**Disaster Risk Reduction and Management**

(Course Code: HAZ301)

**Fall semester, 2018**

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| Coordinator | **Yogeeta Dahal** |
| Credits | 6 ECTS (Compulsory course), 30 in-class hours |
| Lecturers | **Yogeeta Dahal** (Environment and Climate Studies, The College of Natural Resources, Royal University of Bhutan) |
| Level | BSc |
| Host institution | Environment and Climate Studies, The College of Natural Resources, Royal University of Bhutan |
| Course duration | August 01- November 30, 2018 |

### Summary

*This 6 ECTS course covers the foundations of disasters and their different phases. The main content of the course focuses on how disasters can be reduced and managed through use of technologies, education and public awareness. The other component also include the institutional arrangement and measures that are required to be in place to reduce the risks and hazards of disasters. It introduces students to the different types of disasters and then raises questions on how the small and mountainous countries like Bhutan can adapt and mitigate the disasters effectively with the limited available resources. The course includes several group exercises, and role play and in depth understanding of disaster management in specific context.*

### Target student audiences

Second year BSc of Environment and Climate Studies students.

### Prerequisites

None

### Aims and objectives

This module provides fundamental knowledge on biological and health effects of environmental pollutants. It explores eco-toxicological issues and classifications related to environmental and human health. It will also equip students with practical experiences in testing environmental pollutants.

### General learning outcomes:

By the end of the course, successful students will:

* Explain on disasters and their implications
* Describe disaster management cycle
* Use of technologies to predict and prevent disasters
* Assess the diverse impacts of disasters
* Identify common disasters and hazards in Bhutan
* Explain techniques of public education and awareness on disasters

### Overview of sessions and teaching methods

The course is delivered comprising of laboratory practical and case study with interactive sessions. The course starts with introduction to different types of hazards and risks and how early warning systems can help avoid disasters. Also include different phases of disasters and post disaster event.

### Course workload

The table below summarizes course workload distribution:

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| --- | --- | --- | --- |
| **Activities** | **Learning outcomes** | **Assessment** | **Estimated workload (hours)** |
| **In-class activities** | | | |
| Lectures | Understanding theories, concepts, methodology and tools | Class participation | 30 |
| Moderated in-class discussions | Understanding preparedness, evacuation, post disaster recovery and awareness. | Class participation and role play | 60 |
| In-class assignments | Understanding different types of disasters and mitigation strategy | Class participation | 10 |
| **Independent work** | | | |
| Group work:   * Contribution to the case-study projects * Contribution to the preparation and delivery of individual presentation * Contribution to the rescue and recovery plan for local government and communities | Ability to interpret data, to analyze audience, and to use the concepts, tools, and methods for communication in adaptation and mitigation to disasters  Plan and develop a message to reduce the hazards and risks to natural resources management | Quality of group assignments and individual presentations | 20 |
| Course group assignment | Ability to conceptualize and frame strategies to reduce the risks and hazards. | Quality of their presentation | 10 |
| Reading and discussion of assigned papers for seminars and preparation for lectures | Familiarity with and ability to critically and creatively discuss key concepts, tools and methods to address the natural and man-made risks and hazards. | Class participation. | 20 |
| ***Total*** |  |  | ***150*** |

### Grading

The students’ performance will be based on the following:

* Level of preparedness for participation in class discussions and seminars (10 %) (from 100 % for active participation and demonstrated familiarity with the course readings to 0 % for completely ignoring in-class discussions);
* Applicability of proposed strategy for communication, awareness, evacuation, post event recovery and including preparedness to reduce the risks and hazards from the different types of disasters (40 %) (from 100% for clearly demonstrated input to 0 % for non-participation);
* Variety of proposals (40%)
* Quality of communication strategies (20%)

