

## DEPARTMENT OF COMMUNICATION SCIENCES AND DISORDERS

### FLORIDA ATLANTIC UNIVERSITY

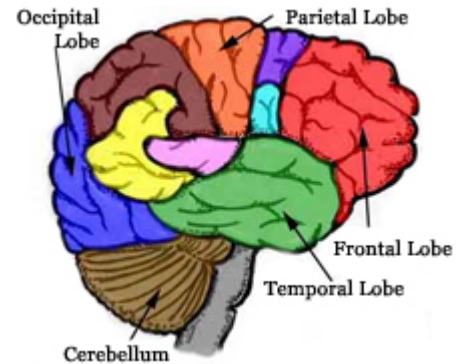
Course Syllabus

SPA 4104

*Neural Bases of Speech, Language, and Hearing*

Spring 2009

[http://www.coe.fau.edu/csd/SPA\\_4104.htm](http://www.coe.fau.edu/csd/SPA_4104.htm)



**Professor:** Dr. Ali Danesh

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**E-mail:** [danesh@fau.edu](mailto:danesh@fau.edu)

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

**Class Time:** 4:00-6:50 p.m. Tuesdays

**Class Location:** ED 124

**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.

**COURSE TEXT:** Subhash C. Bhatnagar (2008). Neuroscience for the study of Communicative Disorders, 3<sup>rd</sup> Edition. Philadelphia: Wolters Kluwer/Lippincott Williams & Wilkins. ISBN: 978-0-7817-8990-5

#### ASSOCIATED WEBSITE FOR STUDENT RESOURCES:

[HTTP://THEPOINT.LWW.COM/BHATNAGAR3E](http://THEPOINT.LWW.COM/BHATNAGAR3E)

**SUPPLEMENTAL TEXT (NOT REQUIRED):** Webster, Douglas B. (1999). Neuroscience of Communication, 2<sup>nd</sup> 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. (2001). Neuroscience Exploring the Brain, 2<sup>nd</sup> 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. (2000). The Human Brain, In photographs and diagrams, Second Edition. St Louis: Mosby.

## 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://www.ismrm.org/mr\\_sites.htm](http://www.ismrm.org/mr_sites.htm) (MRI)
2. <http://www.neuropat.dote.hu/>
3. <http://www.loni.ucla.edu/SVG/Animations/Anatomy.html> (animations)
4. <http://www.strokecenter.org/prof/> (stroke information)
5. <http://www.nih.gov/nidcd/>
6. <http://www.ninds.nih.gov/>
7. <http://www.nimh.nih.gov/>
8. <http://afni.nimh.nih.gov/afni/> (fMRI programs and information)
9. <http://ctl.augie.edu/perry/ear/ear.htm>
10. <http://www.meddean.luc.edu/lumen/MedEd/Neuro/Neuro.html>
11. <http://www.audiology.org/index.htm>
12. <http://www.asha.org/>
13. <http://www.neuropat.dote.hu/myelin.htm>
14. 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 text and other supporting 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 DESIRED. 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, 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. Please see me 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:**

Regular attendance is expected. Only absences occasioned by an emergency or illness (with supporting documents), and university sponsored activities will be excused. More than two unexcused absences will result in 10 points reduction from your final grade. If you miss an exam, because of an emergency, it is your responsibility to contact the professor ASAP for a make-up examination.

**CHEATING POLICY:**

Any kind of cheating, including conversation during the exams and plagiarism, will result in an F grade. Submitted materials are subject to inspection using turnitin.com software.

Honor Code:

*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\\_Honor\\_Code.pdf](http://www.fau.edu/regulations/chapter4/4.001_Honor_Code.pdf).*

**CELLPHONE/TEXT MESSAGING POLICY:**


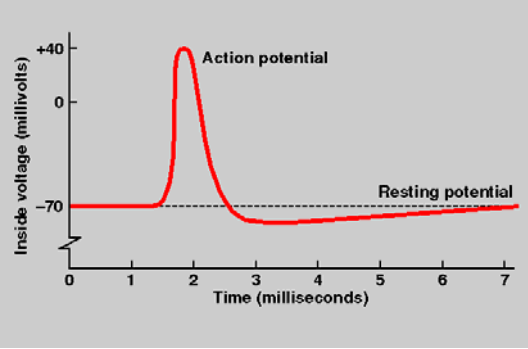
Please use extra caution with cell phone use in the class. Cell phones should be turned into "silent" or "vibration" modes during the class time. **NO TEXT MESSAGING IS PERMITTED DURING CLASS.**

**STUDENTS WITH DISABILITY:**

In compliance with the Americans with Disabilities Act (ADA), 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 Raton - SU 133 (561-297-3880), in Davie - MOD I (954-236-1222), in Jupiter - SR 117 (561-799-8585), or at the Treasure Coast - CO 128 (772-873-3305), and follow all OSD procedures.

NOTE: ALL OF THE PPT PRESENTATIONS WILL BE AVAILABLE AT MYFAU IN PDF FORMAT.

**CONTENT OUTLINE:**

<b>Date</b>	<b>Topic/Reading</b>
1/6/09	Introduction to neuroscience, Chapter 1 (essential concepts and principles. What is neuroscience?, why neuroscience of communication?, neuroanatomical and neurophysiological terminology) <a href="http://braininfo.rprc.washington.edu/mainmenu.html">http://braininfo.rprc.washington.edu/mainmenu.html</a> <a href="http://www.neuropat.dote.hu/">http://www.neuropat.dote.hu/</a>
1/13/09	Introduction to the gross structure of the brain, Chapters 2,3&4 <a href="http://www.med.harvard.edu/AANLIB/home.html">http://www.med.harvard.edu/AANLIB/home.html</a> <a href="http://medlib.med.utah.edu/WebPath/HISTHTML/NEURANAT/NEURANCA.html">http://medlib.med.utah.edu/WebPath/HISTHTML/NEURANAT/NEURANCA.html</a>
	
1/20/09	Morphological Neuroscience and Gross Anatomy. Gross anatomy of the brain continued (anatomical organization of the structures) Chapters 2,3&4 <a href="http://rpiwww.mdacc.tmc.edu:80/se/anatomy/brain/">http://rpiwww.mdacc.tmc.edu:80/se/anatomy/brain/</a> <a href="http://science.nhmccd.edu/biol/cardio/willis.htm">http://science.nhmccd.edu/biol/cardio/willis.htm</a>
	
1/27/09	Cellular neuroscience, Chapter 5 (introduction to the neurons, neurophysiology of neurons, synapses, action Potential...) <a href="http://www.neuro.wustl.edu/neuromuscular/lab/schcell.html">http://www.neuro.wustl.edu/neuromuscular/lab/schcell.html</a> <a href="http://www.awa.com/norton/struc/chap_02/2_18.html">http://www.awa.com/norton/struc/chap_02/2_18.html</a>
2/3/09	Diencephalon, Thalamus and associated structures, structural basis of thalamic nuclei, Chapter 6, anatomy of cerebrum, Brodmann areas <a href="http://www.sci.uidaho.edu/med532/thalamus.htm">http://www.sci.uidaho.edu/med532/thalamus.htm</a> <a href="http://www.umich.edu/~cogneuro/jpg/Brodman.html">http://www.umich.edu/~cogneuro/jpg/Brodman.html</a>

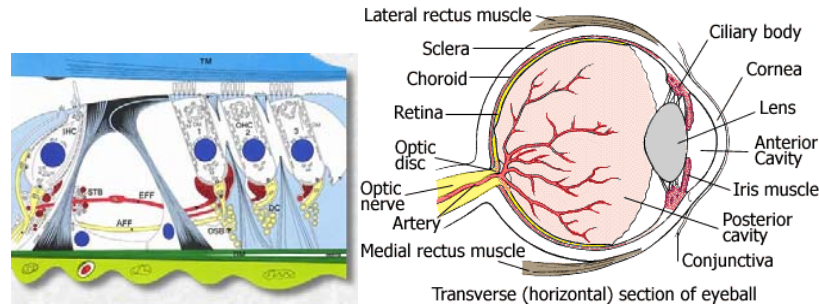
2/10/09

**Test One.** Somatosensory system. Introduction to human senses Chapters 7-8. Sensory systems (somesthetics, vision, gustation, olfaction), brief description of the structure and central pathways.

