Neurological Bases of Speech and Hearing (ASLP 4050)
University of North Texas
Fall 2018
(Tuesday/Thursday, 3:30-4:50, Gateway 137)

Your professor: Gloria Streit Olness, Ph.D., CCC-SLP  
Office*  SPHC 217  golness@unt.edu  940-369-7455
E-mail**

Your TA: Tabitha DeGarmo  
Office*  SPHC 215  Tabitha.degarmo@unt.edu  940-369-7382
E-mail**

* Office hours are by appointment at a time and location mutually agreed upon by student(s) and instructor(s). You may e-mail the TA to set appointments with either the TA or the professor.

** The best way to reach us is by e-mail.

Required resource


It is essential that you obtain access to the text and have full access to the on-line student resource.

Suggested resource


Especially helpful for visual learners

Prerequisite course

ASLP 3025: Anatomical Bases of Speech and Hearing Sciences (prior or concurrent enrollment strongly recommended; see professor on first class day to discuss exceptions)

What you can expect to achieve in this course

This course, for advanced undergraduate students, is designed to provide an introduction to the structure and function of the human central nervous system (brain, spinal cord) and the human peripheral nervous system, as related to the practice of speech-language pathology and audiology. Normal neurological bases for multiple aspects of communication and swallowing are addressed, as well as neuropathology associated with disorders of communication and swallowing. There is an emphasis on the reception and integration of sensation (with a focus on hearing, speech and language comprehension, tactile sensation, vision, smell and taste and proprioception), and the planning and production of verbal and non-verbal responses (speech and language production, gesture, writing/drawing, posture, and mastication/swallowing).

Upon successful completion of this course, you will be able to:

1. discuss the gross anatomy of the central and peripheral nervous systems;
2. discuss the neuromuscular control for normal speech, swallowing and gestural movements;
3. discuss the nervous system as it relates to normal language production, language comprehension, and cognition;
4. discuss the nervous system as it relates to hearing, balance, vision, taste, smell, and touch; and
5. apply your knowledge of neuropathology toward an understanding of the clinical-pathological method as it relates to neurogenic disorders of communication, hearing, and swallowing.
**What this achievement will take on your part**

Emphasis is placed on your steady progress and consistent participation in this course, through regular class attendance, regular study habits, home-works, exercises and exams.

1. Consistent attendance and participation in class
2. Regular allocation of 6 hours per week outside of class for review, reading, home-work completion, exercise completion, individual study, group study, and/or meetings with T.A. or professor, which is standard for a 3 credit-hour course (i.e., 2 hours of out-of-class work for every hour in class)
   i. It is important to first study the big picture before studying details. Treat this class like you would a puzzle – look at the overall picture on the front of the box before you start trying to piece it all together.
   ii. Treat your book like an encyclopedia. Encyclopedias are not read from beginning to end. Rather, you scan across the headers and sub-headers to see the overall frame-work first, and then you dig down for the details that you need. Once you see the overall frame-work, finding and understanding detailed information becomes much easier.
3. Accessing lectures in advance of class, for note-taking and pre-study, if desired; lectures will be posted on Canvas at least 2 hours in advance of each lecture.
4. Checking your UNT email on a regular basis. Instructors will send all class correspondences to your official UNT email address (yourname@my.unt.edu).
5. Completion of all home-works. Note: All home-works need to be completed to earn full credit, although only the top five home-work scores will count toward your grade.
6. Completion of exercises. Note that exercises are optional, but they are very helpful in support of test preparation.
7. Preparation for and completion of five examinations

**Our commitment as professor and teaching assistant**

1. Careful selection of readings and materials
2. Careful preparation of lectures, in-class activities, home-works and exercises
3. Availability for discussion of course content and student progress
4. Provision of feedback on your learning, via the home-works and the five examinations
5. Help in arranging optional study/discussion groups (by request) outside of class, if this fits your learning style

**Strongly recommended participation**

**Attendance**: Attendance is not recorded and does not contribute to calculation of your final course grade. However, attendance is very strongly encouraged (See “Attendance” below).

**Exercises**: Periodically, exercises based on the lecture content will be distributed to the class via Canvas. Exercises are designed to help you more deeply learn the lecture content and the clinical applications of that content, to prepare for the exams. Completion of these exercises is strongly encouraged to reinforce your learning, although completed exercises are not submitted for a grade, and they are not used in course grade calculations. Use exercises to guide your question-asking in study/help sessions.

