

Course Title: Karewas of Kashmir

Course Code: MCS1401-OE

Course Type: Open Elective

Credits: 2 (2-0-0-0)

Max. Marks: 50

COURSE OBJECTIVES

- Understand the lithology and geological evolution of the Kashmir region, including Karewa stratigraphy and paleoenvironment.
- Examine the socio-economic importance and human–environment interactions within Karewa landscapes.
- Assess environmental challenges and develop skills for sustainable land-use and resource management in mountain ecosystems.

LEARNING OUTCOMES: After completing the course, students will be able to:

- Identify major lithological units of Kashmir and interpret Karewa stratigraphy and paleoenvironmental evolution.
- Analyze human–environment interactions and assess environmental issues in Karewa landscapes.
- Apply field and analytical skills for geological mapping, interpretation, and sustainable resource management..

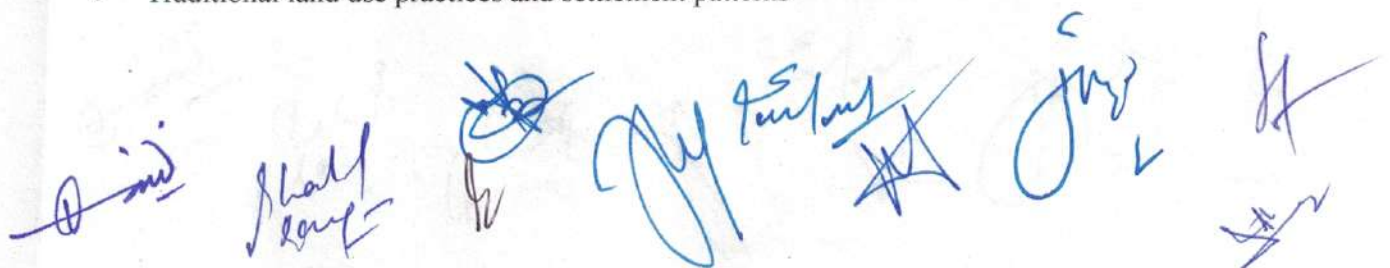
Detailed Syllabus

Unit 1: Geology of the Kashmir Region (16 hours)

- Overview of lithological units: Crystalline basement, Panjal Traps, Murree, Siwalik, and Quaternary deposits.
- Petrographic characteristics and depositional environments.
- Economic and hydrological significance of lithological variations.
- Field identification of lithological units and contact relationships.
- Definition, distribution, and geomorphic characteristics of Karewas.
- Stratigraphy and division into Lower and Upper Karewas.
- Sedimentology, facies characteristics, and depositional environments.
- Chronostratigraphy and paleoclimatic reconstruction (OSL, ^{14}C , isotopic studies).
- Paleoecological and archaeological significance of Karewa deposits.

Unit 2: Environmental Sustainability & Socio-Economics of the Karewas (16hours)

- Human-environment interactions in Karewa regions
- Geotourism
- Traditional land use practices and settlement patterns

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- Historical evolution of Karewa-based livelihoods
- Role of Karewas in regional food security and economy: Dryland farming, horticulture, and cash crops (saffron, almond, apple, walnut)
- Soil characteristics, irrigation challenges, and productivity constraints
- Soil erosion, deflation, and land degradation processes
- Groundwater depletion, water scarcity, and climate stress
- Impacts of urban expansion, brick kilns, mining, and infrastructure development
- Sustainable land-use planning and agroecological practices
- Soil and water conservation techniques
- Role of science, governance, and education in sustainable Karewa management

SUGGESTED READINGS

- Middlemiss, C. S. (1911). *Geological observations in Kashmir and adjacent areas*. Memoirs of the Geological Survey of India.
- Agrawal, D. P., & Kusumgar, S. (1985). *Climate and geology of the Kashmir Valley*. Concept Publishing Company.
- Bhat, M. I., Bhat, G. M., & Ahmad, S. (2002). Tectonic evolution of the Kashmir Valley. *Journal of Asian Earth Sciences*, 20(3), 299–312. [https://doi.org/10.1016/S1367-9120\(01\)00052-1](https://doi.org/10.1016/S1367-9120(01)00052-1)
- Bhatt, D. K. (2019). *Quaternary geology of Northwest Himalaya*. Springer.
- Shah, R. A., Lone, A. M., Shah, M. A., & Rashid, I. (2021). Paleoclimatic reconstruction of the Karewa deposits of Kashmir Valley, northwest Himalaya: A review. *Quaternary International*, 575–576, 1–15. <https://doi.org/10.1016/j.quaint.2020.12.012>
- Recent research articles from *Quaternary International*, *Geomorphology*, and *Journal of Asian Earth Sciences*.