### Course schedule

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| --- | --- | --- | --- |
| **Day** | **Time** | **Topic** | **Lecturer** |
| September 13 Thursday |  | Overview of Disasters  Types of disasters  Implication of disasters  Physical impacts  Socio-economic impacts  Emotional Impact | Yogeeta Dahal |
| September 14 Friday |  | Disaster Management Cycle Phases I, II, III, and IV  Disaster management cycle  Disaster Mitigation: phase I  Mitigation strategies  Development and resilient infrastructure | Yogeeta Dahal |
| September 20  Thursday |  | Disaster preparedness: Phase II  Disaster Risk Reduction (DRR)  Emergency operation plan (EOP)  Disaster Response: Phase III  Aim of disaster response  Modern and traditional responses  Disaster recovery: Phase IV  Recovery plan | Yogeeta Dahal |
| September 21 Friday |  | Education and Public Awareness Part  Community based initiatives  Rationale for community-based approach  Advantages and disadvantages of Community Based Approach  Community Based Action Plan | Yogeeta Dahal |
| September 28 Friday |  | Categories of stakeholders  Stakeholders, roles and responsibilities  National and local disaster managers and policy makers  Training and Volunteer assistance  Regional and International Organizations/Donor agencies  Performance Monitoring Plan (PMP)  Types of Evaluation (Formative and Summative Evaluation) | Yogeeta Dahal |
| October 8 Monday |  | Role of Technology in Emergency and Disaster Management  Emergency Management System (EMS)  Geographic Information Systems (GIS) and Disaster management  Use of GIS in disaster management  Advantages and challenges of using of GIS in disaster management  Application of Global Positioning System (GPS) to Disaster Management  Use of Remote Sensing in Disaster Management  Advantages and Challenges of Remote Sensing applications | Yogeeta Dahal |
| October 9 Tuesday |  | Emergency Health Services  Emergency Health Services during Disasters  Infrastructure and procedures in accessing emergency situations  Risk factors contributing to spread of communicable diseases and outbreaks  Preventing and reducing outbreaks of communicable disease in emergency settings | Yogeeta Dahal |
| October 12 Friday |  | Vulnerable groups in disaster  Definition of Vulnerable Groups  People with disabilities  Elderly People  Internally Displaced People and Refugees  Women and Children | Yogeeta Dahal |
| October 15 Monday |  | Disaster Hazards and vulnerabilities in Bhutan  Earthquakes, Landslides and Fire (Forest and settlement fires)  Epidemic, pests and diseases  Glacial Lake Outburst Floods (GLOF) & Flash floods  Windstorms/hailstorms | Yogeeta Dahal |
| October 17 Wednesday |  | Unsafe Construction practices and rapid urbanization  Pressure on land and settlements  Socio-economic factors  Lack of awareness and preparedness planning | Yogeeta Dahal |
| October 24 Wednesday |  | Institutional arrangement and disaster preparedness in Bhutan  Disaster Management in Bhutan  National Disaster Management Authority (roles and functions) | Yogeeta Dahal |
| October 26 Friday |  | Dzongkhag Disaster Management Committee (roles and functions)  Disaster Preparedness  Construction Guidelines; Seismic zonation maps, school drills,  Environmental Management framework, National Action Plan for earthquake | Yogeeta Dahal |
| November 01 Thursday |  | Submission of projects and wrap up | Yogeeta Dahal |

### Course assignments

Course assignments will constitute a project:

* Assignment **#1** (mostly in-class) – designing a preparedness plan taking account of probably disasters in Bhutan.
* Assignment **#2** (mostly in-class) – designing a process of evacuation and relocation plan and demonstration during the occurrences of different types of disasters. This will be done in groups – a proposal for a specific place in Bhutan.
* Assignment **#3** – Demonstration post recovery plan (both written and role play) reflecting the role of different stakeholders for mitigation and adaptation.

To complete the assignments the class will be divided into several groups. **Assignment #1** will help students to understand and design the preparedness to address specific issues with regard to natural and man-made disasters. The outcome of the first assignment is to develop a deeper understanding of types of disasters and relate to specific disasters. (ppts, oral presentations, poster presentation and role play).

**Assignment #1** will link the Assignment #1 where the process of evacuation will be taken in to account relating the level of preparedness relating to the specific types of disasters. (ppts, oral presentations, poster presentation and role play).

**Assignment #3** is based on the assignments #2 that the specific activities and measures required to be undertaken post disaster event. The students will propose a communication package for local leaders and communities who would self-organize to mitigate and adapt to post disaster situation relating to recovery. The group work output can be in a form of ppt presentation, role play, poster presentation and also in the form of stage skit.

### Literature

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