HONOURS SEMINAR

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A Review and Proof of the Classical Brouwer's Fixed Point Theorem and Schauder's Generalization

April 13, 2021
2:00 p.m.
Live Stream via Zoom

Abstract:

Brouwer's Fixed Point Theorem and Schauder's generalization are well known results in mathematics and are notable for their diverse applications. These fixed point theorems have become indispensable tools in numerous branches of mathematics and have applications in many other fields. They allow us to prove powerful existence results in Differential Equations, Functional Analysis, Optimization, Set Theory, Game Theory, and Economics, to name a few. In this talk I shall first present a proof of Brouwer's Fixed Point Theorem for the closed unit ball in $\mathbb{R}^n$, and then extend it to any compact, convex subset of $\mathbb{R}^n$. I will generalize this to obtain Schauder's Fixed Point Theorem for arbitrary normed vector spaces. I will also describe some examples of the many applications of Brouwer and Schauder's Fixed Point Theorems.

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Mathematics and Statistics