

BRAIN AND LANGUAGE
LIN 4790-122C
SYLLABUS - FALL Semester 2013

Classroom & time: Tuesday 4th period TUR 1105 (10:40-11:30am)
Thursday 4+5th periods FAC 120 (10:40am-12:35pm)

Instructor: Dr. Edith Kaan
Office: 4127 Turlington Hall.
Office Hours: T5+6 (11:45am-1:40pm); R6 (12:50-1:40 pm), and by appointment
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Course description:

In this course, major issues and terminology in brain and language research will be introduced. Topics addressed include: brain imaging techniques, ERPs, lesion studies, auditory perception, categorization in the brain, localizationist versus generalist approaches, symbolist versus connectionist approaches, modularity, innateness, critical period, lateralization, plasticity, hemispheric differences. Students will be familiarized with important controversies related to these issues, and will learn to evaluate data from brain imaging research. In laboratory sessions and assignments, students will have the opportunity to focus in on a particular topic.

Objectives:

- To learn about central issues in brain and language research
- To learn to evaluate data from neurolinguistic and brain imaging studies
- To improve written and oral presentation skills

Prerequisite: LIN3010 or SPA4004

Course website:

- Course materials (reading, lecture notes, syllabus, etc) and exercises will be made available on the Sakai course website on E-learning (<https://lss.at.ufl.edu/>). You'll find the syllabus as well as some of the readings, and any handouts or other relevant materials. **Deadlines and grades** will also be posted on the website. You are responsible for checking the site regularly and for letting the instructor know *promptly* if anything is unclear, or if your grade has been entered incorrectly.

Course readings:

- Ward, Jamie (2010). *The student's guide to cognitive neuroscience*. 2nd edition. Psychology Press. ISBN 978-1-84872-003-9. Available at the Reitz Union bookstore.
- Chapters 1 and 3 from Plunkett, K. & Elman, J.L. (1997). Exercises in rethinking innateness. MIT Press, 1997; Electronically available through MIT Cognet (UF lib)
- Readings available on-line (through UFLib, or course website), see last page for full references.

Requirements:

- Please bring your **laptop** to class, since we will be regularly doing assignments in class for which you need access to information posted on-line. These assignments serve as an extension of the materials covered by the lecture, and will allow students to focus on

particular problems into more detail, and to get hands-on experience in using relevant internet sources and interpreting data from experiments.

- **Homework Assignments/Lab:** Some of the assignments made in class (lab), will need to be handed in, and will be graded. In addition, all homework assignments will be graded, unless indicated otherwise. Answers to lab and homework assignments are to be submitted through Sakai *before* the start of the next class, unless indicated otherwise.
- **Tests:** Tests are non-cumulative and will test material covered in the lectures, labs and course readings. These exams will consist of short multiple-choice questions, and at least one essay question in which you will be asked to apply your knowledge to a new situation. Tests should always be submitted individually.
- **Final paper:** The final paper assignment should be carried out and handed in individually, although interactions among students are strongly encouraged. You can choose among the topics provided by the instructor later in the course, or choose your own topic in discussion with the instructor. For the final paper, you are requested to do a literature search, and find a few relevant journal articles, each discussing different points of view. The final paper should clearly summarize the main points and arguments (data) in favor of one position or the other and should conclude with your own stance, as well as suggestions for further experimentation. The paper should be double spaced and between 6 and 12 pages long, including references. It should be formatted according to APA guidelines, and submitted through Sakai. At various points throughout the semester draft versions of this paper, or other assignments related to this paper need to be handed in.
- **Poster presentation:** The course is concluded with an individual poster presentation on the basis of your final paper project. The poster should clearly summarize the main points and arguments (brain imaging data) in favor of one position or the other and should conclude with your own stance, and suggestions for further experimentation. You will be graded on the quality of the poster and on the oral presentation of the poster during a poster session.
- **Participation in LIN/SLSH experiments.** *Before November 12!* To encourage awareness of different aspects of experimental research in language-related fields, you are required to participate in 2 hours of language or communication research during the semester. A list of experiments that qualify for this credit can be found at <http://slhs.phhp.ufl.edu/student-info/participant-pool-2/>. This site will be updated throughout the semester. Please retain a copy of the IRB form as proof that you participated. You need to have participated in 2 hours of experiments before November 12, 2013 for you to receive credit. This assignment will be worth 2% of your course grade. If you choose not to participate or do not qualify for any of the studies, you can receive the same amount of course credit for reading a short research article and writing a 2 page synopsis. This article needs to cover a brain and language topic, and cannot be one of the articles used for your final poster/paper assignment. This paper must be turned in no later than November 12, 2013. If you are currently enrolled in other classes that *require* participation in experiments, and your total participation requirement exceeds 4 hours this semester, please see the instructor.

Overall grade. The weighting of the various requirements in the final grade is

- Homework assignments /lab assignments: 13%
- Tests: 60% (20% each)
- Final paper, paper-related assignments, and poster presentation: 25%

- Participation in LIN/CSD experiments: 2%

The course grading scale is:

A = 90-100 B = 80-83.9 C = 70-73.9 D = 60-63.9

A- = 87-89.9 B- = 77-79.9 C- = 67-69.9 D- = 57-59.9

B+ = 84-86.9 C+ = 74-76.9 D+ = 64-66.9 E = < 56

For UF grading policies for assigning grade points, see:

<https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx>

Policies:

- Please turn off all cell phones.
- Emailing, web browsing, face-booking, chatting and other cell phone or computer activity is not allowed during class unless this is part of the course assignments.
- Students are required to hand in all assignments and tests *before the end of the class period* they are due. Please contact the instructor *in advance* if you need to skip a class, or cannot make a deadline. Please also make sure you have at least one external backup of the assignments you make for this class. Computer problems will not be considered a valid excuse for missing assignments and other deadlines.
- There will be no make-up exams, make-up assignments or extensions of deadlines without a documented medical excuse.
- If you miss *more than 15 minutes of more than three class periods* without a documented medical or academic excuse, one point will be deducted from your final score for each additional time you are absent, leave early, or come late.

Teamwork and academic honesty:

Work should be submitted individually, unless the assignment guidelines state otherwise or you have made prior arrangements with the instructor. Although students are encouraged to discuss course-related issues outside of class, this should not be confused with writing up the results of a classmate's work, letting a classmate copy your work, or having a classmate check your work – this is unacceptable. See the University of Florida Honor Code and the academic honesty guidelines at <https://catalog.ufl.edu/ugrad/1213/advising/info/student-honor-code.aspx>.

Accommodations for students with disabilities:

Students requesting classroom accommodation must first register with the Dean of Students Office: <http://www.dso.ufl.edu/drc/>. The Dean of Students Office will provide documentation to the student who must then provide this documentation to the instructor when requesting accommodation. The Disability Resource Center is located in 001 Building 0020 (Reid Hall). Their phone number is 392-8565.

Schedule:

The following schedule is an estimate of the course's progress, with readings for the given week and **approximate** dates of the tests. The instructor will let you know when the tests and assignment deadlines are exactly as they approach, and will keep you updated if we go off track. *Please also regularly consult the schedule on the course website on Sakai for updates.*

Overview of the course, Fall 2013 (subject to change!)

Week/date	Tuesday	Thursday	Readings
1 -Aug 22		Intro to the course Brain anatomy	Ward Ch 1+2
NEUROIMAGING TECHNIQUES AND CATEGORIZATION IN THE BRAIN			
2 -Aug27/29	ERP	Interpreting ERP data; fMRI	Ward Ch 3; Kaan (2007) Primer on brain imaging techniques
3-Sept 3/5	fMRI	Brain anatomy and neuroimaging; localizing activity	Ward Ch 4, with the exception of p. 59-62
4 -Sept 10/12	Lesions	Interpreting aphasic symptoms; TMS Auditory perception: The mismatch negativity.	Ward Ch 5+10 Optional: Phillips et al. (2000)
5 -Sept 17/19	Auditory perception Q&A session test 1 TBA	<i>Field trip to ERP lab and fMRI scanner (meet at The Rock, Turl. Plaza)</i>	
6 -Sept 24-26	Test 1	Words; Semantic categorization.	Ward pages56-63; 226-9; 233-245; 261-266; 170-2. Patterson, Nestor & Rogers (2007)
RULES VERSUS ASSOCIATIONS			
7-Oct 1/3	Rules versus associations: regular versus irregular morphology	Connectionist models: using TLEARN to make and train a model	Ward Ch 1 p. 5-9; Ch 9 181-187 Ulman (2001) Pinker & Ullman (2002); McClelland & Patterson (2002); Plunkett & Elman, Chapters 1 and 3 (e-book)
8-Oct 8/10	Rules versus associations: reading and dyslexia	Connectionist models: using TLEARN to make and train a model	Ward Ch 12; Gabrieli (2009) Plunkett & Elman (e-book)
9 -Oct 15/17	Sentence level processing;	Sentence level processing Q&A session Test 2 Final projects: find topic Final projects: find references	Kaan & Swaab (2002); Ward Ch 11, p. 245-251; Ward Ch 14.
10 -Oct 22/24	Test 2	Language production Final projects: summarizing	Ward Ch 11 251-258 Jansma et al.
RIGHT /LEFT HEMISPHERE			
11- Oct29/31	TBA	Language acquisition/ bilingualism	Ward Ch 14; 16

