

Prerequisites: Anatomy & Physiology

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Contact Information: Faculty may be contacted through the Canvas messaging system

Additional Information: www.portagelearning.edu^{1*}

Course meeting times: BIOL 331 is offered continuously

Course Description: A systematic examination of the dynamics between functional adaptations, disruptions and compensatory mechanisms during abnormal physiological processes. Analysis of the sequences of changes leading to various disease states within the main body systems will be coupled to the specific principles of prevention, diagnosis and treatments.

Course Outcomes: As a result of this course experience a student should be able to:

- Identify and differentiate between normal and pathological structures and physiologic processes.
- Categorize common pathologies within each body system based upon patient symptomology.
- Evaluate a patient's past medical history and clinical presentation to differentially diagnose common pathologies within each body system.
- Describe diagnostic criteria and methods for common pathologies within each body system.
- Develop an appropriate treatment plan for common pathologies within each body system based upon patient past medical history and clinical presentation.
- Discuss clinical and behavioral measures that can be used to promote disease prevention and slow disease progression.

*Please see the *Module Topics* section below for expanded course outcomes.

*Each of these BIOL 331 student learning outcomes is measured:

- Directly by:
- (1) Module application problems (with instructor feedback)
 - (2) Module exams
 - (3) Cumulative final exam

^{1*} Portage Learning college courses are offered by Geneva College, which is accredited by the Middle States Commission on Higher Education and Bushnell University, which is accredited by Northwest Commission on Colleges and Universities. The Faculty Senate of both institutions have vetted and approved the courses as part of their curriculum.

(4) Adaptive learning exercises

Indirectly by an end of course student-completed evaluation survey

Course Delivery: This course is asynchronously delivered online and is composed of 60 - 70 hours of reviewed module assignments with instructor feedback, and 10 contact hours of secure online module exams.

Course Progression: It is the policy for all Portage Learning courses that only one (module/final) exam is to be completed within a 48-hour period. Research on the best practices in learning indicates that time is needed to process material for optimal learning. This means that once an exam has been completed, the next exam may not be opened or taken until 48 hours after the submission of the previous module exam. This allows for instructor feedback/class expectations as the student moves through the material. Instructors, like the College, are not available during the weekend; grading, therefore, is M-F and may take up to 72 hours during these days. Also, it is the policy of Portage Learning to support a minimum of 28 days to complete a course; this is not a negotiable time period. Please plan your time accordingly.

Note: Professors reserve the right to reset any exam taken in violation of these guidelines.

Required readings, lectures and assignments: Portage courses do not use paper textbooks. Students are required to read the online lesson modules written by the course author which contain the standard information covered in a typical course. Please note the exam questions are based upon the readings. Video lectures which support each lesson module subject should be viewed as many times as is necessary to fully understand the material.

We do not support the use of outside resources to study, except for the ones listed in the syllabus under "Suggested External References". If you have questions about the material or would like further explanation of the concepts, please contact your instructor.

Module Problem Sets: The practice problems within the modules are a part of your final grade, and the module work will be reviewed for completeness (not correctness) by the instructor. **Be sure to answer all of the problems, being careful to answer the questions in your own words at all times since this is an important part of adequate preparation for the exams.** After you answer the practice problems, compare your answers to the solutions provided at the end of the module. If your answers do not match those at the end, attempt to figure out why there is a difference. If you have any questions, please contact the instructor via the Canvas messaging system (see Inbox icon).

NOTE: Module problem sets are not an option or a choice; they are required. This means that you must complete all the review questions within the modules. Not only are problem sets class participation, they are the best way to prepare for the exams.

Academic Integrity is a serious matter. In the educational context, any dishonesty violates freedom and trust, which are essential for effective learning. Dishonesty limits a student's ability to reach his or her potential. Portage places a high value on honest independent work. We depend on the student's desire to succeed in the program he or she is entering. It is in a student's own best interests not to cheat on an exam or put their work into question, as this would compromise the student's preparation for future work. It is the student's responsibility to review the **Student Handbook** and all policies related to academic integrity. If clarification is necessary, the student should reach out to their instructor for further explanation **before** initiating module one.

Required Computer Accessories: It is recommended that students use a desktop or laptop computer, PC or Mac, when taking the course. Some tablet computers are potentially compatible with the course, but not all features are available for all tablet computers. The latest full version of Google Chrome, Firefox, Edge, or Safari browser is required for the optimal operation of the Canvas Learning Management System. In addition, this course will use the Respondus Lockdown Browser for exams; a strong internet connection is needed. You are also **required to use LockDown Browser with a webcam**, which will record you during an online, nonproctored exam. (The webcam feature is sometimes referred to as "Respondus Monitor.") **Your computer must have a functioning webcam and microphone. Additionally, students will need a photo ID that includes your picture and full name is required. Please note, Chromebooks and tablets (other than iPad) are not compatible on exams using the Lockdown Browser.** Instructions on downloading and installing this browser will be given at the start of the course. We highly recommend using a high-speed Internet connection to view the video lectures and labs. You may experience significant difficulties viewing the videos using a dial-up connection.

For more information on basic system and browser requirements, please reference the following:

Canvas browser and system requirements: <https://community.canvaslms.com/t5/Canvas-Basics-Guide/What-are-the-browser-and-computer-requirements-for-Canvas/ta-p/66>

Respondus Requirements: <https://web.respondus.com/he/lockdownbrowser/resources/>

Respondus Monitor Requirements: <https://web.respondus.com/he/monitor/resources/>

Module Topics

Module 1: In this module students will be introduced to the field of study of pathophysiology and how disease mechanistically manifests within essential body systems. Basic cellular concepts are

covered including structural composition, organelles and metabolism. This module will also introduce the concepts surrounding the mechanisms used by a cell to maintain homeostasis.

- Module 2: In this module, students will receive an overview of cell cycle, proliferation and differentiation. Benign and malignant neoplasms will be characterized, followed by the genetic and molecular basis of cancer. Practical application is provided through an overview of the risk factors associated with cellular dysfunction. The epidemiology of cancer will also be examined along with common screening and diagnostic methods and the treatment options often associated.
- Module 3: In this module, students will focus on the concepts of the body's immunity relative to innate and adaptive responses. Content covers pathogen recognition and elimination, cytokine production, responses to infection and the cell types associated with these immune responses. Developmental aspects of immunity will focus on the transfer of immunity from mother to infant, the progressive changes in immune responses relative to age, and the disorders often associated with alterations of the immune system.
- Module 4: In this module, students will be introduced to the organization of the hematopoietic and cardiovascular systems. Students will be introduced to the interplay between these systems and how disorders associated with each system can drastically impact homeostasis. Content includes disorders associated with blood and blood flow, and cardiac function relative to both environmental and infectious sources.
- Module 5: In this module, students will cover the structural aspects of the pulmonary system (bronchial tree and lungs, down to the alveolar level). Attention will be given to respiration in the lungs, gas transport, and respiration at the cellular level. Respiratory function relative to carbon dioxide removal and pH balance and their interrelation associations will be introduced as its discussed with chemoreceptors controlling respiration rate. The carbonic-acid bicarbonate buffer equation will be introduced. Disorders of ventilation and gas exchange will be discussed as well as the associated clinical presentations, diagnosis, prevention and treatment options currently available.
- Module 6: In this module, students will examine the framework of the nervous system. Content includes a comprehensive overview of neurophysiology, and the neurotransmitters implemented in the diseases discussed. Students will also examine the epidemiology of sleep and memory disorders. Practical applications include strategies employed for the clinical assessments and diagnosis of associated disorders.
- Module 7: In this module, students will receive an overview of the structure and organization of the gastrointestinal system. Content covers the physiology of mechanical and chemical digestion,

including hormonal and secretory functions, and elimination strategies. The impact of GI alterations and the importance of motility and the enteric neurons as it pertains to motility disorders will be examined. Attention will also be given to the function and metabolic importance of the liver as well as the associated hepatobiliary disorders.

- Module 8: In this module, the functions of the renal system and the physiology that relates to fluid and electrolyte balance will be examined. The pathologies associated with the kidneys and the systemic ramifications will be covered. Attention will also be given to the body's buffering system and the pathologies associated with its imbalances. Compensatory mechanisms and examples of how the imbalances arise from other disease states will be addressed. Kidney disease and the impacts on fluid, electrolyte and acid/base balance will be examined as well as the preventive strategies for dysfunction avoidance.
- Module 9: In this module, students will focus on alterations of the endocrine system. Content includes an anatomical summary of the endocrine glands, the hormones produced by them as well as the physiological effects of hormones on targeted organs. The general aspects of altered endocrine signaling will focus on dysfunction of the pituitary and thyroid glands as well as the alterations leading to hormonal and metabolic disorders such as diabetes mellitus.
- Module 10: In this module, students will review the basic structural and functional aspects of the musculoskeletal system. Hereditary, infectious and traumatic factors that give rise to physical, metabolic or rheumatic alterations will be discussed. Content will also include practical applications for combating alterations as well as disease prevention.

Suggested Timed Course Schedule (to complete the course within a typical college semester)

All Portage courses are offered asynchronously with no required schedule to better fit the normal routine of adult students, but the schedule below is suggested to allow a student to complete the course within a typical college semester. Students may feel free to complete the course on a schedule determined by them within the parameters outlined under "Course Progression."

<u>Time Period</u>	<u>Assignments</u>	<u>Subject Matter</u>
Days 1-14 (2 weeks)	Module 1, Exam 1	Overview of pathophysiology and cell biology
Days 15-28 (2 weeks)	Module 2, Exam 2	Neoplasia

Days 29-43 (2 weeks)	Module 3, Exam 3	Mechanisms of self-defense: immunity and dysfunctions
Days 44-58 (2 weeks)	Module 4, Exam 4	Cardiovascular and hematopoietic Disorders
Days 59-73 (2 weeks)	Module 5, Exam 5	Pulmonary disorders
Days 74-88 (2 weeks)	Module 6, Exam 6	Neural function disorders
Days 89-103 (2 weeks)	Module 7, Exam 7	Gastrointestinal Disorders
Days 103-117 (2 weeks)	Module 8, Exam 8	Renal disorders and fluid/electrolyte dysfunction
Days 118-132 (2 weeks)	Module 9, Exam 9	Endocrine Disorders
Days 133-147 (2 weeks)	Module 10, Exam 10	Musculoskeletal Disorders
Days 148-152	Final Exam	Based on module material

Grading Rubric:

Check for Understanding =	1 pt.
10 Module Problem Sets = 5 pts. each x 10 =	50 pts.
10 Module exams = 100 pts. each x 10 =	1000 pts.
<u>Final exam = 200 pts.</u>	<u>200 pts.</u>
Total	1251 pts.

Grading Scale:

96.5% - 100% = A+
92.5% - 96.4% = A
89.5% - 92.4% = A-
86.5% - 89.4% = B+
82.5% - 86.4% = B
79.5% - 82.4% = B-
76.5% - 79.4% = C+
72.5% - 76.4% = C
69.5% - 72.4% = C-
66.5% - 69.4% = D+
62.5% - 66.4% = D
59.5% - 62.4% = D-
0% - 59.4% = F

Suggested External References: If the student desires to consult a reference for additional information, the following textbooks are recommended as providing complete treatment of the course subject matter.

- Shella Grossman and Carol Porth, **Porth's Pathophysiology: Concepts of Altered Health States**, LWW

NOTE: We do not support the use of outside resources to study, except the ones listed above.

Learning Support Services:

Each student should be sure to take advantage of and use the following learning support services provided to increase student academic performance:

Video lectures: Supports diverse learning styles in conjunction with the text material of each module

Messaging system: Provides individual instructor/student interaction

Tech support: Available by submitting a help ticket through the student dashboard

Accommodations for Students with Learning Disabilities:

Students with documented learning disabilities may receive accommodations in the form of an extended time limit on exams, when applicable. To receive the accommodations, the student should furnish documentation of the learning disability at the time of registration, if possible. Scan and e-mail the documentation to studentservices@portagelearning.edu. Upon receipt of the learning disability documentation, Portage staff will provide the student with instructions for a variation of the course containing exams with extended time limits. This accommodation does not alter the content of any assignments/exams, change what the exam is intended to measure or otherwise impact the outcomes of objectives of the course.

One-on-one Instruction:

Each student is assigned to his/her own instructor. Personalized questions are addressed via the student dashboard messaging system.

Online learning presents an opportunity for flexibility; however, a discipline to maintain connection to the course is required; therefore, communication is essential to successful learning. **Check your messages daily.** Instructors are checking messages daily Monday-Friday to be sure to answer any questions that may arise from you. It is important that you do the same so you do not miss any pertinent information from us.

Holidays:

During the following holidays, all administrative and instructional functions are suspended, including the grading of exams and issuance of transcripts.

New Year's Day	MLK Day
Easter	Memorial Day
Juneteenth	Independence Day
Labor Day	Thanksgiving weekend
Christmas Break	

The schedule of holidays for the current calendar year may be found under the Student Services menu at www.portagelearning.edu

Code of Conduct: Students are expected to conduct themselves in a way that supports learning and teaching and promotes an atmosphere of civility and respect in their interactions with others. Verbal and written aggression, abuse, or misconduct is prohibited and may be grounds for immediate dismissal from the program. This is a classroom; therefore, instructors have the academic freedom to set forth policy for their respective class. Instructors send a welcome e-mail detailing the policy of their class, which students are required to read prior to beginning the course.

Grievances: If a student has a complaint about the coursework or the instructor, the student is advised to first consult the instructor, who will be willing to listen and consider your concern. To file a formal grievance for consideration by the Academic Review Committee, the process must be initiated by requesting an appeal form from academics@portagelearning.edu.

Remediation: At Portage Learning we allow a "one-time" only opportunity to re-take an alternate version of **one** module exam on which a student has earned a grade lower than 70%. This option must be exercised before the final exam is started. If an exam is retaken, the original exam grade will be erased and the new

exam grade will become a permanent part of the course grade. However, before scheduling and attempting this retest, the student must resolve the questions they have regarding the material by reviewing both the old exam and the lesson module material. Once ready to attempt the retest of the exam they must contact their instructor to request that the exam be reset for the retest. Remember, any module retest must be requested and completed **before** the final exam is opened.

Note: Exams on which a student has been penalized for a violation of the academic integrity policy may not be re-taken.

Syllabi are subject to change as part of ongoing educational review practices. Students are responsible for accessing and using the most recent version of the course syllabus.