GOA UNIVERSITY

Choice Based Credit System (CBCS) B. A. (Geography) as per OC-66 and Amendment No. 2/403/2016-Legal (Vol. XII)/561 dt. 29/05/2017 and circular regarding Common Course Codes.

CORE COURSE (DSC) of BA Geography programme

Semesters	Paper Code	Title of the Paper	Credits
Sem I	**GEC101**	**Theory:**Introduction and Fundamentals of Geography **Practical:** Introduction to Cartographic Techniques	**3T+1P**
Sem II	**GEC102**	**Theory:** Social and Cultural Geography **Practical:** Practicals in Social and Cultural Geography	**3T+ 1P**
Sem III	**GEC103**	**Theory:**Geography of Natural Resource Development **Practical:** Practicals in Cartographic Techniques.	**3T+ 1P**
Sem IV	**GEC104**	**Theory:**Geography of Secondary and Tertiary Activities **Practical:** Practicals in Cartographic Techniques-II	**3T+ 1P**
Sem V	**GEC105 (Gen +Hon)**	**Theory:** Physical Geography **Practical:** Practical in Physical Geography	**3T +1P**
	GEC107 (Hon)	**Theory:** Regional Planning & Development **Practical:** Practical in Regional Planning & Development	**3T+1P**
	GEC108 (Hon)	**Theory:** Quantitative Techniques in Geography I **Practical:** Practical in Quantitative Techniques I	**3T+1P**
Sem VI	**GEC106 (Gen +Hon)**	**Theory:** Climatology and Oceanography **Practical:** Application & Interpretation of Weather Maps	**3T+1P**
	GEC109 (Hon)	**Theory:** Regional Planning in India **Practical:** Practical in Regional Planning of India	**3T+1P**
	GEC110 (Hon)	**Theory:** Quantitative Techniques in Geography II **Practical:** Practical in Quantitative Techniques - II	**3T+1P**

Generic Elective: (GE) under Geography

Semesters	Paper Code	Title of the Paper	Credits
Sem I	**GEG101**	Resource Geography of Goa	**4T**
	GEG103	Fundamentals of Ecology	
	GEG105	Sustainable Development	

Sem II	**GEG102**	Geography of Resource Utilisation in Goa	**4T**
	GEG104	Spatial and Functional Aspects of Ecology	
	GEG106	Spatial Information Technology	
Sem III	**GEG107**	Fundamentals of Population Geography	**4T**
	GEG109	Fundamentals of Tourism Geography	
	GEG111	Fundamentals of Disaster Mitigation	
Sem IV	**GEG108**	Applied Population Geography with a Mini Project	**4T**
	GEG110	Applied Tourism Geography with a Mini Project	
	GEG112	Application of Disaster Risk Reduction and Mitigation with a Mini Project	

Skill Enhancement Course (SEC) under Geography

Semesters	Paper Code	Title of the Paper	Credits
Sem III	**GES101**	Travel and Tourism Operation in Geography	**4T**
	GES103	Field Study and Survey Techniques in Geography	
	GES105	Watershed Development in Geography	
	GES107	Geospatial Technologies In Geography w.e.f 2020-2021	
Sem IV	**GES102**	Application of Travel and Tourism Geography Skills and Mini Project	**4T**
	GES104	Appl. of Field Study & Survey Techniques in Geog. and Mini Project	
	GES106	Appl. of Watershed Development and Mini Project	
	GES108	Application of GIS In Geography w.e.f 2020-2021	

DISCIPLINE SPECEFIC ELECTIVE (DSE) of BA Semester V and VI (Geography General & Honours programme)

Semesters	Paper Code	Title of the Paper	Credits
Sem V	**GED101 (Gen +Hon)**	**Theory:** Fundamentals of Geomorphology **Practical:** Application of Aerial photography in Geomorphology	**3T+ 1P**

	GED102 (Gen +Hon)	**Theory:** Physical Geography of India **Practical**: Thematic Mapping in Physical Geography of India	**3T+ 1P**
	GED103 (Gen +Hon)	Climate Change: Vulnerability and Adaptations	**4T**
	GED104 (Gen +Hon)	Agricultural Geography	**4T**
	GED109 (Hon)	Geography of Rural Settlement	**4T**
	GED110 (Hon)	Political Geography	**4T**
	GEP	Project	
Sem VI	**GED105 (Gen +Hon)**	**Theory:** Environmental Geography **Practical:** Practical in Environmental Geography	**3T+ 1P**
	GED106 (Gen +Hon)	**Theory:** Regional Development of India **Practical:** Application of Remote Sensing and Satellite Imageries	**3T+1P**
	GED107 (Gen +Hon)	Biogeography	**4T**
	GED108 (Gen +Hon)	Social Geography	**4T**
	GED111 (Hon)	Geography of Urban Settlement	**4T**
	GED112 (Hon)	Geography of Health	**4T**
	GEP	Project	

GE: Geography

a. ***GEC: DSC papers in Geography for BA, SGC: DSC papers in Geography for BSC, GES: Skill Ehancemant papersunder Geography, GEG: Generic Elective papers under Geography, GED: DSE papers in Geography for semester V & VI only.***
b. **Theory: Total contact hours:** 45 Lectures of 1 Hour Duration Each and

c. **Practical: Total contact hours:** 15 Laboratory Sessions of 2 continuous hours each.
d. **One Practical batch consists of maximum 20 students.**
e. **In case of only Theory Components of the Paper: Total contact hours: 60 Lectures of 1 Hour Each.**

In case of Practical Components of the Paper:

One Practical Session will comprise of continuous 2 periods of 1hour duration each and One Field Trip Session will comprise continuous 5 periods of 1hour duration.

Goa University
Choice Based Credit System
THREE YEARS B. A. GENERAL AND HONOURS DEGREE PROGRAMME
GEC101: INTRODUCTION AND FUNDAMENTALS OF GEOGRAPHY
GEOGRAPHY CORE COURSE (THEORY)
B. A. SEMESTER-I

Course Credits: 03 **Total Contact Hours: 45 Lectures of 1 Hour Duration each.**

COURSE OBJECTIVES: This introductory paper is intended to acquaint the students with distinctiveness of Geography as a field of learning. The philosophy of the subject is to be taught in order to develop a keen interest in the subject and to pursue it for higher studies**.**

LEARNING OUTCOMES: At the end of this course students will be able to gain knowledge and understand the fundamentals of geographical concepts. They will also acquire the skills to apply this knowledge to solve day to day problems and geographical issues.

Units	Course Content	Contact Hours	Credits
I	Geography: Introduction, Meaning, Definition, Nature and Scope Of Geography as a Discipline, Multi Disciplinary Approach. Pioneers in Geography and their Contributions: Erastosthenes, Ptolemy, Galileo, Vidal De La Blache, Carl Ritter, Homboldt, W. M. Davis, Walter Christaller; Development of Geography in India. Major divisions and branches of geography (Physical & Human Geography). Recent trends in Geography. Career opportunities for Geographers. Major themes in Geography: Location, Place, Human-Environment Interaction, Movement, Regions.	15	1
II	**Physical Geography**: Introduction to the Solar System, Basic Study of planets; Earth & Moon Relationship (Rotation, Revolution, Eclipse, Phases of Moon). **Domains of earth:** Lithosphere: Composition and structure, Orders of relief, Distribution of Oceans and Continents. Atmosphere: Composition and structure, Elements of weather and climate. Hydrosphere: Composition and distribution, Hydrological cycle. Introduction to Geological Time Scale.	15	1
III	**Human geography**: Major schools of Thought: Environmental Determinism, Possibilism, Neo-Determinism. Human Beings, Culture and Environment. Geography and Development: Levels of Development based on Social, Economic and Demographic Indicators. Geography and Nationalism.	15	1

	Total	45	03

Weightage of Marks: I. S. A: 15 + S. E. E.: 60 Total= 75.

Instructions: Maximum thrust to be given to local and national examples.

Suggested Readings / Reference Materials

1. Das Gupta and Kapoor,A.N., (2002): Principles of Physical Geography, S. Chand, New Delhi.
2. Dikshit R.D.,(2000): Geographical Thought - A Contextual History of Ideas, Prentice Hall of India New Delhi
3. Leong, Goh. Cheng.,(1995): Certificate Physical and Human Geography, Oxford University Press, New Delhi.
4. Harvey, David., (2008): Explanation in Geography, Sage Publication
5. Hussain, Masjid.,(2015): Evolution of Geographical Thought, Rawat Publications, Jaipur.
6. Lal, D. S.,(2011): Climatology, Sharda Pushtak Mahal, Allahabad.
7. Leong G.,and Morgan.C.,(1982): Human and Economic Geography Oxford University Press.
8. Perpillou, A V., (1966) : Human Geography, Longman Press, London.
9. Savindra Singh.,(2005): Environmental Geography, Prayag Pustak Bhavan, Allhabad.

Goa University
Choice Based Credit System
THREE YEARS B. A. GENERAL AND HONOURS DEGREE PROGRAMME
GEC101: INTRODUCTION TO CARTOGRAPHIC TECHNIQUES
GEOGRAPHY CORE COURSE (PRACTICAL-I)
B. A. SEMESTER-I

Course Credits: *01.
Total Contact hours: *15 Laboratory sessions of continuous 2 hours duration equals to 01 Credit.

COURSE OBJECTIVES: To develop skills and techniques in map reading and map making.
LEARNING OUTCOMES: At the end of this practical course, students will be able to locate places on the maps. It will enable students to understand maps and interpret the same. Students will also acquire basic skills of drawing maps.

Units	Course Content	Contact Hours
I	Introduction to Cartography and Cartographic Techniques. Exercises: Shape of the Earth. Location of Places on the Globe, Latitude, Longitude and Time, Time Zones. Scale and its Types– System of Measurements (British and Metric System), Conversion of Scale (RF to Verbal and Vice Versa), Construction of Simple, Comparative, Diagonal, Time and Distance Scale.	16
II	Exercises: Study of Globe and Map; Enlargement and Reduction of Maps by Square Method. Maps: Base Maps, Format of a Map. On Campus Field Work: Finding Directions, Measurement of Distances, Calculation of area. Measurement of Area on the Map and Toposheets (By Square Method).	14
	Total	**30**

Weightage of Marks: 25
Credit: 01
Unit I excercises: 10 marks, Unit II excercises: 10 marks, Certified Journal & Viva-Voce: 3+2=5

Instructions

1. Every candidate shall complete the laboratory course prescribed by the University entering all the experiment exercise in the laboratory journal, which shall be produced at the time of Practical Examination along with a certificate signed both by the course Teacher and the Head of the Department of Geography of the concerned college to the effect that he/she has completed the prescribed course in a satisfactory manner.
2. A batch shall consist of not more than 20 students.
3. Workload: One lab session of continuous 2 hrs. Total no. of laboratory sessions: 15 equivalent to 30 hours.
4. The duration of practical exam: 3 hrs carrying 25 marks (May be set for 50 marks and proportionately adjusted from/to 25).
5. Practical examination is to be conducted at the end of the Semester prior to the Theory examination in Geography Laboratory or exclusively designated place/s.

Suggested Readings / References

1. Mishra R. P. and Ramesh A.,(2009): Fundamentals of Cartography, Concept Publishing Company, New Delhi.

2. Monkhouse F. J.and Wilkinson ,H.R.,(2009) : Maps and Diagrams, B. I Publications, New Delhi.
3. Raise, E.,(2004): Principles of Cartography, McGraw Hills, London.
4. Singh,G.,(2010): Map Works and Practical Geography, Vikas Publishing House, New Delhi.
5. Singh R, L., (1979): Elements of Practical Geography, . Kalyani Publishers
6. Singh, R.L. and Singh Rana P.B., (2008): Elements of Practical Geography, Kalyani Publishers, New Delhi.

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THREE YEARS B. A. GENERAL AND HONOURS DEGREE PROGRAMME
GEC102: SOCIAL AND CULTURAL GEOGRAPHY
GEOGRAPHY CORE COURSE(THEORY)
B.A. SEMESTER-II

Course Credits: *03. Total Contact hours: *45 Lectures of 1 hour duration each.

COURSE OBJECTIVES: The paper intends to sensitize students with socio-cultural aspects and the related contemporary issues in India and the world with a geographical outlook. The philosophy of the subject is to be taught in order to develop a keen interest in the subject and to pursue it for higher studies**.**

LEARNING OUTCOMES: At the end of this course, the students will be able to gain knowledge and understand the fundamental concepts of social and cultural geography of the world w.s.r.t. India. They will also acquire the skills to apply the knowledge to solve the day-to-day socio-cultural issues.

Units	Course Content	Contact Hours	Credits
I	Introduction to social and cultural geography. Physical-Cultural Environment and major regions of the world: Equatorial, Monsoon, Grasslands, Mediterranean, Tundra, Taiga and Desert regions. Introduction to culture and civilization, cultural realms, cultural landscapes. Basis of classification of cultural regions.	15	1
II	World population: growth, distribution, Factors affecting world population, rural-urban composition, urbanization. Migration – causes and effects. Linguistic Composition: Global linguistic mosaic, origin and characteristic, linguistic classification of India. Religious Composition: Origin and regional distribution of religions, Major Religions and Cultures, Global and Indian Religious and Cultural Conflicts.	15	1
III	Races of the world: Basis of racial classification, races of India, tribal societies in India. Ethnicity- inequality and conflicts. Contemporary Issues: Gender Inequality, Nutrition, Health and Diseases. Refugees, Communalism, Terrorism, Naxalism and Separatist Groups; Peace efforts. Social wellbeing: Indicators and Efforts in India. Socio-cultural regions in India.	15	1
	Total	**45**	**03**

Weightage of Marks: I. S. A: 15 + S. E. E.: 60 Total= 75.

Instruction: Maximum thrust to be given to national and local examples.

Suggested Readings / References

1. Bergwan, Edward E.,(1995): Human Geography: Culture, Connections and Landscapes, Prentice Hall, New Jersey.
2. Carr M., (1987): Pattern, Processes and Change in Human Geography, McMillan Education, London.
3. Chandna, R C.,(2014): Geography of Population: Concepts, Determinants and Patterns, Kalyani Publishers, Delhi
4. De Blij H. J. and Murphy, Alexandar.,(2006): Human Geography, Culture, Society and Space, John Wiley, New York.
5. Fellman J. L.,(2007): Human Geography: Landscapes of Human Activities, Brown & Benchman, USA.
6. Hussain, Majid.,(2011): Human Geography, Rawat Publishers, Jaipur.
7. Pathak, C. R.,(2017): Spatial Structure and Development in India, RSAI.
8. Unisa, S. Ram, F. and Sekhar,T.V.,(2012): Population, Gender and Reproductive Health, IIPS, Mumbai.

GEOGRAPHY CORE COURSE (PRACTICAL-II)
B. A. SEMESTER – II

Course Credits: *01

Total Contact Hours: *15 Laboratory sessions of continuous 2 hours duration each per week per batch.

COURSE OBJECTIVES: To develop skills and techniques for representation of social and cultural data.

LEARNING OUTCOMES: At the end of this practical course, the students will be able to express and appreciate social and cultural information through cartograms, graphs and charts. It will enable the students to understand and interpret the same. Finally the students will acquire basic skills of drawing a variety of graphs and cartograms.

Units	Course Content	Contact Hours
I	Introduction to Social and cultural data. Cartographic Representation of Population Data on Paper and Graph Papers (Exercises to be given on actual data from authentic sources, which should also be acknowledged in the exercise/s) Line Graph and its types. Bar Graph and its types. Pie Diagram. Age-Sex Pyramid. Urban-Rural Pyramid. Ergo-graph (Circular and Graphical). Tri-Linear Chart. Flow Diagrams.	16
II	Cartographic Exercises on World Maps, State wise Map of India and Taluka Level map of Goa (Data should be Actual and pertain to recent period, i.e. within last 10 years) Dot Maps: Uniform and Multiple. Choropleth. Proportional Circles. Spheres. Pictograms. Chorochromatic Maps.	14
	Total	**30**

Weightage of Marks: 25

Credit: 01

Unit I excercises: 10 marks, Unit II excercises: 10 marks, Certified Journal & Viva-Voce: 3+2=5

Instructions

1. Every candidate shall complete the laboratory work entering all the experiments/exercises in the Practical Book/Journal, which shall be produced at the time of Practical Examination along with a certificate signed both by the course Teacher and the HOD of Geography of the concerned college to the effect that he/she has completed the prescribed course in a satisfactory manner.
2. A batch shall consist of not more than 20 students.
3. Workload- one lab session of continuous 2 hrs. per week. Total number of laboratory sessions: 15.
4. The duration of practical exam: 3 hrs. carrying 25 marks.

5. Practical examination is to be conducted at the end of the Semester prior to the Theory examination in Geography laboratory or exclusively designated place/s.

Suggested Readings / References

1. Campbell, J.,(2004): Introductory Cartography, Prentice Hall, Inc Englewood.
2. Misra, R.P. and Ramesh, A., (2005): Fundamentals of Cartography, Concept Pub. Co., New Delhi.
3. Misra, R. P.,(2014): Fundamentals of Cartography, Concept Pub. Co., New Delhi.
4. Monkhouse, F.J. , and ,Wilkinson, H.R., (2009): Maps and Diagram, B.I. Publication, New Delhi.
5. Singh, Gopal., (2014): Map Work and Practical Geography, 4th Edition, Sterling Book House.

Goa University
Choice Based Credit System
THREE YEARS GENERAL AND HONOURS DEGREE PROGRAMME
GEOGRAPHY GENERIC ELECTIVE
GEG101: RESOURCE GEOGRAPHY OF GOA
B. A. / B. SC. / B. COM.
SEMESTER I

Course Credits: 04 **Total Contact Hours: 60 Lectures of 1 Hour Each.**

COURSE OBJECTIVES: The main objective of this paper is to orient the students to know the physical and economic settings of Goa. It aims at enabling students to appreciate the prospects of the State of Goa and enlighten them of its imminent problems. Compulsory field work will enable the students to visit places of geographical interest in the state and motivate the students to carry out further study and research in these areas.

LEARNING OUTCOMES: At the end of this Generic course, the students will be able to appreciate physical, social, economic and cultural resources available in the State of Goa. The information will enable the students to become rational citizen and express their understanding before others. Finally the students will acquire basic skills of taking judicious decisions and stand about the state and its activities.

Units	Course Content	Contact Hours	Credits
I	Introduction to Goa **Geographical Setting and Physical Resources of Goa** Location: Relative and Absolute, Areal extent. Physical Divisions: Mountains, Plains and Plateaus. Geology and Mineral Wealth. Climate: Characteristics and Seasons. River systems and lakes. Soils: Types and distribution. Forest Wealth: Types and distribution.	15	1
II	**Human Resources: (pre & post liberation, 21st Century)** Population: Growth- decadal and annual, factors. Distribution: Taluka-wise and District-wise; Density: Taluka-wise and District-wise; Age-sex structure, Literacy and Education, Rural- Urban composition Migration: Intra-state, Interstate and International. Occupational structure: Taluka wise and Rural and Urban Future of Population: Short term and long term.	15	1
III	**Resource Utilization: pre & post liberation, 21st Century** Power resources and its limitations. Water Supply Works and Irrigation Projects Transport: Modes and Distribution Role of Banking and Insurance resource utilization Health care and educational facilities Communication (traditional & modern)	15	1

	Information Technology (IT): infrastructure and utility.		
IV	**Regional Disparity and Regional Planning in Goa** Variations in Levels of Socio-Economic Development (High, Medium And Low) in Coastal, Mid-Land and Ghat Talukas. Rural -Urban Divide and Rural- Urban Continuum Measures and Efforts of Regional Development in Goa	15	1
	TOTAL	**60**	**04**

Weightage of Marks: ISA 20 + SEE 80 Total= 100.

Instructions

1. Thrust may kindly be given to draw national and regional examples by the teachers.
2. Field orientation should be attempted by the teachers and the Institutions for verifying ground truths.
3. The Current topics of Local, Regional & National interest have to be updated by referring to subject journals, newspapers, websites and other relevant materials.

Suggested Readings / References

1. Alvares.,Claude.,(2002): Fish Curry and Rice, Eco-Forum, A Goa Foundation Publication., Other India Press Publication.
2. Angle P.S., (1983): Goa : An Economic Review, Goa Hindu Association, Bombay.
3. Angle P.S., (2001): Goa : An Economic Update, Goa Hindu Association, Bombay.
4. Daily Newspapers published from Goa (Publication Houses).
5. De Souza., Teotonio R., (Eds).,Goa University Publications.,(1999): Goa through the Ages – An Economic History.,Vol. I, II & III,Concept PublishingCo, New Delhi.
6. Goa Chamber of Commerce and Industry.,(1992): Thirty years of Economic Development, Printing Press, Panaji.
7. Gomes Olivinho J. F.,(1996): Village Goa: A Study of Goan Social Structure and Change published by National Book Trust India.
8. Govt. of Goa.,(1988): Regional Plan for Goa 2001, Govt. Printing Press, Panaji, Goa.
9. Govt. of Goa, Statistical Pocket Books, Govt. Printing Press, Panaji.
10. Govt. of India., Gazetter of Goa, Daman & Diu, Govt. Printing Press, Panaji-Goa.
11. Govt. of Goa, Economic Survey of Goa, Directorate of Planning,Statistics & Evaluation(DPSE) publication,Porvorim Goa., Govt. Printing Press, Panaji, Goa.
12. Saksena,R.N.,(1964): Goa: Into the Mainstream.,Techno Economic Survey of Goa,Daman &Diu., NCAER, Govt,Printing Press, Panaji.

Goa University
Choice Based Credit System
THREE YEARS GENERAL AND HONOURS DEGREE PROGRAMME
GEG102: GEOGRAPHY OF RESOURCE UTILIZATION IN GOA
GEOGRAPHY GENERIC ELECTIVE
B. A. / B. SC. / B. COM.
SEMESTER II

Course Credits: 04 **Total Contact Hours: 60 Lectures of 1 Hour duration each.**

COURSE OBJECTIVES: To orient the students to comprehend the prevailing pattern and limitations of Resource Utilization in Goa. It aims at enabling the students to appreciate the prospects of the State and take pro active stand to solve its problems. Compulsory field work component will enable the students to visit places of geographical interest in the state and motivate students to carry out further study.

LEARNING OUTCOMES: At the end of this Generic course, the students will be able to appreciate physical, social, economic and cultural resources utilization in the State of Goa. The information will enable the students to become rational citizen and express their understanding before others. Finally the students will acquire basic skills of taking judicious stand about the state and its prospective activities.

