15 MMCC 401 DIFFERENTIAL GEOMETRY (3-1-0)

Module – I : (14 Hours)Tensors

Tensor and their transformation laws, Tensor algebra, Contraction,
Quotient law, Reciprocal tensors, Kronecker delta, Symmetric and skew- symmetric tensors, Metric tensor, Riemannian space, Christoffel symbols and their transformation laws, Covariant differentiation of a tensor, Riemannian curvature tensor and its properties, Bianchi identities, Ricci-tensor, Scalar curvature, Einstein space.

Module – II : (12 Hours)Curves in Space

Parametric representation of curves, Helix , Curvilinear coordinates in E_3. Tangent and first curvature vector, Frenet formulas for curves in space, Frenet formulas for curve in $E_{n.}$ Intrinsic differentiation, Parallel vector fields, Geodesic.

Module – III : (14 Hours)Surfaces

Parametric representation of a surface, Tangent and Normal vector field on a surface, The first and second fundamental tensor, Geodesic curvature of a surface curve, The third fundamental form, Gaussian curvature , Isometry of surfaces, Developable surfaces, Weingarten formula, Equation of Gauss and Codazzi , Principal curvature, Normal curvature, Meusnier's theorem.

Text Book :

1. Tensor Calculas and Application to Geometry and Mechanics :
   (chapter-II and III) – I.S.SOKOLNIKOFF.

2. An Introduction to Differential Geometry:
   (chapter – I,II,III,V and VI) - T.J. WILMORE.

References Book :

1. Vector and Tensor Analysis : Lass, H, Mc Graw Hill
2. Tensor Analysis : Shanti Narayan, Academic Publishers
3. Differential Geometry : Weather burn, C.E.
4. Tenser Calculus - BARY SPAIN, Dover Publication
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