship of the Nervous System & The Endocrine System.

LEARNING OBJECTIVES	REQUIRED RESOURCES
F. Circulatory & Lymphatic Systems	
1. a) Describe the basic functions of the cardiovascular & lyphatic systems of the body.	Thibodeau: Chapter 11
b) Identify & locate the major arteries.	
c) Identify & locate the major veins.	
d) On a diagram of the lymphatic system, identify the direction of flow of lymph nodes.	
e) State the function of the heart & vessels of the cardiovascular & lymphatic systems.	Dissection of the Heart
f) Describe the role of the circulatory & lymphatic systems in supporting adaptation.	
2. a) Describe the basic function of blood.	Thibodeau, A. Chapters 10 & 12
b) Identify the types of blood & their function.	
c) Identify & explain the basic blood groups.	
G. The Respiratory System	
a) Describe the basic functions of the respiratory system.	Thibodeau, A. Chapter 14
b) Identify & locate the major structures of the respiratory system.	
c) Identify the location of these structures in the thoracic cavity.	

LEARNING OBJECTIVES	REQUIRED RESOURCES
d) State the function of these structures in relation to the system as a whole: i) from the nose to the bronchus ii) the lungs	
e) Describe the role of the respiratory system in supporting adaptation.	
H. The Urinary System	
a) Describe the basic functions of the urinary system.	Thibodeau: Chapter 15
b) Identify & locate the major structures of the urinary system.	Dissection of the Kidney
c) Identify & locate the regions of the abdomen & body cavities in which the major structures are located.	
d) State the function of each of the structures in relation to the function of the urinary system as a whole.	
e) Describe the role of the urinary system in supporting adaptation.	
I. The Gastrointestinal System	
a) Describe the basic functions of the G.I. system.	Thibodeau: Chapter 13
b) Identify & locate the major structures of the digestive system.	
c) locate the structures of the G.I. tract according to the regions of the abdomen.	

LEARNING OBJECTIVES	REQUIRED RESOURCES

d) State the function of structures in relation to the function of the G.I. system as a whole:

i) from mouth to small intestine
ii) from large intestine to anus
iii) the accessory organs--liver, pancreas, gall bladder

e) Describe the role of the G.I. system in supporting adaptation.

J. The Reproductive System

a) Describe the basic functions of the female reproductive system. — Thibodeau, A. Chapter 16, 17

b) Identify & locate the major structures of the female reproductive system.

c) Locate these structures within the body cavities.

d) Describe the role of the female reproductive system in supporting adaptation.

e) Describe the basic functions of the male reproductive system.

f) Identify & locate the major structures of the male reproductive system.

g) Locate these structures within the body cavities.

h) Describe the role of the male reproductive system in supporting adaptation.

LEARNING OBJECTIVES	REQUIRED RESOURCES

IV. MICROBIOLOGY

1. Define the selected words associated with microbiology. the library.

   Consult a Microbiology text from the College or other library.

2. Briefly explain the types of microbial pathogens & parasites.

   a) bacteria
   b) algae
   c) rickettsiae
   d) viruses
   e) fungi (yeasts & molds)
   f) protozoa
   g) helminths
   h) arthropods

3. List 1 example of a disease or condition caused by the above types of organisms.

4. Describe the sub-types of bacteria according to shape.

5. Describe the general characteristics of a bacterial cell.

6. Describe the general characteristics of viruses.

7. Describe the growth requirements of most bacteria.

8. Describe the normal flora of the human body.

9. Describe transmission & portals of entry & exit of microorganisms.

10. Explain the criteria important in determining if infection will follow microbial invasion.

    a) number of organisms
    b) virulence of organisms
    c) adaptive responses of host

LEARNING OBJECTIVES	REQUIRED RESOURCES
11. Explain the adaptive responses of the host. a) general adaptive syndrome b) nonspecific c) specific - antigens & antibodies - immunity	
12. Explain "culture & sensitivity".	
13. Explain "drug resistance".	
14. Explain common diagnostic tests which confirm presence of pathogens.	
15. Describe the methods of assisting in adapting to microorganisms. a) physical agents i) mechanical ii) heat iii) miscellaneous b) chemical agents i) disinfectants & antiseptics ii) chemotherapeutic agents	Class presentations
16. Discuss the topics concerned with microbes in everyday life. a) air b) water and sewage c) milk d) food e) useful activities f) world health problems	Class Presentations Community Agencies

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V. EVALUATION METHODS: (INCLUDING ASSIGNMENTS, ATTENDANCE REQUIREMENTS, ETC.)

Teaching/Learning Methods

Lectures, A.V. resources, Class Discussions, Worksheets, Class Presentation

Method of Assessment (Grading Method)

GRADING
A+ 90 - 100%
A 80 - 89%
B 70 - 79%
C 60 - 69%

NOTE: Pass is a "C" overall

Test Schedule

Test #1 Sept. 23	Terminology, Overview of Body Systems and Cells	12%
Test #2 Oct. 8	Cell, Integumentary and Musculoskeletal Systems	12%
Test #3 Oct. 28	Nervous System, Special Senses and Endocrine System	12%
Test #4 Nov. 18	Circulatory & Respiratory Systems	12%
Test #5 Dec. 9	Urinary System Gastrointestinal System Reproductive System	12%
Test #6 Dec. 16	Microbiology, All other units previously covered	30%
Presentation Dec. 2-6	Group Presentations on Microbiology	10%

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NOTE:

1. If you are unable to attend class for a test, you MUST contact the Health Sciences Office BEFORE the test. 759-6774, ext. 689

2. Students who do not pass any of the tests and do not pass the final exam will not be given the privilege of writing the supplemental exam.

3. One supplemental exam will be given. If the supplemental exam is passed, the student will receive a "C" regardless of the final exam mark.

4. Excellent attendance will be taken into consideration for borderline marks.

5. Evaluation of this course will be done mid-term.

6. Tests remain the property of Sault College.

VI. REQUIRED STUDENT RESOURCES:

Thibodeau, Gary and Catherine Anthony, Structure & Function of the Body, Times Mirror/Mosby College Publishing, Toronto, 1988.

Swisher, Linda, Study Guide to Accompany Structure & Function of the Body, Times Mirror/Mosby College Publishing, Toronto, 1988.

VII. ADDITIONAL RESOURCE MATERIALS AVAILABLE IN THE COLLEGE LIBRARY BOOK SECTION:

Several additional Biology/Physiology and Microbiology books are available in the Library.

VIII. SPECIAL NOTES:

Course outline is subject to change at the teacher's discretion based on the learning needs of the students.