MODEL
MULTIDISCIPLINARY
POST-GRADUATE
COURSE

DISASTER RISK MANAGEMENT & SUSTAINABLE DEVELOPMENT

DEVELOPED BY

ASIAN INSTITUTE OF TECHNOLOGY, THAILAND
KEIO UNIVERSITY, JAPAN
MIYAGI UNIVERSITY OF EDUCATION, JAPAN
ANDALAS UNIVERSITY, INDONESIA
UNIVERSITIES GADJAH MADA, INDONESIA

Model Multidisciplinary Post Graduate Course
Disaster Management and Sustainable Development

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Preface

The designed post-graduate courses provide a comprehensive foundation for individuals to understand Disaster Risk Reduction and Sustainable Development. Most importantly, these model courses support producing a qualified human resource for government agencies, inter-governmental organizations, national and international non-governmental organizations, private sectors, and academic institutions for effective program planning and management in disaster resilience and sustainability.

The courses offered in this program are developed through an intensive discussion between representatives and experts of collaborating institutions. To formalize and have coherence in the curriculum and the course's pedagogy, all partnering universities proposed the courses with their expertise developed in a standard curriculum format. To validate the efficiency of the designed module, a two-week concise version of the certificate course was designed based on the developed curriculum. The introductory certificate course was offered to thirty-five post-graduate and doctoral students from nine countries of the Asian region.

Table of Contents

CONCEPTS AND THEORIES

- DISASTER MANAGEMENT FUNDAMENTALS
- COMMUNITY BASED DISASTER MANAGEMENT
- DISASTER GOVERNANCE
- HUMANITARIAN GOVERNANCE

MC O1: Disaster Management Fundamentals

Course Objectives

The course provides a fundamental understanding of basic concepts and elements of disaster. The course aims to develop conceptual clarity about the different elements of disaster and enhance students' knowledge about the types of disaster, the management process, and its complete cycle. This course serves as an introductory course for those coming from diverse backgrounds. Holistically, this course contributes to reducing the potential losses from hazards and supports providing required assistance to disaster-affected populations by sensitizing stakeholders and policymakers about the appropriate steps to be taken. The course offers a hyperlink to other core thematic areas associated with Disaster Risk Reduction and Disaster Management and helps students in selecting the interest areas within the academic domain of Disaster Management.

Learning Outcomes

Upon successful completion of this course, the students will be able to:

- Have a conceptual understanding of the terms and terminologies used in Disaster Management
- Contribute to disaster risk reduction and management
- Understand key associated thematic areas within disaster management

Course Outlines

Activity and assignment details are explained in detail within each week's corresponding learning module.

Week 01: Key Terminologies in Disaster Management

- Hazards
- Vulnerability
- Capacity
- Resilience
- Risk

Week 02**: Elements of Disaster**

- Mitigation
- Preparedness
- Response
- Recovery

Week 03: Thematic Areas of Disaster Management

- Disaster risk reduction
    - Theories

    - Practices
- Disaster governance
    - Legislation
    - Economic
    - Administration
    - Risk communication
- Crises management

Week 04: Approaches in Disaster Management

- Community-based approach
- Engineering-based approach
- Incident command system approach
- Environmental approaches

Week 05: Comprehensive Disaster Management

- Social integration in disaster management
- Tools and technologies in disaster management
- Cross-cutting issues in disaster management
- Development phenomena and disaster management

Laboratory Session (s)

There would be group discussion and group presentations. Group discussion topics will be allocated during the course.

Reference Reading

- Carter, W. N. (2008). Disaster management: A disaster manager's handbook.
- Coppola, D. P. (2006). *Introduction to international disaster management*. Elsevier.
- Gupta, A. K., Nair, S. S., Wajih, S. A., Chopde, S., Gupta, G., & Aggrawal, G. (2014). Mainstreaming Climate Change Adaptation and Disaster Risk Reduction into District Level Development Plans. *NIDM New Delhi (India), GEAG Gorakhpur (UP, India) and ISET, Colorado (US), P*, *114*.
- Khan, H., Vasilescu, L. G., & Khan, A. (2008). Disaster management cycle-a theoretical approach. *Journal of Management and Marketing*, *6*(1), 43-50.
- Nojavan, M., Salehi, E., & Omidvar, B. (2018). Conceptual change of disaster management models: A thematic analysis. *Jàmbá: Journal of Disaster Risk Studies*, *10*(1), 1-11.
- Pearce, L. (2003). Disaster management and community planning, and public participation: how to achieve sustainable hazard mitigation. *Natural hazards*, *28*(2), 211-228.
- Schipper, L., & Pelling, M. (2006). Disaster risk, climate change and international development: scope for, and challenges to, integration. *Disasters*, *30*(1), 19-38.
- Stenchion, P. (1997). Development and disaster management. *Australian Journal of Emergency Management, The*, *12*(3), 40-44.

Teaching and Learning Methods:
Blended: In-Person and Online, Classroom lectures, Assignment, Case Study, Group discussion, and presentation.

Time Distribution and Study Load:

- Lectures: 50%
- Self-study: 30%
- Assignment, presentations, and group activities: 20%

MC O2: Community Based Disaster Management

Course Objectives

The course will help to enhance the understanding of managing the disaster at a community level. The course provides a process to engage with communities for disaster risk reduction and management and provides basic principles of community-based disaster management approaches. The course discusses stakeholder analysis, vulnerability and resource assessment, participatory methodologies as essential tools required for localizing the disaster management process. Students will also have fundamental knowledge about risk reduction, program implementation, issue-based advocacy as an important aspect of communities in the disaster management cycle.

Learning Outcomes

Upon successful completion of this course, the students will be able to:

- Have an understanding about the community-based disaster management approach
- Conduct Stakeholder analysis, vulnerability, and resource assessment
- Understand community-based program implementation methodology
- Evaluate the strategies and frameworks for community-based disaster risk reduction

Course Outlines

Activity and assignment details are explained in detail within each week's corresponding learning module.

Week 01: Concept and Theory

- Concept of CBDM
- Principles of CBDM
- Stages in CBDM

Week 02**: Participatory Approaches in CBDM**

- Tools and techniques
- Community-led risk assessment
- Community-based risk reduction plan
- Community based monitoring approaches
- Assessment methods and tools

Week 03: Risk Management Plan

- Community-based disaster preparedness and management plan
- Resource mapping
- Local committees, Taskforces, and emergency directory

Week 04: Community Risk Profile (Project Work)

- Selection of a community

- Demographic Information
- Identification of possible hazards
- Risk Attributes & Vulnerability
- Hazard Ranking

Week 05: Community-Based Innovations

- Case studies of DRR initiatives
- Local knowledge and practices in DRR

Laboratory Session (s)

Week 04 will be conducted in the field; students will be divided into several groups, and each group will produce a risk profile of a community.

Reference Reading

- Ardaya, A. B., Evers, M., & Ribbe, L. (2019). Participatory approaches for disaster risk governance? Exploring participatory mechanisms and mapping to close the communication gap between population living in flood risk areas and authorities in Nova Friburgo Municipality, RJ, Brazil. *Land Use Policy*, *88*, 104103.
- Center, A. D. P., & ESCAP, U. (2004). Community-based disaster risk management: field practitioners' handbook.
- Larsen, O., Oliver, J., & Casiles Lanuza, E. (2014). Developing a disaster risk insurance framework for vulnerable communities in Pakistan: Pakistan disaster risk profile.
- Luna, E. M. (2014). Community-based disaster risk reduction and disaster management. *Disaster management: International lessons in risk reduction, response and recovery*, 43-63.
- Shaw, R. (Ed.). (2012). *Community based disaster risk reduction*. Emerald Group Publishing.
- Van Niekerk, D., Nemakonde, L. D., Kruger, L., & Forbes-Genade, K. (2018). Community-based disaster risk management. In *Handbook of disaster research* (pp. 411-429). Springer, Cham.
- zumi, T., Shaw, R., Djalante, R., Ishiwatari, M., & Komino, T. (2019). Disaster risk reduction and innovations. *Progress in Disaster Science*, *2*, 100033.

Teaching and Learning Methods

Blended: In-Person and Online, Classroom lectures, Assignment, Case Study, Group discussion and presentation.

Time Distribution and Study Load

- Lectures: 50%
- Self-study: 30%
- Assignment, presentations, and group activities: 20%

MC 03: Disaster Governance

Course Objectives

Disaster governance is an emerging subject in disaster risk reduction and management. It is a comprehensive idea that discusses the legislative, administrative, and economic functions in managing a disaster. Disaster governance provides a systematic integration of DRR concerns into all relevant development spheres and approaches that are well-coordinated and efficient for long-term sustainability. This course aims to provide an understanding of major and developing challenges and perspectives on current disaster trends and the efficient way of governing them.

Learning Outcomes

Upon successful completion of this course, the students will be able to:

- Understand concepts of disaster governance
- Update on legal and structural provisions at national and regional level
- Update on global commitments and initiations on DRR
- Analyze key challenges in mainstreaming DRR at the national and local levels.

Course Outlines

Activity and assignment details are explained in detail within each week's corresponding learning module.

Week 01: Concept and theory

- Concept of disaster governance
- Definition and scopes of disaster governance
- Components of disaster governance

Week 02**: Basic components of disaster governance**

- Legislative function
- Structural provisions
- Financial mechanism
- Multi-layer coordination

Week 03: DM Cycle and Governance

- Legal provision and mandates for preparedness and mitigation
- Disaster response governance
- Leadership and requisite frameworks for reconstruction

Week 04: Introduction of global frameworks

- Hyogo framework
- Sendai framework
- Sustainable Development Goals

- The Paris Agreement

Week 05: Emerging components of disaster governance

- Social sensitivity
- Disaster diplomacy
- Regional and international alliances

Laboratory Session (s)

There would be group discussions and group presentations. Group discussion topics will be allocated during the course.

Reference Reading

- Aitsi-Selmi, A., Egawa, S., Sasaki, H., Wannous, C., & Murray, V. (2015). The Sendai framework for disaster risk reduction: Renewing the global commitment to people's resilience, health, and well-being. *International journal of disaster risk science*, *6*(2), 164-176.
- Goyal, N. (2019). Disaster governance and community resilience: The law and the role of SDMAs. *International Journal of Disaster Risk Management*, *1*(2), 61-75.
- Kapucu, N., & Sadiq, A. A. (2016). Disaster policies and governance: Promoting community resilience.
- Kelman, I. (2017). Linking disaster risk reduction, climate change, and the sustainable development goals. *Disaster Prevention and Management: An International Journal*
- Miller, M. A., & Douglass, M. (Eds.). (2015). *Disaster governance in urbanizing Asia*. Springer.
- Pal, I., & Shaw, R. (Eds.). (2018). *Disaster risk governance in India and cross cutting issues*. Springer Singapore.
- Tierney, K. (2012). Disaster governance: Social, political, and economic dimensions. *Annual Review of Environment and Resources*, *37*, 341-363

Teaching and Learning Methods

Blended: In-Person and Online

Classroom lectures, Assignments, Case Study, Group discussions and presentation.

Time Distribution and Study Load

- Lectures: 50%
- Self-study: 30%
- Assignment, presentations, and group activities: 20%

MC 04: Humanitarian Governance

Course Objectives

The impact of disasters is increasing, and the need for humanitarian assistance is in high demand. One of the prime concerns in humanitarian governance is the dignity of disaster-affected communities and people. The course's main objective is to ensure that organizations and individuals follow basic humanitarian principles while saving lives. Henceforth, the course focuses on humanitarian workers to enhance their capacity with professional competence to serve in preventing and alleviating human suffering without conflicting interests. The course aims to provide a comprehensive understanding of principles, ethics, and key concerns of humanitarian services to those looking forward to contributing to serving society during crises. The course supports the humanitarian service providers to be grounded with local culture and their social context while delivering support during emergencies. The course also discusses ethical deliberation during response and recovery in humanitarian settings that includes the moral responsibilities of an individual and organization while carrying professional duties. This course will support internalizing fundamental components crucial for humanitarian organizations, funding agencies, inter-governmental organizations, and practitioners while delivering humanitarian services in a complex socio-political situation and economically backward countries.

Learning Outcomes

Upon successful completion of this course, the students will be able to:

- Have a comprehensive idea about the humanitarian service and Core Humanitarian Standards (CHS).
- Manage humanitarian assistance and support
- Understand international protocols, standards, and ethical considerations required for humanitarian services
- Will be able to conduct rapid assessment and development response programs in an emergency context.

Course Outlines

Activity and assignment details are explained in detail within each week's corresponding learning module.

Week 01: Definitions

- What is humanitarian governance?
- History and evolution of humanitarian assistance
- Basic principles of humanitarian governance
- Humanitarian organizations

Week 02**: Humanitarian organizations**

- Nature and scope of humanitarian organizations

    - Governmental Agencies
    - Intergovernmental agencies
    - Non-Government Organizations
    - Religious organization
- Types of deliveries of services
    - Search and Rescue
    - Delivery of relief materials
    - Medical Assistance
    - Financial aid

Week 03: Humanitarian Standards

- Global commitments and humanitarian chatter
- Core Humanitarian Standards (CHS)
- Humanitarian ethics

Week 04: Humanitarian Skill and Basic Requirement

- Consist mental, emotional, and physical balance
- Humanitarian technologies
- Expertise areas (medical assistance, search, and rescue, relief and support delivery, task forces, need assessment)

Week 05: Humanitarian Service Delivery

- Understanding of cluster approach
- Key challenges in humanitarian logistic
- Adapting to context
- Quality assistance
- Leave no-one behind
- Multi–layer coordination

Laboratory Session (s)

There would be group discussions and group presentations. Group discussion topics will be allocated during the course.

Reference Reading

- Abdelmagid, N., Checchi, F., Garry, S., & Warsame, A. (2019). Defining, measuring, and interpreting the appropriateness of humanitarian assistance. *Journal of International Humanitarian Action*, *4*(1), 1-13.
- Barnett, M. N. (2013). Humanitarian governance. *Annual Review of Political Science*, *16*, 379-398.
- Beigbeder, Y. (1991). *The role and status of International Humanitarian Volunteers and Organizations: The right and duty to humanitarian assistance* (Vol. 12). Martinus Nijhoff Publishers.

- Daud, M. S. M., Hussein, M. Z. S. M., Nasir, M. E., Abdullah, R., Kassim, R., Suliman, M. S., & Salu-Din, M. R. (2016). Humanitarian logistics and its challenges: The literature review. *International Journal of Supply Chain Management*, *5*(3), 107-110.
- Dijkzeul, D., & Sandvik, K. B. (2019). A world in turmoil: governing risk, establishing order in humanitarian crises. *Disasters*, *43*, S85-S108
- Hilhorst, D. (2015). Taking accountability to the next level. In *On the road to Istanbul: How can the World Humanitarian Summit make humanitarian response more effective?* (pp. 104-112). CHS Alliance.
- Larson, P. D., & Foropon, C. (2018). Process improvement in humanitarian operations: an organisational theory perspective. *International Journal of Production Research*, *56*(21), 6828-6841.

Teaching and Learning Methods

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Classroom lectures, Assignments, Case Study, Group discussions and presentation.

Time Distribution and Study Load

- Lectures: 50%
- Self-study: 30%
- Assignment, presentations, and group activities: 20%

INNOVATIONS, TOOLS AND TECHNOLOGIES

- DISASTER RISK ASSESSMENT
- SCIENCE TECHNOLOGIES AND DISASTER RISK REDUCTIONS
- IMAGED BASED SPATIAL MODELING FOR DISASTER MANAGEMENT
- COSTAL WATERSHED AND HAZARD MODELING

MC 05: Disaster Risk Assessment

Course Objectives

Disaster directly impacts livelihood, property, infrastructure, services, and the environment. The possible damage is proportional to the vulnerability of the exposed areas. So, risk assessment plays an important role to understand it's intensity, so that actions can be taken accordingly for its reduction and mitigation. The goal of this course is to provide perspectives on recent advances in vulnerability and risk assessment methods, tools, and strategies. Students will also learn how to identify significant concerns and obstacles in vulnerability and risk assessments, which will lead to evidence-based policy choices to manage risk.

Learning Outcomes

Upon successful completion of this course, the students will be able to:

- Have fundamental concepts of multiple hazards, vulnerability, and risk
- Will be able to develop indicators for risk assessment
- Can analyze risk to multiple hazards using different approaches

Course Outlines

Activity and assignment details are explained in detail within each week's corresponding learning module.

Week 01: Concept

- Basic concept of Disaster Risk
- Need of hazard, vulnerability, and risk assessment
- Introduction to geospatial data analysis

Week 02: Vulnerability Indicators

- Vulnerability indicators
    - Socioeconomic indicators
    - Physical infrastructure indicators
    - Biophysical indicators
    - Cultural-Natural heritage indicators
    - Governance indicators
- Assessment methods and tools

Week 03: Risk Assessment

- Understanding Risk Elements
- Risk mapping and analysis
- Risk information and decision

Week 04: Use of tools and technologies (exercises and tutorial)

- Introduction of different tools and technologies
- QGIS
- Geospatial data analysis

Week 05: Use of tools and technologies (exercises and tutorial)

- Calculating vulnerability and risk indices
- Hazard-specific and multiple-hazard vulnerabilities and risks assessment
- Generate risk maps using qualitative and quantitative methods
- Statistical analysis for finalizing the indicators

Laboratory Session (s)

Week 04 and Week 05 will be conducted in the laboratory assigning a separate project to each student.

Reference Reading

- Birkmann, J. (2007). Risk and vulnerability indicators at different scales: Applicability, usefulness and policy implications. *Environmental hazards*, *7*(1), 20-31.
- Dyke, G., Gill, S., Davies, R., Betorz, F., Andalsvik, Y., Cackler, J., ... & Verstappen, N. (2011). Dream project: Applications of earth observations to disaster risk management. *Acta Astronautica*, *68*(1-2), 301-315.
- Manfré, L. A., Hirata, E., Silva, J. B., Shinohara, E. J., Giannotti, M. A., Larocca, A. P. C., & Quintanilha, J. A. (2012). An analysis of geospatial technologies for risk and natural disaster management. *ISPRS International Journal of Geo-Information*, *1*(2), 166-185.
- Marshall, T. M. (2020). Risk perception and safety culture: Tools for improving the implementation of disaster risk reduction strategies. *International journal of disaster risk reduction*, *47*, 101557.
- Vatsa, K. S. (2004). Risk, vulnerability, and asset-based approach to disaster risk management. *International Journal of Sociology and Social Policy*

Teaching and Learning Methods

Blended: In-Person and Online

Classroom lectures, Assignments, Case Study, Group discussions and presentations.

Time Distribution and Study Load

- Lectures: 50%
- Self-study: 30%
- Assignment, presentations, and group activities: 20%

MC 06: Science, Technology and Disaster Risk Reduction

Course Objectives

Science and Technology for disaster risk reduction has always been there in some form in different countries. Through the advancement of scientific research, disaster risk reduction has been benefitted, especially in terms of early warning system, to identify risk in both spatial and temporal scale, strengthening of buildings and infrastructures for different types of hazards etc. In recent years, apart from hard science, which is more on innovations and engineering, soft science or social sciences have also got prominence and importance. This course explores and analyzes already existing good examples of role of science and technology in four priorities of Sendai Framework for Disaster Risk Reduction (SFDRR) and suggest the way forward of science base decision making at different levels, with specific focus on Asia.

Learning Outcomes

Upon successful completion of this course, the students will be able to:

- Explain the evolution of science and technology in pre and post Sendai context
- Explain role of S/T in different SFDRR priorities
- Understand the policy perspective of S/T and its application

Course Outlines

Activity and assignment details are explained in detail within each week's corresponding learning module.

Week 01: Thirty years of evolution of S/T in DRR

- Importance of S/T
- Significant developments in science and technology
- Incorporation into the decision making in disaster risk reduction.
- New research and innovations.

Week 02: Priority of action of S/T in post Sendai context

- Science and technology in post - Sendai Context
- Science and Technology for roadmap of UNISDR
- Priority actions of science and technology to accomplish the roadmap
- Multidisciplinary research in the field of disaster risk reduction

Week 03: S/T to enhance disaster resilience in changing climatic condition

- Climate variability and associated extremes
- Building resilience to future climate change
- Risks associated with climate change and variability in Asia and its implications
- Effective communication and inclusive risk-informed decision-making.

Week 04: Investment in S/T

- Investing in DRR for resilience
- Role of stakeholders (local governments, the private sector, and academia/universities)
- DRR investment based on natural and social-science research
    - Structural and non-structural measures.
- DRR investment plans based on their specific situations

Week 05: Emerging technologies and DRR

- Emerging technologies and its effects to enhance disaster resilience.
- Gaps, challenges, capacities for disaster management.
- Emerging technologies
    - Cyber physical systems
    - Geotechnology
    - Drone
    - VR/AR
- Technologies and decision support system.

Laboratory Session (s)

There would be group discussion and group presentations. Group discussion topics will be allocated during the course.

Reference Reading

- Sakurai M. and Shaw R. (2021): Emerging technologies for disaster resilience: Practical cases and theories, Springer, 260 pages.
- Shaw R. (2020): Thirty years of science and technology, and academia in disaster risk reduction and emerging responsibilities, in International Journal of Disaster Risk Science, https://doi.org/10.1007/s13753-020-00264-z
- Shaw R., Shiwaku K. and Izumi T. (2017): Science and technology in disaster risk reduction: Potentials and challenges, Elsevier Academic Press, 525 pages.

Teaching and Learning Methods:

Blended: In-Person and Online

Classroom lectures, Assignment, Case Study, Group discussion and presentation.

Time Distribution and Study Load:

- Lectures: 50%
- Self-study: 30%
- Assignment, presentations and group activities: 20%

MC 07: Image-based Spatial Modeling for Disaster Management

Course Objectives

This course learns about the role of spatial data in dealing with disaster problems. For this purpose, at the beginning of the lecture, students are given basic knowledge about the concepts of disaster that are currently developing. In this concept, among others, the terms of hazard, vulnerability, susceptibility, and element at risk are being distinguished. In addition to these concepts, students were also explained about the disaster management cycle, where the role of spatial data in each cycle will be more specific.

Learning Outcomes

Upon successful completion of this course, the students will be able to:

- Able to explain the role of disasters as spatial, ecological, and regional phenomena, and required geospatial data to be managed properly
- Able to identify various types of disasters with various causal variables, as well as identify types of geospatial data (images and maps), what kind of approaches used to map various variables and their modeling
- Able to extract thematic information through images or other geospatial data related to types of disasters, as well as mapping them
- Able to perform modeling vulnerability zones for various types of disasters and providing management directions, both emergency response and mitigation planning

Course Outlines

Activity and assignment details are explained in detail within each week's corresponding learning module.

Week 01: Introduction, Definition, Scope and Characteristic of Disaster

- Introduction and explanation of learning agreement (methods, assessment, references, evaluation)
- The Definition of Hazard/Disaster
- Characteristic of Disaster
    - Triggering factors
    - Spatial Occurrence
    - Duration of Event
    - Time of Onset
    - Frequency
    - Magnitude
    - Secondary hazard/disaster

Week 02: Types of Disaster, Disaster Risk Concept and Management

- Types of Disaster
- Disaster Risk Concept (Hazard)
- Vulnerability and Risk

- Disaster Risk Management Cycle
    - Mitigation
    - Preparedness
    - Emergency response
    - Rehabilitation/Reconstruction

Week 03: Spatial Information of Disaster and Information Technology

- Disaster Related Data
    - Data Source
    - Data Processing
- Mapping Object of Disaster
    - Object of Disaster Representation (point, line, area)
    - Data Type to Represent Object of Disaster (Nominal, Ordinal, Interval and Ratio)
- The Role of Information Technology
    - Web-based Disaster Mapping
    - Early Warning System

Week 04: Disaster Risk Mapping

- Hazard Mapping
- Vulnerability Mapping
- Risk Mapping
- Evacuation Route Mapping
- Shelter Plan Mapping

Week 05: Post disaster mapping
Post Disaster Mapping

- The Methods for Post Disaster Mapping
- Rapid Assessment (Damage, Impact, Needs)
- Drone for Hill Morphometry Measurement
- Android based Data Acquisition for Post Disaster
- Radar Imagery for Volcanic Deformation
- Radar Imagery for Urban Monitoring
- Preparing the Interferogram

Laboratory Session (s)

There would be group discussion and group presentations. Group discussion topics will be allocated during the course.

Reference Reading

- ADPC 2005. Knowledge Development, education, public awareness training and information sharing. A Primer of Disaster Risk Management in Asia. Asian Disaster Preparedness Center.

- GTZ, 2004, Risk Analysis – a Basis for Disaster Risk Management, Eschborn, Deutsche Gesellschaft für Technische Zusammenarbeit GmbH.
- IRGC, 2006, An introduction to the IRGC Risk Governance Framework, International Risk Governance Council.
- Kerle, N., dan Widartono, B.S., 2008, Geoinformation-Based Response to the 27 May Indonesia Earthquake – an Initial Assessment, Remote Sensing and GIS Technologies for Monitoring and Prediction of Disasters (Nayak dan Zlatanova Ed.), Berlin, Springer-Verlag
- Pine, John C., 2009, Natural Hazards Analysis: Reducing the Impact of Disasters, Boca Raton, Taylor & Francis Group.
- Van Westen, C., dan Kingma, N., 2009, Multi Hazard Risk Assessment, Educational Guide Book Session 5: Vulnerability Assessment, diedit oleh Cees van Westen, ITC, Enschede, The Netherlands.

Teaching and Learning Methods

Blended: In-Person and Online

Class room lectures, Assignment, Case Study, Group discussion and presentation.

Time Distribution and Study Load

- Lectures: 50%
- Self-study: 30%
- Assignment, presentations and group activities: 20%

MC 08: Coastal and Watershed Resources and Hazard Modeling

Course Objectives

This course provides a theory and concept of spatial modeling. The simple spatial model of the coastal and watershed resources will be introduced. In addition, the coastal and watershed hazards model will be also generated and discussed. Some factors for spatial model concerning coastal and watershed area is challenged and discussed. The state of the art of GIS technology will be implemented on the coastal and watershed model. Some experiences on the natural resources and hazards modeling will be initiated.

Learning Outcomes

Upon successful completion of this course, the students will be able to:

- Understand the mapping of the natural resources on watershed and coastal areas.
- Have knowledge of the development of the spatial model
- Have identifying the factors related coastal and watershed models (including physical, social, economic, and cultural aspects)
- Have knowledge on the GIS modeling on group and individual application project.

Course Outlines

Activity and assignment details are explained in detail within each week's corresponding learning module.

Week 01: Introduction (Hazard, Risk, and Modeling), DM and MRHA

- Geographic Information Systems (GIS)
- Types of Data in GIS
    - Spatial data maps, aerial photos, satellite imageries.
    - Attributes rainfall data, boreholes, population, buildings, etc.
    - Images/multimedia terrestrial photos, video, etc.
- Disaster Management Cycle
    - Pre disaster: mapping, socialization, capacity building, education.
    - Emergency response: damage assessment and need assessment.
    - Post disaster: rehabilitation and reconstruction.
- Multi Hazards Risk Assessment
    - Complexity and connectivity of multi-hazard and –risk:

Week 02: Introduction, Conceptual Predictive Modeling of Geo-Object

- Types of Geo-objects
    - Natural geo-objects: discrete spatial entities recognizable in the real world. Example: river channels, faults, rock units
    - Imposed geo-objects: artificial or man-made spatial entities. Example: property boundary, road, pixel.
- Types of models

    - Theoretical models
    - Empirical models
    - Hybrid models
- Conceptual Models
- Predictive Modeling

Week 03: Overview of Geomorphological Hazards and prime factors

- Geomorphological Hazards
    - Volcanic Eruption
    - Earthquake-induced landslide
    - Debris flow in volcanic context (lahar flows)
    - Soil Erosion
- Characteristics of disaster:
    - What? Type of phenomenon
    - Where? Probability of spatial distribution
    - When? Probability of temporal occurrence
    - How? Intensity and magnitude
    - Why? Factors triggering
    - Who? What? Type of element at risk (direct and indirect)
    - How many? Quantity of element at risk
    - How? Value of element at risk
- Precondition (predisposing) factors
- Preparatory factors
- Triggering factors

Week 04: Approaches on Landslide Hazard Study and Density Analysis

- Landslide hazard, vulnerability, and risk
    - Type of event
    - Causal factor
    - Triggering mechanism
    - Magnitude: Volume, domino effect, run out distance, duration, speed
    - Return period

- Hazard Assessment Methods
- Heuristic method (qualitative or semi quantitative method)
    - Geomorphologic approach
    - Qualitative landslide hazard assessment
    - Semi-quantitative assessment
- Statistical method (black-box model)
    - Landslide distribution analysis
    - Landslide density analysis
    - Univariate statistical method
    - Multivariate statistical method

- Deterministic method (white-box model)
- Landslide Density Analysis

Week 05: Tutorial (Watershed Modeling, Octave and Matlab)

- DEM dataset to be Watershed Parameter
    - Read SRTM
    - Subset SRTM
    - Elevation lowpass filtering
    - Slope
    - Aspect
    - Watershed
    - Sink
- Flow Accumulation & Wetness index
    - Gradient
    - Flow accumulation
    - Wetness index
    - Stream power index
- Tutorial Octave and Matlab
    - Overview
    - Start, quit, getting help
    - Variables and data types
    - Matrices
    - Plotting
    - Programming
    - Functions and scripts
    - Files I/O
    - Misc

Laboratory Session (s)

There would be group discussion and group presentations. Group discussion topics will be allocated during the course.

