Neurological Bases of Speech and Hearing (SPHS 4050)
University of North Texas
Spring 2015
(Tuesday/Thursday, 3:30-4:50, BLB 155)

		Office*	E-mail**	Phone
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* Office hours are by appointment: with Leah any day of the week or with Dr. Olness on T/R/F, 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, 4th 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 the clinicopathologic 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, homework 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 Blackboard 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 homework 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

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 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.

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.

Home-works: **Home-works are based on the course readings, via on-line resources associated with your book.** Details of homework assignments, including the home-work due dates, 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 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 homework" is defined as a homework 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: E**arns 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.

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.

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.

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 (in hard copy) if you are unable to turn it in yourself.

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 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 and exercises. Homework content which may appear on the test will be so indicated on the homework 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 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**:

February 5th **February 26th** **March 26th** **April 16th** **May 12th**

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, Leah Bellows

Hello everyone! I am looking forward to working with you this semester. If you ever have any questions about the course or class material, please feel free to contact me. I can help you nail down a tricky topic or help you create strategies for studying and/or test taking. I took this exact class at UNT for my undergraduate degree, so I've had the experience you are about to embark upon. On top of helping with any course material you need, I'm also your go to for looking over and/or discussing exams once exam grades have been posted on Blackboard Learn. Just send me an email, and we'll work out a time that we can meet to go over it. Just know that not only am I here to help support you through this course, I want to support you. It's going to be a great semester!

CHRONOLOGY OF THE COURSE

Week	Date	Lecture Topics	Required Readings	Exam Dates/ Other
1	Jan 20	Relationship between neurosciences + speech/language/hearing/swallowing sciences Principles governing the human brain and its functional organization	**Chapter 1**: **pp. 1-10**	
	Jan 22	Terms of direction and sections/planes Basic terms related to neuronal (nerve cell) structures Basic structures of the central nervous system (CNS)	**Chapter 1: pp. 10-34** **Chapter 18: pp. 414-420** on autonomic nervous system, read for main points and supporting details	
2	Jan 27	CNS vs. PNS Gross anatomy of the CNS, its divisions and associated functions	**Chapter 2** **Chapter 18: pp. 420-426** on limbic system, read for main points and supporting details	
	Jan 29	"	**Chapter 2** **Chapter 18: pp. 426-431** on hypothalamus read for main points only	
3	Feb 3	"	**Chapter 2** **Chapter 18: pp. 431-438** on reticular system, read for main points only	
	Feb 5	-----	-----	**EXAM 1**
4	Feb 10	Protective envelope around the brain (bone and meninges), ventricular system, cerebrospinal fluid (CSF)	**Chapter 8** (**Chapter 2: pp. 69-73 and 77-84** re-read for review of ventricles and meninges)	
	Feb 12	Cerebrovascular system	**Chapter 7**	
5	Feb 17	Nerve cell physiology	**Chapter 5**	
	Feb 19	"	"	
6	Feb 24	Diencephalon: Thalamus and associated structures	**Chapter 6**	
	Feb 26	-----	-----	**EXAM 2**
7	Mar 3	Overview of sensory and motor systems Spinal cord and spinal cord reflexes	**-----** **Chapter 13**	
	Mar 5	Somatosensory system	**Chapter 11**	
8	Mar 10	Motor systems: Cerebellum and cerebellar feedback loop; basal ganglia & basal ganglia feedback loop	**Chapter 14** **Chapter 15**	
	Mar 12	Motor systems: Motor cortex and descending motor pathways	**Chapter 16**	
9	Mar 17	SPRING BREAK – NO CLASS	SPRING BREAK – NO CLASS	
	Mar 19	SPRING BREAK – NO CLASS	SPRING BREAK – NO CLASS	

10	Mar 24	Cranial Nerves, Introduction; names and identification; sensory and motor; location	**Chapter 17: pp.360-370 and associated figures/tables** **(Chapter 2: pp. 84-87 reread for review of the cranial nerves)**	
	Mar 26	-----	-----	**EXAM 3**
11	Mar 31	Cranial nerve of smell + limbic system	**Chapter 17: pp. 370-372 and associated figures/tables** (**Chapter 18: pp. 420-426** re-read for review of the limbic system)	
	Apr 2	Cranial nerves of vision and visual system	**Chapter 17: pp. 372-379, 402 and associated figures/tables** **Chapter 12**	
12	Apr 7	Cranial nerves of hearing and balance Auditory system and vestibular system	**Chapter 17: pp. 389-392 and associated figures/tables** **Chapter 9** **Chapter 10**	
	Apr 9	Cranial nerves of face, tongue, jaw movement, soft palate, pharynx, larynx, head turning and shrugging; manifestations of dysarthria types across structures	**Chapter 17: pp. 380-389, 392-401, 402-405 and associated figures/tables**	
13	Apr 14	"	"	
	Apr 16	-----	-----	**EXAM 4**
14	Apr 21	Summary lecture on dysarthria, cranial nerve syndromes, and clinical correlates of motor systems	**Chapter 17: pp. 405-411** (**Chapter 14: pp. 323-325** re-read for cerebellar clinical correlates) (**Chapter 15: pp. 337-344** re-read for basal ganglia clinical correlates) (**Chapter 16: pp. 352-358** re-read for UPN and LMN clinical correlates)	
	Apr 23	Cerebral cortex: Higher mental functions (right hemisphere syndrome, apraxia of speech and apraxia, aphasia, alexia, agraphia, agnosia, dementia, traumatic brain injury)	**Chapter 19**	
15	Apr 28	"	"	
	Apr 30	"	"	
	May 5	Development of the nervous system	**Chapter 4**	
	May 7	Development of nervous system (cont.) + capstone lecture	"	**Last Day of Class**
FINAL EXAM WEEK	May 12	Location: BLB 155 Time: 1:30pm – 3:30 pm *NOTE:* ***Exam start time is different from typical class start time.***	----------	**EXAM 5**

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

Example of Calculating Final Grade:

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