MA4198 PROJECT PROPOSAL (PROJECT CUM SEMINAR GROUP)

SUPERVISOR'S INFO

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PROJECT ID: PS2510-02

TITLE

Hilbert's 10^{th} problem

BRIEF DESCRIPTION OF PROJECT

Number 10 in Hilbert's famous list of 23 problems asks for an algorithm which will decide whether any given Diophantine equation has an integer solution. Building on earlier work by Martin Davis, Hilary Putnam, and Julia Robinson, Yuri Matiyasevich proved in 1970 that no such algorithm exists. The aim of the project will be to understand the meaning and the proof of Matiyasevich's theorem and its variations. Along the way, we will learn about recursive functions and the formal definition of an algorithm. These notions give us a powerful way to measure the complexity of various mathematical problems.

EXPECTATION/S

Students are expected to actively engage with the readings. They must be prepared to present what they have read to other members of the group and to engage with each other during discussions.

PREREQUISITE/S (at level 3000 or below, with at most one course at level 3000)

MA2202, MA2108

READING REFERENCE/S

1. **Hilbert's 10th Problem by Yuri Matiyasevich, MIT press, 1993.**
2. **Hilbert's Tenth Problem is Unsolvable by Martin Davis, The American Mathematical Monthly, Vol. 80, No. 3 (Mar., 1973), pp. 233-269.**