Reference Reading

- AMEC. 2005. Integrated Watershed Management Plan for the North Saskatchewan River Watershed in Alberta. North Saskatchewan River Watershed Alliance, Edmonto, Alberta.
- Arnell, N. 2014. Hydrology and Global Environmental Change. London: Routledge, Taylor & Francis Group.
- Brooks, K.N., Ffolliott, P.F., Gregersen H.M., and DeBano, L.F. 2003. Hydrology and the Management of Watersheds (3rd edition). Iowa State Press.
- Hendriks, M.R. 2010. Introduction to Physical Hydrology. New York: Oxford University Press.

- Kay, R., and Alder, J. 2005. Second Edition: Coastal Planning and Management. E & FN Spon, the United States of America.

Teaching and Learning Methods

Blended: In-Person and Online

Class room lectures, Assignments, Case Study, Group discussions and presentations.

Time Distribution and Study Load

- Lectures: 50%
- Self-study: 30%
- Assignment, presentations, and group activities: 20%

MANAGEMENT AND SUSTAINABILITY

- RISK REDUCTION AND MITIGATION
- DISASTER RECOVERY
- DISASTER MANAGEMENT AND HUMANITARIAN RESPONSE
- MULTIDISCIPLINARY APPROACH FOR DISASTER MANAGEMENT AND SUSTAINABILITY

MC 09: Disaster Risk Reduction and Mitigation

Course Objectives

This course is designed to educate students about the theories and concepts of hazard, vulnerability, capacity, and risk of disaster. In addition, theories, and concepts about disaster management (disaster management) and disaster risk reduction (disaster risk reduction) are also taught. In this study, it will be emphasized about how the development of areas in disaster prone areas should be carried out, prioritizing the principle of disaster risk reduction, and preparing the region with disaster management efforts that are in accordance with the characteristics of the region. In the other part of this lecture, students are expected to be able to analyze the characteristics of disaster-prone areas, be able to do risk calculations, and be able to do regional planning by considering the disaster vulnerability of an area by prioritizing the disaster risk reduction paradigm.

Learning Outcomes

Upon successful completion of this course, the students will be able to:

- Understand theories and concepts of hazard, vulnerability, capacity, and risk of disaster
- Apprehend regional development and disaster linkages and applications of disaster risk management.
- Identify and analyze characteristics of disaster-prone area.
- Analyze regional development plan by considering disaster risk of the area.
- Identify and select methodologies of assessment of risk, including hazard, vulnerability, and capacity.
- Conceptualize disaster risk-based regional development plan.
- Formulate sustainable and disaster-resilient development plan in a teamwork in multidisciplinary approach.
- Present ideas, issues, and problems of sustainable and disaster-resilient development.

Course Outlines

Activity and assignment details are explained in detail within each week's corresponding learning module.

Week 01: Understanding the Components of Risk and the Disaster Risk Concept

- What is disaster risk
- Fundamental introduction to hazards: types and characteristics
- Understanding exposure
- Vulnerability as human dimension of disasters
- Capacity on disaster risk
- Global policy on disaster management and risk reduction
- Regional, national policy, plans and official statements on disaster risk, climate adaptation and resilience.

- Risk drivers
- Pre-disaster phase
- Syn-disaster phase
- Post-disaster phase
- Disaster governance

Week 02: Hazards, vulnerability, and capacity

- Hazards
    - Geological or geophysical hazards
    - Hydrological hazards
    - Environmental hazards
    - Biological hazards
    - Technological hazards
- Vulnerability
    - Complexity of vulnerability
    - Types of vulnerability
    - Vulnerability analysis
- Capacity
    - Capacity measurement
    - Capacity enhancement
    - Community-based disaster risk management

Week 03: Risk assessment, resilience, and spatial planning

- Risk Assessment
    - Types of risk
    - Risk assessment
    - Disaster risk modeling
    - Disaster risk reduction
- Resilience
    - Coping and adaptive capacity
    - Resilience
    - Linking coping/adaptive capacity, resilience, and risk
- Spatial Planning Based on Disaster Risk Reduction
    - Aspects of spatial planning, spatial use, and controlling spatial use in disaster risk reduction
    - Determination of disaster-prone areas and development areas

Week 04: Risk Perception, Mitigation Strategy and Cross-Cutting Issues

- Risk perception definition
- Risk characteristic and risk models
- Theoretical perspectives in risk perceptions
- Mitigation strategy

- Risk communication

Cross Cutting Issues

- Disaster and gender
- Disaster and culture
- Disaster and environment
- Disaster and ethics

Week 05: Regional Development Strategy Based on Disaster Risk (Project/Group Assignment)

- Hydrometeorological disaster risk-based spatial planning strategies
- Geological disaster risk-based spatial planning strategies
- Environmental disaster risk-based spatial planning strategies
- Biological disaster risk-based spatial planning strategies
- Technological disaster risk-based spatial planning strategies

Laboratory Session (s)

There would be group discussion and group presentations. Group discussion topics will be allocated during the course.

Reference Reading

- Bobrowsky, Peter. 2013. Encyclopedia of Natural Hazards. Springer.
- Ben Wisner, J.C. Gaillard, Ilan Kelman. 2012. Handbook of Hazards and Disaster Risk Reduction. Routledge.
- Sinha and Ravindra. 2013. Earth System Processes and Disaster Management. Springer, Berlin, Heidelberg.
- Peraturan Kepala Badan Nasional Penanggulangan Bencana No. 2 Tahun 2012 tentang Pedoman UmumPengkajian Risiko Bencana
- Shroder, Collins, Jayawickrama. 2015. Hazards, Risks, and Disaster in Society. Academic Press. Elsevier.

Teaching and Learning Methods

Blended: In-Person and Online

Class room lectures, Assignments, Case Study, Group discussions and presentations.

Time Distribution and Study Load:

- Lectures: 50%
- Self-study: 30%
- Assignment, presentations, and group activities: 20%

MC 10: Disaster Recovery

Course Objectives

Disaster recovery is a development opportunity. In post disaster situation, different types of resources are put into the affected region, which varies from technical, financial, intellectual, and community resources. If properly used, it can change the context of risk reduction approaches, and if not, it can create different types of additional hazards. In different countries, the post disaster recovery process changed the socio-economic and political context of the affected region and country. These issues will be discussed in the course.

Learning Outcomes:

Upon successful completion of this course, the students will be able to:

- Key challenges and opportunities of disaster recovery
- GET framework of recovery process
- Examples and issues related to disaster recovery

Course Outlines

Activity and assignment details are explained in detail within each week's corresponding learning module.

Week 01: Post disaster recovery: issues and challenges

- Recovery
- Recovery plan
- Post-disaster recovery using an integrated disaster risk reduction approach
- Rehabilitation
- Interconnection between risk reduction and sustainable development.

Key considerable things on recovery:

- Local community involvement,
- Social capital of communities,
- Local governments

GET (Governance-Education-Technology) framework

Week 02: Institutional mechanism and decision making of recovery process

Extra-Ordinary Mechanisms (EOM) for successful reconstruction.