**Self-quizzes**: Periodically, self-assessment quizzes will be distributed or presented in class, as a personal gauge to your learning. Students are also encouraged to conduct their own self-quizzes, and will be offered guidelines for the self-quizzing process as a recommended study technique.
Required participation; assessing your development

Home-works (top 5 of 8 home-works, 2% each): 10% of course grade*
Completion of Home-works (completion of 8 home-works): 5% of course grade*
Exams (5 exams, 17% each): 85% of course grade*

*Details of these percentage allocations are described below and exemplified at the end of the syllabus. There is also an “automatic” grade calculation spreadsheet on Canvas; you put in your scores (current and estimated future grades) and it automatically calculates your projected grade for the course.

Home-works: Home-works are based on the course readings, via on-line resources associated with your book. Details of home-work assignments, including the home-work due dates, will be posted to Canvas. You will earn up to **2% for each of the top 5 out of 8 home-works**—grades of three lowest home-works are dropped—**for a max of 10% of your final course grade**. To calculate, multiply the % correct on the home-work by 2%, e.g. an 80% on a given home-work earns (80% x 2%) or 1.6 %age points toward your final course grade.

Completion of home-works: Note: Completion of all home-works is worth **5% of your final course grade**. A “completed home-work” is defined as a home-work that has been turned in on-time and in hard copy. Home-work due dates will be specified when the home-work is assigned.
- Complete **all eight** home-works: **Earns the maximum 5%** (five percentage points)
- Complete **seven** home-works: **Earns 3%** (three percentage points)
- Complete **six** home-works: **Earns 1%** (one percentage points)
- Complete **five or fewer** home-works: **Earns 0%** (zero percentage points)

Exams: Exams are based largely on lecture content, as well as home-work content explicitly specified as “exam-eligible” when the home-work assignment is made. Content of exercises may also be included on the examination. You will earn up to **17% for each of 5 exams, for a max of 85% of your final course grade**. To calculate, multiply the % correct on the exam by 17%, e.g. an 80% on a given exam earns (80% x 17%) or 13.6%age points toward your final course grade.

**Raw grades on home-works and exams will be posted throughout the semester on Canvas.** To access Canvas go to [https://unt.instructure.com/login/ldap](https://unt.instructure.com/login/ldap) and login with your EUID and password.

Assignment of final course grade: A: 90-100%
B: 80-89%
C: 70-79%
D: 60-69%
F: <60%

For purposes of final grade assignment, percentages are rounded up to the nearest whole-number percentage. For instance, a final course percentage of 79.1% would round up to 80%, which would earn a ‘B’ in the course. See the last page of this syllabus for instructions on how to calculate your final course grade. **You must IGNORE the automated course grade calculation function performed by Canvas, as it does not allow for accurate weighting of scores and will be grossly inaccurate.**
More about the home-works

The purpose of the home-works is to develop your ability to access detailed information within the overall framework you are learning. This is the process used by practicing clinicians. As you engage in this process, you will also deepen your understanding of the key course concepts. Note: You are not expected to memorize the detailed information from the text unless the home-work guidelines explicitly inform you otherwise. To receive credit, completed home-works must be turned in, in hard copy, by the specified due date and time. No electronic submission of home-works is accepted, although a classmate may turn in your completed home-work for you (in hard copy) if you are unable to turn it in yourself.

You will need access to Canvas and to the online resources associated with your text to complete the home-works. Home-work guidelines will be posted to Canvas. The home-works will be found through the text’s website at http://thePoint.lww.com. Once you are logged into the site, select “Classroom Handouts” under Student Resources. You will find Student Workbooks, divided by chapter. Your home-works are these Student Workbooks.

You are welcome to work on take-home home-works with classmates. However, is to your learning advantage to be actively involved in the thinking and rationale behind your final responses to the home-work questions. It is strongly advised that you do NOT simply copy the correct (or incorrect!) answers of your classmates.

More about the examinations

Examinations cover all course content up to and including the class day prior to the exam. Emphasis is based on frameworks and content taught in lectures and reinforced by the readings and the associated home-works and exercises. Home-work content which may appear on the test will be so indicated on the home-work assignment sheet. Exercise content will give you practice in clinical application of course content, in preparation for the exam.

An understanding of content early in the course is essential for the learning of content in later portions of the course, although the focus of each exam will be placed on the material taught most recently, since the previous exam. The format of the examinations will include primarily multiple-choice questions and matching; labeling, short answer, and short essay may be included occasionally. Question format is tailored to the nature of the content being assessed.

Make-up policy

**Home-works.** There is no late submission of home-works, although early turn-in of home-works is allowed. Home-works must be turned in, in hard copy, by the specified due date and due time. Home-works turned in late or not turned in will earn a zero for that home-work, and will reduce the home-work completion portion of your grade. No exceptions. However, the lowest three of your eight home-work scores will be excluded from your final course grade calculations. Home-work completion grade can be adjusted upward only in extreme emergencies, and formal documentation will be required.

**Exams.** Exams must be taken at the assigned time. The scheduled five examination dates found in this syllabus are fixed, and will not change:

| September 13th | October 9th | November 1st | November 20th | December 11th |

Alternate examination arrangements will be allowed only for sufficient reason and must be requested prior to the time of the scheduled exam, with the associated documentation, through the TA. Exceptions to the fixed
exam dates and times will only be made for extreme emergencies and **documentation will be required**. Students who miss examinations will earn a zero. Please note the date and time of all exams.

**Attendance**

Regular attendance in class and participation in class discussions is expected and very strongly encouraged for all students. Note that even though Power Points of lectures are available on-line, studying from Power Points alone without attendance at lectures is typically insufficient for learning the material. The reason is that physical models, demonstrations, explanations, handouts, and film clips of clinical cases cannot be included in the Power Points.

Attendance at all lectures puts you at a strong advantage for learning the material, and missing even a single lecture can put you at a distinct disadvantage for learning of subsequent material. You are strongly encouraged to cooperate with classmates to share and discuss notes together as the course progresses, especially if you have to miss a class session. Course content of early lectures forms the basis for subsequent lectures, and course content for later portions of the course builds systematically on prior content.

**Office of Disability Accommodation**

The Department of Speech and Hearing Sciences cooperates with the Office of Disability Accommodation (ODA) to make reasonable accommodations for qualified students with disabilities (cf. Americans with Disabilities Act and Section 504, Rehabilitation Act). We encourage all students with disabilities to register with the ODA. If you experience any problems in arranging reasonable accommodation with the ODA, please contact the departmental chair or the ODA directly.

“The University of North Texas makes reasonable academic accommodation for students with disabilities. Students seeking accommodation must first register with the Office of Disability Accommodation (ODA) to verify their eligibility. If a disability is verified, the ODA will provide you with an accommodation letter to be delivered to faculty to begin a private discussion regarding your specific needs in a course. You may request accommodations at any time, however, ODA notices of accommodation should be provided as early as possible in the semester to avoid any delay in implementation. Note that students must obtain a new letter of accommodation for every semester and must meet with each faculty member prior to implementation in each class. For additional information see the Office of Disability Accommodation website at [http://www.unt.edu/oda](http://www.unt.edu/oda). You may also contact them by phone at 940.565.4323.”

**Academic Integrity**

Academic integrity is expected of all students at all times. Issues related to cheating, plagiarism, or other behaviors inconsistent with the UNT student code of conduct will be dealt with according to university guidelines. (Refer to UNT Policy on Student Academic Integrity). Please note that it is the instructor’s belief that cheating by students can be a gateway to unethical professional behavior. As a result, such behavior will always be addressed by the instructor. Visit [https://policy.unt.edu/sites/default/files/06.003.pdf](https://policy.unt.edu/sites/default/files/06.003.pdf) for more information.

**UNT Academic Dates**

Students are responsible for verifying the university deadlines such as census date, last day for auto W, last day to drop, beginning date to request an incomplete, last day to withdraw from the university, and last class day.

For official dates and a complete schedule, refer to Registrar’s website [http://registrar.unt.edu/registration/spring-registration-guide](http://registrar.unt.edu/registration/spring-registration-guide)
**Note:**
- If there are any policy changes (i.e. grading, attendance) during the semester, a new/revised syllabus will be issued and given to all students.
- The course syllabus is on file in the ASLP departmental office.

