



## *Syllabus*

### *Category Theory - 80779*

*Last update 21-08-2018*

*HU Credits:* 2

*Responsible Department:* Mathematics

*Academic year:* 0

*Semester:* 1st Semester

*Teaching Languages:* Hebrew

*Campus:* E. Safra

*Course/Module Coordinator:* Mr. Lior Yanovski

*Coordinator Email:* [lior.yanovski@mail.huji.ac.il](mailto:lior.yanovski@mail.huji.ac.il)

*Coordinator Office Hours:* By appointment

*Teaching Staff:*  
Prof Tomer Schlank

*Course/Module description:*

*Introductory course in category theory for 3rd year undergraduate students and*

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1st year graduate students.

Course/Module aims:

*Familiarity with the basic concepts and theorems of category theory and proficiency in the categorical language with emphasis on examples.*

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

*See course aims.*

Attendance requirements(%):

0

*Teaching arrangement and method of instruction: Lecture*

Course/Module Content:

*The course will cover the following topics:*

- 1. Categories, functors & natural transformations: definitions, examples, basic constructions.*
- 2. Universal properties, representable functors, Yoneda lemma.*
- 3. (co)limits: definitions & examples, special kinds (finite, connected, filtered etc.)*
- 4. (co)limit calculus:  
commutation, functors preserving (co)limits, cofinality etc.*
- 5. Adjoint functors: definitions, examples and basic properties. The adjoint functor theorem (?).*

*In addition, it will cover some of the following topics:*

- 6. More on (co)limits: Kan extensions, (co)ends, weighted (co)limits.*
- 7. Sheaves, localization and topoi: definitions, examples, characterization.*
- 8. Abelian categories: definitions & examples, intro to homological algebra, the embedding theorem.*
- 9. Monoidal categories.*

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10. Intro to 2-categories.

Required Reading:  
none

Additional Reading Material:

Course/Module evaluation:

End of year written/oral examination 100 %

Presentation 0 %

Participation in Tutorials 0 %

Project work 0 %

Assignments 0 %

Reports 0 %

Research project 0 %

Quizzes 0 %

Other 0 %

Additional information:

*This is an introductory course in category theory with emphasis on the categorical language and examples.*