

## JSS COLLEGE FOR WOMEN (AUTONOMOUS)



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Saraswathipuram, Mysore-570009

# DEPARTMENT OF GEOGRAPHY

**PROCEEDINGS OF BOS - STRUCTURE AND DETAILED SYLLABUS** 

## **UNDER NEP**

Four year Multidisciplinary Undergraduate Programme

with Multiple Exit Options in



## GEOGRAPHY

B.A. / B.Sc. Geography Degree (Basic/Honours) Effective from 2021 - 2022 **Syllabus Aims:** The aims of the syllabus describe the B.A. / B.Sc program in geography at 5<sup>th</sup>, 6<sup>th</sup>, 7<sup>th</sup> & 8<sup>th</sup> Level. These aims outline the educational context in which syllabus content should be viewed. Many of these aims may be delivered by the use of suitable case-studies, through application of geographic al skills and practical field visits.

## B.A/B.Sc Semester 1

Title of the Course: Fundamentals of Physical Geography Code: GEOGDSC T1.1

Number of Theory	Number of lecture	Number of	Number of practical
Credits	hours/ semester	practical Credits	hours/ semesters
4	56 or 64	2	56 or 64

#### **Course Outcomes:**

- 1. After the completion of this course, students should be able to:
- Define the field of Geomorphology and to explain the essential principles of it.
   To outline the mechanism of dynamic nature of the Earth's surface and interior of the
- Earth.
- 4. To illustrate and explain the forces affecting the crust of the earth and its effect on it.

5. 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.

52/56Hrs
13/14
13/14
13/14

Unit – 4 Evolution of Landforms	13/14
Evolution of Landforms	
Landforms: Meaning, types & factors controlling landforms development	
Concept of Cycle of Erosion – W.M. Davis	
Agents of <u>Denudation</u> : River, Groundwater, Sea waves, Wind and	
Glaciers and resultant landforms.	
Case Studies: Agents of Denudation.	

- 1. Hugar M R Physical Geography part 1(Kannada Version)
- 2. Kolhapure and S SNanjan, Physical Geography (Kannada Version)
- 3. Nanjannavar S S: Physical Geography (Kannada Version)
- 4. P Mallappa, Physical Geography (Kannada Version)
- 5. Ranganath Principles of Physical Geography (Kannada Version)

#### **Reference Websites**

- 1. http://www.solarviews.com/eng/earth.htm
- 2. http://www.moorlandschool.co.uk/earth/tectonic.htm
- 3. https://www.usgs.gov/
- 4. https://www.ksndmc.org/

## GEOGDSCP1.1 Geomorphology Practical CREDIT: 02 Content of Practical Course 1: List of Experiments to be conducted

**Exercise-1**: Identification of Rocks and Minerals. <u>Mineral samples</u>: Iron

ore, Bauxite ore and Manganese. <u>Rock Samples</u>: Granite, Basalt, Lime Stones, Sandstone, Quartzite and Marble.

**Exercise-2**: <u>Extraction and interpretation</u> of Geomorphic information from Topographical maps

**Exercise-3**: Preparation of contour map from Toposheet, Construction of Relief Profiles: Serial, Super imposed, Projected & Composite.

**Exercise-4**: <u>Slope Analysis</u> - Slope Maps (Wentworth method) Slope

calculation and conversion (Isotan and Isosin) on the basis of Toposheets.

Contour Relief Features: Conical Hill, Uniform and Undulating Slopes,

Concave and Convex Slopes, U and V Shaped Valley and Waterfalls.

**Exercise-5**: <u>Drainage Morphometry</u>: delineation of watershed, stream ordering

<u>Morphometric analysis</u>: mean stream length, drainage density and drainage frequency.

Field Work: Related to local land formation and degradation.

#### B.A. / BSc Semester 1

Title of the Course: GEOGOE T1.1 - 1. Introduction to Physical Geography

Number of Theory Credits	Number of lecture hours/ ser	nester
3	42 - 45	
<ul> <li>Course Outcomes:</li> <li>1. Students will be able to understand the stands basic terminology used forms.</li> <li>3. Describe elements of the atmosphere</li> </ul>	he fundamental concepts in Earth Sc to describe physical processes and lar and the oceans	iences ndscape
<ul> <li>Course Objectives:</li> <li>This course aims to <ol> <li>Study basic principles of the Earth So</li> <li>Understand the landforms, atmosphe oceanography</li> </ol> </li> </ul>	ciences pric elements and structure and basic	s of
Content of Theory Cou	1rse 1 42	/45Hrs
Unit – 1	11	
<u>Movement of the Earth</u> - Rotation & Revolumered Revolumered Revolumered Revolumered Revolumered Revolution Re	tion, Effects of the Earth e.	
Unit – 2	11	
<u>Rocks</u> - types, significance, <u>Weathering</u> – types. <u>Agents of Denudation</u> - River, Glacier, Wind Volcanicity, Earthquakes and Tsunamis	l and Under Ground water.	
Unit – 3	11	
<u>Structure and Composition</u> of Atmosphere, <u>Weather and Climate</u> . Atmospheric <u>Temperature</u> , Heat Budget of t Atmospheric <u>Pressure</u> , Winds and Precipita	the atmosphere <u>tion</u>	
Unit – 4	1	2
<u>Distribution</u> of Land and Sea,. <u>Submarine Relief</u> of the Ocean, <u>Temperatur</u> <u>Ocean Tides</u> , Waves and Deposits, <u>Ocean currents</u> - Atlantic, Pacific and India Marine Resources: Biotic Mineral and Enco	re & <u>Salinity</u> of Sea Water. n Oceans.	

#### References

- 1. B.S. Negi (1993) Physical Geography. S.J. Publication, Meerut
- 2. D.S. Lal (1998) Climatology. Chaitnya publishing house, Allahabad
- 3. K. Siddhartha (2001) Atmosphere, Weather and Climate. Kisalaya publication, NewDelhi
- 4. R.N. Tikka (2002) Physical Geography. KedarnathRamnath& co, Meerut.
- 5. Willian D. Thornbury (1997) Principle of Geomorphology. New Age International (Pvt Ltd.) New Delhi.

Number of Theory Credits	Number of lecture hours/ semester	r
3	42 - 45	
<ul> <li>Course Outcomes:</li> <li>1. This course is to make us and to impart necessary interpretation to the stud in remote sensing.</li> <li>2. Students will learn how t understanding of biophysical statements.</li> </ul>	nderstand the basic concepts of Remote s skills of remote sensing analysis, and im- lents. So that, students acquire employal to handle and process the satellite images sical phenomena of the earth system.	Sensing age ble skills s for
<ul> <li>Course Objectives: <ol> <li>To congregate the basic c principles of remote sensing integration of remote sensin</li> <li>To study basics of digital techniques.</li> <li>To study the applications problems.</li> </ol> </li> </ul>	oncepts and fundamentals of physical g 2. To create a firm basis for successful ag in any field of application. image processing and image interpretati s of the remote sensing to solve the real-w	on vorld
Content of Theory Course 1		52/56Hrs
Unit – 1 Introduction		11
Definition of Remote Sensing, of	levelopmental stages, Laws of Physics,	
and applications. Types-Satelli telemetry of satellites.	tes, Sensors, Payloads, Orbits,	
and applications. Types-Satelli telemetry of satellites. <b>Process and types of Remote</b>	tes, Sensors, Payloads, Orbits, Sensing	11
and applications. Types-Satelli telemetry of satellites. <b>Process and types of Remote</b> Process of remote sensing, inte and targets, atmospheric noise of remote sensing, optical remote spectrum, thermal remote sensing spectral remote sensing, LADA	Sensing raction of radiation with atmosphere s, attenuation in radiance, resolutions ote sensing, visible region of the sing, microwave remote sensing, Hyper R, and other remote sensing Platforms.	11
and applications. Types-Satelli telemetry of satellites. <b>Process and types of Remote</b> Process of remote sensing, inte and targets, atmospheric noise of remote sensing, optical remote spectrum, thermal remote sensing spectral remote sensing, LADA <b>Unit – 3 Image Classification</b>	Sensing raction of radiation with atmosphere es, attenuation in radiance, resolutions ote sensing, visible region of the sing, microwave remote sensing, Hyper R, and other remote sensing Platforms.	11
and applications. Types-Satelli telemetry of satellites. <b>Process and types of Remote</b> Process of remote sensing, inte and targets, atmospheric noise of remote sensing, optical remote spectrum, thermal remote sensing spectral remote sensing, LADA <b>Unit – 3 Image Classification</b> Satellite products and its spect band ratios; Land use land cov NRSC; Visual image interpretation and interpretation keys. Image unsupervised, and principal co assessment.	Sensing raction of radiation with atmosphere s, attenuation in radiance, resolutions ote sensing, visible region of the sing, microwave remote sensing, Hyper R, and other remote sensing Platforms. and Interpretation tral characteristics, composite images, rer classification schemes-Anderson and tion, elements, stages of interpretation classification- supervised, omponent analysis (PCA) and accuracy	11
and applications. Types-Satelli telemetry of satellites. <b>Process and types of Remote</b> Process of remote sensing, inte and targets, atmospheric noise of remote sensing, optical remote spectrum, thermal remote sensing spectral remote sensing, LADA <b>Unit – 3 Image Classification</b> Satellite products and its spect band ratios; Land use land cov NRSC; Visual image interpretation and interpretation keys. Image unsupervised, and principal co assessment. <b>Unit – 4 Applications of Remo</b>	Sensing raction of radiation with atmosphere s, attenuation in radiance, resolutions ote sensing, visible region of the sing, microwave remote sensing, Hyper R, and other remote sensing Platforms. and Interpretation tral characteristics, composite images, rer classification schemes-Anderson and tion, elements, stages of interpretation classification- supervised, omponent analysis (PCA) and accuracy ote Sensing	11 11 12

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- 2. Introduction to Remote Sensing and Image Interpretation (2003); Lillesand T.M.
- 3. Introduction to Remote Sensing, Fifth Edition (2011); James B. Campbell, Randolph H.W ynne
- 4. Introductory Digital Image Processing: A Remote Sensing Perspective, Fourth Edition (2015) John R. Jensen
- 5. Practical handbook of remote sensing, First Edition (2016) Lavender, Andrew, Lavender, Samantha
  - <u>Website</u>
- 1. https://onlinecourses.nptel.ac.in/noc19\_ce41/preview

### B.A. / BSc Semester 2

#### Title of the Course: Introduction to Climatology and Oceanography

#### **CODE:** GEOGDSC T2.1

Number of Theory Credits	Number of lecture hours/ semester	Number of practical Credits	Number of p hours/ sem	ractical esters
4	52 or 56	2	52 or 5	6
<b>Course Outcomes:</b>				
<ul> <li>After the completion</li> <li>1. define the field of composition and</li> <li>2. to outline the me surface and to ex to time and space</li> <li>3. to illustrate and of the formation of t</li> <li>4. to understand an ofCondensation a</li> </ul> <b>Course Objectives:</b> <ul> <li>This course aims to:</li> <li>1. to define the field</li> <li>2. to introduce variant</li> <li>3. to understand the</li> <li>4. to study the condition</li> </ul>	a of this course, s climatology and structure. chanism and pro chanism and pro chanism and pro chant the tempe chant the tempe chant the air pr the Atmospheric 1 and formation of p chant formation of p chant of climatology a cous dimensions of the global atmospheric cept of atmospheric	tudents should be to understand th cess of solar radia erature distributio essure system, with Disturbance. In humidity as well precipitation and and components of of climatology like heric pressure, ter ric moisture and	e able to e atmospheric ation transfer to ea on and variation ac and regulating force and regulating force and regulating force and regulating force the climate system e structure and com- mperature, and wing its types	arth ccording ces and e process em mposition. ind system.
<b>Content of Theory</b>	Course 1			52/56Hrs
Unit – 1 Compositio	on and Structure	e of the Atmosph	ere	14
Nature and Scope of Atmospheric Science Origin and structure Mesosphere, Ionosp Composition of the a	f Climatology, es; Climatology a e of the Atmosphe here, Exosphere a atmosphere Weat	nd Meteorology ere: Troposphere, and their charact her and Climate	Stratosphere, eristics.	
Unit – 2 Atmospher	ic Temperature			14

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Insolation: Definition, Mechanism, Solar Constant.	
Sunspots, Distance between the earth and the sun, effect of the	
atmosphere.	
Heating and cooling process of the atmosphere-Radiation,	
Conduction, convection, and advection.	
Temperature: meaning and Influencing Factors on the	
Distribution of Temperature Distribution of the temperature:	
Budget: Incoming shortwaye solar radiation. Outgoing Longwaye	
Terrestrial radiation.	
Unit – 3 Atmospheric Pressure, Winds and Moisture / Humidity	14
Atmospheric Pressure: Influencing factors on atmospheric pressure.	
<u>Pressure</u> : Vertical and Horizontal Distribution of the atmospheric	
Pressure and Pressure Belts, Pressure Gradient.	
winds-Cyclones and Anti-Cyclones	
Humidity and there types	
Clouds there types and	
Types of <u>Precipitation</u> .	
Unit – 4 Oceanography	14
Relief features of Ocean floor.	
Ocean Temperature, Density and Salinity.	
<u>Ocean Tides</u> .	
Ocean Currents: Pacific, Atlantic and Indian Ocean Currents.	
<u>Ocean Deposits</u> : Coral Reefs and Atolls.	

- 1. Lal, D. S. (1998). Climatology. Allahabad: Chaitanya Publishing House.
- 2. P Mallappa, Physical Geography (Kannada Version)
- 3. Ranganath Principles of Physical Geography (Kannada Version)
- 4. Nanjannavar S S: Physical Geography (Kannada Version)
- 5. Hugar M R Physical Geography part 1(Kannada Version)
- 6. Goudar M B, Physical Geography (Kannada Version)
- 7. Kolhapure and S SNanjan, Physical Geography (Kannada Version)
- 8. Lutgens, Frederic K. & Tarbuck, Edward J. (2010). The Atmosphere: An Introduction to Meteorology. New Jersey: Pearson Prentice Hall.
- 9. Oliver, John E. &Hidore, John J. (2003). Climatology: An Atmospheric Science. Delhi: Pearson Education.
- 10. Singh, S. (2005). Climatology. Allahabad: PrayagPustakBhawan.
- 11. Barry, R.G. and Chorley, R.J. (2003): Atmosphere, Weather and Climate; Psychology Press, Hove; East Sussex.
- 12. Critchfield, H.J., (1975): general Climatology, Prentice Hall, New Jersey.
- 13. Mather, J.R. (1974): Climatology: Fundamentals and Applications; Mc Craw Hill Book Co., U.S.A.
- 14. Rumney, G.R. (1968): Climatology and the World Climates, Macmillan, London.
- 15. Trewartha, G.T. (1980): An Introduction to Climate; McGraw Hill, New York, 5th edition, (International Student Edition)

#### **Reference Websites**

- 1. https://earthobservatory.nasa.gov/
- 2. https://mausam.imd.gov.in/
- 3. https://www.weatheronline.in/
- 4. https://earthexplorer.usgs.gov/
- 5. https://www.nhc.noaa.gov/satellite.php

### GEOGDSC P2.1- Climatology Practical CREDITS: 02 Content of Practical Course 1: List of Experiments to be conducted

Conduct all exercises with Goal, Procedure, devices, and findings.

**Exercise 1**: Understanding <u>Structure and Functions</u> of the Indian Meteorological Department (IMD).

**Exercise 2:** Collection of temperature data from IMD website.

https://mausam.imd.gov.in/bengaluru/

**Exercise 3:** Plotting of downloaded temperature data using graphical methods-line graph.

Elementary Instrumental Observation:

**Exercise 4:** Centigrade and Fahrenheit thermometer for measuring temperature.

**Exercise 5:** Mercurial Barometer and Aneroid Barometer for measuring atmospheric pressure

**Exercise 6:** Wind Vane and cup-anemometer.

**Exercise 7:** Wet and Dry bulb thermometer for measuring humidity

**Exercise 8:** Rainguage- Dial type for measuring rainfall Exercise 3: Rainfall Trend Analysis (monthly and annual) Exercise 4: Interpretation of Indian Daily Weather charts.

Note: Students are expected to download weather charts of the four seasons.

### B.A. / BSc Semester 2 Title of the Course: 1 Introduction to Human Geography CODE: GEOGOE T2.1.1 **Number of Theory Credits** Number of lecture hours/ semester 42 - 45 3 **Course Outcomes:** 1. Students will learn how human, physical, and environmental 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 development of the region **Content of Theory Course 1** 45Hrs **Unit – 1 Introduction to Human Geography** 11 Nature, Scope and Development Environmental Determinism and Possiblism, Neo determinism (stop and go determinism) Approaches to Human Geography: Exploration and Descriptive approach, regional analysis Approach: Areal Differentiation Approach, Spatial organization Approach. Modern approaches: Welfare or Humanistic Approach, Radical Approach, Behavioural Approach, Post Modernism in geography Fields and Sub Fields in Human Geography **Unit - 2 Geographical Analysis of Population** 11 Distribution and Growth of Population Density of population: meaning and Types: Arithmetic Density and Physiological Density. Regional distribution of Density of Population. Population Movement: Migration - Factors of population Migration, Economic factors, Cultural Factors, Environmental (Push and Pull factors) Migration Types: Immigration and Emigration, Internal and International Migration **Unit – 3 Cultural Patterns and Processes** 11

<u>Concept of Culture</u> : Material and Non material Culture. <u>Cultural Regions</u> : Traits & Complexes, Cultural Hearths, Cultural Diffusion.	
Languages of the World: Types, Classification and Distribution.	
<u>Religions</u> : Types and Classification. Distribution. Universalizing <u>Religions</u> : Christianity, Islam, Buddhism. Ethnic Religions: Hinduism, the Chinese religion, Shintoism, Judaism.	
The <u>Major Tribal population</u> of the world.	

Unit – 4 Human Economic Activities, Development and Settlements	12
Primary Economic Activities – Agriculture, Types: Primitive Subsistence,	
Intensive subsistence,	
Plantation Agriculture, Extensive Commercial grain cultivation, Mixed	
Farming, Dairy Farming	
Secondary Activities: Manufacturing, classification – based on size – Small	
Scale and Large scale. Based on Raw material – Argo-based, Mineral based,	
Chemical Based and Forest based. Industrial Regions of the world.	
Tertiary Activities: Types: Trade and commerce, Retail Trading services,	
Wholesale trading.	
Transport and communications: Factors, communication services –	
Telecommunication. Services: Informal and Non formal sector. Information	
technology and service.	
Human Settlements: Factors, Classification, Types and Patterns: Rural,	
Urban. Compact or Nucleated and Dispersed settlements. Rural settlement	
Patterns: linear, rectangular, circular, star shaped, T shaped.	

- 1. Hartshorne, T. A., & Alexander, J. W. (2010). Economic Geography. New Delhi: PHI Learning.
- 2. Knox, P., Agnew, J., & McCarthy, L. (2008). The Geography of the World Economy. London: Hodder Arnold.
- 3. Lloyd, P., &Dicken, B. (1972). Location in Space: A Theoretical Approach to Economic Geography. New York: Harper and Row.
- 4. Siddhartha, K. (2000). Economic Geography: Theories, Process and Patterns, NewDelhi:

Kisalaya Publications.

