

BSC-120 – Principles of Biology – Fall 2017

*** By remaining enrolled in this course, you accept the contents of this syllabus; therefore, you must ensure that you understand the contents ***

~CONTACT INFO ~

Dr. EMILY GILLESPIE gillespieE@marshall.edu

- Use this email only, not the messaging system within MUOnline/ Blackboard (it is not reliable).
- Please come to office hours for complex questions or help with material. Email is for quick answers.
- Email is not texting; do not expect a response immediately. I may not respond to emails during non-business hours. Some days, I have back-to-back appointments.
- I reserve the right to de-prioritize answering emailed questions that are clearly answered in the syllabus and I expect you to check the syllabus before emailing me.
- I expect students to write professional emails, which means writing clearly and concisely, and addressing all instructors appropriately. Do not write in text-ese. Punctuate and use correct grammar. Please provide context and identifying information (I have many students).

Office: Science 364 Phone (304) 696-6467. I strongly prefer email over phone for quick questions. I prefer an in-person meeting for complex questions.

OFFICE HOURS: 1 p.m. – 2 p.m. Tuesdays and 3pm-4pm Wednesdays. No appointment is needed for these times; just come to my office. These hours are firm unless you are in a formal class during all of these times—in which case, email me to set up an alternative time. If these hours prove inadequate for us, I will add more.

LECTURE MEETINGS: Science 374: 2pm – 3:15 p.m. T and R

LAB Meetings: Science 210
Section 112: 5:30 p.m. – 7:20 p.m. T (Andrew Boyles, GA)
Section 113: 12:00 p.m. – 1:50 p.m. W (Alyssa Brady, GA)
Section 114: 2:00 p.m. – 4:00 p.m. W (Kramer Kaplan, GA)

SUPPLEMENTAL INSTRUCTION: Harris Hall 135: M and W 4:00 p.m. – 5:15 p.m.

~COURSE INFO~

COURSE DESCRIPTION: 4 credit hrs. This survey course introduces students to the biological principles common to all organisms, including the chemistry of life, cell biology, metabolism, heredity, and evolution through classroom lecture and laboratory activities.

Course Prerequisite: Minimum of 21 or better on Math ACT, or $\geq C$ in MTH 121 or a higher math course. *The course is intended for biology majors and pre-professional students, and will be taught at a level appropriate for these goals, meaning that it is heavily conceptual but reliant on underlying detail.*

Course Outcomes	Opportunities to Practice Course Outcome	Course Outcome Assessment(s)
Articulate and describe the basic biological principles common to all organisms	In-class discussions, homework and laboratory exercises	Examinations and quizzes
Discuss and use the scientific approach to solve problems within the field of biology	In-class discussions, homework and laboratory exercises	Examinations, quizzes and laboratory reports
Read and analyze charts, graphs, and tables conveying scientific information	In-class discussions, homework and laboratory exercises	Examinations, quizzes and laboratory reports
Collect, interpret, present and discuss scientific data	Laboratory experiments	Formal written laboratory report

REQUIRED COURSE MATERIALS:

1. A notebook and pen/pencil for note-taking. *All office hours visits must include your notebook.*
2. Text: Biology, 4th edition by Brooker et al., 2016 (for home).
3. Software: McGraw-Hill 'Connect' access (for home) Navigate to:
http://connect.mheducation.com/class/gillespie_fall_2017
4. BSC-120 Laboratory Manual by Weinstein (for lab). *Make sure to get the current version.*
5. Short Guide to Writing in Biology by Pechenik—most recent edition (for lab).
6. Safety goggles (for lab).
7. Access to the course management site through www.marshall.edu/muonline (also called Blackboard), where you will find various updates, announcements and materials throughout the semester. Your gradebook will be available here as well. If you cannot access the course, email me right away, because ***you are responsible for any material or announcements posted there, as well as regularly making sure that your gradebook reflects your grades as you understand them.***

~EXPECTATIONS~

University education is a 'two-way street.' In other words, you (the student) and I (the lecturer) must work together in order for your experience to be successful. Your commitment to getting the most out of the course is critical. You will find that college courses are qualitatively different (not just more work or harder work) than high school. It is important that you embrace this difference. I can help with that.

