



### **Instructor Information**

Instructor: Dr. William (Will) Marks

Email: william.marks@utdallas.edu

Office location: JO3.106

Office phone: 972-883-4297 (Note, this phone does not receive text messages)

Class Time & Location: GR4.428, Tuesday and Thursday, 8:30 AM – 9:45 AM

Office Hours: Monday and Thursday 10 AM to 11:30 AM, Wednesday 3 PM to 4PM & by appointment as schedule Permits.

### **TA Information**

Grad TA: Daniella Rodriguez

Email: Daniella.Rodriguez@utdallas.edu

Office Hours: Available by appointment

SI Leader: Satya Vedula

Email: sxv210126@utdallas.edu

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### **Course Description:**

This is an introductory science course that explores the basic structure and function of the nervous system with emphasis on the neurophysiological processes that underlie behavior. The course includes an overview of neuroanatomy, cellular neuroscience, neuropharmacology, sensory and motor systems, cognitive neuroscience, behavioral neuroscience, and disorders of the nervous system.

### **Course Content:**

To begin to study complex behaviors and treat neurological diseases in humans, one must first understand how the brain works. Since this is an introductory neuroscience course, we will first cover the cells of the nervous system and their physiological roles in processes such as the propagation of nerve impulses and the transfer of information between neurons. This will include a survey of basic neuroanatomy and the organization as well as the development of the nervous system. Next, we will explore how sensory systems including touch, vision, and hearing, as well as, motor systems control behavior. We will then delve deeper into emotion and motivation including drugs, sex, hunger, thirst, and sleep. Finally, we will discuss learning and memory, intelligence, psychological disorders, and language. Whenever possible, clinically relevant examples will be incorporated into lectures leading to discussions of current research. This is a lot to pack into a semester, so buckle your seatbelts!

### **Course Learning Objectives:**

Students who complete this course should be able to:

1. Analyze the contributions of anatomical, physiological, behavioral, cell and molecular, developmental, pharmacological, and biological studies to the cross-disciplinary field of neuroscience.
2. Compare and contrast how neurons and glia cells will react in different disease states.
3. Explain how action potentials propagate along neurons, how information is transferred from neuron to neuron, and how glial cells influence these processes.
4. Predict how damage to neuro-anatomical structures will impact specific behaviors.
5. Evaluate the changes that the nervous system undergoes during typical development and how this is influence by genes vs. the environment.
6. Describe the anatomical structures and mechanisms associated with motivation, emotion, sensation, movement, and complex behaviors at the cellular and systems levels.
7. Demonstrate how scientists create and test hypotheses to study complex behaviors, neurological diseases, and psychiatric disorders.
8. Display a basic understanding of neurochemistry and neuropharmacology as it relates to neuronal function and mental disorders
9. Integrate pathological findings from psychology, psychiatry, physiology, and neurology with basic scientific work in the neurosciences.
10. Apply neuroscience concepts, theories, and research findings to issues in everyday life.

**Course Materials:**

- Required textbook: *The Mind's Machine 4<sup>th</sup> edition* by Watson and Breedlove. ISBN- 9781605359731. This book is available in soft cover or as an eBook. Readings to prepare for each lecture will be assigned from this textbook. **Readings should be completed before class.** While the majority of exam questions will come from lectures, **\*\*\*quizzes may also be based on assigned chapter readings\*\*\*.**
- Substitute textbooks: Several Introductory Neuroscience textbooks are available which cover similar topics as *The Mind's Machine*, including but not limited to *Brain & Behavior* and *Neuroscience- Exploring the Brain*. If you choose to use one of these substitute books or another edition of *The Mind's Machine*, you are responsible for finding the corresponding chapter in your book.

