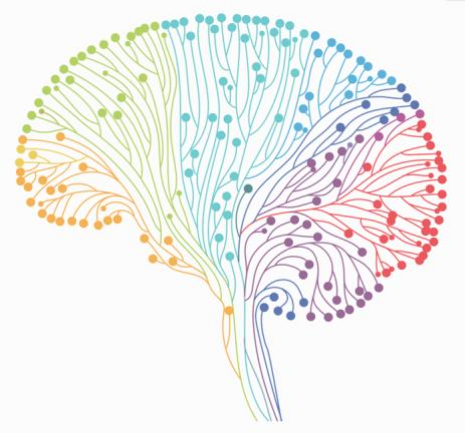
Neuroscience of Behavior/ Biopsychology



Lister Learning and Teaching Centre, 5.3
Monday - Thursday | 1005 - 1135 GMT + 1
Prerequisites: NEUR 2001 OR NEUR 2010, Principles of Neuroscience OR BIOL 1520/BIOS 1108/BIOS 1208, Intro to Organismal Biology AND PSYC 1101, General Psychology AND CHEM 1211K
Recommended Conceptual Knowledge:

- Neurochemical processes such as neurotransmission and neurohormones, homeostasis and behaviors that maintain life, motivated behaviors & emotion, learning & memory, and attention & higher cognition
- Genetic, neurodevelopmental, and neurochemical processes; brain regions and circuits

Recommended Skills:

- Applications of conceptual neuroscience knowledge
- Analysis of primary and review journal articles
- Knowledge and critique of experimental methods and statistical processes

INSTRUCTOR INFO

Professor: Mary Holder, PhD
How to contact me:
Email: mary.holder@psych.gatech.edu expect a response within 24 – 48 business hrs; please use NEUR 3003/PSYC 4020 in the subject line). Please do not use the Canvas email platform or Canvas messages.

Hours available for students: Tuesdays 0900 – 1000; Wednesday 1140 - 1300

I believe that every student can improve their skills, learn from their mistakes, and be successful in this course. Attending office hours is the best way to deepen your understanding of the material and is a great opportunity to improve your skills. I recommend that all students attend office hours, regardless of performance.

COURSE DESCRIPTION

How does our nervous system control our behavior?

Why do we make different decisions when faced with the same choices?

What happens when things go awry in the nervous system?

How can I apply neuroscience in my own life?

The nervous system receives information about the environment and coordinates the actions of an animal in response to this information, and as such, it controls everything we think, do, and feel. We will explore the neural underpinnings of complex behaviors such as the behaviors required to maintain life, emotions and motivated behaviors, memory and learned behaviors, and cognition and consciousness. We will also examine how cognition and behavior are influenced by factors such as age, sex, and trauma or pathology. In addition, we will discover the methods by which behavioral and cognitive neuroscientists examine the relevant neural functions.

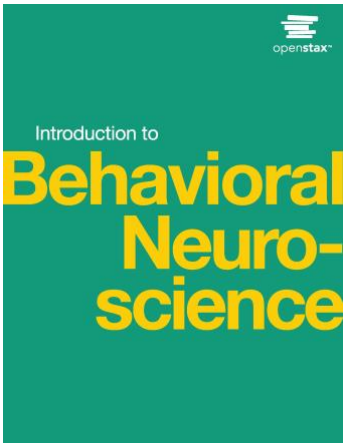
"Nothing in neurobiology makes sense except in the light of behavior." – Gorden Shepherd (1988), *Neurobiology* (2nd Ed), pp 6 – 7

The general goal of this course is to help you develop the ability to think like a behavioral and/or cognitive neuroscientist. To accomplish this goal, we will use pre-class readings, in-class learning activities (e.g., case studies, data analysis, discussions, and group work), and reflections. We will also on continuing to develop skills critical for success in neuroscience or any science course: reading graphs and figures, understanding scientific literature, and writing scientifically. By the end of this course, you should be able to identify an interesting scientific topic, describe and explain the current findings in that identified subfield, and critically evaluate the existing findings to identify future directions in this area of psychology and/or neuroscience.

COURSE MATERIALS AND RESOURCES

Required Readings

All the required pre-class readings will be posted on Perusall.



