



Integrated Mountain Development with Special Reference to the Indian Himalaya

Semester -I: July - December 2020

Coordinator	Prof. Prakash C. Tiwari
Credits	100 Marks [4 Credits]*
Lecturers	Decided in Departmental Meeting
Level	M.A./M.Sc.
Host institution	Department of Geography, Faculty of Arts, Kumaun University, Nainital
Course duration	One Semester [July - December]

Summary

This one full semester course provides the Master level students of Geography the basic understanding of the environmental significance of the mountain regions and the need of their sustainable development. It will present a comprehensive socio-ecological overview of the world's mountains and the impacts of the process of global environmental changes including climate change on high mountain regions, specifically Himalaya. Besides, it will also introduce students to mountain natural resources and role of local institutions mountain environmental governance; and need, approaches and strategies for sustainable mountain development. The course includes individual assignments.

Target Student Audiences

Semester - I Students of M.A./M.Sc.

Prerequisites

Required Courses (or equivalents):

- Environmental Management
- Ecology
- Introduction to Computer Science or Information Technologies,
- Environmental Management

Aims and Objectives

This course has been designed with a view to help students in developing a comprehensive understanding and knowledge of the critical environmental and developmental issues of important mountain regions of the world and need of their sustainable development in context of the Indian Himalayan Region. The main objectives of the proposed course are: (i) to help students in understanding the environmental and socio-cultural significance of mountain regions; (ii) to equip the students with the state-of-art recent knowledge about process, drivers and impacts of the environmental changes in the high mountains; (iii) to educate students about the role and significance of mountain institutions in environmental governance and sustainability; and (iv) to make students to realize to need of sustainable development of mountain regions and their people

* *Note: Kumaun University has Mark System at all Levels*





General Learning Outcomes:

By the end of the course, successful students will:

- Understand the global significance and importance of mountain regions
- Learn the trends and impacts of global environmental changes on mountains
- Gain adequate knowledge of the natural resources of mountains
- Understand fragility, marginality, vulnerability and productivity of mountains
- Develop comprehensive understanding of the role of mountain institutions in environmental governance Understand the concept of science-policy interfaces in climate change adaptation,
- Understand the approaches and techniques of sustainable mountain development

Overview of Sessions and Teaching Methods

The course will make most of interactive and self-reflective methods of teaching and learning including mainly lectures and presentations. It will start with an overview of global significance and importance of mountain regions. Subsequent sessions will combine interactive lecturing on different course components divided up into 5 Units, and individual assignments. The third part of the course is built around supervised preparation of short interdisciplinary dissertation by students.

Course Workload

The table below summarizes course workload distribution:

Activities	Learning outcomes	Assessment	Estimated workload (hours)
In-class activities			
Lectures and Presentations	Unit I- World Mountains and Indian Himalayan Region: Major Mountains of the World; Indian Himalayan Region; Location and Extent; Geology; Physiography; Climate and Drainage System; Demographic and Socio-cultural Characteristics	End Semester Written Examination	08
Lectures and Presentations	Unit II - Mountain Natural Resources: Land, Water, Forest, Wildlife; Biodiversity; Development and Utilization of Natural Resources	End Semester Written Examination	08
Lectures and Presentations	Unit III - Global Environmental Changes and Mountain Region: Environmental Changes; Drivers of Environmental Changes and their Consequences; Climate Change: Impacts and Adaptations; Natural Disasters-Challenges and Strategies in Mountains	End Semester Written Examination	08
Lectures and Presentations	Unit IV- Mountain Institutions and Environmental Governance: Concept and Classification of Institutions; Institutions in Himalaya; Role of Local and Regional Institutions in Environmental Governance in Himalaya	End Semester Written Examination	08
Lectures and	Unit IV- Integrated Development in	End Semester	08





Presentations	Himalaya: Concept of Integrated Development; UN Sustainable Development Goals and Himalaya; Integrated Mountain Development in Himalaya	Written Examination	
Independent work			
- Individual Assignments	Ability to interpret data, and to use the concepts, tools, and methods for communicating information	Individual Presentations	20
Total			60

Grading

The students' performance will be based on the following:

- Written performance at the end Semester Written Examination 75%
- 25% based on the evaluation of 2 individual Assignments and attendance in classroom lectures

Course Schedule: Semester -I: July - December

Course Assignments

The Structure of Course Assignments will be as follows:

- The Course Teacher will set 5 detailed answer Questions one each from 5 Units.
- Each of the students will have answer 2 questions of his/her choice before the commencement of the Semester End Examinations.