**Note from TA**

Hello! I look forward to working with everyone this semester. If you need help or have any questions about the course or class material, please contact me by email. You may also contact me to look over and/or discuss exams once they have been posted on Canvas. Send me an email, and we will work out a time to go over it. Let’s make this a great semester! I look forward to working with you!
<table>
<thead>
<tr>
<th>Week</th>
<th>Date</th>
<th>Lecture topics</th>
<th>Readings associated with lecture topics</th>
<th>Exam dates</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Aug 28</td>
<td>Syllabus review, and approaches to learning and studying in this course Introduction to basic terms and concepts</td>
<td>Ch 1, pp. 19-20</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Aug 30</td>
<td>Relationship between neurosciences + speech/language/hearing/swallowing sciences</td>
<td>Ch 1: pp. 1-6</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Sept 4</td>
<td>Clinical-pathological method and critical thinking Principles governing the human brain and its functional organization</td>
<td>Ch 1: pp. 21-27 Ch 1: Tables 1-2 and 1-3 Ch, pp. 6-8</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Sept 6</td>
<td>Terms of direction, sections/planes &amp; movement Basic terms and structures related to nerve cells (neurons) and gross anatomical structures of CNS and PNS</td>
<td>Ch: pp. 8-12 Ch 1: pp. 12-19 Ch 2: Scan to find parallels with lecture Ch 18: Scan main headers on axial-limbic system Ch 18: pp 401-408 on ANS, scan for main points</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Sept 22</td>
<td>CNS vs. PNS Gross anatomy of the CNS, its divisions and associated functions</td>
<td>Ch 2: Scan for headers, subheaders, and main points to reinforce lecture content Chapter 18: pp. 416 - 423 on reticular system, scan for main points Chapter 18: pp. 408 - 411 on limbic system, scan for main points Chapter 18: pp. 412 - 416 on hypothalamus, scan for main points</td>
<td>EXAM 1</td>
</tr>
<tr>
<td></td>
<td>Sept 25</td>
<td>&quot;</td>
<td>&quot;</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Sept 27</td>
<td>Nerve cell (neuron) physiology</td>
<td>Chapter 5</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Oct 2</td>
<td>&quot;</td>
<td>&quot;</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Oct 4</td>
<td>Overview of sensory and motor systems Spinal cord and spinal cord reflexes</td>
<td>Chapter 13</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Oct 9</td>
<td>&quot;</td>
<td>&quot;</td>
<td>EXAM 2</td>
</tr>
<tr>
<td></td>
<td>Oct 11</td>
<td>Somatosensory system Diencephalon: Thalamus and associated structures</td>
<td>Chapter 11 Chapter 6</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Oct 16</td>
<td>Motor systems: Cerebellum and cerebellar feedback loop; basal ganglia &amp; basal ganglia feedback loop</td>
<td>Chapter 14 Chapter 15</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Oct 18</td>
<td>Motor systems: Motor cortex and descending motor pathways</td>
<td>Chapter 16</td>
<td></td>
</tr>
<tr>
<td>Week</td>
<td>Date</td>
<td>Lecture topics</td>
<td>Readings associated with lecture topics</td>
<td>Exam dates</td>
</tr>
<tr>
<td>------</td>
<td>------</td>
<td>--------------------------------------------------------------------------------</td>
<td>----------------------------------------------------------------------------------------------------------</td>
<td>------------</td>
</tr>
<tr>
<td>9</td>
<td>Oct 23</td>
<td>Cranial Nerves, Introduction; names and identification; sensory and motor; location</td>
<td>Chapter 17: pp.350-359 and associated figures/tables (Chapter 2: pp. 80 - 82 re-read for review of the cranial nerves)</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Oct 25</td>
<td>Cranial nerve of smell + limbic system</td>
<td>Chapter 17: pp. 359 - 360 and associated figures/tables (Chapter 18: pp. 408 - 411 re-read for review of the limbic system)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Oct 30</td>
<td>Cranial nerves of vision and visual system</td>
<td>Chapter 17: pp. 360-371, 390-391 and associated figures/tables Chapter 12</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Nov 1</td>
<td>-----</td>
<td>-----</td>
<td>EXAM 3</td>
</tr>
<tr>
<td></td>
<td>Nov 6</td>
<td>Cranial nerves of hearing and balance Auditory system and vestibular system</td>
<td>Chapter 17: pp. 380 - 381 and associated figures/tables Chapter 9 (auditory system) Chapter 10 (vestibular system)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Nov 8</td>
<td>Cranial nerves of face, tongue, jaw movement, soft palate, pharynx, larynx, head turning and shrugging; manifestations of dysarthria types across structures</td>
<td>Chapter 17: pp. 371 - 380, 381 - 390, 391 - 392 and associated figures/tables</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Nov 13</td>
<td>&quot;</td>
<td>&quot;</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Nov 20</td>
<td>-----</td>
<td>-----</td>
<td>EXAM 4</td>
</tr>
<tr>
<td></td>
<td>Nov 22</td>
<td>THANKSGIVING BREAK</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Nov 27</td>
<td>Cerebral cortex: Higher mental functions (right hemisphere syndrome, apraxia of speech and apraxia, aphasia, alexia, agraphia, agnosia, dementia, traumatic brain injury)</td>
<td>Chapter 19</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Nov 29</td>
<td>&quot;</td>
<td>&quot;</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Dec 4</td>
<td>Development of the nervous system</td>
<td>Chapter 4</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Dec 6</td>
<td>Capstone lecture</td>
<td></td>
<td>Last Day of Class</td>
</tr>
<tr>
<td></td>
<td>Dec 11</td>
<td>Location: Gateway 137 Time: 1:30pm – 3:30 pm</td>
<td>-------</td>
<td>EXAM 5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>NOTE: Exam start time is different from typical class start time.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Helpful resources in support of your learning

