Course Title: **Geography of Environment, Hazard and Disaster Management**

Course No: Geo. Ed.449 (Minor) Nature of course: Theoretical

Level: B.Ed. Full Marks: 100

Year: Fourth Teaching hours: 150

## Course Description

This course has been designed to provide theoretical knowledge of geography of environment, hazard and disaster management to the prospective teachers. It intends to familiarize them with various aspects of environment, natural hazard and disaster management with reference to Nepal.

## General objectives of the course

The general objectives of this course are to

* familiarize the students with the nature, scope and approaches of environmental geography.
* enable the students to understand the concepts of environment, hazard and disaster management.
* acquaint students with the major environmental issues related to natural hazards and disaster management with reference to Nepal.
* enable the students to select and use the strategies of teaching learning geography of environment, hazards and disaster management with reference to Nepal.

## Course Outlines

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| **Specific objectives** | **Contents** |
| * + Describe the nature and scope of environmental geography   + Differentiate among factors, forces, and process   + Explain the approaches of teaching environmental geography   + Identify the relationship between man and environment   + Explain the need for public awareness about hazards and disaster management | **Unit I: Introduction to geography of environment, hazards and disaster management (15)**   * 1. Nature, scope and development of environmental geography   2. Elements of environment: factors, forces, process and result   3. Approaches to teaching environmental geography   4. Man-environment interrelationship   5. Concept of hazards and disaster management and public awareness |
| * Explain the relationship of environmental geography with components of physical of geography * Identify the landscape properties of different geographical regions * Acquire the concept of river network * Mention major properties of climate of the earth surface * Describe acidification and salinization of soils * Identify the role of population and settlement on environment * Discuss the role of human activities on environment | **UNIT II: Relationship of environmental geography with other branches of geography (30)**   * 1. Physical geography      1. Landscape properties: Geological structure and lithology, altitude, slope, aspect, relief      2. River network      3. Soils: acidification and salinization      4. Climatic properties – sunshine, precipitation, temperature, humidity   2. Human and economic geography      1. Population      2. Settlement      3. Human activities: cultivation, infrastructure development, urbanization and industrialization |
| * + Describe the concept of ecology, ecosystem and biodiversity   + Discuss the major types of ecosystem and energy flow   + Describe the process of material and energy flow in the ecosystem   + Identify the interlink of environmental issues with ecology, ecosystem and biodiversity | **UNIT III: Relationship of environmental geography with biological sciences (15)**   * 1. Concept of ecology, ecosystem and biodiversity   2. Types of ecosystem   3. Material and energy flow in the ecosystem   4. Interlink of environmental issues with ecology, ecosystem and biodiversity |
| * + Discuss about the land degradation   + Point out the causes and effects of deforestation and measures to control it   + Identify the causes of loss of biodiversity and endangered species   + Identify the status of carbon emission   + Explain air pollution and ozone layer depletion | **Unit IV: Selected environmental issues and their linkages with environmental Geography (15)**   * 1. Land degradation   2. Deforestation   3. Loss of biodiversity and endangered species   4. Carbon emission   5. Air pollution   6. Ozone depletion |
| * + Identify the geological, atmospheric and hydro- metrological and other hazards and disaster   + Discuss the causes and effects of flood and drought and measures to control them   + Identify the techniques of mitigation for flooding and application of indigenous knowledge and skills of local people in the Nepalese context   + Describe the causes and effects of landslide and measures to control it   + Mention the causes and effects of GLOF and measures to control it   + Describe causes and effects of air pollution, desertification, biodiversity loss   + Discuss on acid rain and fresh water depletion   + Describe the impact of forest and grassland firing   + Explain the impact of gas explosion and radiation leakage | **Unit V: Hazards and disasters (**35)   * 1. Earthquake and volcanoes   2. Landslide, floods and landslide lake outburst flood (LLOF)   3. Drought   4. Storms and lightening   5. Hailstones   6. Fog and cold wave   7. Ozone layer depletion   8. Green house effect (surface warming)   9. Avalanches   10. Glacial lake outburst flood (GLOF)   11. Air pollution   12. Acid rain   13. Desertification   14. Fresh water depletion   15. Biodiversity loss   16. Forest and grassland fire   17. Gases explosion   18. Radiation leakage and explosion |
| * + Discuss the risk and vulnerability   + Mention the steps of preparedness and control measures   + State the experiences of great earthquake 2072   + Identify the measures adopted by local school families in Nepal | **Unit VI: Landslide, flood and earthquake hazard and school safety with reference to Nepal (10)**   * 1. Risk and vulnerability   2. Preparedness and control measures   3. Experiences from the Great Earthquake 2072   4. Safety measures adopted for the schools |
| * Mention the disaster management cycle * Familiarize students with indigenous knowledge on environmental management at local level * Trace out the new plan, efforts and practices of related organization * Discuss development practices and disaster mitigations for sustainability | **Unit VII: Disaster management with reference to Nepal (15)**   * 1. Disaster management cycle – preparedness, response, rescue, rehabilitation, reconstruction   2. Indigenous knowledge on environmental management at local level   3. Disaster management initiatives (role of GOs, NGOs and INGOs)   4. Development practice and disaster mitigation for sustainability |
| * Observe and record geographical facts in the field * Conduct case studies according the nature of topics * Use resource persons and key informants in teaching learning environmental geography, natural hazard and disaster management * Conduct focus group discussion (FGD) for geographical studies * Use local materials in teaching environmental geography, natural hazard and disaster management in Nepal | **Unit viii: Strategies and resources** in **teaching learning environmental geography, hazard and disaster management in Nepal (15)**   * 1. Field observation   2. Case study   3. Resource persons   4. Key informants   5. Focus group discussion (FGD)   6. Use of local materials |