Units	Course Content	Contact Hours	Credits
I	**Geographical Study of primary activities in Goa** **Agriculture:** Significance of agriculture to the State's economic Surge. Factors affecting agriculture in Goa: physical, economic, social and technological. Status of agriculture during pre-liberation, Changes in post-liberation and post-liberalization period, Current problems associated with Goan agriculture. Farming Types: Kharif & Rabi, humid farming, horticulture, plantation; *Vaingan, Puran Xeti, Kumeri, Kulagar*. Major Crops: Factors of Growth, methods of cultivation, distribution and production of cereal crops (rice, millets), cash crops (cashew, sugarcane), garden crops (coconut, beetle nut). **Animal Husbandry**: Types of livestock, dairy and poultry farming and their place in Goan economy, Government schemes to promote poultry and dairy farming in the State. **Fishing:** Types (shore and inland fisheries), species, fishing seasons, fishing jetties, production, marketing, changes, problems and future prospects.	15	1
II	**Geographical Study of Mining & Manufacturing in Goa** **Mining:**		1

	History of mining in Goa, mining methods, production and trade of minerals (iron ore, manganese, bauxite), Benefits of mining to the economy and society, Negative socio-economic and environmental impacts of mining, Current issues related to mining in the State. **Manufacturing:** Industrial scenario in pre-liberation Goa, Stages of Industrial Development during post-liberation and post liberalization period; Role of GIDC, Industrial Estates, Broad Industrial Policy; Types of Industries: House Hold, Handicrafts, Small Scale Industries, Medium and Large Scale Industries. Study of Industries: Sugar, Chemicals and Fertilizers, Pharmaceutical, Shipbuilding, Forest based industries, and Software industries. Importance of Industries to Goa, Problems associated with Industrialization in Goa, Environmental movements and their impact on Industrialization of Goa.	15	
III	**Geographical study of tertiary activities-I** **Tourism:** Meaning, types of tourists; tourist seasons and arrivals. Major tourist attractions (natural, historical, religious-socio-cultural), leading destinations and tourism infrastructural facilities in the State. Factors promoting tourism in Goa. Positive and negative impacts of tourism in Goa: Economic, socio-cultural, political and environmental. Role of GTDC. Diversification efforts and future prospects and problems. **Transport:** Development of transport network, modes and their functional significance (air, roadways, railways and waterways), problems of transport system, future prospects.	15	1
IV	**Geographical Study of Tertiary Activities-II** **Trade:** Internal (intra-state and inter-state) and foreign trade– composition, direction, changes and future prospects. **Ports:** Major and minor ports, Mormugao and Panaji Port– history, hinterland, major developments, prospects and problems. **Study tour and report*** Local study tour to / local survey in a place of physical, social, economic and cultural importance and submission of a Report to that effect is compulsory ***(to be Pre submitted and Assessed before the announcement of SEE Schedule)***.	10 05	1
	Total	**60**	**04**

Weightage of marks: ISA: 20+SEE: 80 (inclusive of Field Study component: 10) Total = 100

Instructions:

1. Thrust must be given to draw examples from national and regional issues as well.

2. The day to day up-dating of Current events of local, Regional & National interests should to be disseminated to the students by referring the subject related journals, reference to news papers and electronic media and other relevant materials so that the students can keep themselves abreast with latest information.
3. **The field trip / survey mentioned above in the curriculum carries the workload for 5 hours per day for a batch of maximum 60 students (one division). The field trip / survey is to enable the students to collect first hand information or primary data and verify the concepts taught in the class.**

Suggested Readings / References:

1. Alvares.,Claude.,(2002): Fish Curry and Rice, Eco-Forum, A Goa Foundation Publication., Other India Press Publication.
2. Angle P.S., (1983): Goa : An Economic Review, Goa Hindu Association, Bombay.
3. Angle P.S., (2001): Goa : An Economic Update, Goa Hindu Association, Bombay.
4. Daily newspapers published from Goa (Publication Houses).
5. De Souza.,Teotonio R., (Eds).,Goa University Publications.,(1999): Goa through the Ages – An Economic History.,Vol. I, II & III,Concept PublishingCo, New Delhi.
6. Goa Chamber of Commerce and Industry.,(1992): Thirty years of Economic Development, Printing Press, Panaji.
7. Gomes Olivinho J. F.,(1996): Village Goa: A Study of Goan Social Structure and Change published by National Book Trust India.
8. Govt. of Goa: Regional Plan for Goa 2001, Govt. Printing Press, Panaji, Goa.
9. Govt. of Goa:, Statistical Pocket Books, Govt. Printing Press, Panaji.
10. Govt. of India: Gazetter of Goa, Daman & Diu, Govt. Printing Press, Panaji-Goa.
11. Govt. of Goa, Economic Survey of Goa, Directorate of Planning,Statistics & Evaluation(DPSE) publication,Porvorim Goa., Govt. Printing Press, Panaji, Goa.
12. Larsen., Karin.,(1998): Faces of Goa., Gyan Publishing House, New Delhi.
13. Saksena,R.N.,(1964): Goa: Into the Mainstream.,Techno Economic Survey of Goa,Daman &Diu., NCAER, Govt,Printing Press, Panaji.

Goa University
Choice Based Credit System
THREE YEARS GENERAL AND HONOURS DEGREE PROGRAMME
GEG103: FUNDAMENTALS OF ECOLOGY
GEOGRAPHY GENERIC ELECTIVE
B. A. / B. SC. / B. COM.
SEMESTER I

Course Credits: 04 **Total Lectures: 60 Lectures of 1 Hour Each.**

COURSE OBJECTIVES: This foundation Course aims to provide the students of all disciplines an overview of Ecology and its interface with environment. It also aims to create awareness of major ecological components and their influences on life. To provide ecological knowledge and information to the students. Finally it endeavors to cultivate interest and concern towards conservation of nature and sustainable development.

LEARNING OUTCOMES: Students from Arts and Science disciplines will be able to understand the basic necessities of the ecological systems around their habitat and the ecological preservation after the successful completion of this foundation course. The course will provide the basic skills to protect the ecology and environment for sustainable development of human beings in relation to their environment.

Units	Course Content	Contact Hours	Credits
I	**Ecology:** Introduction, meaning, objectives, sub-divisions, scope. Historical background and major contemporary developments in Ecology: World and India. **Earth as the only Suitable Habitat for Life** Solar system, origin of the earth, Theories of origin of the earth (Nebular and Big Bang), Major components of physical environment (atmosphere, lithosphere and hydrosphere) and general factors influencing life.	15	1
II	**Biosphere** Meaning, phases of the origin of life on the earth (chemical and organic). **Ecosystem** Concept, general characteristics, structural components of an ecosystem (biotic and abiotic), types of ecosystem (artificial, natural and incomplete ecosystem).	15	1
III	**Functional Aspects of Ecosystem** Energy flow in ecosystem: Sun as the ultimate source of energy, Laws of thermodynamics, Pathways of energy flow in the ecosystem. Primary and secondary production-factors influencing, distribution. Food chain: Meaning, importance and types. Food web, trophic structure and ecological pyramids.	15	1
IV	**Population and Community**	15	1

	Concept of population and population attributes (natality, mortality, density, age structure and growth forms). **Biotic Relationships** Interspecific interactions: Ammensalism, commensalism, neutralism, mutualism, parasitism, prey-predation and competition; Intraspecific interactions: scramble and contest. **Biotic Succession** Concept of community, meaning of ecological succession, Types and general process of ecological succession, trends in succession, significance of ecological succession		
	Total	**60**	**04**

Weightage and Marks: ISA: 20 + SEE: 80, Total: 100

Credit: 04.

Instructions

1. Thrust must be given to draw examples from national, regional and local issues.
2. The day to day up-dating of Current events of Local, Regional & National interests should to be disseminated to the students by referring the subject related journals, reference to news papers, electronic media and other relevant materials so that the students can keep themselves abreast with latest information.

Suggested Readings / References and Books Recommended for study

1. Arora., M. P., (2014): Ecology., Himalaya Publishing House,Pvt,Ltd.
2. Dash M. C., (2009): Fundamentals of Ecology by Tata McGraw Hill Publishing Co. Ltd., New Delhi.
3. Verma., P. S. & Agarwal., V. K.,(2000): Environmental Biology, S. Chand & Co. Ltd.
4. .
5. Kumar, H. D., (1995): Modern Concepts of Ecology.,Vikas Publishing House Pvt. Ltd.
6. Odum E. P.,(2004):Fundamentals of Ecology., Oxford & IBH Publishing Co. Pvt. Ltd.
7. Purphit S.S.,and Ranjan R, (2003): Ecology, Environment and Pollution, Agrobios (India) Publication Jodhpur
8. Rangnathan,Mahesh.,(Ed),(2006): Environmental issues in India- A Reader,1st Edition, Pearson Longman
9. Santra, S. C.,(2011): Environmental Science., Savera Publishing House.
10. Sharma., P. D.,(2015): Ecology and Environment.,Mittal Books India.
11. Singh., Benu.,(2006): Ecology and Environment, Vista International Publishing House, Delhi.
12. Singh, Pramod.,(1987): Ecology of Urban India., Vol.II, Ashish Pub. House.
13. Singh., Pramod., (1987): Ecology of Rural India, National Conference on Rural Ecology : Papers, , Ashish Pub. House.A

Goa University
Choice Based Credit System
THREE YEARS GENERAL AND HONOURS DEGREE PROGRAMME
GEG104: SPATIAL AND FUNCTIONAL ASPECTS OF ECOLOGY
GEOGRAPHY GENERIC ELECTIVE
B. A. / B. SC. / B. COM.
SEMESTER II

Course Credits: 04 **Total Contact Hours: 60 Lectures of 1 Hour Each.**

COURSE OBJECTIVES: This Paper aims to provide the students a multi-disciplinary approach to the spatial and functional overview of ecology and environment. It also aims to create effective awareness of major ecological components and their influences on their life through Field Trip and Field Survey.

LEARNING OUTCOMES: The Students will be able to comprehend the ecological systems and their functionality. The course will provide the basic skills to motivate and guide the common people to protect the ecology and environment for sustainable development of their habitat and zones of living in the world.

Units	Course Content	Contact Hours	Credits
I	**Biogeochemical Cycles** Meaning, Phases, Biogenic nutrients, compartments of biogeochemical cycles, classification. Oxygen cycle, carbon cycle, nitrogen cycle, phosphorus cycle and hydrological cycle – its functional aspects, human interference and possible adverse effects. Cycling of non essential elements.	15	1
II	**Diversity & Spatial Distribution of Major Ecosystems** a) **Aquatic Ecosystem**: Classification (Freshwater ecosystems - lentic and lotic; estuarine and ocean waters) and characteristics. b) **Terrestrial Ecosystems**: i) Forest – characteristics, ecological significance, deforestation-causes and effects, conservation. ii) Grasslands – Characteristics, comparative study of tropical and temperate grasslands. iii) Desert ecosystem – Physical environment, plant life, animal life and their adaptations. iv) Wetlands – Types of wetlands, ecological and economic significance of wetlands, threats to wetlands and protection of wetlands.	15	1
III	a) **Biodiversity** Definition, levels of biodiversity, value of biodiversity (ecological, economic and cultural), threats to biodiversity. Species – endemic species, endangered species, critically endangered species, vulnerable species and extinct species. Hotspots of Biodiversity. Extinction of species. In-situ and Ex-situ conservation of biodiversity. b) **Biodiversity in Indian Scenario**	15	1

	Bio geographical regions in India. Present status of Biodiversity with special reference to Western Ghats and Eastern Himalayas. Wildlife Management in India (National Parks, Wild Life Sanctuaries).		
IV	a) **Global Climate Change** Causes and consequences. Impact Of Climate Change On India and Goa Remedial measures – International Initiatives (Montreal Protocol, Rio Earth Summit, Kyoto Protocol), PARIS DECLARATION-2015 **B) Ecological Field Study/ Trip/ Survey And Report**	10 05	1
	TOTAL	**60**	**04**

Weightage of marks: ISA: 20 + SEE: 80 (inclusive of Field Study: 10). Total: 100

Credit: 04

Instructions

1. Thrust must be given to draw examples from national, regional and local issues.
2. The day to day up-dating of Current events of Local, Regional & National interests should to be disseminated to the students by referring the subject related journals, reference to news papers, electronic media and other relevant materials so that the students can keep themselves abreast with latest information.
3. **The field trip / survey mentioned above in the curriculum carries the workload for 5 hours per day for a batch of maximum 60 students (one division). The field trip / study / survey are to enable the students to collect first hand information or primary data and verify the concepts taught in the class**

Suggested Readings / References and Books Recommended for study

1. Arora., M. P., (2014): Ecology., Himalaya Publishing House,Pvt,Ltd.
2. Dash M. C., (2009): Fundamentals of Ecology by Tata McGraw Hill Publishing Co. Ltd., New Delhi.
3. Verma., P. S. & Agarwal., V. K.,(2000): Environmental Biology, S. Chand & Co. Ltd.
4. Kumar, H. D., (1995): Modern Concepts of Ecology.,Vikas Publishing House Pvt. Ltd.
5. Odum E. P.,(2004):Fundamentals of Ecology., Oxford & IBH Publishing Co. Pvt. Ltd.
6. Purphit S.S., Ranjan R,(2003): Ecology, Environment and Pollution, Agrobios (India) Publication Jodhpur
7. Rangnathan,Mahesh.,(Ed).(2006): Environmental issues in India- A Reader,1st Edition, Pearson Longman.
8. Santra, S. C.,(2011): Environmental Science., Savera Publishing House.
9. Sharma., P. D.,(2015): Ecology and Environment.,Mittal Books India.
10. Singh., Benu.,(2006): Ecology and Environment, Vista International Publishing House, Delhi.
11. Singh, Pramod.,(1987): Ecology of Urban India., Vol.II, Ashish Pub. House.
12. Singh., Pramod., (1987): Ecology of Rural India, National Conference on Rural Ecology : Papers, , Ashish Pub. House.A

Goa University
Choice Based Credit System
THREE YEARS GENERAL AND HONOURS DEGREE PROGRAMME
GEG105: SUSTAINABLE DEVELOPMENT
GEOGRAPHY GENERIC ELECTIVE
B. A. / B. SC. / B. COM.
SEMESTER I

Course Credits: 04 **Total Periods / Lectures: 60 Lectures of 1 Hour Duration Each.**

COURSE OBJECTIVES: This paper will deal with the Sustainable Development of the world with special reference to India. It is intended to acquaint the students with the global development patterns as a scientific and distinctive field of Geography learning to be taught with reference to current topics in the field of sustainable geographical perspective in order to develop a keen interest in the subject**.**

LEARNING OUTCOMES: At the end of this Paper students will be able to gain an insight of sustainable development through geography. They will also acquire the skills to apply this knowledge to appreciate the diversity on the earth's surface. They will be able to broaden their horizon to become global citizen.

Units	Course Content	Contact Hours	Credits
I	1. Sustainability: Definition, Components and Sustainability for Development. 2. The Millennium Development Goals: National Strategies and International Experiences 3. Sustainable Development: Need and examples from different Ecosystems.	15	1
II	4. Inclusive Development: Education, Health; Climate Change: The role of higher education in sustainability; The human right to health; Poverty and disease; Sustainable Livelihood Model; Policies and Global Cooperation for Climate Change Geography and development-Types of economies (LDC and MDC and other global classifications) on social economic and demographic parameters.	15	1
III	5. Globalization and its impact on countries especially on India. Sustainable Development Policies and Programmes: Rio+20; Goal-Based Development; Financing for Sustainable Development; Principles of Good Governance; National Environmental Policy, CDM.	15	1
IV	6. Contemporary Issues- Gender and inequality, Race- ethnicity and equality, Nutrition, health and diseases (medical geography issues). Fundamentalism, terrorism and naxalism. Global and National peace initiatives.	15	1
	Total	**60**	**04**

Weightage of Marks: ISA: 20 + SEE: 80; Total= 100

Credits: 04

Instructions: Thrust should be given to provide some local and national examples.

Suggested Readings / References /Reading List

1. Agyeman,Julian.,(2013): Introducing Just Sustainabilities: Policy, Planning, and Practice, Zed Books Ltd,London
2. Agyeman,Julian, Robert D. Bullard and Bob Evans (Eds.).,(2003): Just Sustainabilities: Development in an Unequal World(Urban & Industrial Environments). Earthscan Publications, London.
3. Ayers,Jessica and David Dodman.,(2010): Climate Change, Adaptation and Development: The state of the debate, Progress in Development Studies 10 (2): 161-168.
4. Baker,Susan (2006): Sustainable Development. Milton Park, Abingdon, Oxon; New York, N.Y.: Routledge. (Chapter 2, The concept of sustainable development).
5. Brosius, Peter (1997): Endangered forest, endangered people: Environmentalist representations of indigenous knowledge, Human Ecology 25: 47-69.
6. Lohman, Larry (2003): Re-imagining the population debate., Corner House Briefing 28.
7. Martínez-Alier, Joan et al (2010): "Sustainable de-growth: Mapping the context, criticisms and future prospects of an emergent paradigm" Ecological Economics 69: 1741-1747.
8. Merchant, Carolyn (Ed.) (1994): Ecology. Atlantic Highlands, N.J: Humanities Press. (Introduction, pp 1-25.)
9. Osorio, Leonardo et al.,(2005): Environment, Development and Sustainability., Debates on sustainable development: Towards a holistic view of reality
10. Robbins, Paul.,(2004): Political Ecology: A Critical Introduction.,Blackwell Publishing.

Goa University
Choice Based Credit System
THREE YEARS GENERAL AND HONOURS DEGREE PROGRAMME
GEG106: SPATIAL INFORMATION TECHNOLOGY
GEOGRAPHY GENERIC ELECTIVE
B. A. / B. SC. / B. COM.
SEMESTER II

Course Credits: 04 **Total Contact Hours: 60 Lectures of 1 Hour Duration Each.**

COURSE OBJECTIVES: This paper will deal with the Spatial Information Technology for Sustainable Development of the world with special reference to India. It is intended to acquaint the students with the global development patterns as a scientific and distinctive field of Geography learning. The paper is to be taught with reference to current topics in the field of SIT and sustainabile geography in order to develop a keen interest in the subject**.**

LEARNING OUTCOMES: At the end of this Paper students will be able to gain an insight of **Spatial Information Technology for** sustainable development and geography. They will also acquire the skills to apply this knowledge to appreciate the diversity on the earth's surface. They will be able to broaden their horizon and use the skill to become global citizen.

Units	Course Content	Contact Hours	Credits
I	1. Introduction: Definitions, Concept and Historical Development of SIT. Components and Sustainability for Development.	15	1
II	2. Spatial Information/Data: Web data sources; Registration and projection; Data structures; Data interpolation and modeling. 3. Working of spatial information system.	15	1
III	4. Functions of Spatial information system: Information retrieval; Topological modeling; Networks; Overlay; Data output. SIT and Globalization: its impact on countries especially on India.	15	1
IV	5. Application of Spatial Information Technology On Contemporary Issues- Gender and inequality, Race- ethnicity and equality, Nutrition, health and diseases. Fundamentalism, terrorism and naxalism.	15	1
	Total	**60**	**04**

Weightage of Marks: ISA: 20 + SEE: 80; **Total=100.**
Credits: 04.

Reading List / Suggested Reading

1. Alias A. Rahman and Morakot Pilouk.,(2008): Spatial Data Modeling for 3D GIS, Springer New York.
2. Esperança C., Samet H., (2001): An overview of the SAND spatial database system, to appear in Communications of the ACM,http://www.cs. umd. edu/ ~hjs/ pubs/ sandprog. ps. Gz.

3. Goodrich, M.,(2000): Data Structures and Algorithms in Java, 2nd Edition Wiley. Malczewski, J.,1999: GIS and Multicriteria Decision Analysis. New York: John Wiley and Sons.
4. Hjaltason. G.,andSamet H., (1995): Ranking in Spatial Databases in Advances in Spatial Databases —4th Symposium, SSD'95, M. J. Egenhofer and J. R. Herring, Eds., Lecture Notes in Computer Science 951, Springer-Verlag, Berlin, , 83-95. http://www.cs.umd.edu/~hjs/pubs/incnear.ps
5. Longley, P.A., et. Al.(2005): Geographic Information Systems and Science. Chichester: Wiley. 2nd edition.
6. Ott, T. and Swiaczny, F.,(2001): Time-integrative GIS. Management and analysis of spatiotemporal data. Berlin / Heidelberg / New York: Springer.
7. Samet H., (1995):Spatial Data Structures in Modern Database Systems: The Object Model, Interoperability, and Beyond, W. Kim, Ed., Addison-Wesley/ACM Press, , 361-385.
8. Samet H., (1990):The Design and Analysis of Spatial Data Structures, Addison-Wesley, Reading, MA,. ISBN 0-201-50255-0.
9. Samet H. and Aref W. G., (1995):Spatial Data Models and Query Processing in Modern Database Systems: The Object Model, Interoperability, and Beyond, W. Kim, Ed., Addison-Wesley/ACM Press, , 338-360. http://www.cs.umd.edu/~hjs/pubs/kim2.ps
10. Tomlin C. D., (1990): Geographic Information Systems and Cartographic Modeling, Prentice-Hall, Englewood Cliffs, NJ,. ISBN 0-13-350927-3.
11. Thurston, J., Poiker, T.K. and J. Patrick Moore.,(2003): Integrated Geospatial Technologies: A Guide to GPS, GIS, and Data Logging. Hoboken, Wiley, New Jersey:.

Choice Based Credit System
THREE YEARS B. A. GENERAL AND HONOURS DEGREE PROGRAMME
GEC103: GEOGRAPHY OF NATURAL RESOURCE DEVELOPMENT
GEOGRAPHY CORE COURSE (THEORY)
B. A. SEMESTER-III

Course Credits: 03
Theory: 45 Sessions of One Hour Duration each.

COURSE OBJECTIVES: To provide an exposure to develop geographical knowledge in understanding and appreciating the distribution of natural resources of the world in general and India in particular.
LEARNING OUTCOMES: At the end of the successful completion of this course, students will be able to understand the location of resources in the world and their occurrences in places within India. It will enable students to understand the interaction among various resources.

Units	Course Content	Contact Hours	Credits
I	Economic Geography: Meaning, Definitions and significance. Bases of world Economy: Physical, Economic, Cultural and Technological; Classification of Economic activities. Historical Evolution of world economic systems: Medieval feudal economies, The rise of Mercentilism & its economic benefits, Emergence of colonialism & its economic benefits, Mechanism of modern economic systems.	**15**	**1**
II	Natural Resources: Meaning, Classification and their significance. Distribution and Development: i) Forest Resources: Types of Forest, Study of Tropical & Temperate Forest, Conservation of Forest ii) World Fisheries: factors affecting distribution, major fishing grounds, Fish Conservation. iii) Mineral Resources: Economic Significance, Global and Indian Distribution a) Metallic: Ferrous - Iron Ore, Non-Ferrous – Bauxite. b) Fuel & Power Resources: Coal & Petroleum.	**15**	**1**

	Renewable: Hydel power. c) Non-Conventional Energy Resources-Merits and distribution.		
III	World Agriculture: Types of Agriculture a) Intensive and Extensive farming b) Subsistence and commercial farming, c) Mixed and Plantation Agriculture. Crops: Cereals - Rice & Wheat; Cash Crops: Beverages-Tea, Coffee; Industrial Crops: Cotton, Sugarcane. Agricultural Land Use Theory by Von Thunen.	**15**	**1**
	Total	**45**	**03**

Weightage: I.S.A: 15 + S.E.E: 60 **Total= 75.**
Credits: 03

Instructions
1. Maximum thrust may be given to local, regional, national and international examples.
2. Due weightage for maps, diagrams in teaching as well as in paper setting is mandatorily expected.

