

SYLLABUS

BIO 203

FUNDAMENTALS OF BIOLOGY: CELLULAR AND ORGAN PHYSIOLOGY

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STONY BROOK UNIVERSITY

SECTION 01

FALL 2018

LECTURE AND EXAM SCHEDULE

Section 01: TuTh 11:30 AM – 12:50 PM, Javits 100

Exam locations will be posted on Blackboard

Unit	Lect.	Date	Instructor	Lecture
1	1	Aug. 28	Collins	Basic Principles
1	2	Aug. 30	Collins	Body Temperature
1	3	Sep. 4	Collins	Body Temperature - Regulation
2	4	Sep. 6	Collins	Water and Ion Balance
2	5	Sep. 11	Collins	Water and Ion Balance - Regulation
3	6	Sep. 13	Collins	Electrochemical Equilibria
3	7	Sep.18	Collins	Membrane Potentials
4	8	Sep. 20	Collins	Cell Signaling
5	9	Sep. 25	Vasudevan	Muscle (Skeletal)
		Sep. 27		Evening Exam 1 (Lectures 1-8): 8:45-10:15 PM No Class
5	10	Oct. 2	Vasudevan	Motor Control
6	11	Oct. 4	Vasudevan	Cardiovascular System
		Oct. 9		No Class: Fall Break
6	12	Oct. 11	Vasudevan	Cardiovascular System – Regulation
7	13	Oct. 16	Vasudevan	Nervous System
7	14	Oct. 18	Vasudevan	Nervous System (continued)
8	15	Oct. 23	Vasudevan	Endocrine Systems
8	16	Oct. 25	Vasudevan	Reproduction
9	17	Oct. 30	Watson	Respiratory Systems
		Oct. 31		Evening Exam 2 (Lectures 9-16): 8:45-10:15 PM
		Nov. 1		No Class
9	18	Nov. 6	Watson	Respiratory Systems and Gas Exchange
10	19	Nov. 8	Watson	Renal System - Anatomy and Cellular Mechanisms
10	20	Nov. 13	Watson	Renal System – Regulation
11	21	Nov. 15	Watson	Digestion
11	22	Nov. 20	Watson	Digestion – Regulation
		Nov. 22		No Class: Thanksgiving Break
12	23	Nov. 27	Watson	Bone and Blood
12	24	Nov. 29	Watson	Immune System - Innate Immunity
12	25	Dec. 4	Watson	Immune System - Adaptive Immunity
	26	Dec. 6	All	Integrative Physiology
		Dec. 12		Final Exam Period Exam 3 (Lectures 17-26): 8:00 - 9:30 AM

COURSE DESCRIPTION**BIO 203 Fundamentals of Biology: Cellular and Organ Physiology**

The fundamentals of cell and organ physiology in mammalian and non-mammalian organisms are introduced. The structure and function of cell membranes, the physiology of cell to cell signaling, cellular respiration and homeostasis of organs and organisms are examined with an emphasis on the comparative physiology of vertebrates and invertebrates.

Prerequisite: C or higher in CHE 129 or CHE 131 or CHE 141 or Corequisite CHE 152

Pre- or Corequisite: MAT 125 or higher or AMS 151

DEC: E

SBC: STEM+

3 credits

COURSE LEARNING GOALS

Upon completion of BIO 203, students will be able to:

1. Recognize the scientific vocabulary of structures, processes and overarching concepts in physiology
2. Describe the basic challenges faced by all organisms (*membrane transport, maintaining water and ion balance, homeostasis, cell-cell communication, acquiring energy*), and the trade-offs required for meeting those challenges.
3. Compare and contrast the strategies used by various organisms (*mammals, other vertebrates, invertebrates*) to meet these basic challenges across levels of biological organization (*cellular, tissue, organ, organ system*) in several organ systems (*neural, musculoskeletal, cardiac, respiratory, digestive, immune, renal, reproductive*).
4. Synthesize and evaluate information surrounding the regulation of physiological systems in written and graphical form.

GENERAL INFORMATION

Course Director: Dr. William Collins william.collins@stonybrook.edu

Courses Instructors: Dr. Erin Vasudevan erin.vasudevan@stonybrook.edu

Dr. Robert Watson robert.watson@stonybrook.edu

Course Administrators:

- **Ms. Diane Pauciullo:** **Exam Grades, Excused Absences**
diane.pauciullo@stonybrook.edu G108 CMM/BLL, (631) 632-8171
- **Ms. Lynette Giordano:** **Course Registration**
lynette.giordano@stonybrook.edu G110 CMM/BLL, (631) 632-8530

Course Blackboard Site:

The BIO 203 Blackboard site can be accessed at blackboard.stonybrook.edu. Students are expected to check Blackboard every day. Important materials such as announcements, lecture slides/handouts, exam answers, and grades will be posted exclusively on the site.

Textbook:

Human Physiology (Dee Unglaub Silverthorn 8e, 2018), Custom Edition for Stony Brook University, State University of New York, Pearson Custom Publishing, bundled with ***interActive PHYSIOLOGY CD***, 10-System Suite, Benjamin Cummings, San Francisco.

Option #1: Loose leaf version of Human Physiology text by Silverthorn 8e packaged with on-line access to both the e-text version of Silverthorn 8e and the Interactive Physiology software (ISBN: 9780134704210). (Purchased through the university bookstore)

Option #2: On-line access to the e-text version of Silverthorn 8e and the Interactive Physiology software only.

Both registration with Pearson Mastering A&P (www.pearson.com/mastering) and an access code are required to access online textbook-related resources. An access code is included in Option #1 or may be purchased directly from Pearson when registering. Registration instructions are provided on the BIO 203 Blackboard site

Student Response Pad:

Student response pads (clickers) will be used in lecture. **The clicker is the Turning Technologies ResponseCard NXT**, for sale at the Turning Technologies online store (<https://it.stonybrook.edu/help/kb/buying-clickers>). To receive clicker participation credit, your clicker must be enrolled in this course through the BIO203 Blackboard site: under “Tools”, click on “TurningPoint Registration Tool ” and follow the instructions. There is no registration fee. Additional clicker information is provided on the Blackboard site under “Course Information”. The Student Support Desk provides assistance with clicker registration (see **TECHNICAL ASSISTANCE** on page 8 of this document for more information.)

**COURSE EXAMINATIONS, ACTIVITIES AND GRADES****Three Midterm Exams (90% of Final Grade Average)**

Exam 1: 28% of Final Grade Average

Exam 2: 28% of Final Grade Average

Exam 3: 34% of Final Grade Average

Any student who misses more than one exam for any reason will receive a Final Grade of F for the course.

Stony Brook Picture ID Card: Every student must present a valid Stony Brook ID when handing in an exam. Other forms of identification (e.g., drivers license) will not be accepted. Students who are unable to present a Stony Brook ID at an exam must bring it to Ms. Pauciullo within 48 hours following the exam. Failure to do so will result in the assignment of a grade of zero (0) for the exam.

No one will be admitted to an exam later than 30 minutes after the posted start time. Any student who arrives later than 30 minutes after the posted start time will not be allowed to take the exam and will receive a grade of zero (0) for the exam.

Activities (10% of Final Grade Average)

There are several types of activities. Description of their content, goals, due dates, scoring, and feedback provided can be found at the end of this document. The Student Support Desk provides assistance with all aspects of accessing and submitting activities through Blackboard, and with accessing grades (see **TECHNICAL ASSISTANCE** on page 8 of this document for more information.)

Up to 1000 activity points will contribute to the final grade. Students earning 1000 or more of the ≥1400 available activity points will earn the full 10% of their final grade. Because of the number of opportunities to earn the full number of activity points, no excused absences or makeup opportunities are available for activities for any reason. Additionally, requests for regrading of activities will not be considered.

Activity	Description	Points per Activity	Total Points
In-Class	In-class V activities	15	360
Post-Class	Online L & I assignments due by 5:00 AM on Fridays ¹	30	360
Post-Class	Online E assignments due by noon on Sundays ¹	40	480
Other	Online surveys and additional activities to be announced in class	TBD	≥200
Maximum possible activity points			≥1400

¹See Assignment Due Dates table (below) for the specific due date for each assignment.

Assignment Due Dates

Week	Unit	Learn / Introspect Assignments ¹	Evaluate Assignment ²
1	1	Aug. 31 by 5:00 AM	Sep. 2 by 3:00 PM
2	2	Sep. 7 by 5:00 AM	Sep. 9 by 3:00 PM
3	3	Sep. 14 by 5:00 AM	Sep. 16 by 3:00 PM
4	4	Sep. 21 by 5:00 AM	Sep. 23 by 3:00 PM
5		Exam 1 Week - No LIVER Assignment	
6	5	Oct. 5 by 5:00 AM	Oct. 7 by 3:00 PM
7	6	Oct. 12 by 5:00 AM	Oct. 14 by 3:00 PM
8	7	Oct. 19 by 5:00 AM	Oct. 21 by 3:00 PM
9	8	Oct. 26 by 5:00 AM	Oct. 28 by 3:00 PM
10		Exam 2 Week - No LIVER Assignment	
11	9	Nov. 9 by 5:00 AM	Nov. 11 by 3:00 PM
12	10	Nov. 16 by 5:00 AM	Nov. 18 by 3:00 PM
13		Thanksgiving Break - No LIVER Assignment	
14	11	Nov. 30 by 5:00 AM	Dec. 2 by 3:00 PM
15	12	Dec. 7 by 5:00 AM	Dec. 9 by 3:00 PM

Notes:

No assignment is due during an exam week or during Thanksgiving Recess.

¹Learn and Introspect assignments are due by 5:00 AM on the Fridays listed.

²Evaluate assignments are due by 3:00 PM on the Sundays listed. Evaluate assignments will be posted on Blackboard at 11:00 AM on the preceding Friday.

EXCUSED ABSENCE FROM AN EXAM

Unavoidable absence from an exam may be excused. A student who is absent from an exam **must notify the course administrator, Ms. Pauciullo, within 24 hours of the exam** and then provide appropriate documentation (e.g., note from medical provider, death certificate, etc.) before an excused absence will be approved.

Any documentation from a medical provider must be accompanied by a medical information act waiver stating that the medical provider has been given permission to VERIFY that the student in question visited the office and was treated as stated in the documentation. **Without a medical information act waiver, the excuse will NOT BE ACCEPTED.** Detailed instructions and a medical waiver form are provided on the BIO 203 Blackboard site (under Course Information).

Any student who starts an exam will not be eligible for an excused absence from that exam.

Makeup Exams: Each student with an excused absence from an exam must take a makeup exam on the content covered by the missed exam.

- Makeup exams for students with excused absences from Exam 1 or Exam 2 will be given later in the semester at a time and place determined by the instructors.
- Students with excused absences from Exam 3 will take a makeup exam at the beginning of the following semester. These students will receive a temporary grade of 'I' until the makeup exam is completed.

DETERMINATION OF COURSE LETTER GRADES

BIO 203 course letter grades will be based on distribution of the Final Grade Averages using the mean and standard deviation. More details will be provided after exam 1. Letter grades will be determined independently for each section.

In addition, students must meet the following performance criteria:

- A minimum of 700 activity points is required to receive a letter grade higher than B+.
- A minimum Final Grade Average of 40 is required to receive a letter grade higher than C-.

COURSE ADMINISTRATION AND POLICIES

The BIO 203 course administrators are Ms. Lynette Giordano and Ms. Diane Pauciullo. For questions related to course content, students should contact the Course Director. Please note the course administrators are not responsible for policy implementation and the Course Director will make the final decision in all matters.

Course Registration: Ms. Giordano is responsible for all BIO 203 registration issues (e.g., add/drop, section change, waitlist). Students with registration issues should contact Ms. Giordano directly. Drs. Collins and Malmquist will not sign add/drop forms.

Exam Grades / Excused Absences: Ms. Pauciullo is responsible for processing exams and excused absences. Students who feel there has been a mistake in the grading of an exam or who are applying for an excused absence from an exam should contact Ms Pauciullo directly.

Other Issues: Students with other concerns or special circumstances should write a petition addressed to Dr. Collins and leave it with Ms. Pauciullo.

DISABILITY SUPPORT SERVICES (DSS)

If you have a physical, psychological, medical, or learning disability that may impact your course work, please contact Disability Support Services (631) 632-6748 or <http://studentaffairs.stonybrook.edu/dss/>. They will determine with you what accommodations are necessary and appropriate. All information and documentation are confidential. Students who require assistance during emergency evacuation are encouraged to discuss their needs with their

Professors and Disability Support Services.

ACADEMIC INTEGRITY

Each student must pursue his or her academic goals honestly and be personally accountable for all submitted work. Representing another person's work as your own is always wrong. Faculty is required to report any suspected instances of academic dishonesty to the Academic Judiciary. For more comprehensive information on academic integrity, including categories of academic dishonesty please refer to the academic judiciary website at [:http://www.stonybrook.edu/uaa/academicjudiciary/](http://www.stonybrook.edu/uaa/academicjudiciary/)

Academic dishonesty includes any act that is designed to obtain fraudulently, either for oneself or for someone else, academic credit, grades, or other recognition that is not properly earned or that adversely affects another's grade. The following represents examples of this and does not constitute an exhaustive list:

- Cheating on exams or assignments by the use of books, electronic devices, notes, or other aids when these are not permitted, or by copying from another student.
- Collusion: two or more students helping one another on an exam or assignment when it is not permitted.
- Ringers: taking an exam for someone else, or permitting someone else to take one's exam.
- Submitting the same paper in more than one course without permission of the instructors.
- Plagiarizing: copying someone else's writing or paraphrasing it too closely, even if it constitutes only some of your written assignment, without proper citation, even instructor notes & presentation slides.
- Falsifying documents or records related to credit, grades, status (e.g., adds and drops, P/NC grading, transcripts), or other academic matters.
- Altering an exam or paper after it has been graded in order to request a grade change.
- Stealing, concealing, destroying, or inappropriately modifying classroom or other instructional material, such as posted exams, library materials, laboratory supplies, or computer programs.
- Preventing relevant material from being subjected to academic evaluation.
- Presenting fabricated excuses for missed assignments or tests.
- Unauthorized clicker use: using someone else's clicker, falsifying attendance roster, signing in for someone
- Electronic communication devices, including cellular phones, beepers, speakers, calculators and headphones must be secured in a closed container (and not, for example, worn on a belt or around the neck) and must be turned off (and not, for example, simply set on vibration mode) during any examination. This policy shall be announced before each examination. Note: even if a student does not answer a ringing cell phone during an exam, it can be considered academic dishonesty for not having it turned off.

All students who are found to engage in Academic Dishonesty on BIO203 will receive a grade of F for the entire course. All written assignments submitted through Blackboard will be submitted for evaluation by the SafeAssign Plagiarism detection tool. SafeAssign checks all student work against an extensive database of published works, web pages, and assignments from all other previous and current BIO203 students. **Plagiarism of any of these sources is considered Academic Dishonesty.**

CRITICAL INCIDENT MANAGEMENT

Stony Brook University expects students to respect the rights, privileges, and property of other people. Faculty are required to report to the Office of Judicial Affairs any disruptive behavior that interrupts their ability to teach, compromises the safety of the learning environment, and/or inhibits students' ability to learn.

EMAIL POLICIES

Email sent via Blackboard (<http://blackboard.stonybrook.edu>) is the principal way we will officially communicate with you for this course. It is your responsibility to make sure that you read your email in your official University email account. For most students that is Google Apps for Education (<http://www.stonybrook.edu/mycloud>) but you may verify your official Electronic Post Office (EPO) address at:

<http://it.stonybrook.edu/help/kb/checking-or-changing-your-mail-forwarding-address-in-the-epo>

If you choose to forward your official University email to another off campus account, we are not responsible for any undeliverable messages to your alternative personal accounts. You can set up email forwarding using these DoIT-provided instructions found at:

<http://it.stonybrook.edu/help/kb/setting-up-mail-forwarding-in-google-mail>

TECHNICAL REQUIREMENTS

This course requires that you have access to the internet. You are responsible for having a reliable computer and internet connection throughout the course. You will need to have access to, and be able to use the following software (all available for free to students through the Division of Information Technology Website at <http://it.stonybrook.edu/services/software-catalog/browse>):

- A web browser (i.e. Google Chrome, Mozilla Firefox, Internet Explorer)
- Adobe Acrobat Reader
- Adobe Flash Player
- Microsoft Word

These programs are available at no charge to students through the Division of Information Technology Website at <http://it.stonybrook.edu/services/software-catalog/browse>. Computers equipped with the appropriate software are also available for use at the various SINC site computer labs on campus. For information on the location and hours of SINC site facilities, visit <http://it.stonybrook.edu/services/sinc-sites>.

*Please note: You **will** be limited if you expect to complete all course activities on a smartphone or tablet. It will not be possible to access, complete, and submit all the course assignment files, blackboard-based assignments, or video recordings on all such devices. Please make sure to have computer access.*

STUDENT TECHNOLOGY SERVICES

The BIO203 instructors are not available to answer all technical questions you may have. It may also take them a while to respond to your technology-related questions. **The fastest and most effective way to get answers to questions or to resolve technical issues you may have is to contact the TLT Student Support Desk.** Please contact the Support Desk *before emailing the course instructors* about technology issues. Student Support Consultants who work for the TLT Support Desk are available to offer support in person at the all of the SINC sites, via email at helpme@stonybrook.edu, via phone at 631-632-9602, or through a live chat feature. If a consultant is unable to help with a problem, they will create and submit a trouble ticket which will be forwarded to the appropriate DoIT staff member for review. To access the live chat feature, and for more information on the services available through the TLT Student Support Desk, visit <https://it.stonybrook.edu/services/tlt-student-help-desk>

The Student Support Desk can help you with:

- Your SBU email account
- Your Google Apps for Education account
- Accessing the course Blackboard Site
- Registering your clicker
- Accessing lecture recordings

Submitting assignments
Viewing grades and rubrics

RECOMMENDED READINGS**Lecture 1: Basic Principles**

Silverthorn 8e: Chapters 1-3, 6 (pp. 181-190)

Lectures 2-3: Body Temperature & Temperature Regulation

Silverthorn 8e: Chapters 4 (pp. 92-110), 22 (pp. 692-707 & 719-724)

Lectures 4-5: Water and Ion Balance

Silverthorn 8e: Chapter 5 (pp. 121-151)

Lecture 6: Electrochemical Equilibria

Silverthorn 8e: Chapter 5
interActive PHYSIOLOGY: Fluids and Electrolytes - Introduction to Body Fluids,
Nervous I - Membrane Potential

Lecture 7: Membrane Potentials

Silverthorn 8e: Chapters 5 (pp. 152-163), 8 (pp. 233-249)
interActive PHYSIOLOGY: Nervous I – Membrane Potential, Action Potential

Lecture 8: Cell Signaling

Silverthorn 8e: Chapters 6, 8 (pp.250-265)
interActive PHYSIOLOGY: Nervous II, - Synaptic Transmission

Lecture 9: Muscle (Skeletal)

Silverthorn 8e: Chapter 12
interActive PHYSIOLOGY: Muscular - Anatomy review, Neuromuscular Junction, Sliding Filament Theory

Lecture 10: Motor Control

Silverthorn 8e: Chapter 13
interActive PHYSIOLOGY: Muscular - Contraction of Motor Units, Contraction of Whole Muscle

Lectures 11-12: Cardiovascular System

Silverthorn 8e: Chapters 14, 15
interActive PHYSIOLOGY: Cardiovascular - Anatomy Review - Intrinsic Conduction System, Cardiac
Action Potential, Cardiac Cycle, Cardiac Output

Lecture 13-14: Nervous System

Silverthorn 8e: Chapters 8 (pp. 223-233), 9, 11
interActive PHYSIOLOGY: Nervous System I, II

Lecture 15: Endocrine Systems

Silverthorn 8e: Chapter 7
interActive PHYSIOLOGY: Endocrine - Biochem, Secretion and Transport of Hormones, The
Actions of Hormones on Target Cells, Response to Stress

Lecture 16: Reproduction

Silverthorn 8e: Chapter 26
interActive PHYSIOLOGY: Endocrine - The Hypothalamic-Pituitary Axis

Lectures 17-18: Respiration

Silverthorn 8e: Chapters 17, 18
interActive PHYSIOLOGY: Respiration

Lectures -19-20: Renal Physiology

Silverthorn 8e: Chapters 19, 20
interActive PHYSIOLOGY: Urinary System - Anatomy Review (pp. 7-10, 16),
Glomerular Filtration (pp. 3, 6, 8-14), Early Filtrate Processing, (p. 13)

Lectures 21-22: Digestion

Silverthorn 8e: Chapter 21
interActive PHYSIOLOGY: Digestive System - Anatomy Review, Control (pp.1-3, 6, 8),

Secretion, Digestion and Absorption

Lectures 23: Bone and Blood

Silverthorn 8e: Chapters 16, 23 (pp. 741-750)

Lectures 24-25: Immune System

Silverthorn 8e: Chapter 24

interActive PHYSIOLOGY: Immune System - Overview, Anatomy Review, Innate Host Defenses,
Common Characteristics, Humoral Immunity, Cellular Immunity

Activity	Description	By completing this, you will	Evaluation	Self-Assessment
L LEARN	<ul style="list-style-type: none"> Online quizzes Due Friday 5:00 AM 3 attempts allowed 	<ul style="list-style-type: none"> LEARN the information presented in the recorded lectures, and to direct their studying Meet Learning Goals 1, 2 and 3 	Scored for accuracy; incorrect questions are shown after each attempt	Self-assessments available after due dates; use them for review.
I INTROSPECT	<ul style="list-style-type: none"> Online Journal Due Friday 5:00 AM 	<ul style="list-style-type: none"> INTROSPECT: examine your values, skills, techniques and strategies for success in BIO203 Develop skills for Learning Goal 4 	Scored for thought and effort; all thoughtful answers receive points	You'll be asked to revisit your answers in subsequent INTROSPECT activities.
V VERIFY	<ul style="list-style-type: none"> Clicker and card activities Completed in class, discussion with others encouraged! 	<ul style="list-style-type: none"> VERIFY that you understand the basic concepts discussed in lecture, and that you are able to apply them to new and complex situations Meet Learning Goals 1, 2, and 4 	Scored for accuracy and/or effort, depending on activity	Questions posted after class; review them and use them to help you complete the EVALUATEs.
E EVALUATE	<ul style="list-style-type: none"> Written assignments, usually 2 questions, 1 paragraph each Due after class, Sunday at 3:00 PM 	<ul style="list-style-type: none"> EVALUATE how well you understand the material from the lectures and how well you are able to apply it to new situations Demonstrate your progress toward Learning Goal 4 	Scored for accuracy according to grading rubrics. Graded by instructors and graduate-level graders.	Feedback is available after due dates. Review your rubric score after your assignment has been graded, and compare your answer to the rubric.
R REFLECT	<ul style="list-style-type: none"> Self-assessments and feedback posted after due dates Blackboard Surveys Other optional activities 	<ul style="list-style-type: none"> REFLECT on all the previous activities, and practice for exams. Provide feedback on how you are learning and your opinions and suggestions for improving learning in BIO203. 	Self-assessments are not scored. Surveys and activities are scored for participation.	Use self-assessments to review for exams.

IN BIO203, we discuss many human organs, but we don't get to spend much time discussing the liver. It's pretty much the coolest organ of all, and that's why we've used the liver acronym to describe BIO203's activities. The liver receives nutrients from digested food, stores some of them for later use, converts simple molecules into some of the most complex and important ones, detoxifies and recycles waste, and regulates several important processes in other organs in the body.

The activities in the class are designed to help you to do all of this – take in knowledge, convert the basic facts you learn into in-depth comprehension and skills, and help you to self-regulate your learning.

BIO203's instructors will be able to use your responses to the course to help make the course better for you and also for students in future offerings of BIO203. We truly appreciate your thoughtful completion of all of the activities.