BRAZOSPORT COLLEGE
LAKE JACKSON, TEXAS

SYLLABUS for BIOLOGY 2302 Lecture
HUMAN ANATOMY AND PHYSIOLOGY II
J. James

Catalog Description:
This 3-credit course is the second half of a two-semester series in human anatomy and physiology. Students will study the structure and function of the human body emphasizing the circulatory, lymphatic, immune, respiratory, digestive, urinary, and reproductive systems. Through a variety of laboratory activities students will have the opportunity to learn the anatomy of these organ systems and participate in activities which demonstrate key concepts associated with these organ systems.

Prerequisite: BIOL 2301(3-3) [2607065124]

Textbook:
Marieb & Hoehn. Human Anatomy and Physiology, 10th edition, Pearson Publishing, 2016, ISBN- 978-0-321-92704-0. The 9th or 8th edition of the same text is equally good. Page numbers and figure numbers will vary slightly but info content is 99% the same. The text is available in a variety of formats; hardback, loose leaf, digital, and can even be rented. The cost varies significantly between these formats.

Required course materials are available at the Brazosport College bookstore on campus or from a variety of online sources. A student of this institution is not under any obligation to purchase a textbook from the college bookstore. The same textbook is/may also be available from independent retailers, including online retailers.

*Students may choose to use an alternate text or even a variety of online resources. However this course (especially lab) has been designed on the assumption the student has access to the aforementioned text.
I. GENERAL COURSE OBJECTIVES

This course is designed to follow BIOL 2301. It continues to build the foundation for those pursuing degrees in a variety of health-related professions. It is a requirement for BSN and ADN degrees and is a prerequisite for many courses in many health-related career fields. The course continues to guide students in their study of anatomical terminology and physiological principles of the human body. The course is extensive and requires considerable time and effort on the part of most students for successful completion. Students will be expected to learn relevant terminology, explain physiological processes in written essays, and use critical thinking skills to draw conclusions and predict physiological responses from information presented.

The course begins with a study of blood and the cardiovascular system and progresses on through the lymphatic, immune, respiratory, digestive, urinary, and reproductive systems. The operation of various negative and positive feedback mechanisms is emphasized throughout.

Weekly laboratory activities are designed to complement and coincide with lecture topics. Laboratory activities will include use of various organ system models, group activities, and dissections of preserved or fresh specimens of hearts, lungs, etc. No live animal experiments are used. The students will be guided through the structural anatomy of the organs and the physiological processes involved in each organ system.

The vast majority of students in A&P II will be those who just completed A&P I and who have career goals in the field of nursing. A few will have career goals in health-related fields such as physical or occupational therapy, dentistry, pharmacology, medical school, nutrition, exercise physiology, etc. Many references will be made to information learned in A&P I. Most students agree that A&P II is more difficult than A&P I and that the good study habits acquired in A&P I are essential for survival in A&P II.

LEARNING OUTCOMES

1. Students will demonstrate knowledge of the cardio-vascular system and control, including: blood, circulation, tissue perfusion and capillary exchange, cardiac muscle fibers, the intrinsic conduction system, and circulation through the heart.
   Exam 1

2. Students will demonstrate knowledge of the roles of various cells and chemical substances involved in our nonspecific and specific defense responses.
   Exam 2

3. Students will demonstrate knowledge of the respiratory system, including: pulmonary ventilation, gas transport, internal respiration, and respiratory control.
   Exam 3

4. Students will demonstrate knowledge of fluid and electrolyte balance, including: pH imbalances causes and cures, interpretation of ABG’s, fluid compartments and shifts, and feedback and control mechanisms.
   Exam 4

5. Students will demonstrate knowledge of the reproductive system, including the hormonal controls of the ovarian and menstrual cycles, and pregnancy and childbirth
   Exam 5
II. LECTURE TOPICS

1. Erythrocytes (RBCs), Structural Characteristics, Hemoglobin. Production of RBCs (Erythropoiesis), Fate and Destruction of RBCs, Regulation of Erythropoiesis (Homeostasis)

2. Anemias & Septicemia, Leukemia, Thalassemias, Hemostasis Sequence of Events, Clot Retraction and Fibrinolysis, Preventing undesirable clotting

3. Hemostasis (cont’d), Disorders of Hemostasis, Clinical applications, Properties of Cardiac Muscle Fibers, Mechanism & Events of Contraction

