MANGALORE UNIVERSITY

Curriculum Framework for Undergraduate

V and VI Semester Syllabus for

BA / BSc. In

GEOGRAPHY

Syllabus Aims:

The aims of the syllabus describe the B.A. / B.Sc. in Geography at 5th, 6th. 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 geographical skills and through practical field visits.

The BA. / B.Sc. Geography syllabus aims to enable students to:

1. Know the significance of scale in studying geography
2. Know the processes functioning at various scales within physical and human environments
3. Improve a sense of space, place and location
4. Develop consciousness of the relevance of geography to understanding and solving contemporary environmental problems
5. Realization of the main fundamentals of physical geography and human geography and the interconnectedness between them
6. Explain the causes and effects of change over space and time on physical and human environments
7. Develop an insight into the nature, value, limitations and importance of different approaches to analyse and explanation in geography
8. Increase the knowledge and ability to use and apply appropriate skills and techniques including fieldwork
9. Improve a logical approach in order to present a structured, coherent and evidence-based argument
10. Develop a concern for accuracy and objectivity in extracting, recording, processing, presenting, analysing and interpreting geographical data

Program Outcomes (POs) By the end of the program the students will be able to:		
PO1	Geographical Knowledge:	Give an explanation of relevant terms and concept of geography includingdefinitions
PO2	Project Management:	Recognize geographical principles, theories and models to manage projects and achieve its objectives.
PO3	Problem Analysis:	Find solution to environmental and Human problems
PO4	Modern Tool:	Application of modern tools and techniques to interpret how processes bring changes in systems, distributions and environments.
PO5	Research of Complex Problems:	Apply research-based knowledge to provide valid conclusions and demonstrateskill of analysis and synthesis of geographical information.
PO6	Communication:	Communicate effectively by identifying human activities and use geographical data to identify trends and patterns.
PO7	Design / development of solutions:	Carry out investigation into the complex and interactive nature of physical andhuman environments.
PO8	Geography andSociety:	To inspect the environmental and societal issues and compare between theplaces, environments and people.
PO9	Multi-disciplinary Settings:	Assemble geographical evidence, ideas and arguments with multi-disciplinary setting.
PO10	Ethics:	Develop ethical principles and commit to professional ethics and responsibilities and norms of scientific practices.
PO11	Life-long Learning:	Understand the effects of geographical processes and change on physical and human environments and life-long learning of geographical studies.
PO12	Environment and Sustainability:	Assess how the viewpoints of different groups of people, potential conflicts ofinterest and other factors interact in the management of physical and human environments to bring environmental sustainability.

MANGALORE UNIVERSITY

BA / BSc in Geography Curriculum

Program Name	**BA / BSc in Geography**	Semester	**5**
Course Title	**Population Resources and Dynamics**		
Course Code:	**GEO C9-T**	No. of Credits	**4**
Contact hours	**60 Hours**	Duration of Sem End Exam	**2 hours**
Formative Assessment Marks	**40**	Summative Assessment Marks	**60**

Course Pre-requisite(s): No Pre-requisite course(s)

Course Outcomes (COs): After the successful completion of the course, the student 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 Analyze population growth issues and challenges.
CO5 Investigate how migration takes place

	Contents	60 Hrs.
Unit: 1	**Introduction**: 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.	10
Unit: 2	**Population Change**: 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 have to prepare report regarding population change in their own area and submit a report.	20
Unit: 3	**Migration:** 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 rural area and get to know how and why migration takes place and submit a report.	15
Unit: 4	**Population as Resource**, Population Resource Regions. Population Policy of India. Policy issues; Social well-being and quality of lif e; population as social capital. Contemporary Issues – Ageing of Population; Declining Sex Rati and its reasons. Population policies in developed and developing countries. Human Development Index (HDI)	15

Course Articulation Matrix: Mapping of Course Outcomes (COs) with Program Outcomes (POs 1-15)

Course Outcomes (COs) / Program Outcomes (POs)	Program Outcomes (POs)											
	1	2	3	4	5	6	7	8	9	10	11	12
CO1	1	-	3	-	-	-	-	-	2	-	2	-
CO2	1	-	-	-	-	1	-	1	2	-	2	-
CO3	3	-	-	-	-	2	1	1	2	-	2	-
CO4	1	-	3	-	-	1	2	1	2	-	2	-
CO5	1	1	2	-	2	1	3	1	2	1	2	-

Pedagogy: Interactive Lectures, Inquiry-based learning, Blended learning, Case Studies.

