

**MASTER OF SCIENCE (DISASTER MANAGEMENT)**  
**CENTRE FOR DISASTER MANAGEMENT**  
**MIZORAM UNIVERSITY**

**COURSE STRUCTURE FOR TWO YEARS PG/ MASTER DEGREE PROGRAMME**

	<b>Course Code</b>	<b>Course Name</b>	<b>Total Credit</b>	<b>Mark</b>
<b>FIRST SEMESTER</b>	CDM/MJ/500	Introduction to Disaster & Hazards	3	100
	CDM /MJ/501	Risk & Crisis Management	3	100
	CDM/MJ/502	Environmental Geography	3	100
	CDM/MJ/503	Geography of India	3	100
	CDM/MN/504	Disaster Management	2	100
	CDM/MN/505	Environmental Studies	2	100
	CDM/FP/506	<i>Urban based field project</i>	4	100
	DMj=9; IMj= 3; DMn=2; IMn=2; FP= 4			<b>20</b>
<b>SECOND SEMESTER</b>	CDM/MJ/550	Research Methodology	3	100
	CDM/MJ/551	Geomorphology	3	100
	CDM/MJ/552	Applied Climatology	3	100
	CDM/MJ/553	Hydrology	3	100
	CDM/MN/554	Geophysical & Climatic Hazards	2	100
	CDM/MN/555	Geoinformatics in Disaster and Climate Studies	2	100
	CDM/FP/556	CSST related Field Project	4	100
	DMj=9; IMj= 3; DMn=2; IMn=2; FP= 4			<b>20</b>
<i>Exit option with PG Diploma with the completion of courses equivalent to 40 credits</i>				
<b>THIRD SEMESTER</b>	CDM/MJ/600	Disaster Risk Reduction & Planning	3	100
	CDM/MJ/601	Remote Sensing & GIS	3	100
	CDM/MN/602	Management of Man-made disasters and Security threats	2	100
	CDM/MN/603	Geography of Mizoram	2	100
	CDM/FP/604	Rural based Field Project	4	100
	CDM/DISS/649	<i>Dissertation</i>	6	100
	DMj=6; DMn=2; IMn= 2; FP= 4; DIS= 6			<b>20</b>
<b>FOURTH SEMESTER</b>	CDM/MJ/650	Natural Hazards Management	4	100
	CDM/INTS/651	<i>Internship</i>	4	100
	CDM/DISS/699	<i>Dissertation</i>	12	100
	DMj=3; Ints= 5; DIS= 12			<b>20</b>
<b>GRAND TOTAL</b>	DMj=28; IMj= 6; DMn=6; IMn=6; FP= 12; Ints= 4; DIS= 18		<b>80</b>	<b>2300</b>

DMj= Disciplinary Major    IMj= Inter- Disciplinary Major    DMn= Disciplinary Minor  
 IMn= Inter- Disciplinary Minor    FP/Ints/Apts= Field Project/ Internship/ Apprenticeship

**MASTER OF SCIENCE (DISASTER MANAGEMENT)  
SECOND SEMESTER**

**CDM/MJ/550: RESEARCH METHODOLOGY**

**Credits: 3**

**Marks: 20+20+60= 100**

**Duration: 3Hrs/ Week**

**Objectives:** To equip the students with requisite knowledge regarding the basics of research methodology - design and formulation, research proposal, stages, collection of data and techniques of analysis and formatting of writing research report.

*The end semester question paper shall have 6 questions (two questions from each unit) and the students shall be required to attempt four questions selecting at least one question from each unit.*

**Course contents:**

**UNIT – I**

1. Meaning and Objectives of Research,
2. Research Process: Problem identification, Literature review, Specification of Aims and Objectives, Hypothesis/Research Question
3. Data collection: Sources and Types of Data, Methods of data collection
4. Sampling: Probability and Non-Probability sampling; Determination of Sample Size

**UNIT – II**

5. Techniques of Data Analysis I - Measures of Central Tendency, Measures of Dispersion, Normal distribution
6. Hypothesis Testing: Formulation of Statistical Hypotheses; Parametric tests (T-test, F-test, ANOVA); Non-parametric tests: Chi-square, Mann-Whitney
7. Measures of Diversity and Inequality: Simpson's Diversity Index, Lorenz curve, Gini Coefficient, Z-Score
8. Correlation: Pearson's Product Moment, Spearman's rank; Linear regression

**UNIT – III**

7. Report Writing: Format and Precautions in Report Writing
8. Citation style - Footnote, End Note, Reference, Bibliography
9. Formulation of Research Proposal

**Suggested readings:**

1. Kitchin, R. and Tate, N.J. (2013): Conducting Research in Human Geography, Routledge.
2. Flowerdew, R. & Martin, D. (eds.) (1997): Methods in Human Geography: A Guide for Students doing a Research Project, Longman, Harlow.
3. Kneale, P.E. (1999): Study Skills for Geography Students: A Practical Guide, Arnold, London.
4. Kothari, C.R. (1982): Research Methodology in Social Sciences, Inter India, New Delhi.
5. Limb, M. and Dwyer, C. (eds.) (2001): Qualitative Methodologies for Geographers, Arnold, London.
6. Parsons, A.J. & Knight, P. (1995): How to do Your Dissertation in Geography and Related Disciplines, Chapman and Hall, London.
7. Rogerson, P.A. (2001): Statistical Methods for Geography, Sage, London.
8. Stoddard, R.H. (1982): Field Techniques and Research Methods in Geography, Kendall

## CDM/MJ/551: GEOMORPHOLOGY

**Credits: 3**

**Marks:20+20+60=100**

**Duration: 3Hrs/ Week**

**Objectives:** To impart scientific knowledge to familiarize students regarding geomorphology with the need for understand fundamental concepts and role of geomorphic processes in the development of different landforms in the landscape.

*The end semester question paper shall have 6 questions (two questions from each unit) and the students shall be required to attempt four questions selecting at least one question from each unit.*

### **Course content:**

#### **UNIT – I**

1. Nature, Scope, Modern Trends in Geomorphology
2. Important Fundamental Concepts in Geomorphology
3. Continental Drift Theory and Plate Tectonic Theory

#### **UNIT – II**

1. The concept of cycle of erosion: W. M. Davis, W. Penck and L.C. King
2. Landforms processes: Fluvial, Glacial, Aeolian and Marine processes
3. Slope and elements and controlling factors

#### **UNIT- III**

1. Earth's Movements: Epeirogenic and Orogenic movements.
2. Characteristics and evolution of hill side slope: Down-wasting Model of Davis, Parallel Retreat Model of Wood and King, Slope Replacement Model of Penck.
3. Weathering; Fluvial Geomorphic Cycle; Karst topography; Topography of Ocean floors

### **Suggested readings:-**

1. Ahmed, E., (1985): Geomorphology, Kalyani Publishers, New Delhi.
2. Bloom. A.L. (1992): Geomorphology, Prentice Hall of India, New Delhi.
3. Chorley, R.J. et al (1984): Geomorphology, Methuen, London.
4. Dayal, P. (1996): A Text Book of Geomorphology, Shukla Book Depot, Patna.
5. Huggett, R. John (2011): Fundamentals of Geomorphology 3rd Edition, Routledge
6. King, C.A.M., (1968): Techniques in Geomorphology, Edward Arnold, London.
7. Sharma, P. (Ed.), (1994): Applied Geomorphology in Tropics.
8. Singh, Savindra, (1998): Geomorphology, Prayag Pustak Bhawan, Allahabad.
9. Sparks, B.W., (1960): Geomorphology, Longmans, London.
10. Stoddart, D.R. (ed.) (1996): Process and Form Geomorphology, Routledge, London.
11. Thornbury, W.D., (1990): Principles of Geomorphology, J.Wiley, New York.
12. Goudie, A. (Ed.), (1990): Geomorphological Techniques, Unwin Hyman, London.

## CDM/MJ/552: APPLIED CLIMATOLOGY

**Credits: 3**

**Marks: 20+20+60=100**

**Duration: 3Hrs/ Week**

**Objectives:** To acquaint the students with the dynamics of climate and application of climatic knowledge for the benefit of the society. Application part will be done through project and experiment based on appropriate seasons.

