Department of Mathematics, IIT Bombay

Fresh Research Scholars Seminars (FRSS)

ABSTRACTS FOR WEEK 2:

Monday, 26th Oct 2020 at 11.30 am

Omkar Javadekar *Serre's conjecture for projective modules*

Abstract: Also known as Quillen-Suslin theorem, Serre's conjecture is a result concerning the relationship between free and projective modules over polynomial rings. It states that every finitely generated projective module over a polynomial ring over a field is free. The statement was conjectured by Serre in 1955, and the first proofs were given independently by Quillen and Suslin in 1976. In this talk we will see a proof of Serre's conjecture.

We begin by defining unimodular extension property. We then show that polynomial rings have unimodular extension property. Finally, appealing to the result that finitely generated projective modules over polynomial rings are stably free, we conclude the proof of Serre's conjecture by showing that stably free modules over a ring having unimodular extension property are free.

Google Meet Link: https://meet.google.com/afe-nzqz-sgt

Wednesday, 28th Oct 2020 at 4 pm

Uttam Ojha   *Hensel's Lemma*

Abstract: We begin with the notions of completion of a module and completeness. Then we prove Hensel's Lemma for a complete ring and deduce the Implicit function theorem as a Corollary.

Google Meet Link: https://meet.google.com/tbg-fghh-nmg

Saturday, 31st Oct 2020 at 11.30 am

Sai Krishna   *Krull's Generalized Principal Ideal Theorem*

Abstract: In this talk, we will discuss the proof of Krull's Generalized Principal Ideal Theorem without using the the Dimension theorem. We will briefly introduce the notion of Krull dimension and prove the Principal ideal theorem and the generalized version. We will look at a few consequences of this result

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