

CMSD 6800 / 4800

PRINCIPLES OF COMMUNICATION NEUROSCIENCE

(Soon to be formally known as: *Neural Bases of Speech, Language & Hearing*)

FALL 2004

**M, W, F 3:35 PM - 4:25 PM
HRS.)**

ADERHOLD 581 (3

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COURSE OVERVIEW

CMSD 6800 / 4800 is a lecture-style course designed to provide select 4th year undergraduate majors and 1st year graduate students in CSD with a basic yet thorough understanding of the current principles in molecular through systems neuroscience related to normal neuromuscular control and somatosensation. Particular emphasis is paid to sensorimotor control of the human vocal tract during communication, vocalization, and certain non-speech behaviours. Select disorders will also be discussed to highlight the effects of breakdowns in normal speech neurophysiology and control. Hands-on laboratory experiences will be provided throughout the semester when feasible. The content areas to be covered in CMSD 6800 / 4800 include the following topics (time permitting):

- Neuroanatomy and gross structure of the human nervous system.
- Cellular and microstructure of the nervous system.
- Basic molecular neurobiology, neural signaling, & synaptic transmission.
- Sensory Transduction and Perception.
- Somatosensory Systems.
- Motor Systems (Direct and Indirect systems)
- Brainstem Systems and the Cranial Nerves.
- Neural Substrate of Speech and Vocalization.
- The Cerebral Cortex and Plasticity.
- Central Auditory Neurophysiology.

COURSE OBJECTIVES (ASHA Standard met in parentheses)

- Demonstrate the ability to comprehend, conceptualize, and integrate the basic underlying principles of neuroanatomy and neurophysiology. (III-A)
- Demonstrate comprehension & correct use of standard neuroscience terminology. (III-A)

- Comprehend, integrate, relate, and explain the basic principles of neuromotor control and somatosensation. (III-A)
- Demonstrate the ability to memorize, visually identify, and verbally describe the location and function of all neuroanatomical areas and systems, along with their substructures, both in general and for speech and/or vocalization. (III-B)
- Appreciate the 3-D structure of the nervous system and how different areas of the nervous system are related to one another from an anatomical and physiological standpoint. (III-A)
- Demonstrate the ability to analyze, synthesize, and evaluate the importance of relationships that exist among motor and sensory systems during functional control of the human vocal tract (from idealization to production). (III-B)
- Appreciate and explain the comparative diversity of human neuroanatomy and neurophysiology as it pertains to vocalization in different species, age group populations, and genders and across populations with differing levels of health, trauma, disease, or disorder. (III-B)
- Be able to relate and integrate your knowledge of normal neuroanatomy and neurophysiology to appreciate and explain the pathophysiology of speech and non-speech disorders due to brain injury, and certain progressive disease processes. (III-C)

WebCT & LISTSERVS

- **WWW:** Open your preferred web browser and go to the following URL: <https://webct.uga.edu/> . You must have a “UGA MyID” to access WebCT. For those students who do not have a “UGA MyID” yet, you can quickly create one at: <http://www.uga.edu/myid> .
- **Listserv:** Check your e-mail frequently for class announcements from our course listserv. (neurospeech-L@listserv.uga.edu)

REQUIRED TEXTBOOKS & SUPPLIES

1. Purves, et al. (2004). **Neuroscience (3rd Ed)**. Sinauer Publishing Group.
2. Haines, D.E. (2004). **Neuroanatomy: An Atlas of Structures, Sections, & Systems (6th Ed.)** Lippincott Williams & Wilkins Publishing.
3. **Highly Recommended:** a medical dictionary of your choice (Tabers, Stedmans, etc).
4. Access to a PC or MAC computer with a fast CD-ROM drive.
5. Internet connectivity and access.
 - Lecture outlines will be available for you to download from our course website on WebCT. The purpose of these outlines is to provide you some help in following the lecture and improving your real-time comprehension of the material. Outlines will generally be available the evening before a scheduled lecture or lecture series. I will announce when they are posted too, ...usually through the class listserv.
 - **A word of advice:** The lecture outlines constitute a useful aide (hopefully) for lectures and are not a substitute for your class attendance. The outlines are just that, ...“outlines”. **They do not contain anywhere near all of the material (lecture or graphics) presented in class.** I’m a big advocate of physically writing notes during class. I’ve always found that those who physically write notes tend to do better than average.

GRADING & ASSESSMENT PROCEDURES

Class Participation (10 points out of 300)

- Up to **10 points for class participation** are available for you to earn.
- By participation I mean the following:
 - Visiting with me during office hours to discuss your progress or any problems.
 - Regular class attendance and being on time.
 - Keeping focused for the full 55 minutes of class.
 - Asking good questions in class that further the topic we are talking about,
 - Being prepared for class each day by doing your readings & reviewing your notes.
 - Attending any scheduled labs.
 - Turning stuff in on time.
 - Cheering for the Yankees, and making nasty, disparaging remarks about the Mets, etc, etc... (just kidding - ☺)

Pop Quizzes (50 points out of 300)

- Five pop quizzes will be given during the semester. The purpose of these pop quizzes is to make sure you are staying up and current with the course content, especially the neuroanatomy from your Haines brain atlas. Each quiz will be approximately 15 minutes long, and objective in format. Each quiz will be worth 10 points.

Exams (100 points out of 300)

- A total of 2 exams will be administered during the semester, each worth 50 points. All exams will typically include the following types of questions; multiple choice, fill-ins, matching, true-false, labeling figures, and some simple figure or flowchart drawing. Essay questions are my preferred mode of questioning and may likely constitute a significant proportion of an exam. You will have the full class period to complete the exam. Exam questions will be derived from lectures, outlines, textbook readings, and any other outside readings that are assigned.
 - BTW, My general answer to the most often asked question, "*What's on the exam?*" ...is usually, ... "*Everything*".
 - Because communication neuroscience is so interactive and complex, all the information we do in class is equally important, but in different ways and to differing degrees.
 - This course is VERY additive in that your understanding of new concepts depends strongly on your understanding and retention of past material.
 - You have to know it all to be able to understand the dynamics of the nervous system.

Exam 1 (50 pts)	September 29 th
Exam 2 (50 pts)	November 5 th
Final Exam (100 pts)	Wednesday, December 15 th , 3:30 - 6:30 pm

* Exam dates are subject to change at the discretion of the instructor.

Final Exam (80 points out of 300)

- The Final exam is worth 80 points and will be cumulative across the semester's content with much greater emphasis on material since Exam 2.

Research Essays (60 points out of 300) [ASHA standard V-A]

- All students will write **three 1 page (single space) research essays** during the semester, each worth 20 points. The essay topics will be assigned as we go along during class (approximately every 3 - 4 weeks) and will correspond with current and past lecture/reading material. The essays will require integration and critical evaluation of the topic. Each essay must be completed individually. No collaborative efforts are allowed.
- You are free to use any scholarly research journal in the allied-health, medical-neurology, and neuroscience domain as a reference, as well as authored textbooks and reviews.
 - However, you may **NOT** use any generic websites, e-journals (unless the e-journal is directly associated with a peer-reviewed print research journal), internet newsgroups, or listserv discussions as a reference.
 - If you are unsure whether a website or internet resource is legit, just ask me...I'd be happy to give you advice.
 - Feel free to consult with me as you collect journal articles or books too, ...just to make sure you're on the right track.
- **An important source for journal references can be found on Medline or PubMed, using typical keyword search strategies.**
 - <http://www.ncbi.nlm.nih.gov/PubMed/>
- **Research Central @ the UGA Libraries is a new resource that is available to all students. It provides a gateway to research resources**
 - <http://www.libs.uga.edu/researchcentral/>
- **Due Dates:** Essays will typically be due one week after they are assigned, but this is flexible and negotiable. Please submit your paper as a hardcopy to my office.
- **Formatting:** The body of the essay must **NOT be more than 1 page (single-sided and single spaced)**. References may be single spaced and placed on a separate page. Papers must be word-processed and proofed carefully before submission. Use 12 pt font. Format using 1" margins. Please place your ID number in the top right corner. Do not place your name anywhere on your essay. I plan to grade and evaluate these essays blindly. References are to be in APA format.

- **Evaluation:**

- Did the writer defend their position using the appropriate research literature or course material effectively? Does the writer demonstrate an understanding of the topic? Were the writer's points clearly stated and supported by their references? Was the content accurate, integrative, and critically evaluated? (15 points)
- Did the paper flow in a logical and organized manner? Was it well constructed in terms of grammar, spelling, presentation, punctuation, etc? Did the paper adhere to APA form? (5 points)

FINAL GRADES

- The course is graded on an linear whole-number point scale rather than on percentages. Please do not translate your point score into a percentage. The main reason I use a point scale is to try and avoid the dreaded "*rounding up or down*" issue associated with percentages.
- As such, your final grade for this course will be based on a grand total of **300 points** summed across all of your exam scores, the research paper, your participation score, pop quiz score, and the final exam. Point totals will be translated into letter grades as follows:
 - 270-300 pts = A
 - 240-269 pts = B
 - 210-239 pts = C
 - 180-209 pts = D
 - 000-179 pts = F

COURSE POLICIES SPECIFIC TO THIS CLASS

- Those students with documented special needs (such as cognitive, learning or physical handicaps), please see me during the first few days of class so that we may discuss your case and plan any modifications to the course that may be necessary.
- A grade of C or better is required in order for this course to count toward your completion of a graduate degree in Communication Sciences. For undergraduates, this course is an elective.
- Midpoint withdrawal deadline is Friday, October 15th.
- There are no extra-credit assignments provided, even if your final course score is 1 point away from a breakpoint on the grading scale.
 - I recognize that it is difficult to be 1 point shy of the next highest grade, but please do not ask for any final grade adjustments. In all fairness to everyone enrolled, ...what I do for one person, I must do for all.
- Attendance at all lectures is expected from everyone, but I won't be taking it formally.
- You are responsible for obtaining copies of any class notes or handouts that were presented and distributed on a day you were absent. Typically, extra copies of handouts can be found in one of the plastic bins on my office door.

- Pop quizzes can not be made up if missed under any circumstances, except in cases of sudden and severe illness. The illness must be documented and acceptance of the excuse is at the discretion of the instructor (see policy below for general details).
- Finally, please be sure to turn off the ringers on your cell phones. Instead, program your cells for vibration mode.

ILLNESS AND ABSENCE POLICY FOR EXAMS

- At the discretion of the instructor, make up exams will be given in cases of documented illnesses and/or emergencies. Documentation must be in the form of an excuse slip or written note from the Health Center or your personal physician, respectively.
- In case you are ill or have an emergency, please let me know your status within 48 hours after the missed exam date by e-mail or in person. Please, do not leave a voice message on my phone. I'm really bad about checking voice mail.
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- Any notification after the 48 hour period will not be accepted and you will not be able to make up the missed exam. Please don't let this happen.
- Make up exams will also be provided for students who observe religious holidays.
 - To make up an exam, you must inform me of your absence 48 hours prior to the exam date. We can arrange a mutually agreeable time for your make up.
 - If you inform me of your religious observance after the exam though, you will not be allowed to make up the exam unless you have a tremendously good excuse.
 - Accepting this excuse and providing a makeup exam is up to the discretion of the instructor.

ACADEMIC HONESTY & INFORMATION

- Let me start off by saying that the following information is **not** meant to scare you but rather to inform you, so you and I can avoid misunderstandings that pertain to your work.
 - Part of your training in CSD involves understanding ethics and ethical behaviour in practice and research. Information on academic honesty is the first step toward this goal.
- As a member of this class and a student at UGA, you are honor bound to observe and demand academic honesty and integrity from yourself and those around you.
- The University of Georgia's Policy on Academic Honesty will be STRICTLY followed for this course. In summary, all students are responsible for maintaining the highest standards of honesty and integrity in every phase of their academics. The penalties for academic dishonesty are severe and *ignorance is not an acceptable defense*. All students are responsible for informing themselves about UGA's academic honesty standards before performing any academic work. You can familiarize yourself with the UGA Academic Honesty Policy by referring to the following web page for details:

http://www.uga.edu/ovpi/academic_honesty/academic_honesty.htm

- As recommended by *UGA's Office of Vice President for Instruction*, a few examples of academic dishonesty specific to this course are offered:
 - Using references or detailed information from the internet without properly crediting or citing original authorship and passing this information off as your own original work.
 - Working collaboratively with other students to develop and write the research essay. In other words, two or more students working together to come up with a single argument that each person then uses for their own paper.
 - Purchasing pre-completed papers from the internet and passing them off as your own original work.
 - Knowingly ignoring someone else's dishonesty by not reporting the transgression.
- Please refer to your current student bulletin and the Fall 2004 Schedule of Classes for details about drop/add, course withdrawal policies and procedures, and any other general UGA academic policies.

EXPECTATIONS

- Always remember
 - "Don't study harder,...*Study smarter!*".
- Take responsibility for your own learning. Be proactive by:
 - Seeking out help early when something is not clicking,
 - Introducing yourself to me and being sure to come to office hours,
 - Seek out study partners,
 - Brainstorm different ways to take notes in class or study for assignments,
 - Practice integrative and technical writing skills all the time.
 - Challenge yourselves to integrate information as much as possible across **ALL** of your CMSD classes.
- I will be expecting you to:
 - Think about and integrate the information we are working on, not simply memorize it.
 - Evaluate the context in which that information was presented to you,
 - Be able to explain clearly how information fits together with other things we are learning.
- ASK QUESTIONS IN CLASS. I cannot emphasize this suggestion enough.
 - There is NO such thing as a stupid or silly question, so..... Please ask if something related to the lecture is not clear in your mind. I'm a pretty nice fellow (although my kids think I'm really silly) and I won't yell at you or sic my Uncle Vinnie from New Jersey on you for asking questions.
- You'll find that the class picks up speed after the first month or so, especially as we start delving in the systems portion of the course.
 - You will be expected to have mastery of anatomical sites and labels, terminology and basic principles of nervous system function by then.

- College level organization, grammar, punctuation, syntax, etc. are expected from all students on any form of writing assignment. By default, always refer to the APA manual (latest edition) for any needed writing or stylistic conventions.
 - If these mechanics remain a difficulty for you, please see me toward the start of the semester so that we can work on strategies to help you improve your writing skills.
- I hope that when you finish this course you are,
 - Reading differently,
 - Writing differently,
 - Thinking differently,
 - Organizing your time differently, and
 - Acting differently.

SOME FRIENDLY SUGGESTIONS AND STUDY TIPS TO HELP YOU SUCCEED

- The #1 tip I can give you is.....Take advantage of my stuttering to finish writing notes or to reflect upon something I just said.
 - Since I have built-in pauses (and some of them can be long), you might as well use them! No sense wasting a good thing I always say.
- Read and use your syllabus – read it thoroughly and refer to all parts of it often, not just the list of dates and assigned stuff.
 - The syllabus includes lots of useful and necessary information (like this stuff in this section) about the class, including such things as grading rubrics, hints for success, and explicit and implicit information about the instructor’s assumptions and expectations.
- Read over the section in **Appendix A**, entitled, “Figuring it Out”. This is a neat reading on the nuts and bolts of figuring out your professor.
- Download the notes from WebCT and review them prior to class.
- Always be prepared and ready to answer questions during any given class.
- Actively take notes in class.
 - Don’t rely on the outlines as your *only* source of lecture information.
 - Like I said before, the key word here is “outline”, ...these handouts are simply a skeleton of the lectures. Your job during class is to elaborate upon the outlines.
- During lecture and when you study, ask yourself “questioning” questions
 - What connections does my instructor want me to see between this material and other things we’ve discussed or read about?
 - How do these different facts fit together?
 - What is the “big picture” or “binding thread” that my teacher is trying to get me to see?
 - What questions would I ask a researcher or author of my reading if I could talk to her/him directly?”
 - How could I explain the importance of this material to a friend?

- Some note taking suggestions:
 - Use a binder to store your notes and papers. Binders make it easy to put in graphics at the right point in a lecture, or to reorganize your notes to make them work for you.
 - Listen, Think,..and then Write (Nist & Holschum, 2002)
 - DO NOT WRITE EVERY WORD I SAY. It's important to be selective about what you write in your notes. Paraphrase my lecture materials.
 - Check-out **Appendix A** - *"Using the Split-Page Method of Note Taking"* – This is one of the most useful ideas I've seen in a while to help you maximize your in-class note taking.
- Remember, that memorizing information is only the first step when you study.
 - When you prepare for an exam, go beyond simply memorizing information, and instead strive for integration, understanding, and comprehension at a deeper "gut" level.
 - Ask yourself, "How do the bits of information I've memorized, fit together into a way that makes sense?"
- Do the readings and do them before lecture.
 - This way the stuff I lecture on isn't brand new to you. It is much easier paying attention to a lecture if you have some basic familiarity with what the professor is talking about.
- Practice active reading strategies. By active reading, I mean the following:
 - Taking notes while reading,
 - Summarize notes into paragraph form,
 - Create margin notes in your textbooks,
 - Merge lecture notes with reading notes,
 - Seek out ancillary information with other sources, etc.
 - Read over **Appendix A** - *"Strategies for Active Reading"*, for more ideas on becoming an active reader.
- Studying ideas and strategies can be found on the last few pages of **Appendix A**.
- Other study ideas include:
 - Develop study groups to help quiz each other and fill-in pieces of information from lecture or the readings that you may have missed.
 - Draw lots of your own pictures and flow charts.
 - Make up your own analogies and real-world examples to help you remember the material as you study. (These tend to stick with you for the long haul)
 - Use the CD-ROM's that accompany your textbooks. Instructions for use are found in the textbooks themselves. These CD-ROM's are excellent for quizzing yourself and studying. They are beautifully designed software packages (*"Man, do I wish I had these when I was in school"*)....please use them.
 - Relate new information as much as possible to something you've already learned.

