

**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**

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

**Choice Based Credit System (CBCS) B. Sc. (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 BSC Geography programme**

<b>Semester s</b>	<b>Paper Code</b>	<b>Title of the Paper</b>	<b>Credits</b>
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<b>Sem I</b>	<b>SGC101</b>	<b>Theory:</b> Fundamentals of Geography <b>Practical:</b> Introduction to Cartographic Techniques	<b>4T+2P</b>
<b>Sem II</b>	<b>SGC102</b>	<b>Theory:</b> Social and Cultural Geography <b>Practical:</b> Practicals in Social and Cultural Geography	<b>4T+ 2P</b>
<b>Sem III</b>	<b>SGC103</b>	<b>Theory:</b> Geography of Natural Resource Development <b>Practical:</b> Practicals in Cartographic Techniques-	<b>4T+ 2P</b>
<b>Sem IV</b>	<b>SGC104</b>	<b>Theory:</b> Geography of Secondary and Tertiary Activities <b>Practical:</b> Practicals in Cartographic Techniques-II	<b>4T+ 2P</b>

#### Generic Elective: (GE) under Geography

<b>Semester s</b>	<b>Paper Code</b>	<b>Title of the Paper</b>	<b>Credits</b>
<b>Sem I</b>	<b>GEG101</b>	Resource Geography of Goa	<b>4T</b>
	<b>GEG103</b>	Fundamentals of Ecology	
	<b>GEG105</b>	Sustainable Development	
<b>Sem II</b>	<b>GEG102</b>	Geography of Resource Utilisation in Goa	<b>4T</b>
	<b>GEG104</b>	Spatial and Functional Aspects of Ecology	
	<b>GEG106</b>	Spatial Information Technology	
<b>Sem III</b>	<b>GEG107</b>	Fundamentals of Population Geography	<b>4T</b>
	<b>GEG109</b>	Fundamentals of Tourism Geography	
	<b>GEG111</b>	Fundamentals of Disaster Mitigation	
<b>Sem IV</b>	<b>GEG108</b>	Applied Population Geography with a Mini Project	<b>4T</b>
	<b>GEG110</b>	Applied Tourism Geography with a Mini Project	
	<b>GEG112</b>	Application of Disaster Risk Reduction and Mitigation with a Mini Project	

## **Skill Enhancement Course (SEC) under Geography**

Semester s	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 SPECIFIC 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)	<b>Theory:</b> Fundamentals of Geomorphology <b>Practical:</b> Application of Aerial photography in Geomorphology	3T+ 1P
	GED102 (Gen +Hon)	<b>Theory:</b> Physical Geography of India <b>Practical:</b> 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)	<b>Theory:</b> Environmental Geography	3T+ 1P

		<b>Practical:</b> Practical in Environmental Geography	
	<b>GED106</b> (Gen +Hon)	<b>Theory:</b> Regional Development of India <b>Practical:</b> Application of Remote Sensing and Satellite Imageries	<b>3T+1P</b>
	<b>GED107</b> (Gen +Hon)	Biogeography	<b>4T</b>
	<b>GED108</b> (Gen +Hon)	Social Geography	<b>4T</b>
	<b>GED111</b> (Hon)	Geography of Urban Settlement	<b>4T</b>
	<b>GED112</b> (Hon)	Geography of Health	<b>4T</b>
	<b>GEP</b>	Project	

**GE: Geography**

- a. **GEC: DSC papers in Geography for BA, SGC: DSC papers in Geography for BSC, GES: Skill Enhancement papers under 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 1 hour duration each and One Field Trip Session will comprise continuous 5 periods of 1 hour 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.

<b>Units</b>	<b>Course Content</b>	<b>Contact Hours</b>	<b>Credits</b>
<b>I</b>	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
<b>II</b>	<b>Physical Geography:</b> Introduction to the Solar System, Basic Study of planets; Earth & Moon Relationship (Rotation, Revolution, Eclipse, Phases of Moon). <b>Domains of earth:</b> 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
<b>III</b>	<b>Human geography:</b> 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

	<b>Total</b>	45	03
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**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, Allahabad.

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**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>I</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
	<b>Total</b>	<b>30</b>

**Weightage of Marks: 25**

**Credit: 01**

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

**Instructions**

- 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.
- A batch shall consist of not more than 20 students.
- Workload: One lab session of continuous 2 hrs. Total no. of laboratory sessions: 15 equivalent to 30 hours.
- The duration of practical exam: 3 hrs carrying 25 marks (May be set for 50 marks and proportionately adjusted from/to 25).
- 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.

**Goa University**  
**Choice Based Credit System**  
**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.

<b>Units</b>	<b>Course Content</b>	<b>Contact Hours</b>	<b>Credits</b>
<b>I</b>	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
<b>II</b>	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
<b>III</b>	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
	<b>Total</b>	<b>45</b>	<b>03</b>

**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.

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**Goa University**  
**Choice Based Credit System**  
**THREE YEARS B. A. GENERAL AND HONOURS DEGREE PROGRAMME**  
**GEC102: PRACTICALS IN SOCIAL AND CULTURAL GEOGRAPHY**  
**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>I</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
<b>Total</b>		<b>30</b>

**Weightage of Marks: 25**

**Credit: 01**

**Unit I exercises: 10 marks, Unit II exercises: 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 B. SC. GENERAL AND HONOURS DEGREE PROGRAMME**  
**SGC101: FUNDAMENTALS OF GEOGRAPHY**  
**GEOGRAPHY CORE COURSE (THEORY)**  
**B. SC. SEMESTER-I**

**Course Credits: 04.**

**Total Contact Hours: 60 Lectures of 1 Hour Duration.**

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

	Human- Environment Interaction, Movement, Regions. Geography and Development. Geography and Nationalism..	15	
	<b>Total</b>	60	04

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

**Credits: 04**

**Suggested Readings / Reference Materials**

1. Broek, O.M., and Webb, J.W., (1981): Geography of Mankind, McGraw-Hill Inc., USA
2. Gupta, Das.A., and Kapoor, A.N., (2013): Principles of Physical Geography, S. Chand & Company Pvt. Ltd.
3. Dikshit R.D., (2000): Geographical Thought - A Contextual History of Ideas, Prentice Hall of India Pvt.
4. Leong, Goh. Cheng., (2003): Certificate Physical and Human Geography, Oxford university press, New Delhi
5. Harvey, David., (1972): Explanation in Geography, Edward - Arnold, London.
6. Hussain, Majid., (1984): Evolution of Geographical Thought, Rawat Publications, Jaipur.
7. Lal, D. S., (2007): Climatology, Pushtakmahal, Allahabad
8. Leong G., and Morgan.C., (1982): Human and Economic Geography, Oxford University Press.
9. Perpillou A V., (1966) : Human Geography, Longman Press, London.
10. Singh. Savindra., (2005): Environmental Geography, Prayag Pustak Bhavan, Allahabad

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**THREE YEARS B. SC. GENERAL AND HONOURS DEGREE PROGRAMME**  
**SGC101: CARTOGRAPHIC TECHNIQUES I**  
**GEOGRAPHY CORE COURSE (PRACTICAL-I)**  
**B. SC. SEMESTER-I**

**Course Credits: \* 02.**

**Total Contact Hours: \*\* 30** Laboratory sessions of continuous 2 hours duration each twice in a week per batch.

**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.

**OBJECTIVE:** To impart training on map making techniques with Field and Laboratory.-

Units	Course Content	Contact Hours
I	<b>Introduction to Cartography and Cartographic Techniques:</b> its significance in geography; Evolution of Cartography as a Science. Shape of the Earth; location of places on the globe, latitude and time, time zones. Calculation of Local Time and Standard Time.	05
II	Globes and their Types. Construction of Latitudes and Longitudes. Longitudes and Time. International Date Line and Time Zones. Globe and map; enlargement and reduction of map: maps as an integral part of geography, Definition, Classification of maps, Base maps, Format of a map. Finding direction, measurement of distance and area on the map. Scale and its types (Construction of Scales- plain, linear, statement - diagonal and comparative, time and distance scale, representative fraction. Conversion of scale (Verbal, Graphical and RF). Maps: Classification of Maps. Base Map and Format of a Map. Map Lettering Styles. Enlargement and Reductions of Maps- (Square method and Method of Similar Triangles). Measurements of Areas on Maps (Square Method).	10
III	Sources of Population Statistics, Population Census and vital statistics; Method of Conducting population Census- Date System and Period System-Sample survey and analysis.	05
IV	Calculation of Socio-Economic Indices- Crude Birth Rate, Fertility Rate, Age and Sex Ratio; Dependence Ratio Child- Women ratio-Infant Mortality Rate- Crude Death Rate; Growth Rate; Population Literacy Rate; Population Concentration Index, Working and non working population and occupational structure. <b>Field Work:</b> On campus field work (Finding Directions, Distances and Calculation of Areas).	10
	<b>Total</b>	30

**Weightage of Marks: 50.**

**Credit: 02.**

**Unit I exercises: 10 marks, Unit II exercises: 10 marks, Unit III exercises: 10 marks, Unit IV exercises: 10 marks, Certified Journal & Viva-Voce: 5+5=10**

## **INSTRUCTIONS**

1. Every candidate shall complete the laboratory course prescribed by the University entering all the experiments/exercises in the 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-Two lab sessions of continuous 2 hrs each per week per batch, i.e. 4 hours per batch.
4. The duration of practical exam: 3 hrs carrying 50 marks.
5. Practical examination is to be conducted at the end of the Semester prior to the Theory exam. in Geography laboratory or exclusively designated place.

## **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. 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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**THREE YEARS B. SC. GENERAL AND HONOURS DEGREE PROGRAMME**  
**SGC102: SOCIAL AND CULTURAL GEOGRAPHY**  
**GEOGRAPHY CORE COURSE (THEORY)**  
**B. SC. SEMESTER-II**

**Course Credits: 04. Total Contact Hours: 60 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.

<b>Units</b>	<b>Course Content</b>	<b>Contact Hours</b>	<b>Credits</b>
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. Basics of classification of cultural regions.	15	1
II	World Population: growth, distribution, factors affecting world population, rural-urban composition, urbanization.  Migration- causes and effects.  Races of the World: Basic of racial classification, races of the India, tribal societies in India.  Ethnicity- inequality and conflicts.	15	1
III	Linguistic Composition: Global linguistic mosaic, origin and characteristics, linguistic classification of India.  Religious Composition: Origin and regional distribution of religions, Major Religions and cultures, Global and Indian Religions and cultural conflicts.	15	1
IV	Contemporary Issues: Gender inequality, nutrition, Health and Disease.  Refugees, Communalism, Terrorism, Naxalism and Fundamentalism, Separatist Groups, Peace efforts.	15	1

	Social wellbeing: Indicators and Efforts in India. Socio-cultural regions in India.		
	<b>Total</b>	<b>60</b>	<b>04</b>

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

**Credit: 04**

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

**Suggested Reading/ References**

1. Bergwan,Edward.E.,(1994): Human Geography: Culture, Connection and Landscapes, Prentice Hall, N.Jersey.
2. Carr, M.,(1987): Pattern, Processes and Change in Human Geography, Thomas Nelson Publishers.
3. De Blij, H.J., et.all.,(2007): *Human Geography: People, Place and Culture*. John Wiley and sons. USA.
4. Fellman, J.L., (2007): Human Geography-Landscapes of Human Activities, Brown and Bench man, Pub. U.S.A.
5. Hussain, Majid., (2011): Human Geography, Rawat Publishers, Jaipur.
6. Pathak, C. R.,(2017): Spatial Structure and Development in India, RSAI.
7. Rubenstein. J. M., (2010): *Contemporary Human Geography*. PHI Learning Pvt, New Delhi.
8. Sharma Y.K., (2007): *Human Geography*. Lakshmi Narain Agrawal, Agra.
9. Unisa, S. et.al.,(Eds), (2012): Population, Gender and Reproductive Health, IIPS, Mumbai.

**Goa University**  
**Choice Based Credit System**  
**THREE YEARS B. A. GENERAL AND HONOURS DEGREE PROGRAMME**  
**SGC102: PRACTICALS IN SOCIAL AND CULTURAL GEOGRAPHY**  
**GEOGRAPHY CORE COURSE (PRACTICAL-II)**  
**B. SC. SEMESTER – II**

**Course Credits: \*\* 02**

**Total Contact Hours: \*\* 30** Laboratory sessions of continuous 2 hours duration each twice in a 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>I</i>	Introduction to Social and cultural data. Sources of Population Data: Population Census and Vital Statistics. Methods of conducting Population census (Date system and Period system). Surveys and their Types (Full count vs. Sample survey)	20
II	Cartographic Representation of Population Data on Paper and Graph Papers (Exercises on actual Census data should be given) Line graphs and its types. Bar Graph and its types. Pie Diagram. Age-Sex Pyramid and their Types. Urban-Rural Pyramid. Ergo-graph (Circular and Graphical). Tri-Linear Chart. Flow Diagrams (Traffic and Population Migration).	20
III	Cartographic Exercises on Census Data and Preparation of State wise, District wise and taluka level Maps: Dot Maps: Uniform and Multiple. Choropleth maps and Chorochromatic Maps. Proportional Circles. Spheres. Pictograms.	20
	<b>Total</b>	<b>60</b>

**Total Weightage of Marks: 50**

**Unit I exercises: 10 marks, Unit II exercises: 15 marks, Unit III exercises: 15 marks, Certified Journal & Viva-Voce: 5+5=10**

**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 per week- Two lab sessions of continuous 2 hrs. each per batch. Total laboratory sessions = 30.
4. The duration of practical exam: 3 hrs. carrying 50 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., (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**  
**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 <b>Geographical Setting and Physical Resources of Goa</b> 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	<b>Human Resources: (pre &amp; post liberation, 21<sup>st</sup> Century)</b> 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	<b>Resource Utilization: pre &amp; post liberation, 21<sup>st</sup> Century</b> 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) Information Technology (IT): infrastructure and utility.	15	1

IV	<b>Regional Disparity and Regional Planning in Goa</b> 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
	<b>TOTAL</b>	<b>60</b>	<b>04</b>

**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.

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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	<p><b>Geographical Study of primary activities in Goa</b></p> <p><b>Agriculture:</b> 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 &amp; Rabi, humid farming, horticulture, plantation; <i>Vaingan, Puran Xeti, Kumeri, Kulagar.</i> 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).</p> <p><b>Animal Husbandry:</b> Types of livestock, dairy and poultry farming and their place in Goan economy, Government schemes to promote poultry and dairy farming in the State.</p> <p><b>Fishing:</b> Types (shore and inland fisheries), species, fishing seasons, fishing jetties, production, marketing, changes, problems and future prospects.</p>	15	1
II	<p><b>Geographical Study of Mining &amp; Manufacturing in Goa</b></p> <p><b>Mining:</b> History of mining in Goa, mining methods, production and trade of minerals (iron ore, manganese, bauxite), Benefits of</p>		1

	<p>mining to the economy and society, Negative socio-economic and environmental impacts of mining, Current issues related to mining in the State.</p> <p><b>Manufacturing:</b>  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.</p>	15	
III	<p><b>Geographical study of tertiary activities-I</b>  <b>Tourism:</b>  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.  <b>Transport:</b>  Development of transport network, modes and their functional significance (air, roadways, railways and waterways), problems of transport system, future prospects.</p>	15	1
IV	<p><b>Geographical Study of Tertiary Activities-II</b>  <b>Trade:</b>  Internal (intra-state and inter-state) and foreign trade–composition, direction, changes and future prospects.  <b>Ports:</b>  Major and minor ports, Mormugao and Panaji Port– history, hinterland, major developments, prospects and problems.  <b>Study tour and report*</b>  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 (<i>to be Pre submitted and Assessed before the announcement of SEE Schedule</i>).</p>	10  05	1
	<b>Total</b>	<b>60</b>	<b>04</b>

