

HYDROLOGY AND WATER RESOURCE MANAGEMENT
PAPER GEDM-905E

Unit 1 Hydrological Cycle:

Precipitation intensity and duration, Evaporation, Infiltration, Evapotranspiration, Runoff.

Unit 2 Water Balance Elements and Analysis:

Water balance analysis, Flood and Drought Analysis

Unit 3 Groundwater occurrence and types:

Hydrogeological cycle, Movement, Darcy's law, Ground water recharge, Water Quality, Types of aquifer, Salinization, Sea water intrusion, Distribution of groundwater in India.

Unit 4 River basin Hydrology:

Major river basins, Surface water potential, Characteristics.

Unit 5 Water Resource Conservation and Management:

Application of Remote Sensing and GIS in Hydrological studies, Water Harvesting, Integrated Watershed Management, National Water Policy, National Water Grid

References :

ENVIRONMENT AND DISASTER MANAGEMENT
PAPER GEDM 906E

GROUP A (Environmental Science)

Unit 1

Environment, Ecosystem, Human Ecology, Environmental perceptions and behavior, Man-environment relationship – Case study of mountain ecosystem.

Unit 2

Environmental Policy of 1986 and 2006, Sustainable Developmental goals, Wildlife Act, Biodiversity Act, Climate change negotiation under COP21, National Action Plan on Climate Change

GROUP B (Disaster Management)

Unit 3

Hazard, disaster, vulnerability, exposure, risk, types of hazard

Unit 4

Major disasters – Flood, Drought, Earthquake, Landslide and cyclones; Human and Technological hazards

Unit 5

Disaster Risk Reduction, prediction and early warning, preparedness, mitigation, recovery and rehabilitation, community based disaster mitigation plan, Disaster Insurance Policy.

References :

RESOURCES AND DISASTER MANAGEMENT (SPECIAL PAPER THEORETICAL)
PAPER GEDM-1001C (D)
NO. OF CREDIT: 4

Unit 1 Resource utilization and Disaster:

Major resources with reference to Tripura, resource utilization and scarcity

Unit 2 Land-induced disaster:

Erosion, Landslide, Rockfall, Avalanche.

Unit 3 Water and climate-induced disaster:

Liquefaction, Extreme rainfall, flash flood, Drought, Cloudburst and cyclone, Arsenic and fluoride contamination.

Unit 4 Forest and biological hazard:

Forest fire, Man-wildlife conflict, Epidemics, Nuclear hazard

Unit 5 Disaster Response and Emergency Management:

Role of communication and GPS technology, Community Risk Reduction; Vulnerable groups during disaster- Women, Physically disabled, Children, Old age, Animals; Youth and Disaster Management.

References :

RESOURCE AND DISASTER MANAGEMENT (SPECIAL PAPER PRACTICAL)

PAPER GEDM-1002C (D)

NO. OF CREDIT: 6

GROUP – A
(Laboratory Practical)
Marks: 50

Unit 1 Soil testing- NPK, Soil pH, soil salinity, soil alkalinity, permeability test.

Unit 2 Water Quality test, Water level recorder (surface and subsurface).

Unit 3 Climograph, Hythergraph, Ombrothermic Diagram, Ergograph.

Unit 5 Micro zonation mapping, Seismic data collection, Geodetic GPS data collection, Flood frequency analysis, Cyclone Analysis, Mapping of landslides, Mapping of Avalanches, Mapping of forest fires.

Unit 5 SWOT Analysis.

Laboratory Notebook and Viva Voce.

GROUP – B
(Dissertation)
Marks: 50

A dissertation paper to be prepared by the candidate on any one selected topic related to Resources and Disaster Management.

11. Pal, S.K. (1998) Statistics for Geoscientists; Techniques and Applications, Concept Publishing Company, New Delhi.
12. Peter, J. Taylor (1977), Quantitative Methods in Geography, Houghton Mifflin Company, Boston.
13. Robert Hammond and Patrik Mc. Cullagh (1974), Quantitative Methods in Geography, Clarendon Press, Oxford.
14. Sarkar, A., Practical Geography
15. Singh, R.L. & P.K. Dutt : Elements of Practical Geography Students friends.
16. Yeates, Mauris (1974), An Introduction to Quantitative Analysis in Human Geography, McGraw Hill, New York.

M.A./M.Sc 4th Semester
GEOGRAPHY AND DISASTER MANAGEMENT
Watershed Management (Special Paper Theory)
Paper: GEDM 1001C (F)
No. of credit: 04

Unit 1 Watershed concept

Definition of watershed, morphological characteristics of watershed, classification of watershed; Concepts of watershed management, Principle of watershed management; Components of watershed management

Unit 2 Management of water quality

Water quality and pollution, types and sources of pollution; Hydrological processes and water quality; Environmental guidelines for water quality (Indian).

Unit 3 Crop management

Cropping pattern, strip cropping; mix cropping, crop rotation; soil water conservation; estimation of soil loss (RUSLE).

Unit 4 Watershed management

Rainwater harvesting; micro-catchments like farm ponds, percolation tanks, check dams etc; watershed development plan; Wasteland management; Watershed approach in Government programmes.

Unit 5 RS and GIS applications

Application of RS and GIS techniques in integrated watershed.

References:

1. Tideman, E.M., "Watershed management: Guidelines for Indian Conditions", Omega Scientific Publishers.
2. Ghanshyam Das, "Hydrology and Soil Conservation Engineering" Prentice Hall India.
3. Rajvir Singh, "Watershed Planning & Management", Yash Publishing House.
4. Pau A. Debarry, John Wiley & Sons, "Watersheds - Processes, Assessment and Management".
5. Singh, V.P. & Donald K. Frevert, Taylor & Francis. "Watershed Models"
6. Subramanya K., "Hydrology, Tata McGraw Hill Co., New Delhi, 1994.
7. Jeya Rami Reddy. P, "Hydrology, Laximi Publications, New Delhi, 2004
8. Odum, E. P. and G. W. Barrett, "Fundamentals of Ecology", India Edition, Thomson Brooks/cole, India, 2005
9. Canter L. W., "Environmental impact assessment", 2nd edition, Mc Graw Hill & Co., NY, USA, 1996

10. Vladimir Novonty, "Water Quality: Diffuse pollution and watershed Management", 2nd edition, John Wiley & Sons, , 2003
11. Jorgensen, S., J. G. Tundisi, J. M. Tundisi, "Handbook of inland aquatic ecosystem management", CRC Press, FL, USA, 2013.
12. Mackenzie L Davis, David A Cornwell, "Introduction to Environmental Engineering", McGraw-Hill 2006.
13. Lal, Rattan. Integrated Watershed Management in the Global Ecosystem. CRC Press, New York, 2000.
14. Heathcote, I. W. Integrated Watershed Management: Principles and Practice. John Wiley and Sons, Inc., New York, 1988.
15. Dhruva Narayana, G. Sastry, V. S. Patnaik, "Watershed Management", CSWCTRI, Dehradun, ICAR Publications, 1997.

M.A./M.Sc 4th Semester
GEOGRAPHY AND DISASTER MANAGEMENT
Watershed Management (Special Paper Practical)
Paper: GEDM 1002 C (F)
No. of credit: 06

GROUP-A
(Laboratory Practical)
Marks: 50

Unit 1: Rainfall intensity; Rainfall variability; Rainfall ratio; Ground water recharge; Estimation of surface water resources; Thermal regime.

Unit 2: Water balance elements: Potential evaporation, Actual evaporation; Water surplus; Water deficit; Aridity index; Moisture index estimating by Thornthwaite and Mathur method, (1955).

Unit 3: Water quality testing like Hardness of water, pH, TDS, BOD etc.,

Unit 4: Estimation the cropping pattern, crop diversification, crop combination etc.

Unit 5: Application of RS & GIS techniques in integrated watershed.

Laboratory note book and Viva-voce

Group –B
(Dissertation)
Marks: 50

A dissertation paper to be prepared by the candidate on any one selected topic related to special paper.