



# *The Hebrew University of Jerusalem*

## *Syllabus*

### *Mechanics for math students - 77154*

*Last update 06-03-2025*

*HU Credits:* 7

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

*Responsible Department:* Physics

*Academic year:* 0

*Semester:* 2nd Semester

*Teaching Languages:* Hebrew

*Campus:* E. Safra

*Course/Module Coordinator:* prof. Yuval Birnboim

*Coordinator Email:* [yuval.birnboim@mail.huji.ac.il](mailto:yuval.birnboim@mail.huji.ac.il)

*Coordinator Office Hours:* By appointment

*Teaching Staff:*

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Prof. Yuval Birnboim,  
Mr. Ariel Kelman

Course/Module description:

*We will learn classical mechanics and special relativity at year 1 undergraduate level*

Course/Module aims:

*The course aims to teach basic terms in mechanics, provide basic tools for physical intuition, to demonstrate use of mathematical tools to solve complex realistic problems.*

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

*On successful completion of this module,  
students should be able to:  
solve problems in mechanics and private relativity.  
Technically use mathematical tools (complex numbers, ordinary differential equations, Taylor series etc.) to solve problems.  
Use physical arguments to guess solutions and test their validity*

Attendance requirements(%):

*90%, war pending*

*Teaching arrangement and method of instruction: flipped classroom: we'll prepare the material before class, and deepen our understandings at class using lectures, group discussion, experiments and demonstrations, and problem solving by lecture and group work.*

Course/Module Content:

*Introduction to physics  
Newton's laws  
Conservation of momentum  
collisions and center of mass  
conservation of energy  
potential energy  
angular momentum  
Harmonic motion (ideal, damped and forced)  
Relativistic kinetics  
Relativistic dynamics*

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Required Reading:

None

Additional Reading Material:

*The Feynman Lectures on Physics*

Grading Scheme:

Written Exam % 65

Submission assignments during the semester: Exercises / Essays / Audits / Reports  
/ Forum / Simulation / others 10 %

Mid-terms exams 15 %

Other 10 %

Additional information: