



KARNATAK UNIVERSITY, DHARWAD
ACADEMIC (S&T) SECTION

ಕರ್ನಾಟಕ ವಿಶ್ವವಿದ್ಯಾಲಯ, ಧಾರವಾಡ
ವಿದ್ಯಾಮಂಡಳ (ಎಸ್&ಟಿ) ವಿಭಾಗ



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NAAC Accredited
'A' Grade 2014

website: kud.ac.in

No. KU/Aca(S&T)/JS/MGJ(Gen)/2024-25/612

Date:

ಅಧಿಸೂಚನೆ

27 JUL 2024

ವಿಷಯ: ಸರ್ಕಾರದ ಆದೇಶ ದಿನಾಂಕ: 08.05.2024 ಅನುಸಾರ 2024-25ನೇ ಶೈಕ್ಷಣಿಕ ಸಾಲಿನಿಂದ ಎಲ್ಲ ಸ್ನಾತಕ ಪದವಿಗಳಿಗೆ NEP ಅಡಿಯಲ್ಲಿ ಪ್ರೋಗ್ರಾಂ ವಿನ್ಯಾಸ (Curriculum Structure)ದಂತೆ ಪರಿಷ್ಕೃತ ಪಠ್ಯಕ್ರಮದ ಅನುಷ್ಠಾನ ಕುರಿತು.

- ಉಲ್ಲೇಖ: 1. ಸರ್ಕಾರದ ಪ್ರಧಾನ ಕಾರ್ಯದರ್ಶಿಗಳು, ಉನ್ನತ ಶಿಕ್ಷಣ ಇಲಾಖೆ ಇವರ ಆದೇಶ ಸಂಖ್ಯೆ: ಇಡಿ 166 ಯುಎನ್ಇ 2023, ದಿ: 08.05.2024.
2. ವಿದ್ಯಾವಿಷಯಕ ಪರಿಷತ್ ಸಭೆಯ ನಿರ್ಣಯಗಳ ಸಂ:2, 3, 4, 5, 6, 7, 8 & 9, ದಿ:16.07.2024.
3. ಮಾನ್ಯ ಕುಲಪತಿಗಳ ಅನುಮೋದನೆ ದಿನಾಂಕ: 27/07/2024

ಮೇಲ್ಕಾಣಿಸಿದ ವಿಷಯ ಹಾಗೂ ಉಲ್ಲೇಖಗಳನ್ವಯ, ಉಲ್ಲೇಖ-01ರ ಸರ್ಕಾರ ಆದೇಶಾನುಸಾರ 2024-25ನೇ ಶೈಕ್ಷಣಿಕ ಸಾಲಿನಿಂದ ಅನ್ವಯವಾಗುವಂತೆ, ಈ ಕೆಳಗಿನ ಎಲ್ಲ ಸ್ನಾತಕ ಪದವಿಗಳ NEP ಅಡಿಯ ಪ್ರೋಗ್ರಾಂ ವಿನ್ಯಾಸ (Curriculum Structure)ದಂತೆ ಪರಿಷ್ಕೃತ ಪಠ್ಯಕ್ರಮ ರಚನೆ ಕುರಿತಾಗಿ ಸಂಬಂಧಿಸಿದ ಅಭ್ಯಾಸಸೂಚಿ ಮಂಡಳಿ ಹಾಗೂ ನಿಖಾಯಗಳ ಶಿಫಾರಸ್ಸಿನಂತೆ ವಿದ್ಯಾವಿಷಯಕ ಪರಿಷತ್ ಸಭೆಯ ಅನುಮೋದಿತ ಪದವಿಗಳ ಪಠ್ಯಕ್ರಮಗಳನ್ನು ಕ.ವಿ.ವಿ. ಅಂತರ್ಜಾಲ www.kud.ac.in ದಲ್ಲಿ ಭಿತ್ತರಿಸಲಾಗಿದೆ. ಸದರ ಪಠ್ಯಕ್ರಮಗಳನ್ನು ಕ.ವಿ.ವಿ. ಅಂತರ್ಜಾಲದಿಂದ ಡೌನ್‌ಲೋಡ್ ಮಾಡಿಕೊಳ್ಳಲು ಸೂಚಿಸುತ್ತ ವಿದ್ಯಾರ್ಥಿಗಳು ಹಾಗೂ ಸಂಬಂಧಿಸಿದ ಎಲ್ಲ ಬೋಧಕರ ಗಮನಕ್ಕೆ ತಂದು ಅದರಂತೆ ಕಾರ್ಯಪ್ರವೃತ್ತರಾಗಲು ಕ.ವಿ.ವಿ.ಯ ಎಲ್ಲ ಅಧೀನ ಹಾಗೂ ಸಂಬಂಧಿಸಿದ ಮಹಾವಿದ್ಯಾಲಯಗಳ ಪ್ರಾಚಾರ್ಯರುಗಳಿಗೆ ಸೂಚಿಸಲಾಗಿದೆ.

ಅ.ನಂ.	ಪದವಿ				ಸೆಮಿಸ್ಟರ್
1	1	B.A	8	BTTM	1 ರಿಂದ 6ನೇ ಸೆಮಿಸ್ಟರ್
	2	BSW	9	B.Sc	
	3	B.Sc. (H.M)	10	BCA	
	4	B.Com	11	B.Com (CS)	
	5	B.Com (E-Commerce Operation)	12	B.Com (Retail Operations)	
	6	B.Com (Banking Financial Services & Insurance)	13	B.Com (Logistics)	
	7	BBA	14	BBA (Logistics Management)	
2	1	B.Sc (Data Science)	2	B.Sc (Artificial Intelligence & Machinery Learning)	1 ಮತ್ತು 2ನೇ ಸೆಮಿಸ್ಟರ್
3	1	BASLP	3	BPA	1 ರಿಂದ 8ನೇ ಸೆಮಿಸ್ಟರ್
	2	BVA	4	B.Sc. Pulp & Paper	

A. Channappa
ಕುಲಸಚಿವರು.

ಅಡಕ: ಮೇಲಿನಂತೆ

ಗೆ,

ಕರ್ನಾಟಕ ವಿಶ್ವವಿದ್ಯಾಲಯದ ವ್ಯಾಪ್ತಿಯಲ್ಲಿ ಬರುವ ಎಲ್ಲ ಅಧೀನ ಹಾಗೂ ಸಂಬಂಧಿಸಿದ ಮಹಾವಿದ್ಯಾಲಯಗಳ ಪ್ರಾಚಾರ್ಯರುಗಳಿಗೆ. (ಕ.ವಿ.ವಿ. ಅಂತರ್ಜಾಲ ಹಾಗೂ ಮಿಂಚಂಚಿ ಮೂಲಕ ಭಿತ್ತರಿಸಲಾಗುವುದು)

ಪ್ರತಿ:

- ಕುಲಪತಿಗಳ ಆಪ್ತ ಕಾರ್ಯದರ್ಶಿಗಳು / ಕುಲಸಚಿವರ ಆಪ್ತ ಕಾರ್ಯದರ್ಶಿಗಳು / ಕುಲಸಚಿವರು (ಮೌಲ್ಯಮಾಪನ) ಆಪ್ತ ಕಾರ್ಯದರ್ಶಿಗಳು, ಕ.ವಿ.ವಿ. ಧಾರವಾಡ.
- ಅಧೀಕ್ಷಕರು, ಪ್ರಶ್ನೆ ಪತ್ರಿಕೆ / ಗೌಪ್ಯ / ಜಿ.ಎ.ಡಿ. / ವಿದ್ಯಾಮಂಡಳ (ಪಿ.ಜಿ.ಪಿ.ಎಚ್.ಡಿ) ವಿಭಾಗ, ಸಂಬಂಧಿಸಿದ ಕೋರ್ಸುಗಳ ವಿಭಾಗಗಳು ಪರೀಕ್ಷಾ ವಿಭಾಗ, ಕ.ವಿ.ವಿ. ಧಾರವಾಡ.
- ನಿರ್ದೇಶಕರು, ಕಾಲೇಜು ಅಭಿವೃದ್ಧಿ / ವಿದ್ಯಾರ್ಥಿ ಕಲ್ಯಾಣ ವಿಭಾಗ / . ಕ.ವಿ.ವಿ. ಧಾರವಾಡ.
- ನೋಡಲ್ ಅಧಿಕಾರಿಗಳು, ಯು.ಯು.ಸಿ.ಎಂ.ಎಸ್. ಘಟಕ, ಕ.ವಿ.ವಿ. ಧಾರವಾಡ.
- ಎನ್.ಇ.ಪಿ. ನೋಡಲ್ ಅಧಿಕಾರಿಗಳು, ಸಿ.ಡಿ.ಸಿ. ವಿಭಾಗ, ಕ.ವಿ.ವಿ. ಧಾರವಾಡ.



KARNATAK UNIVERSITY, DHARWAD

B.Sc. GEOGRAPHY

SYLLABUS

With Effect from 2024-25

**DISCIPLINE SPECIFIC CORE COURSE (DSC) FOR SEM I - VI,
SKILL ENHANCEMENT COURSE (SEC) FOR SEM IV/V/VI and
ELECTIVE COURSES FOR SEM V AND VI**

AS PER N E P (Revised) :2024

Karnatak University, Dharwad
B.Sc.in GEOGRAPHY with effective from 2024-25

Sem.	Type of Course	Theory/ Practical I	Course Code	CourseTitle	Instructio nhour/ week	Total hours / sem	Duration of Exam	Marks			Credits
								Formative	Summative	Total	
I	DSC-1	Theory	C1GEO 1T1	Principles of Geomorphology	04hrs	60	03 hrs	20	80	100	04
	DSC-2	Practical	C1GEO 1P1	Morphological Analysis	04 hrs	56	03 hrs	10	40	50	02
II	DSC-3	Theory	C2GEO 1T1	Principles of Climatology	04hrs	60	03 hrs	20	80	100	04
	DSC-4	Practical	C2GEO 1P1	Weather Analysis	04 hrs	56	03 hrs	10	40	50	02
III	DSC-5	Theory	C3GEO 1T1	Human Geography	04hrs	60	03 hrs	20	80	100	04
	DSC-6	Practical	C3GEO 1P1	Techniques in Human Geography	04 hrs	56	03 hrs	10	40	50	02
IV	DSC-7	Theory	C4GEO 1T1	Regional Geography of India	04hrs	60	03 hrs	20	80	100	04
	DSC-8	Practical	C4GEO 1P1	Representations of Geographical Features of India	04 hrs	56	03 hrs	10	40	50	02
*V	DSC-9A	Theory	C5GEO 2T1	Population Resources and Dynamics	04hrs	60	03 hrs	20	80	100	04
	DSC-10A	Practical	C5GEO 2P1	Techniques in Population Geography	04 hrs	56	03 hrs	10	40	50	02
	DSC-9B	Theory	C5GEO 2T2	Fundamentals of Remote Sensing	04hrs	60	03 hrs	20	80	100	04
	DSC-10B	Practical	C5GEO 2P2	Interpretation of Aerial Photos and Satellite Images	04 hrs	56	03 hrs	10	40	50	02
*VI	DSC-11A	Theory-	C6GEO 2T1	Environmental Geography	04hrs	60	03 hrs	20	80	100	04
	DSC-12A	Practical	C6GEO 2P1	Methods in Environmental Geography	04 hrs	56	03 hrs	10	40	50	02
	DSC-11B	Theory-	C6GEO 2T2	Fundamentals of Geographic Information Systems	04hrs	60	03 hrs	20	80	100	04
	DSC-12B	Practical	C6GEO 2P2	GIS for Map-Making	04 hrs	56	03 hrs	10	40	50	02
V	EC-1	Theory	C5GEO 5T1	Introduction to Physical Geography	03hrs	45	03 hrs	20	80	100	03
VI	EC-2	Theory	C6GEO 5T1	Geography of India	03hrs	45	03 hrs	20	80	100	03
IV/V/VI **	Skill	Practical	COGEO6P1	Geographical Statistics	04 hrs	56	03 hrs	10	40	50	02

*Student shall either DSC 9A and DSC10A or DSC 9B and DSC10B in 5th semester. Similarly, DSC 11A and DSC12A or DSC 11B and DSC12B in 6th semester. ** Student shall study Skill of this subject either in 4th / 5th / 6th but not in all the semester.

Karnatak University, Dharwad
B.Sc. Geography

Programme Specific Outcomes (PSO):

On completion of the 03 years Degree in Geography students will be able to:

- PSO 1** : Enrich the knowledge of understanding the relevant terms and concept of geography including definitions.
- PSO 2** : Enhanced the capability to explain the relevant principles, theories and models in geography.
- PSO 3** : Conceptual clarity about the relationship between the man and environment to understand the process, factors and impact.
- PSO 4** : Know the complex and interactive nature of physical and human environments and changing Process.
- PSO 5** : Enhance the skills in Map Making and Cartographical Principles.
- PSO 6** : Use of Geographical data to identify the trends and patterns and demonstrate through the maps of spatio-temporal changes.
- PSO 7** : Demonstrate the skill of analysis of geographical information, evidences and cause and effects.
- PSO 8** : Trace the trends and process of changes of physical and cultural aspects.
- PSO 9** : Develop the consciousness of relevance of geography to understand and solving the contemporary environmental issues.
- PSO 10**: Exposer in handling the spatial and non-spatial data through Remote Sensing and Geographical Information System.

B.Sc. Semester – I

Discipline Specific Course (DSC) -1

Course Title: Principles of Geomorphology

Course Code: C1GEO 1T1

Type of Course	Theory / Practical	Credits	Instruction hour per week	Total No. of Lectures/Hours / Semester	Duration of Exam	Formative Assessment Marks	Summative assessment Marks	Total Marks
DSC-1	Theory	04	04	60 hrs.	3hrs.	20	80	100

Course Outcomes (COs): At the end of the course students will be able to:

- CO 1 :** To Define the Geomorphology and to explain the essential principles of it.
- CO 2 :** To outline the mechanism of dynamic nature of the Earth's surface and interior of the Earth.
- CO 3 :** To illustrate and explain the forces affecting the crust of the earth and its effect on it.
- CO 4 :** To understand the conceptual and dynamic aspects of landform development.
- CO 5 :** To understand the principles of geomorphology thoroughly and explain them.

Unit	Title: Principles of Geomorphology	60 hrs/sem
Unit I	Introduction to geography: physical and human geography. Introduction to Geomorphology: meaning, nature, development and scope. Principles of Geomorphology and Geological Time Scale. Distribution of continents and oceans.	15 hrs
Unit II	Internal structure of the earth. Alfred Wegener's Continental Drift. Theory of Isostasy: Views of Pratt and Airy Convectional Current Theory and Concept of Sea floor Spreading. Theory of Plate Tectonics: plate boundary, subduction. Case Studies: Volcano, Earthquake: reporting of latest incidents.	15 hrs
Unit III	Earth's Movements: Endogenetic and Exogenetic forces, Sudden and Diastrophic movements- Epeirogenetic and Orogenetic Movements- Process of folding and faulting. Vulcanicity and earthquake Rocks: Characteristics, types, importance and rock cycle. Weathering: meaning, types and controlling factors. Mass Movement: meaning, controlling factors, types-landslides and rock-falls.	15 hrs
Unit IV	Landforms: meaning, types and factors controlling landforms development Slope development: concept and types. Concept of Cycle of Erosion–W.M. Davis and W. Penck. Agents of Denudation: river; drainage patterns, groundwater, Sea waves, Wind and Glaciers and resultant landforms. Application of geomorphology: in India and Karnataka (Regional planning, Urban planning and transportation, Mining, Hazard management, Agriculture and Environmental management).	15hrs

Books recommended:**Text Books:**

1. Ahmed E. (1985) Geomorphology, Kalyani Publishers, New Delhi.
2. Bloom A.L. (1978) Geomorphology: A Systematic Analysis of Late Cenozoic Landforms Prentice – Hall of India, New Delhi.
3. P Mallappa, Physical Geography (Kannada Version)
4. Ranganath Principles of Physical Geography (Kannada Version)
5. Nanjannavar S S: Physical Geography (Kannada Version)
6. Hugar M R Physical Geography part-1 (Kannada Version)
7. Goudar M B, Physical Geography (Kannada Version)
8. Kolhapure and S S Nanjan, Physical Geography (Kannada Version)

References:

9. Brunnsden D. (1985) Geomorphology in the Service of Man: The Future of Geography, Methnen, U.K.
10. Chorley, R.J., Schumm, S. A. and Sugden, D.E. 1984: Geomorphology, Methuen, London
11. Cooke, R.U. and Warren, 1973: Geomorphology in Deserts, Batsford, London
12. Dayal, P. 1996: Textbook of Geomorphology, Shukla Book Depot ,Patna.
13. Goudie Anrew et.al. (1981) Geomorphological Techniques, George Allen &Unwin, London.
14. Homes A. (1965) Principles of Physical Geology, 3rd Edition, ELBSS Edn.
15. Strahler A.N. (1968) The Earth Sciences, Harper & Row Intl. Edn, New York
16. Thornberry W.D. (1969) Principles of Geomorphology 2nd Edition, Wiley Intl. Edn. & Wiley, 1984.
17. Verstappen H. (1983) Applied Geomorphology, Geomorphological Surveys for Environmental Development, Elsevier, Amsterdam.

Websites:

<https://www.solarviews.com/eng/earth.htm>
<https://www.moorlandschool.co.uk/earth/tectonic.htm>
<https://www.usgs.gov/>
<https://www.ksndmac.org>.

Formative Assessment for Theory	
Assessment Occasion/ type	Marks
Internal Assessment Test 1	05
Internal Assessment Test 2	05
Assignment	10
Total	20 Marks
<i>Formative Assessment as per guidelines.</i>	

B.Sc. Semester – I

Discipline Specific Course (DSC)-2

Course Title: Morphological Analysis Practical

Course Code: C1GEO 1P1

Type of Course	Theory / Practical	Credits	Instruction hour per week	Total No. of Lectures/Hours / Semester	Duration of Exam	Formative Assessment Marks	Summative assessment Marks	Total Marks
DSC-2	Practical	02	04	56 hrs.	3hrs.	10	40	50

Course Outcomes (COs): At the end of the course, students will be able to:

- CO 1** : To identify the different types of minerals through their characteristics.
- CO 2** : To interpret the topographical maps extracted the geomorphic information.
- CO 3** : To illustrate the slope analysis and prepare the Hypsometric curve and integral
- CO 4** : To delineate the watershed area, stream ordering, drainage density and drainage frequency.
- CO 5** : Analyze the morphological analysis of any geographical space.

No of Exercises	Morphological Analysis Practical	56 hrs/ Sem
1	Identification of Mineral samples: Iron ore, Bauxite, Ore and Manganese.	06
2	Identification of Rock Sample: Granite, Basalt, Lime Stones, Sandstone, Quartzite and marble.	06
3	Extraction and interpretation of geomorphic information from Topographical Maps.	06
4	Preparation of contour map from Toposheets.	06
5	Construction of Relief Profiles-serial, Super imposed, Projected and Composite.	10
6	Slope Maps (Wentworth method), Slope (isotan and isosin) and aspects, maps and Hypsometric curve and integral.	08
7	Drainage Morphometry: delineation of watershed, stream ordering.	08
8	Morphometric analysis: mean stream length, drainage density and drainage frequency.	08

General instructions:

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

Books recommended:**Text Books:**

1. Ahmed E. (1985) Geomorphology, Kalyani Publishers, New Delhi.
2. Bloom A.L. (1978) Geomorphology: A Systematic Analysis of Late Cenozoic Landforms Prentice – Hall of India, New Delhi.

References:

1. Brunsten D. (1985) Geomorphology in the Service of Man: The Future of Geography, Methuen, U.K.
2. Chorley, R.J., Schumm, S. A. and Sugden, D.E. 1984: Geomorphology, Methuen, London
3. Cooke, R.U. and Warren, 1973: Geomorphology in Deserts, Batsford, London
4. Dayal, P. 1996: Textbook of Geomorphology, Shukla Book Depot ,Patna.
5. Goudie Anrew et.al. (1981) Geomorphological Techniques, George Allen &Unwin, London.
6. Homes A. (1965) Principles of Physical Geology, 3rd Edition, ELBSS Edn.
7. Strahler A.N. (1968) The Earth Sciences, Harper & Row Intl. Edn, New York
8. Thornberry W.D. (1969) Principles of Geomorphology 2nd Edition, Wiley Intl. Edn. & Wiley, 1984.
9. Verstappen H. (1983) Applied Geomorphology, Geomorphological Surveys for Environmental Develop- ment, Elsevier, Amsterdam

Websites:

- <https://www.solarviews.com/eng/earth.htm>
<https://www.moorlandschool.co.uk/earth/tectonic.htm>
<https://www.usgs.gov/>
<https://www.ksndmac.org>.

Formative Assessment for Practical	
Assessment Occasion/ type	Marks
Internal Assessment Test 1	05
Internal Assessment Test 2	05
Total	10 Marks
<i>Formative Assessment as per guidelines.</i>	

B.Sc. Semester – II

Discipline Specific Course (DSC) -3

Course Title: Principles of Climatology

Course Code: C2GEO 1T1

Type of Course	Theory / Practical	Credits	Instruction hour per week	Total No. of Lectures/Hours / Semester	Duration of Exam	Formative Assessment Marks	Summative assessment Marks	Total Marks
DSC-3	Theory	04	04	60 hrs.	3hrs.	20	80	100

Course Outcomes (COs): At the end of the course students will be able to:

CO1: To define the field of climatology and to understand the atmospheric composition and structure.

CO2: To outline the mechanism and process of solar radiation transfer to earth surface and to explain the temperature distribution and variation according to time and space.

CO3: To illustrate and explain the air pressure system, wind regulating forces and the formation of the Atmospheric Disturbance.

CO4: To understand and compute the air humidity as well as to explain the process of Condensation and formation of precipitation and its types.

CO5: To understand the principles of climatology and explain in detail

Unit	Title: Principles of Climatology	60 hrs/ Sem
Unit I	Nature and Scope of Climatology, Atmospheric Sciences, Climatology and Meteorology. Origin and structure of the Atmosphere: Troposphere, Stratosphere, Mesosphere, Ionosphere, Exosphere and their characteristics. Composition of the atmosphere Weather and Climate	15 hrs
Unit II	Insolation: Definition, Mechanism, Solar Constant. Factors affecting the Insolation: Angle of incidence, length of the day, 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: Vertical, Horizontal, and Inversion of temperature. Global Energy Budget: Incoming shortwave solar radiation, Outgoing Longwave Terrestrial radiation, Albedo. Net Radiation and Latitudinal Heat Balances.	15 hrs
Unit III	Atmospheric Pressure: Influencing factors on atmospheric pressure. Vertical and Horizontal Distribution of the atmospheric pressure and Pressure Belts, Pressure Gradient. Tri-cellular-Hadley, Ferrel's and Polar Cells. Winds: influencing factors, Types - planetary, seasonal, local winds, Variable winds- Cyclones and anti-cyclones. Air-Masses and Fronts: Definition, Nature, Source Regions and Classification of Air Masses.	15 hrs
Unit IV	Humidity: Sources, influencing factors and types-Absolute, Relative and Specific. Hydrological cycle: process of evaporation, condensation. Clouds and its types. Precipitation and its forms. Climate Change: Causes and consequences, recent issues-floods, drought and global warming.	15hrs

Recommended books:

Text Books:

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 S Nanjan, Physical Geography (Kannada Version).

Reference:

1. Lutgens, Frederic K. & Tarbuck, Edward J. (2010). The Atmosphere: An Introduction to Meteorology. New Jersey: Pearson Prentice Hall.
2. Oliver, John E. & Hidore, John J. (2003). Climatology: An Atmospheric Science. Delhi: Pearson Education.
3. Singh, S. (2005). Climatology. Allahabad: Prayag Pustak Bhawan.
4. Barry, R.G. and Chorley, R.J. (2003): Atmosphere, Weather and Climate; Psychology Press, Hove; East Sussex.
5. Critchfield, H.J., (1975): general Climatology, Prentice Hall, New Jersey.
6. Mather, J.R. (1974): Climatology: Fundamentals and Applications; Mc Craw Hill Book Co., U.S.A.
7. Rumney, G.R. (1968): Climatology and the World Climates, Macmillan, London.
8. Trewartha, G.T. (1980): An Introduction to Climate; McGraw Hill, New York, 5th edition, (International Student Edition).

Websites:

<https://science.jrank.org>
<https://www.clearias.com>
<https://www.nationalgeographic>
<https://www.space.com>
<https://www.noaa.gov>
<https://www.climate.nasa.gov>
<https://www.weather.gov>
<https://www.cengage.com>

Formative Assessment for Theory	
Assessment Occasion/ type	Marks
Internal Assessment Test 1	05
Internal Assessment Test 2	05
Assignment	10
Total	20 Marks
<i>Formative Assessment as per guidelines.</i>	

B.Sc. Semester – II

Discipline Specific Course (DSC) - 4

Course Title: Weather Analysis -Practical

Course Code: C2GEO 1P1

Type of Course	Theory / Practical	Credits	Instruction hour per week	Total No. of Lectures/Hours / Semester	Duration of Exam	Formative Assessment Marks	Summative assessment Marks	Total Marks
DSC-4	Practical	02	04	56 hrs.	3hrs.	10	40	50

Course Outcomes (COs): At the end of the course, students will be able to:

CO 1 : To understand the structure and functions of the Indian Meteorological Department.

CO 2 : To plot the temperature data using graphical methods.

CO 3 : To handle the instruments to measure the temperature and pressure.

CO 4 : To Use the wet and dry Bulb thermometer for measuring humidity.

CO 5 : To interpret the daily weather map seasonally.

No of Exercises	Morphological Analysis Practical	56 hrs/ Sem
1	Structure and functions of the Indian Meteorological Department (IMD). Collection of temperature data from IMD website.	06
2	Plotting of downloaded temperature data using graphical methods-line graph.	08
3	Centigrade and Fahrenheit thermometer for measuring temperature.	06
4	Mercurial Barometer and Aneroid Barometer for measuring atmospheric pressure.	06
5	Wind Vane and cup-anemometer.	06
6	Wet and Dry bulb thermometer for measuring humidity,	08
7	Rain gauge- Dial type for measuring rainfall and Rainfall Trend Analysis (monthly and annual).	08
8	Interpretation of Indian Daily Weather charts seasonally.	08

General instructions:

1. Conduct all exercises with Goal, Procedure, devices, findings and diagram.
2. Students are expected to download weather charts of the four Seasons.

Books recommended:**Reference:**

1. Lutgens, Frederic K. & Tarbuck, Edward J. (2010). The Atmosphere: An Introduction to Meteorology. New Jersey: Pearson Prentice Hall.
2. Oliver, John E. & Hidore, John J. (2003). Climatology: An Atmospheric Science. Delhi: Pearson Education.
3. Singh, S. (2005). Climatology. Allahabad: Prayag Pustak Bhawan.
4. Barry, R.G. and Chorley, R.J. (2003): Atmosphere, Weather and Climate; Psychology Press, Hove; East Sussex.
5. Critchfield, H.J., (1975): general Climatology, Prentice Hall, New Jersey.
6. Mather, J.R. (1974): Climatology: Fundamentals and Applications; Mc Craw Hill Book Co., U.S.A.
7. Rumney, G.R. (1968): Climatology and the World Climates, Macmillan, London.
8. Trewartha, G.T. (1980): An Introduction to Climate; McGraw Hill, New York, 5th edition, (International Student Edition).

Websites:

<https://science.jrank.org>

<https://www.clearias.com>

<https://www.nationalgeographic>

<https://www.space.com>

<https://www.noaa.gov>

<https://www.climate.nasa.gov>

<https://www.weather.gov>

Formative Assessment for Practical	
Assessment Occasion/ type	Marks
Internal Assessment Test 1	05
Internal Assessment Test 2	05
Total	10 Marks
<i>Formative Assessment as per guidelines.</i>	

B.Sc. Semester – III

Discipline Specific Course (DSC) - 5

Course Title: Human Geography

Course Code: C3GEO 1T1

Type of Course	Theory / Practical	Credits	Instruction hour per week	Total No. of Lectures/Hours / Semester	Duration of Exam	Formative Assessment Marks	Summative assessment Marks	Total Marks
DSC-5	Theory	04	04	60 hrs.	3hrs.	20	80	100

Course Outcomes (COs): At the end of the course students will be able to:

CO1: To learn how human and physical components of the world interact.

CO2: To familiarized with economic processes such as globalization, trade and their impacts on economic, cultural and social activities.

CO3: To describe what geography and human geography are.

CO4: To understand population dynamics and migration.

CO5: To establish the population resource relationships and regional resource development.

Unit	Title: Human Geography	60 hrs/sem
Unit I	Nature, scope and growth of human geography, Branches in human geography. Approaches to man-environment relationship: Environmental Determinism and Possibilism, Neo-determinism (stop and go determinism). Approaches to study human geography: Descriptive approach Regional approach, Areal Differentiation approach and spatial organization approach. Quantitative revolution and Locational Analysis. Welfare or Humanistic approach, Radical approach, Behavioral approach. Regional Synthesis.	15 hrs
Unit II	Concept of Culture, Material and Non-material culture Cultural Regions, cultural Traits and Complexes, cultural Hearths. Major cultural realms of the world. Race: Characteristics and classification. Broad racial groups of the world and their distribution. Linguistic and ethnic diversity. Major Religions and their Distribution: Hinduism, Christianity, Islam and Buddhism. Assignment: Students will have to select nearby area and study religions and their characteristics and submit the report.	15 hrs
Unit III	Primary Economic Activities. Agriculture: Primitive Subsistence, Intensive subsistence, Plantation Agriculture, Extensive Commercial grain cultivation, Mixed Farming, Dairy Farming. Forestry, fishing and mining. Secondary Activities: Manufacturing – Cotton Textile and Iron & Steel. Concept of Manufacturing Region. Industrial Regions of the world. New Industrial Policy. Tertiary Activities: Trade and commerce, Retail Trading services, wholesale trading. Trade balance and trade policy. Major tribes, tribal areas and their problems.	15 hrs

Unit IV	<p>Population: Resource Relationships and regional resource development. Transport and communications: Factors, Types and Distribution of Roads, Railway, airway and waterways.</p> <p>Services: Formal and Informal sector. Information technology.</p> <p>Urban Settlements: Origin and evolution, hierarchy, trends and patterns of urban settlements. Urban morphology. Concept of Primate City and rank size rule.</p> <p>Functional classification of towns, Rural-urban fringe.</p> <p>Problems and remedies of urbanization. Central Place theory Rural Settlements – types, patterns and factors influencing on distribution.</p> <p>Field Study: Students have to study human resource development in local area and prepare a report</p>	15hrs
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Recommended books:

1. Dickens and Pitts (1963) Introduction to Human Geography,
2. Harm D. Blij (1992) Human and Economic Geography, Macmillan Publishing Company, New York
3. Hussain M (2003) Human Geography, Rawat Publications, Jaipur
4. Nellson, Gabler Vining (1995) Human Geography, People, Cultures and Landscapes
5. Ranganath (2002) Principles of Human Geography (Kannada Version) Vidyanidhi, Gadag
6. Rubenstein J.M (2016). An Introduction to Human Geography, Macmillan Publishing Company,
7. New York
8. S.D. Maurya (2012), Human Geography, Pravalika Publications, Allahabad
9. L.R.Singh (2005), Fundamentals of Human Geography, Sharda Pustak Bhawan, Allahabad

Websites:

<https://www.indiaculture.nic.in/>
<https://dea.gov.in/>
<https://dpiit.gov.in/>
<https://www.mines.gov.in/>
<https://censusindia.gov.in/census.website/>

Formative Assessment for Theory	
Assessment Occasion/ type	Marks
Internal Assessment Test 1	05
Internal Assessment Test 2	05
Assignment	10
Total	20 Marks
<i>Formative Assessment as per guidelines.</i>	

B.Sc. Semester – III

Discipline Specific Course (DSC)-6

Course Title: Techniques in Human Geography - Practical

Course Code: C3GEO 1P1

Type of Course	Theory / Practical	Credits	Instruction hour per week	Total No. of Lectures/Hours / Semester	Duration of Exam	Formative Assessment Marks	Summative assessment Marks	Total Marks
DSC-6	Practical	02	04	56 hrs.	3hrs.	10	40	50

Course Outcomes (COs): At the end of the course, students will be able to:

- CO1: To learn how human, physical, and environmental components of the world interact.
- CO2: To familiarized with economic processes such as globalization, trade and their impacts on economic, cultural and social activities.
- CO3: To describe geography and human geography in an effective manner.
- CO4: To Understand population dynamics and migration.
- CO5: To establish the population resource relationships and regional resource development.

List of the Exercises for 56 hrs / Semesters

No of Exercises	Techniques in Human Geography Practical	56 hrs/ Sem
1	Definition, Elements of maps (scale, direction, map projection, Conventional signs and symbols, legend), Types of maps, Uses of maps	06
2	Definition map Scales and Types- Verbal Scale (VS), Representative Fraction (RF), Graphical Scale.	06
3	Conversion of scale - VS into RF and RF into VS (Minimum 2 examples each), Exercise on measuring distance on map and converting map distance into ground distance.	06
4	Field-based Activity: Students are to be prepared a report by reading of maps in the field and collection of data and its representation.	08
5	Meaning and purpose of latitudes and longitude. Map Projections: Classification of map projections and their properties.	06
6	Construction of Cylindrical Projections - Cylindrical Equal Area Projection.	08
7	Construction of the Conical Projections - Conical Projection with one and two Standard parallel.	08
8	Construction of the Zenithal projections - Zenithal Polar Gnomonic Projection. Introduction to UTM Projection.	08

Recommended books:

10. Dickens and Pitts (1963) Introduction to Human Geography,
11. Harm D. Blij (1992) Human and Economic Geography, Macmillan Publishing Company, New York
12. Hussain M (2003) Human Geography, Rawat Publications, Jaipur
13. Nellson, Gabler Vining (1995) Human Geography, People, Cultures and Landscapes

14. Ranganath (2002) Principles of Human Geography (Kannada Version) Vidyanidhi, Gadag
15. Rubenstein J.M (2016). An Introduction to Human Geography, Macmillan Publishing Company, New York
16. New York
17. S.D. Maurya (2012), Human Geography, Pravalika Publications, Allahabad
18. L.R.Singh (2005), Fundamentals of Human Geography, Sharda Pustak Bhawan, Allahabad

Websites:

<https://www.indiaculture.nic.in/>
<https://dea.gov.in/>
<https://dpiit.gov.in/>
<https://www.mines.gov.in/>
<https://censusindia.gov.in/census.website/>

Formative Assessment for Practical	
Assessment Occasion/ type	Marks
Internal Assessment Test 1	05
Internal Assessment Test 2	05
Total	10 Marks
<i>Formative Assessment as per guidelines.</i>	

B.Sc. Semester – IV

Discipline Specific Course (DSC) - 7

Course Title: Regional Geography of India

Course Code: C4GEO 1T1

Type of Course	Theory / Practical	Credits	Instruction hour per week	Total No. of Lectures/Hours / Semester	Duration of Exam	Formative Assessment Marks	Summative assessment Marks	Total Marks
DSC-7	Theory	04	04	60 hrs.	3hrs.	20	80	100

Course Outcomes (COs): At the end of the course students will be able to:

- CO1: To gets exact information regarding mechanism of monsoon and its impact.
- CO2: To interpret and apply the concepts on resource distribution of India and related economic activities.
- CO3: To describe the Locational characteristics of an industry.
- CO4: To demonstrate the economic development through the connectivity of transport and communication.

Unit	Title: Regional Geography of India	60 hrs/sem
Unit I	Location, size and extent. Major physiographical regions (northern mountains, northern great plains, peninsular plateau and coastal plains and islands) and their characteristics. Climate: Seasonal weather characteristics, climatic zones. Mechanism and characteristics of Indian monsoons; Tropical cyclones and western disturbances. Floods and droughts. Drainage system. Soil: types, erosion and conservation. Vegetation: Types, distribution, afforestation, social forestry programs, national parks, wildlife sanctuaries, and biosphere reserves.	15 hrs
Unit II	Water resources of India, surface and groundwater, water demand and utilization. Irrigation: Sources, types and intensity. Issues and challenges: water resources scarcity, Water conservation and management. watershed management, rain water harvesting, recycle and reuse of water. Interlinking of rivers. National water policies, national water mission, Jalashakti Abhiyaan. Command area development and water management. Central Water Commission and Water Tribunal and their role. Agriculture: Landuse and cropping pattern – meaning and concepts, landuse and cropping Patten in India, agro-climatic regions, green revolution – causes and effects, hunger index and malnutrition; food security and right to food to achieve Zero hunger and Good Health and Wellbeing.	15 hrs
Unit III	Locational factors of industries, major industrial regions and their characteristics, Classification of Industries: Agro-based, mineral-based, forest-based and animal-based industries. Special Economic Zones: Industrial / economic corridor. Transport & Communication: Significance, growth and development – Road ways, railway, waterway, airway and pipeline networks and their complementary and competition. Communication: Means of communication their significance.	15 hrs
Unit IV	Growth, distribution and density of population. Composition of population: Age, sex, rural-urban population composition. Migration: meaning, factors, types, causes and consequences. Human Development in India: Measures, levels of development based on HDI, Human Gender Development Index (GDI)	15hrs

Recommended books:

1. Khullar DR. (2009): India: A Comprehensive Geography, kalyani Publishes, New Delhi, Hyderabad, Kolkata.
2. Alka Gautam (2009) Geography of India, Sharada pustak bhawan, University Road, Allahabad – UP.
3. Sharma TC & Coutinho O (2005) : Economic and Commercial geography of India, Vikas Publishing House Ltd., New Delhi-14
4. Tiwari RC. (2008) Geography of India, Prayag Pustak Bhavan, 20-A, University Road, Allahabad- UP
5. Pritivish Nag & Smita Sengupta (1992) Geography of India, Concept Publishing Company, New Delhi.
6. Ranganath (2007) Geography of India, Vidhyanidhi Prakashan, Station Road, Gadag-01.
7. PhaniDeka & Abani Bhagabati (1992) Geography: Economic and Regional, Wiley Eastern Limited, Ansari Raod, Daryaganj, N. Delhi-01.
8. Majid Husain (2008): Geography of India, Tata Mc. Graw hill publishing co. ltd. N. Delhi.
9. Singh R.L. (1971); India A Regional Geography, National Geographical Society of India, Varanasi, UP.
10. Jadish Sing (2003): India: A comprehensive systematic geography, Gyanodaya Prakashan Gorakhpur- UP.
11. Deshpande C. D., (1992): India: A Regional Interpretation, ICSSR, New Delhi.
12. Johnson, B. L. C., ed. (2001). Geographical Dictionary of India. Vision Books, New Delhi.
13. Mandal R. B. (ed.), (1990): Patterns of Regional Geography – An International Perspective. Vol. 3 – Indian Perspective.
14. Sdyasuk Galina and P Sengupta (1967): Economic Regionalisation of India, Census of India
15. Singh R. L., (1971): India: A Regional Geography, National Geographical Society of India.
16. Singh, Jagdish (2003): India - A Comprehensive & Systematic Geography, GyanodayaPrakashan, Gorakhpur.
17. Singh, RB, Schickhoff, Udo, Mal, Suraj (Eds.) (2016) Climate Change, Glacier Response, and Vegetation Dynamics in the Himalaya, Springer, Japan.
18. Singh,R.B. 2014, Urban Development Challenges, Risk & Resilience in Asian Mega Cities, Springer, Tokyo.
19. Spate O. H. K. and Learmonth A. T. A., (1967): India and Pakistan: A General and Regional Geography, Methuen.
20. Alyssa Ayres (2018.), Our Time Has Come, How India is Making Its Place in the World,
21. Panna Lal(2012), India- A Regional Geography, Anmol Publications.

Websites:

<http://www.mapsofindia.com/geography/>

<https://mausam.imd.gov.in/>

<https://tourism.gov.in/>

<https://www.resourcedata.org/dataset/rgi-ministry-of-minerals-energy-and-water-resources>

<https://dpiit.gov.in/>

<https://agricoop.nic.in/en>

<https://www.fao.org/soils-portal/en/>

Formative Assessment for Theory	
Assessment Occasion/ type	Marks
Internal Assessment Test 1	05
Internal Assessment Test 2	05
Assignment	10
Total	20 Marks
<i>Formative Assessment as per guidelines.</i>	

B.Sc. Semester – IV

Discipline Specific Course (DSC) - 8

Course Title: Representations of Geographical Features of India - Practical

Course Code: C4GEO 1P1

Type of Course	Theory / Practical	Credits	Instruction hour per week	Total No. of Lectures/Hours / Semester	Duration of Exam	Formative Assessment Marks	Summative assessment Marks	Total Marks
DSC-8	Practical	02	04	56 hrs.	3hrs.	10	40	50

Course Outcomes (COs): At the end of the course, students will be able to:

- CO1: To understanding the holistically approach about the geography of India.
- CO2: To Interpret and apply the concepts on resource distribution of India and related economic activities.
- CO3: To Interpret and apply the concepts on resource distribution of India and related economic activities.
- CO4: To represent the data in the form of maps and diagrams.
- CO5: To prepare a map of Tourism Destinies in Karnataka and India.

List of the Exercises for 56 hrs / Semesters

No of Exercises	Techniques in Human Geography Practical	56 hrs/ Sem
1	Prepare various landforms using toposheets and interpret.	06
2	Construct soil fertility (NPK) and distribution (India / Karnataka District) map by using choropleth method and interpret.	06
3	Construct rainfall distribution map of India / Karnataka / District by using isopleth method and interpret.	06
4	Field Activity: Candidates are to be taken for field work to nearest local place of natural/ cultural area and ask them to prepare report how natural / cultural landscape change over the time and submit a report.	08
5	Mapping temperature distribution in India / Karnataka / District by using isopleth method and interpret.	06
6	Construct a map regarding impact of industries in India by using buffer analysis digitally / manually and interpret.	08
7	Prepare flow-diagrams relating to air and railway transportation of India / Karnataka / District and interpret.	08
8	Construct special need and tourism interest map of India / Karnataka / District and interpret.	08

Books recommended:

1. Khullar D.R. (2009): India: A Comprehensive Geography, Kalyani Publishes, New Delhi, Hyderabad, Kolkata.
2. Alka Gautam (2009) Geography of India, Sharada Pustak Bhawan, University Road, Allahabad –UP.
3. Sharma TC & Coutinho O (2005) : Economic and Commercial geography of India, Vikas Publishing House ltd., New Delhi-14
4. Tiwari RC. (2008) Geography of India, Prayag Pustak Bhavan, 20-A, University Road, Allahabad-UP
5. Pritivish Nag & Smita Sengupta (1992) Geography of India, Concept Publishing Company, New Delhi.
6. Ranganath (2007) Geography of India, Vidhyanidhi Prakashan, Station Road, Gadag-01.
7. Phani Deka and Abani Bhagabati (1992) Geography: Economic and Regional, Wiley Eastern Limited, Ansari Raod, Daryaganj, N. Delhi-01.
8. Majid Husain (2008): Geography of India, Tata Mc. Graw hill publishing co. ltd. N. Delhi.
9. Singh R.L. (1971); India A Regional Geography, National Geographical Society of India, Varanasi, UP.
10. Jadish Sing (2003): India: A comprehensive systematic geography, Gyanodaya Prakashan Gorakhpur- UP.
11. **websites:**
<http://www.mapsofindia.com/geography/>

Formative Assessment for Practical	
Assessment Occasion/ type	Marks
Internal Assessment Test 1	05
Internal Assessment Test 2	05
Total	10 Marks
<i>Formative Assessment as per guidelines.</i>	

B.Sc. Semester – V

Discipline Specific Course (DSC) – 9A

Student shall select DSC 9A & 10 A or 9B & 10 B for 06 credits only

Course Title: Population Resources and Dynamics

Course Code: C5GEO 2T1

Type of Course	Theory / Practical	Credits	Instruction hour per week	Total No. of Lectures/Hours / Semester	Duration of Exam	Formative Assessment Marks	Summative assessment Marks	Total Marks
DSC-9A	Theory	04	04	60 hrs.	3hrs.	20	80	100

Course Outcomes (COs): At the end of the course students will be able to:

CO1: Apply critical analysis skills on the demographic composition of a country.

CO2: Classify and evaluate migrations and their types.

CO3: Understanding the population resources.

CO4: Analyse population growth issues and challenges.

CO5: Investigate how migration takes place.

Unit	Title: Population Resources and Dynamics	60 hrs/sem
Unit I	Nature and Scope of Population Geography, Population Geography and Demography, Sources of Population Data. Density of Population. World Population: Measures, patterns, and determinants. Growth, distribution, and problems.	15 hrs
Unit II	Concept of over, under & optimum population; Growth of Population in the World and India, Components of Population Change. Fertility and Mortality Analysis: Indices, determinants, and world patterns. Demographic Attributes and Demographic Transition. Theories of Population Growth: Malthus, Sadler, and Ricardo. Assignment: Students are to be prepared a report regarding population change in their own area and submit a report.	15 hrs
Unit III	Meaning, types, causes, consequences, and models. Theories of Migration Ravenstein & Lee. Population composition and characteristics. Age, Sex, rural-urban, occupational structure, and educational level. Field Activity: Students need to visit a nearby village and get to know how and why migration takes place and submit a report.	15 hrs
Unit IV	Population Resource Regions. Population Policy of India. Policy issues; Social well-being and quality of life; population as social capital. Contemporary Issues – Ageing of Population; Declining Sex Ratio; HIV/AIDS. Population policies in developed and developing countries. Human Development Index (HDI).	15hrs

Recommended books:

1. Chandna R.C. (2009), Geography of Population, Kalyani Publicishers, Aneari Road, Daryaganj, New Delhi.

2. Majid Hussain (1999), Human Geography, Rawat publications, Jaipur.
3. Trewartha GT. (1959) A Geography of Population, world Patterns, John Wiley and Sons Inc. New York.
4. Ghosh BN. (1987) Fundamentals of population Geography s, sterling publishing company, New Delhi
Jingam ML. B.K. Bhat, JN Deasi (2003) Demography, Urinda Publishers Pvt. Ltd. Delhi.
5. R.K. Tripathi ((2000) Population geography, commonwealth publishers, New Delhi.
6. Kayastha SL. (1998) Geography of Population, Rawat publications, jaipur.
7. Clerk I (1984) Geography of populations, approaches and applications, pergamon press, Oxford, UK.
8. Ritu Malik (2013), Changes in population Dynamics, Sanjay Prakashan
9. Prthvish Nag, G.C.Debnath (2021), Population Geography, Bharti Prakashan, Varanasi
10. Nanjannavar.S.S (2017) : Janasankhya Bhugola Shastra, Prabhu Publications, Dharwad.

Websites:

<https://censusindia.gov.in/census.website/>

<https://mea.gov.in/icm.htm>

<https://population.un.org/wpp/>

<https://www.popcouncil.org/research/india>

<https://www.cdc.gov/csels/dsepd/ss1978/lesson3/section3.html>

Formative Assessment for Theory	
Assessment Occasion/ type	Marks
Internal Assessment Test 1	05
Internal Assessment Test 2	05
Assignment	10
Total	20 Marks
<i>Formative Assessment as per guidelines.</i>	

B.Sc. Semester – V

Discipline Specific Course (DSC) – 10A

Course Title: Techniques in Population Geography - Practical

Course Code: C5GEO 2P1

Type of Course	Theory / Practical	Credits	Instruction hour per week	Total No. of Lectures/Hours / Semester	Duration of Exam	Formative Assessment Marks	Summative assessment Marks	Total Marks
DSC-10A	Practical	02	04	56 hrs.	3hrs.	10	40	50

Course Outcomes (COs): At the end of the course, students will be able to:

- CO1: Learn various methods of representative of demographic data.
 CO2: Apply various technologies in representation of demographic data.
 CO3: Analyse the trend and pattern of demographic data.
 CO4: Construct different diagrams using the data.
 CO5: Formulate the future trend of the data.

Excer No.	Title : Techniques in Population Geography	56.hrs/ sem
1	Sources of population data: Census of India, United Nations Population Division, Birth And Death Registry, Vital statistics survey, National Sample Survey, National Family and Health Survey.	04
2	Thematic maps for population Distribution-patterns (dot map, Choropleth maps).	06
3	Calculation of Population Growth rate in different decades.	06
4	Calculation of population projection, arithmetic method.	04
5	Calculation of population Density, arithmetic density, and agriculture density.	06
6	Calculation of Crude birth rate, General fertility rate and Total fertility rate.	06
7	Calculation of Crude death rate / mortality rate and Infant mortality rate.	06
8	Calculation of Age-specific mortality rate and Sex-specific mortality rate	06
9	Construction of population pyramids for Age, Sex, Rural and Urban.	06
10	Prepare a population map of district/ Karnataka/India.	06

Books recommended:

- Chandna R.C. (2009), Geography of Population, Kalyani Publicishers, Aneari Road, Daryaganj, New Delhi.
- Majid Hussain (1999), Human Geography, Rawat publications, Jaipur.
- Trewartha GT. (1959) A Geography of Population, world Patterns, John Wiley and Sons Inc. New York.
- Ghosh BN. (1987) Fundamentals of population Geography s, sterling publishing company, New Delhi
- Jingam ML. B.K. Bhat, JN Deasi (2003) Demography, Urinda Publishers Pvt. Ltd. Delhi.
- R.K. Tripathi ((2000) Population geography, commonwealth publishers, New Delhi.

7. Kayastha SL. (1998) Geography of Population, Rawat publications, jaipur.
8. Clerk I (1984) Geography of populations, approaches and applications, pergamon press, Oxford, UK.
9. Ritu Malik (2013), Changes in population Dynamics, Sanjay Prakashan
10. Prthvish Nag, G.C.Debnath (2021), Population Geography, Bharti Prakashan, Varanasi
11. Nanjannavar.S.S (2017) : Janasankhya Bhugola Shastra, Prabhu Publications, Dharwad.

Websites:

<https://censusindia.gov.in/census.website/>

<https://mea.gov.in/icm.htm>

<https://population.un.org/wpp/>

<https://www.popcouncil.org/research/india>

<https://www.cdc.gov/csels/dsepd/ss1978/lesson3/section3.html>

Formative Assessment for Practical	
Assessment Occasion/ type	Marks
Internal Assessment Test 1	05
Internal Assessment Test 2	05
Total	10 Marks
<i>Formative Assessment as per guidelines.</i>	

B.Sc. Semester – V

Discipline Specific Course (DSC) – 9B

Student shall select DSC 9B & 10 B or DSC 9A & 10 A for 06 credits only

Course Title: Fundamentals of Remote Sensing

Course Code: C5GEO 2T2

Type of Course	Theory / Practical	Credits	Instruction hour per week	Total No. of Lectures/Hours / Semester	Duration of Exam	Formative Assessment Marks	Summative assessment Marks	Total Marks
DSC-9B	Theory	04	04	60 hrs.	3hrs.	20	80	100

Course Outcomes (COs): At the end of the course students will be able to:

CO1: Define and describe the components of remote sensing and explain the history of remote sensing

CO2: Differentiate between the types of remote sensors and platforms and analyze.

CO3: Interpret aerial photographs and identify and compare digital and analog data.

CO4: Evaluate the applications of remote sensing, including the new satellite programs of India.

CO5: Analyze ground truth verification using Google Earth and evaluate its usefulness.

Unit	Title: Fundamentals of Remote Sensing	60 hrs/sem
Unit I	Definition and Components, History of Remote Sensing, Electromagnetic Magnetic Spectrum, Interaction of EMR with the atmosphere and with the surface feature, Atmospheric window, spectral reflectance of land covers (minerals, rocks, water, vegetation, and urban area)	15 hrs
Unit II	Types of orbits-sun-synchronous and geosynchronous, Sources of energy, Classification of remote sensors - Active, Passive, Electro-mechanical, and optical sensors. Resolution concept - Spectral, Radiometric, and temporal resolution. Platform types and characteristics Launch of space vehicles. Angular characteristics-FOV and IFOV, pushbroom and whiskbroom cameras, Panchromatic, multispectral, hyper spectral scanners, and geometric characteristics of the imageries. Assignment: Students need to prepare a report on how satellite images are captured, processed, and distributed to the end users by citing Bhuvan, ISRO, ISAC, NRSC, and SGC Websites.	15 hrs
Unit III	Elements, Types and interpretation of Aerial photography, Principles, Classification of Aerial photographs based on Height and Tilt, Scales, Components of camera, film, Aerial platforms. Elements of Aerial photo interpretation, Digital and Analog data, Image formats, Stereo pairs, Applications of Aerial Photography.	15 hrs
Unit IV	Indian remote sensing Centers and their activities, new satellite programs of India. Different Satellites and their Application in Land Resources, Meteorology, and Hydrology. Ground truth verification using Google Earth. Field Activity: Students need to visit a nearby village and get to know how remote sensing images and real world looks and submit a report.	15hrs

Recommended books:

1. Lillesand T. Mand Kiefer R.W (2021), Remote Sensing and Image interpretation, 7th Edition, John Wiley & Sons, Canada.
2. Jensen J. R, (2012), Remote Sensing of Environment: An Earth Resources Perspective, 2nd Edition, Pearson Education, Upper Saddle River, Prentice Hall, New Jersey.
3. Elachi Candvan Zyl J .J, (2006), Introduction to the Physics and Techniques of Remote Sensing, John Wiley & Sons, Canada.
4. Joseph G, (2005), Fundamentals of Remote Sensing, 2nd Edition, Universities Press (India) Pvt Ltd, Hyderabad.
5. Narayan LRA, (1999), Remote Sensing and its Applications, Universities Press (India) Pvt Ltd, Hyderabad.
6. Rampal K. K, (1999), Handbook of Aerial Photography and Interpretation, Concept Publishing Co, New Delhi.
7. Avery T. E and Berlin G.L, (1992), Fundamentals of Remote Sensing and Air Photo Interpretation, 5th Edition, Prentice Hall, New Jersey.
8. Sabins, F.F. Jr, (1987), Remote Sensing; Principles and Interpretation, 2nd Edition, W.H. Freeman and Co, New York.
9. Jensen, John R., (2005), Introductory Digital Image Processing, 3rd Ed., Upper Saddle River, NJ: Prentice Hall, 526 pages.

MOOC

1. Remote Sensing: <https://nptel.ac.in/courses/105/108/105108077/>
2. Introduction to Remote Sensing: <https://nptel.ac.in/courses/121/107/121107009/>
3. Digital Image Processing of Remote Sensing Data: <https://nptel.ac.in/courses/105/107/105107160/>
4. Remote Sensing and GIS: <https://nptel.ac.in/courses/105/103/105103193/>
5. Remote Sensing Essentials: <https://nptel.ac.in/courses/105/107/105107201/>
6. Remote Sensing: Principles and Applications: <https://nptel.ac.in/courses/105/101/105101206/>
7. Basics of Remote sensing, GIS & GNSS technology and their applications:
8. https://onlinecourses.swayam2.ac.in/aic20_ge05/preview
9. <http://rst.gsfc.nasa.gov/Front/tofc.html>.

Web Resources

<https://map-projections.net/imglist.php>

https://www.nrcan.gc.ca/sites/www.nrcan.gc.ca/files/earthsciences/pdf/resource/tutor/fundam/pdf/fundamentals_e.pdf

https://webapps.itc.utwente.nl/librarywww/papers_2009/general/principlesremotesensing.

Pdf <http://earthobsevatory.nasa.gov/Library/RemoteSensing>

<https://earthexplorer.usgs.gov/>

<https://bhuvan.nrsc.gov.in/home/index.php>

<https://map-projections.net/imglist.php>

Formative Assessment for Theory	
Assessment Occasion/ type	Marks
Internal Assessment Test 1	05
Internal Assessment Test 2	05
Assignment	10
Total	20 Marks
<i>Formative Assessment as per guidelines.</i>	

B.Sc. Semester – V

Discipline Specific Course (DSC) – 10B

Course Title: Interpretation of Aerial Photos and Satellite Images - Practical

Course Code: C5GEO 2P2

Type of Course	Theory / Practical	Credits	Instruction hour per week	Total No. of Lectures/Hours / Semester	Duration of Exam	Formative Assessment Marks	Summative assessment Marks	Total Marks
DSC-10B	Practical	02	04	56 hrs.	3hrs.	10	40	50

Course Outcomes (COs): At the end of the course, students will be able to:

CO1: Learn remote sensing techniques.

CO2: Apply modern technology in various geographical areas.

CO3: Interpret remotely sensed data.

CO4: Analyze digital imageries.

CO5: Analyze ground truth verification using Google Earth and evaluate its usefulness.

Expt. No,	Title:	56.hrs/ Sem
1	Basic information of the image (projection histogram, layers, pixel)	04
2	Visual interpretation: colour, texture, association, pattern, tone, shape.	06
3	Satellite Products and Band Characteristics, band combination	06
4	Satellite image downloading portals, Bhuvan, USGS explorer.	04
5	Image Enhancement: Radiometric, spatial enhancement	06
6	Layers Stacking	06
7	Pre-Processing: Geometric and Radiometric Correction	06
8	Spectral enhancement: Spectral Indices, NDVI	06
9	Image Classification: Supervised and Unsupervised	06
10	Change Detection	06

Books recommended:

1. Lillesand T. Mand Kiefer R.W (2021), Remote Sensing and Image interpretation, 7th Edition, John Wiley & Sons, Canada.
2. Jensen J. R, (2012), Remote Sensing of Environment: An Earth Resources Perspective, 2nd Edition, Pearson Education, Upper Saddle River, Prentice Hall, New Jersey.
3. Elachi Candvan Zyl J .J, (2006), Introduction to the Physics and Techniques of Remote Sensing, John Wiley & Sons, Canada.
4. Joseph G, (2005), Fundamentals of Remote Sensing, 2nd Edition, Universities Press (India) Pvt Ltd, Hyderabad.

5. Narayan LRA, (1999), Remote Sensing and its Applications, Universities Press (India) Pvt Ltd, Hyderabad.
6. Rampal K. K, (1999), Handbook of Aerial Photography and Interpretation, Concept Publishing Co, New Delhi.
7. Avery T. E and Berlin G.L, (1992), Fundamentals of Remote Sensing and Air Photo Interpretation, 5th Edition, Prentice Hall, New Jersey.
8. Sabins, F.F. Jr, (1987), Remote Sensing; Principles and Interpretation, 2nd Edition, W.H. Freeman and Co, New York.
9. Jensen, John R., (2005), Introductory Digital Image Processing, 3rd Ed., Upper Saddle River, NJ: Prentice Hall, 526 pages.

MOOC

1. Remote Sensing: <https://nptel.ac.in/courses/105/108/105108077/>
2. Introduction to Remote Sensing: <https://nptel.ac.in/courses/121/107/121107009/>
3. Digital Image Processing of Remote Sensing Data: <https://nptel.ac.in/courses/105/107/105107160/>
4. Remote Sensing and GIS: <https://nptel.ac.in/courses/105/103/105103193/>
5. Remote Sensing Essentials: <https://nptel.ac.in/courses/105/107/105107201/>
6. Remote Sensing: Principles and Applications: <https://nptel.ac.in/courses/105/101/105101206/>
7. Basics of Remote sensing, GIS & GNSS technology and their applications:
8. https://onlinecourses.swayam2.ac.in/aic20_ge05/preview
9. <http://rst.gsfc.nasa.gov/Front/tofc.html>.

Web Resources

1. Projections: <https://map-projections.net/imglist.php>
2. Textbook of Canadian Remote Sensing: https://www.nrcan.gc.ca/sites/www.nrcan.gc.ca/files/earthsciences/pdf/resource/tutor/fundam/pdf/fundamentals_e.pdf
3. ITC Netherlands, Principles of Remote Sensing https://webapps.itc.utwente.nl/librarywww/papers_2009/general/principlesremotesensing.
4. Pdf <http://earthobservatory.nasa.gov/Library/RemoteSensing>
<https://earthexplorer.usgs.gov/>
<https://bhuvan.nrsc.gov.in/home/index.php>
<https://map-projections.net/imglist.php>

Formative Assessment for Practical	
Assessment Occasion/ type	Marks
Internal Assessment Test 1	05
Internal Assessment Test 2	05
Total	10 Marks
<i>Formative Assessment as per guidelines.</i>	

B.Sc. Semester –VI

Discipline Specific Course (DSC) – 11A

Student shall select DSC 11B & 12 B or DSC 11A & 12A for 06 credits only

Course Title: Environmental Geography

Course Code: C6GEO 2T1

Type of Course	Theory / Practical	Credits	Instruction hour per week	Total No. of Lectures/Hours / Semester	Duration of Exam	Formative Assessment Marks	Summative assessment Marks	Total Marks
DSC-11A	Theory	04	04	60 hrs.	3hrs.	20	80	100

Course Outcomes (COs): At the end of the course students will be able to:

- CO1: Understand the interdisciplinary nature and the relationship between man and the environment.
- CO2: Know functioning of ecosystems, including the impact of human activity and global ecological changes.
- CO3: Evaluate man-made changes like pollution, environmental hazards, and the depletion of natural resources.
- CO4: Examine environmental policy, impact assessment, and conservation measures.
- CO5: Apply knowledge of environmental geography to real-world situations.

Unit	Title: Environmental Geography	60 hrs/sem
Unit I	Nature and Interdisciplinary Aspect of Environmental Geography. Ecological Approaches. Definition and meaning of environment. Habitat. Ecological Niche. Biosphere and Biodiversity; bio-diversity and sustainable development. Biomes – major Biomes of the world. Man and Environmental Relationships.	15 hrs
Unit II	Structure and Functioning of Ecosystem, Pond as an Ecosystem, ecosystem management, and conservation. Principle of ecology; human ecological adaptation; the influence of man on ecology and environment. Global and regional ecological change & imbalance. Food Chains, Food Webs, Food Pyramid.	15 hrs
Unit III	Environmental Pollution, i.e., Air, Water, Noise; Solid Waste with special reference to India. Environmental Hazards, i.e., earth as Warehouses, Flood, Famines; Land Slides, Avalanches, Forest Fires; Impact of Green Revolution and Extinction of Species. Man-Made Ecosystem - Urban, Ecotourism, National Parks and Sanctuaries. Depletion of Ozone, Green House Effect, and Acid Rain.	15 hrs
Unit IV	Environmental Policy of India, (post-2000 AD). Environment Impact Assessment (EIA). Global Summits & Agencies of Environment Conservation. Environmental degradation, management and conservation. Problems of Deforestation and conservation measures. Environmental policy; environmental hazards and remedial measures. Environmental Education and Legislation.	15hrs

Recommended books:

1. Strahler A.N. (1968) The Earth Sciences, Harper International Education, New York.

2. Richard H.B. (2004) Physical Geography, Heinmann Simple Services, Rupa & Company, New Delhi
3. Robinson H. (1982) Bio Geography, ELBS, New York.
4. Healey I.N. and Moore P.D. (1973) Biogeography, Backwell Oxford, U.K.
5. Strahler A.N. and Strahler A.H. (1973) Environmental Geo Science, Hamilton, California, USA.
6. Savindra Singh (2004) Environmental Geography, Prayog Pustak Bhawan, Allahabad, India.
7. Paul Selman (2000) Environmental Planning, Sage Publications, New Delhi
8. Cheryl Simon Silve& Ruth S. De Fries (1991) One Earth One Future-Our chaining Global Environment, National Academy of Sciences, Affiliated to East-West Press Pvt. Ltd. New Delhi.
9. Strahler A.N. and Strahler A.H. (1977) Geography and Man's Environment, John Wiley & Sons, New York
10. Goldsmith Edward et al. (1988) The Earth Report – The Essential Guide to Global Issues, Price Stern Solan Inc. California, USA
11. Y.K. Sharma (2020), Narain's Environmental Geography (Resource and Development), Lakshmi Narain Agarwal
12. H.M. Saxena (2021), Environmental Geography, Rawat Publications
13. Strahler A.N. (1968) The Earth Sciences, Harper International Education, New York.
14. Cheryl Simon Silve& Ruth S. De Fries (1991) One Earth One Future-Our chaining Global Environment, National Academy of Sciences, Affiliated to East-West Press Pvt. Ltd. New Delhi.
15. Strahler A.N. and Strahler A.H. (1977) Geography and Man's Environment, John Wiley & Sons, New York.
16. Nanjannavar.S.S (2017): Parisara Bhugolshastra, Prabhu Publications, Dharwad.

Websites:

<https://moef.gov.in/en/>

<http://environmentclearance.nic.in/>

<https://ndma.gov.in/>

<https://bhuvan.nrsc.gov.in/home/index.php>

<http://www.indiaenvironmentportal.org.in/>

Formative Assessment for Theory	
Assessment Occasion/ type	Marks
Internal Assessment Test 1	05
Internal Assessment Test 2	05
Assignment	10
Total	20 Marks
<i>Formative Assessment as per guidelines.</i>	

B.Sc. Semester – VI

Discipline Specific Course (DSC) – 12A

Course Title: Methods in Environmental Geography - Practical

Course Code: C6GEO 2P1

Type of Course	Theory / Practical	Credits	Instruction hour per week	Total No. of Lectures/Hours / Semester	Duration of Exam	Formative Assessment Marks	Summative assessment Marks	Total Marks
DSC-12A	Practical	02	04	56 hrs.	3hrs.	10	40	50

Course Outcomes (COs): At the end of the course, students will be able to:

- CO1: Biotic and Abiotic elements exist in the environment.
- CO2: Identify micro-Biomes in the local region.
- CO3: Identify the water bodies and polluting points in the local region.
- CO4: Identify the waste disposal sites
- CO5: Handle GPS in field.

Expt. No,	Title:	56.hrs/ Sem
1	List out Biotic and Abiotic elements in the local region.	04
2	Identify and map micro-Biomes in the local region and study the biodiversity of the place.	06
3	List some ecosystem management and conservation methods in the local region for water bodies,	06
4	Mapping of water bodies and bore wells.	04
5	Map the polluting points in the local area and their influence of man on the local environment.	06
6	Mapping of Waste disposal sites	06
7	Suitability of the site for waste disposal (with reference to height, location, land use, land value, slope,	06
8	Mapping of parks and open spaces in the neighborhood.	06
9	Mapping of areas in the neighborhood where crowding is prevalent and type of land use around such places.	06
10	Materials required for the practical survey: Use a Boundary map of the neighborhood area and GPS (field mapping) or Google Earth can also be used for mapping neighborhood area.	06

Books recommended:

1. Strahler A.N. (1968) The Earth Sciences, Harper International Education, New York.
2. Richard H.B. (2004) Physical Geography, Heinmann Simple Services, Rupa & Company, New Delhi
3. Robinson H. (1982) Bio Geography, ELBS, New York.
4. Healey I.N. and Moore P.D. (1973) Biogeography, Backwell Oxford, U.K.
5. Strahler A.N. and Strahler A.H. (1973) Environmental Geo Science, Hamilton, California, USA.
6. Savindra Singh (2004) Environmental Geography, Prayog Pustak Bhawan, Allahabad, India.
7. Paul Selman (2000) Environmental Planning, Sage Publications, New Delhi
8. Cheryl Simon Silve& Ruth S. De Fries (1991) One Earth One Future-Our chaining Global Environment, National Academy of Sciences, Affiliated to East-West Press Pvt. Ltd. New Delhi.
9. Strahler A.N. and Strahler A.H. (1977) Geography and Man's Environment, John Wiley & Sons, New York
10. Goldsmith Edward et al. (1988) The Earth Report – The Essential Guide to Global Issues, Price Stern Solan Inc. California, USA
11. Y.K. Sharma (2020), Narain's Environmental Geography (Resource and Development), Lakshmi Narain Agarwal
12. H.M. Saxena (2021), Environmental Geography, Rawat Publications
13. Strahler A.N. (1968) The Earth Sciences, Harper International Education, New York.
14. Cheryl Simon Silve& Ruth S. De Fries (1991) One Earth One Future-Our chaining Global Environment, National Academy of Sciences, Affiliated to East-West Press Pvt. Ltd. New Delhi.
15. Strahler A.N. and Strahler A.H. (1977) Geography and Man's Environment, John Wiley & Sons, New York.

Websites:

<https://moef.gov.in/en/>

<http://environmentclearance.nic.in/>

<https://ndma.gov.in/>

<https://bhuvan.nrsc.gov.in/home/index.php>

<http://www.indiaenvironmentportal.org.in/>

Formative Assessment for Practical	
Assessment Occasion/ type	Marks
Internal Assessment Test 1	05
Internal Assessment Test 2	05
Total	10 Marks
<i>Formative Assessment as per guidelines.</i>	

B.Sc. Semester – VI

Discipline Specific Course (DSC) – 11B

Student shall select DSC 11B & 12 B or DSC 11A & 12A for 06 credits only

Course Title: Fundamentals of Geographic Information Systems

Course Code: C6GEO 2T2

Type of Course	Theory / Practical	Credits	Instruction hour per week	Total No. of Lectures/Hours / Semester	Duration of Exam	Formative Assessment Marks	Summative assessment Marks	Total Marks
DSC-11B	Theory	04	04	60 hrs.	3hrs.	20	80	100

Course Outcomes (COs): At the end of the course students will be able to:

CO1: Understand the definition, components, and interdisciplinary domains of GIS.

CO2: Apply geodesy and spatial mathematics for measuring distances and coordinates.

CO3: Analyze and evaluate spatial data structures, sources, errors, and scales for precision and accuracy.

CO4: Perform geo-processing and visualization techniques including spatial and non-spatial queries.

CO5: Collect and integrate spatial and non-spatial data for a case study using online resources.

Unit	Title: Fundamentals of Geographic Information Systems	60 hrs/sem
Unit I	Definition, Scope of GIS in digital world; Components, functionalities, merits and demerits, global market. Interdisciplinary domains, and its integration with GIS.	15 hrs
Unit II	Meaning scope of geodesy, geographical coordinates, latitude, longitudes; Datum: WGS-84, V/S NAD-32. UTM; Aerial Distance measurement using Geographic and projected coordinates. Area, perimeter, length by coordinates and various international measures. Assignment: students need to prepare hand drawn maps with the help of graticules.	15 hrs
Unit III	Spatial Data and its structures; Sources and Types of data. Collection, Data errors and relationships. Large Scale V/S small scale; Generalization precision and accuracy data.	15 hrs
Unit IV	Spatial and Non-Spatial Queries; Proximity analysis, Preparation of Terrain and Surface models. Hotspot and density mapping. Types of maps, thematic maps and its types, relief maps, flow maps and cartograms. Tabulations: Graphs and Pivot tables. Case Study: Students need to collect available spatial and non-spatial data of all the talukas of their districts from online resources.	15hrs

Recommended books:

1. Ian Heywood (2011), An Introduction to Geographical Information Systems, Pearson
2. Aronoff, S. (1989), Geographic Information Systems: A Management Perspective, Geocarto International: Vol. 4, No. 4, pp. 58-58.

3. Elangovan, K. (2006), GIS - Fundamentals, Applications, and Implementations, Nipa
4. Chang, Kang – Tsung (2015), Introduction to Geographical Information Systems, McGraw-Hill Education
5. Bhatta, B. (2011), Remote Sensing and GIS, Oxford
6. Sharma, H.S. (2006), Mathematical Modelling in Geographical Information System, Global Positioning System and Digital Cartography – New Delhi, India
7. Spatial Analysis and Location-Allocation Models - Ghosh, A. and G. Rushton (1987)
8. Geographic Information Systems and Cartographic Modelling - Tomlin, C.D. (1990)
9. Geographic Information Systems and Science – Paul A. Longley, et.al. (2015)
10. Geographic Information Systems and Environmental Modelling - Clarke, C.,K. (2002)
11. An Introduction to Geographical Information Systems, 3rd Edition- Ian Heywood, Sarah Cornelius, Steve Carver (2009)
12. Concepts and Techniques of Geographic Information Systems- Chor Pang Lo, Albert K.W. Yeung (2016)

Web resources:

IIRS MOOC programme: <https://isat.iirs.gov.in/mooc.php>

ITC Netherlands, Principles of GIS

https://webapps.itc.utwente.nl/librarywww/papers_2009/general/principlesgis.pdf

Geographical Information Systems: Principles, Techniques, Management and Applications

https://www.geos.ed.ac.uk/~gisteac/gis_book_abridged/

<https://www.esri.com/en-us/home>

Formative Assessment for Theory	
Assessment Occasion/ type	Marks
Internal Assessment Test 1	05
Internal Assessment Test 2	05
Assignment	10
Total	20 Marks
<i>Formative Assessment as per guidelines.</i>	

B.Sc. Semester –VI

Discipline Specific Course (DSC) – 12B

Course Title: GIS for Map-Making - Practical

Course Code: C6GEO 2P2

Type of Course	Theory / Practical	Credits	Instruction hour per week	Total No. of Lectures/Hours / Semester	Duration of Exam	Formative Assessment Marks	Summative assessment Marks	Total Marks
DSC-12B	Practical	02	04	56 hrs.	3hrs.	10	40	50

Course Outcomes (COs): At the end of the course, students will be able to:

CO 1: Draw manually point, line, and polygon using a toposheet

CO 2: Draw vector and raster structures using features on the toposheet.

CO 3: Understand the different image formats and file management.

CO 4: Do geo-referencing and digitalization.

CO 5: Prepare Map layout, map composition, and map designing.

Expt. No,	Title: GIS for Map-Making	56.hrs/ Sem
1	Draw manually point, line, and polygon using a toposheet	04
2	Draw vector structures from the toposheet with reference to settlements, roads,	06
3	Create raster structures of a portion of the toposheet using a graph sheet.	06
4	Downloading images from the internet portal (Bhuvan);	04
5	Different image formats	06
6	File Management	06
7	Geo-referencing of toposheet.	06
8	Digitize the Point line polygon, creating layers.	06
9	Buffer analysis, and proximity analysis,	06
10	Map layout, map composition, and map designing.	06

Books recommended:

1. Ian Heywood (2011), An Introduction to Geographical Information Systems, Pearson
2. Aronoff, S. (1989), Geographic Information Systems: A Management Perspective, Geocarto International: Vol. 4, No. 4, pp. 58-58.
3. Elangovan, K. (2006), GIS - Fundamentals, Applications, and Implementations, Nipa
4. Chang, Kang – Tsung (2015), Introduction to Geographical Information Systems, McGraw-Hill Education
5. Bhatta, B. (2011), Remote Sensing and GIS, Oxford
6. Sharma, H.S. (2006), Mathematical Modelling in Geographical Information System, Global Positioning System and Digital Cartography – New Delhi, India
7. Spatial Analysis and Location-Allocation Models - Ghosh, A. and G. Rushton (1987)
8. Geographic Information Systems and Cartographic Modelling - Tomlin, C.D. (1990)
9. Geographic Information Systems and Science – Paul A. Longley, et.al. (2015)
10. Geographic Information Systems and Environmental Modelling - Clarke, C.,K. (2002)
11. An Introduction to Geographical Information Systems, 3rd Edition- Ian Heywood, Sarah Cornelius, Steve Carver (2009)
12. Concepts and Techniques of Geographic Information Systems- Chor Pang Lo, Albert K.W. Yeung (2016)

Web resources:

IIRS MOOC programme: <https://isat.iirs.gov.in/mooc.php>

ITC Netherlands, Principles of GIS

https://webapps.itc.utwente.nl/librarywww/papers_2009/general/principlesgis.pdf

Geographical Information Systems: Principles, Techniques, Management and Applications

https://www.geos.ed.ac.uk/~gisteac/gis_book_abridged/

<https://www.esri.com/en-us/home>

Formative Assessment for Practical	
Assessment Occasion/ type	Marks
Internal Assessment Test 1	05
Internal Assessment Test 2	05
Total	10 Marks
<i>Formative Assessment as per guidelines.</i>	

B.Sc. Semester – V
Elective Course (EC) 01
It is for other combination students

Course Title: Introduction to Physical Geography

Course Code: C5GEO 5T1

Type of Course	Theory / Practical	Credits	Instruction hour per week	Total No. of Lectures/Hours / Semester	Duration of Exam	Formative Assessment Marks	Summative assessment Marks	Total Marks
EC-1	Theory	03	04	45 hrs.	3hrs.	20	80	100

Course Outcomes (COs): At the end of the course students will be able to:

- CO 1 :** To define the Physical Geography, the shape and size of the earth surface.
- CO 2 :** To identify the different types of rocks and their characteristics and agents of denudation.
- CO 3 :** To discuss the nature of structure and composition of Atmosphere.
- CO 4 :** To discuss the ocean floor and marine resources.
- CO 5 :** To analyse the physical geography of any geographical regions.

Unit	Title: Introduction to Physical Geography	45 hrs/sem
Unit I	Origin, Shape and Size of the Earth, Movement of the Earth- Rotation and Revolution. Effects of the movement of Earth, Coordinates -Latitude, Longitude and Time and Structure of the Earth. Rocks and their types, significance of rocks. Weathering and its types. Agents of Denudation - River, Glacier, Wind and Under Ground water. Volcanicity, Earthquakes and Tsunamis.	15 hrs
Unit II	Structure and Composition of Atmosphere. Weather and Climate. Atmospheric Temperature, Heat Budget of the atmosphere Atmospheric Pressure, Winds and Precipitation	15 hrs
Unit III	Distribution of Land and Sea, Submarine Relief of the Ocean, Temperature and Salinity of Sea Water. Ocean Tides, Waves and Deposits, Ocean currents: Atlantic, Pacific and Indian Oceans. Marine Resources: Biotic, mineral and energy resources.	15 hrs

Recommended books:

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. Kishoreya publication, New Delhi
4. R.N.Tikka (2002) Physical Geography. Kedarnath Ramnath & co, Meerut.
5. P Mallappa, Physical Geography (Kannada Version).
6. Ranganath Principles of Physical Geography (Kannada Version).
7. Nanjannavar S S: Physical Geography (Kannada Version).
8. Hugar M R Physical Geography part-1 (Kannada Version).
9. Goudar M B, Physical Geography (Kannada Version).

Websites:

<https://oxfordbibliographies.com>

<https://ncrt.nic.in>

<https://www.nationalgeographic.org>.

<https://researchguide.deartmath.edu>

<https://journals.sagepub.com>

Formative Assessment for Theory	
Assessment Occasion/ type	Marks
Internal Assessment Test 1	05
Internal Assessment Test 2	05
Assignment	10
Total	20 Marks
<i>Formative Assessment as per guidelines.</i>	

B.Sc. Semester – VI

Elective Course (EC) -02

Course Title: Geography of India.

Course Code: C6GEO 5T1

Type of Course	Theory / Practical	Credits	Instruction hour per week	Total No. of Lectures/Hours / Semester	Duration of Exam	Formative Assessment Marks	Summative assessment Marks	Total Marks
EC-2	Theory	03	04	45 hrs.	3hrs.	20	80	100

Course Outcomes (COs): At the end of the course students will be able to:

CO1: To describe the holistic approach about the geography of India

CO2: To interpret and apply the concepts on resource distribution of India and related economic activities.

CO3: To demonstrate the economic development through the connectivity of transport and communication.

Unit	Title: Geography of India.	45 hrs/sem
Unit I	Location and Extension of India, Physiographic divisions, Climate, Drainage system, Soil Types and its distribution. Natural Vegetation, Water Disputes: River Brahmaputra and Indus. Geopolitical Issues: Indo-china, Indo-Pakistan.	15 hrs
Unit II	Need for irrigation, types and distribution. Multipurpose river valley projects Significance of Agriculture, Types of farming. Agro Climatic Regions of India Agricultural Crops: Rice, Wheat, Sugarcane, cotton, Tea and Coffee. Green Revolution, White Revolution, Blue revolution, Blue Revolution.	15 hrs
Unit III	Significance and locational factors. Distribution of Iron ore, Manganese, Bauxite, Coal, Petrol. Distribution and production of industries: Cotton Textile, Jute, Iron and Steel, Aluminum and Paper. Special Economic Zones, Roadways, Railway, airways waterways. Ports and National Water Ways.	15 hrs

Recommended books:

1. Khullar DR. (2009): India: A Comprehensive Geography, Kalyani Publishers, New Delhi, Hyderabad, Kolkata.
2. AlkaGautam (2009) Geography of India, Sharada pustak bhawan, University Road, Allahabad – UP.
3. Sharma TC & Coutinho O (2005) : Economic and Commercial geography of India, Vikas Publishing House Ltd., New Delhi-14.
4. Tiwari RC. (2008) Geography of India, Prayagpustak Bhavan, 20-A, University Road, Allahabad- UP.
5. Pritivish Nag & Smita Sengupta (1992) Geography of India, Concept Publishing Company, New Delhi.

6. Ranganath (2007) Geography of India, Vidhyanidhi Prakashan, Station Road, Gadag-01.
7. PhaniDeka & Abani Bhagabati (1992) Geography: Economic and Regional, Wiley Eastern Limited, Ansari Raod, Daryaganj, N. Delhi-01.
8. Majid Husain (2008): Geography of India, Tata Mc. Graw hill publishing co. ltd. N. Delhi.
9. Singh R.L. (1971); India A Regional Geography, National Geographical Society of India, Varanasi, UP.
10. Jadish Sing (2003): India: A comprehensive systematic geography, Gyanodaya Prakashan Gorakhpur-UP.
11. Kalpana Rajaram (2012), Geography of India, Spectrum Books Pvt. Ltd.
12. Y.I. Singh (2021), Geography of India, Global Net Publication

Websites:

1. <http://www.mapsofindia.com/geography/>
2. <https://agricoop.nic.in/en>
3. <https://www.resourcedata.org/dataset/rgi-ministry-of-minerals-energy-and-water-Resource>
4. <https://dpiit.gov.in/>
5. <http://rfrfoundation.org/nadi-ko-jano/>
6. <https://jalshakti-ddws.gov.in/>

Formative Assessment for Theory	
Assessment Occasion/ type	Marks
Internal Assessment Test 1	05
Internal Assessment Test 2	05
Assignment	10
Total	20 Marks
<i>Formative Assessment as per guidelines.</i>	

B.Sc. Semester –IV/ V/VI

Skill Enhancement Course (SEC)

Student shall study SEC in any one of the Semesters either in IV or V or VI semester

College shall decide to allot the students

Course Title: Geographical Statistics - Practical

Course Code: COGEO6P1

Type of Course	Theory / Practical	Credits	Instruction hour per week	Total No. of Lectures/Hours / Semester	Duration of Exam	Formative Assessment Marks	Summative assessment Marks	Total Marks
SEC	Practical	02	04	56 hrs.	3hrs.	10	40	50

Course Outcomes (COs): At the end of the course, students will be able to:

CO 1 : To define statistics and enable to use for analysis.

CO 2 : To handle the data collection, tabulation and sampling.

CO 3 : To enable the calculations of mean, median and mode.

CO 4 : To enable the calculations of mean, median and mode.

Expt. No,	Title: Geographical Statistics	56.hrs/ Sem
1	Methods of data collection, sources of the data and sampling methods.	04
2	Processing the data, tabulation and formation of frequency.	06
3	Measures of Central Tendency and its significance.	06
4	Calculation of Mean for grouped and ungrouped data.	04
5	Calculation of Median for grouped and ungrouped data.	06
6	Calculation of Mode for grouped and ungrouped data.	06
7	Measures of Dispersion and its importance.	06
8	Calculation of Quartile Deviation for grouped and ungrouped data.	06
9	Calculation of Mean Deviation for grouped and ungrouped data.	06
10	Calculation of Standard Deviation for grouped and ungrouped data.	06

Books recommended:

1. Haymond and Mccullah (1974), Quantitative techniques in geography, An introduction, Oxford London.
2. Aslam Mohamed (1977): Statistical Methods in Geographical Studies, Rajesh Publications, New Delhi.

3. Gupta CB. (1979): An introduction to statistical methods, Vika publishing house pvt. Ltd. New Delhi.
4. Murray R. Spiegel (1972): Theory and problems of statistics, Mc. Grawhill Book co. New York.
5. Singh RL. (2016): elements of Practical Geography, Kalyani Publishers, New Delhi.

Websites:

<https://www.statistics.com>

<https://www.amstat.org>

<https://quora.com>

<https://www.statisticshowto.com>

Formative Assessment for Practical	
Assessment Occasion/ type	Marks
Internal Assessment Test 1	05
Internal Assessment Test 2	05
Total	10 Marks
<i>Formative Assessment as per guidelines.</i>	

B.Sc. programme: 2024-25

GENERAL PATTERN OF **THEORY** QUESTION COURSE FOR DSC/ EC
(80 marks for semester end Examination with 3 hrs duration)

Part-A

1. Question number 1-10 carries 2 marks each. : 20 marks

Part-B

2. Question number 11- 18 carries 05Marks each. Answer any 06 questions : 30 marks

Part-C

3. Question number 19-22 carries 10 Marks each. Answer any 03 questions : 30 marks
(Minimum 1 question from each unit and 10 marks question may have
sub questions for 7+3 or 6+4 or 5+5 if necessary)

Total: 80 Marks

Note: Proportionate weight age shall be given to each unit based on number of hours Prescribed