



UNIVERSITY OF CALICUT

**Abstract**

General and Academic - Faculty of Science - Syllabus of BSc Geography Programme under CBCSS UG Regulations 2019 with effect from 2019 Admission onwards - Implemented- Orders Issued

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**G & A - IV - J**

U.O.No. 8741/2019/Admn

Dated, Calicut University.P.O, 03.07.2019

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*Read:-*1. U.O.No. 4368/2019/Admn dated 23/03/2019

2. Item No. 1 of the minutes of the meeting of the Board of Studies in Geography held on 13/06/2019

3. Item No. I.30 of the minutes of the meeting of Faculty of Science held on 27/06/2019

ORDER

The Regulations for Choice Based Credit and Semester System for Under Graduate (UG) Curriculum-2019 (CBCSS UG Regulations 2019) for all UG Programmes under CBCSS-Regular and SDE/Private Registration with effect from 2019 admission has been implemented vide paper read first above.

The meeting of Board of Studies in Geography held on 13/06/2019 has finalised the Syllabus of B.Sc Geography Programme in tune with the new CBCSS UG Regulation with effect from 2019 Admission onwards, vide paper read second above.

The Faculty of Science at its meeting held on 27/06/2019 has approved the minutes of the meeting of the Board of Studies in Geography held on 13/06/2019, vide paper read third above.

Under these circumstances, considering the urgency, the Vice Chancellor has accorded sanction to implement the Scheme and Syllabus of B.Sc Geography Programme in accordance with the new CBCSS UG Regulations 2019, in the University with effect from 2019 Admission onwards, subject to ratification by the Academic Council.

Sanction is therefore accorded for implementing the Scheme and Syllabus of B.Sc Geography Programme in accordance with CBCSS UG Regulations 2019, in the University with effect from 2019 Admission onwards.

Orders are issued accordingly. (Syllabus appended)

Biju George K

Assistant Registrar

To

The Principals of all Affiliated Colleges

Copy to: PS to VC/PA to PVC/ PA to Registrar/PA to CE/JCE I/JCE IV/JCE VIII/EX and EG Sections/GA I F/CHMK Library/Information Centres/SF/DF/FC

Forwarded / By Order

Section Officer

# **UNIVERSITY OF CALICUT**

## **B.Sc. GEOGRAPHY CORE AND COMPLEMENTARY PROGRAMMES**

### **STRUCTURE, SCHEME and SYLLABUS**

## **2019 Admission Onwards**

## B.Sc. DEGREE PROGRAMME (GEOGRAPHY CORE)

### COURSE STRUCTURE

Seme ster	Course Code	Course Title	Instructional hours		Credit	Maximum Marks <sup>^</sup>
			Total	Per Week		
<b>I</b>	A01	Common Course I – English	72	4	3	75
	A02	Common Course II – English	90	5	3	75
	A07	Common Course III – Language other than English	72	4	4	100
	GRY1B01	Core Course I-Fundamentals of Geomorphology	36	2	3	75
		Core Course Practical I - Representation of Geographical Data and Weather Map Analysis	36	2	*#	
	GRY1C01.1	Complementary I- Development of Geographical Thought	36	2	2	75
		Complementary I- Practical I - Resource Mapping Techniques.	36	2	*#	
		Complementary II	72	4	3	75
	EO1	Environment Studies	-	-	4**	
					<b>18</b>	<b>475</b>
<b>II</b>	A03	Common Course IV – English	72	4	4	100
	A04	Common Course V – English	90	5	4	100
	A08	Common Course VI – Language other than English	72	4	4	100
	GRY2B02	Core Course II – Process Geomorphology	36	2	3	75
		Core Course Practical I - Representation of Geographical Data and Weather Map Analysis	36	2	*#	
	GRY2C01.2	Complementary I - Soil Geography	36	2	2	75
		Complementary I, Practical I - Resource Mapping Techniques.	36	2	*#	
		Complementary II	72	4	3	75
	EO2	Disaster Management	-	-	4**	
				<b>20</b>	<b>525</b>	
<b>III</b>	A 05	Common Course VI – English	90	5	4	100
	A 09	Common Course VIII - Language other than English	90	5	4	100
	GRY3B03	Core Course III - Climatology	36	2	4	100
		Core Course Practical I- Representation of Geographical Data and Weather Map Analysis	72	4	*#	
	GRY3C01.3	Complementary I- Geography of Water Resource	36	2	2	75
		Complementary I- Practical I - Resource Mapping Techniques.	36	2	*#	
		Complementary II	90	5	3	75
	EO3	Human Rights/Intellectual Property Rights/Consumer protection <sup>#</sup>			4**	
				<b>17</b>	<b>450</b>	
<b>IV</b>	A06	Common Course IX – English	90	5	4	100
	A10	Common Course X - Language other than English	90	5	4	100

	GRY4B04	Core Course IV – Oceanography	54	2	3	75	
	GRY4B01(P)	Core Course Practical I- Representation of Geographical Data and Weather Map Analysis	72	4	4	100	
	GRY4C01.4	Complementary I- Introduction to Disaster Management	36	2	2	75	
	GRY4C01(P)	Complementary -I, Practical I - Resource Mapping Techniques.	36	2	4	100	
		Complementary II	72	5	3	75	
	E04	Gender Studies/Gerontology <sup>#</sup>			4 <sup>**</sup>		
					<b>24</b>	<b>625</b>	
V	GRY5B05	Core Course V– Human Geography	36	2	4	100	
	GRY5B06	Core Course VI - Cartography	36	2	3	75	
	GRY5B07	Core Course VII- Introduction to Geoinformatics	36	2	3	75	
	GRY5B08	Core Course VIII-Methodology of Geographical Studies	36	2	3	75	
	Open Course	GRY5D01	Physical Geography	54	3	3	75
		GRY5D02	Geography of India				
		GRY5D03	Fundamentals of Remote Sensing				
			Core Course Practical II-Map Projections and Geoinformatics	108	6	***	
			Core Course Practical III- Topographic Map Analysis and Surveying	108	6	***	
		Course Project	36	2	***		
					<b>16</b>	<b>400</b>	
VI	GRY6B09	Core Course IX – World Regional and Economic Geography	36	2	3	75	
	GRY6B10	Core Course X – General Geography of India	36	2	3	75	
	GRY6B11	Core Course XI- Geographical Appraisal of Kerala	36	2	3	75	
	Core Course XII (Elective)	GRY6B12E1	Models in Geography	54	3	3	75
		GRY6B12E2	Biogeography				
		GRY6B12E3	Cultural Geography				
	GRY6B02(P)	Core Course Practical II-Map Projections and Geoinformatics	108	6	5	100	
	GRY6B03(P)	Core Course Practical III- Topographic Map Analysis and Surveying	108	6	5	100	
	GRY6B(PR)	Course Project	36	2	2	100	
	GRY6B(TR/FS)	Tour Report*/Field Survey	36	2	1	25	
					<b>25</b>	<b>625</b>	
					<b>Total</b>	<b>120</b>	
						<b>3100</b>	

\*Study Tour Report to be evaluated during final semester

<sup>#</sup> Colleges can opt any one of the courses.

\*\*Audit Course

<sup>#</sup> Evaluation in IV Semester

\*\*\*Evaluation in VI Semester

^Internal (20% of total) External (80% of Total)

**CREDIT DISTRIBUTION FOR COMMON, CORE, COMPLEMENTARY & OPEN COURSES OF  
B.SC. GEOGRAPHY PROGRAMME**

Semester	Common Course		Core Course		Complementary Course			Open Course	Total
	English	Language	Theory	Practical	Theory	Statistics			
						Practical			
I	3+3	4	3		2		3		18
II	4+4	4	3		2		3		20
III	4	4	4		2		3		17
IV	4	4	3	4	2	4	3		24
V			4+3+3+3					3	16
VI			3+3+3+3	5+5+2*+1**					25
<b>Total</b>	<b>22</b>	<b>16</b>	<b>38</b>	<b>17</b>	<b>8</b>	<b>4</b>	<b>12</b>	<b>3</b>	<b>120</b>
<b>* Project; ** Tour Report</b>									

## CORE COURSE CREDIT AND MARKS DISTRIBUTION FOR EACH SEMESTER

Semester	Course Code	Course Title	Credit	Max Marks <sup>^</sup>	
<b>I</b>	GRY1B01	Core Course I-Fundamentals of Geomorphology	3	75	
		Core Course Practical I - Representation of Geographical Data and Weather Map Analysis	*		
<b>II</b>	GRY2B02	Core Course II – Process Geomorphology	3	75	
		Core Course Practical I - Representation of Geographical Data and Weather Map Analysis	*		
<b>III</b>	GRY3B03	Core Course III - Climatology	4	100	
		Core Course Practical I- Representation of Geographical Data and Weather Map Analysis	*		
<b>IV</b>	GRY4B04	Core Course IV – Oceanography	3	75	
	GRY4B01(P)	Core Course Practical I- Representation of Geographical Data and Weather Map Analysis	4	100	
<b>V</b>	GRY5B05	Core Course V – Human Geography	4	100	
	GRY5B06	Core Course VI - Cartography	3	75	
	GRY5B07	Core Course VII- Introduction to Geoinformatics	3	75	
	GRY5B08	Core Course VIII - Methodology of Geographical Studies	3	75	
		Core Course Practical II-Map Projections and Geoinformatics	*		
		Core Course Practical III- Topographic Map Analysis and Surveying	*		
		Course Project	*		
<b>VI</b>	GRY6B09	Core Course IX – World Regional and Economic Geography	3	75	
	GRY6B10	Core Course X – General Geography of India	3	75	
	GRY6B11	Core Course XI- Geographical Appraisal of Kerala	3	75	
	Core Course (Elective)	GRY6B12(E1)	Models in Geography	3	75
		GRY6B12(E2)	Biogeography		
		GRY6B12(E3)	Cultural Geography		
	GRY6B02(P)	Core Course Practical II-Map Projections and Geoinformatics	5	100	
	GRY6B03(P)	Core Course Practical III- Topographic Map Analysis and Surveying	5	100	
	GRY6B(PR)	Course Project	2	100	
	GRY6B(FS/TR)	Tour Report*/Field Survey	1	25	
	<b>total</b>	<b>55</b>	<b>1375</b>		

<sup>^</sup> Internal (20% of total) External (80% of Total)

## COMPLEMENTARY COURSE

### CREDIT AND MARKS DISTRIBUTION FOR EACH SEMESTER

Semester	Course Code	Course Title	Credit	Marks <sup>^</sup>
I	GRY1C01.1	Complementary I- Development of Geographical Thought	2	75
		Complementary I- Practical I - Resource Mapping Techniques.	*#	
		Complementary II	3	75
II	GRY2C01.2	Complementary I - Soil Geography	2	75
		Complementary I, Practical I - Resource Mapping Techniques.	*#	
		Complementary II	3	75
III	GRY3C01.3	Complementary I- Geography of Water Resource	2	75
		Complementary I- Practical I - Resource Mapping Techniques.	*#	
		Complementary II	3	75
IV	GRY4C01.4	Complementary I- Introduction to Disaster Management	2	75
	GRY4C01(P)	Complementary -I, Practical I - Resource Mapping Techniques.	4	100
		Complementary II	3	75
			<b>24</b>	<b>700</b>

\*# Evaluation in IV Semester ^ Internal (20% of total) External (80% of Total)

## CORE COURSE THEORY- EVALUATION SCHEME

### COURSE EVALUATION

The evaluation scheme for each course shall contain two parts

- 1) Internal assessment
- 2) External Evaluation

20% weight shall be given to the internal assessment. The remaining 80% weight shall be for the external evaluation.

#### 1. INTERNAL EVALUATION

20% of the total marks in each course are for internal evaluation. The Colleges shall send only the marks obtained for internal examination to university.

**Table : Components of Evaluation – Split of Marks for Test Papers**

Sl. No.	Components	Marks	%
1	Attendance	4	20
2	Test Papers: I & II	4 + 4	40
3	Assignment	4	20
4	Seminar / Viva	4	20
<b>Total</b>		<b>20</b>	<b>100</b>

#### 2. EXTERNAL EVALUATION

External evaluation carries 80% of marks. All question papers shall be set by the University. The external question papers may be of uniform pattern with 80/60 marks.



## QUESTION PAPER TYPES AND MARK DISTRIBUTION

### QUESTION PAPER TYPE 1

**Scheme of Examinations:** The external QP with 80 marks and internal examination is of 20 marks. Duration of each external examination is 2.5 Hrs. The pattern of External Examination is as given below. The students can answer all the questions in Sections A&B. But there shall be Ceiling in each section.

	Type of Questions	Maximum Marks	Total Number of Questions	Total Marks
<b>Section A</b>	Short answer type	2 marks each	10	20
<b>Section B</b>	Paragraph/ Problem type	5 marks each	8	40
<b>Section C</b>	Essay type	10 marks each	(2 out of 4) 2x10	20
<b>Total Marks</b>				<b>80</b>

### QUESTION PAPER TYPE 2

**Scheme of Examinations:** The external QP with 60 marks and internal examination is of 15 marks. Duration of each external examination is 2 Hrs. The pattern of External Examination is as given below. The students can answer all the questions in Sections A & B. But there shall be Ceiling in each section.

	Type of Questions	Maximum Marks	Total Number of Questions	Total Marks
<b>Section A</b>	Short answer type	2 marks each	10	20
<b>Section B</b>	Paragraph/ Problem type	5 marks each	6	30
<b>Section C</b>	Essay type	10 marks	(1out of 2) 1x10	10
<b>Total Marks</b>				<b>60</b>

## CORE COURSE PRACTICAL: EVALUATION SCHEME

20% of the total marks in each course are for internal evaluation. The colleges shall send only marks obtained for internal examination to the university.

**Table : Internal Evaluation – Subdivision of Marks**

Sl.No	Components of Evaluation	Marks	%
1	Attendance	4	20
2	Test Papers I & II	4 + 4	40
3	Viva	4	20
4	Practical Record	4	20
<b>Total</b>		<b>20</b>	<b>100</b>

**Table : External Evaluation – Subdivision of Marks**

Sl.No	Components of Evaluation	Marks	%
1	Practical Exam	72	90
2	Practical Record	08	10
<b>Total</b>		<b>80</b>	<b>100</b>

## CORE COURSE PROJECT: EVALUATION SCHEME

Project evaluation will be conducted at the end of sixth semester. Evaluation of the Project Report shall be done under Mark System.

The evaluation of the project will be done at two stages:

- a) Internal Assessment (supervising teachers will assess the project and award internal marks)
- b) External evaluation (external examiner appointed by the University)
- c) Grade for the project will be awarded to candidates, combining the internal and external marks.

The internal to external components is to be taken in the ratio 1:4.

**Assessment of different components may be taken as below.**

Components	Internal (20% of total)	External (80% of Total)	Total	Components
Originality	4	16	20	Relevance of the Topic, Statement of Objectives
Methodology	4	16	20	Reference/ Bibliography, Presentation, quality of Analysis/ Use of Statistical Tools.
Scheme/ Organisation of Report	6	24	30	Findings and recommendations
Viva voce	6	24	30	Viva voce
<b>Total</b>	<b>20</b>	<b>80</b>	<b>100</b>	

## STUDY TOUR

**Study Tour:** Visit to places/locations of Geographical significance in India with halt not exceeding seven days. The visits can also be split into two or three spells of field visits. Every Student has to submit individual study tour report describing the geographical learning and experiences accompanied by maps, diagrams and photographs.

**Table 1: External Evaluation**

<b>Sl. No.</b>	<b>Components of Evaluation</b>	<b>Marks</b>
1	Tour Report / Field Survey Report*	25
	<b>Total</b>	<b>25</b>

*\*Study tour is compulsory and part of curriculum. Under unavoidable circumstances, in case a student is unable to participate in study tour he/she has to take a short term field survey and submit a report.*

## CREDIT AND MARKS DISTRIBUTION FOR EACH COURSE

Sl. No.	Course	Credit	Marks
1	English	22	550
2	Additional Language	16	400
3	Core course: Geography	55	1375
4	Complementary course I: Geography	12	400
5	Complementary course II: Statistics	12	300
6	Open Course	03	75
<b>Total</b>		<b>120</b>	<b>3100</b>

## TEN POINT INDIRECT GRADING SYSTEM

% of Marks (Both Internal & external put together)	Grade	Interpretation	Grade Point Average	Range of Grade points	Class
95 and above	O	Outstanding	10	9.5 - 10	First Class with distinction
85 to below 95	A <sup>+</sup>	Excellent	9	8.5 - 9.49	
75 to below 85	A	Very good	8	7.5 – 8.49	
65 to below 75	B <sup>+</sup>	Good	7	6.5 – 7.49	First Class
55 to below 65	B	Satisfactory	6	5.5 – 6.49	Second Class
45 to below 55	C	Average	5	4.5 – 5.49	
35 to below 45	P	Pass	4	3.5 – 4.49	Third class
Below 35	F	Failure	0	0	Fail
Incomplete	I	Incomplete	0	0	Fail
Absent	Ab	Absent	0	0	Fail

**UNDERGRADUATE PROGRAMME IN GEOGRAPHY  
(B.Sc. Geography)**

**SYLLABUS**

**CORE COURSES**

# UNDERGRADUATE PROGRAMME IN GEOGRAPHY (B.Sc. Geography)

## SYLLABUS

### SEMESTER I

#### GRY1B01 FUNDAMENTALS OF GEOMORPHOLOGY

Instruction Hours: TWO hours / Week

Credit: 3

Module	Theme	Contents
1	<b>Origin and Interior of The Earth</b>	<ul style="list-style-type: none"><li>• Introduction to Physical Geography, Terminologies and Definitions.</li><li>• Scope, Content and trends in Physical geography.</li><li>• Origin of Earth - Explanation through Nebular, Planetesimal, Binary Star &amp; Tidal theories.</li><li>• Basic Concepts - (uniformitarianism, Geologic Structure, Geomorphic Processes, Geomorphic Stage, Relief, Complexity of Geomorphic Evolution, Pleistocene Climate, Appreciation of World Climates, Historical Extensions)</li><li>• Forces and Earth Movements. - Emphasis on Endogenetic forces.</li><li>• Geological Time Scale (GTS).</li></ul>
2	<b>Continental Drift</b>	<ul style="list-style-type: none"><li>• Structure and Interior of Earth.</li><li>• Tetrahedral Theory - Critical Evaluation.</li><li>• Continental Drift Theory - Critical Evaluation.</li><li>• Developments leading to Plate tectonics - Convection Current, Sea Floor Spreading, Palaeomagnetism.</li></ul>
3	<b>Plate Tectonics &amp; Volcanism</b>	<ul style="list-style-type: none"><li>• Theory of Plate Tectonics - Geometric and Kinematic parts.</li><li>• Evidences of Plate Movement.</li><li>• The Driving Mechanism.</li><li>• Critical Evaluation of the Theory of Plate Tectonics.</li><li>• Volcanism</li></ul>
4	<b>Plate Tectonics and Mountain Building</b>	<ul style="list-style-type: none"><li>• Mountain building Processes.</li><li>• The Geosynclinal theory.</li><li>• Fold Mountain Orogeny and Plate Tectonics.</li><li>• Orogeny and Continental Accretion.</li><li>• Volcanic Island Arcs</li></ul>
5	<b>Plate Tectonics and Earthquakes</b>	<ul style="list-style-type: none"><li>• Origin and Evolution of Earth's Crust.</li><li>• Isostasy.</li><li>• Earthquakes and Plate Tectonics.</li><li>• Factors controlling Landform Development.</li></ul>

## REFERENCES

### 1. Web Resources

- a. <http://www.physicalgeography.net/>
- b. [http://en.wikipedia.org/wiki/Physical\\_geography](http://en.wikipedia.org/wiki/Physical_geography)
- c. <http://www.geography-site.co.uk/pages/physical.html>
- d. <http://ppg.sagepub.com/>
- e. [http://www.earthonlinemedia.com/ebooks/tpe\\_3e/contents.html](http://www.earthonlinemedia.com/ebooks/tpe_3e/contents.html)

### 2. Suggested Readings

#	Book Name	Author
1	Introduction to Physical Geography	Arthur N Strahler
2	Physical Basis of Geography	Woolridge & RS Morgan
3	The Earth, its origin & physical composition	H Jeffrey
4	Physical Geography	F J Monkhouse
5	Physical Geography	Lake P
6	Physical Geography	Morris Davis
7	Elements of Geography	Finch & Trewartha

# UNDERGRADUATE PROGRAMME IN GEOGRAPHY (B.Sc. Geography)

## SYLLABUS

### SEMESTER II

#### GRY2B02 PROCESS GEOMORPHOLOGY

Instruction Hours: TWO hours / Week

Credit: 3

Module	Theme	Contents
1	<b>Forces and Earth Movements</b>	<ul style="list-style-type: none"><li>• Introduction to Landforms -First, Second and Third order.</li><li>• Terminologies and Definitions.</li><li>• Forces and Earth Movements -Endogenetic, Exogenetic and Extra-terrestrial Processes</li><li>• Weathering and Erosion</li><li>• Erosion and Change in Slope.</li></ul>
2	<b>Landforms associated with Fluvial Action</b>	<ul style="list-style-type: none"><li>• Running water as agent of Erosion and deposition.</li><li>• Role of Geology &amp; Structure.</li><li>• Drainage System - Pattern.</li><li>• Erosional Landforms.</li><li>• Depositional Landforms.</li><li>• Stages of Erosion.</li><li>• Rejuvenation.</li><li>• Normal Cycle of Erosion - young, mature, old.</li></ul>
3	<b>Landforms associated with Groundwater and Wind</b>	<ul style="list-style-type: none"><li>• Action of Water in Karst Topography.</li><li>• Erosional &amp; Depositional Karst Landforms.</li><li>• Wind as an Agent of Erosion and Deposition.</li><li>• Erosional and Depositional Landforms by Wind Action.</li></ul>
4	<b>Coastal Landforms</b>	<ul style="list-style-type: none"><li>• Wave Action - Erosional and Depositional.</li><li>• Role of Current and Tides in Coastal Landforms.</li><li>• Types of Coastlines - Emerged, Submerged, Dalmatian, Ria and Fjord Coastlines.</li></ul>
5	<b>Landforms Associated with Glacial Action</b>	<ul style="list-style-type: none"><li>• Glacier Action.</li><li>• Types of Glaciers.</li><li>• Erosional and Depositional landforms.</li></ul>

