B.A. / B.Sc. (Geography) Degree

(Basic / Honours with Research)

Scheme & Syllabus - NEP-2020 & CBCS

Semester	Course Code	Course Title	Teaching Hours	Hours / Week	Examination Pattern Max. & Min. Marks / Paper			Duration of the Exam (hours)	Total Marks / Paper	Credits
					Theory / Practical					
				Theory / Practical	Max.	Min.	IA	Theory / Practical		Theory / Practical
First	DSC.T-1	Principles of Geomorphology	56	4	60	21	40	2	100	4
	DSC.P-1	Geomorphological Mapping Techniques	56	4	25	9	25	2	50	2
	OE-1.1	Introduction to Natural Resources	42	3	60	21	40	2	100	3
	OE-1.2	Introduction to Physical Geography								
	L1-1.1	English	42	3	60	21	40	2	100	3
	L2-1.2	Kannada / Hindi / …..	42	3	60	21	40	2	100	3
	SEC.S-1	Digital Fluency	28	2	30	9	20	2	50	2
	SEC.V-1		14	1			25	1	25	1
	SEC.V-2		14	1			25	1	25	1

Semester	Course Code	Course Title	Teaching Hours	Hours / Week	Examination Pattern Max. & Min. Marks / Paper			Duration of the Exam (hours)	Total Marks / Paper	Credits
					Theory / Practical					
				Theory / Practical	Max.	Min.	IA	Theory / Practical		Theory / Practical
Second	DSC.T-2	Introduction to Climatology	56	4	60	21	40	2	100	4
	DSC.P-2	Interpretation of Weather Maps	56	4	25	9	25	2	50	2
	OE-2.1	Introduction to Human Geography	42	3	60	21	40	2	100	3
	OE-2.2	Fundamentals of Natural Disasters								
	L1-2.1	English	42	3	60	21	40	2	100	3
	L2-2.2	Kannada / Hindi / …..	42	3	60	21	40	2	100	3
	AECC-1	Environmental Studies	28	2	30	9	20	2	50	2
	SEC.V-3		14	1			25	1	25	1
	SEC.V-4		14	1			25	1	25	1

B.A. / B.Sc Semester – I
Title of the Course: DSC.T- 1 Principles of Geomorphology

Number of Theory Credits	Number of theory hours
4	56

Course Learning Outcomes:

After the completion of this course, student should be able to:
1. Define the field of Geomorphology and to explain the essential principles of Geomorphology.
2. To outline the mechanism of dynamic nature of the Earth's surface and it's interior.
3. To illustrate and explain the forces affecting the crust of the earth and its effect.
4. To understand the conceptual and dynamic aspects of landform development.

Course Objectives:

This course aims to:
1. To define the concepts in Geomorphology and Physical Geography.
2. To introduce various concept to understand cycles of the solid Earth surface.
3. To understand the dynamic nature of the Earth's surface, various processes and landforms.
4. To study the impact human on geomorphic system.

	Content of Theory Course	56
Unit – 1	**Introduction**: 1.1 Introduction to Physical Geography – Branches of Physical Geography, Inter Relationship between Physical and Human Geography. 1.2 Geological Time Scale, Importance of Quaternary Period. 1.3 Origin and evolution of the earth's crust. Physical conditions of the earth's interior. 1.4 Factors Controlling landforms development. Isostasy – Pratt and Airy Views	 04 04 02 04
Unit – 2	**Order of Landforms – First Order of Landforms – Continents and Oceans -Origin and Theories** 2.1 Introduction to first order landforms. Endogenetic and exogenetic forces. 2.2 Tetrahedron Theory by Lowthian Green, 2.3 Continental Drift Theory by Alfred Wegener: Geological, Biological and Climatological Evidence. Merits and Criticisms. Geosynclines. 2.4 Convectional Current Theory by Arthur Holmes -Types of Convection currents. Fundamentals of geomagnetism. 2.5 **Assignment:** Students should visit nearby locality and observe landforms types and characteristics and submit a report.	 02 03 04 03 02
Unit – 3	**Second Order Landforms: Origin and Theories. (How mountains Plateau and Plains are formed?)** 3.1 Plate Tectonic Theory – Major and Minor Plates., Causes of Plate Movements, 3.2 Plate Boundaries and Plate Margins 3.3 Associated Landforms – Volcanic Causes and Types, (Endogenetic) 3.4 Earthquakes & Tsunamis - Causes, Waves and its Impact. (Endogenetic) 3.5 Recent Views on Mountains Building- Folded and Faulted Mountains. Sea Floor spreading.	 06 02 02 02 02
	Third Order Landforms (Geomorphological Landforms)	

Unit –4	4.1. Ten Concepts in Geomorphology. Geomorphic cycles and landscape development. Cycle of erosion- Davis and Penck. 4.2. Agents of Denudation - Fluvial, Wind, Glacial, Tides & Waves, Karst and Underground Water – Erosion, Transportation and Depositional landform features. Rejuvenated and polycyclic landforms. 4.4 Rocks - Types, Characteristics and Importance, Weathering: Meaning, Types and Controlling Factors. 4.5 Denudation Chronology; channel morphology; erosion surfaces; slope development 4.6. Soil Formation and Soil Profile 4.6 **Field Study:** Students must be taken to nearby region to observe local land formation and degradation and write a report on their effectiveness.	02 05 02 02 01 02

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2. Strahler A.N. (1968) The Earth Sciences, Harper & Row Intl. Edn, New York
3. Thornberry W.D. (1969) Principles of Geomorphology 2nd Edition, Wiley International Edn. & Wiley Eastern Reprints 1984.
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5. Woodridge S.W and R.S. Morgan (1991) An Outline of Geomorphology, The Physical Basis of Geography, Orient Longman, Kolkata.
6. Dayal P. (1995) A Text Book of Geomorphology 2nd Edition. Sukla Book/Dept. Patna.
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10. Brunsden D. (1985) Geomorphology in the Service of Man: The Future of Geography, Methnen, U.K.
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13. William D. Thornbury(2004). Principles of Gomorphology, 2nd Edition, CBS Publisher and Distributor Pvt. Ltd, New Delhi
14. Vishwas S. Kale, Avijit Gupta (2018), Introduction to Geomorphology, Universities Press.

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3. https://www.gsi.gov.in/webcenter/portal/OCBIS
4. https://www.usgs.gov/
5. https://www.moes.gov.in/

B.A. / B.Sc. Semester – I

Title of the Course: DSC.P- 1 Geomorphological Mapping Techniques

Number of Theory Credits	Number of theory hours
2	56

Course Learning Outcomes:

After the completion of this course, student should be able to:

1. Define the field of Geomorphology and to explain the essential principles.
2. To outline the mechanism of dynamic nature of the Earth's surface and it's interior.
3. To illustrate and explain the forces affecting the crust of the earth and its effect.
4. To understand the conceptual and dynamic aspects of landform development.

Course Objectives:

This course aims to:

1. To define the concepts in Geomorphology and Physical Geography.
2. To introduce various concept to understand cycles of the solid Earth surface.
3. To understand the dynamic nature of the Earth's surface, various processes and landforms.
4. To study the impact human on geomorphic system.

	Content of Practical Course	56
Exercise 1	Collection of Rock types and Rock Samples: Igneous, Sedimentary and Metamorphic rock Samples, (Granite, Basalt, Limestone. Sandstone, Quartzite, Marble and Shale).	7
Exercise 2	Soil Profile: Preparation of Soil profile layers Such as oo, Ao, A, B, C and D soil layers.	7
Exercise 3	Construction of Land forms through Contour from Toposheets –Hill, Plateau, Gorge, Escarpment.	7
Exercise 4	**Field Study:** Students have to visit nearby stream and submit report regarding stream order.	7
Exercise 5	Marginal Information of Topographical Maps.Extraction of geomorphic landforms from topographical maps such as Contour Lines, Form Lines, Spot Heights, Bench-Mark.	7
Exercise 6	Profile drawing using contour from toposheet. Profiles –serial, superimposed, projected and composite.	7
Exercise 7	Delineation of watershed using Topographical sheets or Google map by marking water divide line and Identification of stream orders.	7
Exercise 8	Slope analysis - Wentworth's Method and Hypsometric curve.	7

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1. Ahmed E. (1985) Geomorphology, Kalyani Publishers, New Delhi.

