ALAGAPPA UNIVERSITY

ALAGAPPA UNIVERSITY, KARAIKUDI – 630 003

(A State University Established in 1985)

Karaikudi - 630003, Tamil Nadu, India

2017 Accredited with A+ Grade by NAAC (CGPA : 3.64)

2018 MHRD Govt. of India, UGC University Grants Commission — Graded as Category - 1 & Granted Autonomy

2018 MHRD Government of India — Swachh Campus Rank : 4

2019 nirf National Institutional Ranking Framework — Rank : 28

2019 QS — India Rank : 20, BRICS Rank : 104, Asia Rank : 216

DEPARTMENT OF DISASTER MANAGEMENT

M.B.A., DISASTER MANAGEMENT

[Choice Based Credit System (CBCS)]

[For the candidates admitted from the academic year 2019-2020]

Regulations for M.B.A., Disaster Management Regular Programme

Programme general objectives: Disaster Management is an emerging field of study aiming to enhance knowledge, capacities, skills and perspectives on disasters. With cutting-edge teaching methods, the course provides theoretical and practical perspectives on disaster mitigation, response and recovery. In the context of climate change, there is a high demand for qualified personnel to be involved in disaster risk reduction and disaster recovery process. While enabling an interdisciplinary understanding of disasters, the course ultimately helps the students to find opportunities in disaster management sectors, government and non-government organisations, policy making bodies, research institutes, academic institutions, consultancy firms and development organisations, etc.

Programme specific objectives: The major objective of the designed programme is to train and provide necessary skills and understanding on various aspects of disaster management. The specific objectives of this programme are:

1. To provide in-depth understanding on the basic concepts and theories in various aspects of disaster management;
2. To provide exposure to the national and international institutional and governance frameworks relating to disaster risk reduction and management;
3. To familiarize approaches to risk and vulnerability analysis, and damage loss and needs assessments to the students;
4. To facilitate the students to understand various sources of disaster finance and institutions in the larger development context;
5. To prepare the students to become trained personnel to find place in national and international disaster risk reduction and management organizations, positions at government and non-government organizations, consultancy firms and other leading academic, research and training institutions.

Programme outcome

On successful completion of the programme

1. Students will be enriched with insights on the dimensions of disasters caused by nature and hazards induced by human activities.
2. Students will learn the link between disaster mitigation and development planning.
3. Students will understand the intricate link between climate change impacts and adaptation processes in different sectors such as agriculture, water and coastal areas.
4. Students will be enriched with practical application of remote sensing and GIS techniques in disaster management.
5. The students will be able to acquire significant knowledge to face various competitive examinations.

Duration of the course: This is a two-year full-time programme offered in four semesters under CBCS.

Eligibility: Applicants who have passed any undergraduate degree are eligible for admission to the M.B.A., Disaster Management Programme. Both male and female students not exceeding 50 in number will be admitted to this programme. Those who are waiting for the results of final semester examination can also apply for this programme. The students will be

selected based on their marks scored in the UG programme/entrance examination, group discussion and personal interview.

Conditions for Qualifying the Programme:

Theory Papers: A candidate who does not pass the examination relating to any theory papers in each of the semesters shall be permitted to appear in such failed paper or papers in the ensuing supplementary examination as held by the University.

Practical/fieldwork/internship: Students are required to participate in practical, fieldwork and internship relating to disaster management. They are expected to submit a report at the end of each activity. Practical, fieldwork and internship shall be internally evaluated by the faculty of the department who has guided the student. The evaluation shall be based on the performance of the student in fieldwork, practical and internship which will have a total of 100 marks for each activity.

Project Report: Project report shall be evaluated internally by the faculty of the department who has guided the student and by an external examiner as well. The internal (25 marks) and external examiner (75 marks) shall evaluate the research project/thesis which will have a total of 100 marks. Each candidate shall be required to appear for viva-voce examination in defending the project. A candidate who fails in the project shall not be eligible for M.B.A., Disaster Management degree till he/she repeats the project under supervision and secures pass marks.

Passing Minimum: A candidate shall be declared to have passed the examination, if he/she obtains not less than 50% of the marks in each paper, including project/thesis. Candidates who do not obtain the required minimum marks for a pass in any papers and project/thesis shall be required to reappear and pass the same at the subsequent appearance.

Classification of Successful Candidates: Candidates who secure not less than 60% of the aggregate marks in the whole examination shall be declared to have passed the examination in the first class. Candidates who secure not less than 50% of the aggregate marks in the whole examination but below 60% shall be declared to have passed the examination in the second class. Candidates who obtain 75% of the marks in the aggregate shall be deemed to have passed the examination in first class with distinction, provided they pass all the examinations prescribed for the course at the first appearance.

Ranking: Candidates who pass all the examinations prescribed for the course in the first appearance only are eligible for ranking.

General: In all other matters that are not specified here, the regulations of the University will be followed.

M.B.A., (Disaster Management) – Regular Programme
(Course structure and scheme of examination from the academic year 2019-20 onwards)

S. N	Code	Name of the course	Credit	Hours/ Week	Marks		
		SEMESTER I			IA	EA	Total
1	646 101	Basics of Disaster Management	4	4	25	75	100
2	646 102	Disaster Risk Governance	5	5	25	75	100
3	646 103	Managerial Economics	5	5	25	75	100
4	646 104	Management Concepts	4	4	25	75	100
5	646 501	Ecosystems and Habitat (Elective)	4	4	25	75	100
		Library/Seminar/Spoken English	-	8	-	-	-
		Total	**22**	**30**	**-**	**-**	**500**
		SEMESTER II					
6	646 201	Research Methodology	5	5	25	75	100
7	646 202	Environmental Economics and Management	5	5	25	75	100
8	646 203	Principles of Remote Sensing and GIS	5	5	25	75	100
9	646 204	Fieldwork and Practical – I	3	6	25	75	100
10	646 502	Statistical Methods (E)	4	4	25	75	100
11	646 701	Non-Major Elective - I	2	3	25	75	100
		Introduction to Disaster Management	This paper will be offered to students belonging to other Departments as Non-Major Elective- I.				
	SLC-I*	MOOCs	Extra Credit				
		Library/Yoga/Spoken English/Career Guidance/Seminar	-	2	-	-	-
		Total	**24**	**30**	**-**	**-**	**600**
		SEMESTER III					
12	646 301	Disaster Mitigation	5	5	25	75	100
13	646 302	Geoinformatics in Disaster Mitigation	5	5	25	75	100
14	646 303	Internship	4	4	25	75	100
15	646 304	Fieldwork and Practical - II	3	6	25	75	100
16	646 503	Economics of Disaster and Financing(E)	4	4	25	75	100
17	646 702	Non-Major Elective - II	2	3	25	75	100
		Climate Change and Society	This paper will be offered to students belonging to other Departments as Non-Major Elective- II.				
	SLC-II*	MOOCs	Extra Credit				
		Library/Seminar/Competitive Examination Coaching	-	3	-	-	-
		Total	**23**	**30**	**-**	**-**	**600**
		SEMESTER IV					
18	646 401	Climate Change and Disaster Management	5	5	25	75	100
19	646 402	Disaster Response	5	5	25	75	100
20	646 403	Disaster Recovery	5	5	25	75	100
21	646 999	Project Report and Viva-Voce	6	10	25	75	100

		Library/Yoga/Career Guidance/Seminar	-	5	-	-	-
		Total	**21**	**30**	**-**	**-**	**400**
		Grand Total	**90 + Extra Credit**	**120**	**-**	**-**	**2100**
*Credits earned through Self Leaning Courses (MOOCs) shall be transferred in the credit plan of the programme as extra credits.							

List of Elective Courses

S. No.	Code	Name of the course	Credit	Hours /Week	Marks		
					IA	E	Total
1	646 501	Ecosystems and Habitat	4	4	25	75	100
2	646 502	Statistical Methods	4	4	25	75	100
3	646 503	Economics of Disaster and Financing	4	4	25	75	100
4	646 504	Public Health and Mental Health in Disasters	4	4	25	75	100
5	646 505	Supply Chain Management and Disaster Logistics	4	4	25	75	100
6	646 506	Conflicts, Peace and Development	4	4	25	75	100

Semester – I			
Course code: 646 101	**BASICS OF DISASTER MANAGEMENT**	**Credits: 4**	**Hours: 4**
Objectives	➢ To familiarize the students with the concepts, terminologies and developments in the field of disaster management and to inform them about the prospects of a disaster manager.		
Unit-I	Introduction: Concepts and definitions- Disaster, Hazard, Vulnerability, Resilience and Risks. Disaster management: Meaning, Nature, Importance, Dimensions & Scope- Disaster Management Cycle.		
Unit-II	Natural disasters: Natural Disasters- Meaning and nature of natural disasters, their types and effects. Hydrological Disasters - Floods, Droughts, Cloud bursts. Geological Disasters- Earthquakes, Tsunamis, Landslides, Volcanic eruptions. Wind related- Cyclones, Storms, Storm surges, Tidal waves, Heat and cold Waves. Climate change- Global warming- Sea level rise- Ozone Depletion. Case studies: Floods- Chennai floods 2015, Kerala floods 2018. Cyclones – Odisha 1999, Gaja 2018. Famines and drought- Great Bengal famine in the year of 1876-1878 and 1943, Maharashtra drought 2013.Earthquake- Nepal 2015, Gujarat, Bhuj 2001. Tsunami- Indian Ocean Tsunami2004.		
Unit-III	Man-made disasters: CBRN – Chemical disasters, biological disasters, radiological disasters, nuclear disasters. Fire – building fire, coal fire, forest fire, Oil fire. Pollution - air pollution, water pollution. Deforestation, Industrial waste, Desertification, Mine and Quarries. Soil erosion, groundwater depletion, saltwater intrusion, biodiversity loss and biological warfare. Case studies: Kumbakonam School fire 2004, The Bhopal Gas Tragedy 1984, Fukushima Daiichi nuclear disaster, Japan 2011. Biological disasters – Swine flu 2009.War- Atomic bombings of Hiroshima and Nagasaki1945.		
Unit-IV	Disaster risk and vulnerability- vulnerability as a cause and consequence of disasters, components of vulnerability, vulnerability poverty and development, links to development perspectives: Sen's work on famine and entitlements.		
Unit-V	Disaster Risk and vulnerability assessment approaches: approaches and methods to measuring disaster risk and vulnerability- qualitative and quantitative methods. Indicators of disaster risk and vulnerability.		

References and text books

Alexander, D., & Alexander, D. E. (2000). *Confronting catastrophe: new perspectives on natural disasters*. USA: Oxford University Press.

Andharia, J. (2013). Vulnerability and disasters: Conceptual contours of a people-centred view. In: S. Parasuraman & Unni Krishnan (ed.) *India Disaster Report II: Redefining Disasters.* Delhi: Oxford University Press.

Blaikie, P., Cannon, T., Davis, I., & Wisner, B. (2014). *At risk: natural hazards, people's vulnerability and disasters*. Routledge.

Edward A. Keller and Robert. H. Blodgett. (2008). *Natural* Hazards. Pearson Prentice Hall. USA.

Goel. S.L. (2007). *Disaster Administration and Management,* New Delhi: Deep & Deep publication,

<table>
<tr><td colspan="2">Gupta Anil K, Sreeja S. Nair. (2011). Environmental Knowledge for Disaster Risk Management, New Delhi: National Institute of Disaster Management.
Parasuraman, S. & Unnikrishnan, (2013). India Disaster Report II: Redefining Disasters. Delhi: Oxford University Press
Sen, A.K. (1983). Poverty and Famines: An Essay on Entitlement and Deprivation, New Delhi: Oxford University Press.</td></tr>
<tr><td>Outcomes</td><td>➢ Students will be enriched with insights on the dimensions of disasters caused by nature and hazards induced by human activities.</td></tr>
</table>

Semester – I			
Course code: 646 102	**DISASTER RISK GOVERNANCE**	**Credits: 5**	**Hours: 5**
Objectives	➢ To enable the students to understand the existing national and international institutions, principles and policies related to disaster risk reduction and management.		
Unit-I	Understanding Institutions and governance- Theories and Concepts of Governance- Defining disaster governance- Application of the concept of governance to disaster and risk. Factors affecting disaster governance.		
Unit-II	Disaster governance institutions and networks at multiple scales (international, national and reginal and local scales): United Nations International Strategy for Disaster Reduction (UNISDR), Hyogo Framework for Action (HFA) 2005, Sendai Framework 2015. Disaster Management Framework.		
Unit-III	Policy and institutional arrangements for disaster management in India– Disaster Management Act 2005; National Policy on Disaster Management 2009; Disaster Management Authority responsibilities of government. Important statutes with provisions relevant to Disaster Management.		
Unit-IV	Role of NGO coordination and community processes in disaster management. Governance challenges in the context of disasters.		
Unit-V	Policy and institutional arrangements for disaster management in Tamil Nadu- disaster management authority at state, district and local level.		

References and text books

Alemanno, A. (Ed.). (2011). *Governing disasters: the challenges of emergency risk regulation*. Edward Elgar Publishing.

Chakrabarty, B., & Bhattacharya, M. (Eds.). (2008). *The governance discourse: a reader*, USA: Oxford University Press.