My responsibility to you is to come to class prepared each and every day, and to think critically about what you need to learn in this class in order to be successful biology majors. Another part of my commitment is to be available to you during office hours for help with material and troubleshooting your

study habits, and to give you feedback about your progress in a timely manner. If you require more extensive help maximizing your study skills, I will help you access more resources.

Your responsibility to me is to come to class prepared to participate each and every day, to study actively and conscientiously, to be responsible for your own learning process, and to address problems in a timely manner. *It is extremely difficult to pass this course if you are disengaged, attend poorly, or fail to address what you need help with on a continuing basis.*

Electronics policy. I no longer permit computers in class, because of the proportion of students doing non-class-related work on them instead of paying attention in class. You will be required to take notes in a notebook using a writing utensil. Similarly, phones, tablets, or other hand-held devices are prohibited outside your bag/pack during class, for the same reason as above. The only exceptions are 1) Exam days, when you will need to bring a suitable device, and 2) in consultation with Disable Student Services.

I do not consent to any audio-, video-, or photo-recording of my lectures for any reason. I will make exceptions in consultation with the Office of Disability Services only. Failure to adhere to this policy will be considered academic misconduct.

General conduct. I expect everyone to handle themselves in a professional manner in class, and I will require any student who cannot handle this to leave for the day. In particular, continuing to talk during class other than to the class about class issues will result in you leaving class. I expect you to be professional in your email, during lecture/lab and during one-on-one contact with your lab instructor and myself. If you blatantly and/or frequently mistreat any person in the lecture hall or lab, you will be required to leave immediately and disciplinary action will be sought before you are permitted to return.

My lectures are very informal and I encourage you to ask questions and offer comments, without waiting to be called on. I encourage students to attempt to answer classmates' questions respectfully. I welcome questions that are slightly off-topic, as they often lead to meaningful connections to lecture material. In short, do not be intimidated by our large lecture class. I want you to be professional and considerate, but informal and interactive.

~GRADING INFO~

GRADING: A \geq 90.0; B = 89.9-80; C = 79.9 -70; D = 69.9-60; F \leq 59.9. No curving of grades will occur, including rounding up. Your individual grades will be recorded in Blackboard Gradebook. You should familiarized yourself with the calculation of a 'Weighted Average' and always be generally aware of how you are doing in the class.

'Incomplete' grades will be given only if a student has completed 75% of all anticipated coursework, is passing the course, and in extraordinary circumstances, as determined in consultation with the Department Chair and/or Dean of Students and/or Registrar. Incompletes will not be permitted in the case of 'getting behind', missing an important grade, or having typical absences. Appeals for Incomplete grades will require substantial documentation before approval. Incomplete grades must be resolved as prescribed by the University.

Pre-lecture Connect Assignments. You have one Pre-Lecture Connect assignment for each chapter we cover. The total percentage of points earned from these will constitute **5%** of your course grade. Each assignment will include 10 questions that you should be able to answer reasonably easily IF you have already reviewed the chapter and taken notes. You have only one attempt at these questions, but they are open-book (not open-human). The purpose of these assignments is to incentivize proper preparation for lecture. I will move quickly in class and I will not deliver a list of items to memorize;

being familiar in advance will make lecture easier to follow, will allow you to ask valuable question, and will represent some of the necessary work toward the chapter. Each week's Pre-lecture assignment(s) will open at 8am on Sunday. Each one will be due at 2 p.m. (i.e. class time) on the day we begin that chapter. Note that you can begin reviewing a chapter earlier than the assignment opens up. Late assignments carry a 10% penalty per day, with late day #1 beginning at the due date/time.

Post-lecture Connect Assignments. You have one Post-lecture Connect homework assignment for each chapter we cover. The total percentage of points earned from these will constitute **20%** of your course grade. The number and format of questions will vary, but expect ~40-50 questions on average that range in format from objective to applied, and from straightforward to challenging. If you work these assignments conscientiously and truly master the content, you should do very well on exams. These will become available on Sunday at 8:00 am the week we are scheduled to cover the material, and every assignment will be available until 11:59 p.m. (i.e. midnight) on Wednesday, December 13, at which time no more homework grades will be recorded or updated. This is to encourage you to review regularly, and it will give you unlimited opportunities to earn an excellent score and review for the final exam. Do not wait to start the Connect assignments until late in the semester, as they are significant assignments. No Connect assignments will be dropped.

These assignments are intended to be done on your own, without the help of any human (except Dr. Gillespie). You can use your book, notes or other online resources (but I am not responsible for the accuracy of internet resources!). If you seek other students' help other than for honest studying collaboration (i.e, if you simply *acquire* the correct answers), 1) you are guilty of academic dishonesty and are at risk for disciplinary action, and 2) you will have a highly misleading perception of how prepared you are for your exams. I strongly encourage you to form a study group, however, and you are more than welcome to discuss concepts among yourselves. Your Connect homework should simply reflect your *own* understanding of the material.

Any other assignments, such as **unannounced in-class quizzes** or **small impromptu assignments** (expect a few), will be added into the post-lecture assignment grade partition. For in-class quizzes, no make-up is possible if you are absent, but I will exempt quizzes that fall into the excused absence policy; you have two business days after returning to campus to provide documentation to me; after that, a missed quiz becomes a zero regardless of the reason for missing it. Other assignments will have a longer due date and you will be able to complete them without extension if you happen to be absent on the day we discuss them in class. Your best bet is to miss class only in the case of unavoidable emergency.

Lab. 20% of your course grade will come from your laboratory performance. You will receive a separate syllabus from your Graduate Teaching Assistant lab instructor. You are expected to read and completely understand that syllabus. Your individual assignment scores from lab will not be posted in your MUOnline/Blackboard gradebook (TAs do not have access). As a courtesy, I will post your total running lab grade on Blackboard twice: at midterm and at the end of the term. You are responsible for knowing how you are doing in lab on any particular week.

No make up labs are available because 1) We cannot keep a lab set up late for you, and 2) Most labs sections are enrolled to capacity. You will be allowed a single dropped worksheet grade (not the draft or final lab report). If you are never absent, this will be the lowest score (preferable). If you miss a single lab, that zero will be automatically dropped without any action on your part. Additional absences will require you to meet in person with Dr. Gillespie, provide appropriate documentation for all missed labs and demonstrate that you have not missed lab frivolously this semester. You should NOT treat this single dropped grade as a free day off; it is for an unavoidable/emergency absence from lab only.

Lecture exams—Four regular exams together constitute **40%** of total course grade (i.e. 10% each). *You will need to bring a laptop or other compatible device with you on exam days.* You will be tested on lecture notes, videos, activities, readings from the text and any other materials covered or assigned, formally or informally. Please note your exam dates right away and plan accordingly (see Tentative Schedule, below), as you will receive a zero for any exam you miss for any unexcused reason. No exams will be dropped.

Exam dates will only change if the University formally closes unexpectedly; if this happens, the exam will occur on the next class meeting, without additional announcement. If our class is disrupted such that an exam cannot occur as scheduled, the exam will be deleted from the grading scheme and all other lecture exams will each be worth 3.33% more. The material will still appear on the final exam.

Excused absences include University-sanctioned events, life-threatening illness of yourself or a member of your immediate family for whom you are the primary caretaker, death of a family member or close friend, arrest or legal summons, or military duty. I will thoroughly investigate any excuse before I will schedule a make-up exam. Although I disdain asking for verification of personal things such as death, illness, or other highly personal issues, experience obliges me to do so. I will keep your personal details confidential unless the University *requires* that I disclose them. Routine medical appointments, childcare or car breakdowns, missed alarms, traffic, other exams, minor/manageable illness or injury, family gatherings, early vacations, athletic practice, etc... do not constitute excused absences.

Any regular lecture exam missed for a reason deemed 'excused' will be replaced with a 10-question essay exam. The exam questions will be very general (such as, 'describe the process of photosynthesis' or 'explain how fruit fly embryonic development proceeds') and therefore you should prepare to take all exams in essay format, in the event that you should need to do so. You are required to contact me within 24 hours of missing an exam (unless you are incapacitated) in order to set up a make-up exam time; you should include documentation of your absence at that time. You will have no more than one week (five business days) after your last excused date of absence to complete your make-up exam. You will have a grade entered within one week after.

A **cumulative final exam** constituting **15%** of your course grade will occur on **Thursday, December 14 at 12:45 p.m.** You should confirm this time/date on the University exam schedule. You will need to bring your own compatible laptop for this exam. There is no makeup exam available for the final exam since grades are due the following Tuesday. You may not take the final early for any reason. If you miss the final, your only options will be to take a zero or appeal to the Dean of Student Affairs and Registrar for an Incomplete grade (see above).

Please be very clear that I do not offer bonus work, extra credit or curves to improve your grade. Your only route to a good grade is mastery of the material. Do not ask for an exception to this policy.

SUPPLEMENTAL INSTRUCTION: Your BSC-120 sections have an experimental Supplemental Instruction component. The time was built in to the schedule so that every student can attend. SI leaders are undergraduates who have excelled in this course previously. Please see page 1 of this syllabus for meeting times, locations and leaders. This program exists entirely to give you additional guidance with this demanding course. Student leaders will have different ways to explain things, different examples, and different insights into topics. Unless you are handling the course with ease, these meetings are strongly encouraged!

ATTENDANCE: Attendance and participation in all lectures is expected. You are expected to be present and alert for the entirety of lecture. If you feel that you cannot stay for the entire lecture, I request that you arrive early enough to find a seat nearest the door and that you leave quietly. Any

material covered in your absence is your responsibility, and you should identify a student you trust who might share their notes with you in case you need to be absent. Do not email me to ask what you missed.

The Herd Path Program has installed a scanner on the large lecture halls. Freshmen students must swipe their ID card upon entry in order to record attendance. Excessive absences will result in you being contact by the University to discuss your attendance. This does not involve me (Dr. Gillespie) in any way, shape, or form.

‘Triggers’, controversial topics and sensitive subjects: Biology is an evidence-based, relatively dispassionate subject. We follow the evidence where it takes us and we pursue an understanding of how the natural world operates with as little influence as possible from human biases and emotions. As a discipline, we do not turn away from explanations that challenge our positions, including long-held beliefs. That is the nature of our field and as a biologist you should embrace this stance.

That said, if you feel that you may not be able to handle our discussion of any topic, you are not required to remain in class. I request that you anticipate, by reading ahead, sit near the door and leave without disturbance. You are, however, completely responsible for the information covered and you should identify a classmate who is willing to provide notes to you. You will not be exempted from being examined on any factual information for any reason and I will not provide you notes.

ACADEMIC ACCOMMODATION: Marshall University is committed to equal opportunity in education for all students, including those with physical, learning and psychological challenges. University policy states that it is the responsibility of students with such challenges to contact the Office of Disability Services (ODS), <http://www.marshall.edu/disability/>, in Prichard Hall 117, phone 304-696-2271 to provide documentation of their disability. This office also integrates with the Autism Center, Buck Harless Athletic Program and the HELP Center. The ODS Coordinator will then send a letter to each of the student’s instructors outlining the academic accommodation he/she will need to ensure equality in classroom experiences, outside assignments, and testing. The instructor and student will discuss how the accommodation(s) requested will be provided. Accommodations could include having an assigned note-taker, permission to use certain electronics in class, or having extended time on exams.

I strongly encourage students with learning challenges or atypical neurobiology to seek assistance from these resources if you have any qualifying challenge. Be aware that you must be evaluated by a qualified professional on- or off-campus prior to receiving these services, and modifications are not retroactive. I will not make modifications outside the direction of the Office of Disabled Student Services since I am not qualified to evaluate learning disabilities. Also be aware that while I fully and enthusiastically support modifications for any qualifying student and advocate for your success, you will not receive additional leniency from me. You must be as proactive as any other student. All rules regarding academic honesty and integrity apply equally to students who fall under ODS management.

WITHDRAWAL: If you feel that you cannot complete the course, keep the single-course withdrawal deadline, **OCT 27**, clearly in mind. You must administratively withdraw. Do not simply stop attending (you will almost certainly receive an F!). I have no control over this date and cannot help you withdraw after this date.

ACADEMIC DISHONESTY—Academic dishonesty will not be tolerated, and cheating will be pursued vigorously. This includes, but is not limited to, exams, quizzes, lab papers, etc... If work is intended to be done with a group, you will receive explicit instructions indicating that you have permission to exchange work with other students. Any appearance of cheating (looking around at other people’s exams, talking during exams, etc...) will result in a zero on that assignment *without discussion*. More blatant forms of cheating (being caught directly and unambiguously), such as being caught using notes

during an exam, plagiarizing a lab report, or misrepresenting a request for an excused absence, will be referred for disciplinary action. If you have any questions, please ask, rather than take a chance. The most negative outcomes of being involved in academic dishonesty are grade penalties, formal disciplinary action such as suspension or expulsion, and loss of control of one's reputation.

UNIVERSITY POLICIES AND PROCEDURES: By enrolling in this course, you agree to the University Policies listed below. Please read the full text of each policy by going to www.marshall.edu/academic-affairs and clicking on "Marshall University Policies." Or, you can access the policies directly by going to http://www.marshall.edu/academic-affairs/?page_id=802

COURSE SCHEDULE. Below is our tentative lecture schedule for Fall 2017.

This table includes the dates, topics and chapters. In the 'Background' column, you will find topics that you should bring with you from high school courses (or from intro chemistry if you are currently enrolled) or from earlier in this course; these topics will not be covered in detail during class, so if you are not comfortable with them, you should review prior to that lecture. During class, I may assign specific, limited topics for you to cover on your own, outside of class (e.g., a specific, additional example or a particular topic).

We will make every effort to stay on this schedule, but you will hear *in class* and/or via Blackboard/MUOnline if minor changes are made to the schedule. In extraordinary circumstances, I will revise the course plan significantly (i.e. significant disruption to the University schedule).

TENTATIVE LECTURE SCHEDULE for Fall 2017

WEEK #	WEEK OF	DAY	TOPIC	CH.	GREATEST FOCUS	CRITICAL BACKGROUND
1	Aug 21	T	Welcome/syllabus/ academic survival skills		Syllabus will be posted on Blackboard.	
		R	Pre-test (required!)			
2	Aug 28	T	Earth History	22	Major events/ trends/ shifts. Tree of Life.	Major geologic eras and approximate dates
		R	Evolution	23	Evolutionary mechanisms, evidence for evolution.	Darwin's history and formation of fossils.
3	Sept 4	T	Evolution Part II	23		
		R	Macromolecules	3	Major classes, basic structure & function, & basic functions in cell	Atoms, molecules and bonds from chapter 2
4	Sept 11	T	Overview of cell structure	4	Interactions among organelles, evolutionary history. <u>De-emphasize</u> microscopy concepts—major points only.	Major organelles & their functions. Eukaryotic v. prokaryotic cells. Plant cells v. animal cells.
		R	Membrane structure & synthesis	5	Get structures quickly, then focus on synthesis & transport most.	Major organelles & their functions
5	Sept 18	T	Exam 1 (covering chapters 22, 23, 3, 4, 5)			
		R	Overview of energy, enzymes and metabolism	6	ADP/ATP transition, enzyme structure & function, brief overview of general metabolism.	States of energy, Laws of Thermodynamics, & equilibrium states, proteins
6	Sept 25	T	Cellular Respiration: Overview	7	The 'five Ws' of respiration, basic steps, orientation	Mitochondria, enzyme function, energy, ADP/ATP, geologic time.
		R	Cellular Respiration: Details and alternative pathways	7	Transitional steps, connections between organelles/ compartments, fermentation & anaerobic respiration.	
7	Oct 2	T	Photosynthesis: Overview	8	The 'five Ws' of photosynthesis, basic steps, orientation.	

