

*Neuroscience - Syllabus*  
*Department of Biological Sciences - Marshall University*

**Professor:** Dr. Brian L. Antonsen

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**Office Hours:** Monday and Wednesday 10:00 AM – 11:50 AM, or by appointment.

\*I make every effort to keep scheduled office hours. Please note that conflicts may arise that require my absence.

**Textbook::** Nicholls et al., From Neuron to Brain 5th ed (Sinauer).

**Other Materials:** Handouts to be given in lecture. We will use Blackboard to distribute images or slides from the lectures, supplementary material or exercises, study aids, or additional material you may find interesting or useful.

**Computer Requirements:** Access to and the ability to print documents from MUOnline and online scientific search engines is required. Access to word processing and presentation software (e.g. Word and PowerPoint) is also required. Official course communication will be through your Marshall email account, it is expected that you will check it regularly.

**Lecture:** MWF 12:00-12:50PM, room S276.

**Course Description:**

The fundamentals of cellular and systems neuroscience, with application towards understanding current research and biomedical problems.

**Responsibilities:** By enrolling in this course, you agree to all policies in this syllabus, and all relevant University policies as outlined in this syllabus and on the Academic Affairs website ([www.marshall.edu/academic-affairs](http://www.marshall.edu/academic-affairs), click on “Marshall University Policies”).

**Expected Learning Outcomes:**

I expect that during this course you will develop skills that will put you well on your way towards being an effective neuroscience researcher and communicator. Fundamental to this is a good basic understanding of cellular and systems neuroscience. Once you have this, you will have the ability to research complex topics and use your knowledge to help you successfully interpret them. You will be asked to communicate what you learn in the form of written assignments and examinations.

Course student learning outcomes	How students will practice each outcome in this course	How student achievement of each outcome will be assessed in this course
Students will describe basic cellular neuroscience, membrane and synaptic properties	Classroom discussions, small assignments	Exam questions that assess remembering and understanding
Students will apply knowledge of basic neuroscience to understand integrative topics such as behavior, learning, and sensation	Classroom discussions, sample exercises, small assignments	Exam questions that assess ability to identify core ideas and use them to interpret a problem
Students will demonstrate the ability to research, critically evaluate, and interpret topics in neuroscience from the primary literature	Classroom discussions, sample reading assignments, small assignments	Exam questions that assess ability to critically analyze and interpret information. Written research report. Classroom presentation (grad only)
Students will enhance their communication skills and ability to relate their knowledge in a manner that emphasizes well rounded thoughts, and at the same time brevity and simplicity.	Drafts of the research paper, classroom discussions.	Written answer exam questions, written report.

**Assessment:**

All assignments in this class are designed with the goal of developing your skills as an effective communicator and evaluator of the neuroscience literature, and to develop your skills in interpreting neuroscience-related phenomena. Details of these assignments will be given to you as the class progresses.

**Grading Policy:**

Your grade will be based on the scores you receive for a number of assignments and exams. I will use this scale to determine final grades: 100-90 = A; 89-80 = B; 79-70 = C; 69-60 = D; <59 = F. I round up if your score is X.5 to X.9. There will be no extra credit or bonus points.

**Late assignments will only be accepted with a university approved excuse.**

**Undergrad**

Small Assignments	10%
Research Paper Assignment:	20%
Prelim Exam 1:	20%
Prelim Exam 2:	20%
Final Exam:	<u>30%</u>
Total:	100%

**Grad**

Small Assignments	10%
Research Paper Assignment:	20%
Presentation	10%
Prelim Exam 1:	15%
Prelim Exam 2:	15%
Final Exam:	<u>30%</u>
Total:	100%

**Attendance:**

Missed or late assignments or exams can be made up only in the case of a University approved absence. Marshall's policy on excused absences can be found in the academic calendar. It is your responsibility to be familiar with University policy. In cases of inclement weather, the University's policy will again be followed; it can be found on the web at:

**<http://www.marshall.edu/ucomm/weather.html>**

**Academic Honesty:**

We take scientific integrity very seriously, and will not tolerate any form of dishonest conduct. You are responsible for knowing the University's policies on academic honesty, which can be found in the student handbook or on the web at this location:

**[http://www.marshall.edu/muonline/Academic\\_Dishonesty\\_Policy.pdf](http://www.marshall.edu/muonline/Academic_Dishonesty_Policy.pdf)**

For all assignments, we expect that all references or borrowed material used in your reports or talks are properly cited, and that you work independently. Exceptions to independent work will only be allowed in cases where you are expressly instructed to work in groups. Duplication or improper use of work will not be tolerated. Examples of this include, but are not limited to, use of borrowed ideas or material in figures or slides without proper reference, copying of another's word with or without the use of quotes, **any duplication** of material between students in talks or written reports, and any incidence of plagiarism as defined by the university (see link above).