		Notes about presenting in an academic setting	Steinhauer et al. (2009)
12-Nov5/7	TBA Draft of paper due	TBA	TBA
13-Nov 12/14	Language acquisition/ bilingualism Hand in proof of experimental participation	Poster presentations	
14 –Nov 19/21	Poster presentations RH functions	More RH functions	Jung-Beeman (2005) Campbell (2006) Schirmer & Kotz (2006)
15-Nov26	Q& A session Test 3 Wrap-up, TBA	NO CLASS	
16-Dec 3	Test 3 Final paper due Dec 10		

Course Readings available on-line (e-journals, course website) * = highly recommended, but optional

- Cambell, S. (2006). Language in the non-dominant hemisphere. In: K. Brown (Ed.) *The Encyclopedia of Language and Linguistics*. Elsevier. pp. 529-536
- Gabrieli, J.D.E. (2009). Dyslexia: A new synergy between education and cognitive neuroscience. *Science*, 325 17 July 2009 (280-283).
- Jansma, B.M., Rodriguez-Fornells, A., Müller, J. & Münte, T.F. (2004) 'Electrophysiological studies of speech production.' In Pechmann & Habel (eds.) *Multidisciplinary approaches to language production*. Berlin/New York: Mouton de Gruyter. pp 361-395. E-learning.
- Jung-Beeman, M. (2005). Bilateral brain processes for comprehending natural language. *Trends in Cognitive Sciences*, 9(11), 512-518.
- Kaan, E. (2007). Event-Related Potentials and language processing: A brief overview. *Language and Linguistics Compass*, 1(6), 571-591.
- Kaan, E., & Swaab, T. Y. (2002). The neural circuitry of syntactic comprehension. *Trends in Cognitive Sciences*, 6(8), 350-356.
- McClelland, J. L., & Patterson, K. (2002). Rules or connections in past-tense inflections: what does the evidence rule out? *Trends in Cognitive Sciences*, 6(11), 465-472.
- Patterson, K., Nestor, P.J. & Rogers, T.T. (2007). Where do you know what you know? The representation of semantic knowledge in the human brain. *Nature Reviews Neuroscience*, 8, 976-987.
- *Phillips, C., Pellathy, T., Marantz, A., Yellin, E., Wexler, K., Poeppel, D., McGinnis, M., & Roberts, T. (2000). Auditory cortex accesses phonological categories: An MEG mismatch study. *Journal of Cognitive Neuroscience*, 12(6), 1038-1055.
- Pinker, S., & Ullman, M. T. (2002). The past and future of the past tense. *Trends in Cognitive Sciences*, 6(11), 456-463.
- Plunkett, K. & Elman, J.L. (1997). *Exercises in rethinking innateness*. MIT Press; Electronically available through MIT Cognet (UF lib)
- Schirmer, A. and Kotz, S. (2006). Beyond the right hemisphere: brain mechanisms mediating vocal emotional processing. *Trends in Cognitive Sciences*, 10(1). 24-30.
- Steinhauer, K. White, E.J. and Drury, J.E. (2009). Temporal dynamics of late second language acquisition: evidence from event-related brain potentials. *Second Language Research*, 25 (1),13-41.
- Ullman, M. T. (2001). A neurocognitive perspective on language: The declarative/ procedural model. *Nature Reviews Neuroscience*, 2, 717-726.