Chatterjee, P. (2004). *The politics of the governed: reflections on popular politics in most of the world*. Columbia University Press.

Government of India. (2005). *Disaster Management Act 2005,* Government of India, New Delhi.

Government of India. (2009). *National Disaster Management Policy*, Government of India, New Delhi.

Kundu, A., & Dubey, M. (Eds.). (2006). *India, Social Development Report*, USA: Oxford University Press,

North, D. (1990). *Institutions, institutional change and economic performance,* New York: Cambridge University Press.

Ostrom, E. (2010). *A Polycentric Approach for Coping with Climate Change. Background Paper to the 2010 World Development Report* (Policy Research Working Paper 5095.

Ostrom, E. (2005). *Understanding institutional diversity,* New Jersey: Princeton University press. 393-432.

Renn, O. (2008). *Risk governance: coping with uncertainty in a complex world*. Earthscan.

Renn, O., & Walker, K. (2008). Global risk governance. *Concept and practice using the IRGC framework. Dordrecht*.

Walker, G., Whittle, R., Medd, W., & Watson, N. (2010). Risk governance and natural hazards. *CapHaz-Net WP2 Report, Lancaster Environment Centre, Lancaster University: Lancaster (available at: http://caphaz-net. org/outcomes-results/CapHaz-Net_WP2_Risk-Governance. pdf, consulted on)*.

Outcomes	➢ Students will be able to learn the interrelationship between governance and disaster risk reduction and the role of governance institutions at multiple scales in mitigating disaster risk.

Semester – I			
Course code: 646 103	**MANAGERIAL ECONOMICS**	**Credits: 5**	**Hours: 5**
Objectives	➢ This course aims to provide an understanding of the way economic decision-making takes place at micro and macro level of the economy and the country.		
Unit-I	**Introduction**: Definition of Managerial Economics. Theory of Consumer Behaviour: Utility Theory: Total Utility and Marginal Utility- Ordinal Approach: Indifference Curve (Income and Substitution Effects, Slutsky Theory and Compensated Demand Curve)- Revealed Preference - Theory of Demand (Hicks).		
Unit-II	**National Income**: National Income and National Product– Methods: Income, Expenditure and Product- Concepts of National Income – Measurement of National Income: Current Price and Constant Price– Difficulties in the Measurement of National Income– National Income and Measure of Welfare.		
Unit-III	**Public Revenue and expenditure:** India's Public Revenue – Taxes of Union, State and Local Governments – Trends in Tax Revenue – Tax-GDP ratio- Tax and Distributive Justice – Direct Versus Indirect Taxes-GST in Union and State Taxes. Public Expenditur**e:** India's Public Expenditure – Trend in Union, State and Local Government's Public Expenditure – Public Expenditure/GDP – Change in the Composition of Public Expenditure: Developmental Versus Non-Developmental, Plan Versus Non Plan, Revenue Versus Capital.		
Unit-IV	**Basics of Budgeting:** Constitutional Basis for Budgeting – Process of Passing Finance and Appropriation Bills in the Parliament/Assembly – CAG and PAC – FRBM – Deficit- Public Debt and Monetary Management.		
Unit-V	**Centre-State Financial Relations:** Role of Finance Commission in Filling Vertical and Horizontal Fiscal Imbalance – Plan Transfers and Discretionary Transfers – Latest Finance Commission Report of the Union and State Governments.		

References and text books

Ahuja H.L. (2003). *Advanced Economic Theory: Microeconomic Analysis*, (13th ed.). New Delhi: S.Chand and Co. Ltd.

Baumol W.J. (1982). *Economic Theory and Operations Analysis*, New Delhi: Prentice Hall of India.

Chaturvedi, Gupta & Pal. (2002). *Business Economics: Text and Cases*, New Delhi: Galgotia Publishing Company.

Damodaran, S. (2011). *Managerial Economics*, (2nd ed.). London: Oxford University Press.

Hillman, A. L. (2003). *Public Finance and Public Policy*. London: Cambridge University Press.

Jha, R. (1998). *Modern Public Economics*. Routledge. London.

Koutsoyiannis, A. (1979). *Modern Microeconomics*, (2nd ed.), London: Macmillan Press.

Outcomes	➢ Students will be able to critically analyse and explain micro economic decision making at individual and firm level as well as economic management at macro and country level.

Semester – I			
Course code: 646 104	**MANAGEMENT CONCEPTS**	**Credits: 4**	**Hours: 4**
Objectives	➢ To help the students learn and explore the basic concepts and principles of Management.		
Unit-I	Introduction: Nature of Management – The Evolution of Management Thought – Tasks of a Professional Manager – Manager and Environment – Systems Approach to Management – Levels in Management.		
Unit-II	Planning & Decision Making: Steps in Planning Process – Scope and Limitations – Short-Term and Long- Term Planning – Flexibility in Planning – Characteristics of a Sound Plan – Management by Objectives (MBO). Decision Making Process and Techniques.		
Unit-III	Nature of Organizing: Organisation Structure and Design - Authority Relationships – Delegation of Authority and Decentralisation – Impact of Technology on Organisational design – Mechanistic vs. Adoptive Structures – Formal and Informal Organisation. Span of control – Pros and Cons of Narrow and Wide Spans of Control – Optimum Span.		
Unit-IV	Control: Concept of Control – Application of the Process of Control at Different Levels of Management (top, middle and first line). Performance Standards – Measurements of Performance – Remedial Action - An Integrated Control system in an Organisation – Management by Exception (MBE).		
Unit-V	Business Ethics: Importance of Business Ethics – Corporate Social Responsibility - Ethical Issues and Dilemmas in Business - Ethical Decision Making and Ethical Leadership – Ethics Audit – Environmental Ethics –Sustainable Business Practices.		

References and text books

Certo, S. C. & Certo, T. (2011). *Modern Management*, (12th ed.), USA: Prentice Hall.

DeGeorge, R. (2011). *Business Ethics*, (7th ed.), Pearson.

Govindarajan, M., & Natarajan S. (2009). *Principles of Management*, PHI Learning Pvt. Ltd.,

Griffin, R. W. (2012). *Management*, (11th ed.), South-Western College Publication.

Koontz, H. & Weihrich, H. (2009). *Essentials of Management: An International Perspective*, (8th ed.), Tata McGraw Hill Education Private Ltd.,

Mukherjee, K. (2009). *Principles of Management*, (2nd ed.), Tata McGraw Hill Education Pvt. Ltd.,

Robbins, S & Coulter. (2011). *Management*, Prentice Hall, USA.

Schmerhorn, J.R. (2012). *Management*, (11th ed.), Wiley. USA.

Schmidtz, D. & Willott, E. (2011). *Environmental Ethics*, London: Oxford University Press.

