PMRF-ISSS Teaching Programme

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

Module PMRF-ISSS127/2024

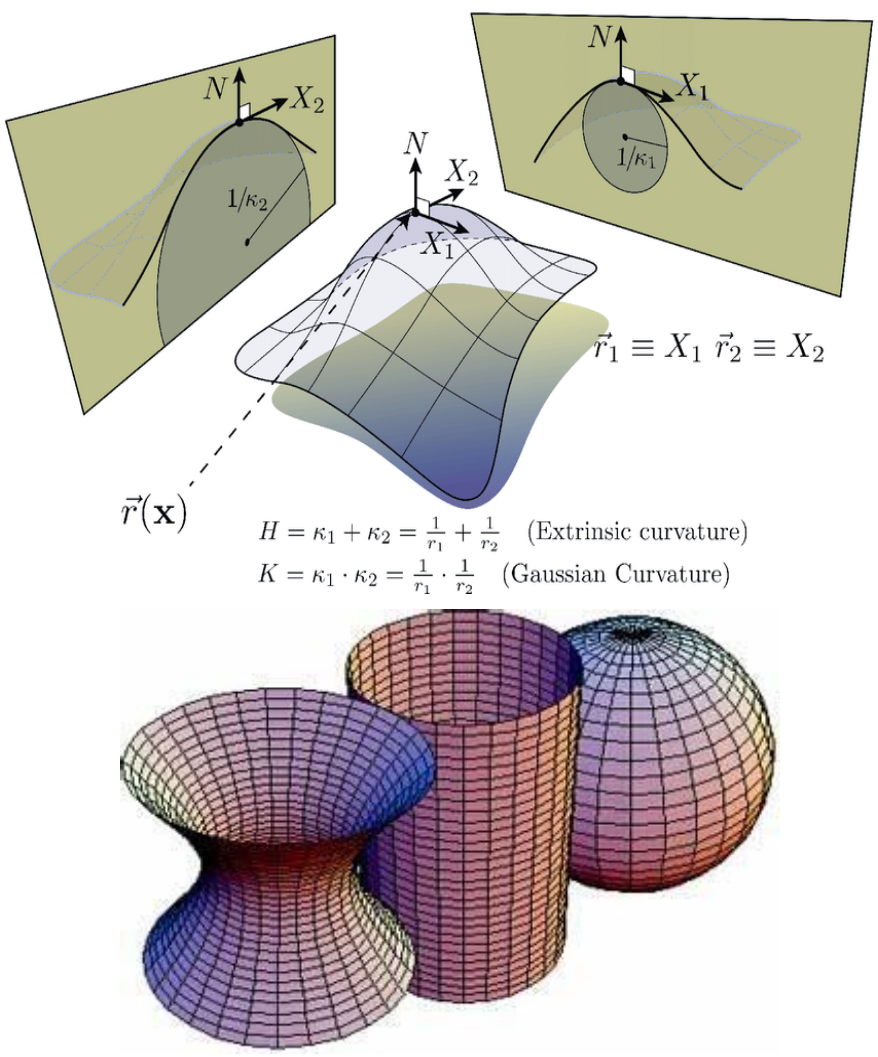
Introduction to Differential Geometry

Name of the PMRF student

G R Krishna Chand Avatar

Required background of the students taught

Aerospace Engineering, Civil Engineering, Mechanical Engineering



Details of the content of the module

Module 1: Curves

Definition, Arc length parametrization, Frames, Curvature, Plane curves, space curves

Module 2: Surfaces

Definition, Smooth surfaces, Surface Maps, Tangents and derivatives, Normals, Examples of surfaces

Module 3: First fundamental form

Lengths of curves on surfaces, Isometries of surfaces, Conformal mappings of surfaces, Spherical geometry

Module 4: Curvature of Surfaces

Second fundamental form, Curvature of surfaces, Gauss and Weingarten maps, Normal and geodesic curvatures, Parallel transport and covariant derivatives, Gaussian, mean and principal curvatures

Module 5: Advanced topics

Gauss' Theorem Egregium, Applications in mechanics

Schedule of the module

Course Start Date – Nov 12, 2024

Course End Date – Dec 12, 2024

Total Duration – 24 hours

Weekly sessions - 6 hrs per week (2 hours on Tuesdays, Wednesdays, Fridays) (tentative)

Session Timings: 6-8 PM (tentative)

Meeting link : Will be shared later

Link

Contact email ID: isss.forum@gmail.com

Registration link: https://forms.gle/mkwy1yXzZ9jVGmYQA