Recommended Supplemental Text

Introduction to Behavioral Neuroscience
Elizabeth D. Kirby et al. 2024
ISBN: 978-1-961584-57-0
Click here to access the open-source online text

Required Materials

Honorlock via Canvas. Exams are take-home, but they will be proctored remotely via Honorlock through Canvas.

Laptop computer that i) connects to university wifi ii) runs the quiz function found in Canvas and iii) has word processing capabilities (e.g., Microsoft Word, Google Docs, or some other word processing that can export as a pdf).

Cell phone or computer to run the Point Solutions app

All other materials (e.g., pre-class readings, in-class collaborative activities, additional materials, and all assignments) will be made available on Canvas. We will also use Perusall for the pre-class readings and Piazza for asking and answering questions.

Please note that all course materials are in the process of being updated for increased accessibility. Please do not hesitate to reach out to the instructional team if you have any issues with accessing course materials.

Please bring your laptop, phone, iPad, or other electronic devices to class as we will be using these devices during our learning activities and during the quizzes. Your device will need to support word processing (e.g., Word or Google doc exported as a pdf); this is necessary as there are writing assignments in this course. It is your responsibility that all work is readable by the instructor.

LEARNING OBJECTIVES

The ultimate goal of this course is for students to be able to **think like a behavioral and/or cognitive neuroscientist**; however other skills are necessary in order to achieve this goal. Therefore, this course has several related learning objectives. After successfully completing this course, students should be able to:

Identify in context**, describe,** and **explain** key concepts in behavioral and cognitive neuroscience (e.g., the foundations of behavioral and cognitive neuroscience; behaviors that maintain life; motivated behaviors & emotion; learning & memory; and attention & higher cognition)

Explain, **illustrate, and predict** how genetic, neurodevelopmental, and neurochemical processes; brain regions and circuits; and environment and experience affect cognition and behavior

Analyze and **interpret** behavioral and cognitive neuroscientific data and graphical representation of these data in context

Evaluate neuroscientific information and data in both popular media representations of neuroscience and in neuroscience research papers

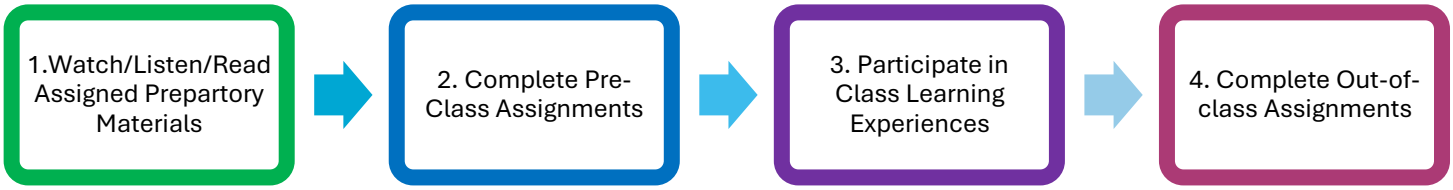
Effectively **communicate** neuroscience information using written text and graphical representations of neuroscientific concepts and data

Apply knowledge of cognitive and behavioral neuroscience concepts to explain their own experience.

COURSE FORMAT

This course will be delivered in an in-person manner. Our class meetings will revolve around learning activities such as case studies, figure interpretation, discussions, small-group work, and active demonstrations and experiments. The out of class work will be doing the required reading prior to class session and taking a short quiz, writing short reflections, working on two (2) communications assignments, and one (1) semester-long project. This class set-up is because studies have shown that student do not learn much in classes in which the instructor gives a series of lectures and students sit quietly, taking notes (Hake (1998) American Journal of Physics, Klymkowsky et al. (2003) Cell Biology Education).

What is your role as a student?

