

**Neurological Bases of Speech and Hearing (SPHS 4050)**  
**University of North Texas**  
**Spring 2014**  
**(Tuesday/Thursday, 3:30-4:50, BLB 055)**

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		<b>Office*</b>	<b>E-mail**</b>	<b>Phone</b>
<b>Your professor:</b>	Gloria Streit Olness, Ph.D., CCC-SLP	SPHS 217	golness@unt.edu	940-369-7455
<b>Your T. A.s</b>	Kimberly Bowen, B.S. Allison Bradford, B.A.	SPHS 215	<a href="mailto:kimberlybowen@my.unt.edu">kimberlybowen@my.unt.edu</a> <a href="mailto:AllisonBradford@my.unt.edu">AllisonBradford@my.unt.edu</a>	940-369-7382

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\* Office hours are by appointment: with Kimberly on M/W or with Dr. Olness on T/R/F afternoons, at a time and location mutually agreed upon by student(s) and instructor.

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

**Required resource**

Bhatnagar, Subhash C. (2013). *Neuroscience for the Study of Communicative Disorders, 4<sup>th</sup> edition*. Baltimore, MD. (ISBN-13: 978-1-6091-3871-4)

*It is essential that you purchase the text, to have full access to the accompanying on-line student resources.*

**Suggested resource**

Diamond, M.C., Scheibel, A.B., & Elson, L.M. (1985). *The Human Brain Coloring Book*. Oakville, CA: Collins. (ISBN: 0-06-460306-7)

*Especially helpful for visual learners.*

**Prerequisite course**

SPHS 3025: Anatomical Bases of Speech and Hearing Sciences (prior or concurrent enrollment strongly recommended; see professor 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. 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 neurogenic disorders of communication, hearing and swallowing.

### What this achievement will take on your part

1. Consistent attendance and participation in class
2. Approximately 6 hours per week of review, reading and studying outside of class, which is standard for a 3 credit-hour course (i.e., 2 hours of out-of-class work for every hour in class)
3. Allocation of regular time in your weekly schedule for approximately 6 hours of reading and individual study, group study, and/or meetings with T.A. or professor, outside of class.
4. Accessing lectures in advance of class, for note-taking and pre-study, if desired; lectures will be posted on Blackboard at least 2 hours in advance of each lecture.
5. Completion of all home-works. Note: All home-works need to be completed to earn full credit, although only the top five homework scores will count toward your grade.
6. 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 and in-class activities
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

### Assessing your development

Emphasis is placed on your steady progress and consistent participation in this course, through regular class attendance, exercises, home-works, and exams. Note the differential weighting for your final course grade.

**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).

**Exercises:** **Periodically, exercises based on the lecture content** will be distributed to the class via Blackboard. Exercises are designed to help you more deeply learn the lecture 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.

**Home-works:** **Home-works are based on the course readings, via on-line resources associated with your book.** Details of homework assignment will be posted to Blackboard. 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.

**Note: Completion of all home-works is worth an additional 5% of your final course grade.**

Turn in **all eight** home-works: **Earns 5%** (five percentage points)

Turn in **seven** home-works: **Earns 3%** (three percentage points)

Turn in **six** home-works: **Earns 1%** (one percentage points)

Turn in **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. 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.

**About the home-works.** The purpose of the home-works is to deepen your understanding of the neurological frameworks taught in lectures, through a process of finding and working with detailed information associated with those frameworks. Note: You are **not** expected to memorize the detailed information from the text unless the instructors explicitly inform you otherwise when the home-work assignment is posted to Blackboard. The purpose of the eight home-works is to give you immediate feedback on your grasp of the **key course material introduced in the lectures and reinforced by the reading** and to encourage regular study habits. Home-works also give you practice in using the textbook as a reference resource. You will need access to Blackboard and to the online "Student Workbook" associated with your text to complete the home-works. **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 homework for you, if you are unable to turn it in yourself.

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

**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. Homework content which may appear on the test will be announced in advance on the homework assignment sheet. 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.

***Grades on home-works and exams will be posted throughout the semester on Blackboard Learn.*** To access Blackboard Learn go to <https://learn.unt.edu> 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.

### **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 homework, and will reduce the homework completion portion of your grade. No exceptions. However, the lowest three of your eight homework scores will be excluded from your final course grade calculations. Homework 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:

<b>January 30</b>	<b>April 10</b>
<b>February 20</b>	<b>May 6</b>
<b>March 20</b>	

Alternate examination arrangements will be allowed only for sufficient reason and must be requested *prior to the time of the scheduled exam*. 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>. 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 Student Code of Conduct). 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 <http://www.vpaa.unt.edu/academic-integrity.htm> 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 with either W or WF, beginning date to request an incomplete, last day to withdraw, and last class day.

For official dates and a complete schedule, refer to Registrar's website  
<http://essc.unt.edu/registrar/schedule/fall/calendar.html>

### **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 SPHS departmental office.

### **Note from TA, Kimberly Bowen**

Feel free to contact me throughout the semester by email if you have any questions about the course or class material. I will make myself available to you to meet to go over an exam after it has been graded. Grades will be posted on Blackboard Learn. If you need extra help in the class, please do not hesitate to contact me so we can set up a meeting time. The best way to contact me will be through e-mail. I look forward to working with you this semester.