4. Setting the Basic Rhythm, Intrinsic Conduction System, Autorhythmicity, Clinical Applications, The Cardiac Cycle, Systole vs. Diastole, EDV vs. ESV

5. Cardiac Output, Regulation of Stroke Volume, Preload, Afterload, & Contractility, Regulation of Heart Rate, Modifying the Basic Rhythm (a.k.a. Extrinsic Innervation), ANS Regulation, Chemical Regulation, Other factors and Congestive Heart Failure

6. Physiology of Circulation, Maintaining Systemic Blood Pressure, Short-Term Mechanisms, Neural Controls, Chemical Controls, Long-Term Mechanisms, Renal Regulation


9. ADAPTIVE (Specific) IMMUNITY, LYMPHOCYTES, Immunocompetence: Positive and Negative Selection, B cells and T cells

10. ANTIGEN-PRESENTING CELLS (APCs), Antigens and MHC/Antigen Complexes, THE HUMORAL IMMUNE RESPONSE - via B CELLS and ANTIBODIES, Activation, Clonal Selection yields Plasma cells and Memory cells, Antibodies (effects of...), Immunological Memory, Antibody Production in Primary and Secondary Responses, Vaccines

11. THE CELL MEDIATED IMMUNE RESPONSE - via T CELLS, T cell Activation, Clonal Selection of T cells, Helper Ts, Cytotoxic Ts, Suppressor Ts, Memory Ts

12. Antibiotics, Transplant Rejections and Immunosuppression, AIDS due to HIV, Autoimmune Diseases, Hypersensitivities, Immediate Hypersensitivities, Anaphylaxis, Anaphylactic Shock, and Atopy, Delayed Hypersensitivities

13. MECHANICS OF BREATHING, PRESSURE RELATIONSHIPS IN THE THORACIC CAVITY, Atmospheric (a.k.a. barometric), Intrapulmonary (a.k.a. alveolar), Intrapleural, Lung Recoil due to lung elasticity, Surface tension of alveolar fluid

14. PULMONARY VENTILATION: INSPIRATION AND EXPIRATION, Boyle's Law (a.k.a. The General Gas
15. DALTON’S LAW OF PARTIAL PRESSURES, HENRY’S LAW, GAS EXCHANGES BETWEEN BLOOD, LUNGS, AND TISSUES, EXTERNAL RESPIRATION, RESPIRATORY MEMBRANE, VENTILATION – PERFUSION COUPLING, INTERNAL RESPIRATION


17. CONTROL OF RESPIRATION, CONTROL CENTERS, GENESIS OF THE RESPIRATORY RHYTHM, HYPERVENTILATION & HYPOVENTILATION (COMPENSATORY VS. NONCOMPENSATORY), FACTORS INFLUENCING RATE AND DEPTH, INFLUENCE OF HIGHER BRAIN CENTERS, CHEMICAL FACTORS

18. CO₂ (AND THEREFORE PH OF CSF), ARTERIAL BLOOD PH, O₂

19. USES OF CHOLESTEROL, CHOLESTEROL TRANSPORT, LIPOPROTEINS, CHYLOMICRONS, VLDLS, LDLS, HDLS, FACTORS INFLUENCING PLASMA CHOLESTEROL LEVELS

20. REGULATION OF BODY TEMPERATURE, MECHANISMS OF HEAT EXCHANGE, THE CONTROL CENTER = HYPOTHALAMUS, HEAT PROMOTING MECHANISMS, HEAT LOSS MECHANISMS

21. HYPERTHERMIA, HEAT EXHAUSTION, HEAT STROKE, FEVER

22. GLOMERULAR FILTRATION, THE FILTRATION MEMBRANE, NET FILTRATION PRESSURE, GLOMERULAR FILTRATION RATE, CLINICAL APPLICATIONS – WHAT IF..., REGULATION OF NFP AND THEREFORE GFR, INTRINSIC CONTROLS (RENA L AUTOREGULATION), EXTRINSIC CONTROLS (SYMPATHETIC STIMULATION AND HORMONAL CONTROLS)

