



# *The Hebrew University of Jerusalem*

## *Syllabus*

### *Algorithms - 67504*

*Last update 07-10-2024*

*HU Credits:* 5

*Degree/Cycle:* 1st degree (Bachelor)

*Responsible Department:* Computer Sciences

*Academic year:* 0

*Semester:* 1st and/or 2nd Semester

*Teaching Languages:* Hebrew

*Campus:* E. Safra

*Course/Module Coordinator:* Alex Samorodnitsky

*Coordinator Email:* [salex@cs.huji.ac.il](mailto:salex@cs.huji.ac.il)

*Coordinator Office Hours:* TUESday 16:00-17:00

*Teaching Staff:*

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Prof. Alex Samorodnitsky,  
Dr. Alon Eden,  
Mr. Yoav Feinstein,  
Mr. emmanuel zerah,  
Mr. elyassaf loyfer,  
Ms. Daniela Horan,  
Prof. Yuval Rabani

Course/Module description:

*The course describes a wide array of basic and advanced algorithms.*

Course/Module aims:

*Developing "algorithmic thinking" by presenting a wide array of algorithmic problems and their solutions.*

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

*know and apply the main algorithmic techniques*

*understand and apply the mathematical tools and ideas which underlie the algorithmic techniques*

*apply main algorithm analysis techniques to assess the complexity of an algorithm*

*recognize (some) problems to be computationally hard and design an approximation algorithm in this case*

*analyze an algorithmic problem and decide on an appropriate algorithmic technique for its solution*

Attendance requirements(%):

0

*Teaching arrangement and method of instruction: Lectures + tutorials*

Course/Module Content:

*Design and analysis of efficient algorithms for basic and advanced algorithmic problems. This includes greedy algorithms, dynamic programming, approximation*

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*algorithms, network flow, fast Fourier transform and applications, number theoretical algorithms, cryptography, and computational linear algebra*

*Required Reading:*

*none*

*Additional Reading Material:*

*Introduction to Algorithms, by T. Cormen, C. Leiserson, R. Rivest, and C. Stein. Second Edition.*

*Algorithm Design, by J. Kleinberg and E. Tardos*

*Algorithms, by S. Dasgupta, C.H. Papadimitriou, and U.V. Vazirani*

*Grading Scheme:*

*Written / Oral / Practical Exam 80 %*

*Submission assignments during the semester: Exercises / Essays / Audits / Reports / Forum / Simulation / others 20 %*

*Additional information:*

*midterm is a 10% Magen for the final grade*