CI: MITOCHONDRIAL GENOMICS

BIOL 4910 [various sections]- Spring 2022

Class meeting times

Lecture: TBD

[this course is also taught face-to-face [&via *Zoom* - IVE component]

Instructor Information

Instructor: Dr. J. Antonio Baeza
Office: 226 Long Hall
Laboratory: 101 Jordan Hall
Phone: 656-1488
E-mail: jbaezam@clemson.edu
Web page: http://www.clemson.edu/cafls/departments/biosci/faculty_staff/baeza_a.html
Office hours: TH 9:30 - 10:30 AM, 226 Long Hall (***online***, previous appointment)

Planned modality of the course: Traditional + Blended/Hybrid

This course will be traditional + blended/hybrid. We will meet face-to-face and via Zoom (with IVE and VE students) on the day/time designated for the class meeting. Using a variety of multimedia elements, I have designed an engaging and high-quality environment. This course contain a blend of synchronous online and face-to-face instruction. Hybrid courses use a variety of multimedia elements, as well as live, face-to-face opportunities. Blending these offerings will provide an engaging and supportive environment for you to the learn the material. Be assured that no matter what medium is used, I have taken a deliberate approach to ensure you a high-quality experience.

Important: check for information about the pandemic situation at the end of this document

Mask/Face Covering Policy

Science supports that the wearing of masks reduces SARS-COVID-2 transmission- out of respect for your classmates and the instructor/guests and their families- I would appreciate everyone wearing a face covering while in class.

Course description in Short: **in this course, we will learn about mitochondrial genomes. Mitochondria are organelles of utmost importance in 99.999% of uni-cellular and multi-cellular organisms. Perhaps more importantly, I will expose you to the scientific method and you will learn to think critically. We will be using various mitochondrial genomes as examples to improve your critical thinking skills. You will also improve your information literacy skills.**

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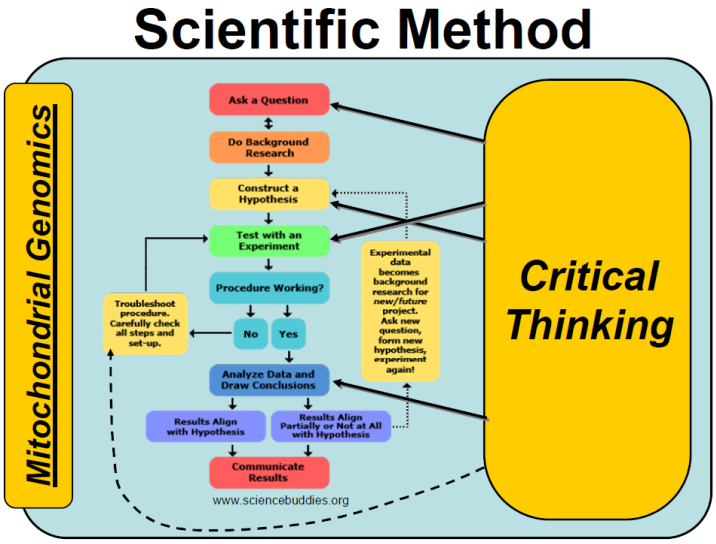

Course Description - Topical Outline

Mitochondria are the energy-transducing organelles of eukaryotic cells in which fuels to drive cellular metabolism are converted into ATP through the process of oxidative phosphorylation. Mitochondria have a double membrane. The outer membrane separates the mitochondrion from the cytosol while the inner membrane is invaginated to form cristae which protrude into and define the matrix of the organelle. The enzyme complexes of the oxidative phosphorylation system are embedded in the mitochondrial inner membrane. In addition to their central role in ATP synthesis mitochondria accommodate central metabolic pathways, like the Krebs cycle and the β-oxidation of fatty acids. They provide cells with a large number of metabolites, such as amino acids and steroids, and are involved in the formation of heme and iron-sulfur clusters.

The question of the origin and subsequent evolution of the mitochondrion has long captivated and challenged biologists. So far, we know that the mitochondrion originated only once, that is, mitochondria in all eukaryotic lineages descend from a common ancestor, the LMCA (last mitochondrial common ancestor). From comparative mitochondrial genomics — through the analysis of genes contained in mtDNA and the protein sequences they specify — we also know that the mitochondrial genome is of (eu)bacterial origin. These sequences point us to members of a particular bacterial phylum, α-proteobacteria (also termed Alphaproteobacteria), as the closest extant free-living relatives of mitochondria, and therefore the bacterial group from within which the mitochondrial genome emerged.

Mitochondria contain their own genome, the mitochondrial DNA (mtDNA), which is located in the mitochondrial matrix. 'Mitochondrial Genomics' is an introductory course to the structure, function, and evolution of animal mitochondrial genomes.

This course has three general topics: (1) *structure*. What is the length and main structural characteristics of animal mitochondria?, How many genes and other elements the mitochondrion genomes code for? What genes are there? (2) *Function*. What is the identity and function of all genes encoded by the mitogenome? (3) *Evolution*, including the exploration of selective pressures in protein coding genes present in animal mitochondrial genomes. In this course, we will explore the structure, function, and evolution of the mitochondrial genome using a set of 'friendly' bioinformatics tools.

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This course will also provide opportunities to participants to improve their critical thinking abilities and information (including digital) literacy.

Clemson Thinks^2

This course is part of the Clemson Thinks^2 (CT^2) critical thinking experiment, a program aimed at improving student critical thinking skills. Simple memorization of facts and repetition of definitions is not a sufficient skill set to address the complex problems our world faces today! **As a Clemson undergraduate, we expect you to develop the ability to think critically and to evaluate how knowledge is constructed and the assumptions underlying such knowledge**.

Critical thinking is reasoned and reflective judgment applied to solving problems or making decisions about what to believe or what to do. Critical thinking gives reasoned consideration to defining and analyzing problems, identifying and evaluating options, inferring likely outcomes and probable consequences, and explaining the reasons, evidence, methods and standards used in making those analyses, inferences and evaluations. Critical thinking is "*skeptical without being cynical, evaluative without being judgmental, and purposefully focused on following reasons and evidence wherever they may lead*". Please, visit https://www.insightassessment.com/FAQ/FAQs-General-Critical-Thinking/What-is-Critical-Thinking for additional information. Also. you can find more information on the CT^2 program at **http://www.clemson.edu/assessment/thinks2**/.

Student Learning Outcomes

- Understand and analyze the structure of animal mitochondrial genomes
- Understand structural and functional annotation of mitochondrial features
- Visualization of protein coding genes, tRNAs, and rDNA.
- Explore and learn online genomic tools
- Understand and estimate selective pressures in protein coding genes
- Infer systematic relationships using protein coding genes present in mt genomes.
- Interpret quantitative relationships in manuscript graphs and tables.
- Explain the limitations of correlational data published in scientific papers.
- Analyze data to identify and summarize problems as part of the scientific method.
- Integrate information/data to solve a problem as part of the scientific method.
- Develop and justify one or more than one hypotheses.
- Identify the limitations of one or more than one hypotheses.
- Identify alternative interpretations of the data or observations.
- Evaluate competing interpretations, explanations, evidence, and conclusions.
- Effectively communicate complex ideas.

Critical Thinking Assessment and In-Class Activities

First, you **might** be assessed by the CT^2 program through the application of a 'pre-course' test (California Critical Thinking Test) which will assess your initial critical thinking status and a second 'post-course' follow-up test to measure the difference. Dates for taking the pre- or post-course tests will be announced by the instructor during the semester.