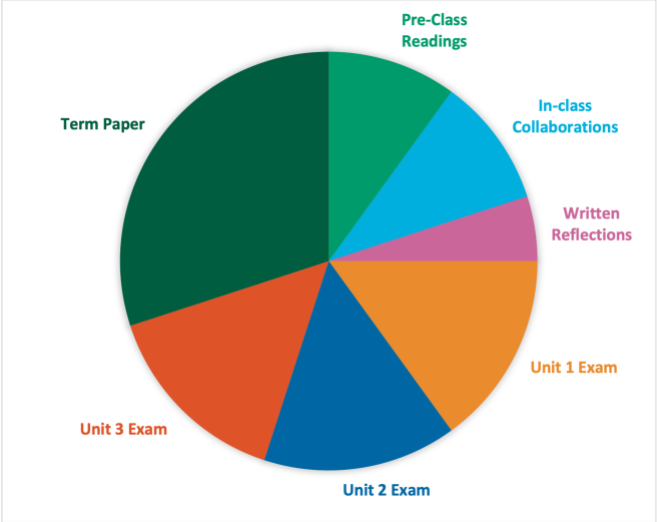


The flow chart summarizes your tasks and the order in which you should complete them for each topic area. Most importantly, you'll need to read assigned book pages or articles and complete any pre-class assignments before each class. You should take notes while engaging with these pre-class materials. During class, you can expect to build your understanding through activities and class discussion. This course format will ask you to develop skills in identifying what information you need and learning how to break down a problem into achievable parts.

ASSESSMENT OF YOUR LEARNING

You will be assessed by your performance on pre-class assessments; in-class collaborations or engagement assignments; a research term paper project; post-class reflections; and on three (3) exams. Please note there is no final exam for this course.

Assessment Type	Number of Assessments	Total Points
Pre-Class Readings	20*	100
In-class Collaborations	20*	100
Written Reflections	5	50
Unit 1 Exam	1	150
Unit 2 Exam	1	150
Unit 3 Exam	1	150
Term Paper	Multiple contributing assessments	300
	**only the top 20 will count*	**1000 points total**



Pre-class Reading Assignments: Before each class, you'll have a pre-class assignment, which will consist of reading a scholarly article. I can understand that reading and comprehending the scientific literature can be challenging, so we will be using Perusall via Canvas to read the articles. In Perusall, students will be able to engage with the article, each other, and me to make comments, ask and answer questions, etc. The pre-class reading will be scored by the engagement with the articles in Perusall. Please know that only the top twenty (20) scored Perusall assignments will be used to calculate your grade.

In-Class Collaboration (ICC): Active engagement and participation in the learning activities is critical for your success in this course. Therefore, you will be able to earn participation points based upon your active engagement in the learning opportunities.

In-class activities will be administered through Canvas or PointSolutions, and completion of these activities will determine your participation credit for the day. Please know that only the top 20 of these ICCs will be used to calculate your grade.

Written Reflections: Reflection on our learning is a significant part of making learning durable. There are multiple cognitive benefits for reflection including retrieval of recently learned information, connecting new knowledge to what you already know, and rephrasing key ideas in your own words. In addition, reflection can help regulate our own learning; therefore, there will be five (5) written reflection assignment on Canvas. Your response should be your original works and thoughts, in your own words. These reflections will be assessed according to the clarity of thought and language, the relevance to the student and the course learning goals, the analysis of how the student has gained some insight, and how this material may relate to other courses or past experiences. Further information is available on Canvas.

Exams: Exams will include multiple-choice, true-false, fill-in-the-blank, and free response questions. The exams will require you to use critical thought to analyze data. That is, exams assess your understanding of concepts and ability to explain and apply those concepts, rather than your ability to memorize facts.

Note that Take-Home exams will be available online and only available once. That means that once you open your exam, you will not be able to close your exam and open it again. I repeat, once you start your exam you MUST finish it in that sitting. Exams should take about seventy-five minutes. So, plan on taking your exam when you have that much time to sit and spend writing your exam.

Please note that take-home exams are considered open book and open note BUT NOT open friend or open internet; therefore, the exams will be proctored via Honorlock on Canvas. **Violations of the academic honor code include, but is not limited to, opening the exam and not finishing it in one sitting, discussing the exam with other students, as well as plagiarizing or copying and pasting from another student or use of a Generative AI assistant such as Co-Pilot, Claude, Gemini, or ChatGPT.** Should there be some catastrophic event (e.g., power outage, internet failure), you need to notify me as soon as possible.

Term Paper: The ultimate goal of this course is to help you develop the skills to be a cognitive or behavioral neuroscientist who extends the field. One key skill of a scientist is to be able to read, integrate, and apply information from the primary literature. In addition, a good scientist must know how to communicate information to a larger audience. This paper is an opportunity to learn more about a topic you find interesting. This paper could include material we discuss in class in further detail for your paper or you may choose a topic that is relevant to the course but not explicitly covered.

