COURSE DETAIL

ABSTRACT ALGEBRA 2: FIELDS, RINGS, MODULES
Country Ireland
Host Institution Trinity College Dublin
Program(s) Trinity College Dublin
UCEAP Course Level Upper Division
UCEAP Subject Area(s) Mathematics
UCEAP Course Number 148
UCEAP Course Suffix
UCEAP Official Title ABSTRACT ALGEBRA 2: FIELDS, RINGS, MODULES
UCEAP Transcript Title ABSTRACT ALGEBRA 2
UCEAP Quarter Units 5.00
UCEAP Semester Units 3.30

Course Description

The course introduces rings, subrings, homomorphisms, ideals, quotients, and isomorphism theorems. It includes integral domains, unique factorization domains, principal ideal domains, Euclidean domains, Gauss' lemma and Eisenstein's criterion. Fields, field of quotients, field extensions, the tower law, ruler and compass constructions, construction of finite fields. Students state the definitions of concepts and prove their main properties, describe fields and rings and perform computations in them. Students discuss the theoretical results covered in the course and outline their proofs. They perform and apply the Euclidean algorithm in a Euclidean domain, giving examples of sets for which some of the defining properties of fields. They focus on proving the tower law, and use it to prove the impossibility of some classical ruler and compass geometric constructions. Students learn to identify concepts as particular cases of fields, rings, and modules (e.g. functions on the real line as a ring, abelian groups, and vector space).

Language(s) of Instruction
English

Host Institution Course Number
MAU22102

Host Institution Course Title
ABSTRACT ALGEBRA II: FIELDS, RINGS, MODULES

Host Institution Course Details
https://www.maths.tcd.ie/undergraduate/modules/MAU22102.php

Host Institution Campus

Host Institution Faculty

Host Institution Degree

Host Institution Department
Mathematics

Course Last Reviewed
2024-2025

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