Ling488: Exploring Natural Languages by Modeling (Boğaziçi Linguistics)

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 computation. Case studies on learning of natural grammars.

3. FACULTY MEMBERS WHO CAN TEACH THE COURSE: Cem Bozşahin, Ümit Atlamaz

4. BACKGROUND REQUIREMENT(S): Third or Fourth-year standing and at least one course in (a) general linguistics, (b) syntax, (c) semantics and (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 modelling a natural language grammar, to understand how models connect to theories, to understand model construction, training and selection. Small language models are developed to facilitate a first-hand experience.

7. COURSE OUTLINE (when Bozsahin teaches it):
   a. Grammar: grammaticality, meaningfulness and linguistic categories (3 weeks)
   b. Parsing (2 weeks)
   c. Sequence learning: features, gradient ascent/descent, learning parameters (1 week)
   d. A toolbox for the working grammarian (1 week)
   e. Acquisition of categories from form-meaning pairs (2 weeks)
   f. Understanding grammatical relations over acquired categories (2 weeks)
   g. Exploring connections in categories: Case, ergativity & accusativity (typology, 2 weeks)

8. READING (when Bozsahin teaches it): 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.
   Bozşahin, Cem (2021). CCGlab Manual. https://github.com/bozsahin/ccglab.

9. COURSE CONDUCT: 10 weeks of two-hour lectures, one-hour in-class or home-class grammar tool study, 3 weeks of model discussion for (7e--g), one midterm exam, in class.

10. GRADING: Midterm exam (25%), Final exam (%30), three mini projects (%45 total, %15 each).

11. EFFECTIVE DATE: Spring 2025.
12. FREQUENCY: On demand.