23. REGULATION OF ECF (AND THEREFORE URINE) CONCENTRATION AND VOLUME, THE COUNTCURRENT MULTIPLIER AND EXCHANGER, FORMATION OF DILUTE URINE, FORMATION OF CONCENTRATED URINE, DIURESIS AND DIURETICS, SOLVENT DRAG (NOT IN TEXT), RENAL CLEARANCE (A.K.A. PLASMA CLEARANCE), TUBULAR MAXIMUM (NOT IN TEXT), MICTURATION

24. PH AND ACID-BASE BALANCE, KNOW THE CONCEPT OF PH, PH VALUES FOR BLOOD, SOURCES OF H+, PH VALUES FOR URINE, AND HOW EACH OF THE 3 COMPENSATORY MECHANISMS WORKS TO MAINTAIN PROPER PH OF THE BLOOD.

25. FLUID COMPARTMENTS - IDENTIFY THE FLUID COMPARTMENTS AND THE PERCENTAGES OF FLUIDS THEY CONTAIN, COMPOSITION OF BODY FLUIDS - LEARN WHICH COMPONENTS ARE MOST ABUNDANT IN EACH COMPARTMENT, OSMOLALITY – HOW TO PREDICT IT.

26. FLUID MOVEMENT AMONG COMPARTMENTS, WATER BALANCE, INPUT VS. OUTPUT, THIRST, DEHYDRATION, HYPTONIC HYDRATION, EDEMA

27. ELECTROLYTE BALANCE - POTASSIUM, CALCIUM, SODIUM, ACIDOSIS: CRITERIA, CAUSES, AND EFFECTS, RESPIRATORY ACIDOSIS, METABOLIC ACIDOSIS, ALKALOSIS: CRITERIA, CAUSES, AND EFFECTS, RESPIRATORY ALKALOSIS, METABOLIC ALKALOSIS, THE ABCS OF ABGs
28. The following lab topics on reproduction are fair game for the lecture exam, Male Anatomy and functions, Female Anatomy and functions, Fertilization, Implantation, Placentation, Hormones of Pregnancy, Parturition – the hormonal controls

29. The Ovarian Cycle, Events and Phases, Hormonal Regulation by FSH and LH (Know the source, target tissue, effect, & stimulus for release for each H.)

30. The Uterine (Menstrual) Cycle, Events and Phases, The Endometrium, Effects of estrogen and progesterone (Know the source, target tissue, effect, & stimulus for release for each H.), Menses

31. PMS Premenstrual Syndrome, Pregnancy Related Topics Preeclampsia and Eclampsia, Lactation, Occlusion of Fetal Blood Vessels and Vascular Shunts, Ventricular septal defect VSD, Atrial septal defect ASD, Neural tube defects: Anencephaly and Spina bifida, Respiratory Distress Syndrome (RDS) in premature infants

32. Stages of Labor, Placenta previa, Placenta abruptio, Menopause

IV. EXAMS and GRADING

- There will be five regular exams plus a comprehensive final exam. Each is worth 100 points.
- If you foresee a conflict you may make arrangements to take an exam earlier than scheduled. There are no makeups “after the fact” for exams missed. *However your score on the comprehensive final may be used to replace your lowest exam score. In this case the final exam score is effectively counted twice.
- Regular exams typically consist of terminology definitions, MC, and essay questions. Exam questions will focus on topics listed in the Study Guides provided by the instructor. The majority of these topics are covered efficiently by your instructor in class.
- The final exam is MC only.
- Regular exams and the final exam are weighted equally. Each has the same value. Total of points earned on 5 exams plus points earned on the comprehensive final is divided by 600.
- Your instructor may require or offer additional assignments at his discretion on a per semester basis.
- A straight grading scale will be used so that:
  - 90% and above - A
  - 80% and above – B
  - 70% and above – C
  - 60% and above – D
  - Below 60% - F

V. COURSE POLICIES

A. ADDITIONAL HELP - SUPPLEMENTAL INSTRUCTION

Supplemental Instructors (SIs) are former students who have done well in the course. They host weekly learning/review/study sessions to help you master the terminology and concepts and do well in the course. Students who participate regularly in SI sessions typically score 10% higher on lab quizzes and 10% higher on lecture exams. All SI services are at no cost to you.
B. STUDENTS WITH DISABILITIES
   Brazosport College is committed to providing equal education opportunities to every student. BC offers services for individuals with special needs and capabilities including counseling, tutoring, equipment, and software to assist students with special needs. Please contact Phil Robertson, Special Populations Counselor, at 979-230-3236 for further information.

