LESSON PLAN (2025-26)

Govt. College for Women, Tosham (Bhiwani)

Name of Assistant Professor – Vinod Kumar

Class - **M.Sc. (Geo.) 1st Sem.** 25 PG GEO 105 **Subject – Digital Cartography and Morphometric Analysis (P)**

Period	Syllabus Covered
11-8-25 to 31-8-25	Introduction to GIS Interface and Data Management: Exploring the GIS environment: QGIS, ArcGIS, Global Mapper, Working with vector and raster datasets, Understanding file formats: shapefiles, GeoTIFFs, CSVs, Managing layers, attributes, metadata, Coordinate systems and layer properties.
1-9-25 to 30-9-25	Understanding Map Scale and Projections: Types of map scales: representative fraction, verbal, and graphical, Understanding coordinate reference systems (CRS) and UTM/Zones, Transformation and reprojection of spatial data, Using EPSG codes and custom projections in GIS. Cartographic Design and Thematic Mapping: Principles of map design: visual hierarchy, color, symbology, typography, Preparation of thematic maps: land use, rainfall, soil, drainage. Use of classification methods: natural breaks, quantiles, equal interval, Creating legends, north arrows, scale bars, inset maps, Map layout preparation and export for publication.
01-10-25 to 19-10-25	Terrain Analysis Using Digital Elevation Models (DEMs): Sources of DEMs: SRTM, ASTER, LiDAR, Generating slope, aspect, hillshade, and contour maps, Elevation profiling and 3D surface visualization, Applications in hazard mapping, urban planning, and watershed studies. Linear and Areal Morphometric Analysis: Stream ordering (Strahler and Horton), stream length, bifurcation ratio, Drainage density, stream frequency, texture ratio, Basin shape indices: form factor, circularity ratio, elongation ratio, Relief aspects: basin relief, ruggedness number, relief ratio. GIS-Based Watershed Delineation and Analysis: Watershed boundary delineation from DEMs, Flow direction, accumulation, stream network extraction, Sink filling and hydrologic correction, Sub-watershed analysis and prioritization using morphometric parameters.
27-10-25 to 01-12-25	GIS-Based Watershed Delineation and Analysis: Watershed boundary delineation from DEMs, Flow direction, accumulation, stream network extraction, Sink filling and hydrologic correction, Sub-watershed analysis and prioritization using morphometric parameters. Small group project: Digital mapping and morphometric assessment of a selected basin and Interpretation of morphometric outputs in relation to geology and land use etc

Signature

LESSON PLAN (2025-26)

Govt. College for Women, Tosham (Bhiwani)

Name of Assistant Professor – Vinod Kumar/Jyoti Bodwal

Class – **B.A. 3rd sem SEC** **25UN-GEO-SEC 301** **Subject** – Thematic Mapping

Period	Syllabus Covered
1-8-25 to 31-8-25	Introduction to Thematic Mapping: Definition, History, and Applications , Types of Thematic Maps: Choropleth, Isopleth, Dot, Flow, and Cartograms
1-9-25 to 30-9-25	Cartographic Principles: Scale, Projections, Generalization, and Symbolization , Data Classification Methods: Equal Interval, Quantile, Natural Breaks, and Standard Deviation
01-10-25 to 19-10-25	Visual Variables in Thematic Mapping: Color, Size, Shape, and Texture , Map Layout and Design: Title, Legend, North Arrow, Scale Bar, and Annotation
27-10-25 to 01-12-25	GIS Software for Thematic Mapping: QGIS/ArcGIS etc. , Accuracy, Ethics, and Interpretation of Thematic Maps

Signature

LESSON PLAN (2025-26)

Govt. College for Women, Tosham (Bhiwani)

Name of Assistant Professor – Vinod Kumar

Class – **B.A. 3rd sem (Major)** **25UN-GEO-301** **Subject** – Geography of India

Period	Syllabus Covered
1-8-25 to 31-8-25	Physical divisions and drainage system. ,. Climate, soils and natural vegetation.
1-9-25 to 30-9-25	Agricultural crops: major crops and cropping pattern. , Development of irrigation sources - canals and tubewells.
01-10-25 to 19-10-25	Population: distribution, density and growth. , Population composition: sex ratio, rural and urban, literacy, language and religion.
27-10-25 to 01-12-25	Resources: Production and distribution of iron ore, coal, petroleum, hydro power, solar and thermal power , Industries: iron and steel, sugar, cotton textile and IT industry.

Signature

LESSON PLAN (2025-26)

Govt. College for Women, Tosham (Bhiwani)

Name of Assistant Professor – Vinod Kumar

Class – M.Sc. 3rd sem 19 GEO 302 **Subject** – Urban Geography

Period	Syllabus Covered
1-8-25 to 31-8-25	Defining Urban, Urbanization and Urbanism; Urban Geography: Definition, nature and scope origin growth & stages of urban systems; (Conurbation, Megalopolis, etc.) Lewis Mumford & Griffith Taylor. Urban population characteristics, Urban systems in Ancient Civilization, Medieval and Modern India. Trend of Urbanization in World & India.
1-9-25 to 30-9-25	City and region; Spatial linkages (rural urban linkages) and interactions; Rural Urban fringe, Suburbanization; Spatial network framework - Central Place Theory: Christaller, Losch, Walter Isard; Size and spacing of cities: Rank Size Rule, Primate City; Functional classification of cities: concepts and scheme of classification.
01-10-25 to 19-10-25	Urban Morphology and land use; Models of city structure: Concentric Zone model by E.W. Burgess, Sector model by Homer Hoyet, Multiple nuclei model by Harris and Ullman; Contemporary urban morphology in the wake of globalization – global city.
27-10-25 to 01-12-25	Urbanisation in India: Patterns and Trends; Urban problems: Environmental issues, overcrowding, transportation and mobility; Urban Inequality: Urban Poverty, Slums & squatter housing, access to housing and amenities; Urban basic services; Quality of Urban Life; Urban Planning in India: National urban policy, Study of master plans of Delhi and Chandigarh; The Smart & sustainable cities.

Signature

LESSON PLAN (2025-2026)
(August 2025 to December 2026) w.e.f.: 01/08/2025
Ch. Bansilal Govt. College For Women, Tosham (Bhiwani)
Name of Assistant Professor – **Dr. Anil Kumar**
Class – **M.Sc. (Geography) 1st Semester**

Subject – **25PG GEO 110: Foundations of Geospatial Technology (Theory)- DEC-1**

Months	**Topics**
11-8-25 to 31-8-25	Fundamentals of Geospatial Technology: Introduction to geospatial technologies: GIS, Remote Sensing, GPS, Web GIS, Spatial data types: raster vs. vector, attributes and metadata, Coordinate systems: Geographic vs. projected; UTM, WGS84, transformations, Open-source and proprietary geospatial software: QGIS, ArcGIS, Google Earth Engine. Familiarization with GIS interface (QGIS/ArcGIS): Loading and visualizing raster and vector data (02)
1-9-25 to 30-9-25	Spatial Data Models and Processing: Spatial databases and data formats (Shapefile, GeoTIFF, KML, GPKG), Topology and spatial relationships, Geospatial data collection: digitization, GPS field data, crowdsourced platforms (OSM), Data quality, accuracy, and standards (FGDC, ISO). Working with coordinate systems and projections: CRS assignment, transformation, and reprojection
01-10-25 to 19-10-25	Applications and Contemporary Trends: Applications: urban planning, environmental monitoring, disaster risk reduction, agriculture, and public health Digitization and editing of spatial features from toposheets or satellite imagery
27-10-25 to 01-12-25	Introduction to spatial analysis: overlay, buffer, proximity, raster operations, Emerging trends: AI in GIS, drone mapping, cloud-based platforms (GEE, ArcGIS Online), Ethical and legal considerations: geoprivacy, data sharing, licensing. Attribute data handling and table joins: Querying and data management in GIS, Georeferencing scanned maps using control points, Buffering, overlay, and spatial query tools for spatial analysis

LESSON PLAN (2025-2026)
(August 2025 to December 2026) w.e.f.: 01/08/2025
Ch. Bansilal Govt. College For Women, Tosham (Bhiwani)
Name of Assistant Professor ¬– Dr. Anil Kumar
Class – M.Sc. (Geography) 3rd Semester
Subject – 19 GEO 309: Fundamentals of Remote Sensing (Theory)

Months	Topics
01-8-25 to 31-8-25	Remote Sensing: History, Development, Definition, Concept & Principles, Electromagnetic Radiation (EMR) and Its Characteristics, Wavelength Regions and their Significance, Interaction of EMR with Atmosphere and Earth's Surface: Absorption, Reflectance and Scattering, Atmospheric Windows, Energy Balance Equation,
1-9-25 to 30-9-25	Electro-Optical Systems, Opto-Mechanical Scanners, Infrared Scanners, Scatterometer, Thermal Properties of Terrain, Thermal IR Environmental Considerations, Thermal Infrared and Thermal Scanners, Microwave Remote sensing concepts: Backscattering, Range Direction, Azimuth Direction, Incident Angle, Depression Angle, Polarization, Dielectric Properties, Surface Roughness and Interpretation, Speckle and Its Reduction,
01-10-25 to 19-10-25	Applications of optical, thermal and microwave remote sensing, Concepts about digital image and its characteristics, Sources of image degradation - Image restoration and Noise Abatement , Radiometric and Geometric correction technique, Linear and non linear transformation for geometric corrections, Look-up Tables (LUT) and Types of image displays and FCC, Radiometric enhancement techniques, Spatial enhancement techniques,
27-10-25 to 01-12-25	Contrast stretching: Linear and non-linear methods, Low Pass Filtering: Image smoothing, High Pass Filtering: Edge enhancement and Edge detection, Gradient filters, Directional and non-directional filtering, Concept of Pattern Recognition, Multi-spectral pattern recognition, Spectral discrimination, Signature bank, Parametric and Non-Parametric classifiers, Unsupervised classification methods, Supervised classification techniques, Limitations of standard classifiers.

LESSON PLAN (2025-2026)
(August 2025 to December 2026) w.e.f.: 01/08/2025
Ch. Bansilal Govt. College For Women, Tosham (Bhiwani)
Name of Assistant Professor ¬– Dr. Anil Kumar
Class – M.Sc. (Geography) 3rd Semester

Subject – 19 GEO 311 Remote Sensing Project Report (Practical)

Months	Topics
01-8-25 to 31-8-25	• Land Use Land Cover (LULC) • Agriculture, Crop Combination & Pattern • Transport Network Analysis at micro-level
1-9-25 to 30-9-25	• Urban Land use, Land Cover and Planning • Deforestation and Land degradation • Land degradation and desertification • Water Management • Hotspot Analysis
01-10-25 to 19-10-25	• Planning for smart cities • Micro climate of Urban areas • Infrastructure development and planning
27-10-25 to 01-12-25	• Mining and environmental degradation • Snow cover and glacial mapping • Hydrological and Runoff Modelling

LESSON PLAN (2025-2026)
(August 2025 to December 2026) w.e.f.: 01/08/2025
Ch. Bansilal Govt. College For Women, Tosham (Bhiwani)
Name of Assistant Professor ¬– Dr. Anil Kumar
Class – B.A. (Geography) 3rd Semester

Subject – 25UN-GEO-301 Geography of India

Months	**Topics**
01-8-25 to 31-8-25	1. Physical divisions and drainage system. 2. Climate, soils and natural vegetation. Identification and delineation of watershed of major rivers on map Land use pattern of India (pie chart)
1-9-25 to 30-9-25	3. Agricultural crops: major crops and cropping pattern. 4. Development of irrigation sources - canals and tubewells. Occupational structure of India (pie chart) Distribution and population density map of India (choropleth and dot method)
01-10-25 to 19-10-25	5. Population: distribution, density and growth. 6. Population composition: sex ratio, rural and urban, literacy, language and religion. Age and sex structure (pyramid diagram) Identification of the major industrial region of India by cartogram
27-10-25 to 01-12-25	7. Resources: Production and distribution of iron ore, coal, petroleum, hydro power, solar and thermal power 8. Industries: iron and steel, sugar, cotton textile and IT industry. Rainfall deviation diagram of at least 20 years Cropping intensity and irrigation intensity (bivariate method)

LESSON PLAN (2025-26)

Govt. College for Women, Tosham (Bhiwani)

Name of Assistant Professor- Meenu Kumari

Class - M.Sc. (Geo.) 1st Sem.25 PG GEO 103

Subject – Population & Development (Theory)

Period	Topics
11-8-25 to 31-8-25	Population Theories, Patterns, and Transitions: Nature, scope, and significance of population geography, Classical and modern demographic theories: Malthus, Marx, Neo-Malthusianism, Demographic Transition, Spatial distribution and density of population: global and regional patterns,
1-9-25 to 30-9-25	Population structure: age-sex pyramid, dependency ratio, literacy, and workforce participation, Population data sources and reliability: census, surveys, civil registration. Population and Development Interface: Population growth and its relationship with economic and human development,
01-10-25 to 19-10-25	Population-resource-environment nexus, Sustainable development goals (SDGs) and demographic indicators, Urbanization, internal migration, and development corridors, Population policies: comparative review (India, China, Sweden, Kenya) Contemporary Issues in Population and Spatial Analysis: Population ageing and implications for health and economy, Gender and population: sex ratio, female literacy, reproductive health, and empowerment
27-10-25 to 01-12-25	Climate change and population vulnerability (environmental migration, climate refugees), Role of geospatial technologies in population mapping and demographic change, Contemporary tools: Population dashboards, UN DESA, IPUMS, WorldPop **Revision**

Signature

LESSON PLAN (2025-26)
Govt. College for Women, Tosham (Bhiwani)
Name of Assistant Professor- Meenu Kumari
Class - M.Sc. (Geo.) 1st Sem.25 PG GEO 10

Subject – Population & Development (Practical)

Period	Topics
11-8-25 to 31-8-25	Construction and interpretation of age-sex pyramids (static and progressive)(2)
1-9-25 to 30-9-25	Analysis of population growth rates and doubling time using census data (2) Calculation of population density, dependency ratio, literacy rate (2)
01-10-25 to 19-10-25	Spatial mapping of population indicators using GIS (e.g., district-level census data) (2)
27-10-25 to 01-12-25	Analysis of Human Development Index (HDI) and other demographic indicators (01) Case study report on a contemporary population issue (e.g., migration, ageing, gender) (01)

Signature

LESSON PLAN (2025-26)
Govt. College for Women, Tosham (Bhiwani)
Name of Assistant Professor- Meenu Kumari
Class –B. A. (Geo.) 1st Sem. 25UN-GEO-101

Subject – Physical Geography (Theory)

Period	**Topics**
1-8-25 to 31-8-25	1. Interior of the earth, Introduction to geological time scale, rocks and their types. 2. Theory of isostasy, continental drift and plate tectonic;
1-9-25 to 30-9-25	3. Degradational processes: weathering, mass wasting. 4. Landforms generated by following geomorphic agents: river, wind and glacier.
01-10-25 to 19-10-25	5. Weather and climate: Atmosphere-composition and structure. 6. Atmospheric temperature, pressure and moisture and their distribution.
27-10-25 to 01-12-25	7. Surface configuration of ocean floors: Pacific, Atlantic and Indian Ocean. 8. Circulation of oceanic waters: current of the Pacific, Atlantic and Indian Ocean. **Revision**

Signature

LESSON PLAN (2025-26)
Govt. College for Women, Tosham (Bhiwani)
Name of Assistant Professor- Meenu Kumari
Class –B. A. (Geo.) 1st Sem. 25UN-GEO-101

Subject – Physical Geography (Practical)

Period	Topics
1-8-25 to 31-8-25	Identification and collection of rock samples: granite, basalt, laterite, limestone, shale, sandstone, conglomerate, slate, phyllite, schist, gneiss, quartzite (1 exercise). Identification of physiographic information from Survey of India 1:50000 topographical maps of mountain, topographical maps of mountain (1 exercise).
1-9-25 to 30-9-25	Identification of physiographic information from Survey of India 1:50000, plateau Identification of physiographic information from Survey of India 1:50000 topographical maps of plateau (1 exercise). Measurement of weather elements using analogue instruments: temperature (maximum, minimum and mean) relative humidity, rainfall and preparation of climograph (1 exercise).
01-10-25 to 19-10-25	Measurement of weather elements using analogue instruments: temperature (maximum, minimum and mean) relative humidity, rainfall and preparation of, hythergraph and hyetograph (2 exercises).
27-10-25 to 01-12-25	Interpretation of a daily weather map of India: PreMonsoon, Monsoon and Post-Monsoon (2 exercises).

Signature

LESSON PLAN (2025-26)

Govt. College for Women, Tosham (Bhiwani)

Name of Assistant Professor – Ram Bir Singh

Class - **M.Sc. (Geo.) 1st Sem.** 25PG-GEO-104 **Subject** – Statistical Methods in Geography

Period	**Syllabus Covered**
11-8-25 to 31-8-25	Fundamentals of Statistical Analysis in Geography: Nature and significance of statistical methods in geography, Types and sources of data: primary, secondary, spatial, and temporal data, Measures of central tendency and dispersion (mean, median, mode, standard deviation, coefficient of variation), 1. Descriptive statistics and data visualization using Excel and SPSS (02) 2. Correlation and regression analysis of geographical data (02)
1-9-25 to 30-9-25	Probability distributions: normal, binomial, and Poisson, Data visualization: histograms, box plots, scatter diagrams, cartograms. U-test. Correlation, Regression, and Hypothesis Testing: Bivariate and multiple correlation analysis, Linear regression: applications in spatial and environmental studies, 3. Principal Component and Factor Analysis using SPSS or R (02) 4. Spatial autocorrelation and mapping using Moran's I in GIS (02)
01-10-25 to 19-10-25	Hypothesis formulation, significance testing, levels of confidence, Parametric and non-parametric tests: t-test, chi-square, ANOVA, Mann-Whitney Multivariate and Spatial Statistical Techniques: Principal Component Analysis (PCA) and Factor Analysis, Cluster analysis and spatial classification, Discriminant analysis and canonical correlation, U-test. 5. Trend and time series analysis in climate or population datasets (01) 6. Application of kriging/interpolation using GIS (QGIS/ArcGIS) (01)
27-10-25 to 01-12-25	Time series analysis and trend forecasting in climatology and demography, Introduction to geostatistics: kriging, interpolation, and spatial 13odeling, Use of R, SPSS, and GIS for spatial statistical computation. U-test.

Ram Bir Singh

Signature

LESSON PLAN (2025-26)

Govt. College for Women, Tosham (Bhiwani)

Name of Assistant Professor – Ram Bir Singh/ Jyoti Bodwal

Class – **B.A. 5th sem SEC** **(20 UGEO501)** **Subject – Geomorphology**

Period	**Syllabus Covered**
1-8-25 to 31-8-25	Nature and Scope of Geomorphology; Fundamental Concepts Theory of Isostasy: Pratt and Airy Plate Tectonics Geological Time Scale. **Unit Test**
1-9-25 to 30-9-25	The Earth's Interior; Endogenetic Forces: Folds and Faults Associated Topography; Volcanoes and Earthquakes. Exogenetic Forces: Weathering and Mass Wasting. **Unit Test**
01-10-25 to 19-10-25	Cycle of Erosion: Davis and Penck, Erosional and Depositional Landforms, Erosional and Depositional Landforms associated with of Fluvial Processes, Erosional and Depositional Landforms associated with Aeolian and Glacial;
27-10-25 to 01-12-25	Application of Geomorphology: Natural Hazards (Landslides, Floods, Earthquakes, and Tsunamis), Hydrology, Engineering Geology, Construction Activities & Regional Planning **Unit Test**.

Ram Bir Singh

Signature

LESSON PLAN (2025-26)

Govt. College for Women, Tosham (Bhiwani)

Name of Assistant Professor – Jyoti Bodwal

Class - **M.Sc. (Geo.) 1st Sem.** 25 PG GEO 101 **Subject –Principles of Geomorphology**

Period	**Syllabus Covered**
11-8-25 to 31-8-25	**Fundamentals and Approaches in Geomorphology**: Nature, Scope, ,Significance of Geomorphology, Historical Development of Geographic thoughts: Davisian, Penkian and Dynamic Equilibrium. Tectonic Geomorphology, Environmental Geomorphology. Interpretation of topographic maps& Arial photographs
1-9-25 to 30-9-25	**Earth Sciences Processes and Landform Development**: Endogenetic Processes: Earth Quake ,Volcanism, Folding, Faults, Mountain building Exogenetic processes: weathering, erosion ,mass movement, transportation and deposition. Slope analysis: Clinographic hypsometric
01-10-25 to 19-10-25	**Tectonic and Climatic Geomorphology:** Plate Tectonics and landform evolution, Neo tectonics and active tectonics in landscape modification. Climatic Geomorphology: Landforms in arid, humid, periglacial, and tropical regions. Drainage Basin and network analysis
27-10-25 to 01-12-25	**Quaternary Landscape evolution**: glacial- interglacial cycles and sea level changes Geomorphic map using GIS tools

Signature