**Course Schedule:**

| Date        | Week      | Reading                     | Lecture Topic                                  |
|-------------|-----------|-----------------------------|--|
| 1/16        | 1         | Syllabus/Chapter 1          | Introductions and the Origins of Neuroscience  |
| 1/18        |           | Chapter 2                   | Neurons and Glia                               |
| 1/23        | 2         | Chapter 2                   | Neuroanatomy- Just the Basics                  |
| 1/25        |           | Chapter 13.3                | Development of the Nervous System              |
| 1/30        | 3         | Chapter 3                   | Communication within the Nervous System        |
| 2/1         |           | Chapters 3                  | Synaptic Transmission                          |
| 2/6         | 4         | Chapters 4.1                | Neurotransmitters                              |
| 2/8         |           | <b>Chapters 1-4.1, 13.3</b> | <b>Exam 1 - Neural Foundation of Behavior</b>  |
| <b>2/13</b> | <b>5</b>  | Chapter 5                   | Sensation and Pain                             |
| 2/15        |           | Chapter 5                   | Motor Control                                  |
| 2/20        | 6         | Chapter 6                   | Hearing  |
| 2/22        |           | Chapter 6                   | Balance  |
| 2/27        | 7         | Chapter 6                   | Taste and Smell                                |
| 2/29        |           | Chapter 7                   | Visual System                                  |
| 3/5         | 8         | Chapter 7                   | Illusion and Perception                        |
| <b>3/7</b>  |           | <b>Chapters 5-7</b>         | <b>Exam 2- Interacting with the World</b>      |
| 3/12        |           | Spring Break                | No class                                       |
| 3/14        |           | No class                    | Spring Break                                   |
| 3/19        | 9         | Chapter 8                   | Hormones                                       |
| 3/21        |           | Chapter 8                   | Neurobiology of Sex                            |
| 3/26        | 10        | Chapter 9                   | Hunger, Thirst, and Homeostasis                |
| 3/28        |           | Chapter 10                  | Biological Rhythms and Sleep                   |
| <b>4/2</b>  | <b>11</b> | Chapter 11                  | Emotions                                       |
| 4/4         |           | Chapter 11                  | Stress and Aggression                          |
| 4/9         | 12        | <b>Chapters 8-11</b>        | <b>Exam 3 - Motivation and Emotion</b>         |
| 4/11        |           | Chapter 4                   | Neuropharmacology                              |
| 4/16        | 13        | Chapter 12                  | Psychopathology                                |
| 4/18        |           | Chapter 13                  | Learning                                       |
| 4/23        | 14        | Chapter 13                  | Memory   |
| 4/25        |           | Chapter 15                  | Language and Lateralization                    |
| <b>4/30</b> | <b>15</b> | Chapter 14                  | Higher Cognition, Attention, and Consciousness |
| <b>5/2</b>  |           | <b>Chapters 4,12,13,15</b>  | <b>Exam 4 - Complex Behavior</b>               |

