



H. LAVITY STOUTT COMMUNITY COLLEGE

Department of Mathematics and Science

College Mission Statement

H. Lavity Stoutt Community College provides quality higher education and lifelong learning that is responsive to changing community needs, the global economy and evolving technology. The offerings promote individual growth, economic, social, and cultural development.

Department Mission Statement

The mission of the Mathematics and Science Department is to provide students with a sound foundation in mathematics and science that will allow them to function effectively in a diverse community and to pursue further studies beyond the community college level.

Programme Goals/Aims for Biology Courses

1. To provide students with a solid understanding of the basic principles of biology.
 2. To enhance communication of scientific knowledge.
 3. To develop critical thinking and problem-solving skills.
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Course

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| Course Title | Anatomy & Physiology II |
| Course Code | BIO 214 |
| Semester | Spring 2019 |
| Instructor | Stephanie Russ Penn, M.S. |
| Office Location | Mathematics and Science Department (Second Floor, Main Building) |
| Office Hours | M: 9:20-10:20, TH: 10:30-11:50 or by appointment |
| Phone | (284) 852-7216 |
| E-mail | sruss@hlsc.edu.vg |
| Class Meeting Days/Time | T & TH: 1:00- 2:30; LAB: W: 1:00-3:50 |
| Class Meeting Location | Lecture: TBD; LAB: BL |
| Credit Hours | 4 |
| Course Sites | http://hlscmoodle.com/ Enrolment Key: BIO214S2019 (case sensitive) |
| Pre-requisite | BIO 212, minimum Grade C |
| Required Textbook: | Principles of Anatomy & Physiology (12 th ed.) by Gerard Tortora and Bryan Derrickson, John Wiley & Sons Inc., 2009. ISBN 9780470084717 Laboratory Manual for Anatomy & Physiology (5 th ed.) by Michael G. Woods, Pearson, USA 2013. ISBN 978-0321794376 |

Course Description

This four (4) credit course is the second of a two-course sequence in Anatomy & Physiology with continued comprehensive study of the structure and function of the human body and related homeostatic mechanisms. Topics covered include the endocrine, cardiovascular, lymphatic, respiratory, digestive, urinary and reproductive systems. The laboratory portion of this course provides students with practical experience in the areas covered and focuses largely on anatomical identification, dissection, case study work and microscopy skills. The course prepares students that are interested in pursuing further studies in any medical, nursing and allied health related field as well as physical education.

Course Learning Outcomes

Upon completing the course, the student will be able to:

1. Use anatomical terminology
2. Describe the structural organization (anatomical features) of the human body from the cellular, tissue, organ and organ system levels (with specific focus on the endocrine, cardiovascular, lymphatic, respiratory, digestive, urinary and reproductive systems.)
3. Explain the physiological characteristics of the endocrine, cardiovascular, lymphatic, respiratory, digestive, urinary and reproductive systems.
4. Relate organ system physiology to the concept of homeostasis

Content Learning Outcomes

UNIT 1: Special Senses & Endocrine System

By the end of the unit students should be able to:

1. Define sensation and discuss the components of sensation
2. List types of sensory receptors and describe their functions
3. Describe the structure of our special senses and explain their basic physiology
4. Compare control of body functions by the nervous system and endocrine system.
5. Distinguish between exocrine and endocrine glands
6. Compare the two chemical classes of hormones.
7. Describe the two general mechanisms of hormone action.
8. Describe the locations of and relationships between the hypothalamus and pituitary gland.
9. Describe the location, histology, hormones, and functions of various endocrine glands (eg. anterior and posterior pituitary, thyroid gland, parathyroid, pancreas, adrenal glands, pineal gland, thymus)

UNIT 2: Cardiovascular System, Lymphatic System and Immunity

By the end of the unit students should be able to:

1. Contrast the structure and function of arteries, arterioles, capillaries, venules, and veins.
2. Outline the vessels through which the blood moves in its passage from the heart to the capillaries and back.
3. Discuss the pressures that cause movement of fluids between capillaries and interstitial spaces.
4. Explain the factors that regulate the volume of blood flow.
5. Explain how blood pressure changes throughout the cardiovascular system.
6. Describe the factors that determine mean arterial pressure and systemic vascular resistance.
7. Describe the relationship between cross-sectional area and velocity of blood flow.
8. Describe how blood pressure is regulated.
9. Define pulse, and define systolic, diastolic, and pulse pressures.
10. Define shock, and describe the four types of shock.
11. Explain how the body's response to shock is regulated by negative feedback
12. Describe and compare the major routes that blood takes through various regions of the body.
13. Describe the functions of blood.
14. Describe the physical characteristics and principal components of blood