Influencing factors in recovery process

- Political will
- Availability of resources
- Requirements of international financial institutions
- Bureaucratic nature
- Political leadership

Week 03: Collaborative governance in post disaster recovery

- Introduction of Collaborative Governance
- Investment in immediate disaster response
- Critical decisions and leadership
- Sustainable Recovery

Week 04: Education sector recovery

- Educational institutions
- Multi-hazard risk at educational institutions
- Institutional contingency plan
- Cascading effects of disaster in educational sector
- Case study on impact of disaster in educational institutions
- Issues of education sector recovery

Week 05: Integrated healthcare as recovery tool

- Rapid response
- First Responders (disaster medical assistance teams, volunteers, and others)
- Healthcare system during disaster
    - Ability to respond
- Adverse effect of disaster in healthcare systems
    - Damaged buildings and equipment,
    - Lack of drugs and other supplies,
    - Increased shortage of healthcare providers.
- Integrated health care recovery

Laboratory Session (s)

There would be group discussion and group presentations. Group discussion topics will be allocated during the course.

Reference Reading

- Otsuyama K. and Shaw R. (2021): Exploratory case study for neighborhood participation in recovery process: A case from the great East Japan earthquake and tsunami in Kesennuma, Japan, Progress in Disaster Science, https://doi.org/10.1016/j.pdisas.2021.100141
- Shaw R. (2015): Tohoku recovery: Challenges, Potentials and Future, Springer Publisher, 193 pages
- Shaw R. (2015): Recovery from the Indian Ocean Tsunami: 10 years Journey, Springer Publisher, 503 pages
- Shaw R. (2014): Disaster Recovery: Used or Mis-used Development Opportunities, Springer Publisher, 431 pages

Teaching and Learning Methods

Blended: In-Person and Online

Classroom lectures, Assignments, Case Study, Group discussions and presentations.

Time Distribution and Study Load

- Lectures: 50%
- Self-study: 30%
- Assignment, presentations, and group activities: 20%

MC 11: Disaster Management and Humanitarian Response

Course Objectives

This course is a specialized course on humanitarian response and disaster management as these subjects are emerging as demanding areas for higher studies. However, fundamental courses on disaster management have been around for a long time, in the past few decades, there has been a rising realization regarding the need for specialized courses in disaster management. Moreover, it demands a specialized understanding of the stages of the disaster management cycle. Thus, this course aims to capacitate students with knowledge of the importance and develop concerns in humanitarian response and disaster management supplemented with perspectives on recent disaster risk management trends.

Learning Outcomes

Upon successful completion of this course, the students will be able to:

- Have a fundamental concept of disaster management and humanitarian response
- Have a comprehensive understanding of basic principles of humanitarian assistance
- Possess the ability to be a humanitarian worker and disaster manager

Course Outlines

Activity and assignment details are explained in detail within each week's corresponding learning module.

Week 01: Types of Hazards and Disasters

- Terminologies in disaster management
- Classification of hazards
- Types of disasters

Week 02: Disaster Management Cycle

- Prevention and mitigation
- Disaster preparedness
- Disaster response and recovery
- Reconstruction and rehabilitation

Week 03: Humanitarian Response

- Humanitarian response
    - Concepts
    - Principles
    - Core Humanitarian Standers
- Rapid Assessment and emergency program development
- Cluster approach for a coordination mechanism
- Local context and sensitivity

Week 04: Program Planning and Development

- Types of assessment
    - Rapid assessment
    - Post-disaster need assessment
- Emergency program design approaches
- Humanitarian assistance approaches
- Humanitarian leadership and ethics

Week 05: Program Management

- Basic understanding of emergency support
- Difference between humanitarian programs and regular development programs
- Program implementation strategies and challenges
- Integration of cross-cutting issues in humanitarian programs

Laboratory Session (s)

There would be group discussion and group presentations. Group discussion topics will be allocated during the course.

Reference Reading

- Acimovic, J., & Goentzel, J. (2016). Models and metrics to assess humanitarian response capacity. *Journal of Operations Management*, *45*, 11-29.
- Crawford, L., Langston, C., & Bajracharya, B. (2013). Participatory project management for improved disaster resilience. *International Journal of Disaster Resilience in the Built Environment*.
- Damon P. Coppola (2013), Introduction to International Disaster Management, Butterworth- Heinemann, Elsevier, USA.
- Salama, P., Buzard, N., & Spiegel, P. (2001). Improving standards in international humanitarian response: The Sphere Project and beyond. *JAMA*, *286*(5), 531-532.
- Seneviratne, K., Baldry, D., & Pathirage, C. (2010). Disaster knowledge factors in managing disasters successfully. *International Journal of Strategic Property Management*, *14*(4), 376-390.

Teaching and Learning Methods

Blended: In-Person and Online

Classroom lectures, Assignments, Case Study, Group discussions and presentations.

Time Distribution and Study Load

- Lectures: 50%
- Self-study: 30%
- Assignment, presentations, and group activities: 20%

MC 12: Multidisciplinary Approach for Disaster Management and Sustainability

Course Objectives

The objective of the course is to provide a fundamental understanding of multidisciplinary approaches in disaster management and sustainability. The course will give an idea about the basic concept of risk paradigms and approaches for its reduction and mitigation. The course discusses social, technical, and educational aspects and their necessities in risk reduction and mitigation. This course aims to produce capable human resources for the contribution in resilience development with skill and techniques in assessing and utilizing tools and frameworks for risk resilience and sustainable development

Learning Outcomes

Upon successful completion of this course, the students will be able to:

- Have a fundamental understanding of social and technical aspects of disaster management
- Understand the essential components in disaster management and can plan activities accordingly.
- Have holistic integration of goals and priorities of SFDRR and SDG

Course Outlines

Activity and assignment details are explained in detail within each week's corresponding learning module.

Week 01: Vulnerability, Resilience, and Governance

- Concept of vulnerability
- Initiation and approaches of resilience
- Risk governance

Week 02**: Emerging Risk paradigms**

- Biological risk reduction
- Engineering risk reduction
- Human-induced risk – (war, technologies, accidents)
- Shifting paradigm of disaster risk

Week 03: Approaches in Risk Reduction

- Science technologies and DRR
- Social Innovation in risk reduction
- Disaster education in risk reduction

Week 04: Methods and Approaches of understanding risk

- Climate change impacts and hydro – climatic extremes
- Vulnerability and risk assessment for sustainability – a geospatial approach

Week 05: Development and Risk Management

- Livelihood resilience framework
- Hazard assessment framework
- Resilience capacity framework

Laboratory Session (s)

There would be group discussion and group presentations. Group discussion topics will be allocated during the course.

Reference Reading:

- Cardona, O. D. (2013). The need for rethinking the concepts of vulnerability and risk from a holistic perspective: a necessary review and criticism for effective risk management. In *Mapping vulnerability* (pp. 56-70). Routledge.
- Gill, D. A., & Ritchie, L. A. (2018). Contributions of technological and natech disaster research to the social science disaster paradigm. In *Handbook of disaster research*(pp. 39-60). Springer, Cham.
- McEntire, D. A., Fuller, C., Johnston, C. W., & Weber, R. (2002). A comparison of disaster paradigms: The search for a holistic policy guide. *Public administration review*, *62*(3), 267-281.
- Saja, A. A., Goonetilleke, A., Teo, M., & Ziyath, A. M. (2019). A critical review of social resilience assessment frameworks in disaster management. *International journal of disaster risk reduction*, *35*, 101096.
- Shaw, R., Mallick, F., & Islam, A. (Eds.). (2013). *Disaster risk reduction approaches in Bangladesh* (Vol. 103). New York, NY: Springer.
- Shi, P. (2019). *Disaster risk science*. Springer.

Teaching and Learning Methods

Blended: In-Person and Online

Classroom lectures, Assignments, Case Study, Group discussion and presentations.

Time Distribution and Study Load

- Lectures: 50%
- Self-study: 30%
- Assignment, presentations, and group activities: 20%

CROSS CUTTING AREAS AND ISSUES

- MEDIA AND DISASTER RISK REDUCTION
- INTERNATIONAL RELATION AND DISASTER DIPLOMACY
- DISASTER EDUCATION
- SOCIAL INCLUSION IN DISASTER MANAGEMENT

MC 13: Media and Disaster Risk Reduction

Course Objectives

Role of media is considered to be of utmost importance in all phases of disasters, before, during and after. Different types of media have different pro-active roles to play in disaster risk reduction. Effective risk communication to enhance pre-disaster mitigation actions is always a challenge. Media plays an important role not only in bringing early warning to people and but also enhancing their perception to take actions. Community radio, social media plays important roles during and post disaster response recovery phases. Resilient media infrastructure is the core of uninterrupted media coverage during and after a disaster. Media literacy becomes an important issue for several stakeholders, including governments. Media governance is also considered important to look at the priorities of disaster risk reduction initiatives within the media house. Trust in media is crucial, which enhances people's actions before and during disasters. These issues will be discussed in the course.

Learning Outcomes

Upon successful completion of this course, the students will be able to:

- Role of media in DRR
- Different types of media in DRR and its effectiveness and challenges
- Examples and issues related to media use in DRR

Course Outlines

Activity and assignment details are explained in detail within each week's corresponding learning module.

Week 01: Media and Disaster Risk Reduction

- Risk communication
- Role of media in disaster management cycle
- Types of media and their target groups

Week 02: Community Radio and DRR

- Local information during times of disaster and recovery and reconstruction.
- Role of community radio in DRR
- Disaster broadcasting stations
- Advantages of community Radio during emergency.
- Models of community radio in DRR.

Week 03: Social Media and Disaster Management

- Social media platforms
- Role of social media in disaster management cycle
    - Primary means for information dissemination,

    - Mapping and sending instant reports,
    - Organizing volunteers and help groups,
    - Connecting with family members,
    - Fund raising
- Evolving role of social media in DRR

Week 04: Challenges and Lessons of Media During and After Disaster

- Disaster Reporting
- Intricacies of media reporting.
- Media: before, during and after the disaster.
- Development of disaster communication practices and media research.

Week 05: Disaster Awareness, Foreign Residents, and Role of Media: Case Study

- Foreign tourists and residents during disaster
- Strategic risk communication process
- Social infrastructure
- Customized emergency information for tourists and foreign residents
- Risk information to enhance daily life preparedness
- Effective strategy
- Disaster awareness and risk communication of foreign tourists and residents

Laboratory Session (s):

There would be group discussion and group presentations, Group discussion topics will be allocated during the course.

Reference Reading:

- Shaw R., Kakuchi S. and Yamaji M. (2021): Media and disaster risk reduction: advances, challenges and potentials, Springer, 249 pages.
- Hua J. and Shaw R. (2020): Corona virus "infodemic" and emerging issues through a data lens: the case of China, in International Journal of Environmental Research and Public Health, 17, 2309; doi:10.3390/ijerph17072309
- Mavrodieva A, ….. , Shaw R. (2019): Role of social media as a soft power tool in raising public awareness and engagement in addressing climate change, in Climate, 2019, 7, 122; doi:10.3390/cli7100122

Teaching and Learning Methods:

Blended: In-Person and Online

Classroom lectures, Assignment, Case Study, Group discussion and presentation.

Time Distribution and Study Load:

- Lectures: 50%
- Self-study: 30%
- Assignment, presentations, and group activities: 20%

MC 14: International Relation and Disaster Diplomacy

Course Objectives

Disaster management is growing as an essential part of the political science and international relations domain. The influence and investment associated with disaster risk reduction and humanitarian assistance have made this sector more influential in the political arena and global commitments. The emerging political interests related to humanitarian services have further reflected its growing demands. The course aims to produce a qualified human who can have a balanced understanding between political consciousness and humanitarian ethics. The course will provide knowledge about the principles of international relations, the formulation process of global commitments, the operational modality of international obligations, and the linkages of inter-government organizations and global goals.

Learning Outcomes

Upon successful completion of this course, the students will be able to:

- Have a broad understanding of international relations, and its principles
- Be a qualified individual with a comprehensive understanding of global discourse in disaster risk reeducation and management domain
- Have a clear understanding of the international mechanism in developing and endorsing global commitments and declarations
- Will be able to lead and advocates the issues of DRR

Course Outlines

Activity and assignment details are explained in detail within each week's corresponding learning module.

Week 01: Concept and Principles of International Relations

- International relations and its principles
- International governance mechanism
- Inter -Governmental organizations and its scopes

Week 02: Global Commitments

- Inter -governmental forums and its mechanism
- Sectoral priority and engagement
- DRR oriented inter -governmental organizations
- DRR focused global commitments and declarations

Week 03: Operational and Governance Modality of Global commitments

- Governance Mechanism of global goals
- Source and channel of investment
- The need of commitments and common forums

Week 04: Disaster as an emerging diplomacy tool

- Disaster Diplomacy: conceptual understanding
- Integrating components
    - Legislations and international commitments
    - Financial assistance
    - Access and control
    - Benefit of doubt

Week 05: Regional Cooperation and Sustainability

- Promotion of peace and sustainable development
- Regional and International issues
    - Regional and national conflicts
    - Refugee and it's growing challenges
    - Climate change and induced hazards
- International platforms and treaties
- Inter-governmental basket approaches

Laboratory Session (s)

There would be group discussion and group presentations. Group discussion topics will be allocated during the course.

Reference Reading

- Egeland, J. (2013). Humanitarian diplomacy. In *The Oxford handbook of modern diplomacy*.
- Goldstein, J. S., Pevehouse, J. C., & Sernau, S. (2008). *Principles of international relations*. Pearson Longman.
- Haynes, J. (2014). *An introduction to international relations and religion*. Routledge.
- Kelman, I. (2018). Connecting theories of cascading disasters and disaster diplomacy. *International journal of disaster risk reduction*, *30*, 172-179.
- Kelman, I. (2018). Disaster diplomacy. *The Encyclopedia of Diplomacy*, 1-6.
- Raustiala, K., & Slaughter, A. M. (2002). International law, international relations and compliance. *International Relations and Compliance. Princeton Law & Public Affairs Paper*, (02-2).
- Sawada, Y., & Zen, F. (2014). Disaster management in ASEAN. *ERIA-DP-2014-03*.
- Yim, E. S., Callaway, D. W., Fares, S., & Ciottone, G. R. (2009). Disaster diplomacy: current controversies and future prospects. *Prehospital and disaster medicine*, *24*(4), 291-293

Teaching and Learning Methods

Blended: In-Person and Online

Classroom lectures, Assignment, Case Study, Group discussion and presentation.