*Note: The figures in the parentheses indicate the approximate periods for the respective units*

## Instructional Techniques

Two types of instructional techniques have been recommended. The first group comprises common techniques applicable to most of the units. The second group includes such instructional techniques which should be applied to teach specific unit.

**4.1 General Instructional Techniques**

* Lecture, discussion, question-answer, student interaction, and paper presentation by the students in selected topics.
* Group work on geographical issues published in the journals and magazines and presentation of reports in class room.
* Preparation of charts and diagrams associated with various landforms.

**4.2 Specific Instructional Techniques**

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| **Unit** | **Instruction Techniques** |
| **Unit I** | Charts and photos related to natural hazards and disaster management will be demonstrated. The need of public awareness about environment will also be discussed with selected examples. The factors, forces, and process of environmental geography will be discussed with examples. The relationship between man and environment will be explained by sharing the students' experiences at local region. |
| **Unit II** | The relationship of environmental geography with other branches of geography will be discussed through the use of charts. The landscape properties of different geographical regions will be explained through charts and pictures. The concept of river network, major properties of climate of the earth surface and the human activities in different geographical regions of the earth will be explained using relevant photographs. |
| **Unit III** | The relationship of environmental geography with biological sciences will be described with the help of charts. The concept of ecology, ecosystem and biodiversity will be explained with examples. The major types of ecosystem and energy flow will be discussed with examples from different regions. |
| **Unit IV** | Various environmental issues and their linkages with environmental geography will be discussed with examples. Land degradation, causes and effects of deforestation and measures to control it will be explained. The causes of loss of biodiversity and endangered species will be explained and the status of carbon emission and air pollution and ozone layer depletion will be discussed by using charts and figures. |
| **Unit V** | The geological, atmospheric and hydro-metrological hazards and disaster will be identified. The causes and effects of flood and drought and measures to control them will be discussed by presenting examples. The status of flooding in Nepal and adjoining countries will be described. The techniques of mitigation for flooding and application of indigenous knowledge and skills of local people in the Nepalese context will be explained by sharing experiences of the students. The causes and effects of landslide and measures to control it will be described and the causes and effects of GLOF and measures to control it will be discussed. |
| **Unit VI** | The risk and vulnerability of landslide, flood and earthquake hazards will be discussed and the steps of preparedness and control measures will be explained. The experiences of the Great Earthquake 2072 will be shared and its effects will be presented with examples. The measures adopted by local school families in Nepal will also be shared with examples from various regions of Nepal. |
| **Unit VII** | The disaster management cycle will be discussed in relation with student participation. The students will be familiarized with indigenous knowledge on environmental management at local level. New plans will be traced out with the efforts and practices of related organizations (GOs, NGOs and INGOs) at local level. |
| **Unit VII** | Related geographical facts will be observed in the field. The students will be assigned to conduct case studies according the nature of topics. Resource persons and key informants will be utilized in teaching learning environmental geography, natural hazard and disaster management in Nepal. |