2. Strahler A.N. (1968) The Earth Sciences, Harper & Row Intl. Edn, New York
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B.A. / B.Sc. Semester – I

Title of the Course: OE.- 1.1 Introduction to Natural Resources

Number of Theory Credits	Number of Theory hours
3	42

Course Learning Outcomes:

At the end of the course the students will:

1. Understand basic the concepts in natural resources management.
2. Familiarization of sustainable use of natural resources.
3. Optimal use of land and water resources.
4. Able to understand the causes and consequences of water stress and draw water conservation and management plans.
5. Study the integrated approaches to natural resources management.
6. Learn to use modern technologies in sustainable development and utilization of natural resources.

Course Objectives:

This course aims to

1. Explain the types of natural resources that exist.
2. Study the role of government and different agencies in the natural resource management.
3. Study the threat to the natural resources and the policies to solve it.

	Content of Theory Course	42 h
Unit – 1	**Introduction to Natural Resource Bases**: 1.1 Concept of resource, classification of natural resources. 1.2 Factors influencing on resource availability, distribution. 1.3 Interrelationships among different types of natural resources. 1.4 Ecological, social and economic dimension of resource management. 1.5 Natural resources and development.	 **02** **02** **02** **02** **02**
Unit – 2	**Biotic Resources:** 2.1 Forest resources, status and distribution, use and over-exploitation and deforestation. 2.2 Timber extraction, mining, dams and their effects on forest and tribal people, Forest products. Strategies for development of forestry. 2.3 Energy resources: Growing energy needs, renewable and non-renewable energy sources, use of alternate energy sources. 2.4 Food resources: World food problems, changes caused by agriculture and over-grazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity. 2.5 Fish and other marine resources: Production, status, dependence on fish resource, unsustainable harvesting, issues and challenges. 2.6 **Assignment**: Students should study water crises in their locality and submit a report.	**02** **02** **02** **02** **02** **02**
Unit – 3	**Land resources:** 3.1 Land as a resource. Land use classification, land use planning and desertification. Land resource management and major issues. 3.2 Water resources: Use and over-utilization of surface and ground water, drought, conflicts over water, dams-benefits and problems. Water ecology and management. 3.3 Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies.	**03** **03** **02**

Unit – 4	**Approaches in Resource Management:** **4.1** Resource Management Paradigms, Ecological approach; economic approach; implications of the approaches; 4.2 Management of Common International Resources: Ocean, climate, international fisheries and management commissions; 4.3 integrated resource management strategies, ISRO-NNRMS project on Integrated Mission on Sustainable Development (IMSD), 4.4 Use of modern technologies (RS, GIS, GNSS, Web-GIS, Google Earth Engine, Bhuvan-ISRO Geospatial Portal) as information sources for managing the natural resources. 4.5 **Field Study:** Students have to study the distribution of Natural Resources and their optimal utilization and prepare a report.	**02** **02** **02** **04** **02**

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B.A. / B.Sc. Semester – I
Title of the Course: OE.- 1.2 Introduction to Physical Geography

Number of Theory Credits	Number of Theory hours
3	42

Course Learning Outcomes:

After the completion of the course, the students will be able to:

1. Students will be able to understand the fundamental concepts in Earth Science.
2. Understands basic terminology used to describe physical processes and landscape.
3. Describe elements of the atmosphere and the oceans.

Course Objectives:

This course aims to

1. Study basic principles of the Earth Science.
2. Understand the landforms formed by various atmospheric and geomorphic agents.
3. Know relief features of ocean bottoms.

	Content of Theory Course	42 h
Unit – 1	**Motions of the earth:** 1.1 Origin, Shape and Size of the Earth, 1.2 Structure of the Earth. 1.3 Movement of the Earth-Rotation and Revolution, 1.4 Effects of the movement of Earth, 1.5 Coordinates - Latitude, Longitude and Time.	 **02** **02** **02** **02** **02**
Unit – 2	**Weathering and Denudation:** 2.1 Rocks-types, significance, 2.2 Weathering–types. Agents of Denudation-River, Glacier, Wind and Groundwater. 2.3 Volcanicity, Earthquakes and Tsunamis. 2.4 **Assignment:** Students will have to study a local weather and prepare report.	 **02** **04** **02** **02**
Unit – 3	**Weather and Climate:** **3.1** Structure and Composition of Atmosphere, 3.2 Weather and Climate. Atmospheric Temperature, 3.3 Heat Budget of the atmosphere. 3.4 Atmospheric Pressure, 3.5 Winds and Precipitation.	 **02** **02** **02** **02** **02**
Unit – 4	**Distribution of Land & Sea:** **4.1** Distribution of Land and Sea, Submarine Relief of the Ocean, 4.2 Temperature and Salinity of Sea Water. Ocean Tides, Waves and Deposits, 4.3 Ocean currents-Atlantic, Pacific and Indian Oceans. 4.4 Marine Resources: Biotic, mineral and energy resources. **4.5 Field Study:** Students need to visit the nearby fields and identify various types of landforms and process behind their formation and submit a report.	 **02** **02** **04** **02** **02**

