BSC-120 – Principles of Biology – Spring 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 website: http://gillespielab.weebly.com/

- Use this email only, not the messaging system within MUOnline/ Blackboard (it is not reliable).
- Email is not texting; do not expect a response immediately. I may not respond to emails during non-business hours. If you don't hear from me within two business days, please stop by office hours.
- 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. Please provide context (I have many students).
- Identify your course (BSC-120) since I teach multiple courses.

Office: Science 364 Phone (304) 696-6467. I strongly prefer email over phone so that I can write you a thoughtful, clear response without being pressed for time.

OFFICE HOURS: 9:15 am – 11am Tuesdays and Thursdays. 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 Lecture Time: T, R 11:00 a.m. – 12:15 p.m.

LAB: Science 210: Section 204: 2:00 p.m. – 3:50 p.m. Tuesday (Diana Boudreau, GA)
Section 205: 10:00 a.m. – 11:50 a.m. Wednesday (Mitchell Kriege, GA)
Section 206: 12:00 p.m. – 1:50 p.m. Wednesday (Leah Ching, GA)

SUPPLEMENTAL INSTRUCTION: Harris hall 236
Tue 6:30-7:45p (Kaleigh)
Wed 5-6:15p (Megan)
Thu 5:30-6:45p (Kaleigh)
Fri 12-1:15p (Megan)

~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* ≥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 comfortable way to take notes (see my Electronics Policy, below).
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/e-gillespie-all-sections-2
4. BSC-120 Laboratory Manual by Weinstein (for lab)
5. Short Guide to Writing in Biology by Pechenik (2013) or another 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, 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. Laptops or other devices are permitted for note-taking *if and only if you agree to the following conditions*: 1) No charging is possible in the lecture hall due to insufficient outlets and tripping risk, 2) Your computer must be quiet, 3) You must arrive early enough to boot up and get settled before class starts, and 4) You are responsible for keeping your attention on lecture and not on other activities that may distract classmates around you. *If you cannot agree to these conditions, particularly #4, please refrain from using a laptop during class.* The same policy applies to tablets or other devices. Exams will require a laptop or other device (anything you are comfortable accessing Connect on).

In general, no phones should be active during class and they should not be allowed to ring during class. If you have a situation where you might need to take an important phone call, please set your phone to 'vibrate', sit nearest the exit and leave without disturbance to attend to your

issue.

I do not consent to any audio-, video-, or photo-recording of my lectures for any reason. Exceptions will be made in consultation with the Office of Disability Services only.

General conduct. I expect everyone to handle themselves in a professional manner in class, and I will ask that students who cannot do this leave for the day. I expect you to be professional and courteous in your email, during lecture/lab and during one-on-one contact with myself and your lab instructor. If you blatantly and/or frequently mistreat any person in the lecture hall or lab, you will be asked to leave immediately and disciplinary action will be sought before you are permitted to return.

My lectures are 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=100 -90; B=89-80; C=79 -70; D=69-60; F ≤59. 'Incomplete' grades will be given only if a student has completed 75% of the 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.

A **cumulative final exam** constituting **15%** of your course grade will be given on **Thursday, May 4 at 10:15 a.m.** There is no makeup exam available for the final exam since grades are due the following Tuesday. You may not take the final early. If you miss the final for any reason, 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).

Lecture exams together constitute **40%** of total course grade. You will be tested on lecture notes, videos, activities, readings from the text and any other materials covered or assigned. 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 reason. **No makeup exams will be permitted**, but your lowest lecture exam will be dropped. If you miss an exam, you should plan to drop that zero exam score. If you miss a second exam, your cumulative final exam will count in place

of that missed exam. In effect, this means that you *can* miss two exams and still do well (albeit missing that excessive exams rarely results in doing well). **If you miss three exams (out of four) for any reason, whether excused or unexcused, I suggest (but do not insist) that you withdraw and attempt the course another semester since you have likely also missed many days. You need a laptop or other working device that can access Connect for all exams.**

Connect Assignments. There will be one Connect homework assignment for each chapter we cover. The number of questions will vary. The total earned points from these will constitute an additional **25%** of your course grade. These are important 'low-risk' assignments that will guide your studying and allow you to test and improve your mastery well in advance of exams. These will become available as we cover the material in class if not sooner, and every assignment will be available until 11:59 p.m. (i.e. midnight) on Wednesday, May 3, at which time no more homework grades will be recorded. This is to encourage you to review regularly, and it will also give you unlimited opportunities to earn an excellent score. Do not wait to start the Connect assignments until late in the semester, as they are significant assignments. None 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 online resources!). If you seek other students' help, 1) you are guilty of academic dishonesty and are at risk for disciplinary action, and 2) you will have a misleading perception of how well-prepared you are for your exams. You may not directly as the SI leaders to tell you the answers to homework questions; they will be helping you with *concepts*.

Other incidental assignments, such as **unannounced in-class quizzes** (expect a few) or small impromptu assignments, will be rolled into this course component as well. For in-class activities, no make-up is possible if you are absent, but I will drop the single lowest of several unannounced, in-class quizzes in order to absorb an emergency absence.

Lab. The remaining **20%** of your course grade will come from your laboratory performance. You will receive a separate syllabus from your 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). Your total running lab grade on Blackboard may be updated only twice: at midterm and at the end of the term.

