

1.2.1 Percentage of new courses introduced of the total number of courses across all programmes offered during the last five years (30)

1.2.1.1: How many new courses were introduced within the last five years

(Last Five Academic Years, 2014-15 to 2018-19)

Name of the new course introduced in the last 5 years	Program name	Program code	Course code	Year of introduction	Link of the relevant document
Diploma in Disaster management(Self Finance-Evening)		G14	DDM	2015	
M.Sc. Disaster management and Climate Sustainability Studies		M70	DMM	2018	
M.Sc. in Disaster Management and Climate Sustainability Studies					
Foundation Course on Disaster Management and Climate Sustainability	M.Sc. in Disaster Management and Climate Sustainability Studies	M70	DMM-101	2018	
Deep Earth and Surface Processes, Earth Materials and Resources	M.Sc. in Disaster Management and Climate Sustainability Studies	M70	DMM-102	2018	
Applied Geomorphology	M.Sc. in Disaster Management and Climate Sustainability Studies	M70	DMM-103	2018	
Geophysical and Meteorological Methods in Disaster and Climate Studies	M.Sc. in Disaster Management and Climate Sustainability Studies	M70	DMM-104	2018	

Geoinformatics in Disaster and Climate Studies	M.Sc. in Disaster Management and Climate Sustainability Studies	M70	DMM-105	2018	
Geological Materials and Interpretation of Geological Maps	M.Sc. in Disaster Management and Climate Sustainability Studies	M70	DMM-106	2018	
Application of Geoinformatics Tools	M.Sc. in Disaster Management and Climate Sustainability Studies 2018	M70	DMM-107	2018	
Field Work	M.Sc. in Disaster Management and Climate Sustainability Studies	M70	DMM-108	2018	
Energy and Climate Change	M.Sc. in Disaster Management and Climate Sustainability Studies	M70	DMM-201	2018	
Economics of Climate Change	M.Sc. in Disaster Management and Climate Sustainability Studies	M70	DMM-202	2018	
Climate Change and Global Sustainability	M.Sc. in Disaster Management and Climate Sustainability Studies	M70	DMM-203	2018	
Global Climate Modelling	M.Sc. in Disaster Management and	M70	DMM-204	2018	

	Climate Sustainability Studies				
Predictive Modelling	M.Sc. in Disaster Management and Climate Sustainability Studies	M70	DMM-205	2018	
Mapping and Analysis of Climatic Data	M.Sc. in Disaster Management and Climate Sustainability Studies	M70	DMM-206	2018	
Geospatial Modelling in Climate Studies	M.Sc. in Disaster Management and Climate Sustainability Studies	M70	DMM-207	2018	
Field Work	M.Sc. in Disaster Management and Climate Sustainability Studies	M70	DMM-208	2018	
Disaster Management Cycle and Laws	M.Sc. in Disaster Management and Climate Sustainability Studies	M70	DMM-301	2018	
Vulnerability and Risk Assessment	M.Sc. in Disaster Management and Climate Sustainability Studies	M70	DMM-302	2018	
Disaster Preparedness and Decision Making	M.Sc. in Disaster Management and Climate Sustainability Studies	M70	DMM-303	2018	

	Studies				
Rescue, Relief and Rehabilitation	M.Sc. in Disaster Management and Climate Sustainability Studies	M70	DMM-304	2018	
Disaster management: Laws and Policies	M.Sc. in Disaster Management and Climate Sustainability Studies	M70	DMM-305	2018	
Geoinformatics for Disaster Management	M.Sc. in Disaster Management and Climate Sustainability Studies	M70	DMM-306	2018	
Field Work	M.Sc. in Disaster Management and Climate Sustainability Studies	M70	DMM-307	2018	
Internship (Dissertation)	M.Sc. in Disaster Management and Climate Sustainability Studies	M70	DMM-401	2018	

COURSE STRUCTURE

M. Sc. in Disaster Management and Climate Sustainability Studies

Semester - I

Paper No	Code	Title	Credit
Paper - I	DMM-101	Foundation Course on Disaster Management and Climate Sustainability	4
Paper - II	DMM-102	Deep Earth and Surface Processes, Earth Materials and Resources	4
Paper - III	DMM-103	Applied Geomorphology	4

Paper - IV	DMM-104	Geophysical and Meteorological Methods in Disaster and Climate Studies	4
Paper - V	DMM-105	Geoinformatics in Disaster and Climate Studies	4
Practical - I	DMM-106	Geological Materials and Interpretation of Geological Maps	1
Practical - II	DMM-107	Application of Geoinformatics Tools	1
Practical - III	DMM-108	Field Work	3
TOTAL CREDITS			25

Semester - II

Paper No	Code	Title	Credit
Paper - VI	DMM-201	Energy and Climate Change	4
Paper - VII	DMM-202	Economics of Climate Change	4
Paper - VIII	DMM-203	Climate Change and Global Sustainability	4
Paper - IX	DMM-204	Global Climate Modelling	4
Paper - X	DMM-205	Predictive Modelling	4
Practical - IV	DMM-206	Mapping and Analysis of Climatic Data	1
Practical - IV	DMM-207	Geospatial Modelling in Climate Studies	1
Practical - V	DMM-208	Field Work	3
TOTAL CREDITS			25

Semester - III

Paper No	Code	Title	Credit
Paper - XI	DMM-301	Disaster Management Cycle and Laws	4
Paper - XII	DMM-302	Vulnerability and Risk Assessment	4
Paper - XIII	DMM-303	Disaster Preparedness and Decision Making	4
Paper - XIV	DMM-304	Rescue, Relief and Rehabilitation	4
Paper - XV	DMM-305	Disaster management: Laws and Policies	4
Practical - V	DMM-306	Geoinformatics for Disaster Management	1
Practical - VI	DMM-307	Field Work	3
TOTAL CREDITS			24

Semester - IV

Paper No	Code	Title	Credit
----------	------	-------	--------

Practical - VII	DMM-401	Internship (Dissertation)	16
TOTAL CREDITS			16

TOTAL CREDITS for 4 Semesters: 90

1. IDENTIFYING INFORMATION

Course title: **Foundation course in Disaster Management and Climate Sustainability**

Course code: **DMM - 101**

2. COURSE CONTENT

UNIT-I

Disaster: definitions and key concepts; History of disaster management; Trends of disasters; Concept of climate change and sustainability; Theories of climate change; Impact of climate change; Disaster management and global sustainability

UNIT-II

Typology and classification of disasters; Natural disaster: floods, droughts, cyclones; Manmade disasters: war, conflict; industrial accidents; Environmental and societal impact of disasters

UNIT-III

Disaster management; approaches and models; Disaster management cycle; Vulnerability analysis; Risk analysis; Disaster risk reduction (DRR); Disaster management ethics; Integrated disaster management

UNIT-IV

Climate sustainability and disaster management; Climate change mitigation and adaptation; Role of remote sensing and GIS in climate change studies and disaster management; Concerns and prospects of disaster management; United Nations Office for Disaster Risk Reduction (UNDRR); Disaster Management Act, 2005

Suggested Readings:

Rodríguez, H., Donner, W., Trainor, J. E., (Eds.). 2018. Handbook of Disaster Research, Second Edition, Springer, Gewerbestrasse Cham, Switzerland

Quarantelli, E. L. (Ed.). 1998. What is a disaster? Perspectives on the Question. London: Routledge

Bosher, L.; Chmutina, K., 2017. Disaster Risk Reduction for the Built Environment, Wiley Blackwell, West Sussex, UK

Coppola, D.P. 2015. Introduction to International Disaster Management, Butterworth-Heinemann, Oxford, UK

Bullock, J.B., Haddow, G.D., Haddow, K.S., Coppola, D.P. 2016. Living with Climate Change: How Communities Are Surviving and Thriving in a Changing Climate, CRC Press, Boca Raton, USA

IDENTIFYING INFORMATION

Paper title: **Deep earth and Surface Processes, Earth Materials and Resources**

Course code: **DMM – 102**

Unit-I - Deep Earth Processes: Interior of the earth and its composition; Characterization of the Thermal, Petrophysical and Mechanical properties of Crust and mantle; Mantle convection; – Wegener, Wilson Cycle; Sea floor Spreading; Continental Drift; Forces of Crustal Instability: Concept of Plate Tectonics, Dynamics of Plate Margins, Mountain belts and adjacent sedimentary basin; Subduction Processes: Accretion, deformation and exhumation.

Unit-II – Lithosphere and Earth Surface Processes: Concept of Gradation - types, classification and effects of weathering; mass wasting; cycle of erosion. Kinematics of Orogenic belts; Examine relation between Deep earth and surface processes in different tectonic regions (mountains; coastal; oceanic belt); Geophysical techniques and seismological methods of imaging deep earth (Geotomography; Electrical; Electromagnetic; Gravity; Seismic and Magnetotelluric passive source tomography).

Unit-III - Earth Materials: Origin and Classification of Rocks: Igneous, Sedimentary and Metamorphic Rocks; Metamorphic and Igneous petrology; constraints and dynamics of plate origin; Mountain belts and adjacent sedimentary basins; Rock Properties Affecting Ground Water, Vertical Distribution of Sub-surface Water, Types of Aquifers, Hydrological Cycle; Groundwater Resource Development and Management. Soils: Process of Formation, Soil profile and Soil types.

Unit-IV – Resources: Types of Resources: Minerals, Rocks, Soil, Water, Oil and Gas formations; Ores - Metallic and Non-Metallic ores; Mineral Exploration - Geological and Geophysical Prospecting, Mining, Environmental Considerations for Mining. Fossil fuels: Coal and Petroleum (Formation, Types, Uses and Environmental Hazards).

Suggested Readings:

1. Strahler A (1996): Introducing Physical Geography, John Wiley and Sons.
2. Singh S (2015): Geomorphology, Pravalika Publications. Allahabad.
3. Hagget R (2010): Physical Geography: The Key Concepts. Taylor and Francis. London and New York.
4. Phillip A (1997): Earth Surface Process. Wiley-Blackwell. ISBN-0632035072.
5. Steven ID (2012): Earth Material and Resources (Earth Science). Har/Psc Edition.

IDENTIFYING INFORMATION

Paper title: **Applied Geomorphology**, Course code: **DMM – 103**

Unit 1 – Concept and Approaches: Nature, Scope and Objectives of Applied Geomorphology; Fundamental concepts in Geomorphology; Historical and Process Geomorphology; Concepts: Uniformitarianism and Neocatastrophism; Equilibrium and its Types; Concept of Space and Time in Geomorphology.

Unit II – Tropical Geomorphology: Geological Framework of the Tropical Lands; Erosion and Land Cover in the Tropics; Tropical Hydrology; Process Geomorphology in the Tropics: Weathering, Slopes; Tropical Highlands; Anthropogenic Alteration of Geomorphic Processes in the Tropics; Urban Geomorphology in the Tropics; Future with Climate Change.

UNIT III – Fluvial Geomorphology: Overview of river processes; River Basin morphology: drainage networks, runoff processes; Mechanics of fluvial erosion: overview of open channel flow; overland, through and ground water flow; Hydraulic geometry: at a station, downstream; Sediment transport: suspended and bedload; River metamorphosis and Quaternary fluvial systems. Fluvial Hazards: River Floods, river shifting, river pollution and their causes, consequences, viability and management.

UNIT IV – Coastal Geomorphology: Coastline, shoreline, hinterland; Coastal evolution and shoreline change; Shore zone processes: tides, waves and currents, swells, breakers and surfs, storm surges and Tsunami; The Tropical Coasts; Processes of Weathering, erosion and transportation in coastal areas; coastal sediments: Production and transport; Coastal zones hazards and management.

Suggested Readings:

1. Robin Davidson-Arnott (2010): Introduction to Coastal Process and Geomorphology; Cambridge University Press. 1st Edition.
2. Masselink Gerhard (2003): An Introduction to Coastal Process and Geomorphology; A Hodder Arnold Publication.
3. Bird EC (1984): Introduction to Coastal Geomorphology, Orient Longman, Calcutta.
4. King CAM (1972): Beaches and Coast, Edward Arnold, London.
5. Bloom AI (2002): Geomorphology, Third Edition, Prentice Hall of India, new Delhi.
6. Goudie AS (2004): (Eds) Encyclopedia of geomorphology, Routledge, London.
7. Hart MG (1986): Geomorphology Pure and Applied. George Allen and Unwin, London.
8. Chorley RJ, Schumm, SA, Sugden DE (1984): Geomorphology, Methuen, London.
9. Faniran A and Jeje LK (1983): Humid Tropical Geomorphology, Longman, London.
10. Thomas MF (1994): Geomorphology in the Tropics: A study of weathering and denudation in low latitudes. John Wiley and Sons.
11. Singh S (2002): Geomorphology, PrayagPustakBhawan, Allahabad.

1. IDENTIFYING INFORMATION

Course title: **Geophysical and Meteorological Methods in Disaster and Climate Studies.**

Course code: **DMM – 104**

UNIT-I

Geophysics: Concepts and Fundamentals; Geophysical properties of Earth material; Seismic Wave velocity of Rocks; Variation of density in Rocks; Geophysical Methods: Seismic Method, Gravity Method, Electrical Resistivity Method, Electromagnetic method, Geo-thermal method and GPR.

Unit-II

Application of Geophysical Method in Seismology; Ground Penetration Radar (GPR); Ground Water Investigation; Landslide Studies and Site Exploration; Subsurface Cavity, Subsidence and Faults and interpretation. Sources of Data: Numerical Weather and Climate Models, Remote Sensing (e.g. satellite, radars), In-situ Observation.

Unit-III

Metrology: Concepts and Fundamentals; Metrology and Weather Forecasting; Forecasting Methods: Synoptic Method, Numerical Method, Statistical Method; Forecasting Tools: Surface data, Soundings, Satellite data, Radar data, Aircraft data; Types of Forecasting: Quantitative Forecasting: Climatology Method, Analogue Method, Persistence and Trend Method.

Unit-IV

Remote Sensing based Forecasting and Monitoring of Weather Phenomena: Flood: Flood Frequency Analysis, Hydraulic parameters and Models; Drought: Drought Prediction, Standardized Precipitation and Evapotranspiration Index, Rainfall and Vegetation based Drought monitoring; Thunderstorm; Cyclone; Remote Sensing and Forecasting Methods: Drift Method, Time Series Method, and Judgmental Methods.

Suggested Readings:

1. Pandey M (2014): Disaster Management. ISBN: 9788126549245, 8126549246.
2. Parasnis DS (1997). Principles of Applied Geophysics. 4th Edition. Chapman and Hall.
3. Griffiths DH and King RF (1981): Applied geophysics for geologists and engineers. 2nd Edition. Pergamon, Oxford.
4. Elliott G (1988): Weather forecasting rules techniques and procedures. American Press.
5. Samui P, Kim D and Ghosh C (2018): Integrating disaster science and management. 1st Edition, Elsevier.
6. Shroder J (2014): Hydro-meteorological hazards, risks and disasters. 1st Edition. Elsevier.

IDENTIFYING INFORMATION

Paper title: **Geoinformatics in Disaster and Climate Studies**, Course code: **DMM – 105**

Unit-1

Meaning and Scope of Geoinformatics: Fundamentals of Remote sensing; Digital Image Processing; GIS; GPS; Photogrammetry; Understanding of Maps; Scale; Projection.

Unit-II Spatial and non-spatial data for disaster and climate studies; toposheet on different scales; satellite data: Panchromatic, multispectral, hyper-spectral, aerial photographs and Radar data; Meteorological Data.

Unit-III Application of Geoinformatics in Natural Disasters: Vulnerability and Risk Assessment of Landslides, Floods, Droughts, Earthquakes, Cyclones; Role of Geoinformatics in Rescue, Relief and Rehabilitation.

Unit-IV

Application of Geoinformatics in Man-made disasters: Vulnerability and Risk Assessment of Industrial, Biological, Chemical, Wars, Riots, Terrorist Attacks, Famine; Role of Geoinformatics in Rescue, Relief, Rehabilitation.

Suggested Readings:

1. Sisizlatanova and Andrea Fabbrijonathanli (2007): Geometrics solutions for Disaster management, Springer Verlag, 2007.
2. C. EmdadHaque (2005): Mitigation of natural Hazards and disasters, KluwerAcademic publishers group.
3. Linda C. Bottersll and ponald A. wilhite (2005): From Disaster response to Risk management. KluwerAcademic publishers group.
4. Sdidmore A (2002): Environmental modeling with GIS and Remote Sensing, Taylor and Francis.
5. Anji Reddy (2004): Geoinformatics for Environmental management. BS Publications.
6. Edmond Mathez (2009): Climate Change: the science of global warmong and our energy future. Columbia University Press. 1st edition. ISBN-0231146426.
7. Gavin Schmidt, Jochuawolfe and Jeffrey D. Sachs (2009): Climate change: picturing the Science. WW Norton and company. ISBN-0393331253.

DMM-107 Application of Geo-informatics tools

M.Sc. Disaster Management

Unit -I: Introduction to Computer & Software

Introduction to computer: Operating systems; Hardware requirements for Geo-informatics software; Graphical user interface: Arc GIS; Erdas Imagine; ENVI; QGIS and Google Earth

Unit - II: Pre-processing, Data Base Creation and spatial statistics

Import and export of spatial data; Pre-processing of spatial data: Geometric correction; spatial enhancement; radiometric correction; spatial data base creation: data base creation in DBF format; linking spatial data with non-spatial data; statistical analysis: zonal statistics; spatial auto-correlation.

Unit-III: Spatial Analysis

Hydrology: extraction of stream from DEM; delineation of watershed; stream ordering; Surface analysis: slope, aspect; hillshade; contour; Interpolation: inverse distance weighted (IDW); Kriging; Overlay analysis: weighted overlay; Fuzzy membership

Unit IV: Global Positioning System

Selection of datum, units and scale; GPS measurement: Collection of GCPs through handheld GPS and Differential GPS; Mobile mapping; Transfer of GPS data in to GIS software.

Books recommended

1. Bernhardsen (2003) *Geographic Information Systems: An Introduction*, 3ed, Wiley India Pvt. Ltd., New Delhi.
2. Demers (2004) *Fundamentals of Geographic Information Systems*, 3ed, Wiley India Pvt. Ltd., New Delhi.
3. Joseph George (2003) *Fundamentals of Remote Sensing*, University Press. Hyderabad
4. Lillesand T.M and Keifer R.W. (2000) *Remote Sensing and Image Interpretation*, IVth Eds. John Wiley and Sons, New York.
5. Lo C.P. & Yeung A.K.W., (2004). *Concepts and Techniques of GIS*, Prentice-Hall of India, New Delhi
6. LO & YEUNG (2009) *Concepts and Techniques of Geographic Information Systems*, 2nd ed., PHI Learning Pvt. Ltd, New Delhi.
7. Laurini, Robert and Direk Thompson, 1992, *Fundamentals of Spatial Information Systems*, Academic Press.
8. N.K.Agarwal (2004), *Essentials of GPS*, Spatial Network Pvt. Ltd.

1. IDENTIFYING INFORMATION

Course title: **Energy and Climate Change**

Course code: **DMM - 201**

2. COURSE CONTENT

Unit-IIntroduction: Climate change: Historical Perspective and overview; Skepticism Myths and reality of climate change, Green House Effect and Global Warming Causes and Consequences of Climate Change; Policies and Politics of Green House: conventions, treaties, negotiation; Energy: History of energy use; energy types; trends of energy use; Impact of energy on environment; observations and projections; Climate change and global issues; energy conservation; energy and climate change. ,

Unit-II Human influence on Climate: Anthropogenic activities affecting Climate: Industries, solid and E-waste; Energy consumption and energy audits; Trends in global carbon emissions; trend in projections for global climate in different time scale.

Unit-III Energy Systems and Emissions: Technological change and energy consumption in industry; Role of energy crisis in climate change; Transition to renewable energy: options, costs and benefits; Emerging and future energy sources. Policy Response.

Unit-IV: Energy and Climate Protection: Energy and Climate Protection: International approaches to cope up climate change: conventions (UNFCCC), Agreements (The Paris Agreement-2005), Protocols (Kyoto protocol etc). Climate change mitigation in developing countries; Public and Private sector role in climate change in India.

Suggested Readings:

1. McElroy, Michael B (2010): Energy: Perspectives, problems and Prospects, New York: Oxford University Press.
2. Elliot David (1997): 'Sustainable technology', Energy Society and environment. New York, Routledge.
3. Naomi Klien (2014): This Changes Everything: Capitalism versus Climate.
4. Edmond Mathez (2009): Climate Change: The Science of Global Warming and Our Energy Future. Columbia University Press.
5. Schmidt et al (2009): Climate Change: picturing the Science. WW Norton and Company.

1. IDENTIFYING INFORMATION

Course title: **Economics of Climate Change**

Course code: **DMM – 202**

UNIT-I

Climate Change: Economics, Ethics and Development Challenges; The Implication of Emission on Climate Change; Climate Treaties and Importance of Enforcement; Climate Change a Critical Analysis.

Unit-II

Climate Change and Economic Development: Effects and Implications on Development; Climate Change and Inequality; The Challenge of Stabilization; Trends in Global Carbon Emission, Trends and Projection for Global Climate; Impact of climate change on Business and Trade; Reversing Emissions from Landuse Changes; Effect of Weather Shocks on Agricultural Prices; Effect of Weather and Climate on Mortality Rates.

Unit-III

The Economics of Climate Change: Economics and Climate Protection; Cost Benefit Analysis; Understanding the Economics of Adaptation in Developed and Developing World; Identifying Cost of Mitigation in Developed and Developing Nations; Carbon Pricing and Emission Markets in Practice; Role of Energy Prices in Global Climate Change; Beyond Carbon Markets and Technology.

Unit-IV

Climate and Development Policy: A State of Change; Financing the Development Response to Climate Change; Carbon Taxes; Emission Trade Permits; Subsidies; Technology transfer; Designing Climate Mitigation Policy; From Negotiation to Implementation: UNFCCC and its Kyoto Protocol.

Suggested Readings:

1. Stern N (2007): The Economics of Climate change. The Stern Review, Cambridge, Cambridge University Press.
2. Nordhaus W. (1977) Economic Growth and Climate: The Case of Carbon Dioxide. The American Economic Review, 67(1), 341-346.
3. Newell RG and Pizer WA (2003): Discounting the Distant Future. How Much do Uncertain Rates Increase Valuation. Journal of environmental economics and Management Vol. 46, pp. 52-71.
4. Frankhauser S, Tol R and Pearce D (1997): The Aggregation of Climate Change Damages: A Welfare Theoretic Approach. Environmental and Resource Economics. Vol.10 pp. 249.66.
5. Helm D and Hepburn C (2009): The Economic and Politics of Climate Change. Published to Oxford Scholarship Online.