## REFERENCES

### 1. Web Resources

- a. <http://www.physicalgeography.net/>
- b. [http://en.wikipedia.org/wiki/Physical\\_geography](http://en.wikipedia.org/wiki/Physical_geography)
- c. <http://www.geography-site.co.uk/pages/physical.html>
- d. <http://ppg.sagepub.com/>
- e. [http://www.earthonlinemedia.com/ebooks/tpe\\_3e/contents.html](http://www.earthonlinemedia.com/ebooks/tpe_3e/contents.html)



## 2. Suggested Readings

#	Book Name	Author
1	Introduction to Physical Geography	Arthur N Strahler
2	Physical Basis of Geography	Woolridge & RS Morgan
3	The Earth, its origin & physical composition	H Jeffrey
4	Physical Geography	F J Monkhouse
5	Physical Geography	Lake P
6	Physical Geography	Morris Davis
7	Elements of Geography	Finch & Trewartha
8	Principle of Geomorphology	Thornbury

# UNDERGRADUATE PROGRAMME IN GEOGRAPHY (B.Sc. Geography)

## SYLLABUS

### SEMESTER III

#### GRY3B03 CLIMATOLOGY

Instruction Hours: THREE hours / Week

Credit: 4

Module	Theme	Contents
1	<b>Weather and Climate</b>	<ul style="list-style-type: none"><li>• Climatology- branch of geography, Definition.</li><li>• Atmosphere- Significance, Composition and layered structure.</li><li>• Weather and Climate.</li><li>• Climatic elements- Insolation- Characteristics, Controlling factors.</li><li>• Temperature-controlling factors.</li><li>• Distribution- Horizontal and vertical.</li><li>• Heat budget.</li><li>• Measurement of temperature- Diurnal, Annual and Seasonal ranges of temperature.</li><li>• Temperature inversion.</li></ul>
2	<b>Atmospheric Pressure and Winds</b>	<ul style="list-style-type: none"><li>• Atmospheric pressure- Controlling factors.</li><li>• Distribution- Vertical, Horizontal.</li><li>• Surface Pressure belts- seasonal shifting and its effect.</li><li>• Winds- Controlling factors.</li><li>• Types of winds-planetary winds, Seasonal winds, Local winds</li><li>• Monsoons- Formation and characteristics.</li></ul>
3	<b>Humidity and Forms of Condensation</b>	<ul style="list-style-type: none"><li>• Humidity- Significance of water vapour.</li><li>• Relative humidity.</li><li>• Hydrologic cycle.</li><li>• Evaporation- controlling factors.</li><li>• Condensation-forms.</li><li>• Fog- formation and types.</li><li>• Clouds - Formation.</li><li>• significance to weather.</li><li>• Precipitation- formation and types.</li></ul>
4	<b>Air Masses, Fronts and Atmospheric Disturbances</b>	<ul style="list-style-type: none"><li>• Air masses- Definition.</li><li>• Source region, classification.</li><li>• Fronts-definition, formation, types.</li><li>• Atmospheric disturbances- cyclones, anticyclones and their characteristics.</li></ul>
5	<b>Climate Change</b>	<ul style="list-style-type: none"><li>• Human influence on climate;</li><li>• Air Pollution and Ozone depletion,</li><li>• Climatic Change - Greenhouse effect and Global warming</li></ul>

## REFERENCES

### 1. Web Resources

- a. <http://www.physicalgeography.net/>
- b. [http://en.wikipedia.org/wiki/Physical\\_geography](http://en.wikipedia.org/wiki/Physical_geography)
- c. <http://www.geography-site.co.uk/pages/physical.html>
- d. <http://ppg.sagepub.com/>
- e. [http://www.earthonlinemedia.com/ebooks/tpe\\_3e/contents.html](http://www.earthonlinemedia.com/ebooks/tpe_3e/contents.html)

### 2. Suggested Readings

#	Book Name	Author
1	Atmosphere, Weather and Climate	Barry R.G. and Chorley R.J
2	Climatology	Lal D.S
3	Introduction to Physical Geography	Strahler, A.N
4	Physical Geography	Lake Philip
5	General Climatology	Critchfield H
6	An Introduction to Climate, International (Student's edition)	Trewartha G.T.
7	Principles of Physical Geography	Dasgupta, A. and Kapoor A.N
8	The Climate of the Earth.	Lydolph, Paul, E