Formative Assessment for Theory	
Assessment Occasion/ type	**Marks**
Sessional Tests-1	10
Sessional Tests-2	10
Seminars / Presentations / **Assignment**	10
Case study / **Field-Study** / Project work etc.	10
Total	**40 Marks**
Formative Assessment as per guidelines.	

MANGALORE UNIVERSITY

BA / BSc in Geography Curriculum

Program Name	**BA / BSc in Geography**	Semester	**5**
Course Title	**Techniques in Population Geography**	Practical Credits	**02**
Course Code	**GEO C10-P**	Contact Hours	**60 Hours**
Formative Assessment	**25 Marks**	Summative Assessment	**25 Marks**

Course Pre-requisite(s): No Pre-requisite course(s)

Course Outcomes (COs):
After the successful completion of the course, the student will be able to:
CO1 Learn various methods of representative of demographic data.
CO2 Apply various technologies in representation of demographic data.
CO3 Analyze the trend and pattern of demographic data.
CO4 Construct different diagrams using the data.
CO5 Formulate the future trend of the data.

1. Sources of population data: Census of India, UNPD (united nations population division), birth and death registry VSS (Vital statistics survey), NSS (National Sample Survey), NFHS (National Family and Health Survey),
2. Population distribution and density
   a) Thematic maps for population Distribution-patterns (dot map, Choropleth maps).
   b) Calculation of Population Growth rate,
   c) Calculation of population projection, arithmetic method,
   d) Calculation of population Density, arithmetic density, and agriculture density.
3. Calculation of different types of fertility and mortality rates for any one region Ex: India / Karnataka /District, using the Census of India latest data.
   a) Crude birth rate,
   b) General fertility rate, Total fertility rate
   c) Crude death rate/ Mortality rate, Infant mortality rate
   d) Age-specific mortality rate
   e) Sex-specific mortality rate
4. Thematic maps for Population composition: construction of population pyramids for Age, Sex, Rural and Urban, for important places on outline map Ex: India / Karnataka /District, using the Census of India latest data.

Course Articulation Matrix: Mapping of Course Outcomes (COs) with Program Outcomes (POs 1-15)

Course Outcomes (COs) / Program Outcomes (POs)	**Program Outcomes (POs)**											
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
CO1	3	-	-	-	-	1	-	-	2	-	2	-
CO2	2	-	-	3	-	1	-	-	2	-	2	-
CO3	1	-	3	-	-	1	2	-	2	-	2	--
CO4	1	-	1	-	-	1	-	-	2	-	2	-
CO5	1	-	1	-	1	1	2	-	2	-	2	-

Pedagogy: Interactive Lectures, Inquiry-based Learning, Cooperative Learning.

Formative Assessment for Practical	
Assessment Occasion/ type	**Marks**
Sessional Tests-1	05
Sessional Tests-2	05
Case study /Assignment / Field-activity / Project work etc	05
Practical Record Maintenance	10
Total	**25 Marks**
Formative Assessment as per guidelines.	

References	
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
5	Jingam ML. B.K. Bhat, JN Deasi (2003) Demography, Urinda Publishers Pvt. Ltd. Delhi.
6	R.K. Tripati ((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	ಮಾನವ ಭೂಗೋಳಶಾಸ್ತ್ರ - ಪ್ರೊ. ಪಿ.ಮಲ್ಲಪ್ಪ,
12	ಮಾನವ ಭೂಗೋಳದ ಮೂಲ ತತ್ವಗಳು. - ಡಾ.ರಂಗನಾಥ್,
13	ಕರ್ನಾಟಕದ ಜನಸಂಖ್ಯೆ ಮತ್ತು ಭೂಗೋಳ. - ಡಾ. ಕೆ. ಚಿನ್ನಸ್ವಾಮಿ
14	ಜನಸಂಖ್ಯಾ ಭೂಗೋಳ: ಸಿದ್ಧಾಂತ ಮತ್ತು ಅನ್ವೇಷಣೆ - ಪ್ರೊ. ಸಿ. ಮಹದೇವಸ್ವಾಮಿ
15	ಜನಸಂಖ್ಯೆ ಮತ್ತು ಭೂಗೋಳ - ಡಾ. ಎಸ್. ಆರ್. ರಂಗನಾಥನ್
16	ಜನಸಂಖ್ಯೆ ಭೂಗೋಳ - ಡಾ. ಆರ್. ವಿ. ರಾಜೇಶ್ವರಿ
	Resource Websites:
1	https://censusindia.gov.in/census.website/
2	https://mea.gov.in/icm.htm
3	https://population.un.org/wpp/
4	https://www.popcouncil.org/research/india
5	https://www.cdc.gov/csels/dsepd/ss1978/lesson3/section3.html

MANGALORE UNIVERSITY

BA / BSc in Geography Curriculum

Program Name	**BA / BSc in Geography**	Semester	**V**
Course Title	**Fundamentals of Remote Sensing**		
Course Code:	**GEO C11-T**	No. of Credits	**04**
Contact hours	**60 Hours**	Duration of Sem End Exam	**2 hours**
Formative Assessment Marks	**40**	Summative Assessment Marks	**60**

Course Pre-requisite(s): No Pre-requisite course(s)

Course Outcomes (COs): After the successful completion of the course, the student 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 sensing sensors and platforms.
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.

	Contents	**60 Hrs.**
Unit:1	**Introduction to Remote Sensing:** 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
Unit: 2	**Sensors & Platforms:** 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, push broom and whiskbroom cameras, Panchromatic, multispectral, hyperspectral scanners, and geometric characteristics of the imageries. **Assignment**: Students need to prepare a report on how satellite images are captured, processed, anddistributed to the end users by citing Bhuvan, ISRO, ISAC, NRSC, and SGC Websites.	20
Unit: 3	**Aerial Photography:** 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**
Unit: 4	**Applications of Remote Sensing:** 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 nearbyvillage and get to know how remote sensing images and real world looks and submit a report.	**10**

Course Articulation Matrix: Mapping of Course Outcomes (COs) with Program Outcomes (POs 1-15)

Course Outcomes (COs) / Program Outcomes (POs)	Program Outcomes (POs)											
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
CO1	3	-	-	-	-	2	-	-	2	-	2	-
CO2	2	-	-	-	-	2	2	-	2	-	2	-
CO3	1	--	1	3	-	2	2	-	2	-	2	-
CO4	1	-	2	-	-	2	2	-	2	-	2	-
CO5	1	-	3	3	-	2	2	-	2	-	2	-

Pedagogy: Blended learning, Interactive Lectures, MOOCs

Formative Assessment for Theory	
Assessment Occasion/ type	**Marks**
Sessional Tests-1	10
Sessional Tests-2	10
Seminars / Presentations / **Assignment**	10
Case study / **Field-Study** / Project work etc.	10
Total	**40 Marks**
Formative Assessment as per guidelines.	

MANGALORE UNIVERSITY

BA / BSc in Geography Curriculum

Program Name	**BA / BSc in Geography**	Semester	**V**
Course Title	**Interpretation of Aerial Photos and Satellite Images**	Practical Credits	**02**
Course Code	**GEO C12-P**	Contact Hours	**60 Hours**
Formative Assessment	**25 Marks**	Summative Assessment	**25 Marks**

Course Pre-requisite(s): No Pre-requisite course(s)

Course Outcomes (COs): After the successful completion of the course, the student will be able to:

CO1. Learn remote sensing techniques
CO2. Apply modern technology in various geographical area
CO3. Interpret remotely sensed data.
CO4. Analyze digital imageries.
CO5. Analyze ground truth verification using Google Earth and evaluate its usefulness.

Practical Content

1. Basic information of the image (projection histogram, layers, pixel)
2. Visual interpretation: location, color, texture, association, pattern, tone, shape.
3. Satellite Products and Band Characteristics, band combination.
4. Satellite image downloading portals: Bhuvan, USGS explorer.
5. Image Pre-Processing: Radiometric correction, Geometric correction.
6. Image Enhancement: Image Reduction, Image Magnification.
7. Layers Stacking.
8. Image Transformation: Spectral Indices, NDVI.
9. Image Classification: Supervised and Unsupervised
10. Change Detection.

Course Articulation Matrix: Mapping of Course Outcomes (COs) with Program Outcomes (POs 1-15)

Course Outcomes (COs) / Program Outcomes (POs)	**Program Outcomes (POs)**											
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
CO1	3	-	-	2	-	-	-	-	2	-	2	-
CO2	2	-	-	3	-	-	2	-	2	-	2	-
CO3	1	--	-	3	-	2	2	-	2	-	2	-
CO4	1	-	3	3	-	-	2	-	2	-	2	-
CO5	1	-	2	3	1	-	3	-	2	-	2	-

Pedagogy: Interactive Lectures, Inquiry-based Learning, MOOC

Formative Assessment for Theory	
Assessment Occasion/ type	**Marks**
Sessional Tests-1	05
Sessional Tests-2	05
Case study /Assignment / Field-activity / Project work etc.	05
Practical Record Maintenance	10
Total	**25 Marks**
Formative Assessment as per guidelines.	

References	
	Books
1	Lillesand T. Mand Kiefer R.W (2021), Remote Sensing and Image interpretation, 7 th Edition, John Wiley & Sons, Canada.
2	Jensen J. R, (2012), Remote Sensing of Environment: An Earth Resources Perspective, 2 nd 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, 5 th Edition, Prentice Hall, New Jersey.
8	Sabins, F.F. Jr, (1987), Remote Sensing; Principles and Interpretation, 2 nd 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/fun dam/pdf/fundamentals_e.pdf
3	ITC Netherlands, Principles of Remote Sensing https://webapps.itc.utwente.nl/librarywww/papers_2009/general/principlesremotesensing.
4	Pdf http://earthobsevatory.nasa.gov/Library/RemoteSensing
5	https://earthexplorer.usgs.gov/
6	https://bhuvan.nrsc.gov.in/home/index.php

6th SEMESTER
BA / BSc
Geography

MANGALORE UNIVERSITY

BA / BSc in Geography Curriculum

Program Name	**BA / BSc in Geography**	Semester	**6**
Course Title	**Environmental Geography**		
Course Code:	**GEO C14-T**	No. of Credits	**4**
Contact hours	**60 Hours**	Duration of Sem End Exam	**2 hours**
Formative Assessment Marks	**40**	Summative Assessment Marks	**60**

Course Pre-requisite(s): No Pre-requisite course(s)

Course Outcomes (COs): After the successful completion of the course, the student 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.

Contents		60 Hrs.
Unit 1	**Introduction to Environment Geography:** 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	10
Unit 2	**Ecosystem:** 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.	20
Unit 3	**Man-Induced Changes in Environment:** 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
Unit 4	**Principles of Environmental Management:** 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.	15

Course Articulation Matrix: Mapping of Course Outcomes (COs) with Program Outcomes (POs 1-15)

Course Outcomes (COs) / Program Outcomes (POs)	Program Outcomes (POs)											
	1	2	3	4	5	6	7	8	9	10	11	12
CO1	3	-	-	-	-	-	-	2	2	-	-	-
CO2	2	-	-	-	-	-	-	3	-	-	-	1
CO3	-	-	-	-	-	-	3	-	-	-	1	-
CO4	-	-	-	-	-	-	2	-	-	-	-	3
CO5	-	-	3	-	-	-	2	-	-	-	-	-

Pedagogy: Interactive Lectures, Inquiry-based learning, Blended learning, Case Studies.

Formative Assessment for Theory	
Assessment Occasion/ type	**Marks**
Sessional Tests-1	10
Sessional Tests-2	10
Seminars / Presentations / **Assignment**	10
Case study / **Field-Study** / Project work etc.	10
Total	**40 Marks**
Formative Assessment as per guidelines.	

