



# *The Hebrew University of Jerusalem*

## *Syllabus*

### *Seminar in analysis: Irrational numbers - 80808*

*Last update 12-08-2020*

*HU Credits: 2*

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

*Responsible Department: Mathematics*

*Academic year: 2023*

*Semester: 1st Semester*

*Teaching Languages: Hebrew*

*Campus: E. Safra*

*Course/Module Coordinator: Dan Mangoubi*

*Coordinator Email: [dan.mangoubi@mail.huji.ac.il](mailto:dan.mangoubi@mail.huji.ac.il)*

*Coordinator Office Hours:*

*Teaching Staff:*

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Prof Dan Mangoubi

Course/Module description:

We follow the book *Irrational numbers* by I. Niven:

- 1)  $e$  is transcendental (Hermite, 1873)
- 2)  $\pi$  is transcendental (Lindemann, 1882)
- 3) Liouville numbers
- 4) Continued fractions
- 5) Hilbert's seventh problem and Gelfond-Schneider's Theorem (1934) If  $a, b$  are algebraic then  $a^b$  is transcendental (unless  $a=0$  or  $1$ ).

Course/Module aims:

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

Acquaintance with ideas of Diophantine approximation and Transcendental Number Theory.

Attendance requirements(%):

100

Teaching arrangement and method of instruction: Lectures by students

Course/Module Content:

See course description.

Required Reading:

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Additional Reading Material:

*Irrational Numbers*, Niven.  
*Transcendental Numbers*, Siegel.  
*The Theory of Numbers*, Hardy and Wright.

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Course/Module evaluation:

End of year written/oral examination 0 %

Presentation 80 %

Participation in Tutorials 20 %

Project work 0 %

Assignments 0 %

Reports 0 %

Research project 0 %

Quizzes 0 %

Other 0 %

Additional information: