



## *The Hebrew University of Jerusalem*

### *Syllabus*

## *MODEL THEORY (1) - 80616*

*Last update 02-09-2021*

*HU Credits: 2*

*Degree/Cycle: 2nd degree (Master)*

*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](mailto:yair.hayut@mail.huji.ac.il)*

*Coordinator Office Hours: meeting can be set by mail.*

*Teaching Staff:*

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Dr. Hayut Yair

Course/Module description:

Model theory looks at mathematical structures from the standpoint of language; specific mathematical languages are suitable to different fields, reflecting the algebraic structure and notions of limit in it. This class a first introduction to the methods of model theory, taking up the story from Logic I.

Course/Module aims:

Achieving understanding of basic ideas of model theory. See moodle page.

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: Lectures, homework problems.

Course/Module Content:

Languages and structures; compactness. Omitting types.  
Countable models of complete theories: homogeneous models, Ryll-Nardjewski.  
Saturated models. Applications to definability theorems (Robinson, Beth, and more).  
Simple applications to algebra. Definable and algebraic closure. Indiscernibles.  
Morley's theorem.

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Required Reading:

*Tent, Ziegler: A course in Model Theory.*

*An alternative: the first three chapters of Chang and Keisler, as well as 4.1, 7.1, 7.2.*

*Chang, C. C.; Keisler, H. J. Model theory. Third edition. Studies in Logic and the Foundations of Mathematics, 73. North-Holland Publishing Co., Amsterdam, 1990. xvi+650 pp. ISBN: 0-444-88054-2*

Additional Reading Material:

*Poizat, Bruno A course in model theory. An introduction to contemporary mathematical logic. Translated from the French by Moses Klein and revised by the author. Universitext. Springer-Verlag, New York, 2000. xxxii+443 .pp*

Course/Module evaluation:

*End of year written/oral examination 0 %*

*Presentation 0 %*

*Participation in Tutorials 0 %*

*Project work 50 %*

*Assignments 50 %*

*Reports 0 %*

*Research project 0 %*

*Quizzes 0 %*

*Other 0 %*

Additional information:

*Other or additional topics may be studied*