*The end semester question paper shall have 6 questions (two questions from each unit) and the students shall be required to attempt four questions selecting at least one question from each unit*

### **Course contents:**

#### **UNIT - I**

1. Nature, Scope and Development of Applied Climatology.
2. Weather, Climate, Society and Culture
3. Climate and Development Interface-Road, Building, Industry, etc.
4. Man-made Micro-climatic Environment

#### **UNIT - II**

5. Climate and Human Health, Agriculture, Animals and Plants
7. Practical on crop/plant growth and its correlation with rainfall and temperature
8. Hydroponic and Aeroponic as an adaptive strategy to climate change and urban farming
8. Climate and Water Resources: Rainfall Pattern and Distribution
9. Climate and Urban Planning, Urban Heat Islands and Acclimatization

#### **UNIT - III**

11. Climate Changes and their Forecast: Short Term and Long Term.
12. Rain Gauge making and Monitoring; Advanced Techniques of Weather Forecasting and its Management.
13. Prediction of weather by observing cloud types and its movement
13. Hands-on practical on Mini-Weather Station

### **Suggested readings:**

1. Horn, L.H and Trewartha (1954) : An introduction to climate, McGraw Hill Book Co., New York.
2. Barry, R. G. (1981): Mountain, Weather & Climate, Methuen, London.
3. Barry, R.G. and Chorley, R.J. (1998): Atmosphere, Weather and Climate, Routledge, London.
4. Battan, L. J. (1983): Weather in Year Life, Freeman, New York.
5. Berry, F.A., Bolla, E. and Beers, N.R. (1945) : Hand book of Meteorology, McGraw, London.
6. Robinson P.J. and Petty A. (ed) (1997): Applied Climatology, Routledge, London.
7. Chorley, R.J. (1969): Earth, Water and Man, Methuen and Co., London.
8. Chorley, R.J. and Barry, R.G. (1971): Atmosphere, Weather and Climate, Methuen, London.
9. Chritchfield, H.J. (1993): General Climatology, Prentice Hall of India New Delhi.
10. Chritchfield, G.H.J. (1975): General Climatology, Prentice Hall of India, New Delhi.

11. Crowe, P.R. (1971): Concept in Climatology, Longmans, London.
12. Lal, D.S. (1989): Climatology, Chaitanya Publishing House, Allahabad.

### **CDM/MJ/553: HYDROLOGY**

**Credits: 3**

**Marks:20+20+60=100**

**Duration: 3Hrs/ Week**

**Objectives:** To provide systematic understanding of Hydrology with pertinent focus on hydrological cycle and associated processes influencing occurrence, movement, quality, quantity and use of water.

*The end semester question paper shall have 6 questions (two questions from each unit) and the students shall be required to attempt four questions selecting at least one question from each unit.*

#### **Course content:**

#### **UNIT – I**

1. Nature and Scope of Hydrology.
2. The Hydrological Cycle: Components and its Characteristics.
3. Interception: Factors and Losses;
4. Evaporation: Factors affecting evaporation, Measurement and Evapotranspiration.

#### **UNIT - II**

5. Soil Moisture and its Zones.
6. Ground Water Resources.
7. Run-off and its Components.
8. Hydrograph: Components and Characteristics.

#### **UNIT-III**

9. Hydrological hazards and disasters
10. Water pollution: Sources and coping measures
11. Sediments yield, transport and conservation
12. River restoration and hydrological engineering

#### **Suggested readings:**

1. Beven, K.J. (2000): Historical Development of Rainfall-Run off Modelling, Wiley, Chichester.
2. Chow, VenTe., Maidment David R., Mays Larry W (2015): Applied Hydrology, McGraw-Hill, New York.
3. Davie, Tim (2002): Fundamentals of Hydrology, Second edition, Routledge
4. David Keith Todd and Larry W. Mays (2011): Groundwater Hydrology, Wiley India, New Delhi.
5. George F. Pinder and Michael A. Celia (2014): Subsurface hydrology, Wiley India, New Delhi.
6. H.K Barriows (1948): Floods: their hydrology and control, McGraw-Hill, New York.
7. P. Jaya Rami Reddy (2016): Textbook of Hydrology, Bengaluru University Science, Bengaluru.
8. Raghunath, H. M (2015): Hydrology Principles, analysis and design, New Age International, New Delhi
9. R.C. Ward, M.Robinson (2011): Principles of Hydrology, McGraw Hill Education, New Delhi.
10. R.W. Herschy R.W. Fairbridge (1998): Encyclopedia of hydrology and water resources, Kluwer Academic, Boston.
11. Vijay P Singh (1992): Elementary hydrology, Prentice-Hall, New Delhi
12. Chorley, R.J., (1969): Introduction to Physical Hydrology, Methuen, London.

