האוניברסיטה העברית בירושלים
THE HEBREW UNIVERSITY OF JERUSALEM

The Hebrew University of Jerusalem

Syllabus

ALGEBRAIC NUMBER THEORY - 80756

Last update 20-08-2021

HU Credits: 3

Degree/Cycle: 2nd degree (Master)

Responsible Department: Mathematics

Academic year: 2022

Semester: 1st Semester

Teaching Languages: English and Hebrew

Campus: E. Safra

Course/Module Coordinator: Ari Shnidman

Coordinator Email: ariel.shnidman@mail.huji.ac.il

Coordinator Office Hours: By appointment

Teaching Staff:

Dr. Schneidman Ari

Course/Module description:
Introduction to the basic properties of algebraic numbers.

Course/Module aims:
Getting acquainted with the basic properties of the rings of integers in number fields, decomposition of prime ideals in extensions, p-adic numbers, Hensel's lemma, finiteness of the class number, finite generation of the group of units.

Learning outcomes - On successful completion of this module, students should be able to:
- to compute rings of integers in algebraic number fields of low degree
- to decompose an ideal to a product of primes
- to evaluate the ramification indices and inertial degrees of primes in extensions of low degree
- to compute units of number fields
- to prove simple properties of algebraic number fields.

Attendance requirements(%):

Teaching arrangement and method of instruction: Lecture

Course/Module Content:
Traces and norms, discriminants, integral ring extensions, Number fields, integer rings, Dedekind rings, ramification and inertia, cyclotomic fields, the geometric embedding, p-adic fields, Hensel's lemma, finiteness of the class group, the structure of the group of units.

Required Reading:
None

Additional Reading Material:

Course/Module evaluation:

End of year written/oral examination 0 %
Presentation 0 %
Participation in Tutorials 0 %
Project work 100 %
Assignments 0 %
Reports 0 %
Research project 0 %
Quizzes 0 %
Other 0 %

Additional information: