

Course Syllabus

16:615:610 Formal Methods for Linguistics
Fall 2016

Class Time and Place

Classroom: SEM 108, Linguistics (18 Seminary Place)
Time: MW4 1:10 – 2:30

Contact Information

Instructor: Prof. Bruce Tesar
E-mail: tesar@rutgers.edu
Office Hours: Tuesdays 11 am – 12 noon, or by appt.
Office: SEM 109

Text

The main text is a set of lectures notes, Formal Methods for Linguistics. It is available in PDF form in the Resources section of the course Sakai site, in the Text folder. You should bring the text with you to class, every time.

Sakai Site

The course Sakai site: 615:610 FORMAL METHODS F16

Software

The problem set on parsing will involve the programming language prolog, and requires a prolog interpreter. A link to a freely available prolog interpreter, SWI-Prolog, is in the Resources section on Sakai.

The sections on mathematical analysis and probability and statistics will involve the statistical software R. A link to download R, which is freely available and runs on all widely used platforms, is in the Resources section on Sakai.

Both SWI-Prolog and R can be installed on the linguistics graduate student computers, and students may freely install them on their own machines. Students are encouraged to download and install both programs early in the semester, so that difficulties may be overcome before the coursework using the software is handed out.

Grading

The grade will be based upon a series of nine problem sets. These will be take-home assignments, and students will typically have about one week to complete them (this can vary depending upon the assignment). Problem sets will be assigned frequently. The final problem set will serve as the final exam. These will be collected and graded. **Students may not work together on problem sets.**

Exercises will be assigned nearly every class period. They will not be collected or graded, but they will be discussed in class. Answers to the exercises will be provided in advance, but you are strongly encouraged to try them on your own before looking at the answers. **Working with other students on the exercises is encouraged.**

Anonymous Comments to the Instructor

Students may send anonymous comments to the instructor via the Anonymous Comments tool on the course Sakai site. Students are welcome (but not required) to use this any time during the semester. The Anonymous Comments tool uses a ScarletDocs form (part of Rutgers ScarletApps).

Schedule

09/07 First Day: Collections and Mappings

09/12 Algebras and logics

09/14 Order, basics of lattices

09/19 Lattices

09/21 Semantics of plurals

09/26 Finite combinatorics

09/28 Countable infinite sets

10/03 Uncountable infinite sets

10/05 Formal languages/grammars

10/10 Regular, context-free grammars

10/12 Context-sensitive, unrestricted grammars

10/17 Automata (FSA, PDA)

10/19 Turing machines

10/24 Theory of computation, Prolog

10/26 Predicate calculus, Resolution

10/31 Variables, unification
11/02 Syntactic Parsing

11/07 Mathematical induction
11/09 Infinite sequences and series

11/14 Derivatives
11/16 Integration

11/21 Modeling coarticulation
11/23 NO CLASS (Acad. Fri.)

11/28 Probability Theory
11/30 Random variables

12/05 Sample distributions
12/07 Estimators, CIs

12/12 Hypothesis testing
12/14 Hypothesis testing