MANGALORE UNIVERSITY

BA / BSc in Geography Curriculum

Program Name	**BA / BSc in Geography**	Semester	**6**
Course Title	**Methods in Environmental Geography**	Practical Credits	**02**
Course Code	**GEO C15-P**	Contact Hours	**60 Hours**
Formative Assessment	**25 Marks**	Summative Assessment	**25 Marks**

Practical Content

1. List out Biotic and Abiotic elements in the local region.
2. Identify and map micro-Biomes in the local region and study the biodiversity of the place.
3. List some ecosystem management and conservation methods in the local region for water bodies,
4. Mapping of water bodies,
5. Mapping of bore wells.
6. Map the polluting points in the local area and their influence of man on the local environment.
7. Mapping of Waste disposal sites.
8. Suitability of the site for waste disposal (with reference to height, location, land use, land value, slope)
9. Mapping of parks and open spaces in the neighborhood.
10. Mapping of areas in the neighborhood where crowding is prevalent and type of land use around such places.
11. Materials required for the practical survey: Use a Boundary map of the neighborhood area and GPS (fieldmapping) or Google Earth can also be used for mapping neighborhood area.

Course Articulation Matrix: Mapping of Course Outcomes (COs) with Program Outcomes (POs 1-15)

Course Outcomes (COs) / Program Outcomes (POs)	**Program Outcomes (POs)**											
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
CO1	3	-	-	-	-	-	-	2	2	-	-	-
CO2	2	-	-	-	-	-	-	3	-	-	-	1
CO3	-	-	-	-	-	-	3	-	-	-	1	-
CO4	-	-	-	-	-	-	2	-	-	-	-	3
CO5	-	-	3	-	-	-	2	-	-	-	-	-

Pedagogy: Interactive Lectures, Inquiry-based Learning, Cooperative Learning.

Formative Assessment for Practical	
Assessment Occasion/ type	**Marks**
Sessional Tests-1	05
Sessional Tests-2	05
Case study /Assignment / Field-activity / Project work etc.	05
Practical Record Maintenance	10
Total	**25 Marks**
Formative Assessment as per guidelines.	

References	
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	Richard H.B. (2004) Physical Geography, Heinmann Simple Services, Rupa & Company, New Delhi
15	Robinson H. (1982) Bio Geography, ELBS, New York.
16	Healey I.N. and Moore P.D. (1973) Bio-Geography, Backwell Oxford, U.K.
17	Strahler A.N. and Strahler A.H. (1973) Environmental Geo Science, Hamilton, California, USA.
18	Savindra Singh (2004) Environmental Geography, Prayog Pustak Bhawan, Allahabad, India.
19	Paul Selman (2000) Environmental Planning, Sage Publications, New Delhi
20	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.
21	Strahler A.N. and Strahler A.H. (1977) Geography and Man's Environment, John Wiley & Sons, New York
22	Goldsmith Edward et al. (1988) The Earth Report – The Essential Guide to Global Issues, Price Stern Solan Inc. California, USA
23	ಪರಿಸರ ಭೂಗೋಳಶಾಸ್ತ್ರ - ಎಂ.ಬಿ.ಗೌಡರ,
22	ಪರಿಸರ ಭೂಗೋಳಶಾಸ್ತ್ರ - ಎಸ್.ಎಸ್.ನಂಜಣ್ಣನವರ್
23	ಪರಿಸರ ಭೂಗೋಳಶಾಸ್ತ್ರ - ಡಾ. ಎಲ್. ಟಿ. ನಾಯಕ,
24	ಪರಿಸರ ಅಧ್ಯಯನ ಮತ್ತು ಮಾನವ ಹಕ್ಕುಗಳು - ಡಾ. ಎಲ್. ಟಿ. ನಾಯಕ,
25	ಪರಿಸರ ಅಧ್ಯಯನ - ಡಾ. ರಂಗನಾಥ್ ಮತ್ತು ಎ.ಎನ್. ಸೋಮಶೇಖರ್
26	ನಮ್ಮ ಪರಿಸರ - ಕೆ. ಭೈರಪ್ಪ,
27	ಪರಿಸರ ಶಿಕ್ಷಣ - ಡಾ. ಕೃಷ್ಣಮೂರ್ತಿ ಮತ್ತು ಡಾ. ಲಕ್ಷ್ಮಿ,
28	ಪರಿಸರ ವಿಜ್ಞಾನ - ಕೃಷ್ಣಮೂರ್ತಿ ಎಚ್. ಆರ್.
	Websites:
1	https://moef.gov.in/en/
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3	https://ndma.gov.in/
4	https://bhuvan.nrsc.gov.in/home/index.php
5	http://www.indiaenvironmentportal.org.in/

