The Hebrew University of Jerusalem

Syllabus

Category Theory - 80779

Last update 21-08-2018

HU Credits: 2

Degree/Cycle: 2nd degree (Master)

Responsible Department: Mathematics

Academic year: 2019

Semester: 1st Semester

Teaching Languages: Hebrew

Campus: E. Safra

Course/Module Coordinator: Mr. Lior Yanovski

Coordinator Email: lior.yanovski@mail.huji.ac.il

Coordinator Office Hours: By appointment

Teaching Staff:

Mr. Lior Yanovski

Course/Module description:
Introductory course in category theory for 3rd year undergraduate students and 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 homolgical algebra, the embedding theorem.

9. Monoidal categories.

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.