



Syllabus

MATHEMATICAL LOGIC (2) - 80424

Last update 12-01-2019

HU Credits: 3

Responsible Department: Mathematics

Academic year: 0

Semester: 2nd Semester

Teaching Languages: Hebrew

Campus: E. Safra

Course/Module Coordinator: Prof. Itay Kaplan

Coordinator Email: kaplan@math.huji.ac.il

Coordinator Office Hours: set an appointment

Teaching Staff:

Prof Itay Kaplan

Mr. Shahar Uriel

Course/Module description:

In the beginning of the 20th century mathematicians tried to find a complete system of axioms for the whole of mathematics and in particular for number theory.

Godel showed that these efforts cannot succeed: Godel's incompleteness theorem says that in any reasonable system of axioms there is always a true statement which cannot be proved.

In the course we will review the incompleteness theorems and relevant parts of recursion theory.

In addition the course includes an introduction to model theory.

Course/Module aims:

See learning outcomes.

Learning outcomes - On successful completion of this module, students should be able to:

Better understanding of mathematical logic, the tools it provides (like compactness) and its limitations (the incompleteness theorem).

Attendance requirements(%):

0

Teaching arrangement and method of instruction: Lecture+exercise

Course/Module Content:

*This is a list of some of the subjects that will be covered in the course:
Godel's incompleteness theorems on Peano arithmetic.*

Tarski's truth theorem.

Recursion theory: recursive function, the recursion theorem, RE sets.

Model theory: ultraproducts, compactness, Lowenheim-Skolem theorems.

Required Reading:

none

Additional Reading Material:

J.L. Bell and M. Machover, A Course in Mathematical Logic

R. Smullyan, Godel's Incompleteness Theorems

J.R. Shoenfield, Mathematical Logic

H. Enderton, A Mathematical Introduction to Logic

Course/Module evaluation:

End of year written/oral examination 85 %

Presentation 0 %

Participation in Tutorials 0 %

Project work 0 %

Assignments 15 %

Reports 0 %

Research project 0 %

Quizzes 0 %

Other 0 %

Additional information:

none