PMRF-ISSS Teaching Programme

Prime Minister Research Fellowship students' teaching requirement

facilitated by the Institute of Smart Structures and Systems

Module PMRF-ISSS041/2023

Unconstrained Optimization
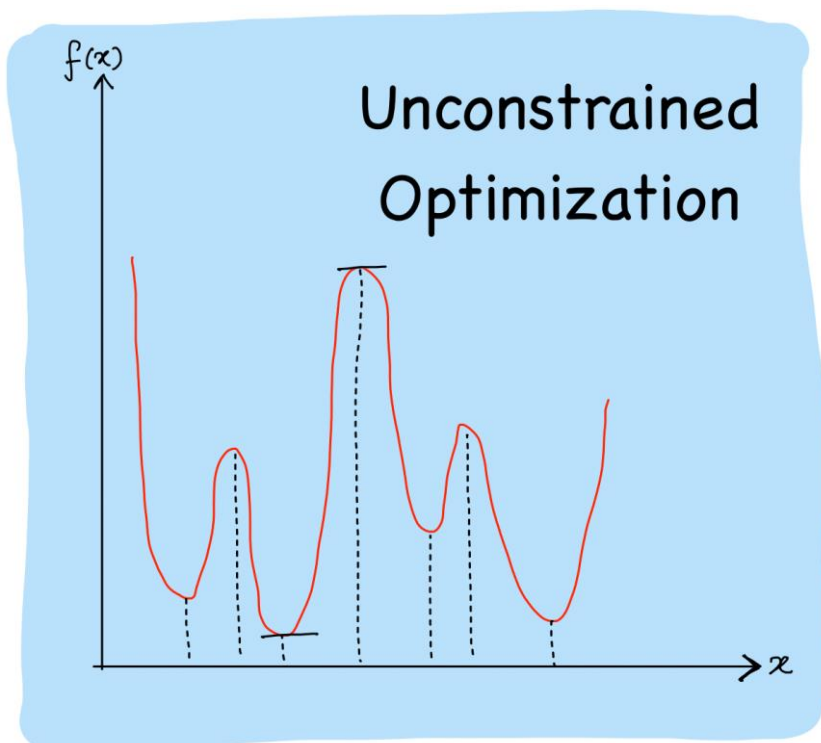
Name of the PMRF student

Aman Singh

Required background of the students taught

Graduate students looking for mathematical understanding of unconstrained optimization.
This course is relevant to all the branches of engineering.

Online session coordinator

Will be chosen from the list of registrants

Details of the content of the module

This course will contain the Unconstrained Optimization. We will first start with some mathematical background and use that to understand the unconstrained optimization theory in detail.

:List of Lectures:
1. Lec-1: Introduction
2. Lec-2: Mathematical Background
3. Lec-3: 1 Dimensional Optimization
4. Lec-4: Convex Sets
5. Lec-5: Convex Functions
6. Lec-6: Multi-Dimensional Optimization
7. Lec-7: Line Search Techniques
8. Lec-8: Global Convergence Theorems
9. Lec-9: Steepest Descent Method
10. Lec-10: Classical Newton Method
11. Lec-11: Trust Region and Quasi-Newton Method
12. Lec-12: Quasi Newton Methods – Rank one correction, DFP methods
13. Lec-13: Quasi Newton Methods – Broyden Family Coordinate methods
14. Lec-14: Conjugate Direction
15. Lec-15: Conjugate Gradient Methods

Schedule of the module

1 class/week, ~1:30 hour/class, Thursday at 3:00pm.

The first lecture "Introduction" will be of 1 hour.

Lec-2 to Lec-5 will be of 2 hours each

Rest of them will be about 1 hour to 1:30 hours

Meeting link : Online-Lecture-Link

Contact email ID: isss.forum@gmail.com

Registration link: Course-Registration-Link