



## INDEX

### DEPARTMENT OF GEOGRAPHY SEMESTER – II

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**DISCIPLINE SPECIFIC CORE COURSE – 4 (DSC-4): GEOMORPHOLOGY**

**CREDIT DISTRIBUTION, ELIGIBILITY AND PRE-REQUISITES OF THE COURSE**

Course title & Code	Credits	Credit distribution of the course			Eligibility criteria	Pre-requisite of the course (if any)
		Lecture	Tutorial	Practical/ Practice		
<b>GEOMORPHOLOGY</b>	<b>4</b>	<b>3</b>	<b>1</b>	<b>-</b>	<b>-</b>	<b>-</b>

**Learning Objectives**

The Learning Objectives of this course are as follows:

- To understand the association between geomorphologic landforms, concepts and processes.
- To critically evaluate and connect information about geomorphic processes.
- To provide a theoretical and empirical framework for understanding landscape evolution and the characteristics of individual types of geomorphic landscapes.

**Learning outcomes**

The Learning Outcomes of this course are as follows:

- To know the functioning of earth systems in real time and analyze how the natural and anthropogenic operating factors affects the development of landforms.
- To distinguish between the mechanisms that controls these processes.
- To assess the roles of structure, stage and time in shaping the landforms, interpret geomorphological maps and apply the knowledge in geographical research.

**SYLLABUS OF DSC-4**

**UNIT – I (2Weeks)**

Geomorphology: Definitions, Principles, Recent Trends

**UNIT – II (4Weeks)**

Plate Tectonics: Concept, Mechanism, Boundaries, Movements and Resultant effects

**UNIT – III (3Weeks)**

Denudation: Weathering, Mass Wasting, Erosion

**UNIT – IV (3Weeks)**

Landform development: Cyclic (ideas of Davis and Penck), non-cyclic and poly-cyclic concepts

**UNIT – V (5 Weeks)**

Landforms: Fluvial, Aeolian, Glacial, and Coastal Landforms

**Practical component (if any) - NIL**

**Suggestive readings**

1. Bloom, A.L., (2003). Geomorphology: A Systematic Analysis of Late Cenozoic Landforms. First Indian Reprint. Delhi: Pearson Education (Singapore) Pte. Ltd.
2. Dyal., P. (2014). Bho-Akriti Vigyan. Rajesh Publications, New Delhi (Hindi).
3. Gupta, S.L. (2008). Bho-Akriti Vigyan. University of Delhi (Hindi).
4. Jat., B.C. (2004). Bho-Akriti Vigyan. Rawat Publications, New Delhi, (Hindi).
5. Singh, S. (1998). Geomorphology. PrayagPuskak Bhawan: Allahabad.
6. Strahler, A.H. and Strahler, A.N. (1992). Modern Physical Geography, Fourth Edition. John Wiley & Sons, Canada.
7. Summerfield, M.A, (1991). Global Geomorphology: an Introduction to the Study of Landforms. Longman, New York.
8. Tarbuck, E.J., Lutgens, F.K and Tasa, D. (2012). Earth Science, Thirteenth Edition, Prentice Hall. Delhi.
9. Thornbury, W.D., (1993). Principles of Geomorphology, Second Edition. Wiley Eastern Limited, New Delhi.

**Note: Examination scheme and mode shall be as prescribed by the Examination Branch, University of Delhi, from time to time.**

**DISCIPLINE SPECIFIC CORE COURSE – 5 (DSC-5): POPULATION GEOGRAPHY**

**Credit distribution, Eligibility and Pre-requisites of the Course**

Course title & Code	Credits	Credit distribution of the course			Eligibility criteria	Pre-requisite of the course (if any)
		Lecture	Tutorial	Practical/ Practice		
POPULATION GEOGRAPHY	4	3	1	-	-	-

**Learning Objectives**

The Learning Objectives of this course are as follows:

- It introduces the basic concepts of population geography to the students.
- An understanding of the importance and need of Demographic data.
- Spatial understanding of population dynamics.

**Learning outcomes**

The Learning Outcomes of this course are as follows:

- The students would get an understanding of the distribution and trends of population growth in the developed and less developed countries, along with population theories.
- The students would get an understanding of the dynamics of the population.

- An Understanding of the implications of population composition in different regions of the world.

## **SYLLABUS OF DSC-5**

### **UNIT – I (3 Weeks)**

Nature and Scope of Population Geography, Sources of Population Data with special reference of Indian Census.

### **UNIT – II (4Weeks)**

Population Size, Distribution and Growth – Determinants and Patterns; Theories of Growth – Malthusian Theory and Demographic Transition Theory.

### **UNIT – III (4Weeks)**

Population Dynamics: Fertility and Mortality – Measures and Determinants, Migration – Determinants and Implications.

### **UNIT – IV (4Weeks)**

Dynamics of Population Pyramids and Women Empowerment and Indian Population Policies.

### **UNIT – V (2 Weeks)**

Contemporary Issues - Ageing of Population, Demographic Dividends, Global Refugee Crisis.

### **Practical component (if any) - NIL**

### **Suggestive readings**

1. Bhende A. and Kanitkar T. (2019). Principles of Population Studies. Himalaya Publishing House, New Delhi, India.
2. Chandna, R.C. (2017). Geography of Population. Kalyani Publishers, Ludhiana, India.
3. Clarks, John, I. (1972). Population Geography. Pergamon Press, New York.
4. Hassan M.I. (2020). Population Geography, A Systematic Exposition. Routledge Taylor and Francis Group, New York.
5. Lutz, W., Warren, C. S. and Scherbov, S. (2004). The End of the World Population Growth in the 21st Century. UK: Earthscan.
6. Majumdar, P.K. (2010). Fundamentals of Demography. Rawat publications, Jaipur.
7. Maurya, S. D. (2021). *JansankyaBhugol*. Sharda Pustak Bhawan, Allahabad.
8. Newbold, K. B. (2017). Population Geography: Tools and Issues. Rowman and Littlefield Publishers, NY, USA.
9. Saroha, J. (2021). JansankhyaBhugol, JanankikievamJansankhyaAdhayan. M.K. Books, New Delhi.
10. Weeks, John R. (2020) Population: An Introduction to Concepts and Issues. Cengage Learning, Boston.

**DISCIPLINE SPECIFIC CORE COURSE – 6 (DSC-6): STATISTICAL METHODS IN GEOGRAPHY**

**Credit distribution, Eligibility and Pre-requisites of the Course**

Course title & Code	Credits	Credit distribution of the course			Eligibility criteria	Pre-requisite of the course(if any)
		Lecture	Tutorial	Practical/ Practice		
STATISTICAL METHODS IN GEOGRAPHY (PRACTICAL)	4	-	-	8		

**Learning Objectives**

The Learning Objectives of this course are as follows:

- The concept of quantitative information in general and Geographical data in particular. The importance of data analytics. The ways data is collected, or data is taken from different sources. The sampling methods' application for data collection purposes.
- To understand the ways to handle the collected data through classification, tabulation and stigmatization.
- To compute relations and impacts among the data series.

**Learning outcomes**

The Learning Outcomes of this course are as follows:

- To differentiate between qualitative and quantitative information.
- To know the nature of various data, different sources and methods of data collection.
- To present data through graphical and diagrammatic formats.
- To analyse the variations in spatial and non-spatial data.

**SYLLABUS OF DSC-6**

**UNIT – I (3 Weeks)**

Data in Geography: Sources of Data, Scales of Measurements in Geography, Tabulation, Frequency Distribution, Geographical Data Matrix.

**UNIT – II (5 Weeks)**

Descriptive Statistics: Central Tendencies – Mean, Median, Mode; Measures of Partitions - Quartile, Decile, Percentile; Measures of Dispersion- Standard Deviation and Coefficient of Variation; Spatial Centro-graphic Techniques – Mean Centre, Median Centre.

**UNIT – III (3 Weeks)**

Sampling Methods: Sampling (Simple Random, Systematic, and Stratified); and Non-probability sampling.

**UNIT – IV (3 Weeks)**

Theoretical Distribution: Concept of Probability Distribution (Theoretical only), Normal Distribution – Characteristics, Area under Normal Curve.

**UNIT – V (3 Weeks)**

Relationship Analysis: Correlation - Spearman's and Karl Pearson's coefficient of correlation; Simple Regression.

