Co-funded by the Erasmus+ Programme of the European Union

Natural Resource Management

Semester -I: July - December 2020

Coordinator	Prof. P. C. Tiwari
Credits	100 Marks [4 ECTS]* 75 Marks End Semester Examination and 25 Marks Assignment
Lecturers	Decided in the 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 fundamental concept of natural resources and of the process of resource development. The students would learn the applications of remote sensing and Geographic Information System in natural resources analysis and mapping in the mountain regions. It will present a comprehensive overview of the carrying capacity and productivity of natural resources in high mountains with specific reference to Himalaya. It will also impart education to the students about the various approaches of natural resource management in high mountains in context of Himalaya. The course includes individual assignments.

Target Student Audiences

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

Prerequisites

Required Courses (or equivalents):

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

Aims and Objectives

This course will help in developing a complete understanding of concept of and process of natural resource development, and their conservation and management using application of Remote Sensing (RS) and Geographic Information System (GIS) with special reference to high mountains and Himalaya. To help students in understanding the concepts of natural resources, learning methods of resource analysis and mapping, and developing natural resources information system using geo-spatial techniques. The main objectives of the course are: (i) to understand the process of natural resource development in varying natural and socio-economic, and legal environment; (ii) to demonstrate the application of state-of-art Remote Sensing (RS) and Geographic Information System (GIS) with special reference to high mountains specifically Himalaya; (iii) to help students in learning concepts and approaches of natural resources management and understanding its inter-linkages with sustainable mountain development in context of Himalaya

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

General Learning Outcomes:

By the end of the course, successful students will:

- The students would be able to reflect upon critically the knowledge and understanding of the fundamental concepts, importance and significance of natural resource management, particularly in the context of high mountains
- The students would be able to demonstrate application of the frontier areas of science and technology, such as Remote Sensing and Geographic Information System in natural resource management
- Students will have the ability to identify and interpret the critical relationship among natural resources, society and economy
- The students would be able to communicate knowledge, information, solutions techniques, tools and methods related to natural resource management to a wide range of stakeholders including experts, policy-decision makers, Non-Governmental Organization [NGOs], civil Society Organizations [CSOs] and common people
- The students would be able to apply their knowledge and understanding in designing people and policy oriented framework for the conservation and sustainable development on mountain natural resources

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 concept of natural resources and their development and management in view of the sustainable development 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 [3 Hours Lecture Per Week Per Paper]			
Lectures and Presentations	**Unit I - Basic Framework:** The students would be able to reflect upon critically the knowledge and understanding of the fundamental concepts, importance and significance of natural resource management, particularly in the context of high mountains	End Semester Written Examination	09
Lectures and Presentations	**Unit II - Application Remote Sensing and Geographic Information System (GIS) in Natural Resources Studies:** The students would be able to demonstrate application of Geo-spatial technologies in natural	End Semester Written Examination	09

	resource management		
Lectures and Presentations	**Unit III - Ecology and Ecosystem:** Students will have the ability to identify and interpret the critical relationship among natural resources, society and economy	End Semester Written Examination	09
Lectures and Presentations	**unit iv - carrying capacity of natural resources:** Would be able to understand and critically reflect upon the carrying capacity of natural resources with special reference to Himalaya	End Semester Written Examination	09
Lectures and Presentations	**Unit V- Natural Resource Management and Sustainable Development in Himalaya:** The students would be able to apply their knowledge and understanding in designing people and policy oriented framework for the conservation and sustainable development natural resources in Himalaya	End Semester Written Examination	09
Independent work [5 Hours Per Week Per Paper Self Study Including Writing Assignments]			
- Individual Assignments	Would be able to critically reflect upon their ability to interpret data, and to use the concepts, tools, and methods for communicating information and knowledge of integrated watershed management to both experts and non-experts	Individual Presentations	75
Total			***120***

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: July - December 2020

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

- Zimmerman, E.W., World Resources and Industries, Harper and Row, London,1951
- Paul, R.E. et.al, Eco-science: Population, Resource and Environment, W.H.Freeman, Sanfrancisco, 1977 Wiley, New York,1977
- G. Simmons, The Ecology of Natural Resources, Edward Arnold, London, 1974
- 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

- G. Rasul and M. Karki (eds) Policy Priorities for Sustainable Mountain Development, Kathmandu: International Center for Integrated Mountain Development, 2008
- Huddlestone, 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
- M.S.S. Rawat et al. (eds), Environment, Resources and Development of the Indian Himalaya, Transmedia Publication, Srinagar, Garhwal, Uttarakhand, India, 2018
-

- 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
- https://www.ircwash.org/sites/default/files/210-89NA-10012.pdf
- 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.
- http://gbpihedenvis.nic.in/ENVIS%20Monograph/ENVIS%20Monograph%201.pdf
- 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.
- http://www.fao.org/3/a-i4141e.pdf
- 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
- http://www.fao.org/3/a-i3928e.pdf