LIN 6796-18B8**: COGNITIVE NEUROSCIENCE OF LANGUAGE**
SYLLABUS - SPRING 2015

Classroom:	MAT 3
Time:	Tuesday 8-10th periods (3-6 pm)
Instructor:	Dr. Edith Kaan Office: 4127 Turlington Hall.
Office Hours:	Tuesdays and Thursdays 1:55-2:45 pm; and by appointment
Contact info:	kaan@ufl.edu
Course website:	on Canvas, lss.at.ufl.edu

Prereqs:
LIN graduate core course, or equivalent in other disciplines. Please contact the instructor for permission.

Aims of this course:
- To learn how brain imaging techniques can be applied to psycholinguistic research, and the potential pitfalls of doing so
- To learn to evaluate brain imaging studies of language in terms of their scientific and methodological aspects
- To improve oral presentation skills

Assignments:
Your grades will be based on: on paper presentations (20 %), active participation in class and timely postings of discussion questions (5 %), three critical summaries (30 %), and a final written assignment (45 %).

Paper presentations:
- Approximately 15 minutes; one paper per presenter per session. The number of presentations over the entire course depends on enrollment.
- Powerpoint or Prezi file, email this to yourself or put it on a memory key
- Last slide has points for discussion, including questions from classmates (see below)
- Will be followed by a 10-15 minute group discussion
- Mail a copy of your slides to kaan@ufl.edu before or right after class.
- Please do not hesitate to contact Dr. Kaan if you have questions when preparing your presentation

Active participation:
- Contributing to discussion in class
- Posting at least one critical question/discussion point and one response for **each paper** on the "Discussion" page on Canvas by 8pm the night before class (preferably sooner).

Summaries:
- Summaries are due on these three topics:
  Summary i: brain imaging methods, N400, LAN, P600, syntax or predictive processing
  Summary ii: visual word form area, morphology, syntax or speech perception
  Summary iii: motor theory, production, cognitive control or the TBA topic of April 14
- For each of these topics:
  (1) write a critical summary of one of the required readings (this needs to be a different reading from the one you presented in class)
  (2) write a summary of an article that is one link away from this or another required reading on that topic, i.e., a paper that cites this required reading or is cited by this required reading.
- Summaries should include how the articles relate to each other and what we can learn from considering the studies together.
- To be handed in through Canvas, on or before: February 10, March 17, and April 21

Final written assignment:

- About 15 pages long, double spaced, including references
- APA formatting
- Structured like a grant proposal
- Contains an overview of the literature on a selected psycho/neurolinguistic topic
- Contains a proposal for a new, original experiment using the brain imaging methods discussed in class, or patients with brain damage, to investigate language in the brain.
- Topic should be chosen before March 17 (each will meet with Dr. Kaan around that time)
- Draft handed in before April 7 (Sakai).
- Final version due: April 28, 2013 (Sakai)
- Students will give a brief presentation of their proposals in the last class

Grading:

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:
http://gradcatalog.ufl.edu/content.php?catoid=5&navoid=1054#grades.

Policies:

- Please turn off all cell phones.
- Students are required to hand in all assignments and tests *before 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 deadlines.
- If you are *absent for more than one class, or miss more than 15 minutes of more than three 50-minute 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. There will be no make-up exams or assignments without a documented medical excuse.
  See: https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx
- Academic Honesty: See the University of Florida Honor Code and the academic honesty guidelines at http://www.dso.ufl.edu/sccr/process/student-conduct-honor-code/

Accommodations for students with disabilities:
Students with disabilities requesting accommodations should first register with the Disability Resource Center (352-392-8565, www.dso.ufl.edu/drc/) by providing appropriate documentation. Once registered, students will receive an accommodation letter which must be presented to the instructor when requesting accommodation. Students with disabilities should follow this procedure as early as possible in the semester.

Course evaluation:
Students are expected to provide feedback on the quality of instruction in this course by completing online evaluations at https://evaluations.ufl.edu. Evaluations are typically open during the last two or three weeks of the semester, but students will be given specific times when they are open. Summary results of these assessments are available to students at https://evaluations.ufl.edu/results/.

Readings:
The list of readings can be found below. Readings can be obtained from the UF library website (e-journals). Where indicated, the reading is available through the course website or e-reserves. In some cases, a hardcopy will be made available for you to xerox. Background readings pertain to the lecture and are optional; Discussion readings are required. NOTE: READINGS AND SCHEDULE BELOW ARE SUBJECT TO CHANGE!

Overview of the course (subject to change!!!)

Date	**Discussions and required readings**	**Lecture**	**Background readings** * highly recommended
(1) *Jan 6*	*Syllabus*	*Introduction to methods of cognitive neuroscience*	*Ward, J. (2006,2010)The student's guide to cognitive neuroscience. New York: Psychology Press, chapters 1-5 (hardcopy available for xeroxing)
(2) *Jan 13*		*Introduction to methods of cognitive neuroscience-continued* *Sign up for presentations*	Gratton, G. & Fabiani. M. (2001) Shedding light on brain function: the event-related optical signal. *Trends in Cognitive Sciences*, 5(8) 357-363. Tse, C-Y, et al. (2007) Imaging cortical dynamics of language processing with the event-related optical signal. *PNAS* 104(43) 17157-17162. Démonet, J.-F., Thierry, & G. Cardebat, D., (2005), Renewal of the neurophysiology of language: Functional neuroimaging. *Physiological Review*, 85, 49-95. Especially pp 49-57. *Kaan, E. (2007). Event-Related Potentials and language processing: A brief overview. *Language and Linguistics Compass, 1*(6), 571-591. *Lau, E.F., Phillips, C. & Poeppel, D. (2008) A cortical network for semantics: (De)constructing the N400. *Nature Reviews Neuroscience, 9*, 920-933.
(3) *Jan20*	*Example presentation: N400* 1. Kutas, M. and Hillyard, S.A. (1980). Reading senseless sentences: Brain potentials reflect semantic incongruity. *Science, 207*, 203-205. *Other required readings:* 2. Simos, P. G., Basile, L. F. H., & Papanicolaou, A. C. (1997). Source localization of the N400 response in a sentence-reading paradigm using evoked magnetic fields and magnetic resonance imaging. *Brain Research, 762*, 29–39. *3.* Gough, P. M., Nobre, A. C. & Devlin, J. T. (2005). Dissociating linguistic processes in the left inferior frontal cortex with transcranial magnetic stimulation. *Journal of Neuroscience, 25*, 8010–8016.	*Tips for giving presentations; syntax*	Kaan, E., & Swaab, T. Y. (2002). The neural circuitry of syntactic comprehension. *Trends in Cognitive Sciences, 6*, 350-356. Hagoort, P (2005). On Broca, brain, and binding: a new framework *Trends in Cognitive Sciences, 9*, 416-423. Stowe, L.A., Haverkort, M. & Zwarts, F. (2005). Rethinking the neurological basis of language, *Lingua 115*, 997-1042.

(4) *Jan 27*	*Discussion: syntax* *1.* Hahne, A., & Friederici, A. D. (1999). Electrophysiological evidence for two steps in syntactic analysis: Early automatic and late controlled processes. *Journal of Cognitive Neuroscience, 11*, 194-205. *2.* Santi, A., & Grodzinsky, Y. (2010). fMRI adaptation dissociates syntactic complexity dimensions. *Neuroimage, 51*, 1285-1293.	*LAN and P600*	*Steinhauer, K., & Drury, J. E. (2012). On the early left-anterior negativity (ELAN) in syntax studies. *Brain and Language, 120*(2), 135-162. doi: 10.1016/j.bandl.2011.07.001 *Friederici, A. D. (2011). The brain basis of language processing: from structure to function. *Physiological reviews, 91*, 1357-1392. *Kuperberg, Gina R. (2007). Neural mechanisms of language comprehension: challenges to syntax. *Brain Research, 1146,* 23–49.
(5) *Feb 3*	*LAN and P600* *1.* Rossi, S., Gugler, M.F., Friederici, A.D., & Hahne, A. (2006). The impact of proficiency on syntactic second-language processing of German and Italian: evidence from event-related potentials. *Journal of Cognitive Neuroscience*, 18, 2030-2048. *2.* Kim, A., & Osterhout, L. (2005). The independence of combinatory semantic processing: Evidence from event-related potentials. *Journal of Memory and Language, 52*, 205-225.	*Predictive processing*	Van Petten, C., & Luka, B. J. (2012). Prediction during language comprehension: Benefits, costs, and ERP components. *International Journal of Psychophysiology, 83*(2), 176-190. doi: 10.1016/j.ijpsycho.2011.09.015 Kaan, E. (2014). Predictive sentence processing in L2 and L1: What is different? *Linguistic Approaches to Bilingualism, 4*(2), 257-282. doi: 10.1075/lab.4.2.05kaa DeLong, K. A., Troyer, M., & Kutas, M. (2014). Pre-Processing in Sentence Comprehension: Sensitivity to Likely Upcoming Meaning and Structure. *Language and Linguistics Compass, 8*(12), 631-645. doi: 10.1111/lnc3.12093
(6) *Feb 10*	*Prediction in sentence processing* *1.* Martin, C., Thierry, G., Kuipers, J.-R., Boutonnet, B., Foucart, A., & Costa, A. (2013). Bilinguals reading in their second language do not predict upcoming words as native readers do. *Journal of Memory and Language, 69*(4), 574-588. doi: http://dx.doi.org/10.1016/j.jml.2013.08.001 *2.* Wlotko, E. W., Federmeier, K. D., & Kutas, M. (2012). To predict or not to predict: Age-related differences in the use of sentential context. *Psychology and Aging*. doi: 10.1037/a0029206	*Processing written words* *Summary I due*	*Price, C.J., Devlin, J.T. (2011). The interactive account of ventral occipitotemporal contributions to reading. *Trends in Cognitive Science, 15*, 246-253. *Dehaene, S. & Cohen, L. (2011) The unique role of the visual word form area in reading. *Trends in Cognitive Science, 15*, 254-262. Visual word recognition. Chapter 6 from: Whitney, P. (1998). *The psychology of language.* Boston, MA: Houghton Mifflin Company. (hardcopy available for Xeroxing)

(7) *Feb 17*	*Discussion: written words* *1.* Cohen, L. et al. (2002) Language-specific tuning of visual cortex? Functional properties of the visual word form area. *Brain, 125*, 1054–1069. *2.* Twomey, T. et al. (2011) Top-down modulation of ventral occipitotemporal responses during visual word recognition. *Neuroimage*, *55*, 1242–1251.	*Morphology*	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. *Ullman, M. T. (2001). A neurocognitive perspective on language: The declarative/ procedural model. *Nature Reviews Neuroscience, 2*, 717-726. Pinker, S., & Ullman, M. T. (2002). The past and future of the past tense. *Trends in Cognitive Sciences, 6*(11), 456-463. Marslen-Wilson, W. and Tyler, L.K. (1998). Rules, representations, and the English past tense, *Trends in Cognitive Sciences*, 2(11), 428-435. Bozic, M., & Marslen-Wilson, W. (2010). Neurocognitive contexts for morphological complexity: Dissociating inflection and derivation. *Language and Linguistics Compass, 4*, 1063-1073.
(8) *Feb 24*	*Discussion: morphology* 1. Devlin, J. T., Jamison, H. L., Matthews, P. M., & Gonnerman, L. M. (2004). Morphology and the internal structure of words. *Proceedings of the National Academy of Sciences of the United States of America, 101*, 14984-14988. 2. Bozic, M., W. D. Marslen-Wilson, E. A. Stamatakis, M. H. Davis, and L. K. Tyler. 2007b. Differentiating morphology, form, and meaning: neural correlates of morphological complexity. *Journal of Cognitive Neuroscience, 19*, 1464–75.	*Perception of Speech*	The recognition of spoken words. Chapter 5 from: Whitney, P. (1998). *The psychology of language.* Boston, MA: Houghton Mifflin Company. Pages 141-159. (hardcopy available for xeroxing) *Phillips, C. (2001). Levels of representation in the electrophysiology of speech perception. *Cognitive Science, 25*, 711-731. Näätänen, R. (2001). The perception of speech sounds by the human brain as reflected by the mismatch negativity (MMN) and its magnetic equivalent. *Psychophysiology, 38* (1), 1-21.
(9) *Mar 3*	*SPRING BREAK; NO CLASS*		
(10) *Mar 10*	*Discussion: Speech perception* 1. Näätänen, R., Lehtokoski, A., Lennes, M., Cheour, *et al.* (1997). Language-specific phoneme representations revealed by electric and magnetic brain responses. *Nature, 385*, 432-4. *and* Cheour, M., Ceponiene, R., Lehtokoski, A., Luuk, A., *et al.* (1998). Development of	*Lexical tones, attrition*	*Gandour, J.T. (2006). Tone: Neurophonetics. In: Brown, K. (ed.) *Encyclopedia of Language and Linguistics.* Elsevier, p. 751-761. Crinion, J.T., Green, D.W., Chung, R., *et al.* (2009). Neuroanatomical Markers of Speaking Chinese. *Human Brain Mapping*, 30 (12), 4108-4115.

