11-722: Grammar Formalisms
Spring Term 2008
Language Technologies Institute
Carnegie Mellon University

Course Syllabus

Time and Place:
T-Th, 3:00-4:30 Wean Hall 4623

Instructors:

Lori Levin	Associate Research Professor Language Technologies Institute Newell-Simon Hall 4631 412-268-6193 `lsl@cs.cmu.edu`
Alan Black	Associate Research Professor Language Technologies Institute 4525 Newell-Simon Hall 412-268-6299 `awb@cs.cmu.edu`

Teaching Assistant

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Prerequisites:

Permission of instructors, or background in linguistics, computational linguistics, language technologies, or psycholinguistics.

Course Description:

The goal of this course is to familiarize students with grammar formalisms (and the underlying linguistic theories) that are commonly used for research in computational lingusitics, language technologies, and lingusitics. We hope to have students from a variety disciplines (linguistics, computer science, psychology, modern languages, philosophy) in order to cover a broad perspective in class discussions. Comparison of formalisms and the underlying theories will lead to a deeper understanding of human language and natural language processing algorithms.
The formalisms will include: Head Driven Phrase Structure Grammar, Lexical Functional Grammar, Tree Adjoining Grammar, and Categorial Grammar. We will also cover Penn Treebank, Prague Treebank, CCG treebank, and other treebanks as time permits.
We will cover the treatment of basic syntactic and semantic phenomena in each formalism, and will focus on how to recognize and analyze these phenomena in real text (as opposed to artificial text-book examples). We will also cover grammar induction from treebanks.

Requirements: Four problem sets (40%), a term project (50%), and class attendance and participation (10%).

Texts:

- Lexical Functional Syntax, Joan Bresnan, Blackwell, 2000.
- Lexical-Functional Grammar (Syntax and Semantics, Volume 34) by Mary Dalrymple, Academic Press.
- Syntactic Theory: A Formal Introduction by Ivan A. Sag and Thomas Wasow (Author), CSLI, 1999.
- Other texts will be added.

Schedule:

Part One: Introduction

Jan. 15	Review syllabus and schedule	Black & Levin
Jan. 17	History of grammar formalisms	Levin
Jan. 22	Syntax Checklist and Penn Treebank	Levin
Jan. 24	Checklist and Treebank	Levin
Jan. 29	Checklist and Treebank	Levin
Jan. 31	Checklist and Treebank	Levin
Feb. 5	Checklist and Treebank	Levin

Part Two: The Formalisms

Feb. 7	Categorial Grammar Formalism and Lambda Calculus	Black
Feb. 12	Categorial Gammar Syntax Checklist	Black
Feb. 14	Categorial Grammar Syntax Checklist	Black
Feb. 19	Categorial Grammar Grammar Induction	Black
Feb. 21	Categorial Grammar Grammar Induction	Black
Feb. 26	HPSG	Levin
Feb. 28	HPSG	Levin
Mar. 4	HPSG	Levin
Mar. 6	HPSG	Levin
Mar. 11	Spring Break	
Mar. 13	Spring Break	
Mar. 18	HPSG	Levin
Mar. 20	HPSG	Levin
Mar. 25	LFG	Levin
Mar. 27	LFG	Levin
Apr. 1	LFG	Levin
Apr. 3	LFG	Levin
Apr. 8	LFG	Levin
Apr. 10	LFG	Levin
After Apr. 15	To be announced	