

Introduction to Differential Geometry for Physicists

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Mathematica and Gemini AI were used in preparing these lecture notes

Recommended Textbooks

- Differential Forms and the Geometry of General Relativity, by Tevian Dray
- Gravity in a Nutshell, by Anthony Zee

COURSE OUTLINE

- Chapter One: Manifolds – The Canvas of Differential Geometry
- Chapter Two: Tangent Spaces, Tensors, and the Metric Tensor
- Chapter Three: Geodesics, Covariant Derivatives, and Curvature
- Chapter Four: Lie Derivatives, Isometries, and Killing Vectors
- Chapter Five: A First Look at Differential Forms and Exterior Derivative
- Chapter Six: Integration of Forms and the Generalized Stokes' Theorem
- Chapter Seven: Intro to General Relativity and Energy-Momentum Tensor
- Chapter Eight: The Derivation of Einstein's Field Equations