**Practical component (if any) – Practical File\***

**Suggestive readings**

1. Alvi Z. (1995). Statistical Geography: Methods and Applications. Rawat Publications, Jaipur.
2. Mahmood A. (1999). Statistical Methods in Geographical Studies. Rajesh Publications, New Delhi.
3. Pal S. K. (1998). Statistics for Geoscientists. Tata McGraw Hill, New Delhi.
4. Rogerson P.A. (2014). Statistical Methods for Geography: A Student's Guide. Sage, New Delhi.
5. Singh D. (2018). प्रारंभिकसांख्यिकीविधियाँ. New Delhi. R K Books, New Delhi.
6. Ebdon D. (1977). Statistics in Geography: A Practical Approach. Oxford, UK. Blackwell.
7. Singh D. (2018). Elementary Statistical Methods. R K Books, New Delhi.
8. Sinha, I. (2007). सांख्यिकीभूगोल. Discovery Publishing House, New Delhi.
9. Walford N. (2011). Practical Statistics for Geographers and Earth Scientists. Wiley-Blackwell, West Sussex, United Kingdom.
10. SPSS (Statistical Package for Social Sciences)
11. Tableau Desktop software/R.

**Note:**

- \*1. Students should construct/collect data matrix (75X5) with each row 75 representing an aerial unit (district/village/town) and 5 columns of relevant attributes of areal units.**
- 2. All the exercises will be based on the data matrix collected by the students.**
- 3. Simple calculator is allowed in the examination.**

**Category II**

**Geography Courses for Undergraduate Programme of study with  
Geography as one of the Core Disciplines**

**(B.A. Programmes with Geography as Major discipline)**

**DISCIPLINE SPECIFIC CORE COURSE – 3 (DSC-3): GEOMORPHOLOGY**

**CREDIT DISTRIBUTION, ELIGIBILITY AND PRE-REQUISITES OF THE COURSE**

Course title & Code	Credits	Credit distribution of the course			Eligibility criteria	Pre-requisite of the course (if any)
		Lecture	Tutorial	Practical/ Practice		
GEOMORPHOLOGY	4	3	1	-	-	-

**Learning Objectives**

The Learning Objectives of this course are as follows:

- To understand the association between geomorphologic landforms, concepts and processes.
- To critically evaluate and connect information about geomorphic processes.
- To provide a theoretical and empirical framework for understanding landscape evolution and the characteristics of individual types of geomorphic landscapes.

**Learning outcomes**

The Learning Outcomes of this course are as follows:

- To understand the functioning of earth systems in real time and analyze how the natural and anthropogenic operating factors affects the development of landforms.
- To distinguish between the mechanisms that controls these processes.
- To assess the roles of structure, stage and time in shaping the landforms, interpret geomorphological maps and apply the knowledge in geographical research.

**SYLLABUS OF DSC-3**

**UNIT – I (2 Weeks)**

Geomorphology: Definitions, Principles, Recent Trends

**UNIT – II (4 Weeks)**

Plate Tectonics: Concept, Mechanism, Boundaries, Movements and Resultant effects

**UNIT – III (3 Weeks)**

Denudation: Weathering, Mass Wasting, Erosion

**UNIT – IV (3 Weeks)**

Landform development: Cyclic (ideas of Davis and Penck), non-cyclic and poly-cyclic concepts

**UNIT – V (5 Weeks)**

Landforms: Fluvial, Aeolian, Glacial, and Coastal Landforms

**Practical component (if any) - NIL**

**Suggestive readings**

1. Bloom, A.L., (2003). Geomorphology: A Systematic Analysis of Late Cenozoic Landforms. First Indian Reprint. Delhi: Pearson Education (Singapore) Pte. Ltd.
2. Dyal., P. (2014). Bho-Akriti Vigyan. Rajesh Publications, New Delhi (Hindi).
3. Gupta, S.L. (2008). Bho-Akriti Vigyan. University of Delhi (Hindi).
4. Jat., B.C. (2004). Bho-Akriti Vigyan. Rawat Publications, New Delhi, (Hindi).
5. Singh, S. (1998). Geomorphology. PrayagPuskak Bhawan: Allahabad.
6. Strahler, A.H. and Strahler, A.N. (1992). Modern Physical Geography, Fourth Edition. John Wiley & Sons, Canada.
7. Summerfield, M.A, (1991). Global Geomorphology: an Introduction to the Study of Landforms. Longman, New York.
8. Tarbuck, E.J., Lutgens, F.K and Tasa, D. (2012). Earth Science, Thirteenth Edition, Prentice Hall. Delhi.
9. Thornbury, W.D., (1993). Principles of Geomorphology, Second Edition. Wiley Eastern Limited, New Delhi.

**Note:** Examination scheme and mode shall be as prescribed by the Examination Branch, University of Delhi, from time to time.

**DISCIPLINE SPECIFIC CORE COURSE – 4 (DSC-4): POPULATION GEOGRAPHY**

**Credit distribution, Eligibility and Pre-requisites of the Course**

Course title & Code	Credits	Credit distribution of the course			Eligibility criteria	Pre-requisite of the course (if any)
		Lecture	Tutorial	Practical/ Practice		
POPULATION GEOGRAPHY	4	3	1	-	-	-

**Learning Objectives**

The Learning Objectives of this course are as follows:

- It introduces the basic concepts of population geography to the students.
- An understanding of the importance and need for Demographic data.
- Spatial understanding of population dynamics.

**Learning outcomes**

The Learning Outcomes of this course are as follows:



- The students would get an understanding of the distribution and trends of population growth in the developed and less developed countries, along with population theories.
- The students would get an understanding of the dynamics of the population.
- An Understanding of the implications of population composition in different regions of the world.

## **SYLLABUS OF DSC-4**

### **UNIT – I (3 Weeks)**

Nature and Scope of Population Geography, Sources of Population Data with special reference of Indian Census.

### **UNIT – II (4 Weeks)**

Population Size, Distribution and Growth – Determinants and Patterns; Theories of Growth – Malthusian Theory and Demographic Transition Theory.

### **UNIT – III (4 Weeks)**

Population Dynamics: Fertility and Mortality – Measures and Determinants, Migration – Determinants and Implications.

### **UNIT – IV (4 Weeks)**

Dynamics of Population Pyramids and Women Empowerment and Indian Population Policies.

### **UNIT – V (2 Weeks)**

Contemporary Issues - Ageing of Population, Demographic Dividends, Global Refugee Crisis.

### **Practical component (if any) - NIL**

### **Suggestive readings**

1. Bhende A. and Kanitkar T. (2019). Principles of Population Studies. Himalaya Publishing House, New Delhi, India.
2. Chandna, R.C. (2017). Geography of Population. Kalyani Publishers, Ludhiana, India.
3. Clarks, John, I. (1972). Population Geography. Pergamon Press, New York.
4. Hassan M.I. (2020). Population Geography, A Systematic Exposition. Routledge Taylor and Francis Group, New York.
5. Lutz, W., Warren, C. S. and Scherbov, S. (2004). The End of the World Population Growth in the 21st Century. UK: Earthscan.
6. Majumdar, P.K. (2010). Fundamentals of Demography. Rawat publications, Jaipur.
7. Maurya, S. D. (2021). *JansankyaBhugol*. Sharda Pustak Bhawan, Allahabad.
8. Newbold, K. B. (2017). Population Geography: Tools and Issues. Rowman and Littlefield Publishers, NY, USA.
9. Saroha, J. (2021). JansankhyaBhugol, JanankikievamJansankhyaAdhayan. M.K. Books, New Delhi.
10. Weeks, John R. (2020) Population: An Introduction to Concepts and Issues. Cengage Learning, Boston.

### Category III

## Geography Courses for Undergraduate Programme of study with Geography as one of the Core Disciplines

(B.A. Programmes with Geography as non-Major or Minor discipline)

### DISCIPLINE SPECIFIC CORE COURSE – 2 (DSC-2): HUMAN GEOGRAPHY

#### Credit distribution, Eligibility and Prerequisites of the Course

Course title & Code	Credits	Credit distribution of the course			Eligibility criteria	Pre-requisite of the course (if any)
		Lecture	Tutorial	Practical/ Practice		
HUMAN GEOGRAPHY	4	3	1	-	-	-

#### Learning Objectives

The Learning Objectives of this course are as follows:

- To understand various dimensions of human geography and cultural landscape.
- To analyse the population growth and distribution.
- To understand the relationship between population and resource.

#### Learning outcomes

The Learning Outcomes of this course are as follows:

- Detailed exposure to contemporary relevance of cultural landscape.
- In-depth knowledge of space and the society of cultural regions.
- Understanding the settlement pattern and population resource relationship.

#### SYLLABUS OF DSC- 2

##### UNIT – I (2 Weeks)

Human Geography: Definition, Scope and Major Themes; Contemporary Relevance, Understanding Cultural Landscape.