Science is not done in isolation. Scientists routinely share their written work with one another for the expressed purpose of getting feedback, so this term paper will be worked on in parts for feedback. The assessment criteria for each assignment are described in Canvas. In addition, a declaration of use of AI tools and technologies is expected in these submissions. **Generative AI tools are NOT allowed to be**

used in any peer review or in the writing of the initial draft or final draft of the term paper or in the creation of the oral presentation slides.

1. Plagiarism & Citation Quiz (4 pts)
2. Term Paper Topic (6 pts)
3. Literature Review Quiz (4 pts)
4. Annotated Bibliography (16 pts)
5. Paper Outline (30 pts)
6. Complete Submission (80 pts)
7. Peer Review (20 pts)
8. Complete Revision Submission, including response to reviewers (140 pts)

Science is not done in isolation. Scientists routinely share their written work with one another for the expressed purpose of getting feedback, so this term paper will be worked on in parts for feedback. The Plagiarism & Citation Quiz and Complete Revision Submission are evaluative assessment in that points will be assigned based upon the scoring scheme for the quiz or the rubric for the Complete Revision Submission. The other assignments (e.g., Annotated Bibliography; Paper Outline; Complete Initial Submission; and Peer Review) will be scored by completion. For the assignment to be considered to complete, evidence for all required elements must be present.

COURSE POLICIES

Georgia Tech Inclusive Values Statement

At Georgia Tech, we see different backgrounds and perspectives as essential to learning, discovery, and creation. We strive to remove barriers to student success, and to build a welcoming community where everyone has the opportunity to contribute to our mission. As outlined in our strategic plan, we want to create an environment of holistic learning where all individuals can grow and learn to lead healthy, purposeful, impactful lives.

We will work together to set classroom climate and norms on the first day of the course.

Grading

This course is graded on a point scale – you are not competing against anyone else for your grade. Your final grade will be assigned as a letter grade according to the following scale:

A: 900-1000 points
B: 800-899 points
C: 700-799 points
D: 600-699 points
F: fewer than 600 points

We highly recommend that you keep track your own scores. The grade estimates in Canvas are often inaccurate.

Grade Repair: Out of fairness, extra credit must be offered to all students and will not be offered on an individual basis. These grade repair options provide opportunities to add an extra 20 points to the overall final semester grade. Each of the options are worth 5 points each.

Course Surveys: If ≥ 80% of students do the mid-semester term course feedback and the final CIOS
Pre-and Post-Tests: Completing both the pre- and post-term quizzes

Grade Changes & Regrade: Grades are not negotiable commodities. However, mistakes can and do occur. If you feel an assignment or quiz has been incorrectly scored, notify your instructor by email as soon as possible. **Any requests for adjustment of grades must be submitted in writing within seven (7) days of the grade posting**. In all cases, the entire assignment will be re-evaluated and a final, revised grade (higher or lower) will be assigned, if warranted. In addition, the instructor reserves the right to re-evaluate and re-assess previous assignments, if warranted.

Final grades are determined based upon the criteria outlined above. Requests for grade rounding or exceptions are not considered in fairness to all students and to prevent conversations from running afoul of the Academic Honor Code. This type of request is asking your instructor to alter the academic grade or rating so as to obtain unearned academic credit, which is a violation of the Academic Honor Code.

The Honor Code states, "*Students are expected to act according to the highest ethical standards. The immediate objective of an Academic Honor Code is to prevent any Students from gaining an unfair advantage over other Students*".

Extensions, Late-Work, and Make-ups: No make-up exams will be administered nor will presentations be rescheduled unless you have documented reasons of illness, family emergency, or participation in approved Institute activities (such as field trips and athletic events, see the catalog for more information regarding exam policies). If you do need a make-up, you will need to make prior arrangements to take the exam earlier, unless there is a medical emergency which prevents the prior arrangements.

All late work will receive a 10% per day late penalty; however, you will be given one (1) "Phase Delay" late token. This late token will allow you to have an extra twenty-four hours (24 h) to complete one assignment without penalty. The use of the late token is not retroactive; that is, you need to tell us no later than **12hr in advance of the due date** when you are using this late token.

The late token cannot be used to extend the deadline for any in-class activity or the final, revised submission.

