האוניברסיטה העברית בירושלים
THE HEBREW UNIVERSITY OF JERUSALEM

# *The Hebrew University of Jerusalem*

## *Syllabus*

# *Topics in Transcendental Number Theory - 80899*

*Last update 23-03-2025*

*HU Credits:* *2*

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

*Responsible Department:* *Mathematics*

*Academic year:* *0*

*Semester:* *2nd Semester*

*Teaching Languages:* *Hebrew*

*Campus:* *E. Safra*

*Course/Module Coordinator:* *Dan Mangoubi*

*Coordinator Email:* *dan.mangoubi@mail.huji.ac.il*

*Coordinator Office Hours:*

*Teaching Staff:*

*Prof. Dan Mangoubi*

*Course/Module description:*
*Classical proofs in transcendental number theory.*
*Lectures are given by students.*
*Possible topics include:*

*Hermite's proof on the transcendence of e,*
*Lindemann's proof on the transcendence of π.*

*Padé approximations,*

*Hilbert 7th problem: 2^{sqrt{2}} is transcendental,*

*Baker's theorem on linear forms in logarithms of algebraic numbers.*

*Diophantine approximations: Dirichlet's theorem, Liouville Theorem, Thue's theorem.*

*Continued fractions,*

*Siegel's theory on values of E-functions.*

*Course/Module aims:*
*Exposure to fascinating theorem of transcendental number theory, with methods bridging analysis and number theory.*

*Learning outcomes - On successful completion of this module, students should be able to:*
*Understanding ideas in transcendental Number Theory with a view towards Spectral Geometry.*

*Attendance requirements(%):*
*100*

*Teaching arrangement and method of instruction:*

*Course/Module Content:*
*See course description*

*Required Reading:*
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*Additional Reading Material:*
*Siegel - Transcendental Numbers*

*Lang-Introduction to transcendental numbers*

*Niven, Irrational numbers*

*Waldschmidt, introduction to Diophantine methods*

*Sound- Transcendental Number Theory*

*Grading Scheme:*
*Presentation / Poster Presentation / Lecture 100 %*

*Additional information:*