Neurological Bases of Speech and Hearing (ASLP 4050, Section 002)  
University of North Texas  
Spring 2019  
(Tuesday/Thursday, 5:00-6:20, Wooten Hall 217)

**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, kinesics (including 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; we also offer optional discussions of exercises outside of class (by student request).
5. Help in arranging optional study/discussion groups (by student request) outside of class, if this fits your learning style

**Strongly recommended participation, and associated learning goals**

**Class 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) in support of your learning.

**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 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, where we can also discuss answers to exercise questions.

**Self-quizzes:** Periodically, self-assessment quizzes will be distributed or presented in class, to bolster learning. Students are also encouraged to conduct their own self-quizzes. We’ll guide you in how to do this; research suggests that self-quizzing optimizes learning.
Required participation, assessment, and associated learning goals

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

Home-works: The purpose of the home-works is to develop and assess 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.

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: 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. 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.

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 designed to assess: (1) learning of lecture content, as bolstered by your engagement with the optional exercises; (2) learning of home-work content that is explicitly noted in the assignment as exam eligible; (3) your ability to apply this learning to clinical scenarios. For many students, learning of this content is further enhanced by reviewing exams after they are graded; all students are welcome to do this.

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.
More about grade calculation and posting

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 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 and the grading calculation on Canvas for guidance on how to calculate your final course grade.

More about the home-works

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:

- January 31st
- February 21st
- March 21st
- April 11th
- May 7th

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.

Rationale for attendance policy

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. 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 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

Note from TA

Hello! My name is Morgan and I am an audiology student. I am originally from Orlando, Florida and received my bachelor’s degree from Florida State University in Communication Disorders. I have had courses with emphasis on neurology in the past that I thoroughly enjoyed and I look forward to getting to know and working with everyone. Let’s work together to make this a great semester! 😊

How do students set up study-help sessions?

Everyone in this class is welcome to arrange for study-help sessions, in support of your learning. This includes questions about the course, wanting to see past exams, study help, guidance with the home-works, or any other topic you wish.

When you want to meet with the professor or with the TA or with both for this study-help session, your first step is to prepare an email to Morgan, your TA. Her contact can be found at the top of this syllabus (morgan.wareing@unt.edu). Here’s what you must include in this email:

- In the subject line of the email, you must write “Request for study-help session (YourLastName)"
  - For example: Request for study-help session (Smith)
- Next, in the body of the email:
  - Specify who you would like to meet with (professor, TA, or both)
  - Specify the group size you are seeking:
    - An individual session (one-on-one)
    - A small-group session (e.g. a meeting of your small study group with the professor or TA)
    - An open-group session (a study-help session that would be open to any/all class members)
  - List all days and the range of time blocks when you could be available for the study-help session
    - The TA and professor will compare your schedule of availability to their schedule of availability and finalize a time accordingly
  - Specify your goals and purpose for this study-help session, so we can make this the best session possible in support of your learning.

What if I want to meet directly with the professor? Can I contact the professor directly?

Yes, of course. Please contact the professor anytime. You can catch her before or after class, and you can also send her a direct email.
## Closely approximated chronology of course content, punctuated with fixed exam dates