Any incidence of dishonest conduct will result in a grade of ZERO for that assignment, and possible failure or dismissal from the course. Every case will also be referred to Academic Affairs for further action. **Students found guilty of academic dishonesty may be placed on academic probation, suspended, or dismissed from the University.**

**Other Aspects of Conduct:**

We will expect everyone to act in a professional and courteous manner. Disruptive, abusive, or offensive behavior directed at anyone involved in the class will not be tolerated. Cell phones and other communication devices should be turned off or set to silent ring. If you absolutely must answer a phone call, quietly leave the class before doing so. Text messaging is not allowed. Use of computers or personal electronic devices is not allowed, unless their use is directly involved with class activities **and** has been approved by your instructors. If you are late, enter quietly and avoid disturbing the class.

**Social Justice:**

Absolutely NO student will be discriminated against based on race, ethnicity, sex, age, sexual orientation, social class, abilities, health condition, or religion. Every student is an integral and essential member of this class, and their opinions and discussion will be treated with value and respect.

**Students with Disabilities:**

Marshall University is committed to equal opportunity in education for all students, including those with physical, learning and psychological disabilities. University policy states that it is the responsibility of students with disabilities to contact the Office of Disabled Student Services (DSS) in Prichard Hall 117, phone 304 696-2271 to provide documentation of their disability. Following this, the DSS Coordinator will send a letter to each of the student's instructors outlining the academic accommodation he/she will need to ensure equality in classroom experiences, outside assignment, testing and grading. The instructor and student will meet to discuss how the accommodation(s) requested will be provided. For more information, please visit <http://www.marshall.edu/disabled> or contact Disabled Student Services Office at Prichard Hall 11, phone 304-696-2271.

## Tentative Schedule\*

<b>Week of</b>	<b>General Topic</b>	<b>Readings (Nicholls 5<sup>th</sup>)</b>
<b>Jan. 12</b>	Introduction to course, Principles Membrane Properties, the Resting Potential	Chapter 1 Chapter 6, 8, 9
<b>Jan. 19</b>	Membrane Properties, the Resting Potential	Chapter 6, 8, 9
<b>Jan. 26</b>	Channels	Chapter 4, 5
<b>Feb. 2</b>	The Action Potential Propagation	Chapter 7 Chapter 7
<b>Feb. 9</b>	Neuroglia	Chapter 8
<b>Feb. 16</b>	Synaptic Transmission and Ionotropic Receptors <b>PRELIMINARY EXAMINATION # 1 on Wednesday Feb 18</b>	Chapter 11, 13
<b>Feb. 23</b>	Metabotropic Receptors	Chapter 12
<b>Mar. 2</b>	Metabotropic Receptors Plasticity	Chapter 12 Chapter 16
<b>Mar. 9</b>	Plasticity	Chapter 16
<b>Mar. 16</b>	SPRING BREAK	
<b>Mar. 23</b>	Integration and Behavior	Chapter 17, 18
<b>Mar. 30</b>	<b>PRELIMINARY EXAMINATION # 2 on Monday March 30</b> Integration and Behavior	Chapter 17, 18
<b>Apr. 8</b>	Integration and Behavior	Chapter 17, 18
<b>Apr. 15</b>	Sensory Transduction	Chapter 19
<b>Apr. 22</b>	Visual System	Chapter 2, 3, 20
<b>Apr. 27</b>	Graduate Student Presentations Review	

\*-Subject to change – keep in mind that we may start specific topics earlier or later than outlined here, depending on how things progress through the term.

**FINAL EXAM: Friday, May 8, 10:15AM-12:15 PM in the lecture room.**