# UNDERGRADUATE PROGRAMME IN GEOGRAPHY (B.Sc. Geography)

## SYLLABUS

### SEMESTER IV

#### GRY4B04 OCEANOGRAPHY

Instruction Hours: TWO hours / Week

Credit: 3

Module	Theme	Contents
1	<b>Historical Review and Development of Oceanography</b>	<ul style="list-style-type: none"><li>• Geographer and Oceanography.</li><li>• Early Explorations and Development of Oceanography.</li><li>• Oceanography as a Systemic Science.</li><li>• Scope of learning Oceanography.</li><li>• Major Oceans - Distribution and extend of all Oceans and Marginal Seas.</li><li>• Oceanographic Institutions.</li><li>• Oceans; International Cooperation and Development challenges.</li></ul>
2	<b>Geomorphology of the Ocean Bottom and Ocean deposits</b>	<ul style="list-style-type: none"><li>• Origin of Earth's Oceans</li><li>• Ocean Bottom Topography - Pacific, Atlantic, Indian, Arctic Oceans.</li><li>• Plate Tectonic and Ocean Floor.</li><li>• Ocean Deposits.</li><li>• Coral Reefs - Types</li><li>• Theories of Coral formation.</li></ul>
3	<b>Physical and Chemical properties of Ocean water</b>	<ul style="list-style-type: none"><li>• Composition of Sea Water and its Salinity.</li><li>• Horizontal and Vertical Distribution of Salinity.</li><li>• Ocean water Temperature.</li><li>• Horizontal and Vertical Distribution of Temperature.</li><li>• Ocean Water Density and Distribution.</li><li>• Global Thermostatic effects.</li><li>• Climate Change and Sea level.</li></ul>
4	<b>Movements of Ocean Water</b>	<ul style="list-style-type: none"><li>• Waves.</li><li>• Tides.</li><li>• Ocean Currents.</li><li>• Upwelling and Downwelling.</li><li>• Thermohaline Circulation.</li><li>• El Nino and La Nina.</li><li>• Ocean Extremes - Tsunami.</li></ul>
5	<b>Resources of the oceans and International Cooperation</b>	<ul style="list-style-type: none"><li>• Physical Resources.</li><li>• Biological Resources.</li><li>• Marine Energy.</li><li>• Exclusive Economic Zone.</li><li>• United Nations and international Law of the Seas.</li><li>• Environmental Concerns - Oil Spleek, Waste Islands, Coastal pollution.</li></ul>

## REFERENCES

### 1. Web Resources

- a. <http://www.physicalgeography.net/>
- b. [http://en.wikipedia.org/wiki/Physical\\_geography](http://en.wikipedia.org/wiki/Physical_geography)
- c. <http://www.geography-site.co.uk/pages/physical.html>
- d. <http://ppg.sagepub.com/>
- e. [http://www.earthonlinemedia.com/ebooks/tpe\\_3e/contents.html](http://www.earthonlinemedia.com/ebooks/tpe_3e/contents.html)
- f. [http://oceanworld.tamu.edu/resources/ocng\\_textbook/PDF\\_files/book.pdf](http://oceanworld.tamu.edu/resources/ocng_textbook/PDF_files/book.pdf)

### 2. Suggested Readings

#	Book Name	Author
1	<b>Ocean Science</b>	Keith Stowe
2	Introduction To Physical Oceanography	Robert H. Stewart
3	Essentials of Oceanography	Alan P. Trujillo, Harold V. Thurman
4	Introduction to Physical Geography	A N Strahler
5	Essentials of Oceanography	Alan P Trujillo

# UNDERGRADUATE PROGRAMME IN GEOGRAPHY (B.Sc. Geography)

## SYLLABUS

### SEMESTER V

#### GRY5B05 HUMAN GEOGRAPHY

Instruction Hours: TWO hours / Week

Credit: 4

Module	Theme	Contents
1	<b>Foundation in Human Geography</b>	<ul style="list-style-type: none"><li>• Meaning ,Nature, Scope and content of Human Geography</li><li>• Principles of Human geography.</li><li>• Approaches of Human geography.</li><li>• Development of Human geography.</li></ul>
2	<b>Cultural Regions</b>	<ul style="list-style-type: none"><li>• Stages of Human development- Primitive culture- Hunting and Food gathering- Pastoral nomadism- subsistence farming- Industrial revolution- Technological Era.</li><li>• Major Races of the World and its distribution.</li><li>• Major Languages of the World and its distribution.</li><li>• Major Religions of the world and its distribution.</li><li>• Geographic Pattern of Culture- World cultural regions</li></ul>
3	<b>Man and Environment</b>	<ul style="list-style-type: none"><li>• Man-environment relations- Forms of Human adaptation to the environment- Cold region-Eskimos, Hot region-Bushmen, Plateau-Masai, Mountains-Nomads.</li></ul>
4	<b>Population</b>	<ul style="list-style-type: none"><li>• Population- World Distribution and Density</li><li>• Factors influencing spatial distribution of population- physical, economic and social</li><li>• Concepts of Over population, Under population, Optimum population, Zero population growth.</li><li>• Theories- Malthusian Theory.</li><li>• Demographic Transition model. Migration- Types- Internal and International.</li></ul>
5	<b>Geo-Politics</b>	<ul style="list-style-type: none"><li>• Frontiers and Boundaries- Heartland and Rimland Theories.</li><li>• India and its Neighbours</li></ul>

## REFERENCES

### 1. Web Resources

- a. <http://www.prb.org/>
- b. [http://en.wikipedia.org/wiki/Human\\_geography](http://en.wikipedia.org/wiki/Human_geography)
- c. <http://www.learner.org/resources/series85.html>
- d. <http://www.hugeog.com/>
- e. <http://phg.sagepub.com/>

## 2. Suggested Readings

#	Book Name	Author
1	Human Geography	Majid Husain
2	Human Geography	R.Jagannathan
3	Human Geography concepts and Issues	Vaishali Singh
4	Human Geography	S.K.Shelar
5	Human Geography	Peter Danils
6	Population Geography	K.Chakraworthy
7	Fundamentals of Human Geography	L.R.Singh
8	Human Migration a social phenomenon	AmalDatta
<b>Scientific Papers and Reports</b>		
1	Dudley Kirk, "Demographic Transition Theory," Population Studies, Vol. 50, No. (November) 1996), pp. 381-87.	
2	Population Reference Bureau, 2006 World Population Data Sheet, <a href="http://www.prb.org/pdf06/06WorldDataSheet.pdf">http://www.prb.org/pdf06/06WorldDataSheet.pdf</a> , pp. 5, 9.	

# UNDERGRADUATE PROGRAMME IN GEOGRAPHY (B.Sc. Geography)

## SYLLABUS

### SEMESTER V

#### GRY5B06 CARTOGRAPHY

Instruction Hours: TWO hours / Week

Credit:

3

Module	Theme	Contents
1	<b>History and Scope of Cartography</b>	<ul style="list-style-type: none"><li>• Meaning and Definition</li><li>• Overview - Historic Development of Cartography</li><li>• Nature and Scope of learning Cartography</li><li>• History of Maps</li><li>• Properties of Maps - Scale, Direction and Shape</li><li>• Institutions of Cartography</li><li>• Survey of India - The Great Trigonometric Survey</li></ul>
2	<b>Earth as a Cartographic Problem</b>	<ul style="list-style-type: none"><li>• Geodesy - Definition and Meaning</li><li>• Two Models of Earth - Mathematical (Spheroid) and Physical (Geoid)</li><li>• Datum - Horizontal and Vertical Datum</li><li>• Geographic and Projected Map Projections</li><li>• Role of Cartography and Geodesy in Spatial Data Infrastructure - National Spatial Data Infrastructure</li></ul>
3	<b>Classification of Maps</b>	<ul style="list-style-type: none"><li>• Classification of Maps</li><li>• Cartographic Coverage of The World</li><li>• Survey of India Maps Topographic Maps - Classification and Naming and Numbering Scheme</li><li>• Conventional Signs and Symbols Used by Survey of India</li></ul>
4	<b>Map Making Process</b>	<ul style="list-style-type: none"><li>• Map Making Processes</li><li>• Surveying - Geodetic and Plane Surveying, Remote Sensing, Aerial Photography and Global Positioning System</li><li>• Collection and Interpretation of Statistical Data</li><li>• Map Design and Layout</li><li>• Lettering and Toponymy</li><li>• Mechanics' of Map Construction</li></ul>
5	<b>Visualization</b>	<ul style="list-style-type: none"><li>• Terrain Mapping</li><li>• Mapping Weather and Climate Data</li><li>• Mapping Socio-economic Data</li><li>• Thematic Mapping</li><li>• Special Purpose Maps</li></ul>



## REFERENCES

### 1. Web Resources

- a. <http://www.ccs.neu.edu/course/is4800sp12/resources/qualmethods.pdf>
- b. <http://en.wikipedia.org/wiki/Cartography>
- c. <http://www.britannica.com/EBchecked/topic/97492/cartography>
- d. <http://www.geography.wisc.edu/histcart/>
- e. <http://www.incaindia.org/>
- f. [www.surveyofindia.gov.in](http://www.surveyofindia.gov.in)

### 2. Suggested Readings

#	Book Name	Author
1	Fundamentals of Cartography	Rameshwar Prasad Misra, A. Ramesh
2	The Mapmakers	John Noble Wilford
3	The Mapmakers	Mark S. Monmonier
4	Social Cartography: Mapping Ways of Seeing Educational Change	Timothy Scrase

# UNDERGRADUATE PROGRAMME IN GEOGRAPHY (B.Sc. Geography)

## SYLLABUS

### SEMESTER V

#### GRY5B07 INTRODUCTION TO GEOINFORMATICS

Instruction Hours: TWO hours / Week

Credit: 3

Module	Theme	Contents
<b>1</b>	<b>Foundation in GIS</b>	• Spatial Thinking in Geography.
		• History and Scope of GIS
		• Terminologies and their Use: - Understanding GI Science, GI Technology and GI System
		• Components of GIS.
		• GIS Communities: - Contributing Technologies.
		• Geographic and Projected coordinate systems
		• Importance of data quality
<b>2</b>	<b>Modeling Real world</b>	• Introduction modeling the real World.
		• Identifying Spatial Objects, Data Acquisition
		• Data Types and Models - Vector and Raster
		• Topology, Topology Rules, Non Topological Vector data
		• Raster Data - Elements of data model, Type of Raster data, Scale and Resolution, Data Compression
		• Metadata
<b>3</b>	<b>Foundation in Remote Sensing</b>	• History and Evolution of Remote Sensing
		• Scope of Remote Sensing
		• Electromagnetic Radiation (EMR) - Terms and Definitions, Laws of Radiation, EM Spectrum, Sources of EMR, Interaction between EMR and matter - Reflection, Absorption and Transmission, Interactions between EM Radiation and Atmosphere, Atmospheric windows
		• Spectral Reflectance - Vegetation, Soil and Water bodies
<b>4</b>	<b>Sensors and Platform</b>	• Remote Sensing Systems - Active and Passive Systems, Imaging and Non Imaging Systems,
		• Orbits and Platforms for Earth Observation
		• Concept of Resolutions in Remote Sensing - Spatial, Spectral, Radiometric and Temporal
		• Remote Sensing Satellites Series -LANDSAT, SPOT,IKONOS, NOAA, QUICKBIRD, GEOS, NIMBUS
		• Indian Remote Sensing Programme - IRS Satellites Series
<b>5</b>	<b>Applications of RS and GIS</b>	• Spatial Thinking - Fundamental Concepts of Geography and Geographic Analysis in GIS.
		• Application of Remote Sensing and GIS in Water Resources.
		• Application of Remote Sensing and GIS in Disaster Management.

## REFERENCES

### 1. Web Resources

#### a. Case Studies

##### i. Water Resources

- [http://en.wikipedia.org/wiki/GIS\\_and\\_hydrology](http://en.wikipedia.org/wiki/GIS_and_hydrology)
- [http://www.esri.com/industries/water\\_resources](http://www.esri.com/industries/water_resources)
- <http://pacewater.com/services/stormwater-management/gis-waterresource-hydraulics/>

##### ii. Disaster Management

- <http://www.osdma.org/ViewDetails.aspx?vchglinkid=GL024&vchplinkid=PL049>
- <http://www.geospatialworld.net/Paper/Application/ArticleView.aspx?aid=985>
- <http://www.esri.com/industries/public-safety/emergency-disaster-management/gis-used>
- <http://www.directionsmag.com/articles/analysis-which-gis-technology-to-use-for-disaster-management/332986>

#### b. Online references

- [http://en.wikipedia.org/wiki/List\\_of\\_geographic\\_information\\_systems\\_software](http://en.wikipedia.org/wiki/List_of_geographic_information_systems_software)
- <http://www.pasda.psu.edu/tutorials/gisbasics.asp>
- <https://www.youtube.com/user/GISTutorials>
- <http://hcl.harvard.edu/libraries/maps/gis/tutorials.cfm>
- <http://www.gistutor.com/>
- <http://www.startup.unigis.net>
- <http://www.training.esri.com>

#### c. Tools of the trade

- [http://bhuvan.nrsc.gov.in/bhuvan\\_links.php](http://bhuvan.nrsc.gov.in/bhuvan_links.php)
- Google Earth
- <https://maps.google.co.in/>
- <http://www.openstreetmap.org>
- <http://maps.bing.com>
- <http://explorer.arcgis.com>

### Web Resources (Remote Sensing)

- <http://www.itc.nl/~bakker/rs.html>
- [www.ccrs.nrcan.gc.ca/resource/tutor/fundam/index\\_e.php](http://www.ccrs.nrcan.gc.ca/resource/tutor/fundam/index_e.php)
- [rst.gsfc.nasa.gov/](http://rst.gsfc.nasa.gov/)
- <http://www.r-s-c-c.org/rscc/v1m1.html>
- [www.isprs.org](http://www.isprs.org)
- [www.spaceimaging.com](http://www.spaceimaging.com)
- [www.landsat.usgs.gov](http://www.landsat.usgs.gov)
- [www.spotimage.fr](http://www.spotimage.fr)
- [www.nrsa.gov.in](http://www.nrsa.gov.in)
- IRS 1C handbook: [http://www.euromap.de/docs/doc\\_013.html](http://www.euromap.de/docs/doc_013.html)
- IRS P6 Users handbook. [http://www.nrsa.gov.in/IRS\\_Documents/Handbook/Resourcesat-1\\_handbook\\_HTML](http://www.nrsa.gov.in/IRS_Documents/Handbook/Resourcesat-1_handbook_HTML)
- [asterweb.jpl.nasa.gov](http://asterweb.jpl.nasa.gov)

## 2. Suggested Readings

#	Book Name	Author
1	Remote Sensing and Image Interpretation	Lillesand Thomas M. & Kiefer Ralph
2	Introduction to Remote Sensing	Campbell John B
3	Remote Sensing and Principles and Image Interpretation	Floyd F. Sabins
4	Manual of Remote Sensing	-
5	Fundamentals of Remote Sensing	George Joseph
6	Computer Processing of Remotely sensed Images: An Introduction	Paul M. Mather
7	Geographic Information System and Science	Paul A Longley, M F Goodchild, D J Maguire, David W Rhind
8	Concepts And Techniques of Geographic Information Systems	Lo.C.P., Yeung. K.W. Albert
9	Principles of Geographical Information systems	Burrough P A P A McDonnell
10	An Introduction to Geographical Information Systems	Haywood.L, Comelius.S and S. Carver
11	Introduction to Geographic Information Systems	Chang,Kang-tsung

# UNDERGRADUATE PROGRAMME IN GEOGRAPHY (B.Sc. Geography)

## SYLLABUS

### SEMESTER V

#### GRY5B08 METHODOLOGY OF GEOGRAPHICAL STUDIES

Instruction Hours: TWO hours / Week

Credit: 3

Module	Theme	Contents
1	<b>Geography as a Science</b>	<ul style="list-style-type: none"><li>• Geography as a Science.</li><li>• Approaches to the study of Geography- Systematic and Regional, Environmental and Humanistic.</li><li>• Four traditions in Geography- Earth Science tradition, Man -land tradition, Spatial tradition and Area studies tradition.</li></ul>
2	<b>Models and Paradigms</b>	<ul style="list-style-type: none"><li>• Data, Information and knowledge.</li><li>• Types of Knowledge- Practical, Theoretical, and Scientific knowledge.</li><li>• Science &amp; Its characteristics.</li><li>• Fact, concept, hypothesis, theories, laws, and Models in the geographical explanation.</li><li