## Evaluation

The students will be evaluated on the basis of the written test, classroom participation, presentation of reports and other classroom activities. But the score obtained will be used only for the feedback purposes. The performance of the students will be evaluated by the annual examination to be held by the Office of the Controller of Examinations. The types and number of questions to be asked in the annual examination are mentioned below:

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| **Types of questions** | **Total questions**  **to be asked** | **Number of questions**  **to be answered and marks allocated** | **Total marks** |
| Group A: Multiple choice items | 20 questions | 20 x 1 mark | 20 |
| Group B: Short answer questions | 8 with 3 'or' questions | 8 x 7 marks | 56 |
| Group C: Long answer questions | 2 with 1 'or' question | 2 x 12 marks | 24 |

## Recommended books and reading materials

**Recommended books**

Bharucha, Erach (2015). *Environmental Studies*. Pune, India: Bharati Vidyapeeth.

Dhakal, Keshab Raj (2073). *Basic Environmental Education*. Kathmandu: Qwest Publication.

Kayastha, S. L. & Kumra, V. K. (1986). *Environmental studies: Fundamentals, problems and management.* Varanasi: Tara Book Agency.

Panday, Ram Kumar (1993). *Vatavarana shiksha.*Kathmandu: CDC, TU.

**Reference materials**

Bhandari, Bishnu B. (2009). *Preliminary Inventory of Nepal's Wetlands*. Kathmandu: IUCN Nepal.

Rana, Bhramashamsher Janga Bahadur (2015) *Nepalko Mahabhukampa 1990*. Kathmandu: Nepalaya.

Dahal, Ranjan Kumar (2006). *Geology for Technical Students*. Kathmandu: Bhrikuti Academic Publications.

Ehrlic, Paul R., Ehrlic, Ann H. & Holdren, John P. (1977). *Ecoscience: Population, resources, environment.* San Francisco: W. H. Freeman and Company.

ICIMOD (2007). *Nepal Biodiversitty Resource Book*. Kathmandu: International Centre for Integrated Mountain Development Nepal

ICIMOD (2001). *Inventory of Glaciers, Glacial Lakes and Glacial Lake Outburst Floods*. Kathmandu: International Centre for Integrated Mountain Development.

Leong, Goh Cheng and Morgan, William Gilian C. (1987). *Human and economic geography.* London: Oxford University Press.

Pande, Badri D., Maharjan, Sharada, Shakya, V., & Karki, Uddhav (ed.) (2000). *Environmental eudcation.* Kathmandu: IUCN.

Panday, Ram Kumar (2009). *Human geography of Nepal.* Kathmandu: Ratna Pustak Bhandar.

Pokhrel, Harihar (2072). *Mahabhukampa 2072*. Kathmandu: Brother Books Publication.

Poudel, Kaladhar et al. (1991). *Janasankhya shiksha: Sandarbha pustak.* Kathmandu: CDC, TU.

Sharma, R. C. (1988). *Population, resource, environment and quality of life.* Delhi: Dhanpat Rai & Sons.

Singh, Savindra (2013). *Environmental Geography*. Allahabad: Pravalika Publications.

Subedi, Bhim P. (1995). Population environment relations in the context of sustainable development in Nepal. In *Population monograph of Nepal (pp.403-439).* Kathmandu: Central Bureau of Statistics.

UNFPA (1999). *Population, resources and environment.* New York: United Nations Population Fund.