NEUROFOUNDATIONS OF LANGUAGE, SPEECH, AND HEARING
Communication Disorders 601 (3.0 credits)
David L. McPherson, Ph.D. - 129 TLRB
422-6458 (office) - 375-9166 (home)

LAST UPDATE: **August 23, 2006**

TABLE OF CONTENTS

COURSE DESCRIPTION 3
COURSE OBJECTIVES 3
Mapping of Course Objectives 3
TEXTBOOKS 4
PREREQUISITES 4
CONTACTING THE INSTRUCTOR 4
WEB SITE INFORMATION 4
HONOR CODE 4
PREVENTING SEXUAL HARASSMENT 5
STUDENTS WITH DISABILITIES 5
ARCHIVING STUDENT WORK 5
DEVOTIONALS 6
GENERAL ACADEMIC REQUIREMENTS 6
Grading Policies and Procedures 6
I. Adjustment Procedure for Assessments 6
II. Final Weighted Grades 7
Examinations 8
Group Assignments 8
Attendance 8
Extra Credit 9
Course Participation 9
COURSE SCHEDULE AND OUTLINE 10
Grading Standard 12
SAMPLE EXAM QUESTION 12

NEUROFOUNDATIONS OF LANGUAGE, SPEECH, AND HEARING
Communication Disorders 601 (3.0 credits**)**
Monday % Wednesday 10:00am - 11:20am - 125 TLRB
David L. McPherson, Ph.D. - 129 TLRB
mailto:david_mcpherson@byu.edu
422-6458 (office) - 375-9166 (home)

COURSE DESCRIPTION

This course is a three credit course required for graduate students majoring in Audiology and Speech-Language Pathology. This course meets the American Speech-Language-Hearing Association's (ASHA) certification requirements for course work in foundations of language, speech and hearing science.

This course presents the foundations of the neurosciences to speech, language, and hearing at a graduate level. Both normal and abnormal neurological systems in communication disorders are discussed as well as the basic science foundation of the neurosciences.

COURSE OBJECTIVES

A. To develop a theoretical and practical knowledge of the neuroscience foundations in communication disorders.

B. To understand the contribution of the neurosciences to communication disorders in the field of hearing, speech and language.

C. To be conversant in neurological terms and imaging as they relate to communication disorders.

Mapping of Course Objectives

Objective	Assessment	Feedback	ASHA CAA Standard*	DOMSE Conceptual Framework*
1. The student will be develop a theoretical and practical knowledge of the neuroscience foundations of communication disorders.	1a. On-line quizzes. 1b. Interim written exams. 1c. Final examination.	Class review of items 1a and 1b. Return of item 1c with comment and instructor meeting with student.	III-B III-C III-D III-E III-F III-G	CF-2 CF-4
2. The student will understand the contribution of the neurosciences to communication disorders in the field of hearing, speech, and language.	2a. On-line quizzes. 2b. Interim written exams. 2c. Final examination.	Class review of items 2a and 2b. Return of item 2c with comment and instructor meeting with student.	III-B III-C III-D III-E III-F III-G	CF-2 CF-4
3. The student will be conversant in neurological terms and imaging as they relate to communication disorders.	3a. On-line quizzes. 3b. Interim written exams. 3c. Final examination.	Class review of items 3a and 3b. Return of item 3c with comment and instructor meeting with student.	III-B III-C III-D III-E III-F III-G	CF-2 CF-4

*More detail is available regarding these standards at: http://www.byu.edu/aslp/

TEXTBOOKS

1. Webster, D.B. *Neuroscience of Communication*. San Diego: Singular Publishing, 1999 [ISBN 1-56593-985-9 [Required text. It is highly recommended that this text be purchased and kept for future reference]

PREREQUISITES

Admissions to a graduate degree program. Completion of at least one course in general anatomy and physiology of the human system and one course in hearing and speech science. Students that have not completed these prerequisites are required to discontinue this course until such time the prerequisite courses have been completed. The instructor reserves the right to dis-enroll students that have not met the prerequisites.

CONTACTING THE INSTRUCTOR

My office hours are primarily by appointment, however, if I am not involved in some activity you are welcome to see me at any time. If you call my office telephone and leave a message be sure to leave a time and phone number that you will be available for me to return your telephone call. I will make two attempts at returning your telephone call. If you contact me using e-mail be sure to put the course number (i.e. COMD 601, etc.) in the subject heading. I prioritize my e-mail by subject heading, with no heading getting the lowest priority. My home telephone is for 'emergencies' and is not to be used to schedule appointments or leave messages. I do not mind being contacted at home for specific questions.

WEB SITE INFORMATION

Registered students in this course are to use BlackBoard for this course. Login to Route Y then select Blackboard in the lower section.

HONOR CODE

The student is expected to be familiar with the Honor Code. The Honor Code is enforced in this class and students will be required to conform to its principles and practices. Cheating and plagiarism may result in a class failure, at the discretion of the instructor.

> "Brigham Young University exists to provide a university education in an atmosphere consistent with the ideals and principles of The Church of Jesus Christ of Latter-day Saints. This atmosphere is preserved through commitment to conduct that reflects those ideals and principles" (Undergraduate Catalog, Brigham Young University).

In keeping with the principles of the BYU Honor Code, students are expected to be honest in all of their academic work. Academic honesty means, most fundamentally, that any work you present as your own must in fact **be** your own work and not that of

another. Violations of this principle may result in a failing grade in the course and additional disciplinary action by the university.

Students are also expected to adhere to the Dress and Grooming Standards. Adherence demonstrates respect for yourself and others and ensures an effective learning and working environment. It is the university's expectation, and my own expectation in class, that each student will abide by all Honor Code standards. Please call the Honor Code Office at 422-2847 if you have questions about those standards.

PREVENTING SEXUAL HARASSMENT

Title IX of the Education Amendments of 1972 prohibits sex discrimination against any participant in an educational program or activity receiving federal funds. The act is intended to eliminate sex discrimination in education. Title IX covers discrimination in programs, admissions, activities, and student-to-student sexual harassment. BYU's policy against sexual harassment extends not only to employees of the university but to students as well. If you encounter unlawful sexual harassment or gender based discrimination, please talk to your professor; contact the Equal Employment Office (D-240C ASB) at 422-5895 or 367-5689 (24-hours); or contact the Honor Code Office at 422-4440.

STUDENTS WITH DISABILITIES

Brigham Young University is committed to providing a working and learning atmosphere that reasonably accommodates qualified persons with disabilities. If you have any disability, which may impair your ability to complete this course successfully, please contact the Services for Students with Disabilities Office (422-2767). Reasonable academic accommodations are reviewed for all students who have qualified documented disabilities. Services are coordinated with the student and instructor by the SSD Office. If you need assistance or if you feel you have been unlawfully discriminated against on the basis of disability, you may seek resolution through established grievance policy and procedures. You should contact the Equal Employment Office at 422-5895. D-382 ASB.

Students in this class must be registered with the Services for Students with Disabilities Office before accommodations will be made. It is in this manner that I may best, and fairly, make necessary accommodations. Accommodations will be made for all course activities, as needed, following registration, and no consideration will be given for course activities completed prior to the instructor being officially notified by the Services for Students with Disabilities Office. Please see me if you should have any questions.

ARCHIVING STUDENT WORK

All materials not claimed by the end of the fourth week of the term following this class will be destroyed. After that date, it will not be possible to contest scores or grades, except according to University policy. The instructor reserves the right to fully review all contested material and adjust scores accordingly.

DEVOTIONALS

Brigham Young University provides devotionals and forums throughout the year on most Tuesdays from 11:00 am to 11:50 am. On days that these enriching experiences are provided, the instructor is not available nor should any of the facilities be used as part of this course during that time period.

GENERAL ACADEMIC REQUIREMENTS

All assignments must be typewritten unless otherwise noted. If computer generated, an easily readable font must be used. Originals and copies must be clear with dark print. Unless otherwise noted all assignments are due by the beginning of the class period on the due date. If late assignments are accepted, penalties may be assigned based on the assignment and the time it was submitted to the instructor. No assignments are accepted after the last day of class.

Reading assignments are to be completed prior to the beginning of the class period. Students that are unprepared may be penalized up to 2% of the final course grade for each occurrence. Absence from class is considered not being prepared.

Grading Policies and Procedures

The grade equivalent is based on the following percentages:

A	96-100 %	C+	78-80 %
A-	92-95 %	C	75-77 %
B+	88-91 %	C-	70-74 %
B	84-87 %	D	65-69 %
B-	81-83 %	E	64% & below

I. Adjustment Procedure for Assessments

Individual assessment functions (i.e., quizzes, exams) are adjusted to account for:

1. The two highest scores on the assessment.
2. Assessment difficulty.
3. Assessment ambiguity.

This is accomplished be discounting the highest two scores on the assessment and using the third highest score as the adjusted maximum score. Adjusted individual scores are then computed by dividing the individual raw score by the adjusted maximum score and multiplying the product by 100. For example:

A	*B*	*C*
Student	Raw Score	Adjusted Score
1	38	82.6
2	50	108.7
3	***46***	***100.0***
4	48	104.3
5	**45**	**97.8**
5	32	69.6

6	15	32.6
7	43	93.5
8	36	78.3
9	29	63.0
10	40	87.0

The highest two scores were 50 and 48, respectively. The third highest score was ***46***. The adjusted score (column *C*) were computed by dividing the values in column *B* by 46 and multiplying the product by 100. Using standard rounding techniques student no. **5** obtained a raw score of **45** and an adjusted score of **97.5**.

