NORTHERN ESSEX COMMUNITY COLLEGE
HAVERHILL, MASSACHUSETTS

COURSE OUTLINE
Summer 2020, Session II, June 22 – July 29

COURSE: BIO 122 LMW (CRN: 5066), Anatomy and Physiology II

INSTRUCTOR: Professor Noel Ways

TEXTS: Anatomy & Physiology II, by Amerman; Publisher: Pearson © 2019

ADDITIONAL SUPPLIES: 1 1/2" Binder, Colored Pencils

LOCATION and TIME:	Lecture:	moved online	(Exams will be held online
	Lab:	moved online	in Blackboard within regularly scheduled class time (@ MW 6 pm)

ABOUT AN ACCELERATED 6 WEEK CLASS:

Anatomy and Physiology II is designed to provide course content in a typical 16-week semester, not a 6-week session. Therefore, students opting to take this course must understand that this unabridged course is accelerated; and that the curricula continues to reflect a four-credit course. Further, as the course is now entirely online substantial time must be allocated by the student for the mastery of the material outside of a typical structured class setting. As this course is online there are readings, videos, and other support material that the student will be required to master independently of class meetings. Note that there is a more detailed rendering under the "Welcome to the Course" link and "What is Entailed in an Accelerated 6 Week Course."

COLLEGE COURSE DESCRIPTION:

BIO122 - Anatomy & Physiology II

A continuation of BIO121 Anatomy & Physiology I. Systems covered are circulatory, endocrine, reproductive, urinary, digestive and respiratory.

4 Credit Hours, 3 lecture credits; 2 lab hours
Prerequisites: Course or Test: BIO121 Anatomy & Physiology I, minimum grade of D

Introduction:

Human Anatomy and Physiology II (A&P II) is designed to provide an anatomical and physiological foundation for students pursuing careers in the allied health fields. Human Anatomy and Physiology, as the name implies, is the study of the human body: how it is put together and how the various parts work together. This course is a continuation of Human Anatomy and Physiology I (A&P I) and will proceed on a system-by-system basis. A&P II assumes a working knowledge of topis and concepts presented in A&P I.

The course will commence with an in-depth study of the cardiovascular system. This is followed by a unit that explores the lymphatic system and immunity. Afterwards, other organ systems such as the respiratory system, digestive system, urinary system, and reproductive systems will also be examined. Other subjects of particular relevance will be discussed at appropriate points during the lecture sequence.

The laboratory component of the course was traditionally designed to give the students a "hands-on" appreciation for the anatomical considerations being discussed in a lecture and to familiarize the student with some of the more basic physiological considerations as they relate to gross anatomy. As this course is now online, laboratory exercises will be video recorded sessions looking at anatomical structures and functions that reinforce lecture topics.

INSTRUCTIONAL OBJECTIVES:

This course is given to provide the essential background needed for students pursuing a career in the medical and paramedical curricula or related fields. It also provides answers to those keenly interested in the human body both in form and function. Lecture topics generally commence with a detailed description of anatomical considerations followed by relevant physiological processes. Throughout this approach, there will also be an aim to integrate the systems relative to their homeostatic functions. With these thoughts in mind, the following course-level objectives will be covered:

1. Students will identify the essential components of the blood and their respective functions. The student will be able to explain the general process by which blood cells are produced and the control mechanisms regulating these processes. The student will demonstrate an understanding of blood

clotting, and it's relationship to the fighting of infection. The student will also be able to explain the mechanisms of gas transport by red blood cells.

2. The student will be able to identify the name and function of all essential anatomy as it relates to the cardiac cycle. This will be followed by a thorough examination of the cardiac cycle of which the student will demonstrate, in writing, his/her comprehension of this important topic. Finally, the regulatory mechanisms that control cardiac output will be identified.
3. The student will then be expected to demonstrate a broad understanding of the anatomical and physiological characteristics of the blood vessels; and how these vessels differ relative to their location to the heart and critical organs. The students will also identify major arteries and veins of the human body, and demonstrate a keen understanding of the hepatic portal system. Finally, the physiological mechanisms of fluid exchange and blood pressure will be examined.
4. The student will identify the various functions of the lymphatic system as they relate to the organs found in this system. An understanding of the importance of the lymphatic system relative to immune function will be examined and demonstrated.
5. The students will be able to explain the essential components of both non-specific and specific host immune responses. This will include the demonstration of interferon and the complement system. Finally, the student will be expected to explain, in essay form, the full functioning of both cellular and humoral immunity.
6. The student will be able to identify the name and functions of all major components of the respiratory system. Critical physiological mechanisms relating to gas transport and exchange will likewise be examined. The student will also demonstrate an understanding of the anatomy of the larynx as well as it's function.
7. The next major topic is the digestive system. Here, the student will be able to sequentially follow the alimentary canal and discuss the various anatomical and physiological modifications to the overall digestive process. The function of accessory organs such as gall bladder, liver, pancreas, salivary glands, as well as human dentition and tooth anatomy will be examined; and the student will be expected to demonstrate his/her competency both in writing and by illustration. The student will also demonstrate in writing lipid transport and regulation.
8. The urinary system and nephron function will follow. Here the students will be able to identify all major anatomical parts of this system as well as it's functioning unit, the nephron. Following this, the student will be presented