Then, throughout the semester, there will be announced home-work as well as in-class activities, artifacts, and reports (see below) during the lecture period worth 1000 points towards your final grade (see below). At least one of these in-class activities include the discussion of a scientific paper. The different activities will be focusing on specific attributes of mitochondrial genomes. **During the activities, you will be exposed to the scientific method and critical thinking**. I will lead the discussion so that you can: i. identify, develop, and/or justify one or more than one hypothesis covered in the activities, ii.. identify the limitations of one or more than one hypothesis proposed in the activities, iii. understand experimental design and its different components to test one or more than one hypothesis, iv. evaluate competing interpretations, explanations, evidence, and conclusions related to the in-silico experiment described in the different activities, and v. identify alternative interpretations of the data or experimental observations. The activity will also allow you to vi. integrate information/data to understand and solve a problem, and vi. effectively communicate complex ideas. Those students absent for the *ICPA* will receive zero points. **You need to participate and respect deadlines to perform well in the course.**

Course prerequisites: At minimum, students are expected to have a basic knowledge of how to use a computer, web browser, and a word processing program to be successful in this online class. Students must be comfortable with their computer system and willing to deal with any problems that may arise. Lack of technical knowledge can greatly interfere with your learning. If you do not have these skills, consider taking a short computer course prior to enrolling in any online course.

Skills you are expected to know:
• Get your password and login into the class Canvas site
• Attach files to email messages or upload them to Canvas
• Compose written documents in a word processor such as Microsoft Word or Pages
• Word processing tasks (type, cut, paste, copy, name, save, rename, etc.)
• Use a web browser
• Download information from the Internet
• Respond to online discussion forms
• Backup your files
• Use a webcam and/or cell phone to take videos and pictures

Participants are expected to be comfortable logging into the online course site and accessing/downloading files such as Microsoft Office documents, YouTube videos, and PDFs. In addition, participants should be able to use Microsoft Office (or an equivalent program suite) to compose written documents, spreadsheets, and PowerPoint presentations. For technical assistance with the online course site, participants should contact CCIT's email (ithelp@clemson.edu) or visit CCIT's website: (http://www.clemson.edu/ccit/help_support/).

Required Knowledge: be a Biology Major. Students are expected to have access to a computer with an internet connection and have some means by which they can stream and record themselves (video and audio). If your laptop or cellphone lacks these

capabilities, make sure you purchase an appropriate device. Course material will be posted directly to our Canvas page unless otherwise communicated by the instructor.

The purpose of this statement is to inform students and parents of medical insurance considerations for undergraduate students working for credit in Clemson research laboratories or other environments that may present inherent hazards (such as machine shops, field research, etc.).

Undergraduate/Graduate students conducting research or other activities whether credit bearing or not (i.e. not in a paid position such as a student worker, etc.) are NOT covered under the university's workers compensation program in the event of an accident. In such cases, any medical costs incurred that are not covered under the student health fee, may have to be paid by the student. It is recommended that students and parents (where necessary) consider the risks associated with the work to be conducted and determine the need for additional medical insurance coverage (if applicable).

A list of services covered and not covered under the student health fee, as well as a link to purchase the Student Health Insurance Plan can be found here: https://www.clemson.edu/campus-life/student-health/insurance-and-billing.html

If the instructor is more than 15 minutes late for lecture without notice, students may leave without penalty.

Should I need to miss class due to illness or travel there will either be a substitute or an e-Learning activity. This would be communicated to you via Canvas.

Lecture Text: NON *Required*

Lecture Grading

Final Lecture Grade: total nº of points earned out of a maximum of 1000 points.
Scale: 900-1000 = A, 800-899.9 = B, 700-799.9 = C, 600-699.9 = D, <600 = Failed

Important Note: Grades will not be rounded up. Thus, the above are hard cutoffs.

Important Note: **You need to bring a white paper to every lecture or be ready to submit a short report online at any point in time during the semester (*word* file)**

Lecture grades will be based on a total of 13 home-works, reports, and artifacts + class participation activities.
The breakdown of points is described below. You will be expected to understand all material presented in lecture, recommended manuscripts, bioinformatics tools, assigned outside readings, and develop artifacts.