C. WITHDRAWAL POLICY
   The Brazosport College Life Sciences Department believes attendance in both lecture and lab is critical for thorough comprehension of material. Therefore, if student absences exceed requirements set by the instructor, he/she may be withdrawn from the course.

   If a student decides to no longer participate in the course, for any reason, it is the student’s responsibility to officially withdraw from the course by the designated deadline. To officially withdraw from the course, students must complete and sign a withdrawal form, available in the Registrar’s Office. Failure to do so will result in the student remaining enrolled and receiving a grade – most likely an ‘F’.

D. ACADEMIC HONESTY
   Brazosport College assumes that students eligible to perform on the college level are familiar with the ordinary rules governing proper conduct including academic honesty. The principle of academic honesty is that all work presented by you is yours alone. Academic dishonesty including, but not limited to, cheating, plagiarism, and collusion shall be treated appropriately. Please refer to the Brazosport College Student Guide for more information. This is available online at http://www.brazosport.edu. This does not prevent you from working in teams to learn the information. In fact, teamwork to learn the material is very much encouraged but your work on any exam, quiz, or assignment should be yours alone and strictly from your memory.

   Academic dishonesty violates both the policies of this course and the college’s Student Code of Conduct. In this class, any occurrence of academic dishonesty will be referred to the Dean of Student Services for prompt adjudication, and may, at a minimum, result in anything from zero for the exam/quiz/assignment to an ’F’ in this course. Additional sanctions & penalties may be imposed by the Dean of Student Services.
E. MOBILE PHONES
Mobile phones are amazingly useful tools. Did you know there is more computing power in the average smart phone than there was on the command module that landed Neil Armstrong on the moon? Along with all the many good things our smart phones can do they can also be huge distractions. They can draw our attention away from the important stuff happening right in front of us.

It is a sign of maturity and self-discipline to be able to manage your time well enough to be able to give your full attention to the task at hand. In the classroom this means giving your full attention to the presenter, your classmate’s questions, and discussions. As a courtesy to your classmates and presenter(s), all mobile phones and communication devices should be turned OFF and OUT OF SIGHT during lectures and labs. Students who have their phones on their desks, in their laps, under their legs and/or in any manner view or utilize their phones during class are NOT giving their full attention to their learning. This indicates a lack of maturity and a lack of dedication to learning.

Various health care programs often have 4 applicants for every 1 seat in the program. They want to admit only those students who are mature enough and dedicated enough to complete the program and enter the workforce. They rely on letters of recommendation from instructors and employers to make these choices. I would like to be able to write a very positive letter of recommendation for you but misuse of your phone in class/lab prevents me from doing so. I cannot with a clear conscience recommend you as a good candidate if you don’t give your full attention to your learning. Please consider practicing good phone manners so I am able to write the best possible letter of recommendation on your behalf.

Other Student Services Information

BC Connect App: Get the information you need – when you need it. Click http://geni.us/BRAZO to install BC Connect on your mobile device to receive reminders, explore careers, map your educational plan, be in the know about events, find out about scholarships, achieve your goals and much more.

Writing Center: Located within the Student Success Center (second floor of the main building above the counseling and registration office) is the Brazosport College Writing Center. The Writing Center provides drop-in tutoring Monday – Thursday 9 am – 8 pm and Friday 9 am – noon. Online tutoring is also available by appointment. The Writing Center can assist with brainstorming, organizing and developing paragraphs, understanding professors’ directions, learning about MLA or other styles, learning how to avoid plagiarism, improving mechanics, using Microsoft Word, becoming an even stronger writer, and much, much more. Check out our growing collection on handouts, videos, and other online resources, too.

Math Center: Located within the Student Success Center (second floor of the main building above the counseling and registration office) is the Brazosport College Math Center. The Math Center provides drop-in tutoring Monday – Thursday 9 am – 8 pm and Friday 9 am – noon. The Math Center can assist with transitional math, college algebra, trigonometry, accounting, statistics, calculus, and every other math course offered at the college. Check out our growing collection on handouts, videos, and other online resources, too.

Library:
Information about the Library is available at http://www.brazosport.edu/~lib/Information.htm or by calling 979-230-3310.