Time Distribution and Study Load

- Lectures: 50%
- Self-study: 30%
- Assignment, presentations, and group activities: 20%

MC 15: Disaster Education

Course Objectives

Education is one of the essential components in Disaster Risk Reduction. The main objective of this course is to give a comprehensive understanding of the role of education in making disaster risk reduction more effective. Education is an essential aspect of disaster management in developing associated individuals' capacity building and contributing to proactive mitigation and preventative actions. Thus, education is a keyway to developing the capacities of disaster managers to bring the interdisciplinary subjects together so that the integration of disaster risk reduction can be assured. The course will discuss the need, approaches, and critical areas of integration of disaster education.

Learning Outcomes

Upon successful completion of this course, the students will be able to:

- Understand concepts of disaster education
- Have clear ideas of interlinkage between education, disaster risk reduction and other disciplinary subjects
- To integrate the DRR in multidisciplinary academic domain.

Course Outlines

Activity and assignment details are explained in detail within each week's corresponding learning module.

Week 01: Disaster Education: Introduction

- Formal, non-formal and informal education
- Approaches in disaster education
- Implementation tools for disaster education

Week 02**: Disaster Education Theory**

- Disaster education principles
- Learning domains
    - Behavioral
    - Cognitive
    - Affective
    - Social
- Theories and Pedagogy
    - Programmed instruction
    - Information processing
    - Constructivist
    - Social and emotional
    - Transformational
- Relevance

Week 03: Importance of Disaster Education

- Education for disaster resilience
- Education for capacity building
- Education for risk mitigation and management
- Disaster research and policy implication

Week 04: Multi-disciplinary Prospective

- Disaster education in engineering
- Disaster education in health and medicine
- Disaster education in social science
- Disaster education in science and technology
- Disaster and economics

Week 05: Disaster Education: as a nexus

- Nexus of academic disciplines
    - Social and technical knowledge
    - Humanitarian services and economics.
    - Innovation and traditional practices

Laboratory Session (s)

There would be group discussion and group presentations. Group discussion topics will be allocated during the course.

Reference Reading

- Dufty, N. (2018). A new approach to disaster education. *Retrieved March*, *4*, 2019.
- Johnson, V. A., Ronan, K. R., Johnston, D. M., & Peace, R. (2016). Improving the impact and implementation of disaster education: Programs for children through theory-based evaluation. *Risk analysis*, *36*(11), 2120-2135.
- Mansur, A., Doyle, J., & Ivaschenko, O. (2017). Social Protection and Humanitarian Assistance Nexus for Disaster Response.
- Nifa, F. A. A., Abbas, S. R., Lin, C. K., & Othman, S. N. (2017, October). Developing a disaster education program for community safety and resilience: The preliminary phase. In *AIP Conference Proceedings* (Vol. 1891, No. 1, p. 020005). AIP Publishing LLC.
- Reinhardt, G. Y., & Ross, A. D. (2019). Expanding social science through disaster studies. *Social Science Quarterly*, *100*(7), 2523-2529.
- Sawada, Y., & Takasaki, Y. (2017). Natural disaster, poverty, and development: An introduction. *World Development*, *94*, 2-15.
- Shaw, R., Shiwaku, K., & Takeuchi, Y. (Eds.). (2011). *Disaster education*. Emerald Group Publishing.
- Thayaparan, M., Siriwardena, M., Malalgoda, C. I., Amaratunga, D., Lill, I., & Kaklauskas, A. (2015). Enhancing post-disaster reconstruction capacity through lifelong learning in higher education. *Disaster Prevention and Management*.

Teaching and Learning Methods
Blended: In-Person and Online
Classroom lectures, Assignment, Case Study, Group discussions and presentations.

Time Distribution and Study Load

- Lectures: 50%
- Self-study: 30%
- Assignment, presentations, and group activities: 20%

MC 16: Social Inclusion in Disaster Management

Course Objectives

The course is designed to interlink societal participation and collaboration in the disaster management domain. Society and its components play an essential role in making disaster management initiatives more relevant. It also ensures the effective participation of the community and provides inclusive, accessible to those affected by or at risk of disasters. Social inclusion looks and gives special consideration to gender, age, disability, and culture into account, and encourage for participatory leadership. The course provides its special focus to the community-organized activities in mitigating and managing the risk. The course aim in blending the traditional knowledge and ongoing societal functioning with the global theory of disaster management for a practical community-based approach

Learning Outcomes

Upon successful completion of this course, the students will be able to:

- Have a holistic understanding between social elements and its interrelation in disaster management
- Provide theoretical prospective of cross cutting social issues that needs special consideration in disaster management
- Support in developing and designing the effective plans for disaster risk reduction and management.

Course Outlines

Activity and assignment details are explained in detail within each week's corresponding learning module.

Week 01: Social Dimensions of Disaster Management

- Cultural dimensions
- Socio- economic Dimension
- Social sustainability

Week 02**: Social Resilience Framework**

- Standard resilience framework
- Context specific resilience
    - Hazard specific
    - Geographic scope
    - Hierarchy

Week 03: Traditional Knowledge in Disaster Management

- Definitions of traditional and indigenous knowledge
- Types of traditional knowledge

    - Adopted practices
    - Myths
- Case Studies of TK and IK in disaster management

Week 04: GESI in Disaster Management

- Conceptual understanding about minorities
- Key principles of GESI
- GESI in regular development
- GESI during emergency management

Week 05: Disaster Cycle and Social Perspective

- Traditional knowledge in preparedness Activities
- Integrated Social innovation for mitigation activities
- Use of social assets in Response and Recovery

Laboratory Session (s)

There would be group discussions and group presentations. Group discussion topics will be allocated during the course.

Reference Reading

- Dillard, J., Dujon, V., & King, M. C. (Eds.). (2008). *Understanding the social dimension of sustainability*. Routledge.
- Okazaki, K., & Shaw, R. (2003). Empowerment of local people for sustainable disaster mitigation: Experiences of developing countries. *Regional Development Dialogue*, *24*(1), 3-14.
- Saja, A. A., Goonetilleke, A., Teo, M., & Ziyath, A. M. (2019). A critical review of social resilience assessment frameworks in disaster management. *International journal of disaster risk reduction*, *35*, 101096.
- Shaw, R., Sharma, A., & Takeuchi, Y. (2009). *Indigenous knowledge and disaster risk reduction: From practice to policy*. Nova Science Publishers, Inc.
- Stanley Jaya Kumar, G. (2000), "Disaster management and social development", *International Journal of Sociology and Social Policy*, Vol. 20 No. 7, pp. 66-81. https://doi.org/10.1108/01443330010789007
- Thapa, V., & Pathranarakul, P. (2019). Gender inclusiveness in disaster risk governance for sustainable recovery of 2015 Gorkha Earthquake, Nepal. *International journal of disaster risk reduction*, *34*, 209-219.
- Webb G.R. (2007) The Popular Culture of Disaster: Exploring a New Dimension of Disaster Research. In: Handbook of Disaster Research. Handbooks of Sociology and Social Research. Springer, New York, NY. https://doi.org/10.1007/978-0-387-32353-4_25
- Yumarni, T., Sulistiani, L. S., Idanati, R., & Gunarto, G. (2021). Gender Equality and Social Inclusion (GESI) for Strengthening Disaster Resilient Village. *JPAS (Journal of Public Administration Studies)*, *6*(1), 8-15.

Teaching and Learning Methods
Blended: In-Person and Online
Classroom lectures, Assignment, Case Study, Group discussion and presentation.

Time Distribution and Study Load

- Lectures: 50%
- Self-study: 30%
- Assignment, presentations, and group activities: 20%