**BIO/PSY 350**

**CELLULAR NEUROSCIENCE**

**BSC 209 West**

**Every Tuesday & Every Thursday**

**10:00 AM -11:15**

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\*\*Read each part of this syllabus to understand the expectations for this class. If you email your professor with a question that is covered in this syllabus, you will be asked to find the answer in the syllabus. Mark your Calendar with important dates.

\*\*Professors take time and care to include information they find important in the syllabus. Understanding what your professor thinks is important is one of the keys to success in any class

**SYLLABUS OUTLINE:**

1. Course Overview
2. Course and Skill Objectives (what you gain from the course)
3. Grade Breakdown
4. Course Overview
	1. Reading
	2. Lectures
	3. Concept Maps
	4. Oral Exams
	5. Article presentation
	6. the Final Project and Outline
5. Academic Honesty
6. Class Management

**1. COURSE OVERVIEW:**

This course examines foundational principles in cellular neuroscience. This includes the electrophysiological nature of neuronal cells, their structure and function, and the various extracellular and intracellular messages used to communicate in the nervous system.

**Required Text**

1. Medical Neurobiology. Peggy Mason 2nd Edition. Oxford University Press
2. Neuroscience Basics. Larimore. 1st Edition. Academic Press

**Course Materials**

* **Posted to Canvas**: PowerPoints PDF files, Unit HW files, and assigned scientific papers
* **Canvas discussion board:** use this to crowdsource explanations to specific questions
* **Canvas syllabus tab** lets you see this syllabus and the schedule for this course.
* **Google Drive folder for this class**: MP3s for the lectures are in the Google Drive - you must be using an Agnes Scott email address.
* **Course Calendar in Canvas** and share it with your Google Calendar <https://community.canvaslms.com/t5/Student-Guide/How-do-I-subscribe-to-the-Calendar-feed-using-Google-Calendar-as/ta-p/535>
* **Must have access to a computer or tablet**. If you need help with this, visit ITS.
* **Cell phones should NEVER be visible/used during class time** and can result in tardiness (see rubric below).
* **Email/Canvas:** Instructors will make announcements regularly via email. It is your responsibility to check your Agnes Scott email AND Canvas page daily. When responding to a professor via email, take care that your email is professional AND that you identify what class you are in.
* Please come see your instructor early in the semester if you are struggling.

**Course Expectations:**

Based on assignments for both lecture and lab, **you will spend 8-10 hours studying for this class (approximately 1 hour a day)** outside of class time.

This class will require about 3 hours for article reading each week, about 2 hours for textbook reading each week, about 2 hours for concept maps, and about 1 hour for project work and presentation work each week.

If you are in 4 classes, and each class requires 10 hours outside of class, that is 40 hours a week, or the equivalent of a full-time job.This course will **require your active, regular participation in lecture times**.

**Purpose and Plan:**

What purpose does this class serve for you? What are your personal goals for this class? What will it take to achieve these goals? The work will get hard and you will need to remind yourself what you are aiming for at the end of the semester.

**2. COURSE OBJECTIVES AND SKILL OBJECTIVES**

Upon successful completion of this course, the student will achieve the following objectives:

* Demonstrate knowledge of the structure and function of the different types of cells in the nervous system
* Demonstrate understanding of the electrophysiological nature of neurons.
* Design an experiment, analyze the results, draw conclusions, and report on the research both with scientific writing and an oral presentation.
* Critically read and evaluate primary scientific literature.
* Utilize effective teamwork to problem solve in an inquiry-based research laboratory project.

Scientific/Career Skills Gained::

Skills you will gain from this course that advance your development as a scientist (and you SHOULD add CV and personal statements). When professors have to submit letters of recommendation, we are also asked to rate students on each of the following.

As such, you should ALWAYS provide evidence (do not simply state you have these skills) that you have mastered these skills from this class and other classes.

1. Critical thinking/Problem Solving – through weekly article analysis, students will be able to critically read and evaluate scientific literature. Through designing experiments and inquiry-driven laboratory experiences, students will sharpen their ability to think critically about neuroscience. These are assignments you can discuss in your personal statement as examples of your ability to solve problems.
2. Oral Communication – through article presentations, students will demonstrate their abilities to present scientific findings to a broad audience – again, assignments that serves as evidence that you can communicate science effectively.
3. Written Communication – through weekly assignments and the final project, students will demonstrate their ability to write scientifically - audience – again, assignments that serves as evidence that you can communicate science effectively.
4. Teamwork/Collaboration – working with a lab team as well as a team for presentations will enable the students to practice real-world teamwork and leadership competencies that are taught as a part of SUMMIT. Whatever your career is in the future, you will be part of a team.
5. Research Skills – as a result of this course, students can design an experiment, analyze the results, draw conclusions, and report on the research both with scientific writing and an oral presentation. The laboratory portion of this course is designed to enhance the learning in the lecture as well as progress the career of each student as a scientist. This experience is huge and sets you apart from a lot of other students. You need to capture this experience as its own paragraph in your personal statement.

**3. GRADING AND DEADLINES**

Deadlines: It is your responsibility to keep up with the class material. Thus, if you miss class, it is up to you to find out from a reliable source if you missed an assignment. If a missed class cannot be avoided because of illness or emergency, it is STRONGLY recommended that you contact the instructor IN ADVANCE, or within 24 hours of the class period. The professors will not accept late work without approval PRIOR to the deadline.

