MATHEMATICS 232A

Riemannian Geometry

Text: *Semi-Riemannian Geometry*, by B. O'Neill

This is the first course in a two quarter introduction to Riemannian Geometry. Topics covered in the first course include the theory of manifolds, Riemannian metrics, isometries, connections, curvatures, tensors, geodesics, completeness.

TOPICS	SUGGESTED NO. OF 80 MIN. CLASSES
Manifolds (Ch. 1)	3
Manifolds, Differential Maps, Vector Fields, Differential Forms, Immersions and Submersions.	
Tensors (Ch. 2)	3
Tensor Fields, Contractions, Derivations, Symmetry Bilinear Forms.	
Semi-Riemannian Manifolds (Ch. 3)	7
Semi-Riemannian Metrics, Levi-Civita Connection, Parallel Translation, Geodesics, Exponential Maps, Curvatures.	
Semi-Riemannian Submanifolds (Ch. 4)	3
Tangents and Normals, Codazzi Equation, Normal Connection.	
Riemannian and Lorentz Geometry (Ch. 5)	3
Gauss Lemma, Arc Length, Riemannian Distance and Completeness	

40 homework problems will be given during the classes. No exam. But **attendence are required**.