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1. Worcester P.G. (1965), A Text Book of Geomorphology, Can North and 2nd Edition, East West Edn. New Delhi.
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B.A. / B.Sc. Semester – II
Title of the Course: DSC.T- 2 Introduction to Climatology

Number of Theory Credits	Number of theory hours
4	56

Course Outcomes:

After the completion of this course, students should be able to

1. Define the field of climatology and to understand the atmospheric composition and structure.
2. To outline the mechanism and process of solar radiation transfer to earth surface and to ex-plain the temperature distribution and variation according to time and space.
3. To illustrate and explain the air-pressure system, wind regulating forces and the formation of the Atmospheric Disturbance.
4. To understand and compute the air humidity as well as to explain the process of Condensation and formation of precipitation and its types.

Course Objectives:

This course aims to:

1. To define the field of climatology and components of the climate system
2. To introduce various dimensions of climatology like structure and composition.
3. To understand the global atmospheric pressure, temperature, and wind system.
4. To study the concept of atmospheric moisture and its types

	Content of Theory Course	56 h
Unit – 1	**Composition and Structure of the Atmosphere:** **1.1** Nature and Scope of Climatology; Climatology and Meteorology. **1.2** Structure: Troposphere, Stratosphere, Mesosphere, Ionosphere, Exosphere and their characteristics. **1.3** Composition of the atmosphere. **1.4** Weather and Climate.	 **02** **03** **02** **01**
Unit – 2	**Atmospheric Temperature:** 2.1. Insolation: Definition, Mechanism, Solar Constant. Factors affecting the Insolation: Angle of incidence, length of the day, Sun spots, 2.2 Heating and cooling process of the atmosphere-Radiation, Conduction, convection, and advection. 2.3 Temperature Distribution: Influencing factors. Vertical, Horizontal, and Inversion of temperature. Atmospheric stability and instability. 2.4 Global Energy Budget: Incoming short-wave, solar radiation, outgoing long-wave, Terrestrial radiation, albedo. Net Radiation and Latitudinal Heat Balances. 2.5 **Assignment:** Students have to observe heating and cooling process of built-up area, agriculture area, water-body and open space of their surrounding and prepare a report.	 **02** **03** **03** **04** **02**
Unit – 3	**Atmospheric Pressure and Winds:** 3.1 Atmospheric Pressure: Influencing factors, Vertical and Horizontal Distribution, 3.2 Pressure Belts, Pressure Gradient. Tri-cellular - Hadley, Ferrel's and Polar Cells. 3.3 Atmospheric Circulation, Winds - Influencing factors, Types - planetary, seasonal, local. Monsoons and jet streams. 3.4 Variable winds – Cyclones and anti-cyclones. 3.5 Air-Masses and Fronts: Definition, Nature, Source Regions and Classification.	 **03** **03** **04** **04** **04**
	Atmospheric Moisture: Humidity:	

Unit –4	**4.1** Sources, influencing factors and types -Absolute, Relative and Specific. 4.2 Hydrological cycle: process of evaporation, condensation. 4.4 Precipitation: Types and distribution. 4.5 Koppen's, Thornthwaite's and Trewartha's classification. 4.6 Global Climate Change**:** Causes and consequences, role and response of man. 4.7 **Field Study:** Students will have to visit and study a local area Weather Station and prepare report how it gathers data and sends to the main station.	**03** **03** **02** **02** **04** **02**

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B.A. / B.Sc. Semester – II

Title of the Course: DSC.P- 2 Interpretation of Weather Maps

Number of Practical Credits	Number of Practical hours
2	56

Course Outcomes:

After the completion of this course, students should be able to

1. Define the field of climatology and to understand the atmospheric composition and structure.
2. To outline the mechanism and process of solar radiation transfer to earth surface and to ex-plain the temperature distribution and variation according to time and space.
3. To illustrate and explain the air-pressure system, wind regulating forces and the formation of the Atmospheric Disturbance.
4. To understand and compute the air humidity as well as to explain the process of Condensation and formation of precipitation and its types.

Course Objectives:

This course aims to:

1. To define the field of climatology and components of the climate system
2. To introduce various dimensions of climatology like structure and composition.
3. To understand the global atmospheric pressure, temperature, and wind system.
4. To study the concept of atmospheric moisture and its types

	Content of Practical Course	56 h
Exercise 1	Understanding functions of the Indian Meteorological Department (IMD) and Acquisition of Climate Variables.	**7**
Exercise 2	Plotting of variables using graphical methods: line-graph / bar-graph. (Manual and Automated).	**7**
Exercise 3	Elementary Instrumental Observation: Centigrade and Fahrenheit thermometer for measuring temperature.	**7**
Exercise 4	Mercurial Barometer and Aneroid Barometer for measuring atmospheric pressure	**7**
Exercise 5	Derivation of Actual and Potential Evapotranspiration	**7**
Exercise 6	Derivation of Drought Indices (Standard Precipitation Index, Aridity Index)	**7**
Exercise 7	Interpretation of Indian Daily Weather charts. (*Download weather charts of any two seasons).*	**7**
Exercise 8	**Field Activity**: Measurement of Water-Balance in the field, Study of erosional and run-off nearby area.	**7**

References

1. Lutgens, Frederic K. & Tarbuck, Edward J. (2010).The Atmosphere: An Introduction to Meteorology. New Jersey: Pearson Prentice Hall.
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B.A. / B.Sc. Semester – II

Title of the Course: OE.- 2.1 Introduction to Human Geography

Number of Theory Credits	**Number of Theory hours**
3	**42**

Course Learning Outcomes:

After the completion of this course, students should be able to

1. Students learn how human and physical components of the world interact.
2. Students will be familiarized with economic processes such as globalization, trade and their impacts on economic, cultural and social activities.
3. The student will describe what geography and human geography are.
4. Understand population dynamics and migration.

Course Objectives:

This course aims to

1. Understand the basics concepts of human geography
2. Study population attributes and dynamic nature of it.
3. Introduce economic, cultural, and trade activities and their impact on the regional development.

	Content of Theory Course	**42 hrs**
Unit – 1	**Introduction to Human Geography:** 1.1 Nature, scope and Development. 1.2 Environmental Determinism and Possiblism, Neo-determinism (stop and go determinism). 1.3 Approaches to human geography: Exploration and Descriptive approach, regional analysis Approach, Areal Differentiation Approach, Spatial organization Approach. 1.4 Modern approaches: Welfare or Humanistic Approach, Radical Approach, Behavioural Approach, Post-Modernism in geography.	**02** **02** **04** **02**
Unit – 2	**Broad racial group and Cultural Patterns of the world:** 2.1 Broad groups of races, main characteristics and distribution in the world. 2.2 Major Religions and their Distribution: Hinduism, Christianity, Islam and Buddhism. 2.3 Concept of Culture, Material and Non-material culture Cultural Regions, cultural Traits and Complexes, cultural Hearths, cultural Diffusion. 2.3 **Assignment:** Students will have to select nearby area and study religions and their characteristics and submit the report.	**02** **04** **02** **02**
Unit – 3	**Human Economic Activities:** 3.1 Primary Economic Activities – Agriculture, Types: Primitive Subsistence, Intensive subsistence, Plantation Agriculture, Extensive Commercial grain cultivation, Mixed Farming, Dairy Farming. Forestry, fishing and mining 3.2 Secondary Activities: Manufacturing – Cotton Textile and Iron & Steel. Concept of Manufacturing Region. Special Economic Zones. 3.3 Tertiary Activities: Trade and commerce, Retail Trading services, wholesale trading.	**04** **04** **02**
Unit – 4	**Transport and communications and Human Settlements:** 4.1 Transport and communications: Factors, Types and Distribution of Roads, Railway, airway and waterways. Services: Informal and Non formal sector. Information technology. 4.2 Human Settlements: Concepts, rural vs. urban – origin and evolution of	**04** **04**

	settlements - influencing factors of settlements- types and patterns of settlements. Trends and patterns of world Urbanization. 4.3 **Field Study:** Students will have to select nearby town and study various activities performed and submit the report.	**02**