References

1. Boesch, H., (1964): A Geography of World Economy, Van Nostrand Co., New York.
2. Chapman J. D. (1989): Geography and Energy, Longman, London.
3. Hartshorne T. N. & Alexander J. W.(1988): Economic Geography, Prentice Hall, New Delhi.
4. Jones C. F. and Darkenwald G. G.,(1975): Economic Geography, Macmillan & Co, New York.
5. Smith, D. M., (1971): Industrial location: An Economic Geographical Analysis, John Wiley, New York.
6. Bengston & Van, G. H. Royan.,(1988): Fundamentals of Economic Geography, Prentice Hall, New Delhi.
7. Leong, G. C. & Morgan, G. H., (1982): Human & Economic Geography, Oxford Univ. Press, New York.

Goa University
Choice Based Credit System
THREE YEARS B. A. GENERAL AND HONOURS DEGREE PROGRAMME
GEC103: CARTOGRAPHIC TECHNIQUES
GEOGRAPHY CORE COURSE (PRACTICAL-III)
B. A. SEMESTER-III

Course Credits: 01
Total Contact Hours: *15 Laboratory sessions of continuous 2 hours duration each per week per batch.

COURSE OBJECTIVES: To develop skills and techniques for transformation of globe information to Paper. Representation and representation of physical features and data pertaining to physical geography.

LEARNING OUTCOMES: At the end of this practical course, the students will be able to express and appreciate globe and map information through. It will enable the students to understand and interpret the same. The students will also acquire basic skills of drawing a variety of physical geography graphs and cartograms.

Units	Course Contents	Contact Hours
I	a) Projections: Definition, classification of projection, Uses and properties. b) Construction of zenithal projection, zenithal gnomonic projection, zenithal stereographic projection, zenithal orthographic projection, zenithal equal projection. c) Construction of conical projection: Simple conical projection with one standard parallel; Simple conical projection with two standard parallel. d) Construction of cylindrical projection:	16
II	Methods of Representation of Relief features – spot heights, Bench Marks, Hachures, Hill shading Contours diagrams – hills, plateaus, mesa, cliff, V-shaped valley, waterfall, escarpment, spur, U-shaped valley, Hanging Valley, Volcano with	14
	Total	**30**

Note:
Weightage of Marks: 25
Credit: 01
Unit I excercises: 10 marks, Unit II excercises: 10 marks, Certified Journal & Viva-Voce: 3+2=5

INSTRUCTION
1. Every candidate shall complete the laboratory course prescribed by the University entering all the experiments/exercises in the laboratory journal, which shall be produced at the time of Practical Examination along with a certificate signed both by the course Teacher and the Head of the Department of Geography of the concerned college to the effect that he/she has completed the prescribed course in a satisfactory manner.

2. A batch shall consist of not more than 20 students.
3. Workload per week- one lab session of 2 continuous hrs. per batch.
4. The duration of practical exam: 3 hrs carrying 50 marks (finally weighted to 25).
5. Practical examination is to be conducted at the end of every Semester prior to the Theory (exam).

REFERENCE

1. Campbell, J.(2004) Introductory Cartography, Prentice Hall, Inc Englewood
2. Misra, R.P. and Ramesh, A., (2009): Fundamentals of Cartography, Concept Pub. Co., New Delhi
3. Monkhouse, F.J. and Wilkinson, H.R., (2009): Maps and Diagram, B.I. Publication, New Delhi
4. Misra, R. P., (2014): Fundamentals of Cartography, Concept Pub. Co., New Delhi
5. Raisz, E,. (2004): Principles of Cartography, McGraw Hills, London
6. Singh, Gopal., (2014), : Map Work and Practical Geography, 4th Edition, Sterling Book House

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Goa University
Choice Based Credit System
THREE YEARS B. A. GENERAL AND HONOURS DEGREE PROGRAMME
GEC104: GEOGRAPHY OF SECONDARY AND TERTIARY ACTIVITIES
GEOGRAPHY CORE COURSE (THEORY)
B. A. SEMESTER-IV

Course Credits: 03
Total Contact Hours: 45 Sessions each of 1 Hour Duration.

COURSE OBJECTIVES: The paper intends to sensitize students with the geographical approach to study secondary and tertiary economic activities and the related contemporary issues in India and the world. The subject is to be taught with maps in order to develop a keen interest in the subject and to purse it for higher studies.

LEARNING OUTCOMES: At the end of this course, the students will be able to gain knowledge and understand the fundamental concepts of economic geography of the world w.s.r.t. India. They will also acquire the skills to apply the knowledge to solve the day-to-day socio-economic and cultural issues.

Units	Course Content	Contact Hours	Credits
I	Manufacturing: Meaning and Importance Theories of Manufacturing: 1) Least Cost Theory 2) Profit Maximization Theory 3) Break Point Theory Detailed Geographical study of Following Industries: **1.** Iron & Steel 2. Aluminum Industry 3. Petroleum Industry 4. Cotton Textile 5. Sugar Industry, 6. Knowledge Intensive Industry (Electronic).	**15**	**1**
II	**Study of Tertiary Activities** Meaning, Importance, & Types **International Transport** Land Routes: Major Roads & Railway Ocean Routes: North Atlantic & Indian Ocean Canals Routes: Suez & Panama Major Air Routes	**15**	**1**

III	World Trade: Bi-lateral, Multi-lateral Retailing & Wholesaling Cities as Service Center Christaller's Central Place Theory, World City patterns, City Ribbon Corridors, Trade Blocks: WTO, EU, BRICS, & SAARC	**15**	**1**
	Total	**45**	**03**

Weightage: I. S. A: 15 + S. E. E: 60 **Total= 75.**
Credit= 3

Instructions
The paper is intended to provide a global exposure to the students. Hence, updated information should be provided and mapping exercises in groups or at individual level is desired.

References or Reading Materials

1 Boesch, H., (1964): A Geography of World Economy, Van Nostrand Co., New York.
2. Chapman J. D. (1989): Geography and Energy, Longman, London.
3. Hartshorne T. N. & Alexander J. W.(1988): Economic Geography, Prentice Hall, New Delhi.
4. Jones C. F. and Darkenwald G. G.,(1975): Economic Geography, Macmillan & Co, New York.
5. Smith, D. M., (1971): Industrial location: An Economic Geographical Analysis, John Wiley, New York.
6. Bengston & Van, G. H. Royan.,(1988): Fundamentals of Economic Geography, Prentice Hall, New Delhi.
7. Leong, G. C. & Morgan, G. H., (1982): Human & Economic Geography, Oxford Univ. Press, New York.

Goa University
Choice Based Credit System
THREE YEARS B. A. GENERAL AND HONOURS DEGREE PROGRAMME
GEC104: DATA COLLECTION AND STATISTICAL METHODS IN GEOGRAPHY
GEOGRAPHY CORE COURSE (PRACTICAL-IV)
B. A.SEMESTER-IV

Course Credits: 01
Total Contact Hours: *15 Laboratory sessions of continuous 2 hours duration each per week per batch.

COURSE OBJECTIVES: To understand basic statistical methods and skills for cartographic transformation of information. Skills in Tabular and graphical representation of data pertaining to geography will be given.

LEARNING OUTCOMES: At the end of this practical course, the students will be able to collect the field data and represent the collected information through tables and cartograms. It will also enable the students to understand and interpret the same.

Units	Course Content	Contact Hours
I	Sampling Techniques: Its Significance in Research & Data collection. Utility of Sampling vs Census method, Types: i) Random Sampling ii) Systematic Sampling iii) Stratified sampling iv) Cluster Sampling v) Purpose Sampling.	4
II	Coding of Sample data Classification and Tabulation of Data, Tabular and Graphical form, Pattern of Frequency distribution. Statistical Measures in Geography Calculation of Mean, Median & Mode, Measures of dispersion: Range, Quartile Deviation, Mean Deviation, Standard Deviation & Variance.	16
III	Field Survey and Report: Individual or Group Project of not more than 4 students on any one of the following: Socio-Economic Survey, Agriculture Survey, Demographic Survey, Transport Survey and Disaster Survey. (The Report has to be based on a Questionnaire or Exploration Schedule which should be attached with the Report or in the Journals).	10
	Total	**30**

Weightage of Marks: 25
Credit: 01
Unit I excercises: 05 marks, Unit II excercises: 10 marks, Unit III excercises: 05 marks, Certified Journal & Viva-Voce: 3+2=5
INSTRUCTIONS
1. Every candidate shall complete the laboratory course prescribed by the University entering all the experiments/exercises in the laboratory journal, which shall be produced at the time of

Practical Examination along with a certificate signed both by the course Teacher and the Head of the Department of Geography of the concerned college to the effect that he/she has completed the prescribed course in a satisfactory manner.

2. A batch shall consist of not more than 20 students.
3. Workload per week- one lab session of 2 continuous hrs. per batch.
4. All the above topics need to be dealt with lab exercises on actual and recent data or event.
5. The duration of practical exam: 3 hrs carrying 50 marks (finally weighted to 25).
6. Practical examination is to be conducted at the end of every Semester prior to the Theory (exam).

READING MATERIALS

1. Campbell, J.(2004) Introductory Cartography, Prentice Hall, Inc Englewood
2. Misra, R.P. and Ramesh, A., (2009): Fundamentals of Cartography, Concept Pub. Co., New Delhi
3. Monkhouse, F.J. and Wilkinson, H.R., (2009): Maps and Diagram, B.I. Publication, New Delhi
4. Misra, R. P., (2014): Fundamentals of Cartography, Concept Pub. Co., New Delhi
5. Raisz, E,. (2004): Principles of Cartography, McGraw Hills, London
6. Singh, Gopal., (2014), : Map Work and Practical Geography, 4th Edition, Sterling Book House

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Goa University
Choice Based Credit System
THREE YEARS GENERAL AND HONOURS DEGREE PROGRAMME
GEG107: FUNDAMENTALS OF POPULATION GEOGRAPHY
GEOGRAPHY GENERIC ELECTIVE
B. A. / B. SC. / B. COM. SEMESTER III

Course Credits: 04 **Total Lectures: 60 Lectures of 1 Hour Each.**

COURSE OBJECTIVES: The main objective of this paper is to orient the students to know the fundamentals or basic concepts of Population Geography of the World, India and Goa. It aims at enabling students to appreciate the prospects of demographic dividend and enlighten them of its imminent problems. Compulsory field work will enable the students to visit places of population related institutions and geographical interest in the state and motivate the students to carry out further study and research in these areas.

LEARNING OUTCOMES: At the end of this Generic course, the students will be able to appreciate the link between the physical, social, economic and human resources available in the world. The information will enable the students to become rational citizen and express their understanding before others. Finally the students will acquire basic skills of taking judicious decisions for their family and social welfare.

Units	Course Content	Contact Hours	Credits
I	Introduction to Population Geography, Fundamentals: Nature, scope and contents of Population Geog.; Source of Population data (Census, Vital Statistics, SRS, NSS). Population as Human Resource: Qualitatively & Quantitatively Spatial pattern of distribution: World, India, Goa in terms of absolute Number, density and Growth- decadal and annual.	15	1
II	Factors of population growth and distribution: Historical, Physical, Economic with elaborate examples from the world and Indian States.	15	1
III	Composition of Population: Age and Sex composition; Rural- Urban composition, economic composition; Literacy and Education, Occupational structure in Rural & Urban. Composition of population in India. Role of Health care and Educational facilities for Population distribution in India. Consequences of High and low concentration of Population.	15	1

IV	Migration: International, Interstate and Intra-state. Current regional patterns in the world and the Indian Scenario. Future of Population: Short term and long term. Thraets to World Population: Diseases, Wars, Insurgency, Natural Calamities and Accidents and Abuses.	15	1
	TOTAL	**60**	**04**

Weightage of marks: ISA 20 + SEE 80 Total= 100.

Instructions

1. Thrust may kindly be given to draw national and regional examples by the teachers.
2. Field orientation should be attempted by the teachers and the Institutions for verifying ground truths.
3. The data should be updated by referring to journals, newspapers, websites and other relevant materials.

Suggested Readings / References

1. Beaujeu-Garnier, J., (1966): Geography of Population (Translated by Beaver, S. H.) Longmans, London.
2. Bhende and Kanitkar (2011), Principles of Population Studies, Himalaya Publishing House,
3. Delhi
4. Census of India 2011 Series - I (2013): India Provisional Population Totals, Pub. Registrar General, India.
5. Chandna, R.C., (2000): Geography of Population: Concepts, Determinants & Patterns, Kalyani Pub., N. Delhi.
6. Clarke J. I (1972), Population Geography, Pergamon Press, Oxford.
7. Mitra&Kamaljit Chandra, (2005) Population Studies and Demography: Vol. 4 Concept of Population Geography, Delhi
8. Peters, G. L. & Larkim R. P.,(1979): Population Geog: Problems, Concepts & Prospects Kendele-Hunt lowa.
9. Srinivasan K. and M. Viass., (2001):Off Population Development Nexus in India: Challenges for theN Millennium,Tata McGraw Hill Publishing Co Ltd., New Delhi.
10. Sundaram K.V. & Nangia Sudesh, (eds).,(1986): Population Geography, Heritage Publishers, Delhi,.
11. Trewartha, G. T.,(1972): The Less Developed Realm - A Population Geography, McGraw Hill, New York.
12. UNDP(2001): Human Development Report, Oxford University Press.
13. Zelinsky, W., (1966): A Prologue to Population Geography, Prentice-Hall, Englewood Cliffs.

Goa University
Choice Based Credit System
THREE YEARS GENERAL AND HONOURS DEGREE PROGRAMME
GEG108: APPLIED / APPLICATION OF POPULATION GEOGRAPHY
GEOGRAPHY GENERIC ELECTIVE
B. A. / B. SC. / B. COM SEMESTER IV

Course Credits: 04 **Total Contact Hours: 60 Lectures of 1 Hour Each.**

COURSE OBJECTIVES: The course is meant to provide an understanding of spatial and structural dimensions of population and the emerging issues. The course is further aimed at familiarizing the students with regional level problems and to equip them for comprehending the Indian situation. Compulsory field work related mini project will enable the students to visit house hold or population related institutions in the state to carry out the study.

LEARNING OUTCOMES: At the end of this Generic course, the students will be able to appreciate the link between the observed physical, social, economic and human resources available in their region. The information will enable the students to become rational citizen and express their understanding before others. Finally the students will acquire basic skills of taking judicious decisions for their family and society.

Units	Course Content	Contact Hours	Credits
I	Introduction to Applied Population Geography, Marital Status: Types, Age at marriage Pattern of Population in the world, India and Goa. Migration: Definitions, Types, Classification, Determinants and Consequences of migration at the place of Origin and Place of Destination; Sources of Pop. Migration data (Census, NSS, Field Survey). Qualitative and Forced Migration, trafficking, Refugees. World, Regional Patterns of migration (Historical and Present); Migration Pattern in India (Historical and Present). Spatial pattern of migration from and to Goa in terms of absolute Number, decadal and seasonal.	15	1
II	Population and environment interface: Cause-effect syndrome; Global and Indian Profile: Historical, Physical, Economic with elaborate examples from the world and Indian States.	15	1
III	Consequences of High and low concentration of Population. Thraets to India's Population: Diseases, Wars, Insurgency, Natural Calamities, Riots, Accidents and Abuses.	15	1

IV	Mini Project Report (Individual or Group of 4 students) based on Field Work / Trip: A Case Study on any one of the relevant topics of the above course in current or earlier Semester.	15	1
	TOTAL	**60**	**04**

Weightage of marks: ISA 20 + SEE 80 Total= 100.

Instructions

1. Thrust may kindly be given to draw International, national and regional examples by the teachers.
2. Field orientation should be attempted by the teachers and the Institutions for verifying ground truths.
3. The data should be updated by referring to journals, newspapers, websites and other relevant materials.

Suggested Readings / References

1. Beaujeu-Garnier, J., (1966): Geography of Population (Translated by Beaver, S. H.) Longmans, London.
2. Bhende and Kanitkar (2011), Principles of Population Studies, Himalaya Publishing House,
3. Delhi
4. Census of India 2011 Series - I (2013): India Provisional Population Totals, Pub. Registrar General, India.
5. Chandna, R.C., (2000): Geography of Population: Concepts, Determinants & Patterns, Kalyani Pub., N. Delhi.
6. Clarke J. I (1972), Population Geography, Pergamon Press, Oxford.
7. Mitra&Kamaljit Chandra, (2005) Population Studies and Demography: Vol. 4 Concept of Population Geography, Delhi
8. Peters, G. L. & Larkim R. P.,(1979): Population Geog: Problems, Concepts & Prospects Kendele-Hunt lowa.
9. Srinivasan K. and M. Viass., (2001):Off Population Development Nexus in India: Challenges for theN Millennium,Tata McGraw Hill Publishing Co Ltd., New Delhi.
10. Sundaram K.V. & Nangia Sudesh, (eds).,(1986): Population Geography, Heritage Publishers, Delhi,.
11. Trewartha, G. T.,(1972): The Less Developed Realm - A Population Geography, McGraw Hill, New York.
12. UNDP(2001): Human Development Report, Oxford University Press.
13. Zelinsky, W., (1966): A Prologue to Population Geography, Prentice-Hall, Englewood Cliffs

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Goa University
Choice Based Credit System
THREE YEARS GENERAL AND HONOURS DEGREE PROGRAMME
GEG109: FUNDAMENTALS OF TOURISM GEOGRAPHY
GEOGRAPHY GENERIC ELECTIVE
B. A. / B. SC. / B. COM. SEMESTER III

Course Credits: 04 **Total Contact Hours: 60 Lectures of 1 Hour Each.**

COURSE OBJECTIVES: The main objective of this paper is to orient the students to know the fundamentals or basic concepts of tourism and its related fields in a geographical perspective. Studying of Tourism as a multi disciplinary subject will also be met.

LEARNING OUTCOMES: At the end of this Generic course, the students will be able to develop interest in Tourism Geography as a skill orientation amongst the students. It will enhance confidence level of the students to achieve gainful employment.

Units	Course Content	Contact Hours	Credits
I	Introduction to Tourism Geography, Fundamentals: Nature, scope and contents of Tourism Geog.; Concepts of Leisure, Recreation and Tourism and their relationship. Tourism in the past and its growth, Motivators of tourism, types of tourism, Tourism as an industry.	15	1
II	Basics of tourism: Dynamics of tourism, Factors influencing tourism - historical, natural, socio-cultural, economic and political. Elements of Tourism.	15	1
III	Geography and Tourism. Tourism as spatial affinity, areal and Locational dimensions, Emerging Fields in tourism with special reference to ecotourism, responsible tourism and sustainable tourism; Case study of coastal, adventure, hill station, national and international tourism.	15	1
IV	Impacts of Tourism: Positive and negative impacts - Social, economic, political and environmental. Case study of coastal / environmental degradation.	15	1
	TOTAL	**60**	**04**

Weightage of marks: ISA 20 + SEE 80 **Total= 100.**

Instructions

1. Thrust may kindly be given to draw national and regional examples by the teachers.
2. Field orientation should be attempted by the teachers and the Institutions for verifying ground truths.
3. The data should be updated by referring to journals, newspapers, websites and other relevant materials.

REFERENCE MATERIALS

1. Neumeyer, M.H. and Neumeyer, E. S.,(1949):Leisure and Recreation, A.S. Burnes & Co., New York.
2. Robinson, H., (1976): A Geography of Tourism, Macdonald and Evans, London.
3. Cosgrove, I and Jackson, R., (1972):The Geography of Recreation and Leisure, Hutchinson,London.
4. Bhatiya, A. K., (1991): International Tourism - Fundamentals and Practices., Sterling, New Delhi.
5. Kaul, R.K., (1985):Dynamics of Tourism and Recreation Inter – India., New Delhi.
6. Singh, J.C., (1975): Tourism and Tourist Industry, New Height, Delhi.
7. Larvery, P., (1971):Recreational Geography, Douglas David and Charles Ltd. Vancouver.
8. Singh, S.N., (1986):Geography of Tourism and Recreation, Inter-India, New Delhi.
9. Meyer, H. D and Brightbill, C.K., (1956):Community Recreation,Prentice Hall Inc., Englewood Cliffs, N.J.
10. Kaur, J., (1985):Himalayan Pilgrimages and New Tourism, Himalayan Books, New Delhi.
11. Miles, C. W. N and Seabrooke, W., (1977):Recreational and Management, E & F. N, Span Ltd. London.
12. Fesenmaker, L (1983):Recreation Planning and Management, ventures Publications, USA.
13. Pearce Douglas, P.,(1996): Tourism Today: A Geographical Analysis, John Wiley, New York.
14. Pearce, D.G., (1979): Towards Geography of Tourism., Annals of Tourism Geography., Elsevier Ltd

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Goa University
Choice Based Credit System
THREE YEARS GENERAL AND HONOURS DEGREE PROGRAMME
GEG110: APPLIED / APPLICATION OF TOURISM GEOGRAPHY
GEOGRAPHY GENERIC ELECTIVE
B. A. / B. SC. / B. COM. SEMESTER IV

Course Credits: 04 **Total Contact Hours: 60 Lectures of 1 Hour Each.**

COURSE OBJECTIVES: The main objective of this paper is to orient the students to know the fundamentals or basic concepts of tourism and its related fields in a geographical perspective. Studying of Tourism as a multi disciplinary subject will also be met.

LEARNING OUTCOMES: At the end of this Generic course, the students will be able to develop interest in Tourism Geography as a skill orientation amongst the students. It will enhance confidence level of the students to achieve gainful or self employment.

Units	Course Content	Contact Hours	Credits
I	Introduction to Applied Tourism Geography, Infrastructure and support system: Accomodation and supplementary Accomodation, travel agencies and tour operators, role of guides. Tour planning stages and importance.	15	1
II	Tourism Development: Stake Holders of Tourism, Role of NGO's. Spatio-temporal aspects, promotion of tourism, current thrust areas, sustainence of tourism: problems and prospects.	15	1
III	Geographical aspects of tourism in Goa Tourism resources of Goa-natural and cultural: Climate, physiography, Water resources, places of worship, culture and folklore, cuisine and tourism promotion events.	15	1
IV	Mini Project and Report / field visit and Report involving One or some aspect/s of tourism such as Promotion, development, Social, economic, political and environmental Impact/s of Tourism (Positive and/or negative), Case study of Tourist spot or corridor.	15	1
	TOTAL	**60**	**04**

Weightage of marks: ISA 20 + SEE 80 Total= 100.

Instructions

1. Thrust may kindly be given to draw national and regional examples by the teachers.
2. Field orientation should be attempted by the teachers and the Institutions for verifying ground truths.
3. The data should be updated by referring to journals, newspapers, websites and other relevant materials.

4. Questions should be set with due weightages to all the units as specified above or by Goa University.

REFERENCE MATERIALS

1. Neumeyer, M.H. and Neumeyer, E. S.,(1949):Leisure and Recreation, A.S. Burnes & Co., New York.
2. Robinson, H., (1976): A Geography of Tourism, Macdonald and Evans, London.
3. Cosgrove, I and Jackson, R., (1972):The Geography of Recreation and Leisure, Hutchinson,London.
4. Bhatiya, A. K., (1991): International Tourism - Fundamentals and Practices., Sterling, New Delhi.
5. Kaul, R.K., (1985):Dynamics of Tourism and Recreation Inter – India., New Delhi.
6. Singh, J.C., (1975): Tourism and Tourist Industry, New Height, Delhi.
7. Larvery, P., (1971):Recreational Geography, Douglas David and Charles Ltd. Vancouver.
8. Singh, S.N., (1986):Geography of Tourism and Recreation, Inter-India, New Delhi.
9. Meyer, H. D and Brightbill, C.K., (1956):Community Recreation,Prentice Hall Inc., Englewood Cliffs, N.J.
10. Kaur, J., (1985):Himalayan Pilgrimages and New Tourism, Himalayan Books, New Delhi.
11. Miles, C. W. N and Seabrooke, W., (1977):Recreational and Management, E & F. N, Span Ltd. London.
12. Fesenmaker, L (1983):Recreation Planning and Management, ventures Publications, USA.
13. Pearce Douglas, P.,(1996): Tourism Today: A Geographical Analysis, John Wiley, New York.
14. Pearce, D.G., (1979): Towards Geography of Tourism., Annals of Tourism Geography., Elsevier Ltd

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Goa University
Choice Based Credit System
THREE YEARS GENERAL AND HONOURS DEGREE PROGRAMME
GEG111: FUNDAMENTALS OF DISASTER MITIGATION
GEOGRAPHY GENERIC ELECTIVE
B. A. / B. SC. / B. COM. SEMESTER III

Course Credits: 04 **Total Contact Hours: 60 Lectures of 1 Hour Each.**

COURSE OBJECTIVES: The main objective of this paper is to orient the students to know the fundamentals or basic concepts of disaster management and mitigation in a geographical perspective. Studying of disaster management and mitigation as a multi disciplinary subject will also be met. It is to develop awareness amongst the students as the catalyst in the Society.

LEARNING OUTCOMES: At the end of this Generic course, the students will be able to understand the link between the physical unavoidable hazard systems in the world. The information will enable the students to become alert citizen and express their understanding before others. Finally the students will acquire basic skills of taking judicious decisions for saving their family and society at the time of distress.

Units	Course Content	Contact Hours	Credits
I	1.Introduction to Disaster Management and Disaster Mitigation Fundamentals: Natural Calamities and Accidents and Abuses. Natural Hazards, Risks, Vulnerability and Disasters: Definition and Concepts, Nature, and contents of Disaster Mitigation in Geog. Source of Disaster data (Govt. agencies and NGOs).	15	1
II	2. Disasters in India: (a) Causes, Impact, Distribution and Mapping: Flood, Landslide, Drought with elaborate examples from the world and Indian States.	15	1
III	3. Disasters in India: (b) Causes, Impact, Distribution and Mapping: Earthquake, Tsunami and Cyclone.	15	1
IV	4. Human induced disasters: Causes, Impact, Distribution and Mapping. 5. Response and Mitigation to Disasters: Mitigation and Preparedness, NDMA and NIDM; Indigenous Knowledge and Community-Based Disaster Management; Do's and Don'ts During Disasters	15	1
	TOTAL	**60**	**04**

Weightage of marks: ISA 20 + SEE 80 **Total= 100.**

Instructions

1. Thrust may kindly be given to draw national and regional examples by the teachers.
2. Field orientation should be attempted by the teachers and the Institutions for verifying ground truths.

3. The data should be updated by referring to journals, newspapers, websites and other relevant materials.
4. Questions should be set with due weightages to all the units as specified above or by Goa University.

Reading List

1. Government of India.,(1997): Vulnerability Atlas of India. New Delhi, Building Materials & Technology Promotion Council, Ministry of Urban Development, Government of India.
2. Kapur, A.,(2010): Vulnerable India: A Geographical Study of Disasters, Sage Publication, New Delhi.
3. Modh, S.,(2010):Managing Natural Disaster: Hydrological, Marine and Geological Disasters, Macmillan, Delhi.
4. Singh, R.B.,(2005): Risk Assessment and Vulnerability Analysis, IGNOU, New Delhi. (Chapter 1, 2 and 3).
5. Singh, R. B. (Ed.).,(2006):Natural Hazards and Disaster Management: Vulnerability and Mitigation, Rawat Publications, New Delhi.
6. Sinha, A., (2001): Disaster Management: Lessons Drawn and Strategies for Future, New United Press, New Delhi.
7. Stoltman, J.P. et al., (2004): International Perspectives on Natural Disasters, Kluwer Academic Publications. Dordrecht.
8. Singh Jagbir (2007): Disaster Management Future Challenges and Oppurtunities"I.K. International Pvt. Ltd., New Delhi, India.

Goa University
Choice Based Credit System
THREE YEARS GENERAL AND HONOURS DEGREE PROGRAMME
GEG112: APPLICATION OF DISASTER RISK REDUCTION AND MITIGATION (WITH A MINI PROJECT)
GEOGRAPHY GENERIC ELECTIVE
B. A. / B. SC. / B. COM. SEMESTER IV

Course Credits: 04 **Total Contact Hours: 60 Lectures of 1 Hour Each.**

COURSE OBJECTIVES: The main objective of this paper is to orient the students to apply the fundamental knowledge of disaster risk reduction, management and mitigation in a geographical perspective. It is to develop preparedness amongst the students as the catalyst in the Society.

LEARNING OUTCOMES: At the end of this Generic course, the students will be able to be alert during the unforeseen hazards. The information will enable the students to become moral citizen and use their understanding before others. Finally the students will acquire confidence of taking judicious decisions for saving their family and society at the time of disasters.

Units	Course Content	Contact Hours	Credits
I	Fundamentals of Application of Disaster Risk Reduction and Mitigation: Understanding the Threat, Mental Preparedness, Logistics, Coordination, Warning Signals, Communication Disaster Mitigation in Geog.	15	1
II	Climate Change: Understanding Climate Change; Green House Gases and Global Warming; Global Climatic Assessment- IPCC.	15	1
III	Impact of Climate Change: Agriculture and Water; Flora and Fauna; Human Health Adaptation and Mitigation: Global Initiatives with Particular Reference to South Asia. National Action Plan on Climate Change; Local Institutions (Urban Local Bodies, Panchayats)	15	1
IV	A Mini Project Report based on any one field based case studies among following disasters and preparedness plan of the Government or respective college or locality: 1. Flood, 2. Drought, 3. Cyclone and Hailstorms 4. Earthquake, 5. Landslides, 6. Human Induced Disasters: Fire Hazards, Chemical, Industrial accidents.	15	1
	TOTAL	**60**	**04**

Weightage of marks: ISA 20 + SEE 80 **Total= 100.**

Instructions

1. Thrust may kindly be given to draw national and regional examples by the teachers.
2. Field orientation should be attempted by the teachers and the Institutions for verifying ground truths.
3. The data should be updated by referring to journals, newspapers, websites and other relevant materials.
4. Questions should be set with due weightages to all the units as specified above or by Goa University.

Reading List

1. Government of India.,(1997): Vulnerability Atlas of India. New Delhi, Building Materials & Technology Promotion Council, Ministry of Urban Development, Government of India.
2. Kapur, A.,(2010): Vulnerable India: A Geographical Study of Disasters, Sage Publication, New Delhi.
3. Modh, S.,(2010):Managing Natural Disaster: Hydrological, Marine and Geological Disasters, Macmillan, Delhi.
4. Singh, R.B.,(2005): Risk Assessment and Vulnerability Analysis, IGNOU, New Delhi. (Chapter 1, 2 and 3).
5. Singh, R. B. (Ed.).,(2006):Natural Hazards and Disaster Management: Vulnerability and Mitigation, Rawat Publications, New Delhi.
6. Sinha, A., (2001): Disaster Management: Lessons Drawn and Strategies for Future, New United Press, New Delhi.
7. Stoltman, J.P. et al., (2004): International Perspectives on Natural Disasters, Kluwer Academic Publications. Dordrecht.
8. Singh Jagbir (2007): Disaster Management Future Challenges and Oppurtunities"I.K. International Pvt. Ltd., New Delhi, India.

Further Readings

1. IPCC (2014): *Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part A: Global and Sectoral Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change* Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA.

Goa University
Choice Based Credit System
THREE YEARS GENERAL AND HONOURS DEGREE PROGRAMME
GES101: TRAVEL AND TOURISM OPERATION IN GEOGRAPHY
GEOGRAPHY SKILL ENHANCEMENT COURSE
B. A. / B. SC. / B. COM. SEMESTER III

Course Credits: 04 **Total contact Hours: 60 Lectures of 1 Hour Each.**

COURSE OBJECTIVES: The main objective of this paper is to orient the students to the skills of travel and tourism operation with the fundamental knowledge of tourism geography. It is to develop preparedness to work or assist travel and tourism enterprise in the competitive market in the society.

LEARNING OUTCOMES: At the end of this skill based course, the students will be able to be comprehend the possibilities and unforeseen challenges in travel and tourism activity. The information gained from the course will enable the students to become fair businessman or worker. Finally the students will acquire confidence of taking up tourism related activities which is expanding every where across the world.

Units	Course Content	Contact Hours	Credits
I	Fundamentals of Geography of Travel and Tourism 1. Concepts, Nature and Scope; Inter-Relationships of Tourism, Recreation and Leisure; Geographical Parameters of Tourism by Robinson. Factors influencing the prosperity and development of Tourism	15	1
II	2. Type of Travel and Tourism: Travels: Need based, Vacational, Vocational, Political, Pilgrimage, Official, Events, Educational, Leisure & Tourism related, Local, National and International, Present Modes of Travel. Tourism: Nature and Eco Tourism, Cultural Tourism, Medical Tourism, Pilgrimage, Educational, Event. 3. Recent Trends of Tourism: International and Regional; Domestic (India); Eco-Tourism, Sustainable Tourism, Meetings, Incentives, Conventions and Exhibitions (MICE)	15	1
III	4. Benefits and Impact of Tourism on Economy, infrastructure, Society at International, National, State and Local Institutional level (Urban Local Bodies, Panchayats) Negative Impacts on economy, society and environment; Human Induced Travel and Tourism Hazards: Fire and travel related accidents.	15	1
IV	5. Travel and Tourism in India: Tourism Infrastructure; Case Studies of Himalaya, Desert and Coastal and Heritage; National and State Tourism Policy.	15	1

	TOTAL	**60**	**04**

Weightage of marks: ISA 20 + SEE 80 Total= 100.

Instructions

1. Complete thrust must be given to draw several global, national and regional examples by the trainers.
2. Field orientation should be attempted by the teachers and the Institutions for exposing to ground truths.
3. The information should be updated by referring journals, newspapers, websites and other relevant materials.

Reading List

1. Dhar, P.N.,(2006): International Tourism: Emerging Challenges and Future Prospects. Kanishka, New Delhi.
2. Hall, M. and Stephen, P.,(2006): Geography of Tourism and Recreation – Environment, Place and Space, Routledge, London.
3. Kamra, K. K. and Chand, M.,(2007): Basics of Tourism: Theory, Operation and Practise, Kanishka Publishers, Pune.
4. Page,S. J.,(2011):Tourism Management: An Introduction, Butterworth-Heinemann- USA. Chapter 2
5. Raj, R.and Nigel, D.,(2007): Morpeth Religious Tourism and Pilgrimage Festivals Management: An International perspective by, CABI, Cambridge, USA, www.cabi.org.
6. Tourism Recreation and Research Journal, Center for Tourism Research and Development, Lucknow.
7.Singh,Jagbir.,(2014):Eco-Tourism.,I.K.International Pvt. Ltd., New Delhi,India. (www.ikbooks.com).

Goa University
Choice Based Credit System
THREE YEARS GENERAL AND HONOURS DEGREE PROGRAMME)
GES102:APPLIED TRAVEL AND TOURISM OPERATION IN GEOGRAPHY (WITH A MINI PROJECT)
GEOGRAPHY SKILL ENHANCEMENT COURSE
B. A. / B. SC. / B. COM. SEMESTER IV

Course Credits: 04 **Total Contact Hours: 60 Lectures of 1 Hour Each.**

COURSE OBJECTIVES: The main objective of this skill based paper is to enable the students to apply the fundamental knowledge of travel and tourism operation gained earlier for management and operation in an efficient way. It is to develop preparedness amongst the students as employees or self employed youths in the Society.

LEARNING OUTCOMES: At the end of this skill based training course, the students will be able to be dedicated employees in travel and tourism operation sector. The students will become trained and moral citizen to use their skill. Finally the students will acquire confidence of taking up part time or full time jobs to help their family.

Units	Course Content	Contact Hours	Credits
I	Infrastructure and support system in travel and tour operation Accomodation and supplementary accomodation, travel agencies and tour operators, tour planning, role of guides.	15	1
II	Application of Travel and Tourism Operation Skills through Geographical Networking and Geographical Tools (Maps, Atlases, Satellite Images) Identifying the areas of Interest, Identifying Places of Interest Budget of the Tourists, Suitable seasons for tourism Feasibility in terms of availability of tickets and accommodation,	15	1
III	Identification and liasioning of Agency or Institution (Tourism Dept., Tourism Corporation, tour or travel agency, enterprenure, company etc.). At least 30 hours Duration of Training Programme for skill development and hands on working experience partly supervised by the teacher or Trainer and certified by the Authority of the agency or Instition of training. Training could be individual or Group of not more than 4 to 5.	15	1
IV	A Mini Project Report based on field based work experience under the joint guidance and certification of the Trainer and the Teacher to be submitted by 15th March. Conduct of a Viva-Voce or Presentation and submission of Marks by 31st March. **Allotment of Marks (40):** Attendance in the Training (10) + Discipline, Dedication, Atticates and Skill / Efficiency during the Training (10) +	15	1

	Training Report of 10-20 pgs (10) + Viva-Voce / Presentation (10).		
	TOTAL	**60**	**04**

Weightage of marks: ISA =20 + SEE 40 Training and Report (40) Total= 100.

Instructions

1. Thrust should be given to application at international, national and regional levels by the teachers.
2. Field orientation is the main focuss, which should be attempted by the students during vacations or non teaching hours. The concerned Institutions should be approached either by students or by teachers or colleges for the hands on training for the students. Periodic checking by the teacher/s is desirable.
3. The information should be updated by referring journals, newspapers, websites and other relevant materials.

Reading List

1. Dhar, P.N.,(2006): International Tourism: Emerging Challenges and Future Prospects. Kanishka, New Delhi.
2. Hall, M. and Stephen, P.,(2006): Geography of Tourism and Recreation – Environment, Place and Space, Routledge, London.
3. Kamra, K. K. and Chand, M.,(2007): Basics of Tourism: Theory, Operation and Practise, Kanishka Publishers, Pune.
4. Page,S. J.,(2011): Tourism Management: An Introduction, Butterworth-Heinemann- USA. Chapter 2.
5. Raj, R. and Nigel,D.,(2007): Morpeth Religious Tourism and Pilgrimage Festivals Management: An International perspective by, CABI, Cambridge, USA, www.cabi.org.
6. Tourism Recreation and Research Journal, Center for Tourism Research and Development, Lucknow.
7.Singh,Jagbir.,(2014):Eco-Tourism.,I.K.International Pvt. Ltd., New Delhi,India. (www.ikbooks.com).

Goa University
Choice Based Credit System
THREE YEARS GENERAL AND HONOURS DEGREE PROGRAMME
GES103: FIELD STUDY AND SURVEY TECHNIQUES IN GEOGRAPHY
GEOGRAPHY SKILL ENHANCEMENT COURSE
B. A. / B. SC. / B. COM. SEMESTER III

Course Credits: 04 **Total Contact Hours: 60 Lectures of 1 Hour Each.**

COURSE OBJECTIVES: The main objective of this paper is to orient the students to the skills of conducting field study and Survey with the fundamental knowledge of techniques in geography. It is to develop preparedness to work or assist on field based studies and research conducted by the competitive market forces and institutions.

LEARNING OUTCOMES: At the end of this skill based course, the students will be able to use their preparedness to face the challenges in field based studies and activities. The confidence and information gained from the course will enable them to become fair field worker. Finally the students will acquire the humbleness of taking up activities which are existing every where across the world.

Units	Course Content	Contact Hours	Credits
I	Fundamentals of Geography and Field Work 1. Field Work in Geographical and Societal Studies – Role, Value and Ethics of Field-Work. Factors influencing the Field work and Survey, Scope of Field Work in the Society, Market, Govt. and Non-Govt. agencies. Limitations of Field Work and Field Surveys.	15	1
II	2. Defining the Field and Identifying the Case Study – Rural / Urban / Physical / Human / Economic / Market / Tourism / Entertainment / Political / Environmental. Need based and Time bound Field Study and Surveys, Vacational, Official, Local. 3. Recent Trends of Field Surveys and on line transfer of Information: Hard Copy, Soft copy, Email, on line etc.	15	1
III	4. Field Techniques – Merits, Demerits and Selection of the Appropriate Technique; Observation (Participant / Non Participant).	15	1
IV	5. Precautions and Safety measures for Field Surveys. Timing of the Survey. Permission, Authorisation, Liasioning and Infrastructure.	15	1
	TOTAL	**60**	**04**

Weightage of marks: ISA 20 + SEE 80 **Total= 100.**

Instructions

1. Exposure & thrust must be given to several global, national and regional examples by the trainers.
2. Field orientation should be attempted by the teachers and the Institutions for exposing the students.

3. The information should be updated by referring journals, newspapers, websites and other relevant materials.

Reading List

1. Dikshit, R. D.,(2003): The Art and Science of Geography: Integrated Readings. Prentice-Hall of India, New Delhi.
2. Eyles,J.,and Smith,D.M.,(Ed).,(1988):*Qualitative Methods in Human Geography*.,Polity Press, U.K.
3. Mukherjee,Neela.,(2002):Participatory Learning and Action: with 100 Field Methods. Concept Publs. Co., New Delhi.
4. Pryczak F. and Pryczak Bruce R.(Ed).,(1998): Writing empirical research reports: A Basic guide for students of the Social and Behavioral Sciences, Pyrczak Publication, Los Angeles.
5. Stoddard R. H.,(1982): *Field Techniques and Research Methods in Geography*, Kendall/Hunt Publication
6. *The Geographical Review.*, (2001): Doing Fieldwork Special Issue,Publication, American Geographical Society, New York.
7. Wolcott, H.,(1995): The Art of Fieldwork. Alta Mira Press, Walnut Creek, CA.

THREE YEARS GENERAL AND HONOURS DEGREE PROGRAMME
GES104: APPLICATION OF FIELD STUDY AND SURVEY TECHNIQUES IN GEOGRAPHY
(WITH A MINI PROJECT)
GEOGRAPHY SKILL ENHANCEMENT COURSE
B. A. / B. SC. / B. COM. SEMESTER IV

Course Credits: 04 **Total Contact hours: 60 Lectures of 1 Hour Each.**

COURSE OBJECTIVES: The main objective of this applied skill based paper is to enable the students to apply the fundamental knowledge of Field Survey and Study gained earlier for efficient management and operation in the field. It is to develop preparedness for the students to work as employees or self employed youths.

LEARNING OUTCOMES: At the end of this applied skill based training course, the students will be able to act as dedicated employees in field job sector. The students will become trained and moral citizen to use their skill. Finally the students will acquire confidence of taking up field based part time or full time jobs in thier tenure as youth.

Units	Course Content	Contact Hours	Credits
I	1. Questionnaire Designing: Open/Closed/Structured/Non Struct. Interview with Special Focus on Focused Group Discussions; Space Survey (Transects & Quadrants, Constructing a Sketch). Field Survey Planning, Role of guides in Field Study or Survey.	15	1
II	2. Designing the Field Report – Aims and Objectives, Methodology, Analysis, Interpretation and Writing the Report.	15	1
III	At least 30 hours Duration of actual field survey or Training Programme for skill development and hands on working experience partly supervised by the teacher or Trainer and certified by the Authority of the agency or Instition of training. Training could be individual or Group of not more than 4 to 5.	15	1
IV	A Mini Project Report based on field based work experience under the joint guidance and certification of the Trainer and the Teacher to be submitted by 15th March. Each student/Group will prepare an individual/Group Report based on primary and secondary data collected during field work. The word count of the report should be about 5000 to 10,000 excluding figures, tables, photographs, maps, references and appendices. A Report should be submitted in soft/soft binding on A 4 size paper. Conduct of a Viva-Voce or Presentation and submission of Marks by 31st March. **Allotment of Marks (40):** Attendance in the Training (10) + Discipline, Dedication, Atticates and Skill / Efficiency during the Training (10) + Training Report of 10-20 pgs (10) + Viva-Voce / Presentation (10).	15	1
	TOTAL	**60**	**04**

Weightage of marks: ISA= 20 + SEE 40 Training and Report (40) Total= 100.

Instructions

1. Thrust should be given to application at regional or / and local levels by the teachers.
2. Field orientation is the main focuss, which should be attempted by the students during vacations or non teaching hours. The concerned Institutions should be approached either by students or by teachers or colleges for the hands on training for the students. Periodic checking by the teacher/s is desirable.
3. The information should be updated by referring journals, newspapers, websites and other relevant materials.
4. Questions should be set with due weightages to all the units as specified above or by Goa University.

Reading List

1. Creswell J., (1994): *Research Design: Qualitative and Quantitative Approaches.*, Sage Publications, New Delhi.
2. Dikshit, R. D.,(2003): The Art and Science of Geography: Integrated Readings. Prentice-Hall of India, New Delhi.
3. Eyles,J.,and Smith,D.M.,(Ed).,(1988):*Qualitative Methods in Human Geography*.,Polity Press, U.K.
4. Mukherjee,Neela.,(2002):Participatory Learning and Action: with 100 Field Methods. Concept Publs. Co., New Delhi.
5. Pryczak F. and Pryczak Bruce R.(Ed).,(1998): Writing empirical research reports: A Basic guide for students of the Social and Behavioral Sciences, Pyrczak Publication, Los Angeles.
6. Stoddard R. H.,(1982): *Field Techniques and Research Methods in Geography*, Kendall/Hunt Publication
7. *The Geographical Review.*, (2001): Doing Fieldwork Special Issue,Publication, American Geographical Society, New York.
8. Wolcott, H.,(1995): The Art of Fieldwork. Alta Mira Press, Walnut Creek, CA.

THREE YEARS GENERAL AND HONOURS DEGREE PROGRAMME
GES105: WATERSHED DEVELOPMENT IN GEOGRAPHY
GEOGRAPHY SKILL ENHANCEMENT COURSE
B. A. / B. SC. / B. COM. SEMESTER III

Course Credits: 04 **Total Contact Hours: 60 Lectures of 1 Hour Each.**

COURSE OBJECTIVES: The main objective of this paper is to train the students to the skills of rural development through watershed development approach by theoretically understanding and physically conducting field study and Survey with the fundamental knowledge of techniques of watershed development in geography.

LEARNING OUTCOMES: At the end of this skill based course, the students will be able to use their preparedness to take up the challenges to develop field based activities. The confidence and information gained from the course will enable them to become semi professional field worker. Finally the students will acquire the skills of taking up watershed or nature based activities every where across the world.

Units	Course sontent	Contact Hours	Credits
I	Fundamentals of Watershed Management and its relationship with Geography: 1. Introduction, Definition, Principles, objectives, Need of watershed development and management. Govt. and Non-Govt. agencies in watershed development. Limitations of watershed development approach.	15	1
II	2. Characteristics of Watershed: Delineation, Geomorphological Characteristics (Linear aspects, Aerial aspects and Relief), Land use, Runoff characteristics	15	1
III	3. Hydrological Process in Watershed: Hydrological Cycle, Precipitation, Interception, Infiltration, Evaporation, Evapotranspiration.	15	1
IV	4. Surface Runoff, Ground water-flow, Water budget. Precautions and Safety measures for Watershed Developmment Field Surveys, Timing of the Survey. Permission, Authorisation, Liasioning and Infrastructure.	15	1
	TOTAL	**60**	**04**

Weightage of marks: ISA 20 + SEE 80 Total= 100.

Instructions

1. Exposure & thrust must be given to global, national and regional examples by the trainers.
2. Field orientation should be attempted by the teachers and the Institutions for exposing the students.
3. The information should be updated by referring journals, newspapers, websites and other relevant materials.

4. Questions should be set with due weightages to all the units as specified above or by Goa University.

Reading List

1. DeBarry. A. Paul.,(2004): Watersheds : Processes, Assessment, and Management, Hoboken, N.J. John Wiley & Sons, New Jersey
2. Heathcote. W. Isobel.,(2009): Integrated Watershed Management : Principles and Practice, 2nd Edition, Hoboken, N.J. : John Wiley & Sons, New Jersey
3. National Watershed Program Manual, The U.S. Department of Agriculture (USDA), Washington, D.C, December, (2009).
4. Narayana, V.V. Dhruva.,(2002): Soil and water conservation research in India, Published by ICAR, New Delhi
5. Singh Rajvir.,(2003): Watershed Planning and Management, 2nd Edition, Yash Publishing House.

Goa University
Choice Based Credit System
THREE YEARS GENERAL AND HONOURS DEGREE PROGRAMME
GES106: APPLICATION OF WATERSHED DEVELOPMENT IN GEOGRAPHY (WITH A MINI PROJECT)
GEOGRAPHY SKILL ENHANCEMENT COURSE
B. A. / B. SC. / B. COM. SEMESTER IV

Course Credits: 04 **Total Contacts Hours: 60 Lectures of 1 Hour Each.**

COURSE OBJECTIVES: The main objective of this applied skill based paper is to enable the students to apply the fundamental knowledge of watershed development approach gained earlier for efficient management of water and land resources in the field. It is to develop preparedness of the students to work as employees or self employed.

LEARNING OUTCOMES: At the end of this applied skill based training course, the students will be able to act as employees in field and agriculture sector. The students will become trained and moral citizen to use their skill for optimal utilization of resources. The students will also acquire confidence of taking up field based part time or full time jobs as youth of the country.

Unit	Course Content	Contact Hours	Credits
I	1. Application of watershed development approach in Geography: Soils in a Watershed, Soil characteristics- Physical, Hydrological. Processes of soil erosion- Erosion due to water and wind. Measurement and Estimation of soil erosion: Universal Soil Loss Equation.	15	1
II	2. Land Capability Classification: Need, Criteria and methods. 1. Designing Questionnaires for watershed development Study: Interview with Special Focus on Group Discussions: Constructing a Sketch of development. Field Survey Planning, Role of Field Study or Survey guide.	15	1
III	At least 30 hours Duration of actual field survey or Training Programme for skill development and practical working experience partly supervised by the teacher or Trainer and certified by the Authority of the agency or Instition of training. Training could be individual or Group of not more than 4 to 5.	15	1
IV	A Mini Project Report based on field based work under the joint guidance and certification of the Trainer and the Teacher to be submitted by 15th March. Each Group will prepare a Report based on primary or secondary data collected during field work. The word count of the report should be about 5000 to 10,000 excluding figures, tables, photographs, maps, references and	15	1

	appendices. One copy of the Report should be submitted in soft/soft binding on A 4 size paper. Conduct of a Viva-Voce or Presentation and submission of Marks by 31st March. **Allotment of Marks (40):** Attendance in the Training (10) + Discipline, Dedication, Atticates and Skill / Efficiency during the Training (10) + Training Report of 10-20 pgs (10) + Viva-Voce / Presentation (10).		
	TOTAL	**60**	**04**

Weightage of marks: ISA =20 + SEE 40, Training and Report (40) Total= 100.

Instructions

1. Thrust should be given to application at regional or / and local levels by the teachers.
2. Field orientation is the main focuss, which should be attempted by the students during vacations or non teaching hours. The concerned Institutions should be approached either by students or by teachers or colleges for the hands on training for the students. Periodic checking by the teacher/s is desirable.
3. The information should be updated by referring journals, newspapers, websites and other relevant materials.

Reading List

1. Creswell J., (1994): *Research Design: Qualitative and Quantitative Approaches.*, Sage Publications, New Delhi.
2. Dikshit, R. D.,(2003): The Art and Science of Geography: Integrated Readings. Prentice-Hall of India, New Delhi.
3. Eyles,J.,and Smith,D.M.,(Ed).,(1988):*Qualitative Methods in Human Geography*.,Polity Press, U.K.
4. Mukherjee,Neela.,(2002):Participatory Learning and Action: with 100 Field Methods. Concept Publs. Co., New Delhi.
5. Pryczak F. and Pryczak Bruce R.(Ed).,(1998): Writing empirical research reports: A Basic guide for students of the Social and Behavioral Sciences, Pyrczak Publication, Los Angeles.
6. Stoddard R. H.,(1982): *Field Techniques and Research Methods in Geography*, Kendall/Hunt Publication
7. Kakde, B. K.,(2010): Watershed Manual – A Guide for Watershed Development Practitioners and Trainers, BAIF Development Research Foundation,Pune., Assests Publications.
8. Suresh,R.,(2012): Soil and Watershed Conversation Engineering., Standard Publication Distributors, Delhi.
9. Schwab, G. O., et al.,(1993): Soil and Water Conservation Engineering, John Wiley & Sons.
10. Rajora,Rajesh.,(1998): Integrated Watershed Management: A Field Manual for Equitable, Productive and SustainableDevelopment.,Rawat Publications, Jaipur.

Goa University
Choice Based Credit System
THREE YEARS GENERAL AND HONOURS DEGREE PROGRAMME
GES107: GEOSPATIAL TECHNOLOGIES IN GEOGRAPHY
GEOGRAPHY SKILL ENHANCEMENT COURSE w.e.f. 2020-21
B. A. / B. SC. / B. COM SEMESTER III

Course Credits: 04 **Total Contact Hours: 60 Lectures of 1 Hour Each.**

COURSE OBJECTIVES: The main objective of this paper is to orient the students to the skills of cartography/ map making with the fundamental knowledge of free and open source geospatial technologies and data sources. It is to develop preparedness to work or assist in satellite and geo-tagged data collection, presentation, mapping and interpretation especially for management of decision support systems and spatial solution enterprises.

LEARNING OUTCOMES: At the end of this skill based course, the students will be able to comprehend the geospatial technologies and their capabilities and finding solutions for spatial and resource management challenges. The information gained from the course will enable the students to become digital image processers and interpreters. Finally the students will acquire confidence of taking up mapping related activities.

UNIT NO.	COURSE CONTENT	Contact Hours	Credits
I	Introduction: Concept, definition, Evolution of Remote Sensing, Remote Sensing System, Electromagnetic Radiation, Applications of remote sensing; Fundamentals of aerial photograph; geometry of the vertical aerial photograph, Types of Aerial photography, Imaging Mode, Stereo-pairs and mosaics.	15	1
II	Photogrammetry: Photo Scale; Planimetric measurements on aerial photographs; Area, Distance, Relative height, Radial displacement due to relief and its controlling factors, photogrammetric instruments, pocket stereoscope, mirror stereoscope, parallax bar, stereo plotter.	15	1
III	Remote Sensing Platforms, Types of satellites and orbits: types of sensors, data types and products; Resolutions: Spatial, Spectral, Radiometric and Temporal; Digital Image processing: Pre-processing; radiometric correction, geometric correction, atmospheric, correction, image rectification, Histogram, stretching, contrast enhancement, linear stretch, and band ratios.	15	1
IV	Data sources, USGS, Sentinel, Bhuvan India sites, DEM data; Digital Elevation Model, application of elevation data, Elements of	15	1

	visual image interpretation and Visual interpretation of aerial photos (02 exercise) and satellite imageries (02 exercise)		
TOTAL		**60**	**04**

Weightage of marks: ISA 20 + SEE 80 **Total= 100** **Credit: 4**

Instructions

1. Emphasis must be given to draw examples from different sources to support the study by the trainers.
2. Field orientation should be attempted by the teachers and the Institutions for exposing to ground truths.
3. The information of latest developments in the fields should be updated by referring print and electronic Medias.
4. Questions should be set with due weightage to all the units as specified above or by Goa University.

Books:

1. George Joseph: Fundamentals of Remote Sensing, Second Edition, Universities Press, Hyderabad
2. Jensen J. R.: Remote Sensing of the Environment: An Earth Resource Perspective, Pearson Education, Singapore.
3. Lillesand, Kiefer and Chipman: Remote sensing and Image Interpretation. 5 Ed. Wiley& sons.
4. Reddy Anji M.: Text Book of Remote Sensing and Geographical Information System, BS Publications, Hyderabad, AP
5. Rees, W. G.: Physical Principles of Remote Sensing, Second Edition, Cambridge University Press, UK.
6. Robinson A. H., Sale, R. D., Morrison, J. L., Muehrcke, P. C.: Elements of Cartography, John Wiley & Sons, New York.
7. Sarkar A,: Practical Geography: A Systematic Approach, Orient BlackSwan (Revised edition), Kolkota
8. Schowengerdt, Robert A.: Remote Sensing; Models and Methods for Image Processing, Academic Press, San Diego, California, USA.

Goa University
Choice Based Credit System
THREE YEARS GENERAL AND HONOURS DEGREE PROGRAMME
GES108: APPLICATION OF GIS IN GEOGRAPHY
GEOGRAPHY SKILL ENHANCEMENT COURSE w.e.f. 2020-21
B. A. / B. SC. / B. COM SEMESTER IV

Course Credits: 04 **Total Contact Hours: 60 Lectures of 1 Hour Each**

COURSE OBJECTIVES: The main objective of this paper is to orient the students to the skills of cartography/ map making with the fundamental knowledge of free and open source geospatial technologies and data sources. It is to develop preparedness to work or assist in data collection, presentation, mapping and interpretation especially for management of decision support systems and spatial solution enterprises.

LEARNING OUTCOMES: At the end of this skill based course, the students will be able to comprehend the geospatial technologies and their capabilities and finding solutions for spatial and resource management challenges. The information gained from the course will enable the students to become cartographic and graphic designer. Finally the students will acquire confidence of taking up mapping related activities.

UNIT NO.	COURSE CONTENT	Contact Hours	Credits
I	GIS: Definition, Hardware and Software Components, Evolution of GIS, Application of GIS and Objectives. Free and Open Source mapping and image analysis Softwares: QGIS, SAGA GIS, GRASS GIS, Surfer, Global Mapper and Mobile Apps for Geo-tagged Data collection; EpiCollect5, GPS Essentials.	15	1
II	Coordinate Systems: Types- GCS and PCS, Geo-referencing; Digitizing, Map Layout and design, Spatial Analysis: Vector based and Raster based Operations for Spatial analysis: Attribute Query and Spatial Query,	15	1
III	DEM (Aspect analysis, slope analysis, viewshed); Preparation of various maps using google earth, Concepts of GPS: History, Types, Navigation, Applications. Geographic Data: Data Sources, Data types: Spatial and Non-Spatial; Spatial Data Types: Vector (point, line, polygon) and Raster (pixels); Non-Spatial: information about features (roads, schools, census data); Database Management System: Definition, difference between Standard and Spatial Database, Types of database Models Popular DBMS software;	15	1
IV	Mini Project: mobile app based geo-tagged data, satellite data, spatial and non- spatial data and application of geospatial technologies for data analysis, presentation and interpretation.	15	1
TOTAL		**60**	**04**

Weightage of marks: ISA 20 + SEE 80 **Total= 100** **Credit: 4**

Instructions

1. Emphasis must be given to draw examples from different sources to support the study by the trainers.
2. Field orientation should be attempted by the teachers and the Institutions for exposing to ground truths.
3. The information of latest developments in the fields should be updated by referring print and electronic Medias.
4. Questions should be set with due weightage to all the units as specified above or by Goa University.

Books:

1. Burrough, P.A.: An Introduction to GIS, 1996
2. Chang, K.: Introduction to Geographic Information Sc., McGraw Hill, 2002.
3. Delaney, J & Niel K V.: GIS: an Introduction, 2nd Ed., Oxford Publishers, 2003
4. Heywood, I., Cornelius S., Carver S., Srinivas Raju: An Introduction to Geographical Information System, Pearson Education, New Delhi, 2009
5. Longley: Geographic Information Systems and Science, 2nd Ed. WILEY, 2003
6. Michael N. DeMers,: Fundamentals of Geographic Information Systems; John Wiley & Sons, 2014

Goa University
Choice Based Credit System
THREE YEARS B. A. GENERAL AND HONOURS DEGREE PROGRAMME
GEC105: Physical Geography
Geography Core Course (Theory)
B. A. SEMESTER-V

Course Credits: 03 Total Contact Hours: 45 Lectures of 1 Hour Duration each.

Course Objectives: This is an introductory paper which is intended to acquaint the students with basics concepts in physical Geography.

Learning Outcomes: At the end of this course students will be able to gain knowledge and about physical Geography.

Units	Course Content	Contact Hours	Credits
I	**Concept and Nature** of P**hysical Geography:** Introduction to physical geography Meaning, Definitions, Nature and Scope of Physical Geography Branches of Physical Geography(Geomorphology, Climatology, Oceanography, Soil Geography and Bio geography)	15	1
II	**Earth Systems I:** Earth and its Structure: Internal Structure of Earth based on Temperature, Density, Pressure & Seismic evidences. Formation and classification of Rocks Folds Faults its origin and type Earthquakes; Volcanoes and Associated Landforms	15	1
III	**Earth Systems II:** Sun as A source of Energy: Insolation, Factors affecting , Global Heat Budget/ Balance Global Warming, Climate change and its impacts Climate Change: Causes and Evidences, Land use change and climate. and its application in agriculture, health and disaster risk reduction Oceans: Study of Relief & Configuration of Pacific, Atlantic & Indian Ocean. Biosphere: Concepts, ecosystem and their types & world hotspots	15	1
	Total	45	03

Weightage of Marks: I. S. A: 15 + S. E. E.: 60 Total= 75.

References:

1. Bloom, Arthur L., (2008): Geomorphology – A Systematic Analysis of Late Cenozoic Landforms, Prentice Hall, Engle Wood Cliff, New.Jersey.
2. Ahmed, E., (2005): Geomorphology, Kalyani Publishers, New Delhi
3. Sharma, V.K., (2006): Geomorphology, Earth Surface, Process and forms, Tata McGraw Hill, New York
4. Lal.D.S ., (2004): Oceanography, Prayag Pustak Bhavan, Allahabad
5. Strahler, A.N., (2005): Physical Geography, 3rd Ed., Wiley Publications
6. Singh, S. (2005): Physical Geography,PrayagPustakBhawan, Allahabad
7. Thornbury, W.D., (2004): Principles of Geomorphology, Wiley International.
8. Wooldridge, S.W. and Morgan, R.S., (2008): The Physical Basis of Geography, Longman (First published in 1937)
9. Worcestor, P.G., (2005): A Textbook of Geomorphology, Van Nostrand, 2nd Ed., East West Edition, New Delhi.
10. Chorley, Richard J., (2002): Spatial Analysis in Geomorphology, Harper and Row Publishers, New York, London.
11. Dayal, P. (2nd edition) (2006): A Textbook of Geomorphology, Shukla Book Depot, Patna
12. Sharma, H.S. (ed), (2002): Perspective in Geomorphology, Vol. I & IV, Concept, New Delhi.
13. Sharma, V.K., (2006): Geomorphology, Earth Surface Processes and Forms, Tata Mc. Graw Hill,New Delhi.
14. Sparks, B.W., (2000): Geomorphology, Longman, London, 2nd edition.

Goa University
Choice Based Credit System
THREE YEARS B. A. GENERAL AND HONOURS DEGREE PROGRAMME
GEC105: Practical in Physical Geography
Geography Core Course (Practical)
B. A. SEMESTER-V

Course Credits: 01 Total Contact Hours: 15 Lectures of 2 Hour Duration each.

Course Objectives: This is an introductory paper which is intended to acquaint the students with basics of topographical mapping.

Learning Outcomes: At the end of this course students will be able to gain knowledge about toposheet map reading and interpretation of the same.

Units	Course Content	Contact Hours
I	**Introduction to Survey of India (SOI) toposheets and with reference to:** Indexing/ Types Scales and Grid Reference Convectional Signs and Symbols Colour Schemes Marginal Information Calculation of Toposheet Area **Comparison of SOI with Ordinal maps of UK and United States Geological Survey Maps (USGS) with reference to:** Indexing/ Types Scales and Grid Reference	15
II	**Topographical Map Interpretation:** Study and interpretation of Indian Topographical maps of survey of India (Series - 1: 50000 or 1: 25000) with reference to physiography, drainage and other water bodies, vegetation, landuse pattern, settlements(size, pattern, Utility), transport and communication aspects with reference to: Mountains Plateaus Coastal Plains One day field Excursion for Orientation of Toposheet, Observation and identification of Geographical features and preparation of a brief report	15
	Total	30

Weightage of Marks: 25
Credit: 01

- **Unit I: 10 marks, Unit II: 10 marks, field trip report: 03, Certified Journal & Viva Voce: 02 marks.**

- **It is proposed by the BOS held on 22.02.2019 to conduct the practical examinations for core and electives in 2 sessions on the same day and by the same panel of examiners as each practical is of 25marks under CBCS.**

Instructions

6. Every candidate shall complete the laboratory course prescribed by the University entering all the experiment exercise in the laboratory journal, which shall be produced at the time of Practical Examination along with a certificate signed both by the course Teacher and the Head of the Department of the concerned college to the effect that he/she has completed the prescribed course in a satisfactory manner.
7. A batch shall consist of not more than 20 students.
8. Workload: One lab session of continuous 2 hrs. Total no. of laboratory sessions: 15 equivalent to 30 hours of workload.
9. The duration of practical exam: 3 hrs carrying 25 marks.
10. Practical examination is to be conducted at the end of the Semester prior to the Theory examination in Geography Laboratory or exclusively designated place/s.
11. Duration of Local trip is not more than two days for FY/SY /TY /B.A./ B.Sc.

Reference Books

1. Cuff J. D. and Mattson M. T., (1982): Thematic Maps: Their Design and Production, Methuen Young Books
2. Dent B. D., Torguson J. S., and Holder T. W., (2008): Cartography: Thematic Map, Design (6th Edition), Mcgraw-Hill Higher Education.
3. Gupta K. K. and Tyagi V. C., (1992): Working with Maps, Survey of India, DST, New Delhi.
4. Kraak M. J., Ormeling F., (2003): Cartography: Visualization of Geo-Spatial Data, Prentice-Hall.
5. Mishra R. P., and Ramesh A., (1989): Fundamentals of Cartography, Concept, New Delhi.
6. Singh R. L., Singh R. P. B., (1999): Elements of Practical Geography, Kalyani Publishers.
7. Slocum T. A., Mcmaster R. B. and Kessler F. C., (2008): Thematic Cartography and Geovisualization (3rd Edition), Prentice Hall.
8. Tyner J. A., (2010): Principles of Map Design, The Guilford Press.
9. Sarkar, A. (2015): Practical geography: A systematic approach. Orient Black Swan Private Ltd., New Delhi

Choice Based Credit System
THREE YEARS B. A. HONOURS DEGREE PROGRAMME
GEC107: Regional Planning and Development
Geography Core Course (Theory)
B. A. SEMESTER-V

Course Credits: 03 **Total Contact Hours: 45 Lectures of 1 Hour Each.**

Course Objectives: To understand and evaluate the concept of region in geography and its role and relevance in regional planning; To identify the issues relating to the development of the region through the process of spatial organization of various attributes and their inter relationship.

Learning Outcomes: at the end of this course, students are expected to understand the concept of regional planning and its variations across time and space. They will be able to correlate and differentiate the various types of regional planning and apply the same to the local settings.

Units	Course Content	Contact Hours	Credits
I	**Regions and Regional Planning:** Concept of regions, Types of regions and their delineation Types of planning, principles and objectives of regional planning, tools and techniques. Regional planning and multi-level planning in India Need for Regional planning in India Metropolitan concept and urban agglomerations	15	1
II	**Regional Development, theories and Models:** Concepts of growth & development, growth versus development Indicators of development: Economic, social and environmental. Human development: Concept and measurement Cumulative causation Theory (Myrdal) Stages of Economic Development (Rostow) Growth pole model (Perroux) Growth centre model in Indian context	15	1
III	**Regional Development: India** Concept & Causes of underdevelopment; efficiency-equity debate. Concept and strategies of regional development with reference to India. Regional development in India, Regional inequality, disparity and diversity. Need and measures for balanced development in India	15	1
	Total	45	03

Weightage of Marks: I. S. A: 15 + S. E. E.: 60 **Total= 75.**

References

1. Bhargava, G.. (2001): Development of India's Urban, Rural, and Regional Planning in 21st Century: Policy,Perspective, Gyan Publishing House

2. Berry, BJ.L.,and Horton, F.F.,(1970): Geographic Perspectives on Urban Systems, Prentice Hall, New Jersey.
3. Bhat L.S.,(1972): Regional Planning In India, Statistical Publishing Society.
4. Blij H. J. De., (1971): Geography: Regions and Concepts, John Wiley and Sons.
5. Chand ,M., and Puri V.K., (2000): Regional planning In India, Allied Publishers, New Delhi.
6. Chandana, R.C.,(2016): Regional Planning and Development, 6th ed, Kalyani Publishers
7. Claval. P. I., (1998): An Introduction to Regional Geography, Blackwell Publishers, Oxford and Massachusetts.
8. Dickinson, R.E., (1947): City, Region and Regionalism, Oxford University Press.
9. Dickinson, R.E.,(1964): City and Region, Rutledge, London.
10. Friedmann J., and Alonso W., (1975): Regional Policy - Readings in Theory and Applications, MIT Press, Massachusetts.
11. Gore, C. G., (1984): Regions in Question: Space, Development Theory and Regional Policy, Methuen, London
12. Glasson, J. (2017): Contemporary Issues in Regional Planning, Routledge.
13. Gore, C. G., (2011): Regions in Question: Space, Development Theory and Regional Policy, Methuen, London.
14. Gore, C. G., Köhler G., Reich U.P., and Ziesemer T., (1996): Questioning Development; Essays on the Theory, Policies and Practice of Development Intervention, Metropolis-Verla., Marburg.
15. Gregory, D., Johnston, R., Pratt, G., Watts., Whatmore, S. (Eds) (2009): The Dictionary of Human, Geography, 5th ed, Wiley.
16. Hall, P., (1992): Urban and Regional Planning, Routledge, London.
17. Haynes J., (2008): Development Studies, Polity Short Introduction Series.
18. Higgins, B., Savoie, D.J. (2017): Regional Development: Theories and Their Application, Routledge.
19. Johnson E. A. J., (1970): The Organization of Space in Developing Countries, MIT Press, Massachusetts.
20. Kulshetra, S. K.,(2012): Urban and Regional Planning in India : A hand book for Professional Practioners, Sage Publication, New Delhi.
21. Kumar, A., Meshram, D.S., Gowda, K. (Eds) 2016. Urban and Regional Planning Education: Learning for
22. India, Springer
23. Kundu, A., (1992): Urban Development Urban Research in India, Khanna Publication, New Delhi.
24. Misra, R.P., Sundaram K.V., Prakash Rao ,VLS.,(1974): Regional Development Planning in India, Vikas Publication, New Delhi.
25. Misra, R.P.,(1992): Regional Planning: Concepts, Techniques, Policies and Case Studies, Concept, New Delhi.
26. N.A.T.M.O. Regional Planning, IGU Publication.
27. Peet R., (1999): Theories of Development, The Guilford Press, New York.
28. Ray, J. 2001. Introduction to Development & Regional Planning, Orient Blackswan.
29. UNDP.,(2001-04): Human Development Report, Oxford University Press.
30. World Bank.,(2001-05): World Development Report, Oxford University Press, New Delhi.