[http://www.kumc.edu/instruction/medicine/anatomy/histoweb/eye\\_ear/eye\\_ear.htm](http://www.kumc.edu/instruction/medicine/anatomy/histoweb/eye_ear/eye_ear.htm)

<http://www.cs.utexas.edu/users/jbednar/papers/bednar.thesis/node6.html>

<http://thalamus.wustl.edu/course/body.html>



2/17/09

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

<http://thalamus.wustl.edu/course/audvest.html>

<http://inst.augie.edu/~hanavan/media/ohc/index.html>

<http://ctl.augie.edu/perry/ear/hearmechn.htm>

[http://nba5.med.uth.tmc.edu/academic/neuroscience/lectures/section\\_2/lecture25\\_01.htm](http://nba5.med.uth.tmc.edu/academic/neuroscience/lectures/section_2/lecture25_01.htm)

2/24/09

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://serous.med.buffalo.edu/hearing/auditory\\_cortex.html](http://serous.med.buffalo.edu/hearing/auditory_cortex.html)

3/03/09

Spring Break (No Class).

3/10/09

Central Auditory Pathway Continued.

3/17/09

Motor System. Anatomy of the spinal cord, brainstem, and the cerebellum, Chapters 11-14.4

<http://www.meddean.luc.edu/lumen/MedEd/Neuro/Neuro.html>

<http://www.vh.org/adult/provider/anatomy/BrainAnatomy/Ch3Text/Section01.html>

3/24/09

**Test Two.** Anatomy of the spinal cord, brainstem, and the cerebellum,

continued. Cranial Nerves and Introduction to diencephalon, Chapters 11-14

<http://www.meddean.luc.edu/lumen/MedEd/Neuro/frames/nlDEs2/NL13FR.HTM>

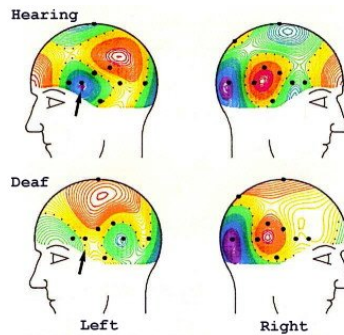
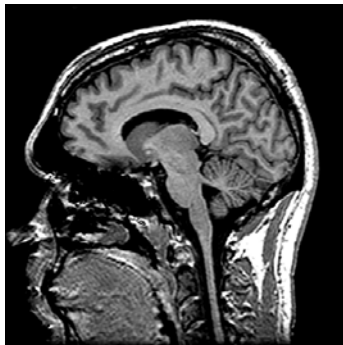
<http://128.104.8.64/neuroweb.html>

[http://medlib.med.utah.edu/neurologicexam/html/home\\_exam.html](http://medlib.med.utah.edu/neurologicexam/html/home_exam.html) (videoclips for the evaluation of the neurological system and cranial nerves).

3/31/09

Motor system Continued.

- 4/7/09 Cranial Nerves Chapter 15, Limbic system, re-examination of cerebrovascular system, re-examination of the ventricular system and CSF circulation. Chapters 16-18
- 4/14/09 Cortical organization of the language and higher mental function, Chapter 19, (language centers of the brain, Brodmann areas, etc.) . Speech production and its neural organization. Neural bases of Speech and Language.  
<http://thalamus.wustl.edu/course/sleep.html>  
<http://www.neuropat.dote.hu/myelin.htm>  
<http://earlab.bu.edu/intro/auditorypathways.html>
- 4/21/09 **Project Due Date.** Diagnostic, Neuroimaging and Brain mapping techniques (MRI, fMRI, PET, SPECT, MEG, EEG and Evoked potential mapping). Chapter 20  
[http://www.ismrm.org/mr\\_sites.htm](http://www.ismrm.org/mr_sites.htm) (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>



4/28/09 **Test Three.**

Neuroscience Seminar, Biomedical Center (TBA).