##### UNIT – II (4 Weeks)

Population: World Population Growth – Trends and Patterns, Population Composition (Residence, Literacy and Age).

##### UNIT – III (4 Weeks)

Space and Society: Cultural Regions, Tribes, Religion and Language.

##### UNIT – IV (4 Weeks)

Settlements: Types of Rural Settlements; Classification of Urban Settlements; Trends and Patterns of World Urbanization.

**UNIT – V (3 Weeks)**

Human Development – Measurements (HDI and IHDI), Regional Variations and Sustainable Development Goals.

**Practical component (if any) - NIL**

**Suggestive readings**

1. Chandna, R.C. (2017). Geography of Population. Kalyani Publishers, Ludhiana, India.
2. Hassan M.I. (2020). Population Geography-A Systematic Exposition. Routledge Taylor and Francis Group, New York.
3. Human Development Reports of United Nations Development Program.
4. Hussain Majid (2021). Human Geography. Rawat Publication.
5. Majid, Hussain (2012). Manav Bhugol. Rawat Publication.
6. Maurya, S.D. (2012). Manav Bhugol. Sharda Pustak Bhawan, Allahabad, India.
7. Patra, P. et. al.(2021). Perspectives of Human Geography. Concept Publications, New Delhi.
8. Rubenstein, J.M. (2008). An Introduction to Human Geography: The Cultural Landscape. Pearson Prentice Hall, NJ.
9. Saroha, J. (2021). JansankhyaBhugol, JanankikievamJansankhyaAdhayan. M.K. Books, New Delhi.
10. Singh, S and Saroha, J. (2021). Human and Economic Geography. Pearson Publication.

**COMMON POOL OF GENERIC ELECTIVES (GE) COURSES OFFERED BY THE  
DEPARTMENT OF GEOGRAPHY**

**GENERIC ELECTIVES (GE-4): GLOBALIZATION AND MOBILITY**

**Credit distribution, Eligibility and Pre-requisites of the Course**

Course title & Code	Credits	Credit distribution of the course			Eligibility criteria	Pre-requisite of the course	Department offering the course
		Lecture	Tutorial	Practical/ Practice			
GLOBALIZATION AND MOBILITY	4	3	1	-	-	-	GEOGRAPHY

**Learning Objectives**

The Learning Objectives of this course are as follows:

- To understand the concept of mobility and migration.
- To understand the global cities, global village and borderless world.
- To understand flexible labour market and mass mobility.

**Learning outcomes**

The Learning Outcomes of this course are as follows:

- The students will able to learn the concept of migration.
- Students will able to differentiate between mobility and migration.
- Students will able to learn the implications of flexible labour market.

**SYLLABUS OF GE-4**

**UNIT – I (2 Weeks)**

Globalization: Concept and Indicators; Mobility and Migration: Concept and Significance.

**UNIT – II (4 Weeks)**

Global Cities, Global Village and Borderless World: Intensification and integration of Economic and Political Relations across borders.

**UNIT – III (4 Weeks)**

Role of freedom of Trade and Information Technology on Human Mobility. Challenges of Globalization.

**UNIT – IV (4 Weeks)**

Mobility: Frequency, Trends, Patterns and Factors; Pressure on Social Infrastructure.

**UNIT – V (3 Weeks)**

Globality: Implications of Flexible Labour Market, Individual and Mass Mobility.

**Practical component (if any) - NIL**

**Suggestive readings**

1. Acharya, L.M. (2012). Economic Geography, Migration and Global Politics. KUNAI Books.
2. Ahmad, Aijazuddin (2002). Social Geography. Rawat Books, Jaipur.
3. Jone, V and Pertierra (2013). Migration, Diaspora and Information technology in Global Societies. Routledge Publication.
4. Kent, Bruce (1991). Building the Global Village. Hopper Collins Publishers Inc.
5. Marshall, Tim (2021). The Power of Geography: Ten Maps That Reveal The Future of Our World. Elliott & Thompson limited.
6. Rajgopalan, S (2012). Rural Urban Migration: Trends, Challenges and Strategies. SBS Publishers.
7. Sengupta, Anita (2015). Globalizing Geographies. KW Publishers Pvt. Ltd.
8. Shrinivasan, Ramesh (2017). Whose Global Village? Rethinking How Technology Shapes Our World. NYU Press.
9. Shroff, Menon (2019). Social Changes in Migration Globalization. Amiga Press Inc.

**GENERIC ELECTIVES (GE-5): DISASTER MANAGEMENT**

**Credit distribution, Eligibility and Pre-requisites of the Course**

Course title & Code	Credits	Credit distribution of the course			Eligibility criteria	Pre-requisite of the course	Department offering the course
		Lecture	Tutorial	Practical/ Practice			
<b>DISASTER MANAGEMENT</b>	<b>4</b>	<b>3</b>	<b>1</b>	-	-	-	<b>GEOGRAPHY</b>

**Learning Objectives**

The Learning Objectives of this course are as follows:

- Understanding the basic concepts of disaster management.
- Detailed analysis about the different types of disasters in India.
- Evaluating the role of institutional frameworks to mitigate the disasters in the country.

**Learning outcomes**

The Learning Outcomes of this course are as follows:

- In depth understanding about the various disasters in the country.
- It will provide thorough understanding about the human responses to the disasters.
- It will highlight the responses and mitigation measures to both natural and manmade disasters.

## **SYLLABUS OF GE-5**

### **UNIT – I (4 Weeks)**

Disasters, Hazards, Risk, Vulnerability- Definition, Concept and Classification; Hazard, Risk Vulnerability Capacity (HRVC) - Methods, Analysis and Mapping

### **UNIT – II (3 Weeks)**

Disaster Management- Disaster Management Cycle, Community Based Disaster Management

### **UNIT – III (3 Weeks)**

Floods, Earthquake, Drought, Cyclone

### **UNIT – IV (3 Weeks)**

Industrial, War, Fire, Epidemics, Nuclear

### **UNIT – V (4 Weeks)**

Strategies for disaster management: International- Yokohama Strategy for a Safer World 1994, Hyogo framework for Action 2005-2015; Sendai Framework for Disaster Risk Reduction 2015-2030; Indian Policy for disaster management: Disaster Management Act 2005, 10 point Agenda of Prime minister on DRR

### **Practical component (if any) - NIL**

#### **Suggestive readings**

1. Asthana , N.C. and Asthana P. (2014). Disaster Management. Pointer Publishers
2. Bryant , E.(2004). Natural Hazards. Cambridge University Press, India
3. Kapur ,Anu(2010). Vulnerable India: A Geographical Study Of Disasters. Sage Publications,
4. Savinder Singh(2019 ). ApdaPrabandhan.PravalikaPrakashan (Hindi).
5. Smith, Keith (2013). Environmental Hazards: Assessing risk and reducing disasters
6. Wisner, B., Blaikie P et al. (2004). At Risk: Natural Hazards, People's Vulnerability and Disasters. Routledge Taylor and Francis Group , NY ([https://www.preventionweb.net/files/670\\_72351.pdf](https://www.preventionweb.net/files/670_72351.pdf))
7. Singh R.B. (ed.) (2006). Natural Hazards and Disaster Management: Vulnerability and Mitigation . Rawat Publications, Jaipur.
8. Singh, J. (2007). Disaster Management: Future Challenges and Opportunities.IK International Pvt. Ltd, New Delhi.
9. Sinha, A. (2001). Disaster Management: Lessons drawn and Strategies for Future. New United Press, New Delhi.
10. Modh, S. (2010). Managing Natural Disaster: Hydrological, Marine and Geological Disasters. Macmillan, Delhi.

**GENERIC ELECTIVES (GE-6): INDIGENOUS KNOWLEDGE SYSTEM AND PRACTICES**

**Credit distribution, Eligibility and Pre-requisites of the Course**

Course title & Code	Credits	Credit distribution of the course			Eligibility criteria	Pre-requisite of the course	Department offering the course
		Lecture	Tutorial	Practical/ Practice			
INDIGENOUS KNOWLEDGE AND PRACTICES	4	3	1	-	-	-	GEOGRAPHY

**Learning Objectives**

The Learning Objectives of this course are as follows:

- To know the meaning of indigenous knowledge system and its significance.
- To be aware of the concept of sustainability and ecosystem services.
- To be acquainted with about the indigenous knowledge of soil and water conservation techniques.

**Learning outcomes**

The Learning Outcomes of this course are as follows:

- Students will be able to know the importance of our indigenous knowledge system.
- Students will learn how indigenous knowledge system will be effective to conserve out resources.
- Students will able to know about the intellectual property rights and socio-cultural heritage.

**SYLLABUS OF GE-6**

**UNIT – I (2 Weeks)**

Introduction: Concept, Meaning and Definition, Approaches of Indigenous Knowledge System, Identification, Documentation, and Validation of Indigenous Knowledge system, Significance of Indigenous Knowledge System.

**UNIT – II (4 Weeks)**

Indigenous Knowledge System (IKS), Sustainability and Ecosystem Services: Indigenous Knowledge and Sustainability, Indigenous Knowledge and Ecosystem Services, Nature Based Solutions (NBSs).

**UNIT – III (3 Weeks)**

Indigenous Knowledge System and Practice: Case Studies: Agriculture, Land and Soil, Water, Forest.

**UNIT – IV (4 Weeks)**

Indigenous Knowledge System and Rights of Communities: Role of Institutions, Intellectual Property Rights (IPRs), Indigenous Knowledge System and Socio-cultural Heritage.

**UNIT – V (4 Weeks)**

Policy Implications/Way Forward: Revival and recognition of Indigenous Knowledge System, Integration of Intergenerational transmission of Indigenous Knowledge System, Need for Policy framework and Role of Various Initiatives with respect to India, Strength, Weakness, Opportunities and Threats (Challenges).

**Practical component (if any) - NIL**

**Suggestive readings**

1. Berkes, F. and Gadgil, M. (1995). Indigenous Knowledge for biodiversity conservation. *Ambio*, 22(2-3): 151-156.
2. Berkes, F. (1999). *Sacred Ecology: Traditional Ecological Knowledge and Resource Management*. Milton Park: Taylor & Francis.
3. Brokensha D.W., Warren D.M. and Werner, O. (1980). *Indigenous Knowledge Systems and Development*. Washington DC: University Press of America.
4. Brush, S. (1993). Indigenous knowledge of biological resources and intellectual property rights: The role of anthropology. *American Anthropologist*, 95 (3): 653–86.
5. Ford, J. and Martínez, D. (2000). Traditional ecological knowledge, ecosystem and environmental management. *Ecol. Application*, 10: 1249-1250.
6. Melissa, N. and Shilling, D. (2018). *Traditional Ecological Knowledge: Learning from Indigenous Environmental Sustainability*. Cambridge University Press.
7. Mishra, P.K. and Rai S.C. (2013). Use of Indigenous Soil and Water Conservation Practices among Farmers in Sikkim Himalaya. *Indian Journal of Traditional Knowledge*, 12(3), July, Pp. 454-464. NISCAR, CSIR, New Delhi.
8. Rai, S.C. and Mishra, P.K. (2022). *Traditional Ecological Knowledge of Resource Management in Asia*. Springer Nature Switzerland AG (In Press).
9. Stori F.T., Peres C.M., Turra, A. and Pressey R.L. (2019) Traditional Ecological Knowledge Supports Ecosystem-Based Management in Disturbed Coastal Marine Social-Ecological Systems. *Frontier in Marine Science*, 6:571.
10. Warren D.M., Slikkerveer L.J. and Brokensha, D. (1995) *The cultural dimension of development: Indigenous Knowledge Systems*. Intermediate Technology Publications, London.



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<b>1</b>	<b>BA (Hons.) GEOGRAPHY - DSC</b> 1. CLIMATOLOGY 2. URBAN GEOGRAPHY 3. FUNDAMEMNTALS OF REMOTE SENSING (PRACTICAL)	<b>2-8</b>
<b>2</b>	<b>BA (Prog) with Geography as Major</b> 1. CLIMATOLOGY 2. POPULATION GEOGRAPHY	<b>9-12</b>
<b>3</b>	<b>BA (Prog) with Geography as Non-Major</b> 1. CLIMATOLOGY	<b>13-14</b>
<b>4</b>	<b>Pool of Discipline Specific Electives</b> 1. BIOGEOGRAPHY 2. GEOGRAPHY OF ARID AND SEMI-ARID REGION	<b>15-18</b>
<b>5</b>	<b>Common Pool of Generic Elective</b> 1. CONTEMPORARY ENVIRONMENTAL ISSUES 2. GEOGRPHY OF TOURISM 3. SPATIAL INFORMATION TECHNOLOGY	<b>19-24</b>

## BSC. (HONS.) GEOGRAPHY

### DISCIPLINE SPECIFIC CORE COURSE – 07 (DSC-07): CLIMATOLOGY

#### CREDIT DISTRIBUTION, ELIGIBILITY AND PRE-REQUISITES OF THE COURSE

Course title & Code	Credits	Credit distribution of the course			Eligibility criteria	Pre-requisite of the course (if any)
		Lecture	Tutorial	Practical/ Practice		
CLIMATOLOGY	4	3	1	-	-	-

#### Learning Objectives

The Learning Outcomes of this course are as follows:

- Explaining various dimensions of climatology
- Analysing atmospheric moisture along with disturbances
- An understanding world climatic regions

#### Learning outcomes

The Learning Outcomes of this course are as follows:

- Detailed exposure to climatology.
- In-depth knowledge of atmospheric moisture and cyclonic features.
- Knowledge of the mechanism of monsoon and climatic classification.

#### SYLLABUS OF DSC-07

**Unit-I: Introduction:** Nature, Scope, and Application.

**Unit-II: Atmospheric Moisture:** Humidity-types, Evapotranspiration, Condensation-process and forms (a. clouds, and b. fog), Precipitation- forms and types, Atmospheric Stability and Instability.

**Unit-III: Atmospheric Disturbances:**

- Tropical Cyclones- Characteristics, Mechanism and Distribution.
- Temperate Cyclones- Characteristics, Mechanism (Polar Front Theory) and Distribution.

**Unit-IV: Monsoon:**

- Mechanism of monsoon.

- Global teleconnections in relation to monsoon in India, ENSO, Indian Ocean Dipole Effect.
- Jet Streams and Monsoon in India.

#### **Unit-V: Climatic Classification:**

- Concept and Purpose of Classification.
- Koppen's Classification.

#### **Suggestive Readings**

1. Frederick K. Lutgens, Edward J. Tarbuck, Dennis G. Tasa (2015) The Atmosphere: An Introduction to Meteorology, Pearson Education
2. Barry R. G. and Carleton A. M. (2001) Synoptic and Dynamic Climatology, Routledge, UK. 2
3. Barry R. G. and Corley R. J. (2003) Atmosphere, Weather and Climate, Routledge, New York.
4. Critchfield H. J. (1987) General Climatology, Prentice-Hall of India, New Delhi
5. Lutgens F. K., Tarbuck E. J. and Tasa D. (2009) The Atmosphere: An Introduction to Meteorolog
6. Oliver J. E. and Hidore J.J. (2002) Climatology: An Atmospheric Science, Pearson
7. Trewartha G. T. and Horne L. H. (1980) An Introduction to Climate, McGraw-Hill.
8. Gupta S.L. (2000): Jalvayu Vigyan, Hindi MadhyamKaryanvayNidishalya, Delhi Vishwa Vidhyalaya, Delhi
9. Lal, D. S. (2006): Jalvayu Vigyan, PrayagPustak Bhavan, Allahabad
10. Vatal, M. (1986): BhautikBhugol, Central Book Depot, Allahabad
11. Singh, S. (2009): Jalvayu Vigyan, PrayagPustak Bhawan, Allahabad
12. Malhotra, N. and Sen, S. (2018) Climatology, M K Books, New Delhi

#### **Practical component (if any) - NIL**

**Note:** Examination scheme and mode shall be as prescribed by the Examination Branch, University of Delhi, from time to time.

## DISCIPLINE SPECIFIC CORE COURSE – 08 (DSC-08): URBAN GEOGRAPHY

### Credit distribution, Eligibility and Pre-requisites of the Course

Course title & Code	Credits	Credit distribution of the course			Eligibility criteria	Pre-requisite of the course (if any)
		Lecture	Tutorial	Practical/ Practice		
URBAN GEOGRAPHY	4	3	1	-	-	-

### Learning Objectives

- To familiarize student with the nature and scope of urban geography.
- To understand the morphology and hierarchy in urban system.
- To learn about the importance of urban issues in mega-cities.
- To provide knowledge about urban planning and governance.
- To make students learn about the new perspectives of futuristic cities.

### Learning outcomes

- Comprehend the fundamentals of urbanization, morphology and hierarchy theories that explain the process of urban development.
- Be conversant with the morphology of Indian cities.
- Be Aware about the issues faced in mega cities.
- Have insight into the master plans, renewal plans, UN-Habitat and urban local bodies
- Explore about the concepts of new urbanism, sustainable, smart and inclusive cities.

## SYLLABUS OF DSC-08

### Unit-1: Introduction

Definition of urban; Nature and scope of urban geography; Theories of urban origin (reference Carter).

### Unit-II: Urban Morphology and Hierarchy

Concept and Theories of morphology (Kearsley modified Burgess, Harris & Ullman and White' model; Concept and Theories of Hierarchy - Christaller and Rank size; Morphology of an Indian City (Madurai or Delhi or Jamshedpur) (ONLY ONE).

### Unit-III: Urban Issues in Mega Cities of India

Urban Basic Services (water in detail with reference to Chennai); Housing and slums (Mumbai); Heat island (suitable examples).

### Unit-IV: Urban Planning and Governance

Planning: Concept of Master Plans, AMRUT; Institutions: UN-Habitat, Urban local bodies in India.

### Unit-V: Futuristic Cities

Concept of New Urbanism; Concepts of futuristic cities: sustainable city, smart city, compact city, virtual city, network city, world class city, global city and inclusive

city(no question on individual concept);Sustainable city or smart cityconcept in detail(ONLY ONE).

### **Suggestive Readings**

1. Carter,H.(2010)TheStudyofUrbanGeography,ArnoldPublishers, London.
2. Pacione, M. (2009). Urban Geography: A Global Perspective. Taylor and Francis , UK
3. Fyfe, N. R. and Kenny, J. T. (2020). The Urban Geography Reader. London, UK: Routledge.
4. Kaplan, D. H., Wheeler, J. O. and Holloway, S. R. (2008). Urban Geography,John Wiley, New York
5. Ramachandran, R., (1992). Urbanisation and Urban Systems of India. New Delhi, India: Oxford University Press.
6. Singh, S and Saroha, J. (2021) Urban Geography, Pearson Education.
7. मंडल, आर. बी. (2012) नगरिय भुगोल, काँन्सेप्ट पब्लिशिंग कंपनी, नई दिल्ली।
8. बंसल, एस. सी. (1997) नगरिय भुगोल, मीनाक्षी प्रकाशन, मेरठ।
9. Misra , R.P. (2013) Urbanisation in South Asia, Cambridge University Press, New Delhi
10. Knox, P. L., and McCarthy, L. (2005) Urbanization: An Introduction to Urban Geography, Pearson Prentice Hall, New York
11. Grant, J. (2005) Planning the Good Community: New Urbanism Theory and Practice, Routledge, London
12. Sharma, P. and Rajput, S. (Eds.) (2017). Sustainable Smart Cities in India; Challenges and Future Perspectives, Springer Nature AG, Switzeland
13. Palen, J.J. (2012) The Urban World. Paradigm Publishers, Boulder, USA
14. Graham H. and Colin H. (2003)Sustainable Cities, Routledge, London
15. Singh, R.B., (Ed.) (2015). Urban Development, challenges, risks and Resilience in Asian megacities, Springer

**Practical Component (if any): NIL**

**Note: Examination scheme and mode shall be as prescribed by the Examination Branch, University of Delhi**

## DISCIPLINE SPECIFIC CORE COURSE – 09 (DSC-09): FUNDAMENTALS OF REMOTE SENSING (PRACTICAL)

### Credit distribution, Eligibility and Pre-requisites of the Course

Course title & Code	Credits	Credit distribution of the course			Eligibility criteria	Pre-requisite of the course (if any)
		Lecture	Tutorial	Practical/ Practice		
FUNDAMEMNTALS OF REMOTE SENSING (PRACTICAL)	4	-	-	4		

**Note: one credit of practical is equal to two hours**

### Learning Objectives

The Learning Objectives of this course are as follows:

- To apprise the students with the relevance of Remote Sensing in Geography and the historical growth of Satellites in India and the world.
- To impart the knowledge of fundamentals of remote sensing and its applications.
- To facilitate the students to have hands on experience on different steps of visual interpretation of satellite images & photographs.
- To facilitate the students to have hands on experience on different steps of satellite image processing using one or more software for a geographical application.

### Learning outcomes

On completion of this course, the student shall be able:

- To comprehend the concepts related to remote sensing and in understanding their relevance in geography discipline.
- To enhance their ability in describing the basic principles of image processing, visualization and analysis.
- To enrich their ability to conduct basic image processing of satellite multispectral imagery.

### SYLLABUS OF DSC-09

#### UNIT – I: Introduction to Remote Sensing (2 Weeks)

Meaning and Definition,

Historical Evolution of Remote Sensing

(i) Platforms (Ground, Air, Space)

(ii) Types of Remote Sensing (Passive, Active).

(iii) Resolution Types (Spatial, Spectral, Radiometric, Temporal)

- Satellite data sources/Search engines: EARTHDATA, USGS, GLCF, LP-DAAC
- Software: QGIS, ARCGIS , ERDAS, IDRISI, TerrSet, ENVI, R, SAGA

**UNIT – II: Aerial Photos: Geometry and Types of Aerial Photography, Stereoscope, Annotation, Interpretation Keys, and Interpretation (2 Weeks)**

- Calculation of photo scale
- Orientation of Aerial Photo
- Annotation and Interpretation Keys

**UNIT – III:Satellite Remote Sensing (3 Weeks):** Principles, Resolutions, EMR Interaction with Atmosphere and Earth Surface Features; Major Satellites and Sensors (LANDSAT, IRS, IKONOS, SPOT, MODIS, Sentinel, QUICKBIRD, any two)

- Downloading Bhuvan Data
- Downloading LANDSAT data (EARTHDATA)
- Band-wise reflection of EMR

**UNIT–IV:Satellite Image Processing:** Pre-processing (Radiometric and Geometric Correction); Enhancement (Filtering); Classification Basics (Supervised and Un-supervised), (4 Weeks).

- DN to reflectance conversion
- Geometric Correction

**UNIT – VApplication of Remote Sensing: Land Use Land Cover, Urban Sprawl, Forest Monitoring(3 Weeks).**

- Land Use/Land Cover,
- Urban Sprawl,
- Vegetation Monitoring

**Suggestive readings**

1. Campbell, J. C., and Wynne, R. H. (2022) Introduction to Remote Sensing, 5th ed. The Guilford Press. New York 622p.
2. Jenson, J.R. (2000). Remote Sensing of the environment – An Earth Resource Perspective, Prentice Hall Inc.
3. Jensen, J.R. (2015) Introductory Digital Image Processing: A Remote Sensing Perspective, 4th Edition, Pearson India.
4. Joseph, G. and Jegganathan, C. (2017) Fundamentals of Remote Sensing , 3rd Edition, Universities Press..
5. Leshner, R.B. and Hogan, T. (2019) The View from Space : NASA’S evolving Struggle to understand our Planet, Lawrence, Kansas : University Press of Kansas, 249pp.
6. Lillisand, T. M. and Keifer, R. W. (2011)). Remote Sensing and Image interpretation',3<sup>rd</sup> Edition John Willey and Sons, New York.
7. NASA (2018) EOSDIS Handbook, NASA, 52 pp.([https://www.earthdata.nasa.gov/s3fs-public/imported/EOSDIS\\_Handbook\\_1.5.pdf](https://www.earthdata.nasa.gov/s3fs-public/imported/EOSDIS_Handbook_1.5.pdf))
8. NRSC,ISRO (2015) Bhuvan : User Handbook, NRSC-DPPAWA-GWGSG,NRSC-ISRO, 92 pp.

9. Qihao, W.(2012)An Introduction to Contemporary Remote Sensing, McGraw Hill Pub, ISBN: 9780071740111
10. Sabins, F.F. (2007) Remote Sensing: Principles and Interpretation, 3rd Edition, Waveland Pr, Inc ,ISBN-13-978-1577665076
11. Toro, F.G. and Tsourdos , (2017) UAV OR Drones for Remote Sensing Applications, MDPI, 406 pp,
12. Tempfli, K., Kerle, N., Huurneman, G.C. and Janssen, L.L.F. (Eds) (2009) Principles of Remote Sensing : An Introductory Text Book, ITC: Enschede, The Netherlands.
13. Wegmann M., Leutner, B., Dech, S. (eds) 2016. Remote sensing and GIS for Ecologists. Pelagic Publishing, UK. 331pp.



## Category II

### **Geography Courses for Undergraduate Programme of study with Geography as one of the Core Disciplines**

**(B.A. Programmes with Geography as Major discipline)**

#### **DISCIPLINE SPECIFIC CORE COURSE – 3 (DSC-07): CLIMATOLOGY**

#### **CREDIT DISTRIBUTION, ELIGIBILITY AND PRE-REQUISITES OF THE COURSE**

Course title & Code	Credits	Credit distribution of the course			Eligibility criteria	Pre-requisite of the course (if any)
		Lecture	Tutorial	Practical/ Practice		
CLIMATOLOGY	4	3	1	-	-	-

#### **Learning Objectives**

The Learning Outcomes of this course are as follows:

- Explaining various dimensions of climatology
- Analysing atmospheric moisture along with disturbances
- An understanding world climatic regions

#### **Learning outcomes**

The Learning Outcomes of this course are as follows:

1. Detailed exposure to climatology.
2. In-depth knowledge of atmospheric moisture and cyclonic features.
3. Knowledge of the mechanism of monsoon and climatic classification.

#### **SYLLABUS OF DSC-07**

**Unit-I: Climatology:** Nature, Scope, and Application.

**Unit-II: Atmospheric Moisture:** Humidity-types, Evapotranspiration, Condensation-process and forms (a. clouds, and b. fog), Precipitation- forms and types, Atmospheric Stability and Instability.

**Unit-III: Atmospheric Disturbances:**

- Tropical Cyclones- Characteristics, Mechanism and Distribution.
- Temperate Cyclones- Characteristics, Mechanism (Polar Front Theory) and Distribution.

**Unit-IV: Monsoon:**

- Mechanism of monsoon.
- Global teleconnections in relation to monsoon in India, ENSO, Indian Ocean Dipole Effect.
- Jet Streams and Monsoon in India.

#### **Unit-V: Climatic Classification:**

- Concept and Purpose of Classification.
- Koppen's Classification.

#### **Suggestive Readings**

1. Frederick K. Lutgens, Edward J. Tarbuck, Dennis G. Tasa (2015) The Atmosphere: An Introduction to Meteorology, Pearson Education
2. Barry R. G. and Carleton A. M. (2001) Synoptic and Dynamic Climatology, Routledge, UK. 2
3. Barry R. G. and Corley R. J. (2003) Atmosphere, Weather and Climate, Routledge, New York.
4. Critchfield H. J. (1987) General Climatology, Prentice-Hall of India, New Delhi
5. Lutgens F. K., Tarbuck E. J. and Tasa D. (2009) The Atmosphere: An Introduction to Meteorolog
6. Oliver J. E. and Hidore J.J. (2002) Climatology: An Atmospheric Science, Pearson
7. Trewartha G. T. and Horne L. H. (1980) An Introduction to Climate, McGraw-Hill.
8. Gupta S.L. (2000): Jalvayu Vigyan, Hindi MadhyamKaryanvayNidishalya, Delhi Vishwa Vidhyalaya, Delhi
9. Lal, D. S. (2006): Jalvayu Vigyan, PrayagPustak Bhavan, Allahabad
10. Vatal, M. (1986): BhautikBhugol, Central Book Depot, Allahabad
11. Singh, S. (2009): Jalvayu Vigyan, PrayagPustak Bhawan, Allahabad
12. Malhotra, N. and Sen, S. (2018) Climatology, M K Books, New Delhi

#### **Practical component (if any) - NIL**

**Note:** Examination scheme and mode shall be as prescribed by the Examination Branch, University of Delhi, from time to time.

## DISCIPLINE SPECIFIC CORE COURSE – 4 (DSC-08): URBAN GEOGRAPHY

### Credit distribution, Eligibility and Pre-requisites of the Course

Course title & Code	Credits	Credit distribution of the course			Eligibility criteria	Pre-requisite of the course (if any)
		Lecture	Tutorial	Practical/ Practice		
POPULATION GEOGRAPHY	4	3	1	-	-	-

### Learning Objectives

- To familiarize students with the nature and scope of urban geography.
- To understand the morphology and hierarchy in urban system.
- To learn about the importance of urban issues in mega-cities.
- To provide knowledge about urban planning and governance.
- To make students learn about the new perspectives of futuristic cities.

### Learning outcomes

- Comprehend the fundamentals of urbanization, morphology and hierarchy theories that explain the process of urban development.
- Be conversant with the morphology of Indian cities.
- Be Aware about the issues faced in mega cities.
- Have insight into the master plans, renewal plans, UN-Habitat and urban local bodies
- Explore about the concepts of new urbanism, sustainable, smart and inclusive cities.

## SYLLABUS OF DSC-08

### Unit-1: Introduction

Definition of urban; Nature and scope of urban geography; Theories of urban origin (reference Carter).

### Unit-II: Urban Morphology and Hierarchy

Concept and Theories of morphology (Kearsley modified Burgess, Harris & Ullman and White' model; Concept and Theories of Hierarchy - Christaller and Rank size; Morphology of an Indian City (Madurai or Delhi or Jamshedpur) (ONLY ONE).

### Unit-III: Urban Issues in Mega Cities of India

Urban Basic Services (water in detail with reference to Chennai); Housing and slums (Mumbai); Heat island (suitable examples).

### Unit-IV: Urban Planning and Governance

Planning: Concept of Master Plans, AMRUT; Institutions: UN-Habitat, Urban local bodies in India.

### Unit-V: Futuristic Cities

Concept of New Urbanism; Concepts of futuristic cities: sustainable city, smart city, compact city, virtual city, network city, world class city, global city and inclusive city (no question on individual concept); Sustainable city or smart city concept in detail (ONLY ONE).

### **Suggestive Readings**

16. Carter, H. (2010) *The Study of Urban Geography*, Arnold Publishers, London.
17. Pacione, M. (2009). *Urban Geography: A Global Perspective*. Taylor and Francis, UK
18. Fyfe, N. R. and Kenny, J. T. (2020). *The Urban Geography Reader*. London, UK: Routledge.
19. Kaplan, D. H., Wheeler, J. O. and Holloway, S. R. (2008). *Urban Geography*, John Wiley, New York
20. Ramachandran, R., (1992). *Urbanisation and Urban Systems of India*. New Delhi, India: Oxford University Press.
21. Singh, S and Saroha, J. (2021) *Urban Geography*, Pearson Education.
22. मंडल, आर. बी. (2012) *नगरिय भुगोल, कॉन्सेप्ट पब्लिशिंग कंपनी, नई दिल्ली।*
23. बंसल, एस. सी. (1997) *नगरिय भुगोल, मीनाक्षी प्रकाशन, मेरठ।*
24. Misra, R.P. (2013) *Urbanisation in South Asia*, Cambridge University Press, New Delhi
25. Knox, P. L., and McCarthy, L. (2005) *Urbanization: An Introduction to Urban Geography*, Pearson Prentice Hall, New York
26. Grant, J. (2005) *Planning the Good Community: New Urbanism Theory and Practice*, Routledge, London
27. Sharma, P. and Rajput, S. (Eds.) (2017). *Sustainable Smart Cities in India; Challenges and Future Perspectives*, Springer Nature AG, Switzerland
28. Palen, J.J. (2012) *The Urban World*. Paradigm Publishers, Boulder, USA
29. Graham H. and Colin H. (2003) *Sustainable Cities*, Routledge, London
30. Singh, R.B., (Ed.) (2015). *Urban Development, challenges, risks and Resilience in Asian megacities*, Springer

**Practical Component (if any): NIL**

**Note: Examination scheme and mode shall be as prescribed by the Examination Branch, University of Delhi**

### Category III

## Geography Courses for Undergraduate Programme of study with Geography as one of the Core Disciplines

(B.A. Programmes with Geography as non-Major or Minor discipline)

### DISCIPLINE SPECIFIC CORE COURSE – 5 (DSC-07): CLIMATOLOGY

#### Credit distribution, Eligibility and Pre-requisites of the Course

Course title & Code	Credits	Credit distribution of the course			Eligibility criteria	Pre-requisite of the course (if any)
		Lecture	Tutorial	Practical/ Practice		
CLIMATOLOGY	4	3	1	-	-	-

#### Learning Objectives

The Learning Outcomes of this course are as follows:

- Explaining various dimensions of climatology
- Analysing atmospheric moisture along with disturbances
- An understanding world climatic regions

#### Learning outcomes

The Learning Outcomes of this course are as follows:

1. Detailed exposure to climatology.
2. In-depth knowledge of atmospheric moisture and cyclonic features.
3. Knowledge of the mechanism of monsoon and climatic classification.

#### SYLLABUS OF DSC-07

**Unit-I: Climatology:** Nature, Scope, and Application.

**Unit-II: Atmospheric Moisture:** Humidity-types, Evapotranspiration, Condensation-process and forms (a. clouds, and b. fog), Precipitation- forms and types, Atmospheric Stability and Instability.

**Unit-III: Atmospheric Disturbances:**

- Tropical Cyclones- Characteristics, Mechanism and Distribution.
- Temperate Cyclones- Characteristics, Mechanism (Polar Front Theory) and Distribution.

**Unit-IV: Monsoon:**

- Mechanism of monsoon.

- Global teleconnections in relation to monsoon in India, ENSO, Indian Ocean Dipole Effect.
- Jet Streams and Monsoon in India.

#### **Unit-V: Climatic Classification:**

- Concept and Purpose of Classification.
- Koppen's Classification.

#### **Suggestive Readings**

1. Frederick K. Lutgens, Edward J. Tarbuck, Dennis G. Tasa (2015) The Atmosphere: An Introduction to Meteorology, Pearson Education
2. Barry R. G. and Carleton A. M. (2001) Synoptic and Dynamic Climatology, Routledge, UK. 2
3. Barry R. G. and Corley R. J. (2003) Atmosphere, Weather and Climate, Routledge, New York.
4. Critchfield H. J. (1987) General Climatology, Prentice-Hall of India, New Delhi
5. Lutgens F. K., Tarbuck E. J. and Tasa D. (2009) The Atmosphere: An Introduction to Meteorology
6. Oliver J. E. and Hidore J.J. (2002) Climatology: An Atmospheric Science, Pearson
7. Trewartha G. T. and Horne L. H. (1980) An Introduction to Climate, McGraw-Hill.
8. Gupta S.L. (2000): Jalvayu Vigyan, Hindi MadhyamKaryanvayNidishalya, Delhi Vishwa Vidhyalaya, Delhi
9. Lal, D. S. (2006): Jalvayu Vigyan, PrayagPustak Bhavan, Allahabad
10. Vatal, M. (1986): BhautikBhugol, Central Book Depot, Allahabad
11. Singh, S. (2009): Jalvayu Vigyan, PrayagPustak Bhawan, Allahabad
12. Malhotra, N. and Sen, S. (2018) Climatology, M K Books, New Delhi

#### **Practical component (if any) - NIL**

**Note:** Examination scheme and mode shall be as prescribed by the Examination Branch, University of Delhi, from time to time.

**COMMON POOL OF DISCIPLINE SPECIFIC ELECTIVE (DSE) COURSES  
OFFERED BY THE DEPARTMENT OF GEOGRAPHY**

**DISCIPLINE SPECIFIC ELECTIVE COURSE – 01 (DSE-01): BIOGEOGRAPHY**

**Credit distribution, Eligibility and Pre-requisites of the Course**

Course title & Code	Credits	Credit distribution of the course			Eligibility criteria	Pre-requisite of the course	Department offering the course
		Lecture	Tutorial	Practical/ Practice			
BIOGEOGRAPHY	4	3	1	-	-	-	GEOGRAPHY

**Course Objectives:**

- To understand various dimensions of biogeography.
- To get detailed analysis of energy cycles and their function.
- To understand the concept of ecological succession and various biogeographical processes.
- To identify geographical distribution of flora and fauna of the world.
- To realize and understand the conservation of biodiversity.

**Learning Outcome:**

- Detailed exposure of biogeography and biodiversity.
- In-depth knowledge of circulation of biogeochemical cycles.
- Functionality of the biogeographical processes.
- Knowledge of Phytogeographical realms and Zoogeographical realms.
- Develop understanding of the global level efforts to conserve biodiversity.

**SYLLABUS OF DSE-01**

**Unit-I:** Biogeography- Nature, Approaches, significance and Scope.

**Unit-II:** Biogeographical Processes- Dispersal, Speciation, Ecological Succession, Extinction.

**Unit-III:** Biogeochemical Cycles- Oxygen, Carbon and Nitrogen.

**Unit-IV:** Geographical Distribution of flora and fauna- Phytogeographical realms, Zoogeographical realms (with specific reference to Wallace and Weber line)- Basis and Classification.

**Unit-V:** Conservation: In situ and ex situ, CBD (Convention on Biodiversity).

## Suggestive Readings:

1. Bhattacharyya, N.N. (2003). Biogeography. New Delhi, India: RajeshPublications.
2. Huggett, R.J. (1998). Fundamentals of Biogeography, USA:Routledge
3. Lomolino, Mark. V., 2020, Biogeography: A Very Short Introduction,Oxford Publication, ISBN:9780198850069
4. Cox, C.B, et.al, 2016, Biogeography: An Ecological and Evolutionary Approach,9th Edition,Wiley-Blackwell.
5. Taylor, J.A., 2021, Themes in Biogeography, Routledge, Taylor and Francis publications, ISBN9780367351106
6. Pielou, E.C., 1979, Biogeography, John Wiley & Sons, USA.  
10: 0471058459ISBN 13:9780471058458
7. L.C Aggarwal, 2018, Biogeography, Rawat publicationJaipur
8. Mathur, H.S. (1998). Essentials of Biogeography. Jaipur, India: AnujPrinters.
9. Singh,Savindra. (2015). JaivBhoogol (Hindi). Allahabad, India: PrayagPushtak Bhawan
10. Sivaperuman, Chandrakasan et al. (2018). Biodiversity and ClimateChange Adaptation in Tropical Islands. London, UK: AcademicPress.



## DISCIPLINE SPECIFIC ELECTIVES (DSE-02): GEOGRAPHY OF ARID AND SEMI-ARID REGION

### Credit distribution, Eligibility and Pre-requisites of the Course

Course title & Code	Credits	Credit distribution of the course			Eligibility criteria	Pre-requisite of the course	Department offering the course
		Lecture	Tutorial	Practical/ Practice			
GEOGRAPHY OF ARID AND SEMI-ARID REGION	4	3	1	-	-	-	GEOGRAPHY

#### Course Objectives:

- To evolve the understanding of the regional dimensions of arid and semi-arid regions.
- To correlate the physical dimensions with human perspectives as population size and occupation of arid regions.
- To understand the challenges of aridity in global perspective and measures of sustainability.

#### Learning Outcome:

- Developing the skill to differentiate the geographical unquities on space.
- Comprehend the regional knowledge of arid regions for the application of social welfare.
- Analysis and evaluation of regional geographical parameters of aridity related to its challenges and livelihood security.

### SYLLABUS OF DSE-02

**Unit-I:** Introduction: Extent, Characteristics and Determinants of arid and semi-arid regions of the world

**Unit-II:** Climate and Vegetation: Types and characteristics.

**Unit-III:** Human Aspects: Population distribution and major tribes.

**Unit-IV:** Economic Aspects: Agriculture, Livestock rearing and tertiary activities.

**Unit-V:** Challenges and sustainability: Desertification, land degradation, biodiversity loss and practices of livelihood security.

#### Suggestive Readings:

1. Hill, Michael, 2002, Arid and Semi-Arid Environments, Hodder Murray, London.
2. Campos-Lopez, Enrique and Anderson, Robert J. (eds), 2018, Natural Resources and Development in Arid Regions, Routledge, Newyork.
3. Goudie, Andrew, S., 2013, Arid and Semi-Arid Geomorphology, Cambridge University Press.

4. Ferguson, Gabriel, 2015, Arid and Semi-Arid Environments, NOVA.
5. Whitford, W.G. and Duval, B.D., 2019, Ecology of Desert Systems, Elsevier.
6. Laity. J., 2018, Deserts and Desert Environments, Wiley Blackwell.
7. Sharma, R.C., 1998, Thar: The Great Indian Deserts, Roli Books.
8. Warner, T., 2004, Desert Meteorology, Cambridge University Press.
9. Bhandari, M.M. and Vyas, S.P. 2019, Flora of The Indian Desert: Their Economic And Medicinal Value, Scientific Publishers.
10. Walton, Kenneth, 2009, The Arid Zones, Aldine Transactions, New Brunswick (UDA), London (UK).
11. Gritzner, Charles F., 2007, Geography of Extreme Environments: Deserts, Chelsea House, Newyork.
12. Aleshire, Peter, 2008, The Extreme Earth: Deserts, Chelsea House, Newyork.