Outcomes	➢ Students will be able to understand the basic concepts and principles of management and apply them in the context of disaster mitigation and management.

Semester – I			
Course code: 646 501	**ECOSYSTEMS AND HABITAT (Elective)**	**Credits: 4**	**Hours: 4**
Objectives	➢ To facilitate students familiar with evolution and changes of different types of ecosystems and habitats		
Unit-I	Introduction to ecosystems and habitats- definition, classification, similarities and differences. Introduction to Ecology - cycling of materials; water, carbon, nitrogen and phosphorus. Trophic pyramids and food webs; Alterations of ecosystem function: acid rain, nuclear winter, global warming and ozone hole, origin of life on earth; changes in earth's atmosphere.		
Unit-II	Aquatic ecosystem and habitats: Introduction to – hydrosphere – hydro-cycle- aquatic systems- subdivisions – Freshwater (rivers and lakes) – Wetlands - Estuarine and marine ecosystems.		
Unit-III	Terrestrial Ecosystems: Tropical forest types- Rain forests and monsoon forests semi-evergreen, deciduous forests, tropical dry evergreen forests and mangroves. Animal life: Richness, diversity and carrying capacity. Niches in the forests and their utilization by animals.		
Unit-IV	Nature conservation in India: Legal measures- Brief history of forest conservation in India; Forest Rights Act 2006, Wildlife Protection Act 1972, Environmental Protection Act 1986, Convention on International Trade in Endangered Species (CITES); Conservation vs. development: Costal Regulation Zone Notification (CRZ) 1991 and subsequent amendments, CRZ Notification 2011 and CRZ Notification 2019.		
Unit-V	Conservation vs. livelihood: Sea Turtle Conservation in Odisha-Gahirmatha Marine Wildlife Santuary, Gulf of Mannar Marine National Park and Biosphere Reserve in Tamil Nadu, Mudumalai National Park and Wildlife Sanctuary.		

References and text books

Chapman, J.L & M.J. Reiss. (1998). *Ecology: Principles and Applications*. Cambridge University Press. UK.

Krebs, C.J. (2008). Ecology: *The Experimental Analysis of Distribution and Abundance*, Benjamin Cummings Publications.

Miller. G.T. (2004). *Environmental Science.* Thomson, California. USA.

Mills, D.H. (1972). *An Introduction to Freshwater Ecology,* Edinburg: Liver & Boyd.

Russell K. Monson, (2014). *Ecology and the Environment*. New York: Springer Dordrecht, Heidelberg.

Singh, J.S., Singh, S.P and S. R. Gupta. (2006). *Ecology, Environment and Resource Conservation.* New Delhi: Anamaya Publications.

Verma & Agarwal. (1995). *Environmental Biology* (*Principles of Ecology*), New Delhi: Chand & co.,

Outcomes	➢ Students will be able to learn varied types of ecosystems and the interrelationship between ecosystems and habitats.

Semester - II			
Course code: 646 201	**RESEARCH METHODOLOGY**	**Credits: 5**	**Hours: 5**

Objectives	➢ To impart knowledge in various kinds of research, the process and techniques involved in carrying out research and writing research report.
Unit-I	**Scientific Research Method:** Definition – Purpose and Principles of Scientific Method, Steps in Scientific Research – Ethical issues in research– Types of Research: Applied and Action Research, Qualitative and Quantitative Research, Development Policy and Participatory Research - Theory and Facts.
Unit-II	**Process of Research:** Identification and Formulation of Research Problem – Criteria in Selection of Topic- Literature Review: Types of review— Objectives and Hypothesis – Role and Functions – Independent and Dependent Variables - Concepts and Model Building.
Unit-III	**Methods of Research:** Research Design and its Components – Exploratory, Descriptive and Experimental Methods of Research – Social Survey Method – Case Study Method - Cross Sectional and Longitudinal Research - Historical Method.
Unit-IV	**Tools of Data Collection and Analysis: Types of Data:** Quantitative and Qualitative–Primary and Secondary Data Sources – National Sample Survey and Census – Internet Sources - Methods of Data Collection : Interview Method, Focus Group Discussion, Participatory Rural Appraisal, Participant Observation – Designing Schedule and Questionnaire – Rating Scale – Pre-Test and Pilot Study – Validity and Reliability Scales – Master Tabulation – Analytical Table Data Cleaning, Trimming.
Unit-V	**Report Writing:** Format of Research Report – Types of Reports - Analysis and Interpretation of Data – Inference - Footnotes and Endnotes – Citations – References and Bibliography – Glossary – Proof Checking; Checking of Plagiarism – Ethics of research- Summary Preparation - Finalisation of Research Report.

Reference and Textbooks

Bhandarkar, P.L. & Wilkinson, T.S. (2010). *Methods and Techniques of Social Research.* Mumbai: Himalaya Publishing House.

Ghosh, B.N. (2007). *Scientific Method and Social Research*, New Delhi: Sterling Publishers.

Gupta, S.P. (2012). *Statistical Methods*, New Delhi: S. Chands & Sons.

Kent, R. (2001). *Data Construction and Data Analysis for Survey Research*. MacMillan. London.

Kishnaswamy, O.R. and Ranganatham, M. (2011). *Methodology of Research in Social Sciences*. Mumbai: Himalaya Publishing House.

Kothari, C.R. (2013). *Research Methodology: Methods and Techniques*, New Delhi: New Age International Publishers.

Kumar, R. (2014), *Research Methodology: A Step-by-Step Guide for Beginners***.** New Delhi: Sage Publishers,

Yin K. Robert. (2014). Case Study Research Design and Methods (5th ed.), Thousand Oaks, CA: Sage.

Young, P.V. (2008). *Scientific Social Survey and Research*. New Delhi: Prentice Hall.

Outcomes	➢ The students with be in a position to design and execute research plans using the major methodologies of the discipline (surveys and qualitative techniques).

Semester – II			
Course code: 646 202	**ENVIRONMENTAL ECONOMICS AND MANAGEMENT**	**Credits: 5**	**Hours: 5**
Objectives	➢ To provide students with the necessary training for the application of economic theory and analysis to natural resource and environmental management issues.		
Unit-I	Introduction: Economics and environment- Circular flow model; Material balance model. Sustainability- meaning; different paradigms.		
Unit-II	Environmental Policies and Issues: Environmental Externalities – public goods and private goods; Design of Environmental Policy– Quantity Based Instruments – Market based Instruments – Pigouvian tax and Subsidy Approach, Emission/effluent charges; Non-Market Instruments: Command and Control – Mixed Instruments – Marketable permits – Tradeable Pollution Permits -Bargaining Solution – Property rights and Coase Theorem.		
Unit-III	Approaches to Environmental Valuation: Contingent Valuation Method, Travel Cost Method, Hedonic Pricing Method– Social Cost Benefit Analysis.		
Unit-IV	Common Property Resource (CPR) Management: Tragedy of the Commons- Hardin; Governing the Commons- Elinor Ostrom; CPRs and Rural Poor in India.		
Unit-V	Environmental movements and environmentalism, environmentalism of the poor. Grass Root Movements- Chipko Movement, Save Silent Valley Movement, Narmada BachaoAndolan.		

Reference and Text Books

Baviskar, Amita (1995). *In the Belly of the River: Tribal Conflicts over Development in the Narmada Valley*, New Delhi: Oxford University Press.

Callan & Thomas. (2013). *Environmental Economics and Management: Theory, Policy and Applications*, (6th ed.), Cengage Learning.

Hanley, Nick & Edward Barbier. (2009). *Pricing Nature: Cost-Benefit Analysis and Environmental Policy*. Edward Elgar.

Kolstad (2011). *Intermediate Environmental Economics* (2nd ed.), London International: Oxford University Press.

Tietenberg, Tom & Lewis, Lynne. (2011). *Environmental and Natural Resource Economics*. Routledge. UK.

Venkatachalam L. (2015). *Economic Valuation of Ecosystem Services: A Case Study of Ousteri wetland, Puducherry*, Research Report submitted to GIZ-MoEF, Madars Institute of Development Studies, Chennai.

Jodha, N.S. (1986). Common Property Resources and Rural Poor in Dry Regions of India. *Economic and Political Weekly* 21:1169-1181.

Martinez-Alier, Joan (2002): The Environmentalism of the Poor: A Study of Ecological Conflicts and Valuation (Cheltenham: Edward Elgar).

Menon, A and Ananda vadivelu G. (2006). Common Property Resources in Different Agro-Climatic Landscapes in India, *Conservation and Society*, 4 (1): 132-154.

NSSO. (1999). *Common Property Resources in India*, NSS 54th Round (January 1998-June 1998). Government of India.

Perman, R., Ma, Y., McGilvray, J., & Common, M. (2003). *Natural resource and environmental economics*. Pearson Education.

Wagner, Gernot and Martin Weitzman. (2015). *Climate Shock: The Economic Consequences*

	of a Hotter Planet, USA: Princeton University Press.
Outcomes	➢ Students will be able to learn the environmental regulatory approaches for correcting market failures, and making use of economic evaluation techniques to assess environmental issues and policies.

Semester – II			
Course code: 646 203	**PRINCIPLES OF REMOTE SENSING AND GIS**	**Credits: 5**	**Hours: 5**
Objectives	➢ To introduce the concepts and fundamentals of Remote Sensing, GIS and GPS.		
Unit-I	Introduction: Remote sensing – definition, history & development, concept and principles, Cartography - General Cartography, Types of Maps, Technologies in cartography, Map composition. Concept of Electromagnetic Radiation (EMR) - EMR Spectrum and its properties, EMR wavelength regions and their applications, Atmospheric windows, Interaction of EMR with matter, Spectral signatures.		
Unit-II	Data Acquisition: Platforms – types and their characteristics, Satellites and their characteristics – geo-stationary and sun-synchronous, Earth Resources Satellites -LANDSAT, SPOT, IRS, IKONOS satellite series, High Resolution Satellites- Geoeye; Cartosat. Meteorological satellites – INSAT, NOAA, GOES.		
Unit-III	Data analysis: Satellite data products and their characteristics, Image processing, Data pre-processing, Atmospheric, Radiometric, Geometric corrections, Basic principles of visual interpretation, Equipment for visual interpretation.		
Unit-IV	Basic Concepts: mapping concepts, definition of GIS, Components of GIS, Variables - points, lines, polygon, Areas of GIS application, Advantage and Limitation of GIS, Spatial and attribute data. Global Positioning System (GPS)- Definition- Development of GPS, GPS – Satellite Systems, GPS Satellite Navigation System and their Segments, Applications of GPs.		
Unit-V	Data acquisition and analysis: GIS Software, Open source GIS software, file organization and formats, Geo-database, Rectification, Digitization and map composition.		

References and text books

Drury, S.A., (1987). *Image Interpretation in Geology,* UK: Allen and Unwin.

Gibson, P.J. (2000). *Digital Image Processing*. London: Routledge Publication.

Gupta, R.P., (1990). *Remote Sensing Geology*, Germany: Springer Verlag.

Joseph, G. (2004). *Fundamentals of Remote Sensing*, Hyderabad, India: Universities Press.

Campbell, J. (2002). *Introduction to Remote Sensing*, London: Taylor & Francis.

Anji Reddy, M. (2008). *Textbook of Remote Sensing and Geographic Information System*, Hyderabad: B.S. Publication,

Paul Longley., (2005). *Geographic Information systems and Science*, USA: John Wiley & Sons,

Lo, C.P., Yeung, A.W. (2002). *Concepts Techniques of Geographical Information Systems*, New Delhi: Prentice-Hall of India,

Chang, K.T. (2008). *Introduction to Geographic Information Systems*, New York: Avenue of the Americas.

Outcomes	➢ Students will be learnt the basic concepts and principles of remote sensing, GIS and GPS.

Semester – II			
Course code: 646 204	**FIELDWORK AND PRACTICAL - I**	**Credits: 3**	**Hours: 6**
Students are required to participate in practical and fieldwork relating to disaster management or allied activities. They are expected to submit a report at the end of each field trip and practical. The practical and fieldwork period shall be spread out throughout the second semester. The evaluation shall be based on the performance of the student during the activity period. The total score assigned for the activity is 100 marks.			

Semester - II			
Course code: 646 502	**STATISTICAL METHODS (E)**	**Credits: 4**	**Hours: 4**

Objectives	➢ To familiarize students the application of statistical methods in socio-economic analysis and disaster management.
Unit-I	**Measures of Central Tendency and dispersion:** Mean, Median and Mode– Empirical Relationship between Mean, Median and Mode; Measures of Dispersion– Range, Mean Deviation, Quartile Deviation, Standard Deviation and Coefficient of Variation– Skewness.
Unit-II	**Probability:** Meaning of Probability – Binomial, Poisson, Chi-square, 't' and 'F' tests for small and large samples – Usefulness of these measures in research.
Unit-III	**Correlation:** Correlation Analysis: Scatter Diagram, Karl Pearson's Coefficient of Correlation; Rank Correlation, Spearman's Coefficient of Rank Correlation; Application of Correlation in Empirical Works.
Unit-IV	**Regression Analysis:** Regression: Difference between Correlation and Regression, Fitting Regression Lines (between two variables), Regression Coefficients; Application of Regression in Empirical Works- Linear Regression- Heteroskedasticity, multi-collinearity and auto-correlation.
Unit-V	**Computer Applications:** Data Entry and Processing using Excel– Downloading Data from Internet and its Conversion into Application-Computing Mean, Median, Mode, Standard Deviation and CV using Excel – Creating and Modifying Graphs and other Charts – Computing Growth Rate-Correlation and Regression using SPSS

Reference and Textbooks

Nagar, A.L. & Das, R.K. (2006). *Basic Statistics* (2nded.). New Delhi: Oxford University Press.