1. IDENTIFYING INFORMATION

Course title: **Climate Change and Global Sustainability**

Course code: **DMM – 203**

UNIT-I Climate Change: Observation of Climate Change; Changes in patterns of temperature, precipitation and sea level rise, Observed effects of Climate Changes, Drivers of Climate Change; Climate Sensitivity and Feedbacks; The Montreal Protocol, UNFCCC, IPCC; Evidences of Changes in Climate and Environment: Global Scale and in India.

UNIT-II Climate Change Impacts and Responses: Overview of climate change impacts, Climate change and its impact on: water resources, world food production, marine ecosystem and marine resources; vulnerability of coastal zones. Impact of climate change on Business and Trade.

UNIT-III

Impacts Of Climate Change on: Air (ozone depletion, smog), Landuse changes, Waste generation (treatment, e-waste), Human Health; Industry, Settlement and Society; Projected Impacts for Different Regions; Uncertainties in the Projected Impacts of Climate Change – Risk of Irreversible Changes.

UNIT-IV

Climate Change Adaptation and Mitigation Measures: Adaptation Strategy/Options in various sectors – Water, Agriculture, Infrastructure and Settlement including coastal zones, Human Health, Tourism, Transport – Energy – Key Mitigation Technologies and Practices: Energy Supply, Transport, Buildings, Industry, Agriculture, Forestry, Carbon sequestration, Carbon capture and storage, Waste (MSW and Bio waste, Biomedical, Industrial waste. International and Regional cooperation. Future vision of sustainable society

Suggested Readings:

1. Anil Markandya , Climate Change and Sustainable Development: Prospects for Developing Countries, Routledge, 2002.
2. Heal, G. M., Interpreting Sustainability, in Sustainability: Dynamics and Uncertainty, Kluwer Academic Publ., 1998.
3. Jepma, C.J., and Munasinghe, M., Climate Change Policy – Facts, Issues and Analysis, Cambridge University Press, 1998.
4. Munasinghe, M., Sustainable Energy Development: Issues and Policy in Energy, Environment and Economy: Asian Perspective, Kleindorfer P. R. et. al (ed.), Edward Elgar, 1996.
5. Dash Sushil Kumar, “Climate Change – An Indian Perspective”, Cambridge University Press India Pvt. Ltd, 2007

1. IDENTIFYING INFORMATION

Course title: **Global Climate Modeling**

Course code: **DMM – 204**

UNIT-I

Ocean Circulation and Climate Overview; Driving Mechanism and Components: Upper and Lower Ocean Circulation; thermohaline circulation; Impact of Climate Change on Oceanic Circulation; Oceanic General Circulation model (GECM).

UNIT-II

Climatic Change and Global Climate Modeling an Overview; Need for Global Models; Components of Global Climatic Models (Atmosphere and Hydrosphere); Governing Factors; Methodology for Climate Modeling; Scientific Basis of Prediction and Forecasting of Climate Change; Climate modeling: Global Climate Models, Earth system model Regional Climate model, Ocean Circulation Model, and modeling of monsoon system.

UNIT-III

Global and Regional climate model: use of Coupled Models to simulate the global and regional climate; Statistical and Dynamical downscaling of regional model; Results to a better Spatial Resolution; Global and Regional Climate Scenarios for Impact Modeling Studies; Global and Regional Climate Prediction: Seasonal and Decadal; Model Simulation: Projected Climate Change Scenarios and their Underlying Uncertainties.

UNIT –IV

Modeling of Monsoon System: The Origin of Monsoon; Global and Indian Monsoon System; Dynamic Weather prediction Model; Multiple Linear Regression Model .

Suggested Readings:

1. Schnoor, J.L. (1996): Environmental Modeling. John Wiley & Sons, Inc., New York.
2. Randall DA and Wood RA (NA): Climate models and their evaluation. Chapter-8.
3. Chapra, S.C. (1997). Surface Water-Quality Modeling. McGraw-Hill International Edition.
4. Schnelle, K. B. and Dey, P.R. (1999). Atmospheric Dispersion Modeling Compliance Guide. McGraw-Hill.
5. David N (2011): Climate change and climate modeling, 1st Edition, Cambridge University press.
6. Marilyn AB and Benjamin KS (2011): Climate change and global energy security: technology and policy options.

DMM- 206 Mapping and Analysis of Climatic Data

M.Sc. Disaster Management

Unit -I: Weather instruments and data sources

Use of weather instruments: Thermometer; Barometer; Wind vane; Rain gauge; Data sources: Indian Meteorological Department; AWS, National Remote Sensing Centre; United States Geological Survey; Google Earth.

Unit - II: Data analysis

Interpretation of weather data: Temperature; Humidity; Rainfall; Pressure; Wind speed and direction. Statistical time series analysis: Actual trend; Semi average; Moving average; Linear trend by least square method

Unit-III: Representation of Data

Synoptic charts; Climatic data representation: Iso-lines; Line graphs; Wind roses; Climograph; Rainfall dispersion diagram; Ergograph

Unit IV: Mapping

Indian Weather Map; Mapping from point data: Rainfall; Temperature; Pressure. Mapping and analysis of microwave data

Books recommended

1. Misra, R. P., & Ramesh, A. (1989). *Fundamentals of Cartography*. Concept Publishing Company
2. Armstrong, L. (2015). *Mapping and modeling weather and climate with GIS*. Esri Press.
3. Dobesch, H., Dumolard, P., & Dyras, I. (Eds.). (2013). *Spatial interpolation for climate data: the use of GIS in climatology and meteorology*. John Wiley & Sons.
4. Singh, R. L., & Dutt, P. K. (1951). *Elements of practical geography*. Students' Friends.

DMM- 207 Geospatial modelling in Climate Studies

M.Sc. Disaster Management

Unit -I: Geospatial data for climate study

Weather map; thematic maps of weather elements; IMD data products; Satellite data products: Landsat; MODIS; NOAA, INSAT series

Unit - II: Characteristics and management of data

Spectral characteristics: Atmospheric window of EMR; Availability of spectral bands on satellite data products. Spatial coverage; Revisit time of sensors; Management of non-spatial data: data conversion; attribute handling; preparing thematic layer from non-spatial weather data.

Unit-III: Geospatial models (Any two)

Temperature models: Land surface temperature; Sea surface temperature; air diurnal temperature cycle. Precipitation estimation; Hydro-climatic simulation by precipitation data; Climate variability; Vegetation dynamics; Evaporation measurement; Aerosol optical depth; Model validation through in situ data

Unit IV: Applications (Any two)

Air pollution; Flood; Urban micro climate; Dust storms; Cyclone; Volcanic eruptions; Forest fires

Books recommended

1. Carleton, A. M. (1991). *Satellite remote sensing in climatology*. Belhaven Press.
2. Beniston, M., & Verstraete, M. M. (Eds.). (2001). *Remote sensing and climate modeling: synergies and limitations*. Kluwer Academic Publishers.
3. Vaughan, R. A. (Ed.). (2012). *Remote sensing applications in meteorology and climatology* (Vol. 201). Springer Science & Business Media.
4. D'Almeida, G. A., Koepke, P., & Shettle, E. P. (1991). *Atmospheric aerosols: global climatology and radiative characteristics*. A Deepak Pub.
5. Carrega, P. (Ed.). (2013). *Geographical information and climatology*. John Wiley & Sons.

Suggested sites:

1. <https://mosdac.gov.in/content/Mission/insat-3d>
2. <https://www.ncdc.noaa.gov/data-access/satellite-data>

1. IDENTIFYING INFORMATION

Course title: Disaster Management Cycle, Laws and Policies,

Course code: DMM – 301

Unit-INecessity and Scope of Disaster Management-Concepts, Definitions, Components and Terminologies in Disaster Management; Disaster Management Cycle;Disaster Risk Reduction (DRR), Disaster Management Cycle-Anti Disaster Response (Risk Assessment, Prevention and Mitigation, Early Warning Systems), During Disaster Response (Evacuation, Search and Rescue, Relief) and Post Disaster Response (PDNA, DALA, Reconstruction and Redevelopment)

Unit-II

Disaster Management Act of India, 2005, Focus and Objectives of NDMA Guidelines on Disaster Management Plan, Disaster Management Policy, Principles, Essential components & Significance of disaster management policy, National Policy of India on Disaster Management (NPDM), Scope of Environmental Legislation and policy; National Action Plan on Climate Change, International Strategy for disaster reduction, Hyogo Framework of action, Environmental protection Act 1989, Coastal Disaster, Coastal Zone Regulation Notification, 1991, NDMA 2005

Unit-III

Disaster Risk Management in India: Emergence of Institutional Arrangement in India, Present Structure for Disaster Management in India- NDMA, NEC, SDMA, SEC, DDMA, National Civil Defense College (NCDC), Nagpur, National Fire Service College (NFSC), Nagpur;

Role and Responsibilities of Police, Home Guards, Armed Forces, Panchayat, urban and local bodies in Disaster Management.

Unit-IV

Case Studies:

- National- Disaster Management Policy in India, National Action Plan on Climate Change.
- International- Disaster Management Policy in Indonesia, Sendai Framework for DRR (2015-30),

Suggested Readings:

1. Disaster management in In Carter, W. Nick, 1991: Disaster Management, Asian Development Bank, Manila
2. Natural Hazards by Bryant, E., Cambridge University Press. London, 1985.
3. Landslide Disaster – Assessment and Monitoring Nagarajan, R., Anmol Publications, New Delhi, 2001.
4. Environmental risks and hazards by Cutter, Susan L., Prentice Hall of India, New Delhi. 1999.
5. Bill McJuire, Ian Mason and C. Killburn (2002) Natural hazards and Environmental change, Oxford University Press, New York.

6. Natural disasters, Patrick L. Abbott, McGraw-Hill Higher Education, 2004
7. Gupta, Harsh K. (2003) Disaster Management, Universities Press (India) Pvt. Ltd.
8. Coppola, Damon P. (2006) Introduction to International Disaster Management.
9. Jha, Madan Kumar (2010) Natural and Anthropogenic Disasters: Vulnerability.

1. IDENTIFYING INFORMATION

Course title: Vulnerability and Risk Assessment & Management,

Course code: DMM - 302

2. COURSE CONTENT

UNIT-I

Hazard, Risk and Vulnerability: Concept, Components and Relationship; Vulnerability Assessment. Physiographic and Environmental vulnerability, Socio-economic vulnerability, Gender and age vulnerability, Rural-urban vulnerability, Risk Analysis Techniques, Understanding the current situations-Needs and Gaps; People's Participation in Risk Assessment;

UNIT-II.

Disaster Preparedness: Concept, element and significance, People and Infrastructure centric Preparedness Plan And Measures; Institutional mechanisms; Community based Disaster Preparedness Plan, Utilization of risk analysis for DRR Planning And Strategies, Land use Planning and Development Regulations in relation to Disasters- Concept & Objectives,

UNIT-III

Application of Science & Technology for Disaster Management (GIS, GPS and RS); Institutional Arrangements for Forecasts, India Meteorological Department (IMD); warning protocols; National forecasting and early warning system, Forecast of Rainfall, Flood; Warning of Cyclones; Tsunami warning-(INCOIS); Disaster Management Support (DMS);

UNIT-IV

Role of Developmental Planning for disaster Management (Preventive Measures and Development of Risk Resilient Infrastructures); **Mitigation- Definitions, Elements and Measures** to minimize impact of draught, Floods, Environmental Impacts; Climate Change Adaptation Measures; Trigger Mechanism; Resource Analyses and Mobilization; Crisis Management Plan (CMP) and Standard Operating

Suggested Readings:

1. Disaster Risk Reduction in South Asia, Pardeep Sahni, Madhavi Malalgoda Ariyabandu -2003
2. Community-Based Disaster Risk Reduction, Rajib Shaw - 2012
3. Natural Disaster Risk Management and Financing Disaster ..., Reinhard Mechler – 2004.
Disaster Risk Management Systems Analysis: A Guide Book, Stephan Baas – 2008.
Collins Larry R. and Schneid Thomas D., Disaster Management and Preparedness Taylor and Francis
2000
1. Managing Disaster Risk in Emerging Economies". Arnold, Margaret and Kreimer, Alcira
(eds.)

2. Living With Risk: A global Review Of Disaster Reduction Initiatives 2004 Vision, United Nations, 2004
3. Disaster Management and Preparedness, Collins Larry R. and Schneid Thomas D., Taylor and Francis 2000
4. Sahni, Pardeep et.al. (eds.) 2002, Disaster Mitigation Experiences and Reflections, Prentice Hall of India, New Delhi
5. White, Gilbert F. and J. Eugene Hass, 1975, Assessment of Research on Natural Hazards, Cambridge, the MIT Press, MA.
6. NOAA Coastal Services Center, Linking People Information and Technology, Risk and Vulnerability Assessment Tool , at,<http://www.csc.noaa.gov/rvat/criticalEdd.html>.
7. www.nidmindia.nic.in.
8. Willson , R; and E. A. C.Crouch, 1987, Risk assessment and comparisons: An Introduction, Science 17, 1987, pp 267-270.
9. Petak, W. J. and Atkisson, A, A. Natural Hazard Risk Assessment and Public Policy: Anticipating and Unexpected, Springer; New York. 1982.
10. Disaster management in India; Website of MHA GOI
11. Mapping Vulnerability: "Disasters, Development and People",Gregankoff, Georg Frerks -2013
12. NOAA Coastal Services Center, "Linking People Information and Technology, Risk and Vulnerability Assessment Tool".
13. Measuring Vulnerability to Natural Hazards: towards disaster ..., irkmann - 2 -
14. Disaster Risk and Vulnerability: Mitigation Through ...,David Etkin, ChowdhuryEmdadul Haque – 2012.

1. IDENTIFYING INFORMATION

Course title: **Rescue and Relief**

Course code: **DMM - 303**

2. COURSE CONTENT

UNIT-I

Principles and Practice of disaster response operations and management, Logistic support system, Supply Chain Management; Types of Intermediaries; India Disaster Resource Network, Crisis Management Plan (CMP) and Standard Operating Procedures (SOPs), Cabinet Committee on Management of Natural Calamities; National Crisis Management Committee (NCMC), State Crisis Management Group (SCMG),

UNIT-II

Role of Information, Education, Communication and Training: Essential Components; Warning Dissemination; Role and Responsibilities of Central, State, District and local administration.; Role and Responsibilities of National Disaster Response Force (NDRF), State Disaster Response Force (SDRF), Armed Forces, Police, Para Military Forces.; Role and Responsibilities of International Agencies, NGOs, Community Based Organizations (CBOs). Community as first responder

UNIT-3

Communication, Participation and Activation of Emergency Preparedness Plans, Operational decision making, Introduction to Emergency Management and planning, organization and structure for Emergency Management; Relief Measures - Minimum Standard of Relief and essential components; Principles and Practice of Disaster Relief and Recovery; Floods and Drought Relief Measures; Health and Medical Intervention in Rescue and relief operations, Application of Modern Technologies for the Emergency communication.