Important: **please, see *Important Specific COVID-19 related information above.***

Important: **It is mandatory that complete all reports, activities and artifacts if you want to pass the course.**

Grading specifics:
[please, check deadlines below]

R: Literature Review Preliminary: 25
R: Literature Review Final: 50
R: Preliminary Annotation I: 50
R: Preliminary Annotation II: 50
R: Final Annotation: 100
A: Circular Depiction: 75
R: Codon & Nucleotide Usage: 25
A: tRNA exploration & depiction: 100
R: D-loop/CR exploration: 25
R: PCG selection analysis I: 100
A: Video I: 100
R & A: PCG selective pressure analysis II: 100
A: Video 2: 200

[Class participation: 50 pts]
[Evaluation: 50 extra points]
Total points for lecture **1000 pts**
R = report, A = artifact (figures or videos)

Activities: Lecture Reports + Artifacts (including videos)
Throughout the semester, there will be unannounced in-class activities worth 1000 points towards your final grade. These activities may include discussing a paper, providing a written report about a specific analysis, designing a figure focusing on a specific mitochondrial feature, and developing videos explaining your results. Those students failing to provide reports or artifacts during the deadline date will receive zero points.

There will be no opportunity to make up missed reports or artifacts. In the case that a student misses a deadline and has a University- and instructor- approved excuse **in advance**, the student will be excused from that specific activity and scores will be prorated.

Important: **Honor students will develop extra activities during the semester**. **These activities will be discussed with the instructor at the beginning of the semester. Activities include the production of two artifacts: one video and one poster.**

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LECTURE SCHEDULE

IMPORTANT NOTICE: *topics and order are subject to minor / moderate change*

Date		Topics		REPORT / ARTIFACT	
Week 1		Introduction		Selecting mitochondrial genomes	
Week 2		Literature Review & Genome Annotation			
Week 3		Literature Review & Genome Annotation		R: Literature Review Preliminary	
Week 4		Mitogenome Annotation & Curation		R: Literature Review Final	
Week 5		Mitogenome Annotation & Curation		R: Preliminary Annotation I	
Week 6		Mitogenome Annotation & Curation		R: Preliminary Annotation II	
Week 7		Mitogenome Circular Depiction		R: Final Annotation	
Week 8		Mitogenome Circular Depiction			
Week 9		Codon & Nucleotide Usage		A: Circular Depiction	
Week 10		tRNA exploration & depiction		R: Codon & Nucleotide Usage	
Week 11		D-loop/CR exploration & depiction		A: tRNA exploration & depiction	
Week 12		Instructions: Video in Spark or Rush		R: D-loop/CR exploration	
Week 13		PCG selective pressure analysis			
Week 14		PCG selective pressure analysis + VIDEO		R: PCG selection analysis I A: Video I	
Week 15					
Week 16		Video script & tools		R & A: PCG selective pressure analysis II	
Week 17		Examinations (3 hrs)		A: Video 2	

Instructor Statement on Attendance Policy

Clemson University undergraduate student attendance policies are available in the undergraduate catalog. This includes sections on attendance policy, enrollment, anticipated absences, unanticipated absences, excused absences, appeals, and auditing. Some of the most pertinent information is copied below.

Important: Any exam that was scheduled at the time of a class cancellation due to inclement weather, University power outage, etc., will be given at the next class meeting unless contacted by the instructor. Any assignments due at the time of a class cancellation due to inclement weather will be due at the next class

meeting unless the instructor contacts students. Any extension or postponement of assignments or exams must be granted by the instructor via email or Canvas within 24 hours of the weather-related cancellation.

You must participate during the first week of class. If you have not participated by AUGUST 24 (last day to add a class) or you accumulate excessive absences (2 or more classes), you may be dropped from the course.

You should speak with me as soon as possible regarding any absence and develop a plan for any make-up work. It is your responsibility to let me know if you need to make any changes due to the pandemic. In the event of an emergency, you should make direct contact with me, preferably before a class or an exam takes place. You may find it helpful to use the Notification of Absence module in Canvas. If you have difficulty or are unable to electronically report the absence, you may call the Office of Advocacy and Success at 864-656-0935 for assistance and guidance.
UPDATED: 08 10 2021

If the instructor is more than 15 minutes late for lecture without notice, students may leave without penalty.

Should I need to miss class due to illness or travel there will either be a substitute or an e-Learning activity. This would be communicated to you via Canvas.

Inclement Weather
Any exam that was scheduled at the time of a class cancellation due to inclement weather, University power outage, etc. will be given at the next class meeting unless contacted by the instructor. Any assignments due at the time of a class cancellation due to inclement weather will be due at the next class meeting unless the instructor contacts students. Any extension or postponement of assignments or exams must be granted by the instructor via email or Canvas within 24 hours of the weather-related cancellation.