Agarwal, Y.P. (2012). *Statistical Methods: Concepts, Applications and Computations.* New Delhi: Sterling Publishers.

Grewal, P.S. (1990). *Methods of Statistical Analysis*. New Delhi: Sterling Publishers.

Gujarathi, D. (2017). *Basic Econometrics.* New Delhi: Tata McGraw Hill.

Gupta, S.P. (2014). *Statistical Methods*. New Delhi: S. Chand & Company.

Gupta, C.B. & Gupta, V. (2009). *An Introduction to Statistical Methods*. New Delhi: Vikas Publishers.

Gupta, S.C. (2014). *Fundamentals of Statistics*. Mumbai: Himalaya Publishing House.

Miller, I. & Miller, M. (1999). *Mathematical Statistics* (6th ed.). Prentice Hall. New Jersey. NJ.

Mood, A.M. Graybill, R.A. & Boes, R.C. (1974). *Introduction to the Theory of Statistics*.

Spiegel, M.R. & Constable, R.L. (1992). *Theory and Problems of Statistics*. McGraw-Hill. Singapore.

Outcomes	➢ Students will be able to understand and apply descriptive and inferential statistical techniques using excel and SPSS.

Semester – III			
Course code: 646301	**DISASTER MITIGATION**	**Credits: 5**	**Hours: 5**
Objectives	➢ To understand mainstreaming of disaster risk reduction activities in the planning process and processes for people centred planning and community led disaster risk reduction.		
Unit-I	Understanding disaster risk and its implication for sustainable development: Risk and linkages between social, economic and environmental vulnerabilities; Disaster risks in the rural/urban setting and trans-boundary contexts; Disaster risks and livelihood security.		
Unit-II	Development planning along with the institutional framework and processes involved in the context of village/ town/ city/ district/ state/ national planning; Planning in neoliberal framework and its critic; planning as driven by bilateral and multilateral agencies.		
Unit-III	Disaster risk: Challenges and possibilities for development planning; Prospective disaster risk management and sustainable development; People centred development and risk mitigation: Social capital for DRR, Community led planning process, participatory planning.		
Unit-IV	Mitigation strategies: Coping strategies- flood, famine, earthquake, drought, desertification. Food security and coping strategies. Livelihood, employment and coping strategies.		
Unit-V	Approaches to disaster risk reduction (DRR): Mainstreaming DRR, Ecosystem and DRR, Flagship programmes and social protection schemes, Livelihood approaches to DRR and Key legislation relevant to DRR.		

References and text books

Pelling, Mark (eds). (2003). *Natural Disasters and Development in a Globalizing World*. Routledge. New York.

Report of the World Commission on Environment and Development: Our Common Future. United Nations (1987). http://www.un-documents.net/our-common-future.pdf

Environmental Guidance Note for Disaster Risk Reduction: Healthy Ecosystems for Human Security. (2009) International Union for Conservation of Nature and Natural Resources.

Below, Regina; Emily Grover- Kopec and Maxx Dilley. (2007). *Documenting Drought-Related Disasters: A Global Reassessment.* The Journal of Environment Development, 16: 328

Kundzewicz, & Zbigniew W. (2009). *Non-structural Flood Protection and Sustainability*, USA: Water International

Apel, HA. H. Thieken; B. Merz, & G. Bloschl. (2004). *Flood risk assessment and associated uncertainty.* Natural Hazards and Earth System Sciences 4: 295–308

Kenny, Charles. (2012*). Disaster risk reduction in developing countries: costs, benefits and institutions.* Disasters, 36(4): 559−588

Arnold, Magret. (2002). *Development for disaster reduction: the role of the World Bank*. Australian Journal of Emergency Management.

Outcomes	➢ Students will be learnt the link between disaster mitigation and development planning.

Semester – III			
Course code: 646 302	**GEOINFORMATICS IN DISASTER MITIGATION**	**Credits: 5**	**Hours: 5**
Objectives	➢ To understand Remote sensing and GIS techniques and its uses in disaster management		
Unit-I	Introduction: Importance of RS and GIS for disaster mitigation, forecast, forewarning system, disaster preparedness with respect to different disasters - Earthquake, volcanoes and landslides: RS and GIS in earthquake prediction and post-quake rehabilitation, GIS for earthquake disaster management, mapping tectonic features, RS of geothermal field, mapping lava flows, volcano hazard management, RS and GIS for zonation, monitoring and management of landslides.		
Unit-II	Flood, cyclone and Tsunami: Flooding potential zonation mapping, flood hazard assessment, ice cover monitoring and its role in flooding; Cyclone monitoring using INSAT, ERS-1, NOAA and DMSP satellites, RS and GIS in cyclone mapping and mitigation, damage assessment, warning; RS and GIS for Tsunamic warning, damage assessment and rehabilitation.		
Unit-III	Drought and Fire: Delineation of drought vulnerable areas, drought monitoring, GIS based drought analysis, desertification factors, monitoring vegetative biomass; Forest Fire – causes, management using GIS, risk zonation mapping, forecasting system		
Unit-IV	Data management: Hazard evaluation – Zonation – Risk assessment and vulnerability, Damage assessment – Land use planning and regulation for sustainable development, Potential of RS and GIS applications in disaster mapping– Disaster management plan.		
Unit-V	Spatial Data Infrastructure (SDI) to facilitate Disaster Management, GIS based Decision Support Systems (DSS) for disaster management, Satellite surveillance for disaster mitigation.		

References and text books

Roy, P.S. (2000). *Natural Disaster and their mitigation*. Published by Indian Institute of Remote Sensing (IIRS).

Bhattacharya, Tushar, (2012). *Disaster Science and Management*, USA: McGraw Hill,

SisiZlatanova& Andrea FabbriJonathanli, (2007). *Geometrics solutions for Disaster management*, Springer Verlag.

Murthy, D.P.N, (2008). *Disaster Management*, India: Deep & Deep Publication.

Orhan, R., Backhaus, P.,Boccardo, S.,Zlatanova. (2010). *Geoinformation for Disaster and Risk Management Examples and Best Practices*, Joint Board of GeospatialInformation Societies and United Nations Office for Outer Space Affairs, Denmark

Singh, R.B, (1994). *Space Technology for Disaster Monitoring and Mitigation in India*, International Center for Disaster-Mitigation Engineering

ESRI. (2006). *GIS and Emergency Management in Indian Ocean Earthquake/Tsunami Disaster*, An ESRI® White Paper.

