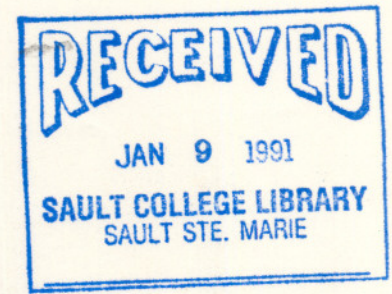


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SAULT COLLEGE OF APPLIED ARTS & TECHNOLOGY
SAULT STE. MARIE, ONTARIO

COURSE OUTLINE



COURSE TITLE: BIOLOGY

CODE NO: BIO 121-5 SEMESTER: 2

PROGRAMME: NURSING

AUTHOR: MARGARET HURTUBISE

DATE: JAN/91 PREVIOUS OUTLINE DATED: JAN/90

APPROVED: *D. [Signature]* *Jan 3/91*
Dean Date

BIOLOGY

BIO 121-5

Course Name

Code No.

TOTAL CREDIT HOURS: 75

PREREQUISITE(S): BIO 101-5

I. PHILOSOPHY/GOALS:

The Biology course deals with the structure and function of the human body.

This course also 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 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 for the selected systems.
 - 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 specified changes that occur in structure and function as the human body ages.
- 2) explain the concept of biological adaptation.
 - a) Discuss some common biological stimuli that impinge upon the human body.
 - b) Explain the concept of adaptation using examples from the biological mode.
 - c) Describe some variables that influence biological responses.
 - d) Illustrate some adaptive and/or ineffective biological responses to specified stimuli.
 - e) Describe how an individual maintains and promotes biological adaptation.

III. TOPICS TO BE COVERED:

- 1) Respiratory System
- 2) Circulatory & Lymphatic Systems
- 3) Urinary System
- 4) Gastrointestinal (Digestive) System
- 5) Fluid, Electrolytes and Acid-Base Balance
- 6) Reproductive System
- 7) Development and Inheritance

IV. LEARNING ACTIVITIES

REQUIRED RESOURCES

V. SUPPORT SYSTEMS (cont'd)

B. Respiratory System

1. Define the words associated with the respiratory system.
2. Describe the structure, location and function of the organs of the respiratory system.
 - a) nose
 - b) pharynx
 - c) larynx
 - d) trachea
 - e) bronchi
 - f) lungs
3. Discuss the function of the diaphragm, intercostal muscles, ribs & sternum in the act of ventilation (breathing).
4. Describe the mechanisms involved in inspiration and expiration.
5. Explain the process of gas exchange:
 - a) external respiration
 - b) internal respiration
6. Explain the transportation of O₂ and CO₂.
7. Describe the control of respirations:
 - a) nervous stimuli
 - b) chemical & pressure stimuli
8. Explain the importance of cardio-pulmonary resuscitation.

Read Unit Five,
Chapters 19 and 20

Review bones, paranasal
sinuses

Read about Pulmonary
Circulation, p. 467 & 469

IV. LEARNING ACTIVITIES

REQUIRED RESOURCES

9. Development of the respiratory system:

- a) describe the embryonic development
- b) describe the effects of aging
- c) discuss ways to improve life during the aging process

C. Circulatory & Lymphatic Systems

1. Blood

- a) define the words associated with the Circulatory System
- b) describe the constituents of blood
- c) state the normal values in the human body of the following:
 - i) erythrocytes
 - ii) leukocytes
 - iii) thrombocytes
 - iv) hemoglobin
 - v) hematocrit
- d) describe the adaptive mechanisms of hemostasis
- e) discuss clotting time, bleeding time and prothrombin time
- f) describe the ABO blood group system on the basis of their antigen-antibody components
- g) describe the Rh factor
- h) explain the significance of cross-matching on the basis of agglutination

Read Unit Four, Chapter 15

Watch filmstrip and complete worksheets

- 1) An Introduction to the Blood
- 2) White Blood Cells - Defenders Against Infection
- 3) Antigenic Properties of RBC
- 4) Normal Hemostasis

