

*Ling488: Exploring Natural Languages by Modeling (Boğaziçi Linguistics)*  
Fall 2025

1. COURSE CODE, TITLE AND CREDIT:  
Ling488: Exploring Natural Languages by Modeling
2. CATALOG DESCRIPTION: Basic concepts of natural grammar. Basic concepts of modeling. Relating natural grammars to models. Case studies on learning of natural grammars.
3. LECTURER: Prof. Cem Bozşahin
4. BACKGROUND REQUIREMENT(S): Third or Fourth-year standing, and at least one course in (a) general linguistics, (b) syntax, (c) semantics or (d) morphology. Knowledge of programming is a plus but not required.
5. COURSE IN RELATION TO THE PROGRAMS: This course is intended as an undergraduate senior level and graduate level elective in Linguistics.
6. COURSE OBJECTIVES: To gain a first-hand experience of modeling a natural language grammar, to understand how models connect to theories, to understand model construction, training and selection. Theory-laden language models are developed to facilitate a first-hand experience.
7. COURSE OUTLINE
  - a. Preliminaries: functions and probabilities (2 weeks)
  - b. What is a scientific model? (1 week)
  - b. Analysis and Grammar (4 weeks)
    - Analysis and semantics (about reference)
    - Analysis and syntax (about grammaticality)
    - Categorical analysis (about reference making a distinction in grammaticality)
    - From analysis to training and ranking (from grammars to models)
  - c. A tool for analysis and modeling, case study on (i) a syntactic construction (2 weeks)
  - d. Model development, model use, and model choice: training and ranking (2 weeks)
  - e. Case studies on (ii) word order, (iii) language acquisition (2 weeks)
8. READING: The following are not textbooks but main references:
  - Bozşahin, Cem (2025). *Connecting Social Semiotics, Grammaticality and Meaningfulness: The Verb*. Newcastle Upon Tyne: Cambridge Scholars. (Available at department's library).
  - Bozşahin, Cem (2024). TheBench Guide. <https://github.com/bozsahin/thebench>.
  - Short reference material on linguistic categorization, lambda calculus and probability.
9. COURSE CONDUCT: 10 weeks of lectures (2 preliminary; 2 in-class lab; 6 core), 1 week of in-class exam, study, 3 weeks of case study discussion.
10. GRADING: Midterm exam (20%), Final exam (%15), three case studies (%45 total, %15 each), two short homework (5% each; total 10%). Solo work in homeworks; group work in case studies.