## Course Policies

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| <p><b>Class Materials</b></p>     | <p>The instructor may provide class materials that will be made available to all students registered for this class as they are intended to supplement the classroom experience. These materials may be downloaded during the course, however, these materials are for registered students' use only. Classroom materials may not be reproduced or shared with those not in class, or uploaded to other online environments except to implement an approved Office of Student AccessAbility accommodation. Failure to comply with these University requirements is a violation of the <a href="#">Student Code of Conduct</a>.</p>   |
| <p><b>Class Attendance</b></p>    | <p>The University's attendance policy requirement is that individual faculty set their course attendance requirements. Regular and punctual class attendance is expected. Students who fail to attend class regularly are inviting scholastic difficulty. In some courses, <b>(Like this one)</b> instructors may have special attendance requirements; these should be made known to students during the first week of classes. See section on grading and assessment below for more details.</p>   |
| <p><b>Class Participation</b></p> | <p>Regular class participation is expected. Students who fail to participate in class regularly are inviting scholastic difficulty. Participation may include engaging in group or other activities during class that solicit your feedback on homework assignments, readings, or materials covered in the lectures (and/or labs). Class participation is documented by faculty. Successful participation is defined as consistently adhering to University requirements, as presented in this syllabus. Failure to comply with these University requirements is a violation of the <a href="#">Student Code of Conduct</a>.</p>   |
| <p><b>Class Recordings</b></p>    | <p>Students are expected to follow appropriate University policies and maintain the security of passwords used to access recorded lectures. Unless the Office of Student AccessAbility has approved the student to record the instruction, students are expressly prohibited from recording or photographing any part of this course. Recordings or materials provided by the instructor may not be published, reproduced, or shared with those not in the class, or uploaded to other online environments except to implement an approved Office of Student AccessAbility accommodation. Failure to comply with these University requirements is a violation of the <a href="#">Student Code of Conduct</a>. The instructor may record meetings of this course. These recordings, if made, will be made available to all students registered for this class if the intent is to supplement the classroom experience. If the instructor or a UTD school/department/office plans any other uses for the recordings, consent of the students identifiable in the recordings is required prior to such use unless an exception is allowed by law.</p>   |
| <p><b>Grading criteria</b></p>    | <p><b>Quizzes:</b> 10% of your grade There will be 8 online quizzes for completion outside class. Quizzes will be announced on a Thursday, and due at the beginning of class the following Tuesday. The lowest quiz grade will be dropped. Quizzes will reflect material from the text readings from that week as well as the lectures.</p> <p><b>Attendance:</b> 10% of your grade. Attendance will be taken during each class session. Being present (and hopefully, engaged) in 20 of the 25 class sessions will land you full attendance credit (that is 4 of every 5 sessions). Unexcused absences beyond the allowance will result in loss of 5 points from your attendance grade (each class is 5 points, x 20 minimum sessions = 100 possible points)</p> <p><b>Exams:</b> 80% of your grade. There will be 4 exams &amp; the lowest exam grade will be dropped.</p> <p><b>Grading Scale</b> The plus/minus grading system is used in this course. Letter grades will be assigned according to the following cutoffs:</p> <p>A+ (96 - 100)<br/> A (90 - 95)<br/> A- (86 - 89)<br/> B+ (82 - 85)<br/> B (78 - 81)<br/> B- (74 - 77)<br/> C+ (70 - 73)<br/> C (66 - 69)<br/> C- (62 - 65)<br/> D+ (58 - 61)<br/> D (54 - 57)<br/> D- (50 - 53)</p> |

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|                              | <p>F (&lt; 50).</p> <p>The numbers represented by the grading scale are not flexible. Anything less than the minimum cutoff for a grade will be considered in the category below (Example: a score of 89.95 will result in an A-. A score of 90.00 will result in an A). Rounding or “grade bumps” will not be considered under any circumstances. Requests for rounding or “grade bumps” will be declined.</p>  |
| <b>Make-up Exams</b>         | <p>Excused absences for exams require both appropriate documentation and advance notice by email. Excused absences will be given only if: (a) you are seriously ill and have verifiable documentation from a physician, or (b) you were detained by law at the exam time, or (c) you made prior arrangements to attend a verified religious or family event, or represent UTD in a university-sanctioned event. In ALL these cases except (b), you must notify the instructor in advance by email; for (b), your court order will suffice. If it is not possible to notify in advance, notification must be made as soon as possible. <b>It is the students responsibility to inform me of any issues.</b> Otherwise, you will receive a zero (0) for that evaluation. A maximum extension of one week (7 days) beyond the scheduled due date can be granted.</p> <p>Make up exams <b>WILL NOT</b> be the same as the exam administered in class, and may be administered in a different format (for example, short answer, essay or oral exam) as determined by the instructor.</p> |
| <b>Extra Credit</b>          | <p>Extra credit <u>may</u> (note the choice of word “may”, and not “will”) be given only at the instructor’s discretion to the entire class. No individual requests for extra credit will be granted. <b>Requests for extra credit for the whole class make such an event more unlikely.</b></p>   |
| <b>Late Work</b>             | <p>Late work will not be accepted and will be graded as a Zero. If an issue comes up that prevents you from completing an assignment, it is the students responsibility to notify according to the policy below.</p> <p>Makeups for missed assignments requires appropriate documentation, advance notice by email, and confirmation by the instructor. Appropriate reasons are laid out in the “Make-up exams” section. Criterion will be more strict for approval, as quizzes and assignments are not single day events (<b>waiting until the last minute is never a good strategy</b>). A maximum extension of one week (7 days) beyond the scheduled due date can be granted, but length is contingent on assessment by the instructor on a case by case basis. <b>Makeups for missed assignments will only be given/graded if completed before the exam for which the assignment was preparing you.</b> (for example, a quiz on material for exam one cannot be completed after exam one has been administered).</p>  |
| <b>Classroom Citizenship</b> | <ul style="list-style-type: none"> <li>You are expected to do your own work. Cheating, plagiarism, collaboration/collusion, and any other form of academic dishonesty will not be tolerated and will result in referral to the Office of Community Standards and Conduct.</li> <li>Meaningful and constructive dialogue is encouraged in this class and requires a willingness to listen, tolerance for different points of view, and mutual respect from all participants. All course members will be expected to show respect for individual differences and viewpoints at all times.</li> <li>Any discussion from class that continues online should adhere to these same rules and expectations.</li> <li>The use of electronic devices can be disruptive to those around you. As a result, the use of such devices should be limited to class-related tasks.</li> </ul>   |
| <b>Communication</b>         | <p>This course utilizes both in-person and online tools for interaction and communication. Grades will be posted as soon as they are available. Student emails will be answered within 3 working days under normal circumstances. <b>ALWAYS</b> include the course number/name in the email subject line so I can figure out which class you are emailing for.</p> <p>In event of classroom emergencies, (such as lecture cancellations for a DFW Snowpocalypse), I will send an email to all enrolled in the class.</p>   |