IV. LEARNING ACTIVITIES

REQUIRED RESOURCES

2. Heart and Blood Vessels

- | | |
|--|---|
| a) describe the structure and function of the heart | Read Unit Four, Chapters 16 and 17 |
| b) trace the flow of blood through the heart & lungs from Superior & Inferior vena cavae to the aorta | Watch filmstrip and complete worksheets |
| c) describe the conduction system of the heart | 1) The Heart: Anatomy I |
| d) describe the nervous control of the heart | 2) The Heart: Anatomy II |
| e) describe the blood supply of the heart | |
| f) explain the structural characteristics & the functions of arteries, capillaries and veins | |
| g) identify major arteries and veins in the human body | |
| h) describe portal circulation | |
| i) describe pulmonary circulation | |
| j) describe systemic circulation by tracing the flow of blood from the heart to different areas of the body & back again | Dissect a heart |
| k) discuss stimuli which influence the P. & B.P. rate | |

3. Lymphatic System

- | | |
|---|----------------------------|
| a) define the words associated with the Lymphatic System | |
| b) describe the structure, location & function of parts of the Lymphatic System | Read Unit Four, Chapter 18 |
| i) capillaries | |
| ii) vessels | |
| iii) ducts | |
| iv) nodes | |
| c) describe lymphatic circulation and the importance of it | |
| d) describe the structure, location & function of the spleen, tonsils & thymus | |

IV. LEARNING ACTIVITIES

REQUIRED RESOURCES

4. Development of the Circulatory and Lymphatic Systems

- a) describe the embryonic development
- b) describe the effects of aging
- c) discuss ways to improve life during the aging process

D. The Urinary System

Read Unit Five, Chapter 24

- 1. Define the words associated with the urinary system.
- 2. Describe the structure, location & function of the organs of the urinary system:
 - a) kidney
 - b) ureters
 - c) urinary bladder
 - d) urethra
- 3. Describe the blood and nerve supply.
- 4. Describe the structure & function of the nephron.
- 5. Describe the process of urine formation.
 - a) glomerular filtration
 - b) tubular reabsorption
 - c) tubular secretion (excretion)
- 6. Explain aldosterone and A.D.H. influence on the kidneys.
- 7. Describe the physical characteristics of normal urine.
- 8. Discuss the normal & abnormal constituents of urine.

Watch filmstrip and complete worksheets.

- 1) Anatomy of the Kidneys, Ureters, Bladder & Urethra
- 2) Physiology of the Kidney

IV. LEARNING ACTIVITIES

REQUIRED RESOURCES

9. Describe the process of micturition.
10. Development of the Urinary System:
 - a) describe the embryonic development
 - b) describe the effects of aging
 - c) discuss ways to improve life during the aging process

E. The Gastrointestinal (Digestive) System

Read Unit Five,
Chapters 21 & 22

1. Define the words associated with the gastrointestinal system.
2. Describe the location, structure & function of the organs of the digestive system.
 - a) mouth (oral cavity)
 - b) pharynx
 - c) esophagus
 - d) stomach
 - e) small intestine
 - f) large intestine (colon)
3. Discuss the structural layers of the gastrointestinal tract.
4. Describe the location, structure & functions of the accessory organs of the gastrointestinal system.
 - a) teeth & tongue
 - b) salivary glands
 - c) liver
 - d) gallbladder
 - e) pancreas
 - f) vermiform appendix

IV. LEARNING ACTIVITIES

REQUIRED RESOURCES

5. Describe the digestive processes as they relate to the organs & accessory organs of the gastrointestinal system.
 - a) mechanical digestion
 - b) chemical digestion
 - c) absorption
 - d) defecation
6. Describe the absorption from the stomach, small intestine & large intestine.
7. Describe the circulation of absorbed foodstuffs in blood & lymphatics.
8. Describe the normal composition & characteristics of feces.
9. Describe the metabolic processes of fats, carbohydrates & proteins.

Read Unit Five, Chapter 23

 - a) anabolism of each
 - b) catabolism of each
10. Describe the relationship of foods to body heat.