Academic Continuity
Clemson has developed an Academic Continuity Plan for academic operations. Should university administration officially determine that the physical classroom facility is not available to conduct classes, class will be conducted in a virtual (online) form. The university issues official disruption notifications through email, website, text notification and Social Media. When notified, use one of the following links to navigate to Clemson Canvas where you will find important information about how we will conduct class:

- Primary access link: http://www.clemson.edu/canvas
- Secondary access link, if needed: https://clemson.instructure.com/
- You can also use the Canvas Student App. Visit the downloads page for this app.

Course activities will occur through the Canvas course and GoogleDrive.

Expectations
Expectations (in terms of your performance) are high for this course!!!

In the case I require isolation/quarantine, I will be lecturing via Zoom.

As we continue to learn more about the state of the pandemic and the current level of risk, policies to mitigate the spread of disease in our classroom may change throughout the semester. Your instructor will inform you of these changes ahead of time so that you can prepare accordingly.

Please be familiar with the information on the Healthy Clemson website.
https://www.clemson.edu/covid-19/faqs.html

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Please use appropriate conduct to help maintain a safe learning environment.
Participants should:
• Never transmit or promote content known to be illegal.
• Respect people's privacy as well as your own.
• Forgive other people's mistakes.
• Never use harassing, threatening, embarrassing, or abusive language or actions.

UNIVERSITY POLICIES

Instructor Statement on Attendance Policy
You must participate during the first week of class. If you have not participated by January 12 (last day to add a class) or you accumulate excessive absences, you may be dropped from the course (**Important**: ***missing two classes [and/or examinations] constitutes excessive absences***).

You should speak with me as soon as possible regarding any absence and develop a plan for any make-up work. It is your responsibility to let me know if you need to make any changes due to the pandemic. In the event of an emergency, you should make direct contact with me, preferably before a class or an exam takes place. You may find it helpful to use the Notification of Absence module in Canvas. If you have difficulty or are unable to electronically report the absence, you may call the Office of Advocacy and Success at 864-656-0935 for assistance and guidance.

If the instructor is more than 15 minutes late for lecture without notice, students may leave without penalty.

Any exam that was scheduled at the time of a class cancellation due to inclement weather will be given at the next class meeting unless contacted by the instructor. Any assignments due at the time of a class cancellation due to inclement weather will be due at the next class meeting unless the instructor contacts students. Any extension or postponement of assignments or exams must be granted by the instructor via email or Canvas within 24 hours of the weather related cancellation.

** COVID-19 Related Information

This is an in-person course and will be delivered in a traditional modified format but it can transition to online depending upon the pandemic situation. This means that this course is **in-person** unless circumstances arise that require us to move to an online format. Should the instructor become ill or quarantined, it may be necessary to hold sessions in Zoom. If I need to be out for medical reasons, the lectures will be delivered asynchronously and over video recordings. I will maintain you fully updated if that is the case.

If you test positive or are asked to quarantine/isolate because of exposure to the virus, let me know as soon as possible by using the Notification of Absence module in Canvas. If you need to be out for medical reasons ask one of your peers to help you out with notes. Make sure to consult the handouts that will become available to you regularly during the semester. If

you study the handouts and read the book, you should be able to perform well during the semester in the case you are not able to attend classes due to an infection.

To maintain an inclusive and safe environment so that all members of this course may succeed, it is also expected that those in attendance follow health guidelines for everyone's safety. As biologists that are working to understand concepts of ecology, immunology, and disease spread, all students should wear masks while inside the classroom. ***There is currently a mandate to wear masks inside university buildings***. In the absence of a mandate, the use of masks will still be expected in my classroom. It is a sign of understanding biological principles, public health responsibilities, and looking out for your fellow students and their families that may not be able to be vaccinated yet.