Submitted Work Policy: It is your responsibility to ensure that the instructional team (e.g., TAs and instructor) will be able to grade your work. This means that you need to check the formatting of your work after you submit it in Canvas, which you can do by clicking back into the assignment and downloading your file. If your work is blank, the document converted your text into symbols, the file format is corrupted, etc., that work cannot be assessed and will be scored as a zero (0). Instructors will not click links to access files. Assignments submitted as links will be scored as a zero (0). Subsequent submissions will be subject to the above-stated late penalty.

Academic Integrity: Georgia Tech seeks to cultivate a community based on trust, academic integrity, and honor. This Honor Code helps maintain an optimal learning environment that foster academic and scholastic integrity. These include respecting the intellectual property of others, submitting your own individual work unless otherwise allowed by an instructor, and protecting your own academic work from

misuse by others. All students are assumed to have read the GT Academic Honor Code and consented to be bound by it.

This Academic Honor Code prevents any students from gaining an unfair advantage through academic misconduct while supporting your ability to develop your own cognitive skills. For this class, specific examples of academic misconduct and dishonesty include:

- Plagiarism: the unattributed use of words and/or ideas of another person. Examples include but are not limited to: words written by another person (including yourself for a previous class) or lifted from the internet with and without proper citation; ideas taken from another person without proper citation. If there is work that you have submitted or plan on submitting for another course that is relevant to the assignment in this course, please reach out to discuss an appropriate approach in this situation.
- Unauthorized collaboration: working with someone else, including AI agents on graded work (e.g., assignments, quizzes, or presentations) without explicit permission from the instructor
- Use of unauthorized aids (including, but not limited to, online 'homework' help sites) during quizzes.
- Not submitting the exams prior to leaving the classroom and continuing to edit your responses.
- Unauthorized use of generative AI in which students copy and paste from the AI-based assistance on graded work (see Policy on Use of Generative AI below).

In short, produce your own work unless you are told otherwise. You are more than welcome to use your notes and work with others for pretty much every aspect of the course except the exams; you just need to make sure that the assignments and writing you submit are ultimately your own. One way to help protect yourself is to use a platform that shows your version history or keep your written notes, outlines, etc. throughout the term to show to develop of your thinking towards the creation of the submitted assignment

Any student suspected of cheating or plagiarizing on a quiz, exam, or assignment will be reported to the Office of Student Integrity, who will investigate the incident and identify the appropriate penalty for violations.

Policy on Use of Generative AI for class work:

In this class we treat AI-based assistance, such as ChatGPT and Copilot, the same way we treat collaboration with other people: for individual assignments, you are welcome to talk about your ideas and work with other people, both inside and outside the class, as well as with AI-based assistants. Please be aware that everything that you give to the AI model becomes data that is used to train the model. **Do not** upload anything generated by your instructors or your classmate (including but not limited to slides, assignments, or rubrics) to a generative AI model as that would constitute theft of intellectual property.

However, all work you submit must be your own. You should never include in your assignment anything that was not written directly by you without proper citation (including quotation marks and in-line citation for direct quotes); APA does have guidance for how to cite the use of AI tools for the cases in which you are permitted to use these AI tools.

Including anything you did not write in your assignment without proper citation will be treated as an academic misconduct case. If you are unsure where the line is between collaborating with AI and copying AI, we recommend the following heuristics:

Heuristic 1: Never hit "Copy" within your conversation with an AI assistant. You can copy your own work into your own conversation, but do not copy anything from the conversation back into your assignment.

Instead, use your interaction with the AI assistant as a learning experience, then let your assignment reflect your improved understanding.

Heuristic 2: Do not have your assignment and the AI agent open at the same time. Similar to the above, use your conversation with the AI as a learning experience, then close the interaction down, open your assignment, and let your assignment reflect your revised knowledge.

This heuristic includes avoiding using AI directly integrated into your composition environment: just as you should not let a classmate write content or code directly into your submission, so also you should avoid using tools that directly add content to your submission.

Deviating from these heuristics does not automatically qualify as academic misconduct; however, following these heuristics essentially guarantees your collaboration will not cross the line into misconduct.

Institute Approved Absences (including accommodations for religious observances): Any letter for Institute approved absences (e.g., conference presentations, athletic events or competitions, religious absences, and/or health emergencies) should be given to the instructor as soon as possible. If you are requesting an absence due to religious observations, those could be made informally with the instructor or via the request form submitted to the registrar. These religious absences should be requested within the first two weeks of the semester. Please see the registrar's page for more information about approved absences.