**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.
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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	<p><b>Ecology:</b> Introduction, meaning, objectives, sub-divisions, scope. Historical background and major contemporary developments in Ecology: World and India.</p> <p><b>Earth as the only Suitable Habitat for Life</b> 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.</p>	15	1
II	<p><b>Biosphere</b> Meaning, phases of the origin of life on the earth (chemical and organic).</p> <p><b>Ecosystem</b> Concept, general characteristics, structural components of an ecosystem (biotic and abiotic), types of ecosystem (artificial, natural and incomplete ecosystem).</p>	15	1
III	<p><b>Functional Aspects of Ecosystem</b> 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.</p>	15	1
IV	<p><b>Population and Community</b></p>	15	1

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

**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,1<sup>st</sup> 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

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**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	<p><b>Biogeochemical Cycles</b>  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.</p>	15	1
II	<p><b>Diversity &amp; Spatial Distribution of Major Ecosystems</b></p> <p>a) <b>Aquatic Ecosystem:</b>  Classification (Freshwater ecosystems - lentic and lotic; estuarine and ocean waters) and characteristics.</p> <p>b) <b>Terrestrial Ecosystems:</b></p> <p>i) Forest – characteristics, ecological significance, deforestation-causes and effects, conservation.</p> <p>ii) Grasslands – Characteristics, comparative study of tropical and temperate grasslands.</p> <p>iii) Desert ecosystem – Physical environment, plant life, animal life and their adaptations.</p> <p>iv) Wetlands – Types of wetlands, ecological and economic significance of wetlands, threats to wetlands and protection of wetlands.</p>	15	1
III	<p>a) <b>Biodiversity</b>  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.</p> <p>b) <b>Biodiversity in Indian Scenario</b></p>	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	<b>a) Global Climate Change</b> 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>B) Ecological Field Study/ Trip/ Survey And Report</b>	10	1
	<b>TOTAL</b>	<b>60</b>	<b>04</b>

**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,1<sup>st</sup> 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.

<b>Units</b>	<b>Course Content</b>	<b>Contact Hours</b>	<b>Credits</b>
<b>I</b>	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
<b>II</b>	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
<b>III</b>	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
<b>IV</b>	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
	<b>Total</b>	<b>60</b>	<b>04</b>

*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.

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**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 sustainable 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.

<b>Units</b>	<b>Course Content</b>	<b>Contact Hours</b>	<b>Credits</b>
<b>I</b>	1. Introduction: Definitions, Concept and Historical Development of SIT. Components and Sustainability for Development.	15	1
<b>II</b>	2. Spatial Information/Data: Web data sources; Registration and projection; Data structures; Data interpolation and modeling. 3. Working of spatial information system.	15	1
<b>III</b>	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
<b>IV</b>	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
	<b>Total</b>	<b>60</b>	<b>04</b>

**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.,and Samet H., (1995): Ranking in Spatial Databases in Advances in Spatial Databases —4<sup>th</sup> 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:.

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**Goa University**  
**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.

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

	Renewable: Hydel power. c) Non-Conventional Energy Resources-Merits and distribution.		
<b>III</b>	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.	<b>15</b>	<b>1</b>
	<b>Total</b>	<b>45</b>	<b>03</b>

**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.

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**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
	<b>Total</b>	<b>30</b>

**Note:**

**Weightage of Marks: 25**

**Credit: 01**

**Unit I exercises: 10 marks, Unit II exercises: 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 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 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.

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



<b>III</b>	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	<b>15</b>	<b>1</b>
	<b>Total</b>	<b>45</b>	<b>03</b>

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

**Total= 75.**

### **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.

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**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.

<b>Units</b>	<b>Course Content</b>	<b>Contact Hours</b>
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
	<b>Total</b>	<b>30</b>

**Weightage of Marks: 25**

**Credit: 01**

**Unit I exercises: 05 marks, Unit II exercises: 10 marks, Unit III exercises: 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 B. SC. GENERAL AND HONOURS DEGREE PROGRAMME**  
**SGC103: GEOGRAPHY OF NATURAL RESOURCE DEVELOPMENT**  
**GEOGRAPHY CORE COURSE ( THEORY)**  
**B. SC. SEMESTER-III**

**Course Credits: 04**

**\*Theory: 60 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.

<b>Units</b>	<b>Course Content</b>	<b>Contact Hours</b>	<b>Credits</b>
<b>I</b>	<p><b>A. Economic Geography Today:</b></p> <p>Bases of world Economy- Physical, Cultural and Technological, Economic bases of Economic activities. Classification of Economic activities.</p> <p><b>B. Historical Evolution of world economic systems.</b> Medieval feudal economies. The rise of Mercantilism &amp; its economic benefits. Emergence of colonialism &amp; its economic benefits.</p> <p>Mechanism of modern economic systems.</p>	15	1
<b>II</b>	<p>World Agriculture: Types of Agriculture-</p> <p>a) Intensive and Extensive farming</p> <p>b) Subsistence and commercial farming,</p> <p>c) Mixed and Plantation Agriculture.</p> <p>Crops: Cereals - Rice &amp; Wheat, Cash Crops: Beverages- Tea, Coffee</p> <p>Industrial Crops: Cotton, Sugarcane.</p>	15	1
<b>III</b>	<p>A) World Fisheries: factors &amp; distribution of major fishing grounds</p> <p>B) Forest Resources: Direct and Indirect uses of forest, Tropical &amp; Temperate Forestry.C) Forest Products in the world, India and Goa.</p>	15	1

<b>IV</b>	Natural Resources: Distribution and Development of a) Metallic: Ferrous - Iron Ore Mining, Non-Ferrous - Bauxite Mining b) Fuel & Power resources: Fossil Fuels - Coal, Petroleum Renewable: Hydel power. Non-Conventional Energy Resources: Solar, Tidal, Wind & Geothermal.	15	1
	<b>Total</b>	<b>60</b>	<b>04</b>

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

**Credits: 04**

### **INSTRUCTIONS**

- i) Thrust may be given to International, local, regional and national examples.
- ii) Due weightage for maps, diagrams in teaching as well as in paper setting is desirable. Map related questions will give due exposure to the students.

### **READING AND REFERENCE 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 and Economic Geography, Oxford University Press – New York.
8. Berry J. L.,(1967): Geography of Market Centres and Retail Distribution, Prentice Hall , New York.
9. Chatterjee, S. P., (1984): Economic Geography of Asia, Allied Book Agency, Calcutta.
10. Chorley, R. J. and Haggett, P. (ed.), (1969): Network Analysis in Geography, Arnold, London.
11. Dreze, J. & Sen, A.,(1996): India-Economic Development & Social Opportunity, Oxford, N. Delhi.
12. Eckarsley, R.(ed.), (1995):Markets, the State and the Environment, McMillan, London.
13. Garnier. B. J. and Delobez, A.,(1979): Geography of Marketing, Longman, London.

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**Goa University**  
**Choice Based Credit System**  
**THREE YEARS B. SC. GENERAL AND HONOURS DEGREE PROGRAMME**  
**SGC103: CARTOGRAPHIC TECHNIQUES**  
**GEOGRAPHY CORE COURSE ( PRACTICAL-III)**  
**B. SC. SEMESTER-III**

**Course Credits: 02**

**Total Contact Hours: \*30** 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 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 & economic geography graphs and cartograms.

Unit	Course Contents	Contact Hours
<b>I</b>	<b>Map Projections:</b> Definition, classification of projection, Uses and properties. a) Construction of zenithal projection, zenithal gnomonic projection, zenithal stereographic projection, zenithal orthographic projection, zenithal equal projection. b) Construction of conical projection: Simple conical projection with one standard parallel; Simple conical projection with two standard parallel.	20
<b>II</b>	<b>Methods of Representation of Relief features</b> – spot heights, Bench Marks, Hachures, Hill shading Contours diagrams: hills, plateaus, mesa, cliff, U & V-shaped valleys, waterfall, escarpment, spur, Hanging Valley, Volcano with crater, Ria coast, Fiord coast, Profile drawing and types.	20
<b>III</b>	<b>Measurement Scales in Geography:</b> Natural Symbols and nature of Geographical Data. Types of Measurements: i. Nominal Measurement. ii. Ordinal Measurement iii. Interval Measurement iv. Ratio Measurements.	10
<b>IV</b>	<b>Human Resource Indices and their calculations:</b> Growth Rate of Population, Population Concentration Index (Gini's), Rank Size Rule, Literacy Rate, Working and Non-Working Population Rate, Occupational Structure. Dependency Ratio, Fertility Rates: Crude Birth Rate, Age-Sex Ratio, Child-Women Ratio, Mortality Rates: Crude Death Rate, Infant Mortality Rate.	10
	<b>Total</b>	<b>60</b>

**Weightage of Marks: 50.**

**Credit: 02.**

**Unit I exercises: 15marks, Unit II exercises: 15 marks, Unit III exercises: 05 marks, Unit IV exercises: 05 marks, Certified Journal & Viva-Voce: 5+5=10**

**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- two lab sessions of 2 continuous hrs. per batch.
4. The duration of practical exam: 3 hrs carrying 50 marks to be conducted at the end of the Semester prior to Theory.

#### **REFERENCES**

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

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**Goa University**  
**Choice Based Credit System**  
**THREE YEARS B. SC. GENERAL AND HONOURS DEGREE PROGRAMME**  
**SGC104: GEOGRAPHY OF SECONDARY AND TERTIARY ECONOMIC ACTIVITIES**  
**GEOGRAPHY CORE COURSE (THEORY)**  
**B. SC. SEMESTER-IV**

**Course Credits: 04**

**Theory: 60 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 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 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.

<b>Units</b>	<b>Course Content</b>	<b>Contact Hours</b>	<b>Credits</b>
<b>I</b>	<p><b>Manufacturing:</b> Meaning and Importance, Manufacturing processes &amp; locations, Classical location principles-Theories of Manufacturing: 1) Least Cost Theory, 2) Profit Maximization Theory, 3) Behavioural Location Theory, 4) Structural Approach, 5) Break Point Theory.</p> <p>Detailed Geographical study of Following Industries:</p> <p>1. Iron &amp; Steel 2. Aluminum Industry 3. Petroleum Industry</p> <p>4. Cotton Textile 5. Sugar Industry 6. Knowledge Intensive Industry (Electronic) 7. Biotechnology &amp; 8. Telecommunication industry.</p>	<b>15</b>	<b>1</b>
<b>II</b>	<p><b>Study of Tertiary Activities:</b> Meaning, Importance, &amp; Types</p> <p><b>International Transport</b></p> <p>Land Routes: Major Roads &amp; Railway</p> <p>Ocean &amp; Canal Routes: North Atlantic &amp; Indian Ocean, Suez &amp; Panama</p> <p>Major Air Routes</p> <p><b>World Communication System:</b> Importance, Types, Satellite &amp; Remote Sensing, IT Revolution and its spread.</p>	<b>15</b>	<b>1</b>



<b>III</b>	<b>Trade:</b> Domestic: Retailing & Wholesaling, International Trade: Export & Import, Patterns and types of World Trade: Bi-lateral, Multi-lateral, Open and Free Trade. Natural vs. Economic Trade Blocks: WTO, EU, BRICS, & SAARC.	<b>15</b>	<b>1</b>
<b>IV</b>	<b>Cities as centres of Manufacturing and Services:</b> Justification with examples. World City Patterns, Metropolitan Hierarchies, Rank Size Rule, Central Place Theory, Trade Areas Analysis, Changing Physical Structures, Emerging Polycentric Cities, Ribbon corridors.	<b>15</b>	<b>1</b>
	<b>Total</b>	<b>60</b>	<b>04</b>

**Weightage: I. S. A: 20 + S. E. E: 80**  
**Credit= 4.**

**Total= 100.**

### **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. Bengston & Van, G. H. Royan.,(1988): Fundamentals of Economic Geography, Prentice Hall, New Delhi.
2. Boesch, H., (1964): A Geography of World Economy, Van Nostrand Co., New York.
3. Chapman J. D., (1989): Geography and Energy, Longman, London.
4. Hartshorne T. N. & Alexander J. W.,( 1988): Economic Geography, Prentice Hall, New Delhi.
5. Jones C. F. and Darkenwald G. G.,(1975): Economic Geography, Macmillan & Co, New York.
6. Leong, G. C. & Morgan, G. H., (1982): Human and Economic Geography, Oxford University Press – New York.
7. Rodrigue, Jean-Paul, Comtois Claude and Slack Brian (2013): The Geography of Transport Systems, Routledge, London.
8. Smith, D. M.,(971): Industrial location: An Economic Geographical Analysis, John Wiley, New York.
9. Singh, S.,(2011): Industrial Geography , ABD Publisher.

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**Goa University**  
**Choice Based Credit System**  
**THREE YEARS B. SC. GENERAL AND HONOURS DEGREE PROGRAMME**  
**SGC104: DATA COLLECTION AND STATISTICAL METHODS IN GEOGRAPHY**  
**GEOGRAPHY CORE COURSE (PRACTICAL-IV)**  
**B. SC. SEMESTER-IV**

**Course Credits: 02**

**Total Cont Hours: \* 30** Laboratory sessions of continuous 2 hours duration each per week per batch.

**COURSE OBJECTIVES:** To develop skills and techniques for representation of demographic or socio-economic indicators and data pertaining to spatial geography.

**LEARNING OUTCOMES:** At the end of this practical course, the students will be able to express and appreciate data set information through statistical approach. It will enable the students to understand and interpret the same. The students will also acquire basic skills of drawing a variety of economic geography cartograms.

<b>Units</b>	<b>Course Contents</b>	<b>Contact</b>
<b>I</b>	Data Sets in Geography: Primary, Secondary; Classification and Tabulation of Data; Sources of Primary Data: Survey, Observation, Exploration; Presentation of data in Tabular and Graphical form, Typical Pattern of Frequency distribution and Skewness. 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.	16
<b>II</b>	Coding of Sample data. Utility of Statistical Measures in Geography, Measures of Central Tendency: Mean, Median and Mode. Quartiles, Deciles and Percentiles. (Calculation of Mean, Median & Mode on recent and actual data set).	16
<b>III</b>	Measures of Dispersion: Absolute measures: Range, Quartile Deviation, Mean Deviation, Standard Deviation & Variance. Relative measures of Dispersion: i) Graphical: Line Graph and Scatter diagram. ii) Algebraic: Pearson's Product Movement Co-relation, Co-relation Co-efficient. iii) Regression Lines iv) Moving Averages.	16
<b>IV</b>	Field Survey, Report and viva-voce: (Individual or Group Project of not more than 4 students on any one of the following area) 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 Journal).	12
	<b>Total</b>	<b>60</b>

**Weightage of Marks: 50.**

**Credit: 02.**

**Unit I exercises: 10marks, Unit II exercises: 10 marks, Unit III exercises: 10 marks, Unit IV exercises: 5+5=10 marks, Certified Journal & Viva-Voce: 5+5=10**

### **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- two lab sessions of 2 continuous hrs. per batch.
4. The duration of practical exam: 3 hrs carrying 50 marks.
5. Practical examination is to be conducted at the end of every Semester prior to the Theory (exam).

### **REFERENCES**

1. Bygot, J.,(2001): An Introduction to Map Work and Practical Geography, Bookbarn Internationals, U.K.
2. Campbell, J., (2004): Introductory Cartography, Prentice Hall, Inc Englewood
3. Jackson, R.H. and Hudmar, L.E.,( 2001): Regional Geography: Issues for today
4. Misra, R.P. and Ramesh, A.,( 2005): Fundamentals of Cartography, Concept Pub. Co., New Delhi
5. Monkhouse, I.J. and Wilkinson, H.R., (2001): Maps and Diagram, B.I. Publication, New Delhi
6. Raisz, E.,( 2005): General Cartography, McGraw Hills Co., London
7. Robinson, A.H., et al, (2003): Elements of Cartography, John Wiley and Sons, New York
8. Singh, R.L., (2000): Elements of Practical Geography, Kalyani Publishers, New Delhi
9. Singh, R ; Singh L.R., (2001): Mapworks in Practical Geography,Central book Depot, Allahabad

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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.

<b>Units</b>	<b>Course Content</b>	<b>Contact Hours</b>	<b>Credits</b>
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
	<b>TOTAL</b>	<b>60</b>	<b>04</b>

**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, Delhi
3. Census of India 2011 Series - I (2013): India Provisional Population Totals, Pub. Registrar General, India.
4. Chandna, R.C., (2000): Geography of Population: Concepts, Determinants & Patterns, Kalyani Pub., N. Delhi.
5. 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 Iowa.
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**  
**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.

<b>Units</b>	<b>Course Content</b>	<b>Contact Hours</b>	<b>Credits</b>
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
	<b>TOTAL</b>	<b>60</b>	<b>04</b>

**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 Iowa.
9. Srinivasan K. and M. Viass., (2001): Off Population Development Nexus in India: Challenges for the N 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.

<b>Units</b>	<b>Course Content</b>	<b>Contact Hours</b>	<b>Credits</b>
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
	<b>TOTAL</b>	<b>60</b>	<b>04</b>

**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.

<b>Units</b>	<b>Course Content</b>	<b>Contact Hours</b>	<b>Credits</b>
I	Introduction to Applied Tourism Geography, Infrastructure and support system: Accommodation and supplementary Accommodation, 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, sustenance 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
	<b>TOTAL</b>	<b>60</b>	<b>04</b>

**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.

<b>Units</b>	<b>Course Content</b>	<b>Contact Hours</b>	<b>Credits</b>
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
	<b>TOTAL</b>	<b>60</b>	<b>04</b>

**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.
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**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.

<b>Units</b>	<b>Course Content</b>	<b>Contact Hours</b>	<b>Credits</b>
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
<b>TOTAL</b>		<b>60</b>	<b>04</b>

**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.

<b>Units</b>	<b>Course Content</b>	<b>Contact Hours</b>	<b>Credits</b>
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



<b>TOTAL</b>	<b>60</b>	<b>04</b>
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**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).

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**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.

<b>Units</b>	<b>Course Content</b>	<b>Contact Hours</b>	<b>Credits</b>
I	Infrastructure and support system in travel and tour operation Accommodation and supplementary accommodation, 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 15 <sup>th</sup> March. Conduct of a Viva-Voce or Presentation and submission of Marks by 31 <sup>st</sup> March. <b>Allotment of Marks (40):</b> 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).		
	<b>TOTAL</b>	<b>60</b>	<b>04</b>

**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).

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**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.

<b>Units</b>	<b>Course Content</b>	<b>Contact Hours</b>	<b>Credits</b>
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
	<b>TOTAL</b>	<b>60</b>	<b>04</b>

**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, Pryczak 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.

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**Goa University**  
**Choice Based Credit System**  
**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.

<b>Units</b>	<b>Course Content</b>	<b>Contact Hours</b>	<b>Credits</b>
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 15 <sup>th</sup> 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 31 <sup>st</sup> March. <b>Allotment of Marks (40):</b> 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
	<b>TOTAL</b>	<b>60</b>	<b>04</b>

**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,* Pryczak 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.

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**Goa University**  
**Choice Based Credit System**  
**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.

<b>Units</b>	<b>Course content</b>	<b>Contact Hours</b>	<b>Credits</b>
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 Development Field Surveys, Timing of the Survey. Permission, Authorisation, Liasioning and Infrastructure.	15	1
	<b>TOTAL</b>	<b>60</b>	<b>04</b>

**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, 2<sup>nd</sup> 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.

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**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.

<b>Unit</b>	<b>Course Content</b>	<b>Contact Hours</b>	<b>Credits</b>
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 Institution 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 15 <sup>th</sup> 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 31 <sup>st</sup> March. <b>Allotment of Marks (40):</b> Attendance in the Training (10) + Discipline, Dedication, Attitudes and Skill / Efficiency during the Training (10) + Training Report of 10-20 pgs (10) + Viva-Voce / Presentation (10).		
	<b>TOTAL</b>	<b>60</b>	<b>04</b>

**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 focus, 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,* Pyczak 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.

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**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 processors 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 visual image interpretation and Visual interpretation of aerial	15	1

	photos (02 exercise) and satellite imageries (02 exercise)		
<b>TOTAL</b>		<b>60</b>	<b>04</b>

**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), Kolkata
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
<b>TOTAL</b>		<b>60</b>	<b>04</b>

**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.

<b>Units</b>	<b>Course Content</b>	<b>Contact Hours</b>	<b>Credits</b>
<i>I</i>	<b>Concept and Nature of Physical Geography:</b> 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
<i>II</i>	<b>Earth Systems I:</b> 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
<i>III</i>	<b>Earth Systems II:</b> 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
	<b>Total</b>	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
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**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>I</i>	<p><b>Introduction to Survey of India (SOI) toposheets and with reference to:</b></p> <p style="padding-left: 40px;">Indexing/ Types  Scales and Grid Reference  Convectional Signs and Symbols  Colour Schemes  Marginal Information  Calculation of Toposheet Area</p> <p><b>Comparison of SOI with Ordinal maps of UK and United States Geological Survey Maps (USGS) with reference to:</b></p> <p style="padding-left: 40px;">Indexing/ Types  Scales and Grid Reference</p>	15
<i>II</i>	<p><b>Topographical Map Interpretation:</b></p> <p style="padding-left: 40px;">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:</p> <p style="padding-left: 40px;">Mountains  Plateaus  Coastal Plains</p> <p style="padding-left: 40px;">One day field Excursion for Orientation of Toposheet, Observation and identification of Geographical features and preparation of a brief report</p>	15
	<b>Total</b>	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.
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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

**Goa University**  
**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 interrelationship.

**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.

<b>Units</b>	<b>Course Content</b>	<b>Contact Hours</b>	<b>Credits</b>
<i>I</i>	<b>Regions and Regional Planning:</b> 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
<i>II</i>	<b>Regional Development, theories and Models:</b> 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
<i>III</i>	<b>Regional Development: India</b> 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, B.J.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.
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**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
	<b>Total</b>	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.
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Goa University  
Choice Based Credit System  
**THREE YEARS B. A. HONOURS DEGREE PROGRAMME**  
**GEC108: Quantitative Techniques in Geography- I**  
**Geography Core Course (Theory)**  
**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	<p><b>Geographical Database:</b> Introduction to Statistics Importance of Statistics in Geography Geographical research and Statistical Techniques.</p> <p><b>A) Measurement</b> – scales in statistical geography. Nominal, ordinal, interval and ratio scale/ measurements</p> <p><b>B) Descriptive Statistics-I</b> Classification, Tabulation and types Tabulation, (format) and types of table</p>	15	1
II	<p><b>Frequency Distribution:</b> Measures of central tendency and partition values Arithmetic &amp; Geometric Mean, Median, Mode, Quartiles, Deciles, Percentiles for Grouped &amp; Ungrouped data. Combined mean.</p>	15	1
III	<p><b>Descriptive statistics – II</b> (Measures of Dispersion): Absolute measures of dispersion and skewness: Range, Quartile Deviation, Mean Absolute Deviation, Standard Deviation, Variance.</p> <p><b>Relative Measures of Dispersion:</b> Coefficient of variation (C.V.), Lorenz curve.</p>	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.
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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.
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**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	<p><b>. Descriptive Statistics-I (Exercises based on theory )</b>            Tabulation            Graphical presentations, Frequency distribution and typical pattern of frequency distribution: Histogram and Frequency Polygon.            Arithmetic &amp; Geometric Mean, Median, Mode, Quartiles, Deciles, Percentiles (Grouped &amp; Ungrouped data)            Combined mean.</p>	14
II	<p><b>Descriptive statistics – II (Measures of Dispersion): (Exercises based on theory )</b>            Absolute measures of dispersion and skewness: Range, Quartile Deviation, Mean Absolute Deviation, Standard Deviation, Variance  <b>Relative Measures of Dispersion:</b>            Coefficient of variation (C.V.), Lorenz curve.</p>	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
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**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 be able to understand the concepts of climatology and oceanography and apply the same for interpretation.

Units	Course Content	Contact Hours	Credits
I	<b>Atmospheric Circulation:</b> 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	<b>Extreme Events and Climatic Classification:</b> 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	<b>Oceanography:</b> Ocean Salinity & temperature Waves, Types of Tides & Ocean Currents (Atlantic ocean) Coral Reefs & their types	15	1
	<b>Total</b>	45	03

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

**References**

- Ahrens, C.D. 2012. Essentials of Meteorology: An Invitation to the Atmosphere. 9th Ed, Cengage Learning.
- Barry R. G. and Carleton A. M., (2001): Synoptic and Dynamic Climatology, Routledge, UK.
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Websites:

India Meteorological Department: [www.imd.gov.in](http://www.imd.gov.in)

Intergovernmental Panel on Climate Change: [www.ipcc.ch](http://www.ipcc.ch)

World Bank Climate Change Knowledge Portal: [sdwebx.worldbank.org/climateportal/index.cfm](http://sdwebx.worldbank.org/climateportal/index.cfm)

World Meteorological Organization: [public.wmo.int/en](http://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>I</i>	<b>Weather Maps Reading:</b> 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
<i>II</i>	<b>Study and Interpretation of Indian Daily Weather Report (IDWR):</b> 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
	<b>Total</b>	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.
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**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	<b>Regional Planning in India:</b> 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	<b>Resource Regionalisation of India:</b> Industrial regions. Growth centre strategy; District Planning. Metropolitan Planning. Manpower Planning In India, Planning problems, Objectives and priorities in India  <b>Urban regions in India:</b> Census definitions; Changing connotations Hierarchy of urban systems, city types, metropolitan areas, urban agglomerates	15	1
III	<b>Planning regions of India</b> 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  <b>Planning in Goa:</b> Tribal and coastal region, drought and flood region, Local	15	1



	Government and Planning.		
	<b>Total</b>	45	03

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

**Total= 75.**

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1. Bhargava, G.,(2000): Development of India's Urban, Rural, and Regional Planning in 21st Century: Policy Perspective, Gyan Publishing House, Delhi.
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**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	<p><b>Preparation of Thematic maps (Manually)</b>            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 &amp; Potential Models            Preparation of Z score and composite Index from suitable data</p>	20
II	<p><b>Application of Computer Cartography:</b>            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</p>	10
	<b>Total</b>	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
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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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**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

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

**Weightage of Marks: 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**  
**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	<b>Non- Parametric Statistics: Co-relation and Regression analysis</b> Scatter Diagram Karl Person's Co-efficient correlation Spearman's rank correlation Kendall's rank correlation regression analysis.	10
II	<b>Non-Parametric: Hypothesis testing</b> i) Chi-square test ii) Variance analysis iii) T-Test <b>Matrices &amp; Indices:</b> Index numbers: unweighted, weighted indices and cost of living index  <b>Preparation of Survey Report:</b> 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.
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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.

<b>Units</b>	<b>Course Content</b>	<b>Contact Hours</b>	<b>Credits</b>
<i>I</i>	<b>Introduction to Geomorphology:</b> Nature, scope and significance of geomorphology. Fundamental concepts and approaches in geomorphology. Application of Geomorphology in Environment, Agriculture, Mining, Transportation and Settlements.	15	1
<i>II</i>	<b>Theories in Geomorphology:</b> 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
<i>III</i>	<b>Geomorphic landforms and Processes:</b> Weathering, Mass Wasting and Erosion River Moulded Landforms Glacial Landforms Aeolian Landforms Karst Landforms Coastal Landforms	15	1
	<b>Total</b>	45	03

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

**References:**

1. Ahmed, E., (2005): Geomorphology, Kalyani Publishers, New Delhi.
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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>I</i>	<b>Aerial Photography and its Components:</b> 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
	<b>Aerial Photograph Interpretation:</b> 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
	<b>Total</b>	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. Bhatta, B., (2011): Global Navigation Satellite Systems: Insights into GPS, GLONASS, Galileo Compass and Others, CRC Press.
  2. Bhatta, B., (2011): Remote Sensing and GIS, 2nd ed, Oxford Univ. Press.
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  4. Brewer, C.A., (2015): Designing Better Maps: A Guide for GIS Users, 2nd ed, Esri Press.
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- WEBSITES:
  - ALOS Global Digital Surface Model: [www.eorc.jaxa.jp/ALOS/en/aw3d30/index.htm](http://www.eorc.jaxa.jp/ALOS/en/aw3d30/index.htm)
  - International Society for Photogrammetry and Remote Sensing: [www.isprs.org](http://www.isprs.org)
  - ISRO Bhuvan 2D and 3D Platforms: [bhuvan.nrsc.gov.in/map/bhuvan/bhuvan2d.php](http://bhuvan.nrsc.gov.in/map/bhuvan/bhuvan2d.php)
  - [bhuvan.nrsc.gov.in/globe/3d.php#](http://bhuvan.nrsc.gov.in/globe/3d.php#)
  - NASA Landsat Science: [www.landsat.gsfc.nasa.gov](http://www.landsat.gsfc.nasa.gov)
  - National Remote Sensing Centre: [www.nrsc.gov.in](http://www.nrsc.gov.in)
  - USGS Global Visualization Viewer: [www.glovis.usgs.gov](http://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	<p><b>Introduction, Location, Extent and Geo-Political significance:</b> Location and extent Relationship with Neighboring countries Geo- Political importance of Indian Ocean</p> <p><b>Major Physiographic regions and their importance:</b> The Northern mountains The Northern plain Peninsular plateau The Coastal lowlands Islands</p>	15	1
II	<p><b>The Himalayan Drainage System of India:</b> The Indus The Ganga The Bramhaputra.</p> <p><b>The Peninsular River system:</b> East flowing Rivers: Mahanadi, Krishna &amp; Cauvery West flowing Rivers: Narmada, Tapi and Mahi Rivers of Sahyadri: Mandovi and Zuari</p> <p><b>Water Resource Development:</b> multipurpose projects, inland waterways plan</p>	15	1
III	<p><b>Climatic characteristics, Origin and Mechanism of Monsoons and Various Seasons:</b> Characteristics of Indian Climate Role of various controlling factors on climate of India Monsoons: Origin and Mechanism Various seasons and weather associated with them.</p> <p><b>Natural Resources:</b> Soil, Forest, Mineral, Power Production Mineral and power resources distribution and utilization: iron ore, coal, petroleum, gas.</p>	15	1

	<b>Total</b>	45	03
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**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.
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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>I</i>	<b>Preparation and Interpretation of Maps</b> Base Map: Location and extent Neighboring countries Geo- Political link in Indian Ocean region Major Physiographic regions: Mountains, Plateaus, plains and coastal lands.	15
	<b>Drainage Basins of India:</b> The Indus, The Ganga, The Brahmaputra, Mahanadi, Krishna Cauvery Narmada, Tapi and Mahi, Mandovi and Zuari Mapping of Hydel power projects Map of Inland waterways	15
	<b>Maps of Natural Resources:</b> Soil, Forest, Mineral (iron ore, coal, petroleum, gas), thermal power.	
	<b>Total</b>	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).
  2. Monkhouse, F.J., Wilkinson, H.R., (1971). Maps and Diagrams: Their Compilation and Construction, 3<sup>rd</sup> ed (2017 reprint), Alphaneumera-Kolkata.
  3. Robinson, A.H., Morrison, J.L., Phillip, C.M., Kimerling, A.J., Guphill, S.C.,(1995): Elements of Cartography, 6th ed, Wiley.
  4. Sarkar, A.,(2015): Practical Geography: A Systematic Approach, 3rd ed, Orient Blackswan Private Ltd.
  5. Singh, R.L., Singh, R.P.B, (2008): Elements of Practical Geography, Kalyani Publishers.
- WEBSITES:
  - Geological Survey of India: [www.gsi.gov.in](http://www.gsi.gov.in)
  - Indian Naval Hydrographic Department: [www.hydrobharat.nic.in](http://www.hydrobharat.nic.in)
  - National Bureau of Soil Survey and Land Use planning: [www.nbsslup.in](http://www.nbsslup.in)
  - Survey of India: [www.surveyofindia.gov.in](http://www.surveyofindia.gov.in)
  - ISRO Bhuvan 2D Platform: [bhuvan.nrsc.gov.in/map/bhuvan/bhuvan2d.php](http://bhuvan.nrsc.gov.in/map/bhuvan/bhuvan2d.php)
  - National Remote Sensing Centre: [www.nrsc.gov.in](http://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 SPECIFIC 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.