If you need, please, check this document online:
"Checklist for Keeping Up in Class During Quarantine or Isolation"
https://www.clemson.edu/asc/documents/checklist-for-keeping-up-in-class-during-quarantine-or-isolation.pdf

The academic resources of Clemson University are provided for the intellectual growth and development of students. Class attendance is critical to the educational process; therefore, students should attend scheduled courses regularly if they are to attain their academic goals. In the event of an emergency, the student should make direct contact with the course instructor, preferably before a class or an exam takes place. Students should speak with their course instructors regarding any scheduled absence as soon as possible and develop a plan for any make-up work. It is the student's responsibility to secure documentation of emergencies, if required. A student with an excessive number of absences may be withdrawn at the discretion of the course instructor. Course instructors must implement fair grading procedures and provide an opportunity to make up missed assignments and examinations that does not unfairly penalize the student when an excused absence is accepted. Such make-up work shall be at the same level of difficulty with the missed assignment or examination. Course instructors shall hold all students with excused absences to the same standard for making up missed assignments or examinations. While course instructors should seek to make reasonable accommodation for a student involved in University-sponsored activities, students should understand that not every course can accommodate absences and that absences do not lessen the need to meet all course objectives.

Absence from class is detrimental to the learning process, so course instructors may use reasonable academic penalties which reflect the importance of work missed because of unexcused absences. Course instructors who penalize students for unexcused absences must specify attendance requirements as related to grading in the course syllabus and must keep accurate attendance records. Course instructors are obligated to honor exceptions to the university attendance policy for students covered by the Americans with Disabilities Act, as verified through paperwork issued by Student Disability Services.

Notification of Absence

The Notification of Absence module in Canvas allows students to quickly notify instructors (via an email) of an absence from class and provides for the following categories: court attendance, death of family member, illness, illness of family member, injury, military duty, religious observance, scheduled surgery, university function, unscheduled hospitalization, other anticipated absence, or other unanticipated absence. The

notification form requires a brief explanation, dates and times. Based on the dates and times indicated, instructors are automatically selected, but students may decide which instructors will receive the notification. This does not serve as an "excuse" from class, and students are encouraged to discuss the absence with their instructors, as the instructor is the only person who can excuse an absence. If a student is unable to report the absence electronically, he/she may call the Office of Advocacy and Success at 864-656-0935 for assistance and guidance.

The Office of Advocacy and Success also assists students in identifying various appropriate methods of documenting absences and assists families in using the electronic Notification of Absence system when students are unable to do so themselves.

Instructor Statement on Missing Class, Lab or Exams

The course lectures are designed and presented in classroom (or Zoom) using Microsoft PowerPoint. I will attempt to make each PowerPoint presentation available to you (as an outline file) the evening or night before a specific lecture topic is covered during class hours. This material will be posted in Canvas. Remember, you need a valid Clemson computer account to access all these materials. The different files I will be posting will be organized by topic. Also, the file names are listed on the lecture schedule above. Ideally, you do need to read the different book chapters before the lectures for optimal understanding and performance during the course. The outline file is useful as a guide during lectures. You do need to take additional in-class notes and read the different book chapters in Brusca & Brusca (2016) to enrich the outline file and understand the material/ information transmitted during lectures. Remember, you need to (1) attend lecture, (2) take notes, and (3) read the book, in order to do well on the lecture quizzes and exams.

Important: If you fail to participate in an activity (e.g., ICPA or exam) you will have a zero grade for that activity. If, for major reasons, you know that will be unable to attend a regularly scheduled class, exam or lab you need to contact the instructor in advance to make arrangements to take the exam early or attend another section of lab (please, see attendance policy above). In the case of an unplanned absence due to illness or death in the family, contact your instructor as soon as possible.

Important: The material presented in lecture most probably will go beyond what is presented in your textbook and lecture PowerPoint slides. The above explains why is important for you to attend lectures!. If you miss a lecture, I recommend seeking the notes of a classmate(s) and study with him/her(them) for exams.

Expectations

While on campus, face coverings are required in all buildings and classrooms. Face coverings might also be required in outdoor spaces where physical distance cannot be guaranteed. Please be familiar with the additional information on the Healthy Clemson website.

