

Department of Mathematics, IIT Bombay

Fresh Research Scholars Seminars (FRSS)

ABSTRACTS FOR WEEK 4:

[Monday, 9th Nov 2020 at 11.30 am](#)

Lovy Jain *Lax-Milgram lemma and its applications*

Abstract: Lax-Milgram lemma is an effective tool in checking the well-posedness of a weak formulation. Derived from basic theorems of functional analysis, it saves hectic calculations that serves the purpose otherwise in differential equations' analysis.

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

[Wednesday, 11th Nov 2020 at 4 pm](#)

Subhajit Das *The Yoneda lemma*

Abstract: Category Theory is an alternate foundation of mathematics, the first (and more common) one being Set Theory. Category Theory provides a bird's eye view of the entire "landscape" of mathematics, and determines the nature of objects based on their relationships with other objects and not their internal composition. Perhaps the most important theorem in category theory is the Yoneda Lemma. The purpose of this exposition is to delineate the statement and proof of the Yoneda Lemma and a special consequence of it, namely the Yoneda Embedding which talks about embedding any category into a "nice well-behaved" category. Interestingly enough, we shall see how the Yoneda Lemma can be viewed as a vast generalization of Cayley's Theorem for groups.

Google Meet Link: <https://meet.google.com/hhk-ijhb-ivr>