References

1. Dickens and Pitts (1963) Introduction to Human Geography,
2. Hussain M (2003) Human Geography, Rawat Publications, Jaipur
3. Nellson, Gabler Vining (1995) Human Geography, People, Cultures and Landscapes
4. Ranganath (2002) Principles of Human Geography (Kannada Version) Vidyanidhi, Gadag
5. Hartshorne, T.A., & Alexander, J.W. (2010). Economic Geography, New Delhi: PHI Learning.
6. Knox, P., Agnew, J., & McCarthy, L. (2008), The Geography of the World Economy, London: Hodder Arnold.
7. Lloyd, P.,& Dicken, B. (1972), Location in Space: A Theoretical Approach to Economic Geography, New York: Harper and Row.
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B.A. / B.Sc. Semester – II

Title of the Course: OE.- 2.2 Fundamentals of Natural Disasters

Number of Theory Credits	**Number of Theory hours**
3	**42**

Course Learning Outcomes:

After the completion of this course, students should be able to

1. Understand the basics concepts in natural disasters
2. Study types of natural disasters and their effects
3. To understand to create disaster awareness on human and natural habit
4. Learn to use modern technologies like remote sensing and GIS in reducing their impact.

Course Objectives:

The course aims to

1. To provide a general concept in the dimensions of disasters caused by nature beyond the human control.
2. Introduce a holistic classification of natural disasters considering the Earth Sciences
3. Demonstrate the devastating effect of natural disasters to society.

	Content of Theory Course	**42 h**
Unit – 1	**Introduction to Natural Disaster:** 1.1 Meaning, definition, and scope of Natural Disasters study. 1.2 Natural and human-made disasters. 1.3 Commonly occurring disaster in India, their impact on Indian economy. 1.4 Disaster management structure in India.	 **04** **02** **02** **02**
Unit – 2	**Natural Disasters of atmospheric, Lithospheric, hydrospheric and Biotic origin:** **2.1** Heat wave and wildfires, Cloud burst, hailstorm, Drought and famines and effects. 2.2 Earthquakes, volcanoes, Tsunami its effects and preparedness. 2.3 Cyclones, Floods and flash floods. 2.4 Epidemics and pandemics, Covid -19 and their effects. 2.5 Impact of climate change on the frequency and severity of disasters. 2.6 **Assignment:** Students will have to assess heat and droughts in local area and prepare report for its impact on human life.	 **02** **02** **02** **02** **02** **02**
Unit – 3	**Techniques and technology to mitigate natural disasters:** 3.1 Satellite remote sensing and Global Navigation Satellite Systems for data collection. 3.2 Geographic Information Systems for data processing and visualization, 3.3 Mobile GIS information collection (crowd sourcing). 3.4 Internet / Web GIS for information dissemination and public participation.	 **02** **02** **02** **02**
Unit – 4	**Success stories of managing the disasters in India and national/ international policy Frameworks:** **4.1** Cyclonic early warning by IMD 4.2 Flood early warning and damage assessment by NESAC, Shillong 4.3 Landslide hazard assessment by Centre for Ecology, IISc, Bangalore 4.4 COVID-19 management inputs given by KSRSAC, Bangalore 4.5 Information services being supplied by Karnataka State Disaster Monitoring Centre (KSNDMC), Bangalore. 4.6 National and international policies for disaster management 4.6 UN Sustainable Development Goals (SDGs) related to disaster management. 4.7 **Field Study:** Students will have to study COVID-19 situation in local area and prepare report for its impact on society.	 **01** **01** **01** **01** **01** **02** **03** **02**

References

1. Mrinalini Pandey, Disaster Management, Wiley India Pvt. Ltd.
2. Disasters in India- can remote Sensing do something? ISRO Technical Report, 1983.
3. U.R Rao 1998, Space Technology for Sustainable Development, Mc Graw Hill, India
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5. Jagbir Singh (2013), Disaster Management: Future Challenges and Opportunities KW Publishers, Pvt. Ltd.
6. J.P. Singhal (2016), Disaster Management, Laxmi Publications.
7. C.K. Rajan & Navale Pandharinath (2009), Earth and Atmospheric Disaster Management: Nature and Manmade, BS Publication
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