<b>Units</b>	<b>Course Content</b>	<b>Contact Hours</b>	<b>Credits</b>
I	<b>The science of climate change:</b> Origin, scope and trends Climate change with reference to the geological time scale <b>The science of climate change</b> The nature–man dichotomy Greenhouse gases and Global warming Electromagnetic spectrum, atmospheric window, heat balance of the earth	15	1
II	<b>Global climatic assessment:</b> IPCC reports <b>Climate change and vulnerability:</b> Physical; economic and social <b>Impact of climate change:</b> Agriculture and water; flora and fauna; human health and morbidity	15	1
III	<b>Global initiatives to climate change mitigation:</b> 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.	<b>National Action Plan on climate change:</b> 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.
3. 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 B: Regional Aspects-Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change, Cambridge University Press.
4. Organisation for Economic Co-operation and Development (OECD) (2008): Climate Change Mitigation: What Do we do? Organisation and Economic Co-operation and Development.
5. United Nations Environmental Programme (UNEP) (2007): Global Environment Outlook: GEO4: Environment for Development, United Nations.
6. Singh, M., Singh, R.B., Hassan, M.I. (Eds) (2014): Climate change and biodiversity: Proceedings of IGU Rohtak Conference, Vol-1, Springer.
7. Sen Roy, S., Singh, R.B. (2002): Climate Variability, Extreme Events and Agricultural Productivity in Mountain Regions, Oxford & IBH.

**Goa University**  
**Choice Based Credit System**  
**THREE YEARS B. A. GENERAL & HONOURS DEGREE PROGRAMME**  
**GED104: Agricultural Geography**  
**DISCIPLINE SPECIFIC 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.

<b>Units</b>	<b>Course Content</b>	<b>Contact Hours</b>	<b>Credits</b>
<b>I</b>	<b>Introduction of Agricultural Geography:</b> 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
<b>II</b>	<b>Determinates of Agriculture:</b> Physical Factors, Economic Factors, Social Factor & Technological Factors.  <b>Agricultural Systems of the World:</b> 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
<b>III</b>	<b>The Agricultural Regions of the World:</b> (Whittlesey's Scheme).  <b>Classification of Agricultural Regions:</b> Land use & Land use capability, Landuse Efficiency.  <b>Regional Agricultural Specialization:</b> Models/Theories of Agricultural location - Von Thunen Landuse theory, Landuse Analysis in India.	15	1
<b>IV.</b>	<b>Land use pattern:</b> a) Measurements of Agricultural Productivity, Crop Combination	15	1

	<p>&amp;Crop Diversification, Delineation of crop combination regions</p> <p>b) Measurement of Regional Disparities in Agricultural production.</p> <p>Agricultural planning and policies in India, Agro-climatic regions of India, Green revolution in India;</p> <p><b>Second generation reforms in Indian agriculture:</b> Land and institutional reforms, Evergreen revolution; Organic and contract farming.</p>		
	Total	60	04

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

**References:**

1. Aher, A. B., Salunkhe V., (2015): Agriculture Geography, Diamond Publication, Pune.
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.
4. Brown, L.R., (1990): The Changing World Food Prospects - The Nineties and Beyond. World Watch Institute, Washington D.C.
5. Dyson, T., (1996): Population and Food - Global Trends and Future Prospects, Routledge, London,
6. Gregor, H.P., (1970): Geography of Agriculture, Prentice Hall, New York,
7. Grigg, D.B., (1974): The Agricultural Systems of the World, Cambridge University Press, New York.
8. Hartshorn, T.N., and Alexander, J.W., (1988): Economic Geography, Prentice Hall, New Delhi,
9. Mannion, A.M., (1995): Agriculture and Environment Change, John Wiley, London,
10. Morgan W.B., and Norton, R.J.C.,(1971) : Agricultural Geography, Mathuen, London.
11. Morgan, W.B., (1978): Agriculture in the Third World - A Spatial Analysis, Westview Press, Boulder.
12. Saptarshi P.G., More J.C., Ugale V.R., Musmade A.H.,(2009): India A Geographical Analysis, Diamond, Pune.
13. Sauer, C.O., (1969): Agricultural Origins and Dispersals, M.I.T. Press, Mass, U.S.A.
14. Singh, J., and Dhillon, S.S., (1988): Agricultural Geography, 2nd edition, Tata McGraw-Hill, New Delhi.
15. Wigley, G., (1981): Tropical Agriculture: The Development of Production, 4th edition, Arnold, London.

**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.

<b>Units</b>	<b>Course Content</b>	<b>Contact Hours</b>	<b>Credits</b>
<i>I</i>	<b>Introduction to settlement Geography:</b> 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
<i>II</i>	<b>Spatial organization of rural settlements:</b> 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
<i>III</i>	<b>Internal morphology of villages:</b> (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
<i>IV</i>	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

	<b>Total</b>	60	04
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**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.
4. Clout, R.D., (1970):Rural Geography, Pergamon Press, London.
5. Gilg, A.W.,(1985):. An Introduction to Rural Geography, Edwin Arnold.
6. Ghosh, Sumita., (1998): Introduction to Settlement Geography, Orient longman.
7. Krishnamurthy,J.,(2000):. Rural Development:Problems and Prospects, Rawat Publications.
8. Lee, D.A., Chaudhri, D.P., (Eds) (1983): Rural Development and State, Methuen Publishing.
9. Mandal. R. B, (2001): Introduction to Rural Settlement, Concept Publishing Company, New Delhi.
10. Misra, H.N., (ed.) (1987): Rural Geography, Heritage Publishers, New Delhi.
11. Money, D.C., (1972): Patterns of Settlements, Evan Brothers, London.
12. Misra, R.P., Sundaram, K.V., (Eds) (1979): Rural Area Development: Perspectives and Approaches, Sterling Publishers.
13. Misra, R.P., (Ed.) (1985): Rural Development: Capitalist and Socialist Paths, Vol-1, Concept Publishing.
14. Mukerji, R.K.(1968): Man and His Habitation, Popular Books, Bombay.
15. Ramachandran, H., Guimaraes, J.P.C., (1991): Integrated Rural Development in Asia: Learning from Recent Experience, Concept Publishing.
16. Robb, P., (Ed.) (1983): Rural South Asia: Linkages, Change and Development, Curzon Press.
17. Singh, K., Shishodia, A., (2016): Rural Development: Principles, Policies, and Management, 4th ed, Sage.
18. Singh, R.L. et al (1972): Reading in Rural settlement Geography, Tara Publications, Varanasi.
19. Singh R.Y., (1998): Geography of Settlements, Rawat publications, Jaipur.
20. Thomas, Chris., (2001): Rural Geography,Routledge, London.
21. Yugandhar, B.N., Mukherjee, N., (Eds) (1991): Studies in Village India: Issues in Rural Development, Concept Publishing.
22. Wanmali, S., (1992): Rural Infrastructure, the Settlement System and Development of the Regional Economy in Southern India, International Food Policy Research Institute.
23. Woods, Michael.,(2005): Rural Geography: Processes, Responses and Experiences in Rural Restructuring, SAGE Publications Ltd, University of Wales, Aberystwyth.
24. Woods, M., Holloway, Lewis., &Panelli, Ruth.,(2012): Key Concepts in Rural Geography,Sage Publication, London

**Goa University**  
**Choice Based Credit System**  
**THREE YEARS B. A. HONOURS DEGREE PROGRAMME**  
**GED110: Political Geography**  
**DISCIPLINE SPECIFIC 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.

