CDT Syllabus: GU-ART for M.Sc in Remote Sensing and GIS

Basics of Remote Sensing: Definition, history, and significance of remote sensing. Energy interactions with Earth's surface (absorption, reflection, transmission). Basics of aerial photography and satellite remote sensing. Key remote sensing platforms of India. Land-use mapping and environmental monitoring.

Geographic Information Systems (GIS) and Cartography: Basic principles of GIS and its role in geography. Spatial data. Map projections and coordinate systems. GIS tools for spatial analysis. Land cover, climate, and hydrology.

Physical Geography & Environment: Fundamentals of landforms, climate, and ecosystems. Basics of geomorphology. Landforms and Processes. Urbanisation. Agriculture. Water resources. Topography and Thematic Maps. Contour Maps and Digital Elevation Models.

Basic Statistics: Mean, Median, Quantiles, Variance, Standard deviation, Correlation, Regression, Slope, Intercept, Data collection, Types, Classification, tabulation and graphical representation, Interpolation and extrapolation, Measures of central values, Measures of dispersion, Probability, Sampling, distributions, Tests of significance.

Basic Mathematics: Algebra, Geometry, Trigonometry, Ratio and proportions.

Computer Science: Concepts of hardware and software, Storage devices, Graphic User Interface, database concepts, Compilers and interpreters; Number systems: Binary, Decimal, Common Application Softwares, Computer networks, Internet tools and browsers, data structures, logical reasoning, data sufficiency questions.

Earth's Atmosphere: Components of Earth's atmosphere, Vertical structure of the atmosphere, Temperature scales, Air pressure and density.

Geography: Geographic principles; Concepts of geomorphic cycles Landforms and Land scape development; Erosion surfaces; Slope development; Geomorphology. Genesis of soils; Classification and distribution of soils; Soil profile; Soil erosion, Degradation and conservation; Problems of deforestation and conservation measures; Social forestry, agro-forestry; Wild life; Principle ecology; Human ecological adaptations; Influence of man on ecology and environment; Types and patterns of rural settlements; Environmental issues in rural settlements; Concept of a region; Types of regions and methods of regionalization; Growth centres and growth poles; Structure and relief; Drainage system and watersheds; Physiographic regions; Ecological issues: Environmental hazards: landslides, earthquakes, Tsunamis, floods and droughts, epidemics; Issues related to environmental pollution; Changes in patterns of land use; Principles of environmental impact assessment and environmental management; Environmental degradation; Deforestation, desertification and soil erosion; Concept of sustainable growth and development; Environmental awareness; Linkage of rivers; Basic components of Maps and Type of Maps.

Reference Books:

1. Lillesand, T., Kiefer, R.W., & Chipman, J.W. (2015). *Remote Sensing and Image Interpretation (7th Edition).* John Wiley & Sons.
2. Campbell, J.B., & Wynne, R.H. (2011). *Introduction to Remote Sensing (5th Edition).* Guilford Press.
3. Chang, K.T. (2019). *Introduction to Geographic Information Systems (9th Edition).* McGraw-Hill Education.
4. Strahler, A.N. & Strahler, A. (2013). *Introducing Physical Geography (6th Edition).* Wiley.
5. Chorley, R.J., Schumm, S.A., & Sugden, D.E. (1984). *Geomorphology.* Methuen.
6. Kumar, A. (2016). *Environmental Studies: A Multidisciplinary Approach.* Wiley India.
7. Freund, J.E. (2010). *Modern Elementary Statistics (12th Edition).* Pearson.
8. Thomas, G.B., & Finney, R.L. (2010). *Calculus and Analytic Geometry (9th Edition).* Pearson.
9. Rajaraman, V. (2014). *Fundamentals of Computers (6th Edition).* Prentice Hall India.
10. Burrough, P.A., & McDonnell, R.A. (1998). *Principles of Geographical Information Systems.* Oxford University Press.