Goa University
Choice Based Credit System
THREE YEARS B. A. HONOURS DEGREE PROGRAMME

GEC107: Practical in Regional Planning & Development
Geography Core Course (Practical)
B. A. SEMESTER-V

Course Credits: 01 Total Contact Hours: 15 Lectures of 2 Hour Duration each.

Course Objectives: This is an introductory paper which is intended to acquaint the students with statistics of Regional Development.

Learning Outcomes: At the end of this course students will be able to gain knowledge about potentiality and applicability of statistics.

Units	Course Content	Contact Hours
I	Delineation of formal regions by weighted index method Delineation of functional regions by breaking point analysis Measurement of inequality by location quotient Measuring regional disparity by Sopher index	14
II	Measures of Inequality: Index of Dissimilarity, Gini Coefficient and Location Quotient Measures of Interaction and Spatial Distribution: Nearest Neighbour Analysis, Rank-Size Rule (Zipf, Berry), Computation of Human Development Index and ranking of countries and Indian states based on HDI and GDI	16
	Total	30

Weightage of Marks: 25
Credit: 01

Unit I: 10 marks, Unit II: 10 marks, Certified Journal & Viva-Voce: 3+2=5

- **It is proposed by the BOS held on 22.02.2019 to conduct the practical examinations for core and electives in 2 sessions on the same day and by the same panel of examiners as each practical is of 25marks under CBCS.**

Instructions

1. Every candidate shall complete the laboratory course prescribed by the University entering all the experiment exercise in the laboratory journal, which shall be produced at the time of Practical Examination along with a certificate signed both by the course Teacher and the Head of the Department of the concerned college to the effect that he/she has completed the prescribed course in a satisfactory manner.
2. A batch shall consist of not more than 20 students.
3. Workload: One lab session of continuous 2 hrs. Total no. of laboratory sessions: 15 equivalent to 30 hours of workload.
4. The duration of practical exam: 3 hrs carrying 25 marks.
5. Practical examination is to be conducted at the end of the Semester prior to the Theory examination in Geography Laboratory or exclusively designated place/s.
6. Duration of Local trip is not more than two days for FY/SY /TY /B.A./ B.Sc.

References:

1. Glasson, J.,(2017): Contemporary Issues in Regional Planning, Routledge.
2. Knowles, R, Wareing, J.,(1990): Economic and Social Geography, Made Simple Books, Rupa.
3. Mahmood, A., (1998): Statistical Methods in Geographical Studies, Rajesh Publication.
4. Monkhouse, F.J., Wilkinson, H.R., (1971): Maps and Diagrams: Their Compilation and Construction, 3rd ed (2017 reprint), Alphaneumera-Kolkata

B. A. SEMESTER-V

Course Credits: 03 Total Contact Hours: 45 Lectures of 1 Hour Duration each

Course Objectives: To introduce students with some basic statistical techniques, relevant to geographical research as the Project/Dissertation is compulsory at UG/PG level.

Learning Outcomes: Students will be able to understand different techniques and their relevance and the knowledge of drawing inferences using the geographical database.

Units	Course Content	Contact Hours	Credits
I	**Geographical Database:** Introduction to Statistics Importance of Statistics in Geography Geographical research and Statistical Techniques. **A)Measurement** – scales in statistical geography. Nominal, ordinal, interval and ratio scale/ measurements **B) Descriptive Statistics-I** Classification, Tabulation and types Tabulation, (format) and types of table	15	1
II	**Frequency Distribution:** Measures of central tendency and partition values Arithmetic & Geometric Mean, Median, Mode, Quartiles, Deciles, Percentiles for Grouped & Ungrouped data. Combined mean.	15	1
III	**Descriptive statistics – II** (Measures of Dispersion): Absolute measures of dispersion and skewness: Range, Quartile Deviation, Mean Absolute Deviation, Standard Deviation, Variance. **Relative Measures of Dispersion:** Coefficient of variation (C.V.), Lorenz curve.	15	1
	Total	45	03

Weightage of Marks: I. S. A: 15 + S. E. E: 60 Total= 75.

REFERENCE

1. Aronoff S., (1989):Geographic Information Systems: A Management Perspective, DDL Publication, Ottawa.
2. Burrough P.A., (1986): Principles of Geographic information Systems for Land Resource Assessment, Oxford University Press, New York.
3. David Unwin., (1981): Introductory Spatial Analysis, Methuen, London.
4. Fraser.,Taylor.D.R.,(1991): Geographic information System, Pergamon Press, Oxford.
5. Gregory, S., (1978): Statistical Methods and the Geographer, Longman, London.

6. Haggett. P., Cliff A. D., & Frey. Allan., (1977): Location Methods Vol. I and II, Edward, Arnold, London
7. Hammond. R., and P.S. McCullagh., (1974): Quantitative Techniques in Geography: An Introduction, Clarendan Press, Oxford.
8. John, P.C., and Cuchlaine A. M. King., (1968): Quantitative Geography, John Wiley, London.
9. Johnston, R. J., (1973): Multivariate Statistical Analysis in Geography, Longman, London.
10. King, L. S., (1969): Statistical Analysis in Geography, Prentice-Hall.
11. Mahmood, A., (1977): Statistical Methods in Geographical Studies, Concept, Delhi.
12. Maquire, D.J., Goodchild. M.F., Rhind. D. W., (eds.), (1991): Geographic information Systems: Principles and Application, Taylor & Francis, Washington.
13. Monmonier, M.S.,(1982): Computer-Assisted Cartography, Prentice-Hall, Englewood Clif., New Jersey.
14. Majumdar, P.K., (2002): Statistics: A Tool for Social Sciences, Rawat Publications, Jaipur & NewDelhi.
15. Pal, S. K., (1982): Statistical Techniques: A Basic Approach to Geography, Tata –McGraw Hill, New Delhi.
16. Pal, S.K., (1998): Statistics for Geoscientists — Techniques and Applications, Concept, New Delhi.
17. Peuquet,D.J., and Marble.D.F., (1990): Introductory Reading in Geographic Information Systems, Taylor & Francis, Washington.
18. Rastogi, R.S.,(2005): Elementary Statistics, Rohit Publications, Delhi.
19. Robinson, A.H. et al., (1995): Elements of Cartography, John Wiley & Sons, U.S.A.
20. Sarkar, A.,(2013) Quantitative geography: Techniques and Presentations, Orient Black Swan Private Ltd, New Delhi.
21. Silk J., (1979): Statistical Concepts in Geography, Allen and Unwin, London.
22. Star J and Estes. J., (1994): Geographic Information Systems: An Introduction, Prentice- Hall, Englewood Cliff, New Jersey.
23. Yeats M., (1974): An Introduction to Quantitative Analysis in Human Geography, McGraw Hill, New York.
24. Zamir Alvi., (2000): Statistical Geography: Method and Applications, Rawat Publications, New Delhi.

Goa University
Choice Based Credit System
THREE YEARS B. A. HONOURS DEGREE PROGRAMME
GEC108: Practical in Quantitative Techniques in Geography- I
Geography Core Course (Practical)
B. A. SEMESTER-V

Course Credits: 01 Total Contact Hours: 15 Lectures of 2 Hour Duration each

Course Objectives: To introduce students with some basic statistical techniques, relevant to geographical research as the Project/Dissertation is compulsory at UG/PG level.

Learning Outcomes: Students will be able to understand different techniques and their relevance and the knowledge of drawing inferences using the geographical database.

Units	Course Content	Contact Hours
I	. **Descriptive Statistics-I (Exercises based on theory**) Tabulation Graphical presentations, Frequency distribution and typical pattern of frequency distribution: Histogram and Frequency Polygon. Arithmetic & Geometric Mean, Median, Mode, Quartiles, Deciles, Percentiles (Grouped & Ungrouped data) Combined mean.	14
II	**Descriptive statistics – II** (Measures of Dispersion): **(Excercises based on theory**) Absolute measures of dispersion and skewness: Range, Quartile Deviation, Mean Absolute Deviation, Standard Deviation, Variance **Relative Measures of Dispersion:** Coefficient of variation (C.V.), Lorenz curve.	16
	Total	30

Weightage of Marks: 25
Credit: 01

Unit I: 10 marks, Unit II: 10 marks, Certified Journal & Viva-Voce: 3+2=5

- **It is proposed by the BOS held on 22.02.2019 to conduct the practical examinations for core and electives in 2 sessions on the same day and by the same panel of examiners as each practical is of 25 marks under CBCS.**

Instructions

1. Every candidate shall complete the laboratory course prescribed by the University entering all the experiment exercise in the laboratory journal, which shall be produced at the time of Practical Examination along with a certificate signed both by the course Teacher and the Head of the Department of the concerned college to the effect that he/she has completed the prescribed course in a satisfactory manner.
2. A batch shall consist of not more than 20 students.
3. Workload: One lab session of continuous 2 hrs. Total no. of laboratory sessions: 15 equivalent to 30 hours of workload.
4. The duration of practical exam: 3 hrs carrying 25 marks.
5. Practical examination is to be conducted at the end of the Semester prior to the Theory examination in Geography Laboratory or exclusively designated place/s.
6. Duration of Local trip is not more than two days for FY/SY /TY /B.A./ B.Sc.

References

1. Gregory., (1963): Statistical methods and the Geographer, Longman S. London
2. Gupta S.P., (1979: Practical Statistics, S. Chand and Co.
3. Johnson R.J., (1980): Multivariate statistical Analysis in Geography, Longman
4. Khan Z.A., (1998): Text book of practical Geography, Concept Publication, New Delhi
5. Majumdar, P.K., (2002): Statistics: A Tool for Social Sciences, Rawat Publications, Jaipur & New Delhi.
6. Pal. S. K., (1982): Statistical Techniques: A basic approach to Geography, Tata –McGraw Hill, New Delhi.
7. Rastogi, R.S.,(2005): Elementary Statistics, Rohit Publications ,Delhi.
8. Succheti D.C. and Kapoor V.K., (2002) - Statistics (Theory, methods and application), Sultan Chand &sons.
9. Zamir,Alvi., (2000): Statistical Geography:Method and Applications, Rawat Publications, New Delhi.

Goa University
Choice Based Credit System
THREE YEARS B. A. GENERAL AND HONOURS DEGREE PROGRAMME
GED106: Climatology and Oceanography
Discipline Specific Elective in Geography (Theory)
B. A. SEMESTER-VI

Course Credits: 03 **Total Contact Hours: 45 Lectures of 1 Hour Duration each.**

Course Objectives: The focus of this course is to introduce key concepts of Climatology and Oceanography in general.

Learning Outcomes: On completion of this course students will able to understand the concepts of climatology and oceanography and apply the same for interpretation.

Units	Course Content	Contact Hours	Credits
I	**Atmospheric Circulation:** Inversion of Temperature Forms and processes of Condensation: Clouds formation and types, Cloud burst. Factors controlling Air Motion and resulting Flow Patterns Planetary pressure & wind system, local wind system.	15	1
II	**Exetreme Events and Climatic Classification:** Jet Stream: Origin& Characteristics Genesis of Monsoon with particular reference to South Asia Origin and Classification of Air –masses& Fronts, Frontogenesis and Frontolysis Origin and Characteristics of Tropical and Temperate Cyclones Classification of World Climates: Schemes of Koppen and Thornthwaite	15	1
III	**Oceanography:** Ocean Salinity & temperature Waves, Types of Tides & Ocean Currents (Altantic ocean) Coral Reefs & their types	15	1
	Total	45	03

Weightage: I.S.A: 15 + S.E.E: 60 Total= 75

References

1. Ahrens, C.D. 2012. Essentials of Meteorology: An Invitation to the Atmosphere. 9th Ed, Cengage Learning.
2. Barry R. G. and Carleton A. M., (2001): Synoptic and Dynamic Climatology, Routledge, UK.
3. Barry, R.G, Chorley R.J. 2009. Atmosphere Weather and Climate. 9th Ed, Routledge.
4. Barry R. G. and Corley R. J., (1998): Atmosphere, Weather and Climate, Routledge, New York.
5. Critchfield H. J., (1987): General Climatology, Prentice-Hall of India, New Delhi, (2010 Reprint).
6. Lal, D.S. 2012. Climatology. Sharda Pustak Bhawan.
7. Lutgens F. K., Tarbuck E. J. and Tasa D.,(2009): The Atmosphere: An Introduction to Meteorology, Prentice-Hall, Englewood Cliffs, New Jersey.
8. Oliver J. E. and Hidore J. J., (2002): Climatology: An Atmospheric Science, Pearson
9. Education, New Delhi.

Websites:
India Meteorological Department: www.imd.gov.in
Intergovernmental Panel on Climate Change: www.ipcc.ch
World Bank Climate Change Knowledge Portal: sdwebx.worldbank.org/climateportal/index.cfm

World Meteorological Organization: public.wmo.int/en

Goa University
Choice Based Credit System
THREE YEARS B. A. GENERAL AND HONOURS DEGREE PROGRAMME
GEC106: Application & Interpretation of Weather Maps
Geography Core Course (Practical)
B. A. SEMESTER-VI

Course Credits: 01 Total Contact Hours: 15 Lectures of 2 Hour Duration each.

Course Objectives: This is an introductory paper which is intended to acquaint the students with basics of weather maps.

Learning Outcomes: At the end of this course students will be able to gain knowledge about understanding and interpretation of weather maps.

Units	Course Content	Contact Hours
I	**Weather Maps Reading:** Introduction to Weather Maps Signs & Symbols used in Weather Report Isobaric pattern: Cyclones, Anti cyclones, V shaped Cyclones, V Shaped, Anti Cyclones , Col Representation of Weather Data (Hythergraph, Climographs, Wind Roses and their types) Weather Instruments (Traditional and Modern) Weather Station models	15
II	**Study and Interpretation of Indian Daily Weather Report (IDWR):** Summer Season South- West Monsoon Season Retreating Monsoon Winter Season Study tour to be conducted & report writing with reference to weather, drainage, climate, soil, topography cultural landscape& economic activities outside the state for minimum of 03 days exclusive of travel time.	15
	Total	30

Weightage of Marks: 25
Credit: 01

- **Unit I: 08marks, Unit II: 08 marks, Field trip report: 05, Certified Journal & Viva Voce: 04marks.**

- **It is proposed by the BOS held on 22.02.2019 to conduct the practical examinations for core and electives in 2 sessions on the same day and by the same panel of examiners as each practical is of 25 marks under CBCS.**

Instructions

1. Every candidate shall complete the laboratory course prescribed by the University entering all the experiment exercise in the laboratory journal, which shall be produced at the time of Practical Examination along with a certificate signed both by the course Teacher and the Head of the Department of the concerned college to the effect that he/she has completed the prescribed course in a satisfactory manner.
2. A batch shall consist of not more than 20 students.
3. Workload: One lab session of continuous 2 hrs. Total no. of laboratory sessions: 15 equivalent to 30 hours.
4. The duration of practical exam: 3 hrs carrying 25 marks.

5. Practical examination is to be conducted at the end of the Semester prior to the Theory examination in Geography Laboratory or exclusively designated place/s.
6. Duration of Local trip is not more than two days for FY/SY B.A.B.Sc. Duration for long tour for TYBA/B.Sc will be between 3 to 12 days. The Deputed faculty members will be entitled for the T.A/D.A

References:

1. Anson R. and Ormelling F. J., (1994): International Cartographic Association: Basic Cartographic Vol. Pregmen Press.
2. Gupta K.K. and Tyagi, V. C., (1992): Working with Map, Survey of India, DST, New Delhi.
3. Mishra R.P. and Ramesh, A., (1989): Fundamentals of Cartography, Concept, New Delhi.
4. Monkhouse F. J. and Wilkinson H. R., (1973): Maps and Diagrams, Methuen, London.
5. Rhind D. W. and Taylor D. R. F., (eds.), (1989): Cartography: Past, Present and Future, Elsevier, International Cartographic Association.
6. Robinson A. H., (2009): Elements of Cartography, John Wiley and Sons, New York.
7. Singh R. L. and Singh R. P. B., (1999): Elements of Practical Geography, Kalyani Publishers.
8. Sarkar, A. (2015) Practical Geography: A systematic approach. Orient Black Swan Private Ltd., New Delhi.

Goa University
Choice Based Credit System
THREE YEARS B. A. HONOURS DEGREE PROGRAMME
GEC109: Regional Planning in India
Geography Core Course (Theory)
B. A. SEMESTER-VI

Course Credits: 03 **Total Contact Hours: 45 Lectures of 1 Hour Duration each.**

Course Objectives: To understand and evaluate the concept of region and regional planning with reference to India. To identify the issues relating to the development of the regions in India through the process of spatial organization of various attributes and their inter relationship.

Learning Outcomes: at the end of this course, students are expected to understand the concept of regional planning and its variations across time and space. They will be able to correlate and differentiate the various types of regional planning and apply the same to the local settings.

Units	Course Content	Contact Hours	Credits
I	**Regional Planning in India:** Need for regional planning in India ,context & Strategy Delineation of Planning Region in India Agro Ecological Zones in India Multi-level planning in India Need and measures for balanced development in India	15	1
II	**Resource Regionalisation of India:** Industrial regions. Growth centre strategy; District Planning. Metropolitan Planning. Manpower Planning In India, Planning problems, Objectives and priorities in India **Urban regions in India:** Census definitions; Changing connotations Hierarchy of urban systems, city types, metropolitan areas, urban agglomerates	15	1
III	**Planning regions of India** Micro level planning in Rural area Backward area development programme Urban fringe of Indian cities: Problems and planning Special Area Development Plans in India Regional policy and Regional Planning Five-Year Plans: Features, achievements and failure Changing planning mechanism of India: NITI Ayog **Planning in Goa:** Tribal and coastal region, drought and flood region, Local Government and Planning.	15	1
	Total	45	03

Weightage of Marks: I. S. A: 15 + S. E. E.: 60 Total= 75.

References

1. Bhargava, G.,(2000): Development of India's Urban, Rural, and Regional Planning in 21st Century: Policy Perspective, Gyan Publishing House, Delhi.

2. Chand, Mahesh., (2000):Regional Planning In India, Allied Publishers Ltd, Mumbai.
3. Chandana, R. C., (2016):Regional Planning and Development, Kalyani Publishers, New Delhi.
4. Devi, L.(ed.)., (2000):Planning Development and Regional Disparities, Anmol Publications, New Delhi.
5. Dikshit, J. K. (ed.)., (2011): The Urban Fringe of Indian Cities: Professor Jaymala Diddee Felicitation Volume, Rawat Publications, Jaipur.
6. Freeman T. W., (1958): Geography And Planning, Hutchinsen University, London.
7. Hall, P., (2016): Urban and Regional Planning, Routledge, London.
8. Jhingan, M. L., (2017):The Economics of Development and Planning, Vrinda Publications (P) Limited, Delhi.
9. Glasson, J., and Marshall.,(2007): Regional Planning, Taylor And Francis.
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11. Misra, R. P. (2002): Regional Planning, Concept Publishing Co, New Delhi.
12. NITI Ayog (2017): Three Year Action Plan (2017-18 to 2019-20), NITI Ayog, New Delhi.
13. Sundaram, K. V., (1985): Geography and Planning: Essays in Honours of Prof. V. L. S. PrakasaRao, Concept Publishing Co, New Delhi.
14. Sundaram, K. V., (1989): Regional Planning and Development: Essays on Space,
15. Society, and Development in Honours of Professor R. P. Misra, Heritage Publishers, New Delhi.
16. Tiwari, R. C., (2016): Geography of India, Pravalika Publications, Allahabad.
17. Vidyarthi, A. et al., (2017): Understanding India's New Approach to Spatial Planning and Development: A Spatial Shift?, Oxford University Press, New Delhi.
18. Yojana, Monthly Journal Published by Government of Maharashtra.

Goa University
Choice Based Credit System
THREE YEARS B. A. HONOURS DEGREE PROGRAMME
GEC109: Practical in Regional Planning of India
Geography Core Course (Practical)
B. A. SEMESTER-VI

Course Credits: 01 **Total Contact Hours: 15 Lectures of 2 Hour Duration each.**

Course Objectives: To understand and evaluate the concept of region and regional planning with reference to India. To identify the issues relating to the development of the regions in India through the process of spatial organization of various attributes and their inter relationship.

Learning Outcomes: at the end of this course, students are expected to understand the concept of regional planning and its variations across time and space. They will be able to correlate and differentiate the various types of regional planning and apply the same to the local settings.

Units	Course Content	Contact Hours
I	**Preparation of Thematic maps (Manually)** Preparation of a district thematic maps with actual data- Choropleth and Isopleth, Dot and Pictogram, Located bar, located circle and pie chart Delineation of agricultural regions according to given criteria using Weaver's Method of Crop Combination/ Rafiullah's Method of Critical Combination Determination of sphere of influence by gravity model & Potential Models Preparation of Z score and composite Index from suitable data	20
II	**Application of Computer Cartography:** Cartograms of one, two and three dimensions, Graphical Representation-Histogram, Bar Graphs, Line Graphs, Multiple Line Graphs, Scatter Diagrams, Pie Diagrams. Preparation of Questionnaire and Survey Schedule for assessment of Development and Perception Study	10
	Total	30

Weightage of Marks: 25
Credit: 01

Unit I: 10 marks, Unit II: 10 marks, Certified Journal & Viva-Voce: 3+2=5

- **It is proposed by the BOS held on 22.02.2019 to conduct the practical examinations for core and electives in 2 sessions on the same day and by the same panel of examiners as each practical is of 25 marks under CBCS.**
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Instructions

1. Every candidate shall complete the laboratory course prescribed by the University entering all the experiment exercise in the laboratory journal, which shall be produced at the time of Practical Examination along with a certificate signed both by the course Teacher and the Head of the Department of the concerned college to the effect that he/she has completed the prescribed course in a satisfactory manner.
2. A batch shall consist of not more than 20 students.
3. Workload: One lab session of continuous 2 hrs. Total no. of laboratory sessions: 15 equivalent to 30 hours.
4. The duration of practical exam: 3 hrs carrying 25 marks.
5. Practical examination is to be conducted at the end of the Semester prior to the Theory examination in Geography Laboratory or exclusively designated place/s.