<b>Units</b>	<b>Course Content</b>	<b>Contact Hours</b>	<b>Credits</b>
<b>I</b>	<p><b>Nature, scope and subject matter of political geography.</b>  <b>A new perspective:</b>            Scope, redefined and recent trends            Concept of state and factors            Conceptual states: i) Spencer and Scclaffle, ii) Friedrich Ratzel            iii) Rodolf Kjella            Concept of Nation, Nation-State, and Nationalism            Organic states, Geopolitik and Geopolitics - a new dimension</p>	15	1
<b>II</b>	<p><b>Approaches to the study of political geography and its contemporary relevance:</b>            Law- Landscape approach of Whittlesey            Functional approach of Hartshorne            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</p>	15	1
<b>III</b>	<p><b>Frontiers and Boundaries:</b>            Concept of frontiers and distinction between frontiers and boundaries            Functions of Frontiers and Boundaries            Classification of Boundaries            India's Boundaries: Characteristics and Disputes</p> <p><b>Geostrategic and Geopolitical Views:</b>            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</p>	15	1

IV.	<b>Electoral Geography</b> 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

1. Bhagwati, J.N., (ed). (1976): New International Economic Order - The North-South Debate, M.I.T. Press, London.
2. Adhikari, S., (2015): Political Geography, Rawat Publications, Jaipur
3. Adhikari, S., (2011): Political Geography of India: A Contemporary Perspective, Sharda Pustak Bhawan, Allahabad.
4. Dikshit R., (1985): Political Geography: A Contemporary Perspective, McGraw Hill, New Delhi.
5. Dikshit, S., (1993): Electoral Geography of India, Vishwavidyalaya Prakashan, Varanasi.
6. Dwivedi, R., (1996): Political Geography, Chaitanya Prakashan, Allahabad.
7. Glassner M. I., (1993): Political Geography, John Wiley, New York.
8. Jones, M., (2004): An Introduction to Political Geography: Space, Place and Politics, Routledge.
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10. Painter, J., and Jeffrey, A., (2009): Political Geography, Sage Publications.
11. Panikkar, K.M., (1956): Geographical factors in Indian History. Bharatiya Vidya Bhavan, Bombay.
12. Pounds N.T., (1972): Political Geography, Mc Graw Hill, New York,.
13. Prescott, J.R.V., (1972): Political Geography, Methuen & Co., London.
14. Schwartzberg, J.E., (1993): A Historical Atlas of South Asia, University of Chicago press, U.S.A.
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16. Sinha, M., (2007): Electoral Geography of India, Adhyayan Publications and Distributers, New Delhi.
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20. William C. H. (ed) (1993): Political Geography of the New World Order Halsted Ben, New York.

**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.

<b>Units</b>	<b>Course Content</b>	<b>Contact Hours</b>	<b>Credits</b>
I	<b>Introduction to Environmental Geography</b> 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	<b>Environmental Challenges in India</b> 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	<b>Sustainable Development and Environmental Management</b> 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:**



1. Basu, R. and Bhaduri, S. (Eds) (2007): Contemporary Issues and Techniques in Geography, Progressive Publishers.
2. Chandna R. C., (2002): Environmental Geography, Kalyani, Ludhiana.
3. Chapman, J.L., Reiz, M.J.,(1993): Ecology: Principle and Applications, Cambridge University Press.
4. Cunningham W. P. and Cunningham M. A., (2004): Principals of Environmental Science: Inquiry and Applications, Tata Macgraw Hill, New Delhi.
5. Gilpin, A., (1994): Environmental Impact Assessment: Cutting Edge for the 21st Century, Cambridge University Press.
6. Goudie A., (2001): The Nature of the Environment, Blackwell, Oxford.
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15. Singh, M., Singh, R.B. and Hassan, M.I. (Eds.) (2014) Climate change and biodiversity: Proceedings of IGU Rohtak Conference, Volume 1. Advances in Geographical and Environmental Studies, Springer
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.
19. Withgott, J.H., Laposata, M. 2017. Environment: The Science behind the Stories, 6th ed, Pearson.

#### WEBSITES:

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

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**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.

<b>Units</b>	<b>Course Content</b>	<b>Contact Hours</b>
<i>I</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
<i>II</i>	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
	<b>Total</b>	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,
5. Morgan R.K., (2002): Environmental Impact Assessment: A Methodological Perspective, Kluwer Academic Publishers, London
6. Northey, N., Draper, D., Knight, D.B.,(2015): Making Sense in Geography and Environmental Sciences: A Student's Guide to Research and Writing, 6th ed, Oxford University Press.

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	<p><b>Regional disparities in India since Independence:</b> Disparities in agricultural development Disparities in industrial development Disparities in human resource development in terms of education and health</p> <p><b>Regions of regional disparity: Physical &amp; Cultural bases:</b> North-Eastern States Jammu &amp; Kashmir Jharkhand</p>	15	1
II	<p><b>Success Stories of Regional Development:</b> Metropolitan Regions: Mumbai Metropolitan Region River Project: Narmada Project Hydel Power Projects: Tehri project Rural Development/Reconstruction e.g. Anand Dairy Farming Tribal Development Block - Bastar Plateau</p>	15	1
III	<p><b>A) Regional Development and Contemporary Issues:</b> Globalization Border issues Water Disputes. Socio -Ethnic Tension</p> <p><b>Regional Development &amp; Future Vision:</b> Golden Quadrangle Oil and gas Pipe Line (Iran and India). River-Linking Projects Antarctica Expeditions</p>	15	1
	<b>Total</b>	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.
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**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	<p><b>Introduction to Remote Sensing and EMR:</b>                      Electromagnetic Radiation &amp; Electromagnetic Spectrum, its Characteristics and components, Stages of Remote Sensing, Remote Sensing &amp; its Types, interactions of EMR with Earth's atmosphere and surface features; Spectral response of Earth's natural surface.</p> <p><b>Satellites Imageries:</b>                      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</p>	15
II	<p><b>Introduction to GIS &amp; GPS:</b>                      Content of GIS, objectives of GIS, Application of GIS, Components of GIS, Elements of GIS, Hardware &amp; Software Requirements, Point Line and Polygon, Layers and Coverage, Raster and Vector Data, Components of GPS.</p>	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.
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**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.

<b>Units</b>	<b>Course Content</b>	<b>Contact Hours</b>	<b>Credits</b>
<i>I</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
<i>II</i>	<b>Biosphere and Energy:</b> 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
<i>III</i>	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
<i>IV</i>	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.



3. Chiras D.D. Reganold J.P., Owen, O.S., (2002): Natural Resource Conservation. Management for a Sustainable Future. 8th edition, Prentice Hall. Englewood Cliffs.
4. Dash. M.C.(2001): Fundamentals of Ecology, 2nd edition, Tata McGraw-Hill, New Delhi.
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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.

<b>Units</b>	<b>Course Content</b>	<b>Contact Hours</b>	<b>Credits</b>
I	<b>Society, Identity and Crisis:</b> 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	<b>Basis of social region formation:</b> 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	<b>Social Wellbeing and Planning:</b> 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	<b>Social Planning:</b> 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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5. Holt, L., (2011): *Geographies of Children, Youth and Families: An International Perspective*, Taylor & Francis.
6. Majumdar, P.K., (2013):. *India's Demography: Changing Demographic Scenario in India*, Rawat Publications.
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	<p><b>Urban Settlements – Origin and Evolution:</b>  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 &amp; cities &amp; functional classification of towns.  Patterns of urbanisation in developed and developing countries</p>	15	1
II	<p><b>Theories of urban evolution and growth and hierarchies:</b>  Hydraulic theory,  Economic theory  The rank size rule,  The law of the primate city model  August Lösch’s theory of market centres</p>	15	1
III	<p><b>Urban Places – Changing Scenario:</b>  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 &amp; Goa.  Patterns and trends of urbanisation in India : Case study metropolitan i.e. Mumbai, Kolkata, Delhi (any one suggested by BOS)</p>	15	1
IV	<p><b>Urban Issues:</b>  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.</p>	15	1
	<b>Total</b>	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.
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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.

<b>Units</b>	<b>Course Content</b>	<b>Contact Hours</b>	<b>Credits</b>
<i>I</i>	<b>Perspectives on Health</b> 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	<b>Health Risks and Diseases:</b> 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	<b>Climatic Change, Diseases and Human Health:</b> 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	<b>Health Care Facilities:</b> 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
	<b>Total</b>	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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