האוניברסיטה העברית בירושלים
THE HEBREW UNIVERSITY OF JERUSALEM

The Hebrew University of Jerusalem

Syllabus

AXIOMATIC SET THEORY - 80650

Last update 15-10-2020

HU Credits: 2

Degree/Cycle: 1st degree (Bachelor)

Responsible Department: Mathematics

Academic year: 0

Semester: 1st Semester

Teaching Languages: Hebrew

Campus: E. Safra

Course/Module Coordinator: Yair Hayut

Coordinator Email: yair.hayut@mail.huji.ac.il

Coordinator Office Hours:

Teaching Staff:

Dr. Hayut Yair

Course/Module description:

During this course we shall introduce the formal framework for Set Theory: The Axiom system of Zermello-Fraenkel (ZFC). We shall formally introduce some basic notions like: ordinals, cardinals, wellfoundedness and basic concepts of combinatorial Set Theory. We shall prove some easy cases of independence (For instance the independence of the axiom of replacement)
We shall prove the consistency of the axiom of choice, using the model of hereditarily ordinal definable sets. We shall present the constructible universe (L) and we shall use it to prove the consistency of the Generalized Continuum Hypothesis. Time permitting, we shall talk about an advanced topic at the end of the course (e.g., measurable cardinals, Suslin trees, etc.)

Course/Module aims:

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

Ability to prove and apply the theorems presented in the course.

Ability to apply correctly the mathematical methodology in the context of the course.

Acquiring the fundamentals as well as basic familiarity with the field which will assist in the understanding of advanced subjects.

Ability to understanding and explain the subjects taught in the course.

Attendance requirements(%):

0

Teaching arrangement and method of instruction:

Course/Module Content:

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Required Reading:
For those who did not take the basic logic course are expected to read about the following topics:

First-order language, formulas, sentences, theories, structures, the satisfaction relation, definability, the compactness and completeness theorems (without proof).

Additional Reading Material:

Course/Module evaluation:
End of year written/oral examination 40 %
Presentation 0 %
Participation in Tutorials 0 %
Project work 20 %
Assignments 40 %
Reports 0 %
Research project 0 %
Quizzes 0 %
Other 0 %

Additional information:
The final grade will be composed of midterm assignment (20%), exercises (40%) and a final exam/assignment (40%)