

**DEPARTMENT OF COMMUNICATION SCIENCES AND DISORDERS
FLORIDA ATLANTIC UNIVERSITY**

Course Syllabus

SPA 4104 (3 credit hours)

Neural Bases of Speech, Language, and Hearing

Spring 2015

http://www.coe.fau.edu/faculty/danesh/courses/SPA_4104.htm



Professor: Dr. Ali Danesh

Office: Rm 434 College of Education

Phone: 297-2071 (office) & 297-2258 (Communication Disorders Clinic)

E-mail: danesh@fau.edu **Web:** <http://www.coe.fau.edu/faculty/danesh/>

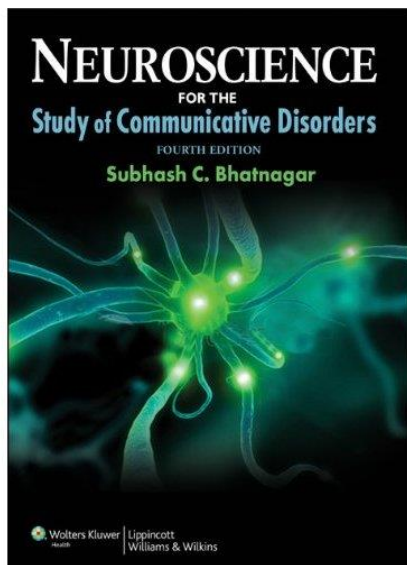
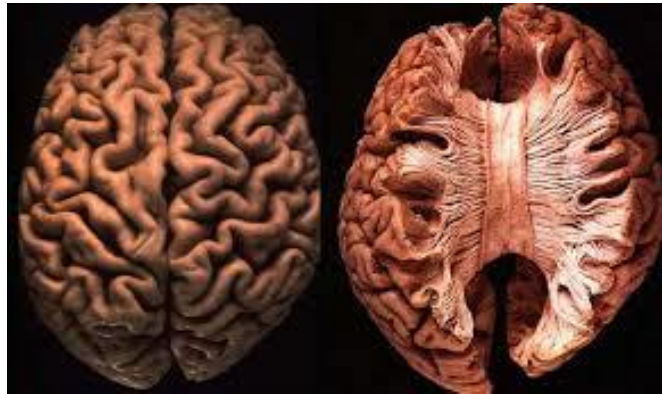
Office Hours: 1-3:50 p.m. on Mondays and Tuesdays (appointments available)

Class Time: 4:00-6:50 p.m. Mondays

Class Location: BU 410

Prerequisite/co-requisite courses: None (anatomy background is helpful)

CATALOG DESCRIPTION: Study of the neuroanatomy and neurophysiology underlying normal speech, language, and hearing. Study of central and peripheral nervous systems. Consideration of embryologic development.



SUPPLEMENTARY COURSE TEXT: Subhash C. Bhatnagar (2012). *Neuroscience for the study of Communicative Disorders*, 4th Edition. Philadelphia: Wolters Kluwer/Lippincott Williams & Wilkins. ISBN: 978-0-7817-8990-5

ASSOCIATED WEBSITE FOR STUDENT RESOURCES:
[HTTP://THEPOINT.LWW.COM/BHATNAGAR4E](http://thepoint.lww.com/bhatnagar4e)

SUPPLEMENTAL TEXT (NOT REQUIRED): Webster, Douglas B. (1999). *Neuroscience of Communication*, 2nd Edition. San Diego: Singular/Thompson Delmar Learning. ISBN: 1-56593-985-9

TEXTS IN THE MAIN LIBRARY:

Hendelman, W. (1994). *Student's atlas of neuroanatomy*. Philadelphia : W.B. Saunders, CALL NUMBER: QM451 .H35 1994

Kuehn, D.P., Lemme, M.L., & Baumgartner, J.M. (1989). Neural bases of speech, hearing, and language. Boston : Little, Brown, CALL NUMBER: QP399 .N45 1989.

SUGGESTED ADDITIONAL REFERENCES:

Bear, M., Connors, B., & Paradiso, M. (2006). Neuroscience Exploring the Brain, 3rd Edition. Baltimore: Lippincott, Williams and Wilkins

Nolte, J. (2002). The Human Brain, An introduction to its functional anatomy, Fifth Edition. St Louis: Mosby.

Nolte, J. & Angevine, J.B. (2008). The Human Brain, In photographs and diagrams, Sixth Edition. St Louis: Mosby.

ONLINE TEXTBOOK

<http://neuroscience.uth.tmc.edu/>

INTERNET RESOURCES:

Each class session is linked to websites that can be used for additional information. Also, I have included a few general websites that are of interest to students pursuing a degree in speech pathology and audiology.

1. <http://visiblehuman.epfl.ch/intapplet.php> (Visible Human Server)
2. <http://www.med.harvard.edu/AANLIB/home.html> (MRI)
3. http://www.med.wayne.edu/diagradiology/anatomy_modules/brain/brain.html
4. <http://www.loni.ucla.edu/SVG/Animations/Anatomy.html> (animations)
5. <http://www.strokecenter.org/prof/> (stroke information)
6. <http://www.nidcd.nih.gov/Pages/default.aspx> (NIDCD) <https://www.nidcd.nih.gov/order/> (free publications)
7. <http://www.ninds.nih.gov/> (NINDS) http://www.ninds.nih.gov/disorders/disorder_index.htm (neurologic disorders)
8. <http://www.nimh.nih.gov/> (NIMH)
9. <http://afni.nimh.nih.gov/afni/> (fMRI programs and information)
10. <http://ctl.augie.edu/perry/ear/ear.htm>
11. <http://www.meddean.luc.edu/lumen/MedEd/neurology/topics.htm>
12. <http://www.audiology.org/Pages/default.aspx>
13. <http://www.asha.org/>
14. <http://www.hhmi.org/biointeractive/neuroscience/video.html> (neuroscience videos)
15. <http://www.opencolleges.edu.au/informed/learning-strategies/>
16. Or, type key words such as neuroscience, neuroanatomy, and neurophysiology in search engines.

COURSE OBJECTIVES:

The student will be able to demonstrate:

1. Knowledge of the basic communication process
2. Knowledge of the various portions of the central and peripheral nervous systems
3. Knowledge of the sensory systems
4. Knowledge of the human auditory mechanism including anatomy and neuroanatomy of the peripheral and central systems
5. Knowledge of the cranial nerves, especially those involved in the process of speech and hearing

ASSIGNMENTS:

1. Readings: Students are required to read the course material and supporting instructional materials.
2. Due to the nature of the field of Communication Sciences and Disorders, **Student Participation** in class activities and discussions is encouraged.
**CLASS PARTICIPATION AND INVOLVEMENT IS ENCOURAGED. STUDENTS ARE FREE TO ASK QUESTIONS, PARTICIPATE IN CLASS DISCUSSIONS, AND SHARE THEIR PERSONAL EXPERIENCE. Bonus points will be given to academically and collegially active students. The professor reserves the rights in granting bonus points only to eligible students who meet his criteria in class participation.
3. Term Project: Each student is required to sketch three neuroanatomical diagrams (e.g., pathways of the nervous system, sections of spinal cord, cerebrum, cerebellum, sensory systems, etc.). They have to be colored and each anatomical portion must be labeled (at least 20 landmarks) (paper size 16X13 inches or greater). Include all of your references and sources. Plagiarism will not be tolerated. Sketches should not be from the class textbook. Students are encouraged to use illustrations from neuroanatomy atlases

and figures from the reliable internet resources. Please see the course professor if you have any questions regarding to your project. Failure to submit your assignment on the stated due date will result, automatically, in a grade of "F".

GRADING POLICY:

1. Project: 10% (i.e., 10 points) of your final grade.
2. Three tests will be given (each will be 1/3 of the remaining 90 points).

GRADING SCALE:

A	=	93-100	C+	=	77-79.99	F	<=	62.99%
A-	=	90-92.99	C	=	73-76.99			
B+	=	87-89.99	C-	=	70-72.99			
B	=	83-86.99	D+	=	67-69.99			
B-	=	80-82.99	D	=	63-66.99			

ATTENDANCE POLICY: According to University policies “Students are expected to attend all of their scheduled University Classes and to satisfy all academic objectives as outlined by the instructor.” Attendance includes meaningful, active involvement in all class sessions, class discussions, and class activities as well as professional, ethical, conduct in class. Reasonable accommodations are made for religious observances. .

STUDENTS WITH DISABILITIES: In Compliance with The Americans with Disabilities Act (A.D.A.), students who require special accommodations due to a disability to properly execute coursework must register with the Office for Students with Disabilities (OSD) located in Boca – SU 133 (561-297-3880), in Davie – MOD I (954-236-1222), or in Jupiter – SR 117 (561-799-8585) and follow all OSD procedures. The purpose of this office “is to provide reasonable accommodations to students with disabilities.” Students who require assistance should notify the professor immediately by **submitting a letter from the Disabilities Office to your instructor** requesting your need of specific assistance. Without such letter, the instructor is not obligated to make any accommodations for students.

CODE OF ACADEMIC INTEGRITY: Students at Florida Atlantic University are expected to maintain the highest ethical standards. Academic dishonesty, including cheating and plagiarism, is considered a serious breach of these ethical standards, because it interferes with the University mission to provide a high quality education in which no student enjoys an unfair advantage over any other. Academic dishonesty is also destructive of the University community, which is grounded in a system of mutual trust and places high value on personal integrity and individual responsibility. Harsh penalties are associated with academic dishonesty. For more information, see http://www.fau.edu/regulations/chapter4/4.001_Code_of_Academic_Integrity.pdf.

CELLPHONE POLICY: Off or silent mode!

ELECTRONIC ETIQUETTE: We are living in an electronic era. Use of technology in my classes is acceptable as long as there is no abuse. You can use your laptop in my class for note taking or surfing the web for course materials ONLY.

TEXT MESSAGING AND E-MAIL CHECK: Not acceptable!!! However, multi tasking is possible for the young minds like yours. If you choose to text during the class the professor has the right to ask questions from you about the lecture. If you fail to provide him with correct/ appropriate answer you will lose the privilege to use texting for the rest of the semester.

POLICY REGARDING PLAGIARISM AND CHEATING (partially adopted from Deena L. Wener, PhD):

There is a zero-tolerance policy for students found plagiarizing or cheating. Students who are found cheating or plagiarizing will receive an immediate “F” in the course.

Plagiarism, as defined by Webster’s Unabridged Dictionary, is:

“The unauthorized use or close imitation of the language and thoughts of another author and the representation of them as one’s own original work.”

Plagiarism encompasses both the presentation of a prominent or published author’s work as your own and the presentation of another student’s work as your own. This also includes presenting another’s thoughts or opinions as your own in oral presentation.

Cheating, with regard to exams, as defined by Webster’s Unabridged Dictionary, is:

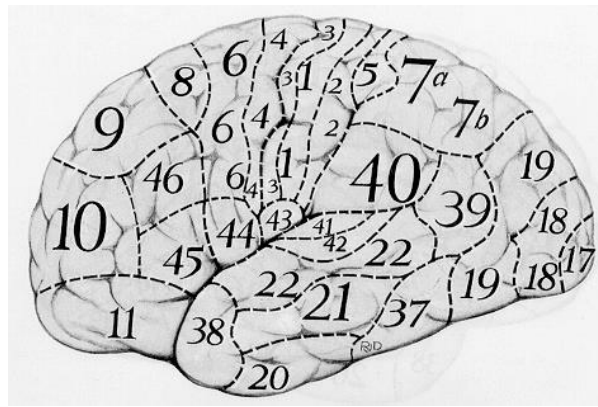
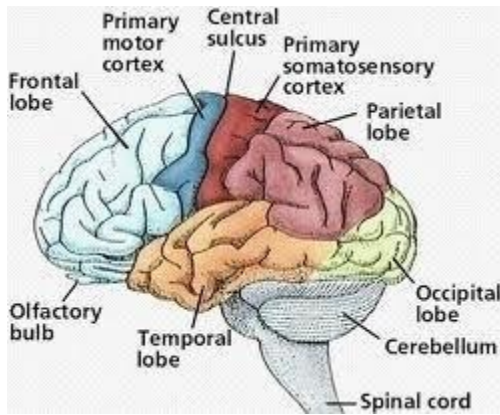
“The taking of an examination or test in a dishonest way, as by improper access to answers.”

Examples would include, but are not limited to, copying answers from another student’s paper or bringing written answers into an exam without authorization.

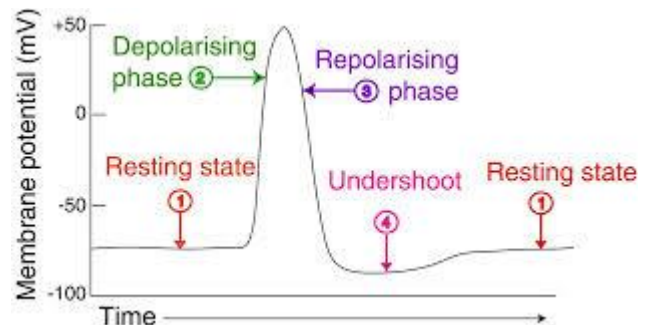
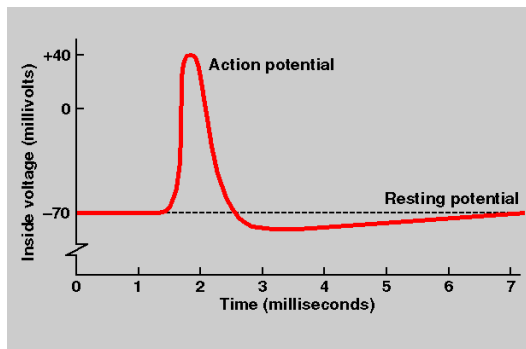
NOTE: ALL OF THE PPT PRESENTATIONS WILL BE AVAILABLE AT BLACKBOARD 9 IN PDF/PPT FORMAT.

CONTENT OUTLINE:

Date	Topic/Reading
1/5/15	Introduction to neuroscience, Chapter 1 (essential concepts and principles. What is neuroscience? Why neuroscience of communication, neuroanatomical and neurophysiological terminology) http://braininfo.rprc.washington.edu/ http://www9.biostr.washington.edu/da.html
1/12/15	Introduction to the gross structure of the brain, OPTIONAL READING Chapters 2,3&4 http://www.med.harvard.edu/AANLIB/home.html http://www.pbs.org/wnet/brain/3d/ (3D Animation)
1/19/15	No Class. M.L. King Jr. Holiday



1/26/15	Morphological Neuroscience and Gross Anatomy. Gross anatomy of the brain continued (anatomical organization of the structures) OPTIONAL READINGS Chapters 2,3&4 http://www.mayfieldclinic.com/PE-AnatBrain.htm
---------	--



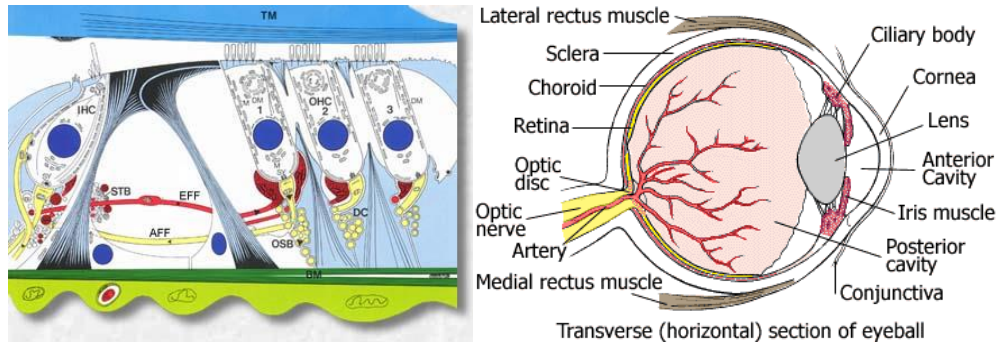
2/02/15	Cellular neuroscience, OPTIONAL READINGS Chapter 5 (introduction to the neurons, neurophysiology of neurons, synapses, action Potential....) http://highered.mcgraw-hill.com/sites/0072495855/student_view0/chapter14/animation_the_nerve_impulse.html (Action Potential) http://outreach.mcb.harvard.edu/animations/actionpotential_short.swf http://www.med.harvard.edu/aanlib/cases/caseM/case.html
---------	--

2/09/15	Test One. Diencephalon, Thalamus and associated structures, structural basis of thalamic nuclei, OPTIONAL READINGS Chapters 6,7,8, anatomy of cerebrum, Brodmann areas http://www.umich.edu/~cogneuro/jpg/Brodmann.html http://www.slideshare.net/ananthatiger/anatomy-of-thalamus
---------	---

2/16/15

Somatosensory system. Introduction to human senses Chapters 11. Sensory systems (somesthetics (chapter 11), vision (chapter 12), gustation, olfaction), brief description of the structure and central pathways.

http://www.kumc.edu/instruction/medicine/anatomy/histoweb/eye_ear/eye_ear.htm
<http://nba.uth.tmc.edu/neuroscience/s2/chapter04.html>



2/23/15

Sensory Systems continued. Introduction to Hearing and Balance. Hearing and Balance, OPTIONAL READINGS Chapters 9-10 (anatomy of the peripheral systems, neuroanatomy of the systems). Vestibular system.