Babar, Md. (2007). *Environmental Changes and Natural Disasters*, India: New Publishing Agency.

Outcomes	➢ Students will be enriched with practical application of remote sensing and GIS techniques in disaster management.

Semester – III			
Course code: 646 303	**INTERNSHIP**	**Credits: 4**	**Hours: 4**
Students are required to closely work with government, non-government organisations, research institutes and consultancy firms for a period of one month during summer vocation after the completion of second semester. The work or training shall be related to disaster management or allied activities. They are expected to submit a report at the end of the internship. The evaluation shall be based on the performance of the student during the internship which will have a total of 100 marks.			

Semester – III			
Course code: 646 304	**FIELDWORK AND PRACTICAL - II**	**Credits: 3**	**Hours: 6**
Students are required to participate in practical and fieldwork relating to disaster management or allied activities. They are expected to submit a report at the end of each field trip and practical. The practical and fieldwork period shall be spread out throughout the third semester. The evaluation shall be based on the performance of the student during the activity period. The total score assigned for the activity is 100 marks.			

Semester – III			
Course code: 646 503	**DISASTER ECONOMICS AND FINANCING (E)**	**Credits: 4**	**Hours: 4**
Objectives	➢ To become familiar with the various economic consequences of disasters and to acquire the knowledge and skills to effectively carry out financial operations of organisations involved in disaster management.		
Unit-I	Economics of Information- Imperfect Information-the market for lemons- Akerlof's Model- Adverse Selection- Moral Hazard- Signalling and screening- Transaction cost- the Principal-Agent Model.		
Unit-II	Impact of Disaster: Humanitarian impact; economic impact. Direct and Indirect Costs; Tangible and Intangible Costs. Damage assessment methods: Damage Loss and Needs Assessment; Risk identification and assessment.		
Unit-III	Risk aversion- Arrow-Lind measure of risk aversion; Disaster risk financing: Market imperfections and catastrophe insurance- Principles for public intervention in the catastrophe insurance markets- Risk transfer: Alternative risk transfer instruments: Catastrophe bonds, weather derivatives, contingent credit and catastrophe swap.		
Unit-IV	India's disaster financing framework and policy. Disaster financing in India- trends and magnitude over the years. Finance Commission- role and functions.		
Unit-V	The role of international financial institutions in disaster finance. Disaster and development- disaster and international finance capital in the neoliberal world.		

References and text books

Bardhan, Pranab (1991). *The Economic Theory of Agrarian Institutions*, UK: Clarendon:

Benson Charlotte, & Clay Edward (2004). *Understanding the Economic and Financial Impacts of Natural Disasters*, Disaster Risk Management Series No. 4, Chapter 3 Public Finance and Disasters, World Bank.

Cunnins, David J and Oliver Mahul (2009). *Catastrophe Risk Financing in Developing Countries: Principles for Public Action*, The World Bank: Washington, D.C.

Eric, C. Jones; Arthur, D. Murphy, A. (Ed) (2009). *The Political Economy of Hazards and Disasters*, Altamira Press, USA.

Goodwin, Barry K; Vincent H. Smith (1995).*The Economics of Crop Insurance and Disaster Aid*. AEI Press. USA.

Hochrainer, Stefan (2006). *Macroeconomic Risk Management Against Natural Disasters Analysis* focussed on Governments in Developing Countries. Dissertation Universitat Wien.

Kern, William, S (2010). *The Economics of Natural and Unnatural Disasters*. W.E Upjohn Institute for Employment Research. Michigan

Shaw, Rajib, Koichi Shiwaku, Yukiko Takeuchi (2011). *Community, Environment and Disaster Risk Management* Volume 7. Emerald Group Publishing Limited

The Asian Tsunami: (2010). Aid and Reconstruction after a Disaster. Asian Development Bank Institute.

Zack, Naomi (2009). Ethics for Disaster. Rowman & Littlefield Publishers INC.

Outcomes	➢ Students will be able to learn the theoretical foundations of risk economics and appreciate linkages between disaster financing and development financing.

Semester – IV			
Course code: 646 401	**CLIMATE CHANGE AND DISASTER MANAGEMENT**	**Credits: 5**	**Hours: 5**
Objectives	➢ Students will be able to understand the necessity for adaptation to climate change.		
Unit-I	Global climate change trends and impacts: Meaning of adaptation to climate change- Vulnerability to climatic changes - Linking adaptation to development - Adaptation at the international level - Governance and policies for adaptation - Integrating adaptation into development planning - Moving ahead on adaptation in India.		
Unit-II	Adaptation in Agriculture: Impact of climate change in agriculture- The meaning of adaptation in agriculture- Governance and policies for adaptation in agriculture- Adaptation options in agriculture - Linking adaptation and mitigation.		
Unit-III	Adaptation and water resources: Impact of climate change in water resources- The meaning of adaptation in water resources management- Governance and policies for adaptation in water resources management- Adaptation options in water resources management- Linking adaptation and mitigation.		
Unit-IV	Adaptation in Coastal Zones: Climate change impact in coastal zones- The meaning of adaptation in coastal zones- Governance and policies for adaptation in coastal zones- Adaptation options in coastal zones- Linking adaptation and mitigation.		
Unit-V	Adaptation in Disaster Risk Management: How does climate change impact disaster risks? What does adaptation in disaster risk management mean? Governance and policies for adaptation in disaster risk management- Adaptation options in disaster risk management- Linking adaptation and mitigation.		

References and text books

Byravan, S. and Sudhir ChellaRajan (2012). *An Evaluation of India's National Action Plan for Climate Change*, IFMR: Chennai.

Dubash K.Navroz (ed). (2019). *India in a Warming World: Integrating Climate and Development*, Oxford University Press. London.

Food and Agricultural Organisation of the United Nations (FAO) (2007). *Adaptation to climate change in agriculture, forestry and fisheries: Perspective, framework and priorities*. http://www.fao.org/3/a-au030e.pdf (accessed on 16 June 2020).

Government of India (GoI) (2008). *National Action Plan on Climate Change*. http://www.nicra-icar.in/nicrarevised/images/Mission%20Documents/National-Action-Plan-on-Climate-Change.pdf (accessed on 16 June 2020).

Shah, T. Deb Roy, A. Qureshi, A.S.Wang, J. (2003).*Sustaining Asia's Groundwater Boom: An Overview of Issues and Evidence.* In: Natural Resources Forum, no. 27/2003, pp. 130-140.

