PMRF-ISSS Teaching Programme

Prime Minister Research Fellowship students' teaching requirement facilitated by the Institute of Smart Structures and Systems

Module PMRF-ISSS097/2025

From *known* linear dynamics to *non*-linear dynamics

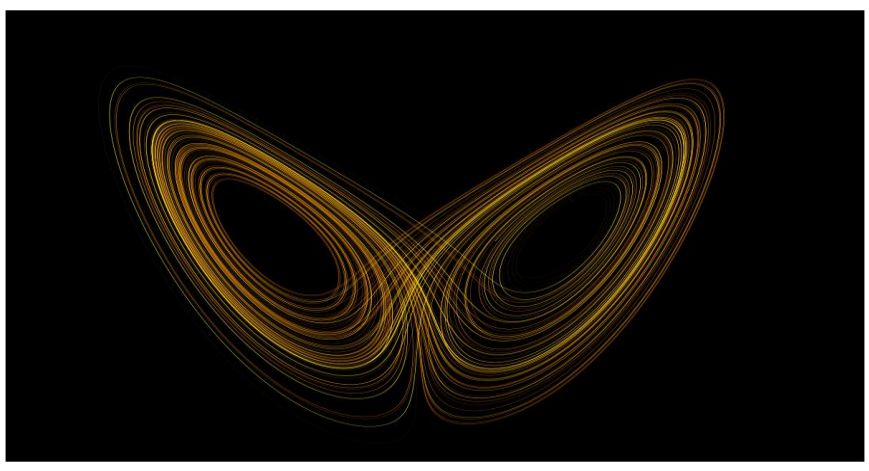
Name of the PMRF student

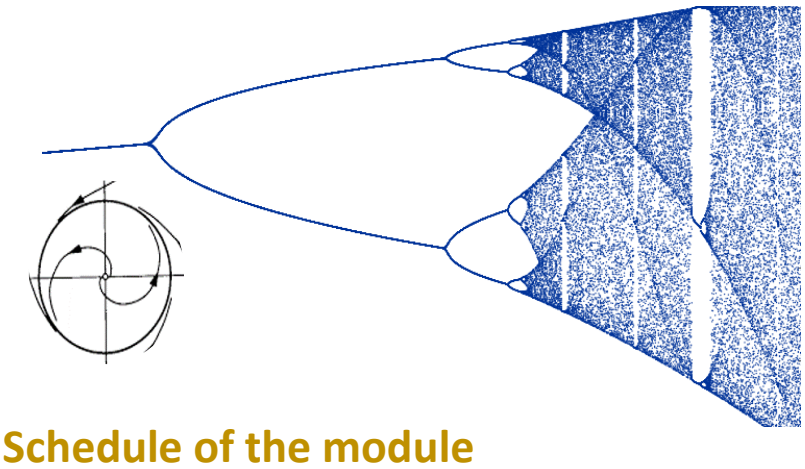
Chotalia Aarsh Amitbhai

Required background of the students taught

For undergraduate and graduate students pursuing a career in physics or any branch of engineering

*Familiarity with basic linear algebra is welcome but not mandatory





Details of the content of the module

The lectures will cover:

- Introduction to dynamics. Examples of known systems
- Discrete systems: Logistic map, Period doubling route to chaos
- Stability: Criteria and Lyapunov exponent
- Fractals.
- Continuous systems: Linearization, Jacobian, stability.
- Limit cycles: Poincaré–Bendixson theorem
- Bifurcations: Saddle-node, Trans-critical, Pitchfork, Hopf.
- Identification of chaos.
- Application to real world: brain dynamics.

Schedule of the module

Start Date: 02/10/2025

End Date: 04/12/2025 (Tentative)

Time: Thursday (3:00 pm – 5:00 pm)

Meeting link : Will be shared later

Link

Contact email ID: isss.forum@gmail.com

Registration link:

https://forms.gle/GCJv4wHxLPyNcF1EA