Nepal Algebra Project(NAP)
Central Department of Mathematics
Tribhuvan University,Kirtipur, Kathmandu,Nepal
Fields and Galois Theory- Short Note of Lecture Module 1 - Lecture 1
Course Instructor: Prof. Michel Waldschmidt

Summary of NAP: Module -1, Lecture 1, Tuesday, May 2, 2017

- Introduction

- Starting from the set $\mathbb{N} = \{0, 1, 2, \dots\}$ of natural numbers, construction of the ring $\mathbb{Z}$ of rational integers, next of the field $\mathbb{Q}$ of rational numbers (as a quotient), of the field $\mathbb{R}$ of rational numbers (no detail), and then construction of $\mathbb{C}$ as a quotient $\mathbb{R}[X]/(X^2 + 1)$.

- Complex conjugation.

- Rings, integral domains, group of units. Units of $\mathbb{R}[X]$ when $\mathbb{R}$ is a domain.

- Definition of irreducible polynomials over a field.

- Property (without proof): $\mathbb{C}$ is algebraically closed.

- Exercises:

  - Which are the irreducible polynomials over $\mathbb{R}$?
  - The fields $\mathbb{Q}(i)$, $\mathbb{Q}(\sqrt{2})$