**CHRONOLOGY OF THE COURSE**

Week	Date	Lecture Topics	Required Readings	Exams Dates/ Other
1	Jan 14	Relationship between neurosciences + speech/language/hearing/swallowing sciences Principles governing the human brain and its functional organization	<b>Chapter 1: pp. 1-10</b>	
	Jan 16	Terms of direction and sections/planes Basic terms related to neuronal (nerve cell) structures Basic structures of the central nervous system (CNS)	<b>Chapter 1: pp. 10-34</b> <b>Chapter 18: pp. 414-420</b> on autonomic nervous system, read for main points and supporting details	
2	Jan 21	CNS vs. PNS Gross anatomy of the CNS, its divisions and associated functions	<b>Chapter 2</b> <b>Chapter 18: pp. 420-426</b> on limbic system, read for main points and supporting details	
	Jan 23	"	<b>Chapter 2</b> <b>Chapter 18: pp. 426-431</b> on hypothalamus read for main points only	
3	Jan 28	"	<b>Chapter 2</b> <b>Chapter 18: pp. 431-438</b> on reticular system, read for main points only	
	Jan 30	----	----	<b>EXAM 1</b>
4	Feb 4	Protective envelope around the brain (bone and meninges), ventricular system, cerebrospinal fluid (CSF)	<b>Chapter 8</b> <b>(Chapter 2: pp. 69-73 and 77-84</b> re-read for review of ventricles and meninges)	
	Feb 6	Cerebrovascular system	<b>Chapter 7</b>	
5	Feb 11	Nerve cell physiology	<b>Chapter 5</b>	
	Feb 13	"	"	
6	Feb 18	Diencephalon: Thalamus and associated structures	<b>Chapter 6</b>	
	Feb 20	----	----	<b>EXAM 2</b>
7	Feb 25	Overview of sensory and motor systems  Spinal cord and spinal cord reflexes	-----  <b>Chapter 13</b>	
	Feb 27	Somatosensory system	<b>Chapter 11</b>	
8	Mar 4	Motor systems: Cerebellum and cerebellar feedback loop; basal ganglia & basal ganglia feedback loop	<b>Chapter 14</b> <b>Chapter 15</b>	
	Mar 6	Motor systems: Motor cortex and descending motor pathways	<b>Chapter 16</b>	
9	Mar 11	SPRING BREAK- NO CLASS	SPRING BREAK- NO CLASS	
	Mar 13	SPRING BREAK-NO CLASS	SPRING BREAK-NO CLASS	

10	Mar 18	Cranial Nerves, Introduction; names and identification; sensory and motor; location	<b>Chapter 17: pp.360-370 and associated figures/tables</b> <b>(Chapter 2: pp. 84-87 reread for review of the cranial nerves)</b>	
	Mar 20	----	----	<b>EXAM 3</b>
11	Mar 25	Cranial nerve of smell + limbic system	<b>Chapter 17: pp. 370-372 and associated figures/tables</b> <b>(Chapter 18: pp. 420-426 re-read for review of the limbic system)</b>	
	Mar 27	Cranial nerves of vision and visual system	<b>Chapter 17: pp. 372-379, 402 and associated figures/tables</b> <b>Chapter 12</b>	
12	Apr 1	Cranial nerves of hearing and balance Auditory system and vestibular system	<b>Chapter 17: pp. 389-392 and associated figures/tables</b> <b>Chapter 9</b> <b>Chapter 10</b>	
	Apr 3	Cranial nerves of face, tongue, jaw movement, soft palate, pharynx, larynx, head turning and shrugging; manifestations of dysarthria types across structures	<b>Chapter 17: pp. 380-389, 392-401, 402-405 and associated figures/tables</b>	
13	Apr 8	"	"	
	Apr 10	----	----	<b>EXAM 4</b>
14	Apr 15	Summary lecture on dysarthria, cranial nerve syndromes, and clinical correlates of motor systems	<b>Chapter 17: pp. 405-411</b> <b>(Chapter 14: pp. 323-325 re-read for cerebellar clinical correlates)</b> <b>(Chapter 15: pp. 337-344 re-read for basal ganglia clinical correlates)</b> <b>(Chapter 16: pp. 352-358 re-read for UPN and LMN clinical correlates)</b>	
	Apr 17	Cerebral cortex: Higher mental functions (right hemisphere syndrome, apraxia of speech and apraxia, aphasia, alexia, agraphia, agnosia, dementia, traumatic brain injury)	<b>Chapter 19</b>	
15	Apr 22	"	"	
	Apr 24	"	"	
16	Apr 29	Development of the nervous system	<b>Chapter 4</b>	
	May 1	"	"	<b>Last Day of Class</b>
<b>FINAL EXAM WEEK</b>	May 6	Location: BLB 055 Time: 1:30pm – 3:30 pm <b>NOTE: Exam start time is different from typical class start time.</b>	-----	<b>EXAM 5</b>

**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. Use this as a supplemental resource to the class lectures, readings, and exercises.

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