- Pace yourselves by trying to study your brain atlas a little everyday in order to keep the anatomy fresh in your mind (Trust me, it will be very difficult to cram all this neuroanatomy the night before a quiz or exam – like they say... ‘been there, done that ☺.).
- Review past material and notes before tackling new information. This course is VERY additive in that your understanding of new concepts depends strongly on your understanding of past material.
- **Last, (but not least), if your having trouble with the content, get help from me, the GA or one of you classmates ASAP! Please, don't wait !**
 - Feel free to drop-in and visit with me or the GA during posted office hours in order to ask questions, seek tutoring, or discuss any concerns regarding the class. Questions via e-mail are also very much welcomed. If you cannot attend any of the posted office hours, other meeting times may be scheduled with the instructor by appointment only.
 - **Again, be sure to visit my office hours if you are confused, need further explanations, or simply want to chat about things** (like baseball, “hair” bands of the 80’s, home improvement, baby juggling, the fine art of cleaning jelly out of your DVD player, etc...)

WEB-SITES FOR HELP AND INFORMATION

- CMSD Home Page: <http://www.coe.uga.edu/csd/>
- Login to WebCT: <https://webct.uga.edu/>
- Student Resources for WebCT: <https://webct.uga.edu/www/student.html>
- Browsers configuration information: <http://webct.uga.edu/www/helplets/browser/>
- WebCT Student FAQ: <http://webct.uga.edu/www/student/guide/>
- Student Electronic Services: <http://www.uga.edu/ses/>
- Division of Academic Assistance: <http://www.uga.edu/daa/>
- Important Dates for Students: <http://www.reg.uga.edu/or.nsf/public/acalendar>
- UGA Libraries: <http://www.libs.uga.edu/>
- Research Central @ UGA: <http://www.libs.uga.edu/researchcentral/>
- University Computing and Networking Services: <http://www.uga.edu/ucns/>
- Computer Lab Sites @ UGA: <http://www.uga.edu/ucns/sites/>
- Lastly, it's important to have fun and play too: <http://www.uga.edu/recsports/>

TOPIC SCHEDULE, READINGS, & ATLAS PLATES

- Topic coverage is flexible and strongly influenced by the pace of the class. Changes in the format and pace of the course during the semester are up to the discretion of the instructor.
- The course syllabus is only a **general plan** for the semester and deviations announced to the class by the instructor (either verbally, through listserv e-mails and/or through postings on the course website) may be necessary as the semester progresses.
- Consult the course website frequently for updates and/or announcements
- The Haines brain atlas is primarily for your own self-study, to help you visualize the structures and pathways we are discussing or reading about.
 - I will assign specific plates/pages from the atlas for each lecture topic. Please study these plates. The plates will be posted on the course website, announced in class, and/or posted on the class listserv.
- Specific pages to read for each chapter from Purves et al (2004) will be posted on the course website, announced in class, and/or posted on the class listserv.
- Outside readings (if assigned) may be found on reserve in OIT (2nd Floor Aderhold). Additional master copies of the readings will be posted to my office door. Please return the master copies of the readings to their place of origin after you have xeroxed them, as a courtesy to you fellow classmates.

Topic	Notate your readings here.
Neuroanatomy and gross structure of the human nervous system.	
Basics of cellular and molecular neurobiology*. <i>(*this sounds more scary than it actually is)</i>	
Sensory transduction.	
Perception and somatosensation.	
Primary somatosensory systems.	
Principles of neuromuscular control of movement.	
Primary descending motor control pathways.	
Cerebellar systems and regulation of movement.	
The Basal Nuclei and the initiation of movement.	
Brainstem & Cranial Nerve systems.	
Central Auditory System.	
Basic neural substrate of language.	