 Smith, D. M. (1971). Industrial Location: An Economic Geographical Analysis, NewYork: John Wiley and Sons.

## B.A. / BSc Semester 2 Title of the Course: 2. Basics of Geographic Information Systems (GIS)

CODE: GEOGOE T2.1.2

Number of Theory Credits	Number of lecture hours/ semester	ber of lecture hours/ semester	
3	39 or 42		
<ol> <li>Course Outcomes:         <ol> <li>Students are trained to adapt the mathematical models of geogenetic spatial data collection, data store display through the thematic mathematic mathematic are exposed on spatial withrange of proven mathematic 4. Students can employ in various they deal to solve geographical proven are explored on spatial to solve geographical proven are explored.</li> </ol> </li> </ol>	ne theoretical concepts in a practical way graphy. In training on various modes of spatial a rage, data analytics, data interpretation aps. I thinking to solve the geographical pro cal and statistical models. corporate and government organisatio problems.	ay through and non- a and data blems n where	
<ul> <li>Course Objectives:</li> <li>This course aims to: <ol> <li>Understand the concept and tec</li> <li>Define the GIS data types and s</li> <li>Study geo processing and visual</li> </ol> </li> </ul>	chniques of the Geographic Information tructures. lization concepts and techniques in GIS	Systems.	
Content of Theory Course 1		52/56Hrs	
Unit – 1 Introduction		10	
Emergence of GI Science, Milestone at Definition, scope, role of GIS in digital merits and demerits, global market, in integration with GIS.	nd Developmental stages in GIS, l world; Components, functionalities, nterdisciplinary domains, and its		
Unit – 2 Geodesy and Spatial Mathe	matics	10	
Cartesian coordinates, latitude, longit geographical coordinates, Datum: WG measurement using Geographic and p length by coordinates and various inte	udes, formats of angular units, S84, vs NAD32. UTM, Aerial Distance projected coordinates, Area, Perimeter, ernational measures.		
Unit – 3 GIS Data and Scale		10	
Spatial Data and its structures; source errors, topology of data and relationsh generalization; precision and accuracy spatial data integration	ees and types of data collection; data hip. Large Scale vs Small Scale, y of data-logical consistency and non-		
Unit – 4 Geoprocessing and Visualiz	ation	12	
Spatial and Non-Spatial Queries, prox and Surface models. Hotspot and den maps and	timity analysis, Preparation of Terrain sity mapping. Types of maps, thematic		

- 1. An Introduction to Geographical Information Systems Ian Heywood (2011)
- 2. Geographic Information Systems and Cartographic Modelling Tomlin, C.D. (1990)
- 3. Geographic Information Systems and Environmental Modelling Clarke, C., K. (2002)
- 4. Geographic Information Systems and Science Paul A. Longley, et. al. (2015)
- 5. Geographic Information Systems: A Management Perspective Aronoff, S. (1989)
- 6. GIS Fundamentals, Applications, and Implementations Elangovan, K. (2006)
- 7. Introduction to Geographical Information Systems Chang, Kang-Tsung (2015)
- 8. Mathematical Modeling in Geographical Information System, Global Positioning System and Digital Cartography Sharma, H.S. (2006)
- 9. Remote Sensing and GIS Bhatta, B. (2011)
- 10. Spatial analysis and Location-Allocation Models Ghosh, A. and G. Rushton (1987)

#### **Reference Websites**

- 1. IIRS MOOC programme: https://isat.iirs.gov.in/mooc.php
- ITC Netherlands, Principles of GIShttps://webapps.itc.utwente.nl/librarywww/papers\_2009/general/principle sgis.pdf
- 3. Geographical Information Systems: Principles, Techniques, Management and Applications https://www.geos.ed.ac.uk/~gisteac/gis\_book\_abridged/

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