Course Syllabus

11-722: Grammar Formalisms
Spring Term 2004
Language Technologies Institute
Carnegie Mellon University

Time: T-Th 3:00-4:30
Place: OSC 202

Instructors:

Lori Levin	Associate Research Professor Language Technologies Institute Newell-Simon Hall 4631 412-268-6193 `lsl@cs.cmu.edu`
Alon Lavie	Associate Research Professor Language Technologies Institute Newell-Simon Hall 412-268-5655 `alavie@cs.cmu.edu`
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Carolyn Rosé	Research Computer Scientist Language Technologies Institute 4531 Newell-Simon Hall 412-268-7130 `cprose@cs.cmu.edu`

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. If time permits, we will cover Penn Treebank, dependency grammar, and Construction Grammar.
We will cover the treatment of basic syntactic and semantic phenomena in each formalism, and will also discuss algorithms for parsing and generating sentences for each formalism. If time permits, we may discuss formal language theory and generative capacity.

Requirements: Four problem sets (30%), a term project (60%), 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 and Reading Assignments:

Part One: Introduction

Jan. 13	Review syllabus and schedule	Black, Lavie, Levin, Rosé
Jan. 15	History of grammar formalisms	Levin
Jan. 20	Syntax checklist	Levin
Jan. 22	Lambda calculus and first order logic	Black
Jan. 27	Semantics checklist	Black
Jan. 29	Parsing	Lavie

Part Two: The Formalisms

Feb. 3	Tree Adjoining Grammar	Lavie
Feb. 5	Tree Adjoining Grammar	Lavie
Feb. 10	Tree Adjoining Grammar	Lavie
Feb. 12	Tree Adjoining Grammar	Lavie
Feb. 17	Categorial Grammar	Black
Feb. 19	Categorial Grammar	Black
Feb. 24	Categorial Grammar	Black
Feb. 26	Categorial Grammar	Black
Mar. 2	Lexical Functional Grammar Architecture of the theory Formalism for co-description	Levin
Mar. 4	Lexical Functional Grammar Parsing	Levin
Mar. 9	Spring Break: No Class	
Mar. 11	Spring Break: No Class	
Mar. 16	Lexical Functional Grammar Syntax checklist	Levin
Mar. 18	Lexical Functional Grammar Syntax checklist	Levin
Mar. 23	Lexical Functional Grammar Glue Semantics	Levin
Mar. 25	Lexical Functional Grammar Principles, universals, and diversity	Levin
Mar. 30	Parsing with Unification Based Grammars	Rosé
Apr. 1	Parsing with Unification Based Grammars	Rosé
Apr. 6	Head Driven Phrase Structure Grammar Syntax	Levin
Apr. 8	Head Driven Phrase Structure Grammar Syntax	Levin
Apr. 13	Head Driven Phrase Structure Grammar	To be announced
Apr. 15	Head Driven Phrase Structure Grammar	To be announced

Part Three: Student Presentations

Apr. 20	Student Presentations
Apr. 22	Student Presentations
Apr. 27	Student Presentations
Apr. 29	Student Presentations