

MATH 406 - Introduction to Mathematical Logic and Model Theory, Fall 2024

Course Syllabus

Website: <https://blog.metu.edu.tr/benli/teaching/math-406-introduction-to-mathematical-logic-and-model-theory/>

Office hours: (Will be announced later)

Textbooks:

(Main textbook) An Invitation to Mathematical Logic, David Marker

(Supplementary book) A Friendly Introduction to Mathematical Logic (2nd Edition), Christopher C. Leary and Lars Kristiansen

Grading: There will be **two** midterms (each one out of 100) and a final exam (out of 100). Your total grade will be calculated by the following formula:

Total grade = (Midterm 1 + Midterm 2) x 0.3 + Final x 0.4

NA policy:

- If your two midterm scores **add up to less than 20 points**, (i.e., $M1+M2 < 20$) then you shall not be able to take the final exam and get an NA grade.
- If you will take the makeup exam for one of the midterms and your score of the other midterm is **less than 10**, then you shall not be able to take the final exam and get an NA grade.
- If you miss more than one midterm, then you shall not be able to take the final exam and get an NA grade.

Make-up policy: There will be one makeup exam at the end of the semester. No make-ups will be given without an official report. You cannot take more than one make-up exam even if you have official report.

You have 48 hours after the exam to notify the course coordinator about your exam absence.

Academic dishonesty policy: You are expected to be familiar with the university's [academic integrity guide](#) for students. No form of academic dishonesty is tolerated. If you are caught cheating, then you will fail the course **and** official disciplinary action may be pursued.

Information for students with disabilities: To obtain disability-related academic adjustments and/or auxiliary aids, students with disabilities must contact the course coordinator and the METU Disability Support Office as soon as possible. For further information, visit the web site <http://engelsiz.metu.edu.tr>.

Content of the course:

Our aim is to cover the first two parts of the main textbook. If time permits, we may also cover additional topics.

Here is the content of the first two parts:

Part I Truth and Proof

1	Languages, Structures, and Theories	3
2	Embeddings and Substructures	31
3	Formal Proofs	43
4	Gödel's Completeness Theorem	53

Part II Elements of Model Theory

5	Compactness and Complete Theories	67
6	Ultraproducts	85
7	Quantifier Elimination	97
8	Model Theory of the Real Field	121