GERMANNA COMMUNITY COLLEGE

COURSE OUTLINE

FOR

NAS 161-162

HEALTH SCIENCE I-II

Helen Mergenthal, Ph.D **1/11/10**

INSTRUCTOR **DATE**

COURSE OUTLINE (PART A)
for
NAS 161-162
HEALTH SCIENCE I-II (4 credits), (4cr)

I. COURSE DESCRIPTION:

Presents an integrated approach to human anatomy and physiology, microbiology, and pathology. Includes chemistry and physics as related to health sciences. Lecture 3 hours per week. Recitation and laboratory 3 hours per week. Total 6 hours per week.

II. Textbooks

A Short Course in Medical Terminology by C.E. Collins, Lippincott Williams & Williams, Baltimore, MD 2006.

Fundamentals of Anatomy and Physiology, VIII ed by Martini and Nath, Pearson, San Francisco, CA 2009.

Get Ready for A&P by Lori Garrett, Pearson, San Francisco, CA 2007.

PhysioEx 8.0 for A&P by Zao et al., Pearson, San Francisco, CA 2009.

III. INTRODUCTION

The purpose of this course is to give the student a detailed, accurate and up-to-date understanding of the structure and the function of the human body. A second purpose is to present the mechanisms of disease, diagnostic techniques, and therapeutic measures. The course is primarily for nursing students but is designed so that it provides a good basic background for students in a variety of curricula, i.e. science, pre-med, nursing, health sciences, physical education and art.

IV. COURSE OBJECTIVES 3

The objectives of this course are:

1. to provide the student the opportunity to obtain a basic background in anatomy and physiology on a cellular, tissue, and gross level.

2. to determine the nature of disease, explain various diagnostic techniques, and therapeutic measures for disease control.

3. to encourage the development of a greater appreciation of the human body, of physiological and anatomical concepts, and of the scientific method.

4. to develop abilities in dissection, experimentation, use of equipment, observation, recording of data, and organization and interpretation of results in a scientific manner.

5. to provide an atmosphere in which the student can best achieve his/her learning potential, can exercise his/her independence and creativity, and can further develop confidence in his/her scientific ability.

6. to encourage the development of the following qualities in future health professionals: integrity, a code of ethics, the ability to synthesize information and come to independent conclusions, empathy for the patient and his/her family, and not the least of all, the use of common sense.

V. TOPIC OUTLINE:

The major content areas covered in this course NAS 161-162:

1. chemistry as it relates to the human body.
2. the structure and the function of cells.
3. tissues composing the organs of the human body.
4. the normal structure and function of the 11 major systems of the human
5. pathology, the mechanisms of disease, diagnostic techniques, and therapeutic measures.
6. microorganisms as agents of disease.

VI. ATTENDANCE STANDARD:

The college-wide standard for required attendance applies in this course. Germanna students are expected to be present and on time at all regularly scheduled classes and laboratory meetings. See GCC college catalog. Tardiness to class (10 minutes or more) will be tolerated only three times. A point will be taken off the final grade for each tardy after the initial three.

VII. SPECIFIC OBJECTIVES:

1. To aid the student in developing their working knowledge of the human body, how it is constructed and how the various parts function.
2. To assist the student in developing an understanding of the nature of disease.
3. To encourage the student to develop a greater appreciation for the levels of complexity in a human body: subcellular, cellular, tissue, organ and organ systems. Also, how these levels contribute to homeostasis.
4. To promote the scientific method of inquiry.
5. To promote individual inquiry through independent study.
6. To promote professional attitudes of a competent health care provider.

VIII. INSTRUCTIONAL PROCEDURES:

Instructional procedures may include:

1. lectures and discussions.
2. laboratory work (including experimentation and dissection, laboratory notebooks and reports, demonstrations, charts, and models).
3. CDs, transparencies, films.
4. viewing of normal and pathological organs.
5. field trips.
6. tests.
7. guest speakers.
8. oral presentations

IX. COURSE CONTENT:

NAS 161 will include the following areas listed below: 1 through 18. The remaining material will be discussed in NAS 162: 18 through 27. (Martini chapters)

1. What are anatomy and physiology? (Chapter 1) Different approaches to their study, how their coordination supports homeostasis
    - A. Structural levels of the body
    - B. Organ systems
    - C. Anatomical terminology
2. Chemistry (Chapter 2)
    - A. Structure of matter
    - B. How atoms combine
    - C. Chemical reactions
    - D. Properties of water
    - E. Acids and bases
    - F. Important organic compounds: carbohydrates, fats, proteins, nucleic acids, ATP

3. The Cell (Chapter 3)
    - A. Cell membranes
        - (1) structure
        - (2) movement through
    - B. Organelles
    - C. Nucleus
    - D. Cell cycle
    - E. Protein synthesis
    - F. Cell differentiation
    - G. Cell aging
    - H. Abnormal cells (cancer)

4. Tissues (Chapter 4)
    - A. Epithelial
        - (1)general characteristics
        - (2)classification
    - B. Connective tissue (CT)
        - (1)matrix
        - (2)CT Proper
        - (3)Specialized CT
    - C. Muscle tissue (discussed with section)
    - D. Nervous tissue (discussed with section)
    - E. Membranes

5. The Integumentary system (Chapter 5)
    - A. Skin
        - (1) Epidermis
        - (2) Dermis
        - (3) Hypodermis
        - (4) Color
        - (5) Wound healing
    - B. Glands of the skin
        - (1) sweat
        - (2) oil
    - C. Hair
    - D. Nails
    - E. Effects of aging on skin

6. Osteology (Chapter 6)
    - A. Types of Bones
    - B. Gross Anatomy of a Bone
    - C. Bone as a tissue
    - D. Microanatomy of bone tissue cells
    - E. Bone development
        - (1)endochondral
        - (2)intramembranous
    - F. Bone modeling and remodeling
    - G. Homeostasis and physiological function of bones
    - H. Effects of aging on bones
    - I. Nature and recovery of fractures

7. The Axial Skeleton (Chapter 7)
    A. Skull
        (1) Paranasal sinuses
        (2) Bones of Face
        (3) Bones of Cranium
        (4) The Vertebral Column
        (5) The Thorax

8. The Appendicular Skeleton (Chapter 8)
    A. Upper Extremity
        (1) Pectoral girdle
        (2) Bones of arm, forearm and hand
    B. Lower Extremity
        (1) Pelvic girdle
        (2) Bones of the thigh, leg and foot

9. Articulations (Chapter 9)
    A. Fibrous joints
    B. Carilaginous joints
    C. Synovial joints
        (1) structure
        (2) types
        (3) movements
    D. Aging and Pathology

10. Muscular Tissue (Chapter 10)
    A. Skeletal muscle
        (1) cell structure
        (2) connective tissue association
        (3) blood supply
        (4) nerve supply
        (5) muscle contraciton
            a. energy
            b. types of contractions
            c. types of fibers
    B. Smooth muscle (discussed with viscera)
    C. Cardiac muscle (discussed with heart)

11. The Muscular System (Chapter 11)
    A. Attachments
    B. Actions
    C. Principal muscles whose action effects:
        (1) Facial expression
        (2) Mastication
        (3) Head and neck
        (4) Back (vertebral column
        (5) Trunk
        (6) Upper extremity

(7) Lower extremity
(8) Respiration
(9) Abdominal wall

D. Paralysis

12. Nervous Tissue (Chapter 12)
    A. Organization of the nervous system
    B. Anatomy of a nerve
    C. Physiology of a nerve
    D. Associated cells of the nervous system
    E. Neuronal circuits

13. The Spinal Cord (Chapter 13)
    A. Basic anatomy
    B. Functional pathways
    C. Spinal reflexes
    D. Structure and distribution of spinal nerves
    E. Herniated disc

14. The Brain and Cranial Nerves (Chapter 14)
    A. The meninges
    B. The ventricles and cerebrospinal fluid
    C. Nutrition of the brain
    D. Brainstem
    E. Cerebellum
    F. Diencephalon
    G. Cerebrum
    H. Cranial NN I to XII
    I. EEG

15. The Autonomic Nervous System (chapter 16)
    A. Central control
    B. Sympathetic division
    C. Parasympathetic division
    D. Functions of the ANS
    E. Stress (as relates to ANS)

16. The Senses (Chapter 17)
    A. Sensory reception
    B. General senses: touch, temperature, pain
    C. Specific senses: taste, smell, vision, audition, equilibrium
    D. Sensory pathways

17. The Endocrine System (Chapter 18)
    A. Hormones and their methods of action
    B. Hormones and negative feedback
    C. Sites of endocrine glands
    D. Principal hormones as they effect organ systems (continued in NAS 162)

18. Microbes (Reference Review of Medical Microbiology)
    - A. Noncellular
    - B. Prokaryotes
    - C. Eukaryotes
    - D. Characteristics of microbial categories
    - E. Tests for identification
    - F. Diseases associated with principal categories
    - G. Control of microbes
    - H. Treatment
    - I. Microbes which affect each system

19. Respiratory System (Chapter 23)
    - A. Functions
    - B. Respiratory tract
        - (1) Nose
        - (2) Pharynx
        - (3) Larynx
        - (4) Trachea
        - (5) The Respiratory Tree
        - (6) Lungs
        - (7) Nerve and Blood Supply
    - C. Mechanics of breathing
    - D. Factors affecting gas movement and solubility
    - E. Gas Treatment
    - F. Neurochemical control of breathing
    - G. Other activities of the respiratory system
    - H. Pathology

20. Digestive System (Chapter 24)
    - A. Functions
    - B. Tissue structure
    - C. Parts
        - (1) Mouth-Oral Cavity
        - (2) Pharynx
        - (3) Esophagus
        - (4) Stomach
        - (5) Small Intestine
        - (6) Abdominal Cavity
        - (7) Pancreas
        - (8) Liver
        - (9) Gall Bladder
        - (10) Large Intestine
        - (11) Rectum, Anal Canal, Anus
        - (12) Disorders
21. Metabolism, Nutrition (Chapter 25)
    - A. Carbohydrate metabolism
    - B. Protein metabolism
    - C. Lipid metabolism

D. Absorptive/Postabsorptive states
E. Nutritional needs
F. Metabolic rate and temperature control

22. The Urinary System (Chapter 26)
A. Components and functions
B. Anatomy of the kidneys
C. Physiology of the kidneys
D. Accessory excretory structures
E. Urine and urination
F. Disorder

23. Regulation of Body Fluids, Electrolytes and pH (Chapter 27)
A. Body fluids: compartments and composition
B. Movement of body water
C. Water
D. Electrolytes
E. Acid-base balance
F. Imbalances

24. The Reproductive System (Chapter 28)
A. Male reproductive system: anatomy and physiology
B. Female reproductive system: anatomy and physiology
C. Hormonal regulation
D. Formation of sex cells
E. Fertilization

25. Human Growth and Development (Chapter 29)
A. embryonic development
B. Fetal development
C. Birth and lactation
D. Postnatal life cycle
E. Disorders

26. The Cardiovascular System (Chapters 19,20, and 21)
A. The structure of the heart
B. The physiology of the heart
C. Disorders of the heart
D. Types of blood vessels
E. Circulation of the blood
F. Major arteries and veins
G. Physiology of circulation
H. Disorders of the blood vessels
I. Functions of the blood
J. Properties of blood
L. Hemostasis
K. Components of blood
M. Blood types
N. Blood disorders

27. The Lymphoid System(Chapter 22) 10
    A. Functions
    B. Anatomical parts
    C. Immune system

X. EVALUATION:

1. Grading will be according to the following standards:

90-100=	A
80-89=	B
70-79=	C
60-69=	D
>60=	F

2. Final Grade will be determined as follows:

	161	162
Lecture Tests	4	5
Lab Tests	4	4
Lab Report Grade	1	1
Medical Terminology	1	1
Microbiology	1	1
	11	12
Cumulative Final Exam	2	2 (counts twice)

If an "A" average is maintained over the grades up to the final exam, the final exam is unnecessary. However, if one has to take the final (prefinal average is less than 89.5), the lowest lecture or lab test grade will be dropped and the exam will be counted twice.

If you miss a lab test, it cannot be made up and will be considered the grade to be dropped at the end of the semester.(Requiring you to take the final exam)

If you miss a lecture test, you must call me as soon as possible and explain the circumstances. The first time this occurs, it will be your drop grade. Subsequent occurrences may be made up at my discretion and within an appropriate time frame.

XI. OFFICE HOURS: Locust Grove Campus, Room 407I

Mon., Wed: 8-9 am, 2:45-3:30 pm
Tues, Thur: 8:30-9:30 am, 3:15-3:30 pm
Friday: 8-12 pm
(or by appointment)
Communication other than in person:
Voicemail: 540-423-9847
Email: hmergenthal@germanna.edu
Remember, you must use your GCC account to reach me online!

XII. HONOR VIOLATIONS

THE STUDENT IS EXPECTED TO COMPLETE HIS OR HER OWN ASSIGNMENTS (EXERCISES, LAB REPORTS , PAPERS, TESTS, ETC.) UNLESS OTHERWISE ASSIGNED (USING REFERENCE MATERIALS APPROPRIATELY CITED). ANY DEVIATION FROM THESE STANDARDS WILL RESULT IN A FAILING GRADE FOR THAT ASSIGNMENT. ADDITIONAL DEVIATIONS WILL RESULT IN A GRADE OF "F" FOR THAT COURSE.

XIII. SPECIAL NEEDS COUNSELOR

If you are a student with a disability and will need accommodations for this course, please contact the Special Needs Counselor in the Counseling Center(Room 205).

XIV. WITHDRAWAL POLICY

It is the responsibility of the student to officially withdraw from this course. Withdrawal without academic penalty may be made within the first 60% of the course. The student will receive a grade of "W" for withdrawal. After that time, the student will receive a grade of "F". Exceptions to this policy may be considered under mitigating circumstances, which must be documented and submitted to the appropriate Dean of Instruction for review and consideration. The last day to withdraw from this course without academic penalty is March 23, 2010.