**Grading:** The final grade for this course will be based on the following:

| **LECTURE GRADE:** |  |
| --- | --- |
| Exams | 100 points (50 points each x 2 tests) |
| Outline for Final Project | 20 points |
| Class Final Project Draft | 30 points  |
| Class Final Project | 100 points |
| Article Presentations | 20 points |
| Lecture Concept Maps | 220 points (20 points each x 11) |
| Attendance Policy | 60 points |

\*Additional points or assignments may be added by the instructors

*The following grading scale will apply for converting numerical grades into final letter grades:*

*93 to 100: A, 90 to 92.9: A-, 87 to 89.9: B+, 83 to 86.9: B, 80 to 82.9: B-, 77 to 79.9: C+, 73 to 76.9: C, 70 to 72.9: C-, 67 to 69.9: D+, 63 to 66.9: D, 60 to 62.9: D-, Lower than 60: F*

**4. COURSE OVERVIEW:**

**a. Reading:**

There will be chapter reading and an article assigned for each topic. READ the chapter and take notes on the chapter BEFORE the lecture on that chapter. A peer-reviewed article from primary literature will be assigned every week (see Canvas for articles) and that article will be discussed during a student presentation.

**b. Lectures:**

Open the lecture file BEFORE class and create an outline for note taking before coming to class. Add notes from the chapter. Take notes during lectures. You will receive 1 grade (60 points) for the entire semester for your attendance, participation, and quality of participation in class. See the rubric below, which will evaluate your entire semester.

|  | **Excellent****20** | **Good Work****15** | **Fair****10** | **Below Average****5** | **Poor****0** |
| --- | --- | --- | --- | --- | --- |
| **Semester Attendance** | Attended all sessions or received approval for necessary absences | 2 unexcused absences | 3 unexcused absences | 4 unexcused absences | 5 or more unexcused absences |
| **Semester Tardies** | Was on time and did not leave early for all sessions and/or received approval for necessary altered hours | 1 unexcused tardy (came more than 5 minutes late or left more than 5 minutes early, or was on a website/app that did not contribute to class) | 2 unexcused tardy (came more than 5 minutes late or left more than 5 minutes early, or was on a website/app that did not contribute to class) | 3 unexcused tardy (came more than 5 minutes late or left more than 5 minutes early, or was on a website/app that did not contribute to class) | 4 or more unexcused tardy (came more than 5 minutes late or left more than 5 minutes early, or was on a website/app that did not contribute to class) |
| **Semester evaluation of student’s contribution to class discussions** | Engaged in the conversation.Comments were almost always insightful and constructive. Comments were almost always balanced, using scientific terminology and showed critical analysis skills | Mostly engaged in the conversation.Comments were mostly insightful and constructive. Comments were mostly balanced, using scientific terminology and showed critical analysis skills. Occasionally comments were too general or not relevant. | Partially engaged in the conversation.Comments were sometimes insightful. Comments were sometimes balanced, using scientific terminology and showed critical analysis skills. Often comments were too general or not relevant. | Often inattentive in class.Comments were infrequent and the student appeared inattentive. | Not engaged with the conversation - to others or make insightful comments. |

**c. Lecture Concept Maps:**

This semester, for each lecture, you will construct a concept map that illustrates the major properties, functions and examples of each topic.

Concept maps for this course will include

1. the lecture material - include 10 - 20 points of information from the lecture that are NECESSARY for understanding the lecture topic. Include a minimum of 1- 2 figures or images or sketches.
2. the assigned reading - in a different color than the lecture material, include 10 - 20 points of information from the assigned chapter reading that are NECESSARY to understanding the lecture topic.Include a minimum of 1- 2 figures or images or sketches.
3. the assigned article for that topic. - in a different color than the lecture material and the assigned reading material - include 5 points from the background section and 5 points from the conclusion. Put 1 figure in the concept map - explain the key takeaway from that figure and why that figure is important to the paper.

Each of these 3 sections needs to be color coded. There should be a legend on the concept map indicating what color represents which material. See the schedule on Canvas to ensure you have ALL the assigned readings for a topic. Concept maps function as review questions for each chapter and can assist you in learning the information covered in the lecture. Due date time is on Canvas. Examples are on Canvas.

You can use your book and other resources to create a comprehensive graphic that contains details and sketches, just cite your sources. There are many websites that allow you to create concept maps, including Google Docs limitless page!

| **Concept Map Grading Rubric** | **5** | **4 - 3** | **2.9 - 2** | **1.9 - 1** |
| --- | --- | --- | --- | --- |
| **Material from the Textbook in their own color** | Topic has 10-20 accurate details which include examples, definitions, and locations or functions, subtopics are included, includes 1-2 sketches/images per topic | Topic has 5-9 details which include examples, definitions, and locations or functions, subtopics are included. May include minor errors with details. Includes at least 1 sketch. | Topic has at least 4 details which include examples, definitions, and locations or functions, subtopics are included, some errors in details, sketches not included | Fewer than four accurate details, major errors in details and examples.  |
| **Material from the Article presentation in their own color** | Topic has 10-20 accurate details which include examples, definitions, and locations or functions, subtopics are included, includes 1-2 sketches/images per topic | Topic has 5-9 details which include examples, definitions, and locations or functions, subtopics are included. May include minor errors with details. Includes at least 1 sketch. | Topic has at least 4 details which include examples, definitions, and locations or functions, subtopics are included, some errors in details, sketches not included | Fewer than four accurate details, major errors in details and examples.  |
| **Material from lecture in their own color** | Topic has 10-20 accurate details which include examples, definitions, and locations or functions, subtopics are included, includes 1-2 sketches/images per topic | Topic has 5-9 details which include examples, definitions, and locations or functions, subtopics are included. May include minor errors with details. Includes at least 1 sketch. | Topic has at least 4 details which include examples, definitions, and locations or functions, subtopics are included, some errors in details, sketches not included | Fewer than four accurate details, major errors in details and examples.  |
| **Overall Organization** | Graphic organizer is a map (not a list or outline), individual details are short phrases and are linked to other details. Map uses color or shapes to make it easy for the reader to follow.  | Graphics are mostly mapped, though some details are listed and not linked to other details. Somewhat difficult to follow, or minor problems with organization.  | Graphics are not well mapped, created as lists or as paragraphs, details are not linked, but may be included otherwise, somewhat difficult to read or follow. | The Graphics are poorly organized, difficult to follow, lacking links or clarity.  |