Learning Accommodations: I have designed this course with principles of Universal Design for Learning in mind to try to make this course accessible for all. Some specific aspects of the accessible design already incorporated include: i) the use of live captioning during the lecture (please note, that this live captioning is not always accurate, especially with respect to scientific terms), ii) use of microphone during lecture (if possible), and iii) use of a color scheme that should allow for contrasts in individuals with colorblindness. The course instructor is in process of updating all instructional materials posted on Canvas to the Web Content Accessibility Guidelines (WCAG) Version 2.1, Level AA technical standards such that materials are Perceivable (e.g., use of alt text for image, captions), Operable (e.g., keyboard navigable, Understandable (e.g., with clear language and consistent formatting), and Robust (e.g., compatible with assistive technology such as screen readers).

If there are aspects of the instruction or design of this course that result in barriers to your inclusion or accurate assessment of achievement, please notify me as soon as possible so we can resolve the issue. Students with disabilities should also contact the Office of Disability Services (ODS), whose purpose is to collaborate with students, faculty, and staff to create a campus environment that ensures all students have an equal opportunity to access the Georgia Tech community. ODS can be reached at 404.894.2563, dsinfo@gatech.edu, or https://disabilityservices.gatech.edu. Please contact us ahead of time to discuss any issues related to disabilities. We are happy to work with you.

Mobile Technology Usage: As research on learning shows, unexpected noises and movement automatically divert and capture people's attention, which means everyone's learning experience is affected if a cell phone, pager, laptop, etc. makes noise or is visually distracting during class. In addition, the literature also demonstrates that students recall information better if they take notes by hand. Therefore, it is highly encouraged that you put your electronic devices away and take your notes using pen and paper.

That said, there will be times in which you will need your electronic device to answer poll questions, participate in the in-class learning activities, or conduct some research on the internet, so please bring your laptop, phone, iPad, or other electronic devices to class. We will let you know when we will be using the devices and provide sufficient time for you to get started.

Modified Campus Operations / Digital Learning Days:

In the event of incremental weather or other reasons for campus shutdown students should expect to move to a virtual class session (using the instructor's zoom link found above) at the regularly scheduled class time, unless otherwise specified via Canvas Announcement. Depending on the day(s) that campus is closed we may choose to hold class via zoom, assign an alternative assignment for students to work on (replacing an in-class activity), or give students free time to work on their term projects. In the unlikely event that an exam/quiz is scheduled for that time/day then we will move it to the next in-person class.

Email Policy:

Please email using my direct gatech email address on all matters. You should expect a response within 24 – 48 business hrs. In general, this means 8am - 5 pm Monday through Friday as I do not always check my emails during the weekend. The exception is during the Take-Home Exam periods. I will check my email during that period to monitor for any technological challenges.

Recordings of Class Sessions and Required Permissions:

Classes may **not** be recorded by students without the express consent of the instructor unless it is pursuant to an accommodation granted by the Office of Disability services. Class recordings, lectures, presentations, and other materials posted on Canvas are for the sole purpose of educating the students currently enrolled in the course.

Students may not record or share materials or recordings, including screen capturing or automated bots, unless the instructor gives explicit permission.

TOLERANCE, COMPASSION AND ASSUMING THE BEST

I have worked hard to be transparent as to why I have created the assessments, what the expectations and criteria for success are, and when they are due, but I'm sure I'll make some mistakes along the way. I'm also sure that we will have issues with Canvas throughout the course, such as when it doesn't factor any manually scored items into the grades – or when there are issues arising from the time zone. In addition, we will not always have the same infrastructure as a course housed in the Atlanta campus.

I'm also sure we will be a community of learners, growing along the way. When there are bumps in the road, our tolerance, compassion, and assuming the best of each other will help us handle this with grace and humor.

ON ACADEMIC & PERSONAL SUPPORT

Even though we are abroad, all Georgia Tech student resources are available to you. Please see the Canvas module for up-to-date information

Non-Discrimination: The Georgia Institute of Technology is committed to equal opportunity, a culture of inclusion, and an environment free from discrimination and harassment in its educational programs and employment.

COURSE SCHEDULE

Please see the detailed course calendar in Canvas for further details on what you can expect during each scheduled class session in addition to the due dates for all of your assignments. If there are changes, I will update our schedule on Canvas.