II. Final Weighted Grades

Since each assessment may have different point values to adjust the weighting of that particular assessment to the final grade, a weighting factor is assigned each assessment and adjusted accordingly.

Possible Weighted Score

1. Multiply each possible point by the weighted factor (as a decimal).
2. Sum the possible weighted points which results in the Possible Weighted Score.

Earned Weighted Score

1. Multiply each earned point by the weighted factor (as a decimal).
2. Sum the earned weighted point to obtain the Earned Weighted Score.

Weighted Percentage

1. Divide the Earned Weighted Score by the Possible Weighted score.
2. Multiply the product by 100 to obtain the Weighted Percentage.
3. Compare Weighted Percentage with the course grade rule.

For example:

A	*B*	*C*	*D*	*E*	*F*	*G*
Assignment	Percent Weight	Decimal Weight	Possible pts	Weighted Possible pts	Earned pts	Weighted Earned pts
				*C*D*		*C*F*
1	8%	0.008	35	0.28	33	0.264
2	20%	0.02	120	2.4	105	2.1
3	10%	0.01	95	0.95	90	0.9
4	12%	0.012	10	0.12	9	0.108
5	50%	0.05	150	7.5	97	4.85
Sum	100%	0.1	410	**11.25**	334	**8.22**

The Weighted Percentage then equals (for this example): [8.22/11.25]*100 = 73.08
Using standard rounding techniques, this would have a Final Weighted Earned Score for the course of **73**. Using the table below, this would give the student a **C-** in the course.

A	96-100 %	C+	78-80 %
A-	92-95 %	C	75-77 %
B+	88-91 %	**C-**	**70-74 %**
B	84-87 %	D	65-69 %
B-	81-83 %	E	64% & below

Examinations

Examinations will be essay or short answer type. Additional points on each question may be awarded for exceptional answers without penalizing other students. Students are encouraged to meet with the instructor following examinations to discuss each question/answer. However, this must be within two weeks of the examination being returned to the student. Examinations are given as scheduled. A sample question is included in the course syllabus.

Group Assignments

The class will be divided into groups of four or five students. Each group will meet, as a group, and complete the "Study Guide" section at the end of each chapter. Each study group will submit, via email, the assignment. The first paragraph of each assignment will list the names of each group member that fully participated in the assignment. "Fully participated" means that they were present at each group meeting and participated in the completion of the final product. If such is attested to, and in fact it did not occur, the assignment will be counted as a failure and other consequences in accordance with the Honor Code may be instituted. Also, please see the "Attendance" and "Course Participation" policies. An example of the statement is as follows:

> The following members of the study group fully participated in this assignment:
>
> Amy Simple McPherson
> Sophia Loren
> Henry Thoreau
> Mary Shelly
> Albert Einstein
>
> The following was not in attendance or did not fully participate:
> Benedict Arnold

Attendance

Students are expected to attend each class session according to the course syllabus. No, it is not all right to miss class. I do not give examinations other than the posted times. Please make your lifestyle arrangements according to the University calendar. The instructor reserves the right to dis-enroll students that do not attend class or fail to submit assignments in a timely manner. Please review the first two paragraphs under the heading "General Academic Requirements."

Extra Credit

In some instances extra credit may be given, at the discretion of the instructor, for participating in projects, attending seminars or other professional experiences. Extra credit is not given for purposes of grade deficiencies.

Course Participation

The student is expected to be prepared. This includes having read the material prior to class. Students that are not prepared may be penalized 2% of the final course grade for each occurrence. Absence from class, except for medical purposes, is considered unprepared. Excessive absences may result in the instructor dis-enrolling the student from the course.