**d. Exams (see schedule for tentative dates):**

There will be 2 exams during the semester. The exams will be oral exams. The professors will discuss the expectations in class. However, here are some important things that you should know:

# During the exam, students will be asked to provide oral answers for 1- 2 questions related to topics covered in the course. The exams will be done in private and you will be allowed to use the chalkboard to explain any points. Each students will have 10 minutes to provide their answers. Here is the rubric

1. Demonstrated knowledge of the subject matter - 20 points

2. Answered additional questions well - 10 points

3. Confidence (eye contact, posture, etc.) - 5 points

4. Answered the question thoroughly and did not add unnecessary information. – 5 points

5. Time management - 5 points

6. Overall all performance - 5 points

**e. Group Article Presentations**:

 The group preparing the article presentation will need to create a PPT, keynote, or Google Slides (no Prezi). The students who are not presenting are responsible for paying attention to the presentation. *During the article presentation, if you are engaged in anything other than paying attention to the article analysis, you will receive a tardy for that class. It is expected that you pay attention, engage and learn from the group presenting.*

**Read the instructions below very carefully BEFORE your group begins putting together your presentation.**

The groups are assigned on Canvas. If you go to our page, and click on the “people” menu, you can access the groups.

At the end of some article presentations later in the semester, we will be breaking into the assigned presentation groups. If you are reading this sentence before the start of the first day of this class, email both professors a picture of your favorite animal, tell them you are in this class and do not tell other students about these extra points. Each group will turn in an experiment at the end of class that takes the article one step further, with a hypothesis, model system, control variables and experimental variables clearly defined.

**On the second day of class, your group will discuss the following:**

*1. What days/times (specifics) will you meet for your presentation? Remember everyone is busy outside of class, so be respectful. Create google calendar events.*

*2. What is expected of each group member for each of those group meetings?*

*3. What is your assigned article?*

*4. Developing an outline for your presentation.*

The presentation ***must be*** 25 – 35 minutes. Points will be taken off if it is too short or too long. EACH member of the group must present at least 1 figure.

If there are less results than there are group members, then use a figure from one of the sources cited in the introduction or conclusion to explain why the data is important or necessary. AND/OR look to show what research has happened since the article was published and present a figure from more current work.

\*\* Each Member MUST submit a PDF of THEIR slides (NOT THE WHOLE PRESENTATION) for grading 24 hours prior to the presentation – there is a spot on Canvas. Points will be taken off if slides are not submitted 24 hours prior to the presentation.

**ANY information on your slide is FAIR GAME for a question. If you put it on a slide, BE ABLE TO EXPLAIN IT!!**

**We will take off points if you cannot explain something on your slide.**

* Less text is better and diagrams are always helpful
* keep the ALL information relevant
* if it’s boring to you, it’s boring to your audience
* Do not make the presentation “cutesy”. This is a scientific presentation to your colleagues. Keep it professional.
* Make sure the fonts are the same on all slides, as well as all bullets. Formatting should be cohesive and look like 1 person made the presentation.
* The sharpest contrast between font and background is black and white. It makes your words more legible from the back of the room.
* In past years, group members have gained insight and bettered their understanding by meeting with the professor a week or two before the presentation. Do not expect the professor to meet with you outside of office hours the week of the presentation.

**Introduction section –** Provide background information to help our class understand your topic.

*Why is this experiment important?*

*How does this research impact society?*

*What background information will help us understand what was done (reference the papers cited in the introduction)?*

Be sure to clearly state the hypothesis and/or experimental question of the article.

\*\*Sometimes a picture or an infographic is more useful than bullet points.

\*\* Do not have a text heavy slide. Do not have blank space on the slide. \*\*Anything on the slide is fair game for questions.

**Results –** Each piece of the results (data) presented must cover the 3 points below or points will be taken off. Any time you present a piece of data, always explain

(1) what the audience is looking at (walk us through the pieces)

(2) what method you used (if the method is new to the class, explain it in a clear way, potentially using videos or graphics), and

(3) what the data mean (your interpretation) and why they are important.

Be sure to include a figure legend and a descriptive figure title for each.

\*\* Do not label figure/results slides with the title as “Figure 1”. Gives us a more descriptive title like “Does sleep quality impact learning and memory?”.

**Conclusions –** Include simple statements to describe the key takeaway points from the experiments and their importance in the field of study. This is a summary of the results section, but it is necessary to remind everyone.

*How did the study contribute to the hypothesis?*

*How does this data impact society?*

Remind the audience why this research was important to the field of study.

**Feedback from the professors after the presentation in front of the class**

The professors will **heavily** critique each presentation. This is done with all the respect of an individual presenting and for the benefit of the individual. While the professor’s critique in this manner may come across as harsh, this is not the intention and should not be taken personally, as our critique does not reflect our opinion of you. This may be the first time many are presenting scientific data, and we are fully aware and respect that. Our critical analysis is meant to aid an individual in becoming the best scientist they can. They are hard critiques that put a student on the spot and may point out a lack of preparation or a lack of understanding.

The feedback given in this assignment is done in a professional manner. We ask questions about the project, not a personal assessment. Meeting with the professor before and following through with advice and feedback is the easiest way to prepare for the presentations.

|  | **5 points EXCELLENT** | **4 points** **GOOD** | **3 points MOSTLY GOOD** | **2 points** **FAIR** | **1 point** **NEEDS WORK** | **0 points** **POOR** |
| --- | --- | --- | --- | --- | --- | --- |
| **The material/the content is organized.** | • Clear title • Clearly defined sections • Clear flow of topics • Easy to follow • eye-catching • Diagrams clearly labeled • Good balance of text and graphs or pictures • Engaging use of color | • Clear title • Sections defined • Generally easy to follow, though may require rereading for clarity • Neat • Some use of color • Diagrams present • Fair balance of text and graphs or pictures | • Title present • Sections unclear or inappropriate • Takes effort to follow thoughts and ideas • Bland • Little or no color • Diagrams absent or unclear • Mainly or all text | • Sections unclear or inappropriate • Takes too much effort to follow thoughts and ideas • Boring • Little or no color • Diagrams absent or wrong • Mainly or all text | • Title unclear or absent • Sections unclear or absent • No flow of ideas • Cluttered, messy • Bland • Boring • No variety in layout • Diagrams absent • Majority is text | No Marks |
| **Science Content** | • contains all the necessary information to understand the project • Information is explained in a very understandable fashion • No excess information that is distracting • All abbreviations are defined | • contains most of the information necessary to understand the project • Information is explained in a pretty understandable fashion • The majority of the information is not distracting • Most abbreviations are defined | • contains some of the information necessary to understand the project • Information is poorly explained • Excess information is distracting • Some abbreviations are defined | • Information is poorly explained • Excess information is distracting • Some abbreviations are defined | • contains little to no information necessary to understand the project • Information is not explained • Excess information is distracting • abbreviations are not defined | No Marks |
| **Oral Presentation** | • Well-rehearsed without long pauses • clear articulation • appropriate eye contact, voice volume | Well-rehearsed with some pauses • Articulation, eye contact, voice volume generally adequate | •Decent-rehearsal • Lacking in one of areas: articulation, eye contact, voice volume | • Obvious lack of rehearsal • Lacking in one of areas: articulation, eye contact, voice volume | • Obvious lack of rehearsal • lack of conveyed information • lacking in one or more of the following areas: articulation, eye contact, voice volume | No Marks |
| **Ability to Answer Questions** | Answers questions asked by audience in a clear manner that demonstrates knowledge of the topic | Answers questions asked by audience in a clear manner that demonstrates some knowledge of the topic | Answers questions asked by audience in a manner that demonstrates a bit of knowledge of the topic | Answers questions asked by audience in a manner that demonstrates little knowledge of the topic | Answers questions asked by audience in a clear manner that demonstrates no knowledge of the topic | No Marks |

**f. Class Final Project:**

For the final in this class, you will be completing a Project that integrates the information you have learned in this class under a Neuroscience theme. **The goal of this project is to be able to make connections between the major concepts from these courses.**

* The professors will assign the themes of this final project. The themes are assigned below, but the assignment of each student per theme will be on Canvas on the discussion board or the announcement section.
* Each topic/section should be fully explained as to how it relates to your theme.
* Be sure to properly cite any literature used to construct your document in the formatting style for review Projects in the Journal of Neuroscience. References should be listed in the script, not on the slides
* Three files will be submitted:
	+ A PDF document (no other file type accepted) of the SCRIPT of your presentation - what you say during the presentation AND the sources cited/used in the presentation
	+ A PDF document (no other file type accepted) of the slides of your presentation
	+ A singular MOV or MP4 file (no other file type accepted) of you presenting your slides. Your slides should be visible on the screen as you present them. (An easy way to do this is to record your presentation in PPT or in Zoom).
* For citations - only review articles and primary literature.
* The Final Project will include 12 slides:
	+ 1 slide Introduction
	+ 2 slides Genetics and Mutations
	+ 2 slides Subcellular Organelles
	+ 2 slides AP and Ion Channels
	+ 2 slides Neurotransmitters and Release
	+ 2 slides Current advancements
	+ 1 slide Conclusion

The link below is not intended to be a source, but an introduction into the disease theme you are being assigned. It is to ensure that you are clear on what disorder we are referring to.

Themes:

1. Obsessive Compulsive Disorder - Jamiaya White - <https://www.mayoclinic.org/diseases-conditions/obsessive-compulsive-disorder/symptoms-causes/syc-20354432>
2. Major Depressive Disorder - Amirah Tolbert - <https://www.mayoclinic.org/diseases-conditions/depression/symptoms-causes/syc-20356007>
3. Trisomy 21 - Colleen Thorson - <https://www.cdc.gov/ncbddd/birthdefects/surveillancemanual/quick-reference-handbook/trisomy-21-down-syndrome.html>
4. Alzheimer’s Disease -Kilee Thomas - <https://www.alz.org/alzheimers-dementia/what-is-alzheimers>
5. Parkinson’s Disease - Jade Thigpen - <https://www.parkinson.org/>
6. Asperger’s Disease - Nadia Small - <https://www.webmd.com/brain/autism/mental-health-aspergers-syndrome>
7. Rett Syndrome - Amani Singleton - <https://www.rettsyndrome.org/>
8. Amyotrophic lateral sclerosis -Lizzy Singh - <https://www.als.org/understanding-als/what-is-als>
9. Multiple Sclerosis - Ellen Poulter - <https://www.mayoclinic.org/diseases-conditions/multiple-sclerosis/symptoms-causes/syc-20350269#:~:text=Multiple%20sclerosis%20(MS)%20is%20a,the%20rest%20of%20your%20body.>
10. Dravet Syndrome - Grace Phillips - <https://www.chop.edu/conditions-diseases/dravet-syndrome#:~:text=is%20Dravet%20syndrome%3F-,What%20is%20Dravet%20syndrome%3F,and%20differences%20in%20childhood%20development.>
11. Schizophrenia - Danni Nguyen - <https://www.mayoclinic.org/diseases-conditions/schizophrenia/symptoms-causes/syc-20354443>
12. Fragile X Syndrome - El Melter - <https://www.cdc.gov/ncbddd/fxs/index.html>
13. Bell’s Palsy - Lila McMaster- <https://www.mayoclinic.org/diseases-conditions/bells-palsy/symptoms-causes/syc-20370028>
14. Myasthenia Gravis - Ashley Mabrey - <https://www.mayoclinic.org/diseases-conditions/myasthenia-gravis/symptoms-causes/syc-20352036>
15. Migraines - Anjali Kunnatha - <https://www.mayoclinic.org/diseases-conditions/migraine-headache/symptoms-causes/syc-20360201#:~:text=The%20most%20common%20symptom%20of,from%20one%20person%20to%20another.>
16. Frontotemporal Dementia (not Alzheimer’s) - Rosybel Hernandez Perez <https://www.mayoclinic.org/diseases-conditions/dementia/symptoms-causes/syc-20352013>
17. ADHD - Sophie Gregoretti - <https://www.cdc.gov/ncbddd/adhd/facts.html>
18. Bipolar Disorder - Isis Franklin- <https://www.mayoclinic.org/diseases-conditions/bipolar-disorder/symptoms-causes/syc-20355955>
19. Glioblastoma Multiforme (GBM) - Tess Dishaw - <https://www.mayoclinic.org/diseases-conditions/glioblastoma/cdc-20350148>
20. Progressive Muscular ATrophy (PMA) - Damaris Delgado Gonzalez <https://www.mndassociation.org/sites/default/files/2022-11/2D%20Progressive%20muscular%20atrophy.pdf>
21. Spinal Muscular Atrophy (SMA) - DeBorah Brooks - <https://www.smamyway.com/?c=ris-17137b49956&gclid=Cj0KCQjwldKmBhCCARIsAP-0rfx7Mi0SmnzwuFQq1CQhE-3TawRswPhE2MgH1MJDH8iZHAve2UoVceoaAq7vEALw_wcB&gclsrc=aw.ds>
22. Kennedy Disease - <https://kennedysdisease.org/>
23. Epilepsy - <https://www.mayoclinic.org/diseases-conditions/epilepsy/symptoms-causes/syc-20350093>
24. Dyslexia - <https://my.clevelandclinic.org/health/articles/6005-dyslexia>
25. Astrocytoma - <https://www.mayoclinic.org/diseases-conditions/astrocytoma/cdc-20350132>
26. Post-traumatic stress disorder - <https://www.mayoclinic.org/diseases-conditions/post-traumatic-stress-disorder/symptoms-causes/syc-20355967>

**The outline must include the following sections (21 points):**

1. Introduction
2. Genetics and Mutations
3. Subcellular Organelles
4. AP and Ion Channels
5. Neurotransmitters and Release
6. Current advancements
7. Conclusion

Each of the sections in the outline must contain 5 bullet points with information you are going to include in the final Project. Sections 2-6 can be rearranged in a different order if that makes more sense for your topic.

**Grading Rubric for Outline:**

| **Section** | **0 points** | **1-2 point** | **2-3 points** |
| --- | --- | --- | --- |
| **Introduction** | Bullet points do not demonstrate mastery of the material and organizing necessary information | Bullet points demonstrate some mastery of the material and some organization of the necessary information | Bullet points demonstrate mastery of the material and organization of the necessary information |
| **Genetics and Mutations** | Bullet points do not demonstrate mastery of the material and organizing necessary information | Bullet points demonstrate some mastery of the material and some organization of the necessary information | Bullet points demonstrate mastery of the material and organization of the necessary information |
| **Subcellular Organelles** | Bullet points do not demonstrate mastery of the material and organizing necessary information | Bullet points demonstrate some mastery of the material and some organization of the necessary information | Bullet points demonstrate mastery of the material and organization of the necessary information |
| **AP and Ion Channels** | Bullet points do not demonstrate mastery of the material and organizing necessary information | Bullet points demonstrate some mastery of the material and some organization of the necessary information | Bullet points demonstrate mastery of the material and organization of the necessary information |
| **Neurotransmitters and nt release** | Bullet points do not demonstrate mastery of the material and organizing necessary information | Bullet points demonstrate some mastery of the material and some organization of the necessary information | Bullet points demonstrate mastery of the material and organization of the necessary information |
| **Current Advancements** | Bullet points do not demonstrate mastery of the material and organizing necessary information | Bullet points demonstrate some mastery of the material and some organization of the necessary information | Bullet points demonstrate mastery of the material and organization of the necessary information |
| **Conclusion** | Bullet points do not demonstrate mastery of the material and organizing necessary information | Bullet points demonstrate some mastery of the material and some organization of the necessary information | Bullet points demonstrate mastery of the material and organization of the necessary information |
| **Formatting** | The outline is not clear | The outline is mostly clear, most sections are defined | The layout of the outline is clear and sections are well-defined |