You will be allowed a single (lowest) dropped worksheet grade (NOT the draft or final lab report) in order to absorb an emergency absence. If you miss more than one lab, I will exempt the second absence ONLY if the first was also excused and unavoidable. I strongly encourage you to not skip lab frivolously, because you may wish you had that latitude if you have an emergency later on. If you have two or more absences, be prepared to provide me documentation for all absences.

Please be aware 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: This semester, BSC-120 Sections 204, 205 and 206 have a Supplemental Instruction component. SI leaders are undergraduates who have exceled in this course previously. Set meeting times where you can 'walk-in' for additional help will be held regularly (and frequently). Please see page 1 of this syllabus for meeting times, locations and leaders. This program exists entirely to give you additional instruction 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 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. In the case of an absence on exam day for any reason, you should plan to count that as your single dropped exam score.

'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) in Prichard Hall 117, phone 304-696-2271 to provide documentation of their disability. This office also integrates with the Autism 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. For more information, please visit http://www.marshall.edu/disabled .

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 cannot make these modifications outside the direction of the Office of Disabled Student Services. 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.

WITHDRAWAL: If you feel that you cannot complete the course, keep the Withdrawal deadline, **MAR 17**, 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) may be referred for disciplinary action. If you have any questions, please ask, rather than take a chance.

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 be 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 Spring 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).

We will make every effort to stay on this schedule, but you will hear *in class* if changes will be made to the schedule. Any attempt by a student to disrupt a planned lecture will simply place the responsibility on students to cover the material on their own. A disrupted exam will be given during the first half (only) of the next available lecture period. Exam dates will never change, unless classes are officially cancelled on an exam day. In case this rare event occurs, the exam will be taken on the first day back after a University cancellation. In extraordinary circumstances, I will revise the course plan significantly (i.e. significant disruption to the University schedule).

TENTATIVE LECTURE SCHEDULE for Spring 2017						
Week #	**Week of**	**Day**	**Topic**	**Ch.**	**Greatest Focus**	**Critical Background**
1	Jan 9	T	Syllabus/welcome/ academic survival skills		Syllabus will be posted on Blackboard.	
		R	Pre-test—bring laptop or other device & access to Connect			
2	Jan 16	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	Jan 23	T	Evolution Part II	23		
		R	Macromolecules	3	Major classes, basic structure & function, & basic functions in cell	Molecules and bonds from **chapter 2**
4	Jan 30	T	Overview of cell structure	4	Interactions among organelles, evolutionary history. De-emphasize microscropy concepts—major points only.	Major organelles & their functions. Eukaryotic v. prokaryotic cells. Plant cells v. animal cells.
		R	**Exam 1** (covering chapters 22, 23, 3, 4)			
5	Feb 6	T	Membrane structure & synthesis	5	Get structures quickly, then focus on synthesis & transport most.	Major organelles & their functions
		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	Feb 13	T	Cellular Respiration: Overview	7	The 'five Ws' of respiration, basic steps, orientation	Mitochondria, enzyme function, energy, ADP/ATP, geologic time.

TENTATIVE LECTURE SCHEDULE for Spring 2017						
Week #	**Week of**	**Day**	**Topic**	**Ch.**	**Greatest Focus**	**Critical Background**
		R	Cellular Respiration: Details and alternative pathways	7	Transitional steps, connections between organelles/ compartments, fermentation & anaerobic respiration.	
7	Feb 20	T	Photosynthesis: Overview	8	The 'five Ws' of photosynthesis, basic steps, orientation.	
		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	Feb 27	T	**Exam 2** (covering chapters 5, 6, 7, 8)			
		R	Cell signaling: Overview	9	Kinds of signals, basic parts of cell signaling systems	Energetics, ADP/ATP, enzyme structure & function, Membranes
9	Mar 6	T	Cell signaling: Details & specific pathways	9	How signaling components interact, specific examples.	
		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	Mar 13	T	Gene expression: Transcription	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	*lac* and *trp* operons in bacteria Comparative complexity of regulation in eukaryotes.	Gene expression, prokaryotic v. eukaryotic cells.

TENTATIVE LECTURE SCHEDULE for Spring 2017						
Week #	**Week of**	**Day**	**Topic**	**Ch.**	**Greatest Focus**	**Critical Background**
11	Mar 20	T	Spring Break – No classes			
		R	Spring Break – No classes			
12	Mar 27	T	Gene regulation Part II	13		
		R	**Exam 3** (covering chapters 9, 11, 12, and 13)			
13	Apr 3	T	Mutation, DNA repair & cancer	14	Types of mutations & options for repair. Molecular and physiological consequences of unrepaired mutations.	DNA structure & replication, macromolecules, gene expression.
		R	Cell division: mitosis & gamete production: meiosis	15	Control of cell division (incl. gamete production), consequences of errors in health and evolution.	
14	Apr 10	T	Complex inheritance	17	Epistasis, continuous variation & linkage	Cell structure, chromosome structure, *basic* steps of both cell divisions, **chapter 16**
		R	Complex inheritance part II	17	Extra-nuclear inheritance, X-inactivation & genomic imprinting.	Mendelian inheritance, chromosomes, meiosis
15	Apr 17	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	Apr 24	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

TENTATIVE LECTURE SCHEDULE for Spring 2017						
WEEK #	WEEK OF	DAY	TOPIC	CH.	GREATEST FOCUS	CRITICAL BACKGROUND
		R	**Exam 4** (Chapters 14, 15, 17, 19 & 21)			
	May 4	R	**Final Exam**: 10:15 – 12:15 p.m.	all		