## GENERIC ELECTIVES (GE-07): CONTEMPORARY ENVIRONMENTAL ISSUES

### Credit distribution, Eligibility and Pre-requisites of the Course

Course title & Code	Credits	Credit distribution of the course			Eligibility criteria	Pre-requisite of the course	Department offering the course
		Lecture	Tutorial	Practical/ Practice			
CONTEMPORARY ENVIRONMENTAL ISSUES	4	3	1	-	-	-	GEOGRAPHY

### Learning Objectives

- To understand the basic concepts of human environment and the resultant impact.
- To evaluate the contemporary environmental issues world over.
- To assess each problem in detail along with a case study of the best practices in the world.
- To discuss the global level initiatives or policies related to these issues.

### Learning Outcomes

- The changes that have taken place due to the human impact on nature.
- Recognize the concept of planetary boundaries and how humanity has already crossed the tipping point.
- Have an understanding of both the problems and some specific solutions.
- An in-depth understanding on the global policies and where the world stands today.
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## SYLLABUS OF GE-07

### Unit-I:

Understanding the human environment relationship and its historical progression, concept of planetary boundaries.

### Unit-II:

Biodiversity Loss (causes and impacts), Conservation and Global initiatives, Case study on best practices.

### Unit-III:

Pollution- Air and Water (causes and impacts), Solid Waste (impact and management), Global initiatives, case Study on best practices.

### Unit-IV:

Land Degradation (causes and impacts), Global initiatives, Case Study on best practices.

### Unit-V:

Climate Change: Concept, Adaptation and Mitigation.

### Suggested Readings

1. Brusseau M L, Pepper I L and Gerba C P (2019) Environmental and Pollution Science, Academic Press, USA.

2. Cunningham, WP and Cunningham, M A (2004) *Principals of Environmental Science: Inquiry and Applications*, Delhi: Tata Macgraw Hill.
3. Goudie A (2001) *The Nature of the Environment*, Blackwell, Oxford, UK: Blackwell.
4. Haris F (Ed) (2004) *Global Environmental Issues*, John Wiley and Sons, W Sussex.
5. Kemp D D(1994)*Global Environmental Issues: A Climatological Approach*, Routledge London and NY.
6. Pickering K T and Owen L A (2017)*An Introduction to Global Environmental Issues*, Routledge London (eBook).
7. Raven P H, Berg L R, Hassenzehl D M et al. (2015) *Environment*, John Wiley and Sons, Jefferson City.
8. Rich Nathalien(2020) *Losing Earth: A Recent History*, Picador, New York.
9. Rockstrom J and Gaffney O (2021) *Breaking Boundaries: The Science of Our Planet*, Penguin Random House LLC.
10. Sivaperuman, Chandrakasan. et al. (2018) *Biodiversity and Climate Change Adaptation in Tropical Islands*, London, UK: Academic Press.
11. Tsing A Lowenhaupt et al. (Ed) (2017) *Arts of Living on a Damaged Planet: Ghosts and Monsters of the Anthropocene*, University of Minnesota Press, Minneapolis.
12. Wright RT and Boorse DF (2010) *Towards a Sustainable Future*, PHI Learning Pvt Ltd, New Delhi.

## GENERIC ELECTIVES (GE-08): GEOGRAPHY OF TOURISM

### Credit distribution, Eligibility and Pre-requisites of the Course

Course title & Code	Credits	Credit distribution of the course			Eligibility criteria	Pre-requisite of the course	Department offering the course
		Lecture	Tutorial	Practical/ Practice			
GEOGRPHY OF TOURISM	4	3	1	-	-	-	GEOGRAPHY

### Course Objectives

- To be aware of the various dimensions of Geography of Tourism.
- To make the students aware about the growth and development of international and domestic tourism with its positive and negative impacts.
- To assess sustainable ecotourism and other contemporary forms of tourism with help of case study.
- To critically evaluate the infrastructure in tourism in India along with reviewing the tourism policy.

### Learning Outcome:

- Equip with a basic understanding of nature and scope of geography of tourism and various types of tourists and tourism.
- Have sound knowledge of geographical, environmental, and socio-cultural aspects of tourism.
- Apply the principles of sustainable tourism and analyse the prospects and problems associated with unsustainable tourism activities

## SYLLABUS OF GE-08

### Unit-I:

Introduction to Geography of Tourism; Nature and Scope; Tourism, Recreation and Leisure; Types of Tourism and Types of Tourists

### Unit-II:

Factors affecting Tourism: Growth and Development of International and Domestic Tourism.

### Unit-III:

Significance of Tourism, Impact on Environment, Economy, Society and Culture.

### Unit-IV:

Contemporary Forms of Tourism: Sustainable - Ecotourism (Case Study), Geo-Heritage (Case Study), Space tourism, E-Tourism, MICE.

### Unit-V:

Tourism Infrastructure Development in India, National Tourism Policy of India.

### Suggested Readings

1. Brian Boniface, Chris Cooper, Robyn Cooper., Worldwide Destinations: The Geography of Travel and Tourism(8th edition, 2020)

2. Douglas G. Pearce., Tourist Development (Topics in applied geography). 1981 3rd Edition
3. Stephen Williams, Alan A. Lew., Tourism Geography- Critical Understandings of Place, Space and Experience
4. Velvet Nelson., An Introduction to the Geography of Tourism, 3rd edition, 2021
5. Maria Giaoutzi., Tourism and Regional Development - New pathways (economic geography series) 2017.. Routledge
5. Stephen Hall, C. Michael and J. Page., The Geography of Tourism and Recreation: Environment, Place and Space. 4th edition, 2014. Routledge
6. पर्यटन का भूगोल (Geography of Tourism) Chaturbhuj Mamoria and Komal Singh
7. पर्यटन भूगोल: प्रा.के.ए. खतीब, मेहता पब्लिशिंग हाऊस
8. Kapoor, B.K. (2008) Paryatan Bhugol, Vishwa Bharti Publication, Delhi.
9. E Book of India Tourism Statistics, 2022. Ministry of Tourism, Govt. of India.
10. UNWTO, 2022. Tourism Data Dashboard.

## GENERIC ELECTIVES (GE-09): SPATIAL INFORMATION TECHNOLOGY

### Credit distribution, Eligibility and Pre-requisites of the Course

Course title & Code	Credits	Credit distribution of the course			Eligibility criteria	Pre-requisite of the course	Department offering the course
		Lecture	Tutorial	Practical/ Practice			
SPATIAL INFORMATION TECHNOLOGY	4	3	1	-	-	-	GEOGRAPHY

### Course Objectives:

1. The main objective of this course is to give students an insight on the concepts of spatial information technology.
2. The paper discusses the concept, historical developments, functioning and application of spatial information technology in detail.

### Learning Outcome:

1. Will be familiar with the concept, components of SIT.
2. Will gain knowledge on various data sources, structures, and their interpolation and modeling.
3. Will acquire in-depth knowledge of various functions applied in SIT.
4. Will gather detailed information on the application of SIT in various fields of mapping.

### SYLLABUS OF GE-00

**Unit-I:** Introduction: Definitions, Concept, Components and Historical Development.

**Unit-II:** Spatial Information/Data: Web data sources; Registration and projection; Data types structures; Data interpolation and modelling.

**Unit-III:** Working on spatial information system: Data creation with GIS software's, making layers, data editing and cleaning, spatial and non-spatial data linking, extracting information.

**Unit-IV:** Functions of Spatial Information System: Overlay Analysis; Buffer Analysis, Network Analysis.

**Unit-V:** Application of Spatial Information Technology for sustainable development.

### Suggested Readings

1. D. Tomlin. (1990). *Geographic Information Systems and Cartographic Modeling*. USA: Prentice-Hall, Englewood Cliffs, NJ, ISBN0-13-350927-3.

2. Esperança and Samet, H. (1997). *An overview of the spatial data base system, to appear in Communications of the ACM.* (<http://www.cs.umd.edu/~hjs/pubs/sandprog.ps.gz>)
3. Heywood, I., Comelius, S., and Carver, S. (1988). *An Introduction to Geographical Information Systems.* NewYork , USA: Addison Wiley Longmont.
4. Samet, H. (1990). *Applications of Spatial Data Structures: Computer Graphics, Image Processing, and GIS.* USA: Addison-Wesley, Reading, MA, ISBN 0-201- 50300-0.
5. Samet, H. (1990). *The Design and Analysis of Spatial Data Structures.* USA: Addison-Wesley, Reading, MA, ISBN0-201-50255-0.
6. Samet, H. (1995). *Spatial Data Structures in Modern Database Systems: The Object Model, Interoperability, and Beyond,* W. Kim, (Ed.,) USA: Addison-Wesley/ACM Press, 361.
7. <http://www.cs.umd.edu/~hjs/pubs/kim.ps>
8. <http://www.cs.umd.edu/~hjs/pubs/kim2.ps>