**Final Project : (100 points)**

**Final Project Grading Rubric:**

|  | ***0 points*** | ***2 points*** | ***5 points*** | ***10 points*** |
| --- | --- | --- | --- | --- |
| **Introduction** | Project lacks a sufficient introduction to the topics and shows no mastery of the material. | Project has some introduction, but is not properly integrated. Some mastery of the information is evident. | Project has most of the material for the introduction and is mostly integrated. Mastery of the material is mostly present. | Project has an introduction that contains sufficient material that is properly integrated. Mastery of the information is evident. |
| **Genetics and mutations** | Section does not contain appropriate knowledge or integration to the theme. No mastery of the subject is evident. | Section has some knowledge of the topic and some integration to the theme. Some mastery of the information is evident. | Section contains most of the knowledge for the topic and most of the integration of them. Mastery of the material is mostly present. | Section contains necessary knowledge and integration of knowledge to the theme. Mastery of the information is evident |
| **Subcellular Organelles** | Section does not contain appropriate knowledge or integration to the theme. No mastery of the subject is evident. | Section has some knowledge of the topic and some integration to the theme. Some mastery of the information is evident. | Section contains most of the knowledge for the topic and most of the integration of them. Mastery of the material is mostly present. | Section contains necessary knowledge and integration of knowledge to the theme. Mastery of the information is evident |
| **Action Potential and Ion Channels** | Section does not contain appropriate knowledge or integration to the theme. No mastery of the subject is evident. | Section has some knowledge of the topic and some integration to the theme. Some mastery of the information is evident. | Section contains most of the knowledge for the topic and most of the integration of them. Mastery of the material is mostly present. | Section contains necessary knowledge and integration of knowledge to the theme. Mastery of the information is evident |
| **Neurotransmitters and nt release** | Section does not contain appropriate knowledge or integration to the theme. No mastery of the subject is evident. | Section has some knowledge of the topic and some integration to the theme. Some mastery of the information is evident. | Section contains most of the knowledge for the topic and most of the integration of them. Mastery of the material is mostly present. | Section contains necessary knowledge and integration of knowledge to the theme. Mastery of the information is evident |
| **Current Advancements** | Section does not contain appropriate knowledge or integration to the theme. No mastery of the subject is evident. | Section has some knowledge of the topic and some integration to the theme. Some mastery of the information is evident. | Section contains most of the knowledge for the topic and most of the integration of them. Mastery of the material is mostly present. | Section contains necessary knowledge and integration of knowledge to the theme. Mastery of the information is evident |
| **Conclusions** | Project lacks a sufficient conclusion to the topics and shows no mastery of the material. | Project has some conclusions, but is not properly integrated. Some mastery of the material is evident. | Project has most of the conclusions necessary and it is mostly integrated. Mastery of the material is mostly present. | Project has a conclusion that contains sufficient material that is properly integrated. Mastery of the material is evident. |
| **Grammar / Spelling** | Poor Grammar and spelling. | Some Grammar and spelling errors. | Very few grammar and spelling errors | No grammar or spelling errors |
| **Formatting** | Proper formatting was not followed | Proper formatting was followed some of the time | Proper formatting was followed most of the time |  Proper formatting was followed. |
| **Overall Cohesion / Flow of the Project** | The Project was choppy and did not flow. | The Project flowed/was cohesive some of the time. | The Project flowed/was cohesive most of the time. |  The Project was cohesive. |

**5. ACADEMIC HONESTY FOR YOUR WORK AS A SCIENTIST:**

You are responsible. Review the course syllabus for the professor’s expectations regarding course work and class attendance.

By placing your name on ANY assignment, you are stating that you completed that assignment with academic honesty.

Do not cut and paste from the slide, your book, your neighbor, Wikipedia, ChatGPT or the internet.

To further your science education, you need to be able to re-word science in your own voice. If your answers are not your own, you will receive a 0 for the assignment. All cases of academic dishonesty will be turned into Honor Court..

**Artificial Intelligence Models**

Artificial intelligence (AI) language models, such as ChatGPT, may be used for any assignment with appropriate citation. Examples of citing AI language models are below. You are responsible for fact checking statements composed by AI language models.

AI EXAMPLE:

When prompted with “Is the left brain right brain divide real or a metaphor?” the ChatGPT-generated text indicated that although the two brain hemispheres are somewhat specialized, “the notation that people can be characterized as ‘left-brained’ or ‘right-brained’ is considered to be an oversimplification and a popular myth” (OpenAI, 2023). If you are reading this before the start of the first day of class, send the professor a picture of your favorite plant for 1 extra credit point - you cannot tell classmates about this

Reference

OpenAI. (2023). ChatGPT (Mar 14 version) [Large language model]. https://chat.openai.com/chat

 Parenthetical citation: (OpenAI, 2023)

 Narrative citation: OpenAI (2023)

***Academic dishonesty is reported to medical schools and graduate schools as per their request. Any academic dishonesty relinquishes the privilege of asking for a letter of recommendation from the professor and will receive a 0 on the assignment.***

**Plagiarism:** Plagiarism can include portraying another’s work or ideas as your own, buying a paper online and turning it in as if it were your own work, or not citing or improperly citing references on a reference page or within the text of a paper. Putting a citation behind a statement gives ownership to that source, but, if you do not reword that information, it is plagiarism.