<http://ctl.augie.edu/perry/ear/hearmechn.htm>
<http://www.britannica.com/EBchecked/topic/175622/human-ear/65062/The-physiology-of-balance-vestibular-function>

3/02/15

Spring Break (No Class). March 2-8.

3/09/15

Hearing and Balance Continued. Introduction to the Central auditory pathway, (description of the nuclei, bundles, tracts, and pathways involved in the processing of the acoustic stimuli)

<http://www.utmb.edu/otoref/grnds/Vestibular-2004-0414/Vestibular-2004-0414.htm>
http://www.health.utah.edu/pt/facultystaff/materials/courses/Vestib_APreading_sm.pdf
<http://nba.uth.tmc.edu/neuroscience/s2/chapter11.html>

3/16/15

Test Two The Auditory and Vestibular systems and Central Auditory Pathways Continued.

<http://www.soc.northwestern.edu/brainvolts/#>
<http://neuroscience.uth.tmc.edu/s2/chapter13.html> (interesting animation to see)
<http://earlab.bu.edu/>

3/23/15

Motor System. Anatomy of the spinal cord, brainstem, and the cerebellum, OPTIONAL READINGS Chapters 13-15

<http://www.neuroanatomy.wisc.edu/coursebook/motor1.pdf>
<http://pathology.mc.duke.edu/neuropath/nawr/motor-systems.html>

3/30/15

Anatomy of the spinal cord, brainstem, and the cerebellum, continued. Cranial Nerves and Introduction to diencephalon, OPTIONAL READINGS Chapters 13-15 AND Motor system Continued.

<http://www.meddean.luc.edu/lumen/MedEd/Neuro/frames/nlDEs2/NL13FR.HTM>
http://library.med.utah.edu/neurologicexam/html/cranialnerve_abnormal.html#01 (video clips for the evaluation of the neurological system and cranial nerves) (Neurological exam)

4/6/15

Cranial Nerves Chapter 17, Limbic system, re-examination of cerebrovascular system, re-examination of the ventricular system and CSF circulation. OPTIONAL READINGS Chapters 16-18

<http://www.wisc-online.com/Objects/ViewObject.aspx?ID=AP11504> (interesting animation)

4/13/15

Project Due Date. Cortical organization of the language and higher mental function, OPTIONAL READINGS Chapters 18 & 19, (language centers of the brain, Brodmann areas, etc.) . Speech production and its neural organization. Neural bases of Speech and Language.

http://physics.ucsd.edu/neurophysics/courses/physics_171/Barbas.pdf

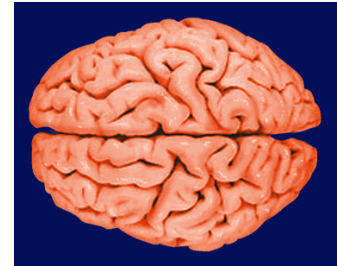
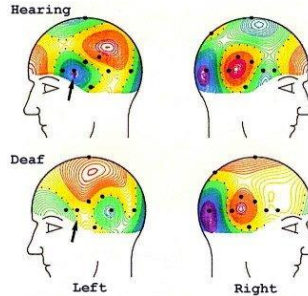
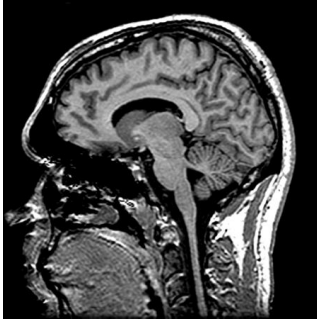
Diagnostic, Neuroimaging and Brain mapping techniques (MRI, fMRI, PET, SPECT, MEG, EEG and Evoked potential mapping). OPTIONAL READINGS Chapter 20

<http://www.ismrm.org/resources/mr-sites/#Tutorials> (MRI)

<http://surfer.nmr.mgh.harvard.edu/>

<http://www.loni.ucla.edu/SVG/Animations/Anatomy.html>

<http://www.cis.rit.edu/htbooks/mri/inside.htm>



4/20/15

MRI DATA REVIEWS

<http://www.users.on.net/~spinupdownunder/>

4/27/15

Test Three

