האוניברסיטה העברית בירושלים
THE HEBREW UNIVERSITY OF JERUSALEM

The Hebrew University of Jerusalem

Syllabus

Metric Embedding Theory & its Algorithmic Applications - 67720

Last update 17-09-2024

HU Credits: *3*

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

Responsible Department: *Computer Sciences*

Academic year: *2025*

Semester: *1st Semester*

Teaching Languages: *English and Hebrew*

Campus: *E. Safra*

Course/Module Coordinator: *Prof Yair Bartal*

Coordinator Email: *yair@cs.huji.ac.il*

Coordinator Office Hours: *Coordinate in advance*

Teaching Staff:
Prof. Yair Bartal

Course/Module description:
The course concerns with Metric embedding theory and its applications. This is a field which took a central place in the theory of algorithms in recent years due to its many applications.

Course/Module aims:
See learning outcomes.

Learning outcomes - On successful completion of this module, students should be able to:
Knowledge of the theory of metric embedding and its applications

Attendance requirements(%):
85

Teaching arrangement and method of instruction: Lecture

Course/Module Content:
Among the course topics are the following: Metric spaces, low distortion embedding, dimension reduction, low distortion embedding, embedding into normed spaces, probabilistic embedding of metrics into trees and its applications, metric Ramsey properties,, embedding of low average distortion, and nearest neighbor search.

Required Reading:
NA

Additional Reading Material:
Matousek's book - Lectures on Discrete Geometry, Chapter 15 <http://moodle.cs.huji.ac.il/cs10/mod/resource/view.php?id&eq;3439>
Deza-Laurent's book: Geometry of Cut and Metrics <http://moodle.cs.huji.ac.il/cs10/mod/resource/view.php?id&eq;3442>

Grading Scheme:

Submission assignments during the semester: Exercises / Essays / Audits / Reports / Forum / Simulation / others 100 %

Additional information:

The course suits both Computer Science students as well as students of Mathematics.
The course is intended for M.Sc. Registration of B.Sc. students requires lecturer's approval.