MANGALORE UNIVERSITY

BA / BSc in Geography Curriculum

Program Name	**BA / BSc in Geography**	Semester	**6**
Course Title	**Fundamentals of Geographic Information Systems**		
Course Code:	**GEO C16-T**	No. of Credits	**4**
Contact hours	**60 Hours**	Duration of Sem End Exam	**2 hours**
Formative Assessment Marks	**40**	Summative Assessment Marks	**60**

Course Pre-requisite(s): No Pre-requisite course(s)

Course Outcomes (COs): After the successful completion of the course, the student 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.

	Contents	**60 hrs.**
Unit 1	**Introduction:** Definition, scope, of GIS in digital world; Components, functionalities, merits anddemerits, global market. Interdisciplinary domains, and its integration with GIS.	10
Unit 2	**Geodesy and Spatial Mathematics:** Meaning scope of geodesy, geographical coordinates, latitude, longitudes; Datum: WGS-84, vs 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.	20
Unit 3	**Data and Scale:** Spatial Data and its structures; Sources and Types of data collection. Data errors, and relationships. Large Scale vs Small Scale; Generalization; precision and accuracy of data.	15
Unit 4	**Geo-processing and Visualization:** 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, f low 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.	15

Course Articulation Matrix: Mapping of Course Outcomes (COs) with Program Outcomes (POs 1-15)

Course Outcomes (COs) / Program Outcomes (POs)	Program Outcomes (POs)											
	1	2	3	4	5	6	7	8	9	10	11	12
CO1	3	-	-	-	-	-	-	-	2	-	-	-
CO2	2	-	-	-	-	-	-	-	3	-	-	-
Course Outcomes (COs) / Program Outcomes (POs)	**Program Outcomes (POs)**											
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
CO3	1	-	2	3	-	-	-	-	-	-	-	-
CO4	-	-	-	-	3	-	-	-	2	-	-	-
CO5	-	1	-	2	-	-	-	-	3	-	-	-

Pedagogy: Interactive Lectures, Inquiry-based learning, Blended learning, Case Studies.

Formative Assessment for Theory	
Assessment Occasion/ type	**Marks**
Sessional Tests-1	10
Sessional Tests-2	10
Seminars / Presentations / **Assignment**	10
Case study / **Field-Study** / Project work etc.	10
Total	**40 Marks**
Formative Assessment as per guidelines.	

MANGALORE UNIVERSITY

BA / BSc in Geography Curriculum

Program Name	**BA / BSc in Geography**	Semester	**6**
Course Title	**GIS for map-making**	Practical Credits	**02**
Course Code	**GEO C17-P**	Contact Hours	**60 Hours**
Formative Assessment	**25 Marks**	Summative Assessment	**25 Marks**

Practical Content

1. Introduction to GIS software.
2. Draw vector structures from the toposheet with reference to settlements, roads, water bodies, etc.
3. Create raster structures of a portion of the toposheet using a graph sheet.
4. Downloading images from the internet portal (Bhuvan).
5. Image formats.
6. Coordinate system.
7. Geo-referencing toposheet.
8. Digitize the Point line polygon, creating layers.
9. Buffer analysis: Point, Line, Polygon.
10. Multiring buffer: Point, Line, Polygon.
11. Map layout, map composition, and map designing.

Pedagogy: Interactive Lectures, Inquiry-based Learning, Cooperative Learning.

Formative Assessment for Practical	
Assessment Occasion/ type	**Marks**
Sessional Tests-1	05
Sessional Tests-2	05
Case study /Assignment / Field-activity / Project work etc	05
Practical Record Maintenance	10
Total	**25 Marks**
Formative Assessment as per guidelines.	

References

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 DigitalCartography – 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)

References	
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:
1	IIRS MOOC programme: https://isat.iirs.gov.in/mooc.php
2	ITC Netherlands, Principles of GIS https://webapps.itc.utwente.nl/librarywww/papers_2009/general/principlesgis.pdf
3	Geographical Information Systems: Principles, Techniques, Management and Applications https://www.geos.ed.ac.uk/~gisteac/gis_book_abridged/
4	https://www.esri.com/en-us/home