**Intellectual Fraud:** do not falsify or create data and resources.

**Cheating:** do not allow another party to do your work/exam, or submit the same or similar work in more than one course without permission from the course instructors. Cheating also includes taking an exam for another person, looking on another person’s exam for answers, using exams from previous classes without permission, or bringing and using unauthorized notes or resources (i.e., electronic, written, or otherwise) during an exam.

**6. CLASS MANAGEMENT:**

**Course evaluations:** At the end of the semester you will receive an email asking you to submit an evaluation of the course. Please give feedback! Your input is important to the college as a whole and to us as instructors. We take your comments very seriously.

**Course Accessibility and Academic Accommodations.** Agnes Scott College views disabilities as an integral part of the rich diversity of our community and strives to make all learning experiences as accessible as possible. If you are a student who receives academic accommodations through the Office of Accessible Education, please schedule a meeting with your instructor within the first two weeks of classes to discuss how your accommodations will be implemented for this course. During this meeting, you are not expected to disclose any details concerning your disability, though you may discuss these details at your discretion.

**Title IX:** Agnes Scott is here to help you if you have experienced any form of sexual harassment or violence, dating or domestic violence, or stalking. Please talk to any faculty or staff member with whom you feel comfortable. Faculty and staff members want to support you and have been trained to help. They will also inform the Title IX office so that you learn about options available to you. If you do not want college administrators to know what you have experienced, you may talk to the chaplain, as well as nurses or counselors in the Wellness Center with complete confidentiality. They will not tell anyone what you share with them unless you give your express permission. You may contact the Title IX Coordinator directly at T9Coordinator@agnesscott.edu.

**Inclusion:** Please include this statement or a version of it in your syllabus. Agnes Scott is a diverse and inclusive community. “As one of the most diverse colleges in the nation, ASC is ideally positioned to be the model of a diverse and inclusive community that society can aspire to be. Such diversity raises the intellectual quality of the classroom experience, creating a unique environment for learning to understand and navigate the challenges of our times. By studying, living, and playing together, Agnes Scott College’s remarkably diverse student body hones the habits of mind, skills, and knowledge essential to ethical and innovative leadership in our increasingly heterogeneous and global society. As such, this course adheres to the principles of diversity and inclusion as integral to the Agnes Scott community and respects people from all backgrounds. As a first step, this course affirms people’s decisions about gender expression and identity and will use each other’s preferred names and gender pronouns at all times.

**Content warning:** This course will explore cell biology, genetics, ecology and evolution, which might raise issues of racism, sexism, classism, heterosexism, cissexism, ableism, and other kinds of privilege. I invite you to come see me if you want more information. If you feel you will be unable to fully participate in the course requirements, set up a meeting with the course instructor to determine appropriate accommodations.