6. Duration of Local trip is not more than two days for FY/SY B.A.B.Sc. Duration for long tour for TYBA/B.Sc will be between 3 to 12 days. The Deputed faculty members will be entitled for the T.A/D.A

References:

1. Gregory., (1963): Statistical methods and the Geographer, Longman S. London
2. Gupta S.P., (1979: Practical Statistics, S. Chand and Co.
3. Johnson R.J., (1980): Multivariate statistical Analysis in Geography, Longman
4. Khan Z.A., (1998): Text book of practical Geography, Concept Publication, New Delhi
5. Majumdar, P.K., (2002): Statistics: A Tool for Social Sciences, Rawat Publications, Jaipur & New Delhi.
6. Monkhouse F.J.,(1971): Maps & Diagrams, (3rd Edition, Revised),Methuen and Co., London.
7. Pal. S. K., (1982): Statistical Techniques: A basic approach to Geography, Tata – McGraw Hill, New Delhi.
8. Rastogi, R.S.(2005): Elementary Statistics, Rohit Publications ,Delhi.
9. Sarkar A., (2013):Quantitative Geography, Orient Black Swan, New Delhi.
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11. Singh, R.L., & Singh P. B., (2005): Elements of Practical Geography, Kalyani Publishers.
12. Succheti D.C. and Kapoor V.K., (2002) - Statistics (Theory, methods and application), Sultan Chand &sons.
13. Zamir,Alvi., (2000): Statistical Geography:Method and Applications, Rawat Publications, New Delhi.

Goa University
Choice Based Credit System
THREE YEARS B. A. HONOURS DEGREE PROGRAMME
GEC110: Quantitative Techniques in Geography- II
GEOGRAPHY CORE COURSE (Theory)
B. A. SEMESTER-VI

Course Credits: 03 **Total Contact Hours: 45 Lectures of 1 Hour Each.**

Course Objectives: To introduce students with some basic statistical techniques, relevant to geographical research as the Project/Dissertation is compulsory at UG/PG level. To acquaint students with potentiality and applications of statistics.

Learning Outcomes: Students will be able to understand different techniques and their relevance. The knowledge of drawing inferences using the geographical database

Units	Course Content	Contact Hours	Credits
I	**Use of Data in Geography:** Geographical Data Matrix Significance of Statistical Methods in Geography Sources of Data **Parametric Statistics: Sampling Techniques** Significance in research and data collection. Sampling Plan Methods of sampling Sampling estimates	15	1
II	**Non- Parametric Statistics:** Co-relation and Regression analysis Scatter Diagram Karl Person's Co-efficient correlation Spearman's rank correlation Kendall's rank correlation regression analysis. **Non-Parametric: Hypothesis testing** Meaning, types of hypothesis Testing of hypothesis i) Chi-square test ii) Variance analysis iii) T-Test	15	1
III	Matrices & Indices: Elementary introduction to geographic matrices Index numbers: unweighted, weighted indices and cost of living index	15	1
	Total	45	03

Weightage of Marks: I. S. A: 15 + S. E. E.: 60 Total= 75.

References

1. Aronoff S., (1989):Geographic Information Systems: A Management Perspective, DDL Publication, Ottawa.
2. Burrough P.A., (1986): Principles of Geographic information Systems for Land Resource Assessment, Oxford University Press, New York.
3. David Unwin., (1981): Introductory Spatial Analysis, Methuen, London.
4. Fraser., Taylor.D.R.,(1991): Geographic information System, Pergamon Press, Oxford.
5. Gregory, S., (1978): Statistical Methods and the Geographer, Longman, London.
6. Haggett. P., Cliff A. D., & Frey. Allan., (1977): Location Methods Vol. I and II, Edward, Arnold, London

7. Hammond. R., and P.S. McCullagh., (1974): Quantitative Techniques in Geography: An Introduction, Clarendan Press, Oxford.
8. John, P.C., and Cuchlaine A. M. King., (1968): Quantitative Geography, John Wiley, London.
9. Johnston, R. J., (1973): Multivariate Statistical Analysis in Geography, Longman, London.
10. King, L. S., (1969): Statistical Analysis in Geography, Prentice-Hall.
11. Mahmood, A., (1977): Statistical Methods in Geographical Studies, Concept, Delhi.
12. Maquire, D.J., Goodchild. M.F., Rhind. D. W., (eds.), (1991): Geographic information Systems: Principles and Application, Taylor & Francis, Washington.
13. Monmonier, M.S.,(1982): Computer-Assisted Cartography, Prentice-Hall, Englewood Clif., New Jersey.
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15. Pal, S. K., (1982): Statistical Techniques: A Basic Approach to Geography, Tata –McGraw Hill, New Delhi.
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18. Rastogi, R.S.,(2005): Elementary Statistics, Rohit Publications, Delhi.
19. Robinson, A.H. et al., (1995): Elements of Cartography, John Wiley & Sons, U.S.A.
20. Sarkar, A.,(2013) Quantitative geography: Techniques and Presentations, Orient Black Swan Private Ltd, New Delhi.
21. Silk J., (1979): Statistical Concepts in Geography, Allen and Unwin, London.
22. Star J and Estes. J., (1994): Geographic Information Systems: An Introduction, Prentice- Hall, Englewood Cliff, New Jersey.
23. Yeats M., (1974): An Introduction to Quantitative Analysis in Human Geography, McGraw Hill, New York.
24. Zamir Alvi., (2000): Statistical Geography: Method and Applications, Rawat Publications, New Delhi.

Goa University
Choice Based Credit System
THREE YEARS B. A. GENERAL AND HONOURS DEGREE PROGRAMME
GEC110: Practical in Quantitative Techniques in Geography- II
GEOGRAPHY CORE COURSE (Practical)
B. A. SEMESTER-VI

Course Credits: 01 **Total Contact Hours: 15 Lectures Of 2 Hours Each.**

Course Objectives: To introduce students with some basic statistical techniques, relevant to geographical research as the Project/Dissertation is compulsory at UG/PG level. To acquaint students with potentiality and applications of statistics.

Learning Outcomes: Students will be able to understand different techniques and their relevance. The knowledge of drawing inferences using the geographical database

Units	Course Content	Contact Hours
I	**Non- Parametric Statistics: Co-relation and Regression analysis** Scatter Diagram Karl Person's Co-efficient correlation Spearman's rank correlation Kendall's rank correlation regression analysis.	10
II	**Non-Parametric: Hypothesis testing** i) Chi-square test ii) Variance analysis iii) T-Test **Matrices & Indices:** Index numbers: unweighted, weighted indices and cost of living index **Preparation of Survey Report:** Questionnaire Formulation Field Book Preparation Conducting on-field survey (Village, Market, Ward) 08 05 Data analysis using MS Excel and compilation Report	20
	Total	30

Weightage of Marks: 25
Credit: 01

Unit I: 10 marks, Unit II: 10 marks, Certified Journal & Viva-Voce: 3+2=5

- **It is proposed by the BOS held on 22.02.2019 to conduct the practical examinations for core and electives in 2 sessions on the same day and by the same panel of examiners as each practical is of 25 marks under CBCS.**

Instructions

1. Every candidate shall complete the laboratory course prescribed by the University entering all the experiment exercise in the laboratory journal, which shall be produced at the time of Practical Examination along with a certificate signed both by the course Teacher and the Head of the Department of the concerned college to the effect that he/she has completed the prescribed course in a satisfactory manner.
2. A batch shall consist of not more than 20 students.
3. Workload: One lab session of continuous 2 hrs. Total no. of laboratory sessions: 15 equivalent to 30 hours.
4. The duration of practical exam: 3 hrs carrying 25 marks.

5. Practical examination is to be conducted at the end of the Semester prior to the Theory examination in Geography Laboratory or exclusively designated place/s.
6. Duration of Local trip is not more than two days for FY/SY B.A.B.Sc. Duration for long tour for TYBA/B.Sc will be between 3 to 12 days. The Deputed faculty members will be entitled for the T.A/D.A

References:

1. Hammond P. and McCullagh P. S., (1978): Quantitative Techniques in Geography: An Introduction, Oxford University Press.
2. King L. S., (1969): Statistical Analysis in Geography, Prentice-Hall.
3. Mahmood A., (1977): Statistical Methods in Geographical Studies, Concept.
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5. Sarkar, A. (2013) Quantitative geography: techniques and presentations. Orient Black Swan Private Ltd., New Delhi
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Goa University
Choice Based Credit System
THREE YEARS B. A. GENERAL AND HONOURS DEGREE PROGRAMME
GED101: Fundamentals of Geomorphology
Discipline Specific Elective in Geography (Theory)
B. A. SEMESTER-V

Course Credits: 03 **Total Contact Hours: 45 Lectures of 1 Hour Duration each.**

Course Objectives: The course provides the basic concepts, theories and application in geomorphology in a brief but adequate manner.

Learning Outcomes: This course will facilitate the students to understand and appreciate the basic concepts in geomorphology, its theories and applications with reference to various geomorphological phenomena.

Units	Course Content	Contact Hours	Credits
I	**Introduction to Geomorphology:** Nature, scope and significance of geomorphology. Fundamental concepts and approaches in geomorphology. Application of Geomorphology in Environment, Agriculture, Mining, Transportation and Settlements.	15	1
II	**Theories in Geomorphology:** Wegner's Continental Drift Theory Theory of Isostasy: Airy and Pratt Concept of Sea floor Spreading Plate Tectonics: Concept, plate margins, types and movements.	15	1
III	**Geomorphic landforms and Processes:** Weathering, Mass Wasting and Erosion River Moulded Landforms Glacial Landforms Aeolian Landforms Karst Landforms Coastal Landforms	15	1
	Total	45	03

Weightage: I.S.A: 15 + S.E.E: 60 Total= 75

References:

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Goa University
Choice Based Credit System
THREE YEARS B. A. GENERAL AND HONOURS DEGREE PROGRAMME
GED101: Application of Aerial photography in Geomorphology
Geography Core Course (Practical)
B. A. SEMESTER-V

Course Credits: 01 Total Contact Hours: 15 Lectures of 2 Hour Duration each.

Course Objectives: This is an introductory paper which is intended to acquaint the students with basics of Aerial photography and its components.

Learning Outcomes: At the end of this course students will be able to interpret aerial photographs

Units	Course Content	Contact Hours
I	**Aerial Photography and its Components:** Types of Aerial photos, Error In Flying, Geometry, Scales, Resolution, Relief Displacement, Stereoscopes Parallax Stereo Model and Mosaic Angle of Photographs Difference between Aerial Photographs and Maps Difference between Aerial photographs and Imageries Elements of Image Interpretation Application	15
	Aerial Photograph Interpretation: Calculations of Scales of Aerial photos Identification of Earth Surface Features (Any 03 Photographs to be Interpreted with reference to physical features, drainage and water bodies, vegetation, land use and settlement)	15
	Total	30

Weightage of Marks: 25
Credit: 01

- **Unit I:10 marks, Unit II: 10 marks, Certified Journal & Viva Voce: 03+ 02marks**

- **It is proposed by the BOS held on 22.02.2019 to conduct the practical examinations for core and electives in 2 sessions on the same day and by the same panel of examiners as each practical is of 25 marks under CBCS.**

Instructions

1. Every candidate shall complete the laboratory course prescribed by the University entering all the experiment exercise in the laboratory journal, which shall be produced at the time of Practical Examination along with a certificate signed both by the course Teacher and the Head of the Department of the concerned college to the effect that he/she has completed the prescribed course in a satisfactory manner.
2. A batch shall consist of not more than 20 students.
3. Workload: One lab session of continuous 2 hrs. Total no. of laboratory sessions: 15 equivalent to 30 hours of workload.
4. The duration of practical exam: 3 hrs carrying 25 marks.
5. Practical examination is to be conducted at the end of the Semester prior to the Theory examination in Geography Laboratory or exclusively designated place/s.

References:

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2. Bhatta, B., (2011): Remote Sensing and GIS, 2nd ed, Oxford Univ. Press.
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9. Sarkar, A., (2015): Practical Geography: A Systematic Approach. 2nd ed, Orient Black Swan Private Ltd.

- WEBSITES:
- ALOS Global Digital Surface Model: www.eorc.jaxa.jp/ALOS/en/aw3d30/index.htm
- International Society for Photogrammetry and Remote Sensing: www.isprs.org
- ISRO Bhuvan 2D and 3D Platforms: bhuvan.nrsc.gov.in/map/bhuvan/bhuvan2d.php
- bhuvan.nrsc.gov.in/globe/3d.php#
- NASA Landsat Science: www.landsat.gsfc.nasa.gov
- National Remote Sensing Centre: www.nrsc.gov.in
- USGS Global Visualization Viewer: www.glovis.usgs.gov

Goa University
Choice Based Credit System
THREE YEARS B. A. GENERAL AND HONOURS DEGREE PROGRAMME
GED102: Physical Geography of India
Discipline Specific Elective in Geography (Theory)
B. A. SEMESTER-V

Course Credits: 03 **Total Contact Hours: 45 Lectures of 1 Hour Duration each.**

Course Objectives: The course provides the basic understanding of India in a brief but adequate manner.

Learning outcomes: At the end of this course, students are expected to have an understanding of the inter linkages and interaction between physical aspects and resource base of India.

Units	Course Content	Contact Hours	Credits
I	**Introduction, Location, Extent and Geo-Political significance:** Location and extent Relationship with Neighboring countries Geo- Political importance of Indian Ocean **Major Physiographic regions and their importance:** The Northern mountains The Northern plain Peninsular plateau The Coastal lowlands Islands	15	1
II	**The Himalayan Drainage System of India**: The Indus The Ganga The Bramhaputra. **The Peninsular River system:** East flowing Rivers: Mahanadi, Krishna & Cauvery West flowing Rivers: Narmada, Tapi and Mahi Rivers of Sahyadri: Mandovi and Zuari **Water Resource Development:** multipurpose projects, inland waterways plan	15	1
III	**Climatic characteristics, Origin and Mechanism of Monsoons and Various Seasons:** Characteristics of Indian Climate Role of various controlling factors on climate of India Monsoons: Origin and Mechanism Various seasons and weather associated with them. **Natural Resources:** Soil, Forest, Mineral, Power Production Mineral and power resources distribution and utilization: iron ore, coal, petroleum, gas.	15	1
	Total	45	03

Weightage: I.S.A: 15 + S.E.E: 60 Total= 75

Reference:

1. Deshpande C.D, (1992): India-A Regional Interpretation Northern Book Centre, New Delhi.

2. Dhara, M.K., Basu, S.K., Bandyopadhyay, R.K., Roy, B., Pal, A.K., (Eds.) (1999): Geology and Mineral Resources of the States of India, Part-1: West Bengal, Geological Survey of India, Miscellaneous Publication.
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Goa University
Choice Based Credit System
THREE YEARS B. A. GENERAL AND HONOURS DEGREE PROGRAMME
GED102: Thematic Mapping in Physical Geography of India
Geography Core Course (Practical)
B. A. SEMESTER-V

Course Credits: 01 Total Contact Hours: 15 Lectures of 2 Hour Duration each.

Course Objectives: This is an introductory paper which is intended to enable students to prepare maps various aspects of physical geography of India.

Learning Outcomes: At the end of this course students will be able to gain knowledge about map reading and interpretation of various aspects of physical Geography of India.

Units	Course Content	Contact Hours
I	**Preparation and Interpretation of Maps** Base Map:Location and extent Neighboring countries Geo- Political link in Indian Ocean region Major Physiographic regions: Mountains, Plateaus, plains and coastal lands.	15
	Drainage Basins of India: The Indus, The Ganga, The Bramhaputra, Mahanadi, Krishna Cauvery Narmada, Tapi and Mahi, Mandovi and Zuari Mapping of Hydel power projects Map of Inland waterways **Maps of Natural Resources:** Soil, Forest, Mineral (iron ore, coal, petroleum, gas), thermal power.	15
	Total	30

Weightage of Marks: 25
Credit: 01

- **Unit I:10 marks, Unit II: 10 marks, Certified Journal & Viva Voce: 03+ 02marks**

- **It is proposed by the BOS held on 22.02.2019 to conduct the practical examinations for core and electives in 2 sessions on the same day and by the same panel of examiners as each practical is of 25 marks under CBCS.**

Instructions

1. Every candidate shall complete the laboratory course prescribed by the University entering all the experiment exercise in the laboratory journal, which shall be produced at the time of Practical Examination along with a certificate signed both by the course Teacher and the Head of the Department of the concerned college to the effect that he/she has completed the prescribed course in a satisfactory manner.
2. A batch shall consist of not more than 20 students.
3. Workload: One lab session of continuous 2 hrs. Total no. of laboratory sessions: 15 equivalent to 30 hours of workload.
4. The duration of practical exam: 3 hrs carrying 25 marks.
5. Practical examination is to be conducted at the end of the Semester prior to the Theory examination in Geography Laboratory or exclusively designated place/s.

References:

1. Bolton. T., (2009): Geological Maps: Their Solution and Interpretation, Cambridge Univ. Press. (reprint).
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- WEBSITES:
- Geological Survey of India: www.gsi.gov.in
- Indian Naval Hydrographic Department: www.hydrobharat.nic.in
- National Bureau of Soil Survey and Land Use planning: www.nbsslup.in
- Survey of India: www.surveyofindia.gov.in
- ISRO Bhuvan 2D Platform: bhuvan.nrsc.gov.in/map/bhuvan/bhuvan2d.php
- National Remote Sensing Centre: www.nrsc.gov.in

Goa University
Choice Based Credit System
THREE YEARS B. A. GENERAL & HONOURS DEGREE PROGRAMME
GED103: Climate Change: Vulnerability and Adaptations
DISCIPLINE SPECEFIC ELECTIVE IN GEOGRAPHY (THEORY)
B. A. SEMESTER-V

Course Credits: 04 **Total Contact Hours: 60 Lectures of 1 Hour Each**

Course Objectives: The course content allows students who need to acquaint with a different presentation of Earth Science than they have seen/perceived in the class. It supplements the classroom teaching and experiences.

Learning Outcomes: Since important connections of natural surroundings are lost in the dry facts and abstract concepts the discussion with example orientation will give the reader a complete knowledge.
Ultimately a firm grasp of the concepts of how and why our world works makes us partners in a relationship with nature as we are all immersed in every day as we are neither foreign objects or subjects rather than victims of it.

Units	Course Content	Contact Hours	Credits
I	**The science of climate change:** Origin, scope and trends Climate change with reference to the geological time scale **The science of climate change** The nature–man dichotomy Greenhouse gases and Global warming Electromagnetic spectrum, atmospheric window, heat balance of the earth	15	1
II	**Global climatic assessment:** IPCC reports **Climate change and vulnerability:** Physical; economic and social **Impact of climate change:** Agriculture and water; flora and fauna; human health and morbidity	15	1
III	**Global initiatives to climate change mitigation:** Kyoto Protocol, carbon trading, clean development mechanism, COP, climate fund Climate change vulnerability assessment and adaptive strategies with particular reference to South Asia	15	1
IV.	**National Action Plan on climate change:** Role of urban local bodies, panchayats and educational institutions on climate change mitigation Awareness and action programmes	15	1
	Total	60	04

Weightage: I.S.A: 20 + S.E.E: 80 Total= 100

References

1. Parry, M., Canziani, O., Palutikof, J., Linden, P., Hanson, C. (Eds) (2007):. Climate Change 2007: Impacts,Adaptation and Vulnerability-Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, Cambridge University Press.
2. Field, C.B., Barros V.R., Dokken, D.J., Mach, K.J., Mastrandrea, M.D., Bilir, D.E., Chatterjee, M., Ebi, K.L.Estrada, Y.O., Genova, R.C., Girma, B., Kissel, E.S., Levy, A.N., MacCracken, S., Mastrandrea, P.R., White, L.L. (Eds) (2014): Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part A:Global and Sectoral Aspects-Contribution

of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change, Cambridge University Press.
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Goa University
Choice Based Credit System
THREE YEARS B. A. GENERAL & HONOURS DEGREE PROGRAMME
GED104: Agricultural Geography
DISCIPLINE SPECEFIC ELECTIVE IN GEOGRAPHY (THEORY)
B. A. SEMESTER-V

Course Credits: 04 **Total Contact Hours: 60 Lectures of 1 Hour Each.**

Course Objectives: To familiarize the students with the concept, origin, and development of agriculture; to examine the role of agricultural determinants towards changing cropping patterns, intensity, productivity, diversification and specialization.
To discuss environmental, technological and social issues in agricultural sector with special reference to India.

Learning Outcomes: Students will familiarize themselves with the application of various theories, models and classification schemes of cropping patterns and productivity.

Units	Course Content	Contact Hours	Credits
I	**Introduction of Agricultural Geography:** Definition, Nature & Scope of Agricultural Geography Approaches: Regional approach, Systematic approach, Commodity approach, Recent approaches. Importance of Agriculture in Indian Economy Recent Trends in Agriculture	15	1
II	**Determinates of Agriculture:** Physical Factors, Economic Factors, Social Factor & Technological Factors. **Agricultural Systems of the World:** Shifting Cultivation, Dry land farming, Intensive Subsistent farming, Mixed farming, Horticulture / Truck farming, & Community farming. Role of irrigation in Agricultural Development, Dry Land farming And Watershed Management. Problems & Prospects of Agriculture.	15	1
III	**The Agricultural Regions of the World:** (Whittlesey's Scheme). **Classification of Agricultural Regions:** Land use & Land use capability, Landuse Efficiency. **Regional Agricultural Specialization:** Models/Theories of Agricultural location - Von Thunen Landuse theory, Landuse Analysis in India.	15	1
IV.	**Land use pattern:** a) Measurements of Agricultural Productivity, Crop Combination &Crop Diversification, Delineation of crop combination regions b) Measurement of Regional Disparities in Agricultural production. Agricultural planning and policies in India, Agro-climatic regions of India, Green revolution in India;	15	1

	Second generation reforms in Indian agriculture: Land and institutional reforms, Evergreen revolution; Organic and contract farming.		
	Total	60	04

Weightage: I.S.A: 20 + S.E.E: 80 Total= 100

References:

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2. Bayliss, Smith, T.P., (1987): The Ecology of Agricultural Systems. Cambridge University Press, London.
3. Berry, B.J.L. et. al., (1976): The Geography of Economic Systems. Prentice Hall, New York.
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9. Mannion, A.M., (1995): Agriculture and Environment Change, John Wiley, London,
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Goa University
Choice Based Credit System
THREE YEARS B. A. HONOURS DEGREE PROGRAMME
GED109: Geography of Rural Settlements
Discipline Specific Elective in Geography (Theory)
B. A. SEMESTER-V

Course Credits: 04 Total Contact Hours: 60 Lectures of 1 Hour Duration each.

Course Objectives: To acquaint the students with the spatial and structural characteristics of rural settlements and to bring about awareness on special issues related to rural settlements.

