האוניברסיטה העברית בירושלים
THE HEBREW UNIVERSITY OF JERUSALEM

The Hebrew University of Jerusalem

Syllabus

COMPLEX VARIABLES AND APPLICATIONS - 80314

Last update 18-04-2020

HU Credits: *4*

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

Responsible Department: *Mathematics*

Academic year: *0*

Semester: *2nd Semester*

Teaching Languages: *Hebrew*

Campus: *E. Safra*

Course/Module Coordinator: *Prof. Genadi Levin*

Coordinator Email: *levin@math.huji.ac.il*

Coordinator Office Hours: *N/A*

Teaching Staff:

Prof Genady Levin
Mr. Tzoor Plotnikov

Course/Module description:
The course is an introduction to the theory of analytic functions of one complex variable. A basic knowledge of the calculus of real variables is assumed.

Course/Module aims:
The course is an introduction to the theory of complex valued functions of one complex variable.

Learning outcomes - On successful completion of this module, students should be able to:
To know fundamental notions of the theory of analytic functions and be able to apply them to calculations of integrals etc.

Attendance requirements(%):
0

Teaching arrangement and method of instruction: Lectures + exercises

Course/Module Content:
Complex numbers, elementary complex functions and their properties.
Introduction to the concept of analytic function.
Cauchy-Riemann conditions.
Elementary conformal mappings and their geometric properties. Mobius transformations.
Complex integration. The Cauchy theorem. The Cauchy integral formula and its consequences. Power series. Cauchy-type integrals.
The uniqueness theorem for analytic functions. Analytic continuation.
The Liouville theorem. The Morera theorem and its applications.
Laurent series. Zeros and singularities of analytic functions.
The Residue Theorem and its applications to the evaluation of integrals. The argument principle. The Rouche theorem and its applications. The maximum principle.
Harminic functions.

Required Reading:

none

Additional Reading Material:
M.A. Analytic Functions.

L. Ahlfors. Complex Analysis.

אגמון, אנליזה קלסית

Course/Module evaluation:
End of year written/oral examination 80 %
Presentation 0 %
Participation in Tutorials 0 %
Project work 0 %
Assignments 20 %
Reports 0 %
Research project 0 %
Quizzes 0 %
Other 0 %

Additional information:
An alternative exam if necessary. If also such exam will not be possible, the evaluation will be made on the basis of home assignments.