with his/her most challenging component of the course: a detailed understanding of nephron physiology expressed in essay form.

9. Discussion of the human reproductive systems will aim providing essential anatomy and physiology as well as hormonal controls for these systems. Besides being able to identify major anatomical components and their respective functions, the student will be asked to illustrate both male and female hormonal regulation. Finally, the unique adaptations of the female body to the carry, support, and nurture a fetus/infant will be discussed.
10. The last lecture of the semester will cover the endocrine system but also serve as a synthesis of homeostatic themes presented throughout the course. In this respect, the student can anticipate some review of control mechanisms previously presented, but in a more focused context of the endocrine system. As such, the student will become familiar with the anatomy and location of endocrine organs and their specific roles in the maintenance of homeostasis. Several control systems will be presented and the student will illustrate several of these in illustration form.

INSTRUCTIONAL MODES

This course will be delivered online utilizing resources available through Blackboard and/or the instructor's web site. Each lecture/module will have an instructional guide that will guide the student through the supportive readings, videos, animations, and other media under consideration for any particular lecture/module. The online resources will guide the student through the essential information the student needs in preparation for associated assessment exams. The video lectures will follow a lecture outline, both of which can be found online. These are essential tools to prepare the student for the lecture assessment exams. Exams are given on a lecture by lecture basis and should be completed before beginning the next lecture. These exams will cover material covered on the outlines, handouts, as well as on the videos. The exams are noncumulative but any particular lecture assumes a working knowledge of previous lecture topics.

For additional details of the module week, see "Course Walkthrough (or Instructional Rhythm) in the Course Information folder on Blackboard

Course student outcomes include but and not limited to:

- Describe the functions of the blood in the maintenance of homeostasis.
- Describe the process of erythropoiesis and erythrocyte break down.
- Describe the process of hemostasis (blood clotting).
- Describe the anatomy and heart of heart structures.
- Describe in detail the events of the cardiac cycle.

- Describe control measures in cardiac output.
- Describe and distinguish the various classifications of blood vessels and the particular function in blood transport.
- Identify specific blood vessels in the list provided.
- Explain how blood pressure is controlled.
- Describe the various means by which the body accomplishes a non-specific host immune response.
- Explain the process of wound healing.
- Explain what initiations the complement system and interferon and the specific outcomes of both systems.
- Describe how the specific host immune system develops.
- Provide details on several specific host immune paradigms.
- Describe the anatomy and physiology of organs of the respiratory system.
- Describe the structure and function of the larynx.
- Describe how the lungs remain inflated, and what happens during pneumothorax.
- Explain how partial pressure effects gas movement.
- Explain the mechanics of ventilation.
- Describe how environmental conditions effect the carrying capacity of hemoglobin for oxygen.
- Describe the anatomy and physiology of organs of the digestive system.
- Describe the events that occur during deglutition.
- Describe the function of the stomach and how gastric events are regulated.
- Describe the anatomy and functions of the gall bladder, pancreas, and liver.
- Describe the metabolic processes associated with the liver.
- Identify the anatomical structures large intestine and describe their functions.
- Describe the anatomy and the physiology of organs associated with the urinary system.
- Describe the anatomical and physiological characteristics of each part of the nephron.
- Describe and identify the organs of the reproductive tract.
- Explain how spermatogenesis in controlled.
- Explain how the ovarian and uterine cycle works together and the control mechanisms for both.

TEACHING PROCEDURES:

The lecture sequence will be presented in a systematic fashion using YouTube videos. These videos will follow lecture outlines, all of which can be found

online. Accompanying visuals to facilitate organization and understanding of the lecture material will be presented in the videos. Significant emphasis will be placed upon physiological processes occurring within body systems. An additional goal will be to integrate how the anatomy and physiology of the various body systems work together to maintain life.

GRADING POLICY

The assignment of a final semester grade will be dependent upon the completion of all lecture exams and lab practicals.