## CDM/MN/554: GEOPHYSICAL & CLIMATIC HAZARDS

**Credits: 2**

**Marks:20+20+60= 100**

**Duration: 2Hrs/ Week**

**Objectives:** To provide an understanding of geophysical hazards and introduce various methods of estimation, forecasting and control of geophysical and climatic hazards.

*The end semester question paper shall contain 6 questions (3 questions from each unit) and the students shall be required to answer 2 questions from each unit*

### **Course content:**

#### **UNIT – I**

1. Earthquake: Causes and Impacts; Magnitude and Intensity of earthquake; Seismic zonation
2. Earthquake risk mitigation –Retrofitting of vulnerable buildings; Earthquake preparedness; Tsunami Warning System.
3. Landslide: Causes, Types, and Analysis
4. Landslide hazard zonation, Landslide Risk Mitigation– Landslide control measures.

#### **UNIT – II**

5. Flood: Causes, Characteristics and Impacts; Flood Frequency Analysis; Glacial Lake Outburst Floods (GLOF)
6. Drought: types of drought -meteorological, agricultural, hydrological, and famine
7. Cyclone: Causes, Characteristics and Assessment
8. Remote Sensing and Forecasting Methods of Cyclone, Flood & Drought.

### **Suggested readings:-**

- 1) Coppola, D.P. (2015). Introduction to International Disaster Management. Butterworth-Heinemann, Oxford, UK.
- 2) Hyndman, D. and D. Hyndman, Natural Hazards and Disasters, 2nd edition. USA, Belmont: Brooks/Cole, 2009.
- 3) Keller E.A. and DeVecchio D.E. (2012): Natural Hazards, Pearson Prentice Hall, USA.
- 4) Pirasteh, S. and Jonathan Li (eds.), Global Changes and Natural Disaster Management: Geo-information Technology, Springer, 2017.
- 5) Handmer, J. (1987). Flood hazard Management. CRC Press
- 6) Shroder, J. (2014) Earthquake Hazard, Risk and Disasters, Academic Press

## **CDM/MN/555: GEOINFORMATICS IN DISASTER AND CLIMATE STUDIES**

Credits: 2

Marks:20+20+60= 100

Duration: 2Hrs/ Week

**Objectives:** To provide an understanding of geophysical hazards and introduce various methods of estimation, forecasting and control of geophysical and climatic hazards.

### **Course content:**

#### **UNIT – I**

1. Meaning and Scope of Geoinformatics
2. Application of Geoinformatics in Natural Disasters: Vulnerability and Risk Assessment of Landslides, Floods, Droughts, Earthquakes, Cyclones
3. Role of Geoinformatics in Rescue, Relief and Rehabilitation

#### **UNIT – II**

4. Spatial and non-spatial data for disaster and climate studies
5. Application of Geoinformatics in Man-made disasters: Vulnerability and Risk Assessment of Industrial, Biological, Chemical, Wars, Riots, Terrorist Attacks, Famine
6. Role of Geoinformatics in Rescue, Relief, Rehabilitation.

### **Suggested readings:-**

- 1) Anji Reddy (2004): Geoinformatics for Environmental management. BS Publications.
- 2) Coppola, D.P. (2015). Introduction to International Disaster Management. Butterworth-Heinemann, Oxford, UK.
- 3) Sdidmore A (2002): Environmental modeling with GIS and Remote Sensing, Taylor and Francis.
- 4) Sisi zlatanova and Andrea Fabbri jonathanli (2007): Geometrics solutions for Disaster management, Springer Verlag, 2007.

## **CDM/FP/556: CSST RELATED FIELD PROJECT**

**Credits: 4**

**Marks: 100**

**Duration: 4 Hrs/ Week**

**Objectives:** To expose students to varying nature of terrain, pattern of economic activities, types of human settlements and cultural landscapes inside or outside Mizoram. The students have to write a report on this project.

**The end-semester examination will consist of two parts:**

A. Study Tour Report : 70 Marks

B. Viva-voce : 30 Marks

The examination shall be conducted by 2 examiners of which one should be an external examiner.