A guide to some helpful pages in the coloring book. Some of the pages listed below may be more detailed than what is necessary for this class, but still may be beneficial to your learning, especially if you are a visual learner. Use this as a supplemental resource to the class lectures, readings, and exercises.

<table>
<thead>
<tr>
<th>TOPICS</th>
<th>COLORING BOOK PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nature of communication and swallowing</td>
<td>1-1</td>
</tr>
<tr>
<td>Basic principles, structures, and terms in neuroscience</td>
<td></td>
</tr>
<tr>
<td>Gross anatomy, terms of direction and sections/planes</td>
<td>1-5, 1-6</td>
</tr>
<tr>
<td>Major divisions and surface anatomy</td>
<td>1-2, 1-3, 1-4, 5-1, 5-2, 5-15, 5-44, 5-30</td>
</tr>
<tr>
<td>Anatomy at neuronal level</td>
<td>2-1, 2-2, 2-3, 7-2</td>
</tr>
<tr>
<td>Anatomy &amp; physiology at neuronal level; Meninges; Ventricular system</td>
<td>2-4, 2-5, 2-6, 2-7, 2-8</td>
</tr>
<tr>
<td></td>
<td>9-8, 9-9, 9-10, 9-11, 9-12</td>
</tr>
<tr>
<td>Blood supply</td>
<td>9-1, 9-2, 9-3, 9-4, 9-5, 9-6, 9-7</td>
</tr>
<tr>
<td>Spinal cord</td>
<td>4-1, 4-2</td>
</tr>
<tr>
<td>Simple reflex arc</td>
<td>4-3</td>
</tr>
<tr>
<td>Somato-sensory systems and tracts</td>
<td>2-9, 2-10, 4-4, 4-5, 4-6, 4-7, 4-8, 4-13</td>
</tr>
<tr>
<td>Motor systems and tracts, including upper and lower motor neurons and basal ganglia</td>
<td>2-12, 4-9, 4-13</td>
</tr>
<tr>
<td>Peripheral nervous system</td>
<td>7-1, 7-4, 8-2</td>
</tr>
<tr>
<td>Cranial Nerves, Introduction; names and identification; sensory and motor</td>
<td>6-1, 6-2</td>
</tr>
<tr>
<td>Cranial nerves of smell/taste + limbic system</td>
<td>6-5, 5-26</td>
</tr>
<tr>
<td>Cranial nerves of vision and visual system</td>
<td>6-6, 6-7, 6-8</td>
</tr>
<tr>
<td>Cranial nerves of hearing and balance</td>
<td>6-17, 6-18</td>
</tr>
<tr>
<td>Cranial nerves of face</td>
<td>6-11, 6-14, 6-15, 6-16</td>
</tr>
<tr>
<td>Cranial nerves of tongue</td>
<td>6-26, 6-21</td>
</tr>
<tr>
<td>Cranial nerves of jaw movement</td>
<td>6-13</td>
</tr>
<tr>
<td>Cranial nerves of soft palate and pharynx</td>
<td>6-21, 6-22, 6-23, 6-24, 6-25</td>
</tr>
<tr>
<td>Neurogenic speech production disorders</td>
<td></td>
</tr>
<tr>
<td>Neurology of speech perception and language comprehension</td>
<td>5-29</td>
</tr>
<tr>
<td>Neurogenic language &amp; cognitive-communicative disorders</td>
<td>5-29</td>
</tr>
<tr>
<td>Embryonic development of nervous system</td>
<td>3-1 through 3-11</td>
</tr>
</tbody>
</table>

A free 3D Brain app from Cold Spring Harbor Laboratory is available online. You’ll find the link under “App and Crash Course videos, to support learning” in Canvas. This is especially helpful for learning brain anatomy and the anatomical relationships between and among brain structures.