UNIT-4

Response, Incident Management Systems and Emergency Operations Center, National Emergency Operation Centre (NEOC), State Control Room, District Control Room, Immediate Needs Assessment, ICS/IRS Disaster Response, Contingency Planning, Community Search, Rescue, Evacuation and other logistic management, Emergency Response Team, Disaster Site Management and Law & order issues, National and International disaster recovery policies, Managing the economy and essential services in emergencies, Managing the media and popular conscience

Suggested Readings:

1. Collins Larry R. and Schneid Thomas D., Disaster Management and Preparedness Taylor and Francis 2000
2. Goel S.L. and Kumar Ram, Disaster Management, Deep and Deep Publications, 2001.
3. Living With Risk: A global Review Of Disaster Reduction Initiatives 2004 Vision, United Nations, 2004.

4. Parasuraman S., India Disasters Report: Towards a Policy Initiatives, Oxford University Press, 2004.
5. Arnold, Margaret and Kreimer, Alcira (eds.), "Managing Disaster Risk in Emerging Economies", Disaster Risk Management Series No. 2, World Bank, Washington, D.C., 2000. Disaster Response and Homeland Security, James F. Miskel – 2008.
6. Disaster response: principles of preparation and coordination, Erik Auf der Heide – 1989.
7. Principles of Incident Response and Disaster Recovery, Michael Whitman, Herbert Mattord, Andrew Green, 2013.
8. Disaster Management in India; MHA, GOI.
9. Crisis Management: Master the Skills to Prevent Disasters, SURESH GOEL – 2009
10. S, N. Charry, Production & Operation Management, TATA McGraw Hill, 2005.

1. IDENTIFYING INFORMATION

Course title: **Post Disaster Response**

Course code: **DMM – 304**

UNIT-I

Concept of Rescue and evacuation; Reconstruction and Rehabilitation as Means of Development; Role of various Agencies in Disaster Management and Development; Tasks of Relief and Rehabilitation, Medium and Long Term Rehabilitation Aspects; Relief mechanism (Needs Assessment, Relief Administration and Distribution, Management of Relief Centers, External Support etc.), Disaster Induced Migration

UNIT-II

Creation of Long-term Job Opportunities and Livelihood Options; Funding Arrangements for Reconstruction; Nature of Damage to Houses and Infrastructure due to Disasters; Damage and Loss Assessment (DALA); Post Disaster Need Assessment (PDNA); Rehabilitation: Physical and social infrastructure, Relocation and reconstruction of housing; Introducing the Concept of Build Back Better in all Reconstruction works; Role of Housing and urban & Regional Development Authorities.

UNIT-III

Dealing with Victims Psychology and Trauma; Medical Aid Therapy and Counseling-Psycho-social issues; Role of Information Dissemination; Capacity Building For Reconstruction And Rehabilitation, Skill Enhancement for Livelihood Development, Training and Awareness Program; Participative Rehabilitation Process: Some Case Studies.

UNIT-IV

Role of Various Agencies in Recovery Measures; Linking Of Relief And Rehabilitation With Development; Project formulations for Recovery and Resource Mobilization; Monitoring and Evaluation of Rehabilitation Work; Constraints in Monitoring and Evaluation; Long-term Recovery; Long-term Counter Disaster Planning; Repair and retrofitting: superficial repair, structural repair, structural strengthening of habitable spaces, public buildings, roads, bridges, dams etc.

Suggested Readings:

1. Disaster Management and Rehabilitation, Rajdeep Dasgupta, 2007
2. Sharma, Vinod K. Disaster management, NCDM, IIPA, New Delhi, 1994.
3. Post-Earthquake Rehabilitation and Reconstruction, F.Y. Cheng, Y.Y. Wang – 1996
4. Mathur, G.C. Housing in Disaster prone areas, National Building Organization and U.N. Regional Centre. ESCAP, New Delhi, 1986.
5. Bryant Edwards (2005): Natural Hazards, Cambridge University Press, U.K.

6. Kasperson, J.X., R.E. Kasperson, and B.L. Turner III (Eds.), 1995, Regions atRisk: Comparisons of Threatened Environments, United Nations University Press, Tokyo.
7. Singh Satendra (2003): Disaster Management in the Hills, Concept Publishing Company, New Delhi.
8. www.nidmindia.nic.in.

1. IDENTIFYING INFORMATION

Course title: Disaster Finance

Course code: DMM – 305

2. COURSE CONTENT

Unit-I

Financing the Relief Expenditure; Funding Relief- short term and long term; National Disaster Mitigation Fund; Recommendation of Finance Commission; National Disaster Response Fund(NDRF); Disaster Response Reserve; Capacity Building Grant; Environmental Relief Fund; Plan & Non-Plan Schemes;

Unit-II

Fiscal Response to Public Finance and Budgetary Guidelines; Insurance Linked Financing; Role of Micro Finance; Role of other Agencies in Financing Disaster Components- NABARD, Nationalized Banks, World Bank, ADB, DFID etc.

Unit-III

National Institute of Disaster Management(NIDM); Disaster Management Centers in the States; Training of the National Disaster Response Force(NDRF); Incident Response System(IRS); National Fire Service College(NFSC), Nagpur; National Fire Service College(NFSC), Nagpur; Capacity Building-Setting up of EOC at State, District and Block level, Training and Capacity Building of all Stakeholders, Mock Drills, Capacity Development of the First Responders; Drills for First Aid and Health Care.

Unit IV

International Agencies: United Nations and its specialized agencies like UNDP, UNISDR; UNOCCHA; FAO; Global Facility for Disaster Risk Reduction (GFDRR); International Federation of Red Cross and Red Crescent Societies (IFRC), GFDRR; WHO; IPCC; Yokohama, Hyogo framework for action, Sendai Framework for DRR (2015-30)

Suggested Readings:

1. Waugh, William L. Jr. (2000). Living with Hazards, Dealing with Disasters: An Introduction to Emergency Management. Armonk, New York: M.E. Sharpe.
2. Disaster Medical Guidelines, Emergency Medical Services Authority, State of California, EMSA no. 214, June 2003
3. Hulme, David and Paul Mosley, "Finance against Poverty", Routledge London, 1996
4. Meyer, Richard L, " Micro Finance, Poverty Alleviation and Improving Food Security: Implications for India in Food Security and Environmental Quality, CRC Press LLC, BOCA Raton, FL. 2002.
5. Disaster Management in India, MHA GOI

DMM- 306 Geo-informatics for Disaster Management

M.Sc. Disaster Management

Unit -I: Data base creation and data preparation Thematic maps: Generation of vector layers; conversion from vector to raster; conversion of non-spatial to spatial data; Data preparation: raster data resampling; reclassification of raster data.

Unit - II: Modelling

Geo-hazards modelling: Earthquake zonation; Flood inundation; landslide susceptibility; forest fire susceptibility; climate change: climate variability; hydro-climatic modelling; glacial retreat

Unit-III: Risk Assessment

Mapping of socio-economic variables: population distribution; land use pattern; communication and transport; overlay analysis: risk assessment; vulnerability analysis

Unit IV: Management Practices

Suitability analysis: Land suitability analysis; habitat suitability analysis; mapping of disaster free sites; network analysis for disaster response; proximity analysis for fire safety and first aid.

Books recommended

Tomaszewski, B. (2014). Geographic information systems (GIS) for disaster management. Routledge.

K. VenuGopal Rao (2010) Geoinformatics For Disaster Management, Manglam Publications

Li, J., & Zlatanova, S. (2007). Geomatics solutions for disaster management, A. G. Fabbri (Ed.). Berlin, Heidelberg, New York: Springer.

Bernhardsen (2003) Geographic Information Systems: An Introduction, 3ed, Wiley India Pvt. Ltd., New Delhi.