Relate to Metabolic rate at various ages
11. Describe the mechanisms of heat gain and loss.
12. Development of the gastrointestinal system.
 - a) describe the embryonic development
 - b) describe the effects of aging
 - c) discuss ways to improve life during the aging process

IV. LEARNING ACTIVITIES	REQUIRED RESOURCES
F. <u>Fluid, Electrolytes & Acid-Base Balance</u>	Read Unit Five, Chapter 25 & 26
<ol style="list-style-type: none">1. Define the words associated with Fluid, Electrolytes & Acid-Base Balance.2. Describe the body fluid compartments.3. Describe water percentage according to age & amount of fat present.4. Describe fluid intake & output.5. Differentiate between electrolytes and nonelectrolytes.6. Describe electrolyte concentration & distribution in the fluid compartments.7. Explain the functions & regulations of the major electrolytes.8. Describe the movement of fluid between the 3 body fluid compartments.9. Describe the mechanisms which regulate body fluids.10. Explain the buffer systems in maintaining the acid-base balance of the body.11. Explain the roles of the respiratory & urinary systems in maintaining a normal acid-base balance.12. Describe briefly respiratory acidosis and alkalosis.13. Describe briefly metabolic acidosis and alkalosis.	Review diffusion, osmosis, filtration and A.T.

IV. LEARNING ACTIVITIES

REQUIRED RESOURCES

G. The Reproductive System

Read Unit Six, Chapters
27 & 28

1. Define the words associated with the reproductive system.
2. Describe the location, structure & function of the male organs of reproduction.
 - a) scrotum
 - b) testes
 - c) epididymis
 - d) vas deferens
 - e) seminal vesicle
 - f) ejaculatory duct
 - g) prostate
 - h) bulbourethral glands
 - i) urethra
3. Describe the components and production of seminal fluid.
4. Describe the structure of the spermatozoa.
5. Explain the hormonal control of the male sex characteristics and the reproductive function.
6. Describe the nervous control of the male reproductive organs.
7. Describe the location, structure & function of the female organs of reproduction.
 - a) vagina
 - b) Bartholin's glands
 - c) uterus
 - d) fallopian tubes
 - e) ovaries
 - f) vulva and perineum
 - g) mammary glands
8. Describe how the uterus and ovaries are supported in the pelvic cavity.

Review the endocrine system (gonadotrophic hormones as well as testosterone, estrogen & progesterone)

IV. LEARNING ACTIVITIES

REQUIRED RESOURCES

9. Identify the major muscles of the perineum and discuss their function.
10. Describe the structure of the ova.
11. Explain the hormonal control of the female sex characteristics and the reproductive functions.
12. Explain the menstrual cycle when:
 - a) fertilization does not occur
 - b) fertilization does occur
13. Describe the nervous control of the female reproductive organs.
14. Development of the Reproductive System:
 - a) describe the embryonic development
 - b) describe the effects of aging
 - c) discuss ways to improve life during the aging process

H. Development and Inheritance

- | | |
|--|---|
| <ol style="list-style-type: none">1. Describe the process of gamete formation.<ol style="list-style-type: none">a) chromosome numberb) spermatogenesisc) oogenesis2. Discuss the process of sexual intercourse.3. Identify the bones, landmarks and measurements of the pelvis.4. Discuss the changes that occur to the articulations & ligaments of the pelvis during pregnancy. | <p>Review meiosis & mitosis</p> <p>Consult: Boback, I. and Jensen, M., <u>Essentials of Maternity Nursing</u>, 2nd ed., C. V. Mosby Co., Toronto, 1987</p> <p>Review bones & articulations of pelvis.</p> |
|--|---|

IV. LEARNING ACTIVITIES

REQUIRED RESOURCES

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5. Describe the 4 types of female pelvis:
 - a) gynecoid
 - b) anthropoid
 - c) android
 - d) platypelloid
 6. Discuss the implications of the pelvis in the mechanism of delivery.
 7. Discuss the sequence of events involved in pregnancy.
 - a) fertilization
 - b) implantation
 - c) embryonic growth
 - d) fetal growth
 8. Describe the development of the placenta.
 9. Describe movement across the placenta.
 10. Describe and state the function of the amnion and chorion.
 11. Describe fetal circulation.
 12. Discuss the hormones of pregnancy.
 13. Describe the signs of pregnancy:
 - a) presumptive
 - b) probable
 - c) positive
 14. Discuss the physiological changes of the body during pregnancy.