In total, approximately 12 exams are given, of which the lowest grade may be dropped. These exams will cover the material detailed on the lecture outlines and expounded upon in the lecture videos. The nature of the exams are non-cumulative, although material from preceding lectures will be used foundationally during current lecture topics. Any particular lecture will assume a working knowledge of previous lectures.

Exams consist of a variety of question types:

- True and False
- Matching
- Fill in the Blanks
- Illustrations
- Guided Essays
- Short Answers

To read more about the nature of assessment, read the document "Assessement" that is online.

Exams are to be taken at home on Blackboard, and on the designated day indicated on the schedule below. Exams will start at 6 pm and will be timed appropriately for the particular exam under consideration. The length of time for each exam will be identified on the exam prior to taking it.

ATTENDANCE POLICY:

As the course is now online, attendance is not an issue. However, exams will be conducted during currently class times, and will start at 6 pm.

Nevertheless, given that the course is accelerated, and content-heavy, the student will need to budget sufficient time toward mastery of the material. This will be best accomplished by setting aside two blocks of time:

- Time to view the videos (~2 hours per day)
- Time to master the content presented (~4 hours)

COLLEGE STATEMENTS:

- **Evaluation of Student Work** "Northern Essex Community College's commitment to student success involves the evaluation of student work to help ensure that students achieve the learning outcomes identified by our programs and the college. This process may involve the collection of student classroom products for evaluation at the program, department, and/or college levels. When collected for this purpose, students' names will be removed from the products so that the assessing is done anonymously. Evaluations carried out at the program, department, and/or college levels will not impact students' course grades. The process of assigning grades will continue to be the responsibility of the course instructor."
- **Learning Accommodations**

  Learning Accommodations Center:

  Serving students with documented disabilities such as: learning disabilities, attention deficit disorders, autism spectrum disorders, brain injuries, chronic illness, low vision/blink, physical disabilities, psychiatric disabilities, and seizure disorders.

  Location: Student Center SC111, call (978) 556-3654
  Or email: lacenter@necc.mass.edu

  Deaf and Hard of Hearing Services:

  Location: Student Center SC110, call (978) 241-7045 (VP?Voice)
  Or email: deafrservices@necc.mass.edu

NOTES "the fine print"

1 **Administrative**

a. **The Syllabus** Please keep a copy of this syllabus as a record of course content for future application purposes.

2 **Course Delivery**

a. All course material is provided online. Lectures will be done by YouTube video and have closed-caption options available. Videos will broadly follow detailed course outlines and handouts, which can also be found online. Outlines and handouts are designed also to facilitate note taking. You will need to have the outlines in hand while viewing the videos. And you will find that the lecture exams will reflect the outline and video presentations. Generally, I do not assess information that I have not talked about. There are a few exceptions. An important rule is this: if it is on the outline, you need to know it. If something is not on the outline, you do not need to know it.

3 **Attendance**

a. **Attendance** With the exception of taking the exams, your attendance and daily study time is set by you. As mentioned, you will certainly want to schedule two important time allotments:

- Schedule ~two hours ***daily*** for viewing lecture and lab presentations online
- Schedule at least ~four hours ***daily*** for mastery of the material presented.

The specific amount of time allotted and how a student budgets this time is highly personal, and it will vary from student to student depending on your individual learning requirements and learning goals.

b. **Tardiness** Please be on time for taking the scheduled exams at 6 pm on the designated day. If you take an exam outside of the set scheduled time, the grade is effected.

4 **Course Materials/Services**

a. **Alternative Textbook** If the student chooses to use an alternative textbook, or an edition other than the one required for this course, it is the student's responsibility to obtain information that is either not covered or otherwise not approached in a similar manner as in the required text.

b. **Textbook Usage** The role of the textbook is to be a supportive tool for the lectures. The student is not expected to memorize the entire textbook, but to use it to reinforce concepts and material presented during lecture.

c. **Website** The website associated with this course can be found at the following address: www.noelways.com. Also, all course material may be accessed on Blackboard. All exams are done on Blackboard. Once the site is accessed, select your course, and there you will find your lecture outlines, handouts, and other support material.

d. **Lecture Outlines and Supplemental Materials** are to be found on the internet. All course materials should be downloaded and organized in a three-ring binder during the first week of classes.

e. **Tutoring** The college provides free tutoring services during Fall and Spring semesters. Contact the academic support center for the days and times. Tutoring is a free service of the college and designed to assist students who desire to excel in their mastery of the material as well as those struggling.