Learning Outcomes: The students will be able to appreciate the role of geography in rural landscape. They will be also equipped with the skills of rural settlement analysis, understanding the settlements types and changing landscape at local and regional level.

Units	Course Content	Contact Hours	Credits
I	**Introduction to settlement Geography:** Importance of settlement geography Definition, Nature and Scope of Settlement Geography. Characteristics of Settlement Geography Evolution of Rural settlements and the process of settling (With special reference to India). Functional Classification of rural Settlements. Branches of Settlement Geography Approaches to Settlement Geography	15	1
II	**Spatial organization of rural settlements:** Role of sites, size, shape, distribution and hierarchy of settlements. Rural house types with reference to India Spacing of rural Settlements (Nucleated and Dispersed), Types of rural settlements. Social segregation in rural areas; Census categories of rural settlements.	15	1
III	**Internal morphology of villages:** (Any one village-Goa), Material used , house types in different regions of India and field patterns (Primitive , rectangular and Contour type). Case Study of two villages of Goa with reference to impact of urbanization on house types, pattern, functions and growth of rural settlements.	15	1
IV	Changing face of rural India with reference to Drought prone area programmes, PMGSY, SJSY, MNREGA, Jan Dhan Yojana Rural Governance: Panchayati Raj System and rural development policies and Programmes in India Need for planning. Status and future of Rural Geography in India	15	1
	Total	60	04

Weightage: I.S.A: 20 + S.E.E: 80 Total= 100

References:

1. Chisholm, M.,(1970): Rural Settlement and Land Use, Hutchinson, London.
2. Cloke, Paul., (2013): An Introduction to Rural Settlement Planning, Routledge, MiltonPark, Abingdon, Oxon OX14 4SB, UK.

3. Clout Hugh (2007): Contemporary Rural Geographies, Routledge, Milton Park, Abingdon, Oxon OX144RN.
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12. Misra, R.P., Sundaram, K.V., (Eds) (1979): Rural Area Development: Perspectives and Approaches, Sterling Publishers.
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Goa University
Choice Based Credit System
THREE YEARS B. A. HONOURS DEGREE PROGRAMME
GED110: Political Geography
DISCIPLINE SPECEFIC ELECTIVE IN GEOGRAPHY (THEORY)
B. A. SEMESTER-V

Course Credits: 04 **Total Contact Hours: 60 Lectures of 1 Hour Each**

Course Objectives: The course provides the basic concepts, theories and application in political geography in a brief but adequate manner.

Learning Outcomes: This course will facilitate the students to understand and appreciate the basic concepts in political geography, its theories and applications with reference to various political issues and phenomena.

Units	Course Content	Contact Hours	Credits
I	**Nature, scope and subject matter of political geography.** **A new perspective:** Scope, redefined and recent trends Concept of state and factors Conceptual states: i) Spencer and Sclaffle, ii) Friedrich Ratzel iii) Rodolf Kjella Concept of Nation, Nation-State, and Nationalism Organic states, Geopolitik and Geopolitics - a new dimension	15	1
II	**Approaches to the study of political geography and its contemporary relevance:** Law- Landscape approach of Whittlesey Functional approach of Hartshrone Political partitioning model of Gottmann Unified field theory of Jone Concept of Territoriality, state, nation, nationalism, nation building, Location, size, shape of states Spatial functions of states	15	1
III	**Frontiers and Boundaries:** Concept of frontiers and distinction between frontiers and boundaries Functions of Frontiers and Boundaries Classification of Boundaries India's Boundaries: Characteristics and Disputes **Geostrategic and Geopolitical Views:** Mackinder's Heartland and Spykman's Rimland Model Geopolitics of Indian Ocean Geopolitics of International Water Disputes with Special Reference to India Changing Political Map of India	15	1
IV.	**Electoral Geography** Concept, Nature and Approaches of Electoral Geography Geography of Voting: Geographical Factors Affecting Elections Spatial Organisation of Electoral Areas and Geography of Representation Challenges to Election System in India	15	1

	Total	60	04

Weightage: I.S.A: 20 + S.E.E: 80 Total= 100

References

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Goa University
Choice Based Credit System
THREE YEARS B. A. GENERAL AND HONOURS DEGREE PROGRAMME
GED105: Environmental Geography
Discipline Specific Elective in Geography (Theory)
B. A. SEMESTER-VI

Course Credits: 03 **Total Contact Hours: 45 Lectures of 1 Hour Duration each.**

Course Objectives: The course provides the understanding of basic concepts in environmental issues.

Learning Outcomes: At the end of the course students will be able understand the basic concepts in Environmental Geography and learn about environment planning and management.

Units	Course Content	Contact Hours	Credits
I	**Introduction to Environmental Geography** Geographers' approach to environmental studies Perception of environment in different stages of civilization Concept of holistic environment and system approach Approaches to the Study of Man – Environment Relationship Changing Man - Environment Relationship in Historical Perspective	15	1
II	**Environmental Challenges in India** Air pollution and Water Pollution: Cases and Effects Land and Noise Pollution: Cases and Effects Environmental Issues Related to High/large Dams Rural environmental issues: Special reference to sanitation and public health Urban environmental issues with special reference to waste management	15	1
III	**Sustainable Development and Environmental Management** Concepts and Need of Sustainable Development Environmental policies – Club of Rome, earth summits (special reference to Stockholm, Rio, Johannesburg) Global initiatives for environmental management (special reference to Montreal, Kyoto,Paris) Environmental Impact Assessment and Environmental Management Planning Overview of principal environment-related regulations of India. Review of their achievements	15	1
	Total	45	03

Weightage: I.S.A: 15 + S.E.E: 60 Total= 75

References:

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16. Singh, R.B. and Hietala, R. (Eds.) (2014): Livelihood security in Northwestern Himalaya: Case studies from changing socio-economic environments in Himachal Pradesh, India, Advances in Geographical and Environmental Studies, Springer
17. Singh S., (2013): Environmental Geography, Prayag Pustak Bhawan. Allahabad.
18. UNEP, (2007): Global Environment Outlook: GEO4: Environment For Development, United Nations Environment Programme.
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WEBSITES:

BBC – Science & Environment: www.bbc.com/news/science_and_environment
Central Pollution Control Board: www.wbpcb.gov.in
Centre for Science and Environment: www.cseindia.org
Ministry of Environment, Forest and Climate Change: www.envfor.nic.in
The Energy and Resources Institute: www.teriin.org
The World Bank – Environment: www.worldbank.org/en/topic/environment
United Nations Environment Programme: www.unenvironment.org
Goa pollution Control Board:

Goa University
Choice Based Credit System
THREE YEARS B. A. GENERAL AND HONOURS DEGREE PROGRAMME
GED105: Practical in Environmental Geography
Geography Core Course (Practical)
B. A. SEMESTER-VI

Course Credits: 01 Total Contact Hours: 15 Lectures of 2 Hour Duration each.

Course Objectives: This is an introductory paper which is intended to acquaint the students with basics of Environmental issues.

Learning Outcomes: At the end of this course students will be able to prepare questionnaires for environment assessment surveys and interpret the results of the same.

Units	Course Content	Contact Hours
I	Preparation of questionnaire for perception survey on environmental problems. Preparation of check-list for Environmental Impact Assessment of an urban / industrial project Survey to be carried out of any urban or industrial project. Tabulation of the data Preparation of the report	15
II	Quality assessment of soil using field kit: pH and Organic Carbon and interpretation of the data. Interpretation of air quality using data from Goa Pollution Control Board	15
	Total	30

Weightage of Marks: 25
Credit: 01

- **Unit I:10 marks, Unit II: 10 marks, Certified Journal & Viva Voce: 03+ 02marks**

- **It is proposed by the BOS held on 22.02.2019 to conduct the practical examinations for core and electives in 2 sessions on the same day and by the same panel of examiners as each practical is of 25 marks under CBCS.**

Instructions

1. Every candidate shall complete the laboratory course prescribed by the University entering all the experiment exercise in the laboratory journal, which shall be produced at the time of Practical Examination along with a certificate signed both by the course Teacher and the Head of the Department of the concerned college to the effect that he/she has completed the prescribed course in a satisfactory manner.
2. A batch shall consist of not more than 20 students.
3. Workload: One lab session of continuous 2 hrs. Total no. of laboratory sessions: 15 equivalent to 30 hours of workload.
4. The duration of practical exam: 3 hrs carrying 25 marks.
5. Practical examination is to be conducted at the end of the Semester prior to the Theory examination in Geography Laboratory or exclusively designated place/s.

Reference Books

1. Clifford, N., Cope, M., Gillespie, T.W., French, S. (Eds) 2016. Key Methods in Geography, 3rd ed, Sage.
2. CPCB Reports, Ministry of Environment, Forest and Climate Change, Govt. Of India, http://www.cpcb.nic.in/Publications.php
3. Eccleston C.H. (2011): Environmental Impact Assessment: A Guide to Best Professional Practices, CRC Press, New York

4. Gilpin.A., (1994): Environmental Impact Assessment: Cutting Edge for the 21st Century, Cambridge University Press,
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Goa University
Choice Based Credit System
THREE YEARS B. A. GENERAL AND HONOURS DEGREE PROGRAMME
GED106: Regional Development of India
Discipline Specific Elective in Geography (Theory)
B. A. SEMESTER-VI

Course Credits: 03 **Total Contact Hours: 45 Lectures of 1 Hour Duration each.**

Course Objectives: The course provides the basic concepts in regional disparities and development of India in a brief but adequate manner.

Learning Outcomes: This course will facilitate the students to understand and appreciate the basic concepts of regional development of India

Units	Course Content	Contact Hours	Credits
I	**Regional disparities in India since Independence:** Disparities in agricultural development Disparities in industrial development Disparities in human resource development in terms of education and health **Regions of regional disparity: Physical & Cultural bases**: North-Eastern States Jammu & Kashmir Jharkhand	15	1
II	**Success Stories of Regional Development:** Metropolitan Regions: Mumbai Metropolitian Region River Project: Narmada Project Hydel Power Projects: Tehri project Rural Development/Reconstruction e.g. Anand Dairy Farming Tribal Development Block - Bastar Plateau	15	1
III	**A) Regional Development and Contemporary Issues:** Globalization Border issues Water Disputes. Socio -Ethnic Tension **Regional Development& Future Vision:** Golden Quadrangle Oil and gas Pipe Line (Iran and India). River-Linking Projects Antarctica Expeditions	15	1
	Total	45	03

Weightage: I.S.A: 15 + S.E.E: 60 Total= 75

References:

1. Bhargava, G., (2001): Development of India's Urban, Rural, and Regional Planning in 21st Century: Policy Perspective, Gyan Publishing House.
2. Chand,M., Puri, V.K., (2000): Regional Planning In India, Allied Publishers Ltd.
3. Chandana, R.C. (2016): Regional Planning and Development, 6th ed, Kalyani Publishers.
4. Glasson, J., (2017): Contemporary Issues in Regional Planning, Routledge.
5. Gore, C. (2011): Regions in Question: Space, Development Theory, and Regional Policy, Routledge.
6. Gregory, D., Johnston, R., Pratt, G., Watts., Whatmore, S., (Eds). (2009):The Dictionary of Human Geography, 5th ed, Wiley.
7. Hall, P., Tewdwr-Jones, M., (2010): Urban and Regional Planning, Routledge.

8. Higgins, B., Savoie, D.J., (2017): Regional Development: Theories and Their Application, Routledge.
9. Kulshetra, S.K.,(2012): Urban and Regional Planning in India: A Handbook for Professional Practioners, Sage Publication.
10. Kumar, A., Meshram, D.S., Gowda, K., (Eds). (2016): Urban and Regional Planning Education: Learning for India, Springer.
11. Misra, R.P.,(1992): Regional Planning: Concepts, Techniques, Policies and Case Studies, Concept Publishing.
12. Rapley, J., (2007):. Understanding Development: Theory and Practice in the Third World, Lynne Rienner.
13. Ray, J., (2001): Introduction to Development & Regional Planning, Orient Blackswan.
14. Raza, M., (Ed.) (1988): Regional Development: Contributions to Indian Geography, Heritage Publishers.
15. Sen, A., (2000): Development as Freedom, Random House.

Goa University
Choice Based Credit System
THREE YEARS B. A. GENERAL AND HONOURS DEGREE PROGRAMME
GED106: Application of Remote Sensing and Satellite Imageries
Discipline Specific Elective in Geography (Practical)
B. A. SEMESTER-VI

Course Credits: 01 **Total Contact Hours: 15 Lectures of 2 Hour Duration each.**

Course Objectives: The course provides the understanding and application of remote sensing and satellite imageries.

Learning Outcomes: This course will facilitate the students to understand and appreciate the regional development of India through the use of GPS in the field and through interpretation satellite imageries.

Units	Course Content	Contact Hours
I	**Introduction to Remote Sensing and EMR:** Electromagnetic Radiation & Electromagnetic Spectrum, its Characteristics and components, Stages of Remote Sensing, Remote Sensing & its Types, interactions of EMR with Earth's atmosphere and surface features; Spectral response of Earth's natural surface. **Satellites Imageries:** Types of Satellites, Types of Imageries, Platforms, Sensors, tracks, swath, image resolution (spatial, spectral, radiometric and temporal), spectral signatures, Image Histograms; Image Rectification: Radiometric and Geometric. Satellite Series: IRS, Spot, IKONOS and Quick Bird. Application, Identification of Geographical features on Satellite Imageries using elements of Image interpretation	15
II	**Introduction to GIS & GPS:** Content of GIS, objectives of GIS, Application of GIS, Components of GIS, Elements of GIS, Hardware & Software Requirements, Point Line and Polygon, Layers and Coverage, Raster and Vector Data, Components of GPS.	15

Weightage of Marks: 25
Credit: 01

- **Unit I:10 marks, Unit II: 10 marks, Certified Journal & Viva Voce: 03+ 02marks**

- **It is proposed by the BOS held on 22.02.2019 to conduct the practical examinations for core and electives in 2 sessions on the same day and by the same panel of examiners as each practical is of 25 marks under CBCS.**

Instructions

1. Every candidate shall complete the laboratory course prescribed by the University entering all the experiment exercise in the laboratory journal, which shall be produced at the time of Practical Examination along with a certificate signed both by the course Teacher and the Head of the Department of the concerned college to the effect that he/she has completed the prescribed course in a satisfactory manner.
2. A batch shall consist of not more than 20 students.
3. Workload: One lab session of continuous 2 hrs. Total no. of laboratory sessions: 15 equivalent to 30 hours of workload.
4. The duration of practical exam: 3 hrs carrying 25 marks.

5. Practical examination is to be conducted at the end of the Semester prior to the Theory examination in Geography Laboratory or exclusively designated place/s.

REFERENCES

1. C.P.Lo and Albert K. W. Yeung,(2002) Concepts and Techniques of Geographic Information System, Prentice –Hall, India.
2. Heywood I, el. (2011) An Introduction to Geographical Information Systems , Pearson Education Pvt. Ltd., New Delhi.,
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8. Paul A. Lonfley, et al.(2002), Introduction to Geographic Information Systems and Science, John Wiley and Sons Ltd

Goa University
Choice Based Credit System
THREE YEARS B. A. GENERAL & HONOURS DEGREE PROGRAMME
GED107: Biogeography
Discipline Specific Elective in Geography (Theory)
B. A. SEMESTER-VI

Course Credits: 04 **Total Contact Hours: 60 Lectures of 1 Hour Duration each.**

Course Objectives: The course provides the understanding of basic concepts in biogeography with reference to spatial and temporal patterns of biodiversity.

Learning Outcomes: At the end of the course students will understand and appreciate the basic concepts in biogeography and biodiversity.

Units	Course Content	Contact Hours	Credits
I	Introduction to Biogeography: Definitions of Biosphere and Biogeography, Concepts of Biogeography, Meaning of Ecology, Ecosystem, Environment, Ecotone, Communities, Habitats, Niche, Biotopes and Biomes.	15	1
II	**Biosphere and Energy:** Energy Sources, Laws of Energy Exchange, Food Chains and Flow of Energy. Factors of Plant Ecology: Light, Heat, Moisture, Wind and Topography. Bio-geochemical cycles with special reference to carbon dioxide and nitrogen	15	1
III	Impact of Climate and Soil on Distribution of Flora and Fauna. Biomes: Geographical extent, characteristic features of Tropical Rainforest and Temperate Grassland. Bio-Climatic Regions in India and their Characteristics.	15	1
IV	Wildlife Conservation in India: Projects and their Importance with Special Reference to Tiger and Crocodile. Biodiversity and its Importance with reference to Western Ghat	15	1
	Total	60	04

Weightage: I.S.A: 20 + S.E.E: 80 Total= 100

References:

1. Bhattacharyya, N.N.: Biogeography, Rajesh Publications, New Delhi.
2. Chapman J.L., Rens, M.J.,(1993): Ecology: Principle and Applications, Cambridge University Press, Cambridge.
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9. Odum E.P.,(1997): Ecology: A Bridge between Science and Society, Sinaur Associates Inc. Publishers, Sunderland..
10. Sharma P.D.,(1996): Ecology and Environment, 7th edition, Rastogi Publications, Mirat.
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Goa University
Choice Based Credit System
THREE YEARS B. A. GENERAL & HONOURS DEGREE PROGRAMME
GED108: Social Geography
Discipline Specific Elective in Geography (Theory)
B. A. SEMESTER-VI

Course Credits: 04 **Total Contact Hours: 60 Lectures of 1 Hour Duration each.**

Course Objectives: The course provides the basic concepts, theories and application in social geography in a brief but adequate manner.

Learning Outcomes: This course will facilitate the students to understand and appreciate the basic concepts in social geography, its theories and applications with reference to various social phenomena.

Units	Course Content	Contact Hours	Credits
I	**Society, Identity and Crisis:** Social Geography: Concept, origin, nature and scope Concept of Space, Social differentiation and stratification; social processes Social Categories: Caste, class, religion, race and gender and their spatial distribution	15	1
II	**Basis of social region formation:** Evolution of social-cultural regions of India Peopling process of India: Technology and occupational change. Migration Social groups, social behaviour and contemporary social environmental issues with special reference to India	15	1
III	**Social Wellbeing and Planning:** Concepts of social well-being, quality of life. Gender and social well-being Measures of social well-being: Healthcare, education, housing, gender disparity Social geographies of inclusion and exclusion, slums, gated communities, communal conflicts and crime.	15	1
IV	**Social Planning:** Social planning during the five-year plans in India Social policies in India: Education and health Social Impact Assessment: Concept and Importance	15	1
		60	04

Weightage: I.S.A: 20 + S.E.E: 80 Total= 100

References:

1. Ahmed A.,(1999): Social Geography, Rawat Publications.
2. Casino, V. J. D., Jr., (2009): Social Geography: A Critical Introduction, Wiley Blackwell.
3. Cater, J. and Jones T., (2000): Social Geography: An Introduction to Contemporary Issues, Hodder Arnold.
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7. Mukherji, S. 2013. Migration in India: Links to Urbanization, Regional Disparities and Development Policies, Rawat Publications

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Goa University
Choice Based Credit System
THREE YEARS B. A. HONOURS DEGREE PROGRAMME
GED111: Geography of Urban Settlements
Discipline Specific Elective in Geography (Theory)
B. A. SEMESTER-VI

Course Credits: 04 **Total Contact Hours: 60 Lectures of 1 Hour Duration each.**

Course Objectives: The course provides the basic concepts, theories and application in urban geography in a brief but adequate manner.

Learning Outcomes: This course will facilitate the students to understand and appreciate the basic concepts in urbanization.

Units	Course Content	Contact Hours	Credits
I	**Urban Settlements – Origin and Evolution:** Urban Geography: nature and scope, different approaches and recent trends in urban geography Origin of urban places in ancient, medieval, modern and post-modern periods- factors, stages, and characteristics Aspects of urban places: Location, site and situation of urban places, Size and spacing of towns & cities &functional classification of towns. Patterns of urbanisation in developed and developing countries	15	1
II	**Theories of urban evolution and growth and hierarchies:** Hydraulic theory, Economic theory The rank size rule, The law of the primate city model August Lösch's theory of market centres	15	1
III	**Urban Places – Changing Scenario:** Ecological processes of urban growth; urban fringe; city-region Models on city structure: Political economy, bid-rent curve, social area analysis Policies on urbanization Urban change/landscape in post-liberalized period in India & Goa. Patterns and trends of urbanisation in India : Case study metropolitan i.e. Mumbai, Kolkata, Delhi (any one suggested by BOS)	15	1
IV	**Urban Issues:** Problems of urbanization with special reference to housing, slums, civic amenities (water and transport), pollution, urban climate, garbage management. Urban planning and sustainable development of cities.	15	1
	Total	60	04

Weightage: I.S.A: 20 + S.E.E: 80 Total= 100

References:

1. Carter, H.,(1995): The Study of Urban Geography, 4th ed, Arnold.
2. Giuliano, G., Hanson, S., (Eds). (2017): The Geography of Urban Transportation, 4th ed, Guilford Press.
3. Gottdiener, M., Budd, M. Lehtovuori, P.,(2016): Key Concepts in Urban Studies, 2nd ed, Sage Publication.
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9. Levy, J.M., (2016): Contemporary Urban Planning, 11th ed, Routledge.
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Goa University
Choice Based Credit System
THREE YEARS B. A. HONOURS DEGREE PROGRAMME
GED112: Geography of Health
Discipline Specific Elective in Geography (Theory)
B. A. SEMESTER-VI

Course Credits: 04 Total Contact Hours: 60 Lectures of 1 Hour Duration each.

Course Objectives: The course provides the basic concepts in Medical Geography in a brief but adequate manner.

Learning Outcomes: This course will facilitate the students to understand and appreciate the basic concepts in medical geography, with reference health, diseases and climate change.

Units	Course Content	Contact Hours	Credits
I	**Perspectives on Health** Definition and Concept of the term Health, Introducing Medical Geography; Its Scope and Contents Applications of Medical Geography Linkage between Health and Society, Taboo, Environment, Development, Education and Awareness Health and Environmental Trends: Population, Urbanization, Poverty and Inequality, Migration and related health issues.	15	1
II	**Health Risks and Diseases:** Exposure and Health Risks(causes, effects and remedial measures): Air and Water Pollution, Household and Municipal Waste, Radioactive and Plastic. Occupational Hazards and Health Risks; Nutritional Status of Children and Women	15	1
III	**Climatic Change, Diseases and Human Health:** Weather-related diseases (Solar Radiation, Temperature, Rainfall) and climate change and Global health. Solar Ultraviolet Radiation and Related Health Hazards Climate Change and Ecological Transformation Tropical Diseases: Malaria and Dengue- Epidemiological Character and Regional Distribution. Human Adaptation and Adjustment to Climate Change	15	1
IV	**Health Care Facilities:** Health care facilities in India Spatial Distribution of health care facilities in Goa Health care policies in India Health Organisations: WHO, UNISEF, Red Cross Society and NGOs	15	1
	Total	60	04

. **Weightage: I.S.A: 20 + S.E.E: 80 Total= 100**

Reference:

1. AkhtarRais (Ed.), 1990: Environment and Health Themes in Medical Geography, Ashish Publishing House, New Delhi.
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