Literature

- P. Wester, A. Mishra, A. Mukherji, A. B. Shrestha (eds), The Hindu Kush Himalaya Assessment: Mountains, Climate Change, Sustainability and People, Springer Nature Switzerland AG, Cham. pp., 2019
- World Bank, South Asia's Hotspots Impacts of Temperature and Precipitation Changes on Living Standards, Report Preview Spring 2018, World Bank Group, Washington D.C. 2018
- S. Irudaya Rajan, R. B. Bhagat eds, Climate Change, Vulnerability and Migration, Routledge, India, 2018
- M.S.S. Rawat et al. (eds), Environment, Resources and Development of the Indian Himalaya, Transmedia Publication, Srinagar, Garhwal, Uttarakhand, India, 2018
- Tor H. Aase, Climate Change and the Future of Himalayan Farming, Oxford University Press, 2017
- Velma Grover et al.(eds), Global Change and Mountains: Consequences, Responses and Opportunities, Science Publishers, CRS Press, Taylor and Francis, USA, 2015
- E. Grohmann et al. (eds), Environmental Deterioration and Human Health: Natural and Anthropogenic Determinants, Springer, Dordrecht, 2014
- Ning, Wu; Rawat, G.S.; Joshi, S.; Ismail, M.; Sharma, E. (Eds) High-altitude rangelands and their interfaces in the Hindu Kush Himalayas. Kathmandu: ICIMOD, 2013
- Jean Palutikof et al. (eds.) Climate Adaptation Futures, Wiley Publishing Company, U.K., 2013
- C. Margottini et al. (eds), Landslide Science and Practice, Vol. 4, Springer-Verlag, Berlin, Heidelberg, Germany, 2013
- Velma Grover (ed) Impact of Climate Change on Water and Health, CRC Press, Taylor and Francis Group, 2013
- G. Rasul and M. Karki (eds) Policy Priorities for Sustainable Mountain Development, Kathmandu: International Center for Integrated Mountain Development, 2008





- Huddleston, B., Ataman, E. and d'Ostlanl, L. F., Towards a GIS-based analysis of mountain environments and populations, FAO, Rome, 2003
- ICIMOD, Mountains of the world: ecosystem Services in a Time of global and climate change: seizing opportunities meeting challenges Framework paper prepared for the Mountain Initiative of the Government of Nepal by ICIMOD and the Government of Nepal, Ministry of Environment
- IPCC, Climate change: Impacts, adaptation, and vulnerability, Part A: Global and sectoral aspects, Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change, Summary for policymakers, Cambridge University Press, Cambridge, United Kingdom and New York, USA, 2014
- Tse-ring, K., Sharma, E., Chettri, N., Shrestha, A. (eds), Climate change vulnerability of mountain ecosystems in the eastern Himalayas. Climate change impact on vulnerability in the eastern Himalayas-synthesis report. Kathmandu: ICIMOD, 2010
- M. Beniston, Environmental change in mountains and uplands. London, 2000.
- Food and Agricultural Organization, Food Security in Mountains – High time for action. Brochure of the International Mountain Day 2008. <http://www.mountaineering.ie/documentbank/uploads/IMD08%20brochure.pdf>
- Food and Agricultural Organization, International Year of the Mountains. Food and Agriculture Organisation of the United Nations, Rome, 2002.
- Food and Agricultural Organization, Land-water linkages in rural watersheds. Land and Water Bulletin 9. Food and Agriculture Organisation of the United Nations, Rome, 2002
- Martin J. Haigh, Headwater control: integrating land and livelihoods, paper presented at the International conference on Sustainable Development of Headwater Resources. United Nation's International University, Nairobi, Kenya, September, 2002.
- ICIMOD, Mountains of the World –Ecosystem Services in a Time of Global and Climate Change: Seizing Opportunities – Meeting Challenges. Framework paper prepared for the Mountain Initiative of the Government of Nepal by ICIMOD and the Government of Nepal, Ministry of Environment, 2010
- ICIMOD, The Changing Himalayas: Impact of Climate Change on Water Resources and Livelihoods in the Greater Himalayas. ICIMOD, Kathmandu, Nepal, 2009
- IPCC, Climate change 2007: The scientific basis. Working Group I contribution to the Intergovernmental Panel on Climate Change Fourth Assessment Report. Cambridge: Cambridge University Press, 2007
- IPCC, Climate Change: Impacts, adaptation and vulnerability. Working Group II contribution to the Intergovernmental Panel on Climate Change Fourth Assessment Report. Cambridge: Cambridge University Press, 2007
- Messerli, B. and Ives, J. D. (eds), Mountains of the world – A global priority. A contribution to Chapter 13 of Agenda 21. New York: Parthenon, 2007