TENTATIVE LECTURE SCHEDULE for Fall 2017

WEEK #	WEEK OF	DAY	TOPIC	CH.	GREATEST FOCUS	CRITICAL BACKGROUND
		R	Photosynthesis: Details and alternative pathways	8	Transitional steps, connections between organelles/ compartments, C4 & CAM processes.	Mitochondria, chloroplasts, enzyme function, energy, ADP/ATP, geologic time.
8	Oct 9	T	Cell signaling: Overview	9	Kinds of signals, basic parts of cell signaling systems	Energetics, ADP/ATP, enzyme structure & function, Membranes
		R	Cell signaling: Details & specific pathways	9	How signaling components interact, specific examples.	
9	Oct 16	T	Exam 2 (covering chapters 6, 7, 8, 9)			
		R	DNA Structure & overview of Replication	11	Hierarchy: atoms → chromosomes, the basic challenge of DNA replication. Details of replication, impacts on genomes, chromosome structure.	Nucleic acids, enzymes, bonds, organelles
10	Oct 23	T	Gene expression: Transcription & Translation	12	Each process will be covered as an overview and then in detail. Emphasize the interaction between them and with the cell.	DNA structure, proteins (incl. enzymes), cell structure
		R	Gene regulation	13	<i>lac</i> and <i>trp</i> operons in bacteria Comparative complexity of regulation in eukaryotes.	Gene expression, prokaryotic v. eukaryotic cells.
11	Oct 30	T	Gene regulation Part II	13		
		R	Mutation, DNA repair & cancer	14	Types of mutations & options for repair. Molecular and physiological consequences of unrepaired mutations.	DNA structure & replication, macromolecules, gene expression.
12	Nov 6	T	Exam 3 (covering chapters 11, 12, 13, 14)			
		R	Cell division: mitosis & gamete production: meiosis	15	Control of cell division (incl. gamete production), consequences of errors in health and evolution.	

TENTATIVE LECTURE SCHEDULE for Fall 2017

WEEK #	WEEK OF	DAY	TOPIC	CH.	GREATEST FOCUS	CRITICAL BACKGROUND
13	Nov 13	T	Complex inheritance	17	Epistasis, continuous variation & linkage	Cell structure, chromosome structure, <i>basic</i> steps of both cell divisions, chapter 16
		R	Complex inheritance part II	17	Extra-nuclear inheritance, X-inactivation & genomic imprinting.	Mendelian inheritance, chromosomes, meiosis
14	Nov 20	T	Fall Break			
		R	Fall Break			
15	Nov 27	T	Developmental genetics	19	Pattern formation in animals & plants. Evolutionary aspects of development in plants & animals ('evo-devo').	Cell divisions, chromosomes, gene expression, gene regulation, complex inheritance
		R	Developmental genetics part II	19		
16	Dec 4	T	Genomes, Proteomes, & Bioinformatics	21	Genome – Proteome, modern management of genomic data & what you can do with it	Gene structure, basic aspects of gene expression & regulation
		R	Exam 4 (Chapters 15, 17, 19, 21)			
	Dec 14	R	Final Exam: 12:45 p.m. – 2:45 p.m.		all	