COURSE SCHEDULE AND OUTLINE

This schedule is subject to change

All assignments are due at the beginning of class on the date due

COMD 601

Class			Date	Course	Assignments**
1*	JJ	W	9/6/06	Course Introduction	Group membership assignments.
2*	JJ	M	9/11/06	Introduction to the Neurosciences I	Chapter 1. **Group assignment 1 due.**
3*	JJ	W	9/13/06	Introduction to the Neurosciences II	
4	DM	M	9/18/06	Nerve and Cell Physiology I	Chapter 2. **Group assignment 2 due.**
5	DM	W	9/20/06	Nerve and Cell Physiology II	
6	DM	M	9/25/06	Brain Anatomy and Blood Supply I	Chapter 3. **Group assignment 3 due.**
7	DM	W	9/27/06	Brain Anatomy and Blood Supply II	
8	DM	M	10/2/06	Spinal Cord and Hindbrain I	Chapter 4. **Group assignment 4 due.** Video: The Brain Part 1a.
9	DM	W	10/4/06	Spinal Cord and Hindbrain II	Video: The Brain Part 1b.
10	DM	M	10/9/06	Forebrain I	Chapter 5. **Group assignment 5 due.** Video: The Brain Part 2a.
11	DM	W	10/11/06	Forebrain II	Video: The Brain Part 2b.
12	DM	M	10/16/06	Sensory Systems I	Chapter 6. **Group assignment 6 due.** Video: The Brain Part 3a.
13	DM	W	10/18/06	Sensory Systems II	Video: The Brain Part 3b.
14	DM	M	10/23/06	Mid Term Review	
15	DM	W	10/25/06	Mid Term Examination	In class
16	DM	M	10/30/06	Vestibular System I	Chapter 7. **Group assignment 7 due.** Video: The Brain Part 4a.
17	DM	W	11/1/06	Vestibular System II	Video: The Brain Part 4b.
18	DM	M	11/06/06	Peripheral Auditory System I	Chapter 8. **Group assignment 8 due.** Video: The Brain Part 5a.
19	DM	W	11/8/06	Peripheral Auditory System II	Video: The Brain Part 5b.
20	DM	M	11/13/06	Central Auditory System I	Chapter 9. **Group assignment 9 due.** Video: The Brain Part 6a.
21	DM	W	11/15/06	Central Auditory System II	Video: The Brain Part 6b.
22	DM	M	11/20/06	Speech Perception and the Brain I	Chapter 10. **Group assignment 10 due.** Video: The Brain Part 7a.
23	DM	T	11/21/06	Speech Perception and the Brain II	Video: The Brain Part 7b.
24	DM	M	11/27/06	Language and the Brain I	Chapter 11. **Group assignment 11 due.** Video: The Brain Part 8a.
25	DM	W	11/29/06	Language and the Brain II	Video: The Brain Part 8b.
26	DM	M	12/04/06	Speech Production and the Brain I	Chapter 12. **Group assignment 12 due.**
27	DM	W	12/06/06	Speech Production and the Brain II	

COMD 601

Class			Date	Course	Assignments**
28	DM	M	12/11/06	Final Review	
29	DM	W	12/13/06	Final Review	
			12/21/06	**Final Examination**	**7:00am – 10:00am**

*Dr. McPherson away from B.Y.U.

**Note: Group assignments: Each group is to meet and construct the answers to the "Study Guide" questions at the end of each chapter, prior to the beginning of the class period.

Grading Standard

Each assignment will be weighted according to the following percentages:

Grading Schedule*

Assignment	Note	Weighted %	
Examinations			
1 Exam 1	Mid-Term Examination (Comprehensive)	32%	
2 Final Exam	Comprehensive	32%	64%
Group Assignments			
1 12 Assignments		3% ea	36%
		TOTAL	**100%**

*See Course Participation for more details

SAMPLE EXAM QUESTION

Blue books, using double spacing, may be required for some or all examinations and quizzes <u>except</u> for 'take home' examinations which are to be typewritten, double spaced.

Exam question: Describe and characterize the measures used in the auditory brainstem evoked potential recording and their relationship to stimulus intensity.

Response: The auditory brainstem evoked potential may be described as a biphasic waveform with quantitative properties of amplitude and latency. In addition a qualitative feature may be described in terms of its morphology.

Amplitude may either be described in voltage, usually microvolts, from the baseline to corresponding peak, or from positive peak to corresponding negative peak. As stimulus intensity increases, the amplitude of the response increases. The converse is also true. The first amplitude changes from baseline, in ideal recording conditions, may be seen as early as 10 dB above behavioral threshold for the stimulus; especially sharply rising (i.e., clicks) stimuli.

Latency is defined as the time, in milliseconds, from the onset of the stimulus to a peak. For consistency, wave V, which may be broad, is defined as the breaking point, or departure point, from the linear descending slope. Latency decreases as stimulus intensity increases. The converse is also true.

It should be noted that there is a point where both amplitude and latency asymptote.

In formulating this question one point is awarded for each correct identification and discussion of the pertinent areas:

1. Description of amplitude
2. Description of latency
3. Description of morphology
4. Use of microvolts
5. Use of milliseconds
6. Relationship of amplitude to intensity
7. Relationship of latency to intensity

8. Statement of how amplitude is measured
9. Statement of how latency is measured
10. Relationship of amplitude and latency to morphological features

It should be noted that areas 1, 2, 4, 5, 6, 7 and 8 were covered providing 7 points for this answer. However additional discussions in some areas were significant enough that extra points were awarded:

1. Acknowledging that the response is biphasic.
2. Amplitude may be measured using one of two references.
3. Amplitude of a wave may first appear at about 10 dB SL.

Consequently, an additional three points are awarded for this question providing a total of 10 points. Such additional points are solely at the discretion of the instructor. Since a grading curve is not used, other students are not penalized.