Many students enjoy learning specific neurology topics discussed on the Crash Course video series by the Green brothers. You’ll find the links to these YouTube videos in Canvas under “App and Crash Course videos, to support learning.”
Here is a guide to some helpful videos available online from Khan Academy. Although the content of these videos does not supplant the learning benefits you will derive from your ASLP 4050 course lectures, readings, home-works, and exercises, you may find that selected content from the Khan Academy site may support your learning.

https://www.khanacademy.org/test-prep/mcat/organ-systems

I. Biological basis of behavior: The nervous system
   a. Nervous System Questions
   b. Structure of the nervous system
   c. Functions of the nervous system
   d. Motor unit
   e. Peripheral somatosensation
   f. Muscle stretch reflex
   g. Autonomic nervous system
   h. Gray and white matter
   i. Upper motor neurons
   j. Somatosensory tracts
   k. Cerebellum
   l. Brainstem
   m. Subcortical cortex
   n. Neurotransmitter anatomy
   o. Early methods of studying the brain
   p. Lesion studies and experimental ablation
   q. Modern ways of studying the brain

II. Neural Cells
   a. Neural cells questions
   b. Introduction to neural cell types
   c. Overview of neuron structure
   d. Overview of neuron function
   e. Astrocytes
   f. Microglia
   g. Ependymal cells
   h. Oligodendrocytes
   i. Schwann cells

III. Neuron membrane potentials
   a. Neuron membrane potentials questions
   b. Neuron membrane potentials questions 2
   c. Neuron action potentials: The creation of a brain signal
      i. Concentration gradients
      ii. Resting membrane potential
      iii. How action potentials work
      iv. Refractory periods
   d. Action potential velocity
      i. Some signals are very fast
      ii. Size
      iii. Sheath
      iv. Consider the following
   e. Neuron graded potential description
   f. Neuron resting potential description
   g. Neuron resting potential mechanism
   h. Neuron graded potential mechanism
   i. Neuron action potential description
   j. Neuron action potential mechanism
   k. Effects of axon diameter and myelination
   l. Action potential patterns

IV. Neuronal synapses
   a. Neuronal synapses questions
   b. Signal propagation: The movement of signals between neurons
      i. How does information travel
      ii. The synapse
      iii. The Pre-Synaptic Cell
      iv. Neurotransmitters
      v. Post-Synaptic Cell
      vi. Consider the following
   c. Synapse structure
   d. Neurotransmitter removal
   e. Neuroplasticity
Guidance for students in the course grade calculation process

Your professor and TA have provided an automated Excel file on Canvas, to assist you in calculating your final course grade; you’ll find this Excel file alongside the syllabus on Canvas. You can also run the calculations by hand, if you’d like, using the “John Doe” guidelines below.

You must IGNORE the automated course grade calculation function performed by Canvas, as it does not allow for accurate weighting of scores and will be grossly inaccurate.

-----------------------------------------------------------------------

John Doe turned in 7/8 home-works. His scores were 85, 96, 73, 89, 95, 100, 100, and 0 (this is the home-work that was not turned in). On his five exams, he scored 94, 82, 90, 76, and 88.

To calculate John’s final grade, first calculate how much of the 10% points he earned for the home-work grade.
Drop the three lowest scores (0, 73, and 85). Multiply the remaining 5 highest home-work scores each by .02 and then add up all of the results.

96 * .02 = 1.92%
89 * .02 = 1.78%
95 * .02 = 1.9%
100 * .02 = 2%
100 * .02 = 2%

This means John earned 9.6% of the maximum 10% he could earn for his home-work grade.

Next, we will calculate his home-work completion grade. He turned in 7 out of 8 of the home-works. Looking up the percentage points earned for 7 home-works turned in (found on page 3 of the syllabus), John earned 3% of the 5% he could have earned. Add this 3% to his home-work percentage.

9.6% + 3% = 12.6%

The only part left to calculate is the percentage he earned on his five exams. Multiply each of the exam grades by .17 and then add up all of the results.

94 * .17 = 15.98%
82 * .17 = 13.94%
90 * .17 = 15.3%   15.98 + 13.94 + 15.3 + 12.92 + 14.96 = 73.1%
76 * .17 = 12.92%
88 * .17 = 14.96%

Lastly, just add the percentage calculated earlier (the sum of the home-works and home-works grade percentages) to the exams percentage that you just found.

12.6 + 73.1 = 85.7%

Thus, John Doe earned an 85.7% for his final course grade. This rounds up to 86%, and he earns a ‘B’ in the course.