Demers (2004) Fundamentals of Geographic Information Systems, 3ed, Wiley India Pvt. Ltd., New Delhi.

Joseph George (2003) Fundamentals of Remote Sensing, University Press. Hyderabad

Lillesand T.M and Keifer R.W. (2000) Remote Sensing and Image Interpretation, IVth Eds. John Wiley and Sons, New York.

Lo C.P. & Yeung A.K.W., (2004). Concepts and Techniques of GIS, Prentice-Hall of India, New Delhi

LO & YEUNG (2009) Concepts and Techniques of Geographic Information Systems, 2nd ed., PHI Learning Pvt. Ltd, New Delhi.

Diploma in Disaster Management (Evening and Self Finance)

G14

JAMIA MILLIA ISLAMIA

(A Central University by an Act of Parliament)

Department of Geography

Maulana Mohammed Ali Jauhar Marg, New Delhi-110025 Tel: 26985176, 26981717 Ext. 3310, 3312 Fax: 91(11) 26980229



Notice for BOS

An emergency BOS is scheduled to be held on 31.03.2015 at 3:00 P.M. in the chamber of undersigned to discuss the following agenda:

“Modalities for Commencement of Diploma in Disaster Management from coming session, 2015-2016”

Kindly make it convenient to attend.

S. Parveen
(Prof. Shahnaz Parveen)

Copy to:

1. The Dean, Faculty of Natural Sciences, J.M.I., New Delhi
2. Prof. Sudesh Nangia, (External Member), J.N.U., New Delhi
3. Prof. Abha Lakshmi Singh (External Member), Geography Department. A.M.U., Aligarh.
4. Prof. Syed Akhtar Hussain (Internal Member), Department of Biosciences. J.M.I., New Delhi.
5. Prof. Amir Azam (Internal Member), Department of Chemistry, J.M.I., New Delhi.

..... Geography department, J.M.I., New Delhi.



AMIA/2015

MINUTES OF MEETING OF STUDES

An emergent meeting of the Students Union was held on 11/04/2015 at 12:00 p.m. in the Department of Geography. The following members were present:

- 1. Prof. Shabir Parveen (Chairman)
- 2. Prof. S.K. Singh (General Member)
- 3. Prof. Shahid Ahmad (Dean)
- 4. Prof. M. Faraz Khan
- 5. Prof. Moina Masood Ali Khan
- 6. Prof. Masood Masood
- 7. Prof. Masood Masood-Siddiqui
- 8. Dr. Akshay Singh
- 9. Dr. Masood Masood
- 10. Dr. Masood Masood
- 11. Dr. Masood Masood
- 12. Dr. Masood Masood
- 13. Dr. Masood Masood
- 14. Ms. Masood Masood



The following agenda was discussed:

The meeting was presided over by Prof. Shabir Parveen, Chairman of the Students Union. The meeting was held in the Department of Geography, Amia Millia Islamia. The meeting was held on 11/04/2015 at 12:00 p.m. The following members were present: Prof. Shabir Parveen (Chairman), Prof. S.K. Singh (General Member), Prof. Shahid Ahmad (Dean), Prof. M. Faraz Khan, Prof. Moina Masood Ali Khan, Prof. Masood Masood, Prof. Masood Masood-Siddiqui, Dr. Akshay Singh, Dr. Masood Masood, Dr. Masood Masood, Dr. Masood Masood, Dr. Masood Masood, Dr. Masood Masood, Ms. Masood Masood.

JAMIA MILLIA ISLAMIA

(A Central University by an Act of Parliament)

Department of Geography

Moulana Mohammed Ali Jauhar Marg, New Delhi-110025 Tel: 26985176, 26981717 Ext. 3310, 3312 Fax: 90(011) 26981029



- the acceptance by Prof. Abha Lakshmi Singh, Department of Geography, AMU, Aligarh as external member to BOS.
2. The tentative course structure of add-on course on "Diploma in Disaster Management" was discussed and finalized. (Annexure-I).
 3. The modalities regarding the commencement of "Diploma in Disaster Management" from the coming session – 2015, was discussed and finalized(Annexure-II).
 4. The syllabii of 6 Theory Papers and 2 Practical papers were discussed and passed. However, the syllabii will be forwarded to Jamia authorities after the expert opinion of the subject expert on or before 9th April, 2015.

The meeting came to an end at 04.15 P.M. with a vote of thanks.

Khazra 31.3.2015

[Signature]
31.3.15

[Signature]
31/03/15

S. Parveen
31.3.15
(Prof. Shahnaz Parveen)

Head

[Signature]
31/3/15

[Signature]
31.03.2015

48

[Signature]
31.3.15

[Signature]
31/3/15

Mary Tahri
31/3/15

[Signature]
31/3/15

Miscue

Diploma in Disaster Management (Evening & Self-Financed)

Semester - I

PAPER - I

INTRODUCTION TO HAZARDS AND DISASTERS

Unit-I

Conceptual Framework

Introduction to the concept of hazard and disaster; associated terminology; concept of frequency-magnitude relationship; recurrence interval; classification of hazard and disaster: natural and anthropogenic.

Unit-II

Major Hazards: Natural

Hazards related to earthquake; volcanic hazards; mass-movement hazard; landslide and related phenomenon; hazards related to flood; hazards related to long term and short term climate change; hazards related to extra terrestrial objects.

Unit-III

Major Hazards: Anthropogenic

Nuclear reactor accidents, industrial accidents, dam breach, pollution, oil slicks and spills, outbreak of disease and epidemics, war and conflicts.

Unit-IV

Environmental Disaster

Natural disaster in the context of demographic background; rural and urban environment; agrarian structure; social conditions and critical facilities; infrastructure and technological development; resources: natural, economic, human and financial; research institutions; cultural environment: tourism.

Diploma in Disaster Management (Evening & Self-Financed)

Semester - I

PAPER - II

Fundamental & Scientific Background to Hazardous Processes

Unit-I

Geologic Hazard Processes

Earthquake: understanding the concept of plate tectonics, plate boundaries, seismicity and tsunami; locating earthquake, magnitude, intensity, liquefaction; volcanic processes and climate change; landslide processes; mass movement: gravity induced mass movement, falls, slides, flows, submarine mass movements, subsidence.

Unit-II

Atmospheric and hydro-geologic hazards processes

Flood: geomorphology of channels and flood plains, hydrographs, flood frequency curves, geology and flooding of large river system- The Indus, Ganges, Brahmaputra, Yamuna; Cyclones: origin, monitoring, warnings, associated hazards; tsunami vs. waves related atmospheric processes.

Unit-III

Climate Change processes

Scientific bases of climate change; review of latest findings of IPCC; green house effect; green house gases; El-Nino; la-Nina; sea level changes, glacial advances & retreat, international protocol; severe weather processes related to drought; rainfall, heat waves, cold waves, thunderstorms, flash flooding, lightening.

Unit-IV

Tools for Analyzing Hazard processes

Concept of cartography, maps, scales, shift of map-making from traditional to digital; sources of information; data collection, location and analyses tools: remote sensing, GPS & GIS; digital cartography, basic statistics, data processing, computation & tabulation.

Diploma in Disaster Management (Evening & Self-Financed)

Semester - I

PAPER - III

Disasters: Natural & Anthropogenic (case study with reference to South Asia)

Unit-I

Geography of South Asia

Major landforms of South Asia associated with igneous, sedimentary & metamorphic rocks; quaternary (surficial) deposits; drainage; coastal environment; major climatic regions; classification of landforms; natural landscape including Himalaya, alluvial plains, ravines, cold and hot desert; drainage development; inland lakes; the Rann of Kutch; The Sunderbans; The Deccan plateau; the Ghats; the Lonar lakes.