Outcomes	➢ Students will know the intricate link between climate change impacts and adaptation processes in different sectors such as agriculture, water and coastal areas.

Semester – IV			
Course code: 646 402	**DISASTER RESPONSE**	**Credits: 5**	**Hours: 5**
Objectives	➢ To understand the nature and types of emergency response and develop capacity to estimate relief needs during a disaster situation and plan for its delivery.		
Unit-I	Key Response functions -Warning and public evacuation, Post Disaster Need Assessment, Estimation of basic needs- Food, Water, Health, Shelter etc., Concept of Relief- policy, relief delivery and management. Standards and Best Practices in Relief operations-SPHERE standards. Response Management - Emergency Planning, Coordination, Information management, Resource management, Contingency planning, Business Continuity Plans.		
Unit-II	Supply Chain Management, Logistics and Logistics functions. Five Key Building Blocks (Human Resources, Knowledge Management, Logistics, Financial Resources, Community). The humanitarian supply chain management system, its distinctiveness, Principles. Management of relief material and maintenance of essential services. Characteristics of Humanitarian Supply Chain and flows.		
Unit-III	Coordination in Disaster Response: Disaster response organization, Disaster response & administration - Central, State, District and Local, Disaster Response: Policy & Other organization, Role of multiple stakeholders in Disaster Response NDRF, SDRF, ITBP, CRPF, SRPF, EMS.		
Unit-IV	Quick Disaster Response: First responder, medical first aid, life saving techniques, Golden time. Search & Rescue equipment- Search & Rescue equipment for different disasters, its use, procurement, maintenance, management & other teams.		
Unit-V	Individual and Group behaviour, Psychological Response, Trauma & Stress Management, Rumour & Panic Management Relief measures, Minimum standards of relief, managing relief, Funding relief, Recovery.		

References and text books

Aeberhard, P. (2008). "*Expectations are changing for Disaster relief*", Non-Profit and Voluntary Sector Quarterly, Supplement to Vol. 37 (1): 17-24S.

Bollin, C. &Khanna, S. (2007). "*Review of Post Disaster Recovery Need Assessment Methodologies*", Report commissioned by UNDP.

Bowersox, J.D and Closs, D.J (2008).*Logistical Management*: The integrated supply chain process, New Delhi: Tata McGraw Hill.

Chopra, S., Meindl, P. and Kalra, D.V. (2007). *Supply Chain Management*: Strategy, Planning and Operation,

Harvey, P.A. and Reed, R.A. (2005). "Planning environmental sanitation programmes in emergencies", *Disasters*, Vol. 29(2): 129-151

Pearson (Dorling Kindersley (India) Pvt Ltd).

Logistics Operations Guide (Log), (2006). United Nations Joint Logistics Centre (UNJLC)

Paul, B.K. (2006). "Disaster Relief Efforts: an update", *Progress in Development Studies*, Vol. 6 (3): 211-223.

Sphere. (2011). *"Humanitarian Charter and Minimum Standards in Humanitarian Response"*, Handbook by The Sphere Project.

Sahay, B.S., Cavale, Vasant and Mohan, Ramneesh (2003). The Indian Supply Chain Architecture, Supply Chain Management: *An International Journal*, Vol. 8 (2), pp. 93-106.

Outcomes	➢ Students will be enriched on the needs during disaster relief operations and logistics arrangements.

Semester – IV			
Course code: 646 403	**DISASTER RECOVERY**	**Credits: 5**	**Hours: 5**
Objectives	➢ To understand elements of recovery plan and identify various aspects of post-disaster recovery process and its key challenges.		
Unit-I	Concepts of Recovery, Rehabilitation and Reconstruction- Impact of Disaster: Societal changes- displacement; livelihood; infrastructural; public health; environmental changes; political and organizational changes; psychological impact; changes in business environment		
Unit-II	Recovery context; competing values in models of recovery-restore existing or reimagined community, Challenges in recovery processes. Phases of Recovery. Laws and Policies.		
Unit-III	Elements of recovery plan. Community participation in planning process. Role of planning experts, community leaders and other interest groups. Role of NGO, CBO and FBO in recovery process, Role of Media.		
Unit-IV	Mitigating disaster risk during recovery- land use, livelihood, risk assessment methods; choices under uncertainty. Financing of recovery projects, Recovery management approaches- centralized versus decentralized, community as participants.		
Unit-V	Case studies of disaster recovery processes: Indian Ocean Tsunami 2004, Gaja Cyclone 2018, Kerala flood 2018.		

References and text books

Regnier, P., Neri, B., Scuteri, S. and Miniati, S. (2008). "From emergency relief to livelihood recovery Lessons learned from post tsunami experiences in Indonesia and India", *Disaster Prevention and Management*, Vol. 17(3): 410-429

Powell, P.J. (2011). "Post disaster reconstruction: A current analysis of Gujarat's response after the 2001 earthquake", *Environmental Hazards*, Vol. 10(3-4): 279-292.

Das, K. (2002). "Social Mobilization for Rehabilitation", *Economic and Political Weekly*, Vol. 37(48): 4784-4788.

Amaratunga, D. and Haigh, R. (2011). (eds) *Post Disaster Reconstruction of the Built Environment*, Wiley-Blackwell.

Berke, P. R. and Campanella, T.J. (2006). "Planning for Post Disaster Resiliency", *The ANNALS of American Academy of Political and Social Science,* Vol. 604:192

Chang, Y., Wilkinson, S., Brunsdon, D., Seville, E. And Potangaroa, R. (2011). "An integrated approach: managing resources for post disaster reconstruction", *Disasters*, Vol. 35(4): 739-765.

Pelling, M. And Dill, K. (2010). "Disaster politics: tipping points for change in the adaptation of sociopolitical regimes", *Progress in Human Geography*, Vol. 34(1): 21-37.

Allen, B. L. (2007). "Environmental Justice and Expert Knowledge in the wake of a Disaster", *Social Studies of Science*, Vol. 37(1): 103-110

Outcomes	➢ Students will be able to learn disaster recovery process through disaster plans and case studies.

Semester – IV			
Course code: 646 999	**PROJECT REPORT AND VIVA-VOCE**	**Credits: 6**	**Hours: 10**
Students are required to select a topic of their interest after consultation with faculty research guide at the end of third semester and prepare a report. The project report must be submitted in a specified format to the Department for evaluation purpose. The project report shall be evaluated internally by the faculty of the department who has guided the student and by an external examiner as well. The internal (25 marks) and external examiner (75 marks) shall evaluate the research project/thesis which will have a total of 100 marks. Each candidate shall be required to appear for viva-voce examination in defending the project. A candidate who fails in the Project/Thesis shall not be eligible for M.B.A., Disaster Management degree till he/she repeats the Project/Thesis under supervision and secures pass marks.			