<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>Jan 15</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>
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<tr>
<td></td>
<td>Jan 17</td>
<td>Relationship between neurosciences + speech/language/hearing/swallowing sciences</td>
<td>Ch 1: pp. 1-6</td>
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<tr>
<td></td>
<td>Jan 22</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>
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<td></td>
<td>Jan 24</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>
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<tr>
<td>3</td>
<td>Jan 29</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>
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<td>Jan 31</td>
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<td>4</td>
<td>Feb 5</td>
<td>Cerebrovascular system</td>
<td>Chapter 7</td>
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<td></td>
<td>Feb 7</td>
<td>Protective envelope around the brain (bone and meninges), ventricular system, cerebrospinal fluid (CSF)</td>
<td>Chapter 8 (Chapter 2: pp. 65 - 68 and 75 - 80 re-read for review of ventricles and meninges)</td>
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<td></td>
<td>Feb 12</td>
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<td>5</td>
<td>Feb 14</td>
<td>Nerve cell (neuron) physiology</td>
<td>Chapter 5</td>
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<td>Feb 19</td>
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<td>Feb 21</td>
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<td>EXAM 2</td>
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<tr>
<td>6</td>
<td>Feb 26</td>
<td>Overview of sensory and motor systems Spinal cord and spinal cord reflexes</td>
<td>-----</td>
<td>Chapter 13</td>
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<tr>
<td></td>
<td>Feb 28</td>
<td>Somatosensory system Diencephalon: Thalamus and associated structures</td>
<td>Chapter 11 Chapter 6</td>
<td></td>
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<tr>
<td>7</td>
<td>Mar 5</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>
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<tr>
<td>8</td>
<td>Mar 7</td>
<td>Motor systems: Motor cortex and descending motor pathways</td>
<td>Chapter 16</td>
<td></td>
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<tr>
<td>Week</td>
<td>Date</td>
<td>Lecture topics</td>
<td>Readings associated with lecture topics</td>
<td>Exam dates</td>
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<td>9</td>
<td>Mar 12</td>
<td>SPRING BREAK</td>
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<tr>
<td>10</td>
<td>Mar 19</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>
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<td>Mar 21</td>
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<td>EXAM 3</td>
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<tr>
<td>11</td>
<td>Mar 26</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>
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<tr>
<td></td>
<td>Mar 28</td>
<td>Cranial nerves of vision and visual system</td>
<td>Chapter 17: pp. 360-371, 390-391 and associated figures/tables</td>
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<td></td>
<td>Apr 2</td>
<td>Cranial nerves of hearing and balance</td>
<td>Chapter 17: pp. 380 - 381 and associated figures/tables</td>
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<td></td>
<td></td>
<td>Auditory system and vestibular system</td>
<td>Chapter 9 (auditory system) Chapter 10 (vestibular system)</td>
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<td></td>
<td>Apr 4</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>
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<td>Apr 9</td>
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<td>Apr 11</td>
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<td>EXAM 4</td>
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<tr>
<td>14</td>
<td>Apr 16</td>
<td>Summary lecture on dysarthria, cranial nerve syndromes, and clinical correlates of motor systems</td>
<td>Chapter 17: pp. 392 - 397 (Chapter 14: pp. 314 - 317 re-read for cerebellar clinical correlates) (Chapter 15: pp. 327-335 re-read for basal ganglia clinical correlates) (Chapter 16: pp. 342-348 re-read for UPN and LMN clinical correlates)</td>
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<td>Apr 18</td>
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<td></td>
<td>Apr 23</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>
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<td>Apr 25</td>
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<tr>
<td>15</td>
<td>Apr 30</td>
<td>Development of the nervous system</td>
<td>Chapter 4</td>
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<td></td>
<td>May 2</td>
<td>Special topic presentation (class choice, TBD)</td>
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<td>Last Day of Class</td>
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<td></td>
<td>May 7</td>
<td>Location: Wooten Hall 217 Time: 5:00 pm – 7:00 pm</td>
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<td>EXAM 5</td>
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<td>NOTE: Exam start time is the same as typical class start time.</td>
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</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>
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<tr>
<td>Anatomy at neuronal level</td>
<td>2-1, 2-2, 2-3, 7-2</td>
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<tr>
<td>Anatomy &amp; physiology at neuronal level; Meninges; Ventricular system</td>
<td>2-4, 2-5, 2-6, 2-7, 2-8</td>
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<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>
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<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>
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<tr>
<td>Cranial nerves of vision and visual system</td>
<td>6-6, 6-7, 6-8</td>
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<tr>
<td>Cranial nerves of hearing and balance; Auditory system</td>
<td>6-17, 6-18</td>
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<tr>
<td>Cranial nerves of face</td>
<td>6-11, 6-14, 6-15, 6-16</td>
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<tr>
<td>Cranial nerves of tongue</td>
<td>6-26, 6-21</td>
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<td>Cranial nerves of jaw movement</td>
<td>6-13</td>
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<tr>
<td>Cranial nerves of soft palate and pharynx</td>
<td>6-21, 6-22, 6-23, 6-24, 6-25</td>
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<tr>
<td>Neurogenic speech production disorders</td>
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<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.”
Helpful resources in support of your learning (cont.)

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.

\[
\begin{align*}
96 \times .02 &= 1.92 \\
89 \times .02 &= 1.78 \\
95 \times .02 &= 1.9 \\
100 \times .02 &= 2 \\
100 \times .02 &= 2 \\
\end{align*}
\]

1.92 + 1.78 + 1.9 + 2 + 2 = 9.6%

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.

\[
\begin{align*}
94 \times .17 &= 15.98 \\
82 \times .17 &= 13.94 \\
90 \times .17 &= 15.3 \\
76 \times .17 &= 12.92 \\
88 \times .17 &= 14.96 \\
\end{align*}
\]

15.98 + 13.94 + 15.3 + 12.92 + 14.96 = 73.1%

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.

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.