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| <b>Review Sessions</b>                   | <p><i>Review Sessions</i> will be held each week by our TAs. In these sessions, the TAs will review the lecture material presented that week and answer your questions. Although these sessions are not required, students who fear they may struggle with the large amount of content that will be presented in this course are strongly encouraged to attend each week.</p> <p>Supplemental Instruction sessions are also provided by the Office of Student Success.</p> <p>A schedule of review sessions and SI sessions will be posted in eLearning</p> |
| <b>eLearning</b>                         | <p>The course syllabus, class lecture slides and other resources will be posted on elearning, which can be accessed using your UT Dallas NetID account on the <a href="#">eLearning</a> website. Please see the course access and navigation section of the <a href="#">Getting Started with eLearning</a> webpage for more information. No portion of these materials may be sold, retransmitted, reposted, duplicated or otherwise used without the express written approval of the author.</p>   |
| <b>Technical support</b>                 | <p>UT Dallas provides eLearning technical support 24 hours a day, 7 days a week. The <a href="#">eLearning Support Center</a> includes a toll-free telephone number for immediate assistance (1-866-588-3192), email request service, and an online chat service.</p>   |
| <b>Comet Creed</b>                       | <p><i>This creed was voted on by the UT Dallas student body in 2014. It is a standard that Comets choose to live by and encourage others to do the same:</i></p> <p><i>“As a Comet, I pledge honesty, integrity, and service in all that I do.”</i></p>   |
| <b>Academic Support Resources</b>        | <p><i>The information contained in the following link lists the University’s academic support resources for all students.</i></p> <p><i>Please go to <a href="http://go.utdallas.edu/academic-support-resources">http://go.utdallas.edu/academic-support-resources</a>.</i></p>   |
| <b>Academic Integrity:</b>               | <p>Academic Dishonesty including but not limited to cheating on exams and sharing or posting exam questions (with or without the correct answers) will not be condoned in my class or at UTD. Any action deemed as potential academic dishonesty will be reported to the Office of Community Standards and Conduct for official review.</p>   |
| <b>UT Dallas Policies and Procedures</b> | <p><i>The information contained in the following link constitutes the University’s policies and procedures segment of the course syllabus. Please review the sections regarding the <a href="#">credit/no credit</a> grading option and withdrawal from class.</i></p> <p><i>Please go to <a href="http://go.utdallas.edu/syllabus-policies">http://go.utdallas.edu/syllabus-policies</a> for these policies.</i></p>   |

*The descriptions and timelines contained in this syllabus are subject to change at the discretion of the Professor.*

**Individual help** is also available. You are welcome and indeed encouraged to meet with me or our TAs during office hours or by appointment to go over difficult concepts, discuss learning strategies, and review exams. You must help us to help you. **Note:** the day before the test is too late for that exam...the week before finals is too late for the course...Plan ahead!

**If you require any accommodations or have concerns, please let Dr. Marks know as soon as possible so that appropriate arrangements can be made.**

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