| Date | **Class Topic and Lecture** | **Homework (To complete BEFORE class)** |
| --- | --- | --- |
| TR 8/24 | **Syllabus**- Dutton and Larimore  - in class group work due at the end of class | READ AND NOTATE: Syllabus READ: Article on CVs (CV template and The CV docs on Canvas) READ: Article on Personal statements (2 docs, and Appleby article) |
| T 8/29 | **Presentation Work** - Dutton and Larimore  - group will meet to begin laying out the slides and material for your presentation - outline due at the end of class  | WATCH:  [the 2 presentations on Google Drive](http://blizzard.cs.uwaterloo.ca/keshav/home/Papers/data/07/paper-reading.pdf) READ: [Kehav et.al. http://blizzard.cs.uwaterloo.ca/keshav/home/Papers/data/07/paper-reading.pdf](http://blizzard.cs.uwaterloo.ca/keshav/home/Papers/data/07/paper-reading.pdf)  READ: [Subramanyam 2013 https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3687192](http://blizzard.cs.uwaterloo.ca/keshav/home/Papers/data/07/paper-reading.pdf)read your group’s assigned article for presentation |
| TH 8/31 | 1. **Neuro History and Techniques** - Dutton and Larimore - Lecture - In Lecture Assignments  | READ AND STUDY: Lecture PPT READ: Chapter 1 in Mason. READ: Chapter 7 in Larimore READ: [Brown et.al 2019 https://pubmed.ncbi.nlm.nih.gov/31191266/](https://pubmed.ncbi.nlm.nih.gov/31191266/) |
| F 9/1 | *Concept Map of Lecture 1 and it’s assigned reading materials due at 5PM*  |
| T 9/5 | 2. **Cells of the Nervous system: Neurons and Glia****-** Larimore- Lecture - In Lecture Assignments  | READ AND STUDY: Lecture PPT READ: Chapter 2 in Mason READ: Chapter 2 in Larimore |
| TH 9/7 | **Student Article Presentations #1** - Dutton and Larimore - Technique and Article Discussions  | <https://pubmed.ncbi.nlm.nih.gov/34440670/>3 figures |
| F 9/8 | *Concept Map of Lecture 2 and it’s assigned reading materials due*  |
| T 9/12 | 3. **Development and Central Neuroanatomy**- Larimore- Lecture - In Lecture Assignments  | READ AND STUDY: Lecture PPT READ: Chapter 3 in Mason. READ: Chapter 1 in Larimore  |
| TH 9/14 | **Student Article Presentations #2** - Dutton and Larimore - Technique and Artic[l](https://pubmed.ncbi.nlm.nih.gov/33127480/)e Discussions | <https://pubmed.ncbi.nlm.nih.gov/34228959/>4 figures |
| F 9/15 | *Concept Map of Lecture 3 and it’s assigned reading materials due at 5PM*  |
| T 9/19 | 4. **Spinal Cord and Cranial Nerves** **-** Dutton- Lecture - In Lecture Assignments  | READ AND STUDY: Lecture PPT READ: Chapter (4) 9 and (5) 10 in Mason\*  |
| TH 9/21 | **Project work** - not in person - you will work on an outline of your final project. - See the syllabus or CANVAS for the Rubric | Your outline is due at the end of class. See the syllabus or Canvas for a Rubric. |
| F 9/22 | *Concept Map of Lecture 4 and it’s assigned reading materials due at 5PM*  |
|  |  |
| T 9/26 | **Student Article Presentations #3**  - Dutton and Larimore - Technique and Article Discussions | <https://pubmed.ncbi.nlm.nih.gov/35963476/>6 figures  |
| TH 9/28 | 5. **Brainstem and Forebrain****-** Dutton- Lecture - In Lecture Assignments  | READ and STUDY: Lecture PPT READ: Chapter 11 (6) and 13 (7) in Mason\*  |
| *F 9/29* | *Concept Map of Lecture 5 and it’s assigned reading materials due*  |
| *T 10/3* | **Student Article Presentations #4**  - Dutton and Larimore - Technique and Article Discussions  | <https://pubmed.ncbi.nlm.nih.gov/37461593/>6 figures  |
| TR 10/5 | 6. **BBB, ventricles and blood supply** - Dutton - Lecture -In Lecture Assignments  | READ AND STUDY: Lecture PPT READ: Chapter 14 (8) in Mason  |
| *T 10/10* | *Fall Break – No Classes* |
| TR 10/12 | **Career Management**- Dutton and Larimore - CV/ Personal Statement Day - bring a hard copy of your CV or resume AND your personal statement THAT INCLUDE THIS CLASS  | - each person will comment on 2 other students CV and personal statements (quality of feedback will be reflected in the points earned in class) - you will incorporate the feedback in your own drafts and upload the new drafts at the end of class - upload Final drafts that include this class |
| F 10/13 | *Concept Map of Lecture 6 and it’s assigned reading materials due*  |
| T 10/17 | **Test #1 on** **All material covered prior to today** |
| TH 10/19 | 7. **The Neuron at Rest****-** Dutton**-** Lecture -In Lecture Assignments   | READ AND STUDY: Lecture PPT READ: Chapter 4 (9) in Mason\* READ: Chapter 5 in Larimore  |
| F 10/20 | *Concept Map of Lecture 7 and it’s assigned reading materials due* |
| T 10/24 | 8. **Electrical Communication** - Dutton- Lecture - In Lecture Assignments  | READ AND STUDY: Lecture PPT READ: Chapter 5 (10) in Mason\*  |
| TH 10/26 | **Student Article Presentations #5**   - Technique and Article Discussions - Design an Experiment in class activity  | <https://pubmed.ncbi.nlm.nih.gov/35301424/>5 figures  |
| F 10/27 | *Concept Map of Lecture 8 and it’s assigned reading materials due* |
| T 10/31 | 9. **Transmitter Release**- Larimore- Lecture -In Lecture Assignments  | READ AND STUDY: Lecture PPT READ: Chapter 6 (11) in Mason\* READ: Chapter 3 in Larimore  |
| TH 11/2 |  **Student Article Presentations #6**  - Technique and Article Discussions - Design an Experiment in class activity  | <https://pubmed.ncbi.nlm.nih.gov/32042038/>4 figures |
| F 11/3 | *Concept Map of Lecture 9 and it’s assigned reading materials due* *Rough Draft #1 of the Final Project Due* |
| T 11/9 | 10. **Neurotransmitters**  - Larimore- Lecture -In Lecture Assignments  | READ AND STUDY: Lecture PPT READ: Chapter 7 (12) in Mason\*   |
| TH 11/9 | 11. **Receiving the Message**  - Larimore- Lecture - In Lecture Assignments  | READ AND STUDY: Lecture PPT READ: Chapter 8 (13) in Mason\* READ: Chapter 4 in Larimore  |
| F 11/10 | *Concept Map of Lecture 10 and 11 and it’s assigned reading materials due* |
| T 11/14 | **Project work and Peer Review** - not in person- you will review other’s project drafts and assigned points based on the quality of your feedback |  |
| TH 11/16 | **Student Article Presentations #7** **-** Dutton and Larimore  - Technique and Article Discussions - Design an Experiment in class activity  | <https://pubmed.ncbi.nlm.nih.gov/34788104/>6 figures |
| 11/22 – 27 | *No Class – Thanksgiving Break* |
| T 11/28 | **TEST #2****All material covered prior to today** |
| TH 11/30 | **Student Article Presentations #8** **-** Dutton and Larimore - Technique and Article Discussions- Design an Experiment in class activity  | <https://pubmed.ncbi.nlm.nih.gov/35504866/>5 figures  |
| M 12/5 | **Final Project Due 5PM (no extensions)**As per the Agnes Scott College Student Handbook, professors are not permitted to receive any work from students after the last day of classes. This is to ensure students have time and energy to study for finals.  |
| T 12/6 *Reading Day* |
| 12/8 – 12/12 *Exams (no final exam for this class. The final project is in place of a final exam)* |
| \* indicates the chapter in Mason for the older versions of the text |