Please use appropriate online conduct to help maintain a safe learning environment. Participants should:
- Never transmit or promote content known to be illegal.
- Respect people's privacy as well as your own.
- Forgive other people's mistakes.
- Never use harassing, threatening, embarrassing, or abusive language or actions.

UNIVERSITY POLICIES

Instructor Statement on Accessibility /Accessibility Services

Clemson University values the diversity of our student body as a strength and a critical component of our dynamic community. Students with disabilities or temporary injuries/conditions may require accommodations due to barriers in the structure of facilities, course design, technology used for curricular purposes, or other campus resources. Students who experience a barrier to full access to this class should let the instructor know and make an appointment to meet with a staff member in Student Accessibility Services as soon as possible. You can make an appointment by calling 864-656-6848, by emailing studentaccess@lists.clemson.edu, or by visiting Suite 239 in the Academic Success Center building. Appointments are strongly encouraged – drop-ins will be seen if at all possible, but there could be a significant wait due to scheduled appointments. Students who have accommodations are strongly encouraged to request, obtain and send these to their instructors through their AIM portal as early in the

semester as possible so that accommodations can be made in a timely manner. It is the student's responsibility to follow this process each semester. You can access further information at the Student Accessibility website. Other information is at the university's Accessibility Portal.

Non-Discrimination / The Clemson University Title IX (Sexual Harassment) statement
Clemson University is committed to a policy of equal opportunity for all persons and does not discriminate on the basis of race, color, religion, sex, sexual orientation, gender, pregnancy, national origin, age, disability, veteran's status, genetic information or protected activity in employment, educational programs and activities, admissions and financial aid. This includes a prohibition against sexual harassment and sexual violence as mandated by Title IX of the Education Amendments of 1972.

This Title IX policy is located on the Campus Life website. Ms. Alesia Smith is the Clemson University Title IX Coordinator, and the Executive Director of Equity Compliance. Her office is located at 223 Brackett Hall, 864.656.0620.

Remember, email is not a fully secured method of communication and should not be used to discuss Title IX issues.

The University is committed to combating sexual discrimination including sexual harassment and sexual violence. As a result, you should know that University faculty and staff members who work directly with students are required to report any instances of sexual harassment and sexual violence, to the University's Title IX Coordinator. What this means is that as your professor, I am required to report any incidents of sexual harassment, sexual violence or misconduct, stalking, domestic and/or relationship violence that are directly reported to me, or of which I am somehow made aware.

There are two important exceptions to this requirement about which you should be aware:

• Confidential Resources and facilitators of sexual awareness programs such as "Take Back the Night and Aspire to be Well" when acting in those capacities, are not required to report incidents of sexual discrimination.

• Another important exception to the reporting requirement exists for academic work. Disclosures about sexual harassment, sexual violence, stalking, domestic and/or relationship violence that are shared as part of an academic project, a research project, classroom discussion, or course assignment, are not required to be disclosed to the University's Title IX Coordinator.

This policy is located at http://www.clemson.edu/campus-life/campus-services/access/title-ix/. Ms. Alesia Smith is the Executive Director for Equity Compliance and the Title IX Coordinator. Her office is located at 223 Holtzendorff Hall, phone number is 864.656.3181, and email address is alesias@clemson.edu.

**** COVID-19 Face Covering Expectation**
While on campus, face coverings are required in all buildings and classrooms. Face coverings might also be required in outdoor spaces where physical distance cannot be guaranteed. Please be familiar with the additional information on the Healthy Clemson website, such as the use of wipes for in-person classes

Student Safety
Clemson University is committed to providing a safe campus environment for students, faculty, staff, and visitors. As members of the community, we encourage you to take the following actions to be better prepared in case of an emergency:
a. Ensure you are signed up for emergency alerts (https://www.getrave.com/login/clemson),
b. Download the Rave Guardian app to your phone (https://www.clemson.edu/cusafety/cupd/rave-guardian/)
c. Learn what you can do to prepare yourself in the event of an active threat(http://www.clemson.edu/cusafety/EmergencyManagement/)

Academic Integrity

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As members of the Clemson University community, we have inherited Thomas Green Clemson's vision of this institution as a "high seminary of learning." Fundamental to this vision is a mutual commitment to truthfulness, honor, and responsibility, without which we cannot earn the trust and respect of others. Furthermore, we recognize that academic dishonesty detracts from the value of a Clemson degree. Therefore, we shall not tolerate lying, cheating, or stealing in any form. All infractions of academic dishonesty by undergraduates must be reported to Undergraduate Studies for resolution through that office. In cases of plagiarism instructors may use the Plagiarism Resolution Form. See the Undergraduate Academic Integrity Policy website for additional information and the current catalogue for the policy. For graduate students, see the current graduate student handbook for all policies.