IV. LEARNING ACTIVITIES

REQUIRED RESOURCES

15. Discuss the potential hazards to the developing embryo and fetus.
 - a) chemicals & drugs (include caffeine, alcohol)
 - b) irradiation
 - c) cigarette smoking
 - d) poor nutrition
16. Determine the significance of the following essential factors in the process of labour (5 P's - Psyche, power, position, passenger, passageway).
17. Define, describe and explain the 4 stages of labour.
18. Describe the normal process of involution as it relates to the:
 - a) reproductive system
 - b) circulatory system
 - c) urinary system
 - d) gastrointestinal system
 - e) musculature
 - f) endocrine system
19. Describe the physiological adjustments confronting the newborn in transition from fetus in the:
 - a) respiratory system
 - b) circulatory system
 - c) gastrointestinal system
20. Explain the physiology of lactation.
21. Discuss the basic concepts of the passage of hereditary traits.
22. Discuss the inheritance of sex X-linked inheritance.
23. Describe the common methods of birth control.

BIOLOGY

BIO 121-5

Course Name

Code No.

V. EVALUATION METHODS: (includes assignments, attendance requirements, etc.)

METHOD OF ASSESSMENT (GRADING METHOD):

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

Please note that a pass in Biology is a "C".

NOTE:

1. Absence from Tests

If you are unable to attend class for a test, you must contact the Health Sciences office (759-6774 Ext. 689) before the test. If the test is at 0830 hours you must contact the office before 0900 hours.

If you fail to do so, you will not be allowed to write and will receive a mark of zero. You must make individual arrangements with me on the first day back to school. If you fail to do so, you will not be allowed to write and will receive a mark of zero.

Those students who are given the opportunity to write the test at a later date may have a change in the test format (ie. - from multiple choice to short answer, essay, oral, or a combination of each).

2. Supplemental Examinations

A supplemental examination may be offered in this course at the discretion of the teacher subject to the following criteria:

- a) A student must have achieved a passing grade (60%) on at least three (3) of the term tests (3 out of 6); and a mark of at least 50% on the diagram test as well as the final examination.
- b) The entire semester's course material will be tested.
- c) Multiple choice questions, short answer questions and diagrams to be labelled will be used in the supplemental examination.

- d) The final grade for the semester will be based solely on the supplemental examination but the grade achieved will not be higher than a "C". The term mark will not be averaged in with the supplemental examination mark.
 - e) There will only be one supplemental examination allowed for this course.
3. Excellent attendance (80% or better) will be used to improve borderline marks.

<u>Term Work:</u>	Unit Tests	200
	Diagram Test	50
		<u>250</u>
	Final Exam	150
		<u>400</u>

Final Mark: $\frac{\text{Your mark out of a possible 400}}{4} = \%$

Tentative Test Schedule:

<u>Date</u>	<u>Units</u>	<u>Marks</u>	<u>Your Mark</u>
Week of January 28, 1991	Respiratory	20	
Week of February 19, 1991	Circulatory & Lymphatic	50	
Week of March 11, 1991	Digestive	40	
Week of April 1, 1991	Fluids & Electro- lytes & Urinary	40	
Week of April 15, 1991	Reproductive	50	
Week of April 22, 1991	Diagram Test	50	
Week of April 22, 1991	Final Exam	150	

Keep track of all your own test marks so that you may calculate your own term mark.

Units and Hours:

<u>Units</u>	<u>Approximate Hours</u>
Respiratory System	5
Circulatory & Lymphatic System	14
Urinary System	4
Digestive System	9
Fluids & Electolytes	9
Reproductive System (Labour, etc.)	20
Biology Tests and Exam	9
	<u>70</u> HOURS

Biology help available weekly (optional)

VI. REQUIRED STUDENT RESOURCES:

- 1) Anatomy & Physiology, Thibodeau, G.A., Times Mirror/Mosby College Publishing Company, Toronto, 1987.
- 2) Biology Workbook, Semester 2

VII. ADDITIONAL RESOURCE MATERIALS AVAILABLE IN THE COLLEGE LIBRARY BOOK SECTION: (title, publisher, edition, date, library call number if applicable)

Articles, reference texts, videos and film strips will be shown in class or available to students from the library as deemed necessary by the teacher.

VIII. SPECIAL NOTES:

Students will be required to complete problems and readings as assigned.

Students with special needs (eg: physical limitations, visual impairments, hearing impairments, learning disabilities) are encouraged to discuss required accommodations confidentially with the instructor.

Your instructor reserves the right to modify the course as he/she deems necessary to meet the needs of students. Order of topics and subjects may change at the teacher's discretion.