15. Describe the origin of blood cells
16. Describe the structure, functions, and origin of blood cells (red, white, platelets)
17. Describe the life cycle of red blood cells.
18. Distinguish between the ABO and Rh blood groups.
19. Describe the three mechanisms that contribute to hemostasis.
20. Describe the internal and external structure of the heart.
21. Outline the flow of blood through the chambers of the heart and through the systemic and pulmonary circulations.
22. Describe the structural and functional characteristics of cardiac muscle tissue and the conduction system of the heart.
23. Explain how an action potential occurs in cardiac contractile fibers.
24. Describe the electrical events of a normal electrocardiogram (ECG).
25. Describe the pressure and volume changes that occur during a cardiac cycle.
26. Relate heart sounds to the ECG waves and pressure changes during systole and diastole.
27. Define cardiac output.
28. Describe the factors that affect regulation of stroke volume and heart rate
29. List the components and major functions of the lymphatic system.
30. Describe the organization of lymphatic vessels.
31. Explain the formation and flow of lymph.
32. Compare the structure and functions of the primary and secondary lymphatic organs and tissues.
33. Distinguish between innate and adaptive immunity (structurally and functionally)
34. Compare the functions of cell-mediated immunity and antibody-mediated immunity.
35. Outline the steps in a cell-mediated immune response and an antibody-mediated immune response
36. Define immunological surveillance.
37. Distinguish between a primary response and a secondary response to infection.

UNIT 3: Respiratory System and Digestive System

By the end of the course students should be able to:

1. Describe the organization of the respiratory system.
2. Describe the anatomy and histology of structures of the lower and upper airways.
3. Identify the functions of each respiratory system structure.
4. Explain pulmonary ventilation.
5. Explain the difference between tidal volume, inspiratory reserve volume, expiratory reserve volume, and residual volume.
6. Differentiate between inspiratory capacity, functional residual capacity, vital capacity, and total lung capacity.
7. Describe the exchange of oxygen and carbon dioxide in external and internal respiration.
8. Describe how the blood transports oxygen and carbon dioxide.
9. Describe the organization of the digestive system.
10. Describe the structure and function of the layers that form the wall of the gastrointestinal tract.
11. Describe the anatomy and histology of structures of the digestive system.
12. Describe the nerve supply of the GI tract.
13. Describe the three phases of digestion.
14. Describe the major hormones that regulate digestion.
15. Discuss the metabolism of carbohydrates, proteins and lipids.
16. Compare metabolism during the absorptive and postabsorptive states.
17. State the general functions of vitamins and minerals.

UNIT 4: Urinary System and Reproductive Systems

By the end of the course students should be able to:

1. Describe the organization of the urinary system
2. Explains the functions of the urinary system
3. Describe the external and internal gross anatomical features of the kidneys.
4. Trace the path of blood flow through the kidneys.
5. Describe the structure and basic functions of nephrons.
6. Describe glomerular filtration and factors that affect it.
7. Describe the routes and mechanisms of tubular reabsorption and secretion along renal tubules and collecting ducts.
8. Discuss the hormonal regulation of tubular reabsorption and secretion.
9. Describe the anatomy, histology, and physiology of the ureters, urinary bladder, and urethra.
10. Describe the ways that body wastes are handled.
11. Describe the various fluid compartments of the body.
12. Explain fluid movement between compartments and how fluid balance is maintained.
13. Compare the electrolyte composition of fluid compartments and explain how electrolyte concentrations are regulated.
14. Discuss acid-base homeostasis.
15. Describe the location, structure, and functions of the organs of the male reproductive system.
18. Discuss the process of spermatogenesis in the testes.
19. Describe the location, structure, and functions of the organs of the female reproductive system.
20. Discuss the process of oogenesis in the ovaries.
21. Compare the major events of the ovarian and uterine cycles.
22. Discuss the roles of key hormone within the male and female reproductive system
23. Explain the major developmental events that occur during the embryonic periods.
24. State the hormones of pregnancy and their functions.

Methods of Instruction

Lectures using SMART board technology (Internet, short video clips, PowerPoint, audio visuals, etc.), online tutorials, peer/group discussions/activities, practical activities.

Methods of Assessment

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| Quizzes | 10% |
| Lab Practicals/Integrative assignments | 25% |
| Hour Examinations | 25% |
| Final Examination | 40% |

HLSCC Grading Scale

| GRADE | | PERCENTAGE |
|-------|---------------|------------|
| A+ | Superior | 100 |
| A | Outstanding | 99 - 95 |
| A- | Excellent | 94 - 90 |
| B+ | Very High | 89 - 85 |
| B | High | 84 - 80 |
| B- | Good | 79-75 |
| C+ | Above Average | 74 - 70 |
| C | Average | 69 - 65 |
| C- | Below Average | 64 - 60 |
| D | Weak | 59 - 54 |
| F | Failure | 53 - 0 |

NOTE: A penalty may be applied to final grade if class attendance is poor.

Quizzes/Assignments: Regular quizzes will be given at the beginning of lab sessions, in-class and/or online with the lowest quiz grade dropped. Quizzes in lab will mainly cover material from the previous lab, but may also include material from the overview of the current lab session. In class or online quizzes will focus on lecture material. Additional written assignments may also be required as indicated. Only under extreme circumstances will missed quizzes/assignments be allowed to be made up.

Laboratory Practicals

Laboratory practical exams are common in anatomy and physiology courses. For this course the practical exams will be given as scheduled and will cover the lab material studied. The lowest lab practicum will be dropped. Missed practicums will **ONLY BE PERMITTED** under extreme circumstances and must be made up **within a week of the scheduled practicum**. Additional time outside of regularly scheduled lab sessions may be permitted to practice/prepare for lab practicums.

Examinations: Regularly scheduled exams will be given with the lowest exam grade dropped. A comprehensive final exam will be given at the end of the semester.

Students are expected to use **MOODLE** regularly, read prior to coming to class, participate in activities and ask questions to enhance their learning experience.

Attendance, Participation and Conduct: Attendance to class sessions are mandatory as outlined in the HLSCC attendance policy. If you anticipate being absent it is your responsibility to notify me in a timely manner to avoid penalty to your final grade. Students are expected to not cheat and plagiarism nor demonstrate improper personal behavior/conduct. Such behaviours will be subject to consequences as outlined by related HLSCC policies.

Electronic Devices: While in class no cellular phones and other distracting devices are to be used unless use is authorized.

Academic Conduct Policy

Students have the right to be treated fairly by the College, to accomplish the goals for which they came to the College in a conducive environment, harmonious of the College, and to be informed of College policies and/or regulations affecting them. Any student accused of violating College policies and/or regulations is entitled to fair and balanced procedural protection. **For a copy of the full policies and procedures, please refer to the Student Code of Conduct available in the Office of Student Life and on the College's Website**

Student Code of Instructional Behaviour

Cheating or plagiarism on written or oral examinations, quizzes, papers or other academic work is prohibited. All faculty or test invigilators shall have the right to examine materials in the student's possession during any academic exercise and shall have the right to immediately suspend from further work on an academic exercise if students are suspected of engaging in cheating or plagiarism. **For a copy of the full policies and procedures, please refer to the Student Code of Conduct available in the Office of Student Life and on the College's Website.**

Attendance Policy

All students are required to attend and participate in all class meetings and laboratory sessions. The College's mandatory attendance policy requires that attendance be recorded from the first day of class through the final exam and each class shall incorporate as part of its grading scheme an attendance component of no less than 5% and not to exceed 10% OR assess a penalty of no less than 5% and no more than 10% at the end of the semester. A student should maintain attendance of 80%. Special circumstances may arise and in all such cases it is the student's responsibility to contact his/her lecturer or Head of Department and the Student Success Centre.

It is the responsibility of students to know the College's attendance policy. Failure to attend class can result in dismissal from class. Drops or withdrawal must be processed through the Registrar's Office. Any student who stops attending a class without officially withdrawing may receive the grade of "F".

Teaching Philosophy

To create an environment that fosters the development of skills that evolve into effective autonomous learning; To challenge students to critically analyse and integrate concepts while making the learning experience fun, interesting, thought provoking and relevant; To continuously adapt when needed and improve as an educator.

Study Tips

1. Avoid unnecessary stress by managing your time and NOT procrastinating
2. Complete all assigned work on time. This includes reading assignments
3. Read to understand and apply and not just memorize
4. Ask questions
5. Regularly communicate any difficulties with your instructor

BIO 214 Course Schedule (FALL 2019)

| Date | | | Session | Lesson | Assigned Reading |
|-----------------------------------|----|------|------------------|--|--|
| TH | 24 | Jan. | LECTURE | Introduction to BIO 214/Special Senses | |
| M | 28 | Jan. | LAB | Special Senses/Reflexes; Cow eye dissection | Chap 17; Lab Manual: Exercise 27-32 |
| T | 29 | Jan. | LECTURE | Special Senses | Chap. 17 |
| TH | 31 | Jan. | LECTURE | Special Senses/Endocrine System | Chap. 17 & 18 |
| M | 4 | Feb | LAB | Quiz 1; Endocrine System | Lab Manual: Exercise 33 |
| T | 5 | Feb | LECTURE | Endocrine System | Chap. 18 |
| TH | 31 | Feb | LECTURE | Endocrine System | Chap. 18 |
| M | 11 | Feb | LAB | Quiz 2; Blood Vessels and Blood | Lab Manual: Exercise 34 &36 |
| T | 12 | Feb | LECTURE | Cardiovascular System | Chap. 21 |
| TH | 14 | Feb | LECTURE | Cardiovascular System / Review | |
| M | 18 | Feb | PRACTICAL | Practical #1 | |
| T | 19 | Feb | EXAM | Exam #1 | |
| TH | 21 | Feb. | LECTURE | Cardiovascular System | Chap. 20 |
| M | 25 | Feb. | LAB | Quiz 3; Heart Anatomy and Lymphatic System | Lab Manual: Exercise 35 & 38 |
| T | 26 | Feb. | LECTURE | Cardiovascular System | Chap. 19 |
| TH | 28 | Feb. | LECTURE | Quiz 4; Immunity | Chap. 22 |
| M | 4 | Mar. | <i>Holiday</i> | <i>H. Lavity Stoutt Birthday celebrated</i> | |
| T | 5 | Mar. | LECTURE | Immunity; Review | |
| W | 6 | Mar | PRACTICAL | Practical #2 | |
| TH | 7 | Feb. | EXAM | Exam #2 | |
| SPRING BREAK (March 11-15) | | | | | |
| M | 18 | Mar. | LAB | Integrative Assignment #1 (DUE) Respiratory System (Anatomy and Spirometry) | Chap. 23; Lab Manual: Exercise 39 |
| T | 19 | Mar. | LECTURE | Respiratory System | Chap. 23 |
| TH | 21 | Mar. | LECTURE | Digestive System | |
| M | 25 | Mar. | LECTURE | Anatomy of Digestive System/ Spirometry Assignment due | Lab Manual: Exercise 40-41 |
| T | 26 | Mar. | LECTURE | Digestive System | Chap. 24 |
| TH | 28 | Mar. | LECTURE | Digestive System/Metabolism | Chap. 24 |
| M | 1 | Apr | LAB | Review | |
| T | 2 | Apr. | PRACTICAL | Practical #3 | |
| TH | 4 | Apr. | EXAM | Exam #3 | |
| M | 8 | Apr. | LAB | Renal Anatomy | Lab Manual: Exercise 43 |
| T | 9 | Apr. | LECTURE | Urinary System | Chap. 26 |
| TH | 11 | Apr. | LECTURE | Urinary System; Osmoregulation | Chap. 26 & 27 |
| M | 15 | Apr. | LAB | Anatomy of the Reproductive System | Lab Manual: Exercise 45 Chap. 28 |
| T | 16 | Apr. | LECTURE | Reproductive System: Male | |
| TH | 18 | Apr. | LECTURE | Reproductive System: Male | |
| M | 22 | Apr. | <i>Holiday</i> | <i>Easter Monday</i> | |
| T | 23 | Apr. | LECTURE | Reproductive System: Female System | Chap. 28 |
| W | 24 | Apr. | LAB | Anatomy of the Reproductive System | |
| TH | 25 | Apr. | LECTURE | Reproductive System: Female System | Chap. 28 |
| M | 29 | May | LECTURE | Reproductive System: Female System Integrative Assignment #2 (DUE) | Chap. 28 |
| T | 30 | May | LECTURE | Development | Chap. 29 |
| TH | 2 | May | LECTURE | Review | |
| M | 6 | May | PRACTICAL | Practical #4 | |
| T | 7 | May | EXAM | Exam #4 | |
| TBD (May 10-17) | | | | FINAL EXAM | |