Copyright Statement

Materials in some of the courses are copyrighted. They are intended for use only by students registered and enrolled in a particular course and only for instructional activities associated with and for the duration of the course.

Academic Continuity Plan for This Course

Clemson has developed an Academic Continuity Plan for academic operations. Should university administration officially determine that the physical classroom facility is not available to conduct classes, class will be conducted in a virtual (online) form. The university issues official disruption notifications through email, website, text notification and Social Media. When notified, use one of the following links to navigate to Clemson Canvas where you will find important information about how we will conduct class:
o Primary access link: http://www.clemson.edu/canvas
o Secondary access link, if needed: https://clemson.instructure.com/
o You can also use the Canvas Student App. Visit the downloads page for this app.
Course activities will occur through the Canvas course.

Animal Care and Use: Instructor Statement on the Use of Animals in Research and Teaching Laboratories

Failure to treat animals with proper consideration for their health, well being and comfort will not be tolerated. Students who are uncomfortable with the use of animals in lab are encouraged to discuss their concerns with their classmates, TAs and instructor. For more information regarding the proper and ethical use of animals in teaching and research please visit: http://www.clemson.edu/research/compliance/iacuc as well as the following sites: Ethologists for the Ethical Treatment of Animals (www.ethologicalethics.org/) and American Psychological Association (www.apa.org/science/anguide.html)

Helpful Resources

The Department of Biological Sciences is committed to providing a supportive learning environment for all students. If you are facing tough times, please utilize these resources. You may also reach out to me directly.

a. Financial Assistance: Clemson Student Financial Aid (http://www.clemson.edu/financial-aid/index.html), and Anderson Interfaith Ministries (https://www.aimcharity.org/)
b. Food Insecurity: Clemson Paw Pantry (http://facebook.com/CUpawpantry)
c. Textbook Assistance: Clemson Library FAQs (https://clemson.libanswers.com/faq/100017) and Clemson Bookstore Open Education Resources copies (https://clemson.bncollege.com/shop/clemson/page/find-oer)
d. General Resources: (https://www.clemson.edu/studentaffairs/advocacy-success/resources/index.html)
e. Multicultural Resources and Support: Gantt Multicultural Center (https://www.clemson.edu/centers-institutes/gantt/multicultural-programs)
f. LGBTQ Support: Gantt Multicultural Center –LGBTQ Programs (https://www.clemson.edu/centers-institutes/gantt/lgbtq-programs/resources.html)
g. Adjustment and Transition: Counseling and Psychological Services (https://www.clemson.edu/campus-life/student-health/caps) and Student Transitions and Family Programs (http://www.clemson.edu/studentaffairs/stfp/index.html)
h. Interpersonal Violence: Healthy Campus (https://www.clemson.edu/campus-life/healthy-

campus/interpersonal-violence/index.html)

i. Addiction and Recovery: SC: (https://www.daodas.sc.gov/), Web: (https://addictionresource.com/) and Vaping (https://vapingdaily.com/health/).

Emergency Procedures

Emergency procedures have been posted in all buildings and on all elevators. Students should be reminded to review these procedures for their own safety.

Copyright Statement

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General Education Competencies

This course has the ability to satisfy or contribute to the satisfaction of several General Education competencies. This course is designed to satisfy or contribute to the following competencies: 1. Natural Science, 2. Science, Technology, and Society, 3. Communication, 4. Critical Thinking Skills, and 5. Ethical Judgment. Please, consult the Undergraduate Catalog for a complete discussion of the nine competencies.