	language-specific phoneme representation in the infant brain. *Nature Neuroscience, 1,* 351-353. *2.* Mesgarani et al. (2014) Phonetic Feature Encoding in Human Superior Temporal Gyrus *Science* 343, 1006. http://dx.doi.org/10.1126/science.1245994		Dediu, D. & Ladd, R.D. (2007). Linguistic tone is related to the population frequency of the adaptive haplogroups of two brain size genes, ASPM and Microcephalin. *Proceedings of the National Academy of Sciences USA*, 104 (26), 10944-10949. *Köpke, B. (2004). Neurolinguistic aspects of attrition. *Journal of Neurolinguistics, 17*, 3-30.
(11) *Mar 17*	*Discussion: Tones and attrition* 1. Chandrasekaran, B., Krishnan, A.., & Gandour, J. (2009) Relative influence of musical and linguistic experience on early cortical processing of pitch contours. *Brain and Language*, 108(1),1–9. *2.* Pierce, L. J., Klein, D., Chen, J.-K., Delcenserie, A., & Genesee, F. (2014). Mapping the unconscious maintenance of a lost first language. *Proceedings of the National Academy of Sciences, 111*(48), 17314-17319. doi: 10.1073/pnas.1409411111	*Motor theory of speech perception* *Summary II due*	Rizzolatti & Craighero (2004). The mirror-neuron system. *Annual Review of Neuroscience, 27*. 169–192. Galantucci, Fowler, & Turvey. (2006). The motor theory of speech perception reviewed. *Psychonomic Bulletin & Review, 13*, 361–377. Lotto, A. J., Hickok, G. S., & Holt, L. L. (2009). Reflections on mirror neurons and speech perception *Trends in Cognitive Sciences, 13*, 110-114. *Venezia, J. H., & Hickok, G. (2009). Mirror Neurons, the motor system and language: From the Motor Theory to embodied cognition and beyond. *Language and Linguistics Compass, 3*, 1403-1416
(12) *Mar 24*	*Discussion: motor theory* *1.* Meister, I. G., Wilson, S. M., Deblieck, C., Wu, A. D., & Iacoboni, M. (2007). The Essential Role of Premotor Cortex in Speech Perception. *Current Biology , 17*, 1692-1696. *2.* Pulvermüller, F., Huss, M., Kherif, F., Moscoso del Prado Martin, F., Hauk, O., & Shtyrov, Y. (2006). Motor cortex maps articulatory features of speech sounds. *Proceedings of the National Academy of Sciences, 103*, 7865-7870.	*Language production*	Indefrey, P, and Levelt, W.J.M. (2004). Spatial and temporal signatures of word production components. *Cognition, 92*(1-2), 101-144.[especially pp 101-111] *Jansma et al (2004) Electrophysiological studies of speech production' In Pechmann & Habel (eds.) Multidisciplinary approached to Language production. Berlin/New York: Mouton de Gruyter. PP 361-395 *(e-reserves)* Rodriguez-Fornells, A., Schmitt, B.M., Kutas, M. and Münte, T.F. (2002). Electrophysiological estimates of the time course of semantic and phonological encoding during listening and naming. *Neuropsychologia, 40*, 778-787. Ganushchak, L. Y., Christoffels, I. K., & Schiller, N. O. (2011). The use of electroencephalography in language production research: a review. *Frontiers in Psychology, 2* (Article 208), 1-6.

(13) *Mar31*	*Discussion: Production* 1. Rodriguez-Fornells, A., et al. (2005). Second language interferes with word production in fluent bilinguals: brain potential and functional imaging evidence. *Journal of Cognitive Neuroscience, 17*, 422-433. *2.* Strijkers, K., Holcomb, P. J., & Costa, A. (2011). Conscious intention to speak proactively facilitates lexical access during overt object naming. *Journal of Memory and Language, 65*, 345-362.	*Cognitive control and language processing*	*Novick, et al. (2005). Cognitive control and parsing: Reexamining the role of Broca's area in sentence comprehension. *Cognitive, Affective & Behavioral Neuroscience*, 5(3), 263-281. *Harvais-Adelman, A. G., Moser-Mercer, B., & Golestani, N. (2011). Executive control of language in the bilingual brain: integrating the evidence from neuroimaging to neuropsychology. *Frontiers in Psychology*, *2*, 234. Crinion, J., Turner, R., Grogan, A., Hanakawa, T., Noppeney, U., Devlin, J. T., et al. (2006). Language control in the bilingual brain. *Science, 312*, 1537-1540.
(14) *Apr 7*	*Discussion: Cognitive control* 1. January, D., Trueswell, J. C., & Thompson-Schill, S. L. (2009). Co-localization of Stroop and syntactic ambiguity resolution in Broca's area: Implications for the neural basis of sentence processing. *Journal of Cognitive Neuroscience, 21*, 2434-2444. 2. Van Heuven, W. J., Schriefers, H., Dijkstra, T., & Hagoort, P. (2008). Language Conflict in the Bilingual Brain. *Cerebral Cortex, 18*, 2706-2716.	*Topic TBA* *Draft of paper due*	TBA
(15) *Apr 14*	*Discussion: TBA*		
(16) *Apr 21*	*Project presentations*	*Project presentations* *Summary III due*	
Apr 28	*Final version of paper due*		