Unit-II

Geologic Disaster

Earthquake disaster (Gujarat/Assam/2004 Tsunami); Bhuj earthquake 2001; Kashmir Earthquake 2005;; Bhagalpur earthquake Bihar; 2015 Nepal earthquake; Indonesia earthquake 2006; Sikkim earthquake; tsunami in Japan; Indian tsunami 2004; Indonesia tsunami 2004; Sri Lanka tsunami 2004; Mount Pinatoubo Philippines 1991; 2013 Utrakhand landslide and mud-flow; 2014 Malin landslide; Indonesia volcanic eruption 2010 ; impact craters in India;

Unit-III

Atmospheric & Hydro-geologic Disaster

Cyclone Disaster (Phalin/Hudhud/Niloufar/Bangladesh/Odisha); Cyclone Nargis Myanmar 2008; Cyclone Sidr Bangladesh 2007; heavy rainfall in Mumbai 2006; Hurricane Gustavo Haiti; Hurricane Jeanne Haiti 2004; Aceh floods 2006; Floods Sri Lanka 2010; Flood in Kosi river 2008; cloud burst in Leh 2010; flash flood in Utrakhand 2013; Kashmir flood 2014; Bengal Famine.

Unit-IV

Anthropogenic Disasters

Nuclear bomb explosion in Japan 1942; Minamata disaster Japan 1950s; London's Killer Fog 1952; Koyna earthquake Maharashtra India 1967; Dioxin Pollution Meda, Italy 1976; Bhopal gas leak 1984; Chernobyl nuclear disaster Ukraine 1986; Kuwait Oil Fires 1991; Gaisal tragedy West Bengal 1999; Anthrax biological disaster USA 2001; The Al-Mishraq Fire 2003.

Jamia Millia Islamia
Department of Geography
Diploma in Disaster Management (Self Financed & Evening)
Paper - IV
Specific Hazard and Disaster Assessment
Code - DISM - 201

Unit - I

Introduction to specific Hazard and Disaster Assessment - I

Introduction to hazard maps; why hazard maps, types of hazard maps, uses and limitations of hazard maps. Sources of information on natural hazards; data and maps that may be used in assessment of natural hazards and risk reduction. Assessment of hazards related to flooding processes and preparation of hazard maps. Assessment of hazardous processes related to cyclones and preparation of hazard maps.

Unit - II

Introduction to specific Hazard and Disaster Assessment - II

Assessment of hazards related to earthquakes and preparation of hazard maps; risk reduction; case study. Assessment of hazards related to volcanic activity and preparation of hazard maps; risk reduction case study. Assessment of hazards related to landslides processes and preparation of hazard/susceptibility maps; risk reduction; case study of June 2013 Uttarakhand disaster.

Unit - III

Multiple Hazard Mapping Critical Facilities Mapping

Multiple hazard mapping: Concept of multiple hazard mapping; procedure for multiple hazard mapping; advantages and limitations; risk reduction; case study. Critical facilities mapping: Concept of critical facilities mapping; critical facilities and their characteristics; preparation of critical facilities map; critical facilities and multiple hazard maps.

Unit - IV

Disaster Assessment, Environmental Impact Assessment

Application and use of geospatial technologies, remote sensing, in hazards and disaster assessment related to flooding, cyclones, landslides, earthquakes, volcanic activity; use of GIS in natural hazard assessment and integrated development planning; guidelines for preparing a GIS; use of GIS in disaster assessment and risk reduction. Geologic and geomorphic environmental impact assessment. Sources of information on natural hazards; data and maps that may be used in

natural hazard assessment and risk reduction. Case studies of Disaster assessment related to earthquakes, cyclones, flooding, landslides, volcanic activity

Reading resources:

OAS Primer on Natural Hazard Management and Integrated Development Planning

Source book on the integration of natural hazard assessment in the environmental impact assessment process: <http://www.caribank.org/uploads/2012/03/Source-Book5.pdf>

NIDM Publications: <http://nidm.gov.in/books.asp>

Uttarakhand Disaster, NIDM, Parts I to III: <http://nidm.gov.in/PDF/pubs/ukd-p1.pdf>

<http://nidm.gov.in/PDF/pubs/ukd-p2.pdf>

<http://nidm.gov.in/PDF/pubs/ukd-p3.pdf>

Jamia Millia Islamia
Department of Geography
Diploma in Disaster Management (Self Financed & Evening)
Paper - V
Disaster Risk Reduction
Code - DISM - 202

Unit - I

Concept of Disaster Risk Reduction

Disaster; risk and disaster risk; Elements at risks; Hazards, Exposure; Vulnerability; Capacity; Coping capacity; Resilience; Disaster Risk Reduction; Disaster Risk Management; Analysis tools.

Unit - II

Disaster Risk Identification

Potential Risks; Natural and manmade risks; Vulnerability to threats; Underlying causes of vulnerability; Physical, social and economic vulnerability; Hazard data collections and mapping.

Unit - III

Disaster Risk Assessment

Hazards assessment: nature, location, intensity and likelihood of major hazards; Risk assessment; Exposure and vulnerability assessment; inventory and evaluation of existing risk assessment; effective risk reduction options.

Unit - IV

Prevention and Preparedness

Early warning systems; public awareness; education and training; role of media, Government and non government organizations; community participation; emergency plans; role of remote sensing, GIS and GPS in prevention and preparedness of disaster risk reduction.

Jamia Millia Islamia
Department of Geography
Diploma in Disaster Management (Self Financed & Evening)

Paper - VI

Disaster Management and Planning

Code - DISM - 203

UNIT - I

Introduction to Disaster Management

Pre-disaster Management; Post-disaster Management: Response, Rescue, Relief, Rehabilitation, Reconstruction and Recovery; Importance of Disaster Management.

UNIT - II

Post - Disaster Management

A. Response, Rescue and Relief:

Introduction to Disaster Response, Response to hazards/disasters related to earthquakes, cyclones, droughts, floods, landslides and man induced disasters; Human Behaviour and Response: Psychological Response, Medical Trauma and Stress Management, Rumour and Panic Management; Rescue and Relief: Search, Evacuation and other logistic management, Minimum standards of relief, managing relief, funding relief.

B. Rehabilitation, Reconstruction and Recovery:

Reconstruction and Rehabilitation as means of development, Damage assessment, Funding arrangements for Reconstructions and livelihood options; Recovery measures: Sanitation and hygiene, Education and awareness, Long-term Recovery.

UNIT - III

Role of Agencies in Disaster Management

International Laws and standards; Role of international and national agencies in Disaster Management; NGOs; Types of News Media in Disaster Management.

UNIT - IV

Planning and Policies for Disaster Management

Integrated Developmental Planning for Disaster Management; Long-term Disaster Counter Planning; Disaster Management in SAARC; NDMS; National Disaster Management Policy of India, NIDM, NDRF.

List of Recommended Books:

1. **C.K. Rajan, Navale Pandharinath (YEAR): *Earth and Atmospheric Disaster Management: Nature and Manmade*, B.S. Publication.**
2. **Jagbir Singh (YEAR): *Disaster Management: Future Challenges and Opportunities*, K.W. Publishers Pvt. Ltd.**
3. **J.P. Singhal (YEAR): *Disaster Management*, Laxmi Publications.**
4. **Mrinalini Pandey (YEAR): *Disaster Management*, Wiley India Pvt. Ltd.**
5. **Shailesh Shukla, Shamna Hussain (YEAR): *Biodiversity, Environment and Disaster Management*, Unique Publications.**
6. **Tushar Bhattacharya (YEAR): *Disaster Science and Management*, McGraw Hill Education (India) Pvt. Ltd.**