5 **Exams**

a. **The Exam Schedule** below is a tentative but probable schedule of topics and dates. The schedule may be modified according to the progress of the lectures. The exam dates are target dates and will represent only material actually covered on course outlines, handouts, video assignment and other designated

learning venues. Specifics regarding content will be given in the learning guides.

b. **Make-up Lecture Exams** are to be avoided! But if a make-up is needed, documentation is required to certify that the need is legitimate. If documentation is not presented, a make-up is still permitted, but a penalty is applied at the discretion of the instructor. If there is to be a make-up, this task should be accomplished within a week that the student is in good health. Dates and times are limited, so the students may need to make special arraignments to do the make-up. Contact me so that a time and a date can be coordinated. After a week, the instructor reserves the right to refuse a make-up.

6 **Grading**

a. **Dropping One Exam** The lowest grade of the semester is dropped with exception of the last exam unit and any other exam that the instructor designates as "non-droppable".

b. **Final Grade** Your final course grade is typically determined the day of the final exam. Once the grades are submitted, confirm your grade with the college, and contact me if there are any issues. After four weeks of the grades being submitted, exams are recycled, and grades are final.

c. **Exam Grades** are not given over the internet. When the exams are graded the grade will be posted on Blackboard

8 **Final Points**

a. **Contact Information** See email address for the contact link. When emailing, always identify yourself and the class that you are in. Always have the subject line appropriately filled in. I will not open mail that is not properly identified. All email should be done through your college email account.

b. **Recommendations** Should you seek a letter of recommendation to future programs; please provide the instructor with appropriate information and college deadlines that you are facing. Finally, to ensure that your application is complete, please contact the school after a reasonable period of time to assure that they have received the letter. Contact me if there are any problems.

Summer Schedule

This schedule is tentative and will be adjusted according to the progress of the lectures.

Lecture (Module) Date	*LECTURE*	*Exam*
Lecture #1 *June 22 (Mon)*	***Blood***	*No Exam June 22*
Lecture #2 *June 24 (Wed)*	***Heart***	*Exam on Blood @ 6 pm*
Lecture #3 *June 29 (Mon)*	***Vessels and Routes***	*Exam on Heart @ 6 pm*
Lecture #4 *July 1 (Wed)*	***Lymphatic System and Non-specific host Immunity***	*Exam on Vessels and Routes @ 6 pm*
Lecture #5 *July 6 (Mon)*	***Respiratory System, Part 1***	*Exam on Lymph. Sys & Non Sp. Imm @ 6 pm*
Lecture #6 *July 8 (Wed)*	***Respiratory System, Part 2***	*Lab Practical #1 (Heart and Vessels) @ 6 pm*
Lecture #7 *July 13 (Mon)*	***Digestive System, Part 1***	*Exam on Respiratory System @ 6 pm*
Lecture #8 *July 15 (Wed)*	***Digestive System, Part 2***	*Exam on Digestive System, Part 1 @ 6 pm*
Lecture #9 *July 20 (Mon)*	***Male Reproductive System***	*Exam on Digestive System, Part 2 @ 6 pm*
Lecture #10 *July 22 (Wed)*	***Female Reproductive System***	*Exam on Male Reproductive System @ 6 pm*
Lecture #11 *July 27 (Mon)*	*Brief Primer on* ***Urinary System****, and Lab Review Time*	*Exam on Female Reproductive System @ 6 pm*
Lecture #11 *July 29 (Wed)*	*No Lecture assignment*	*Lab Practical #2 (Few Questions on Urinary) @ 6 pm*

Anatomy and Physiology II Exam Contents

(Modification of content, dates, or number of exams will be announced in class, should any be made. Exams may not be given in the order designated below.)

Exam #	**Grade**	**Exam Title**
Exam #1:	_____	_____
Exam #2:	_____	_____
Exam #3:	_____	_____
Exam #4:	_____	_____
Exam #5:	_____	_____
Exam #6:	_____	_____
Exam #7:	_____	_____
Exam #7:	_____	_____
Exam #9:	_____	_____
Exam #10:	_____	_____
Exam #11:	_____	_____

Calculation of your grade is simple. Drop your lowest grade, then do a simple average. This is your course grade to date. Note your grade in the numeric/letter equivalence chart below.

Grading Policy:

A	4.0	93-100	C	2.0	73-76
A-	3.7	90-92	C-	1.7	70-72
B+	3.3	87-89	D+	1.3	67-69
B	3.0	83-86	D	1.0	60-66
B-	2.7	80-82	F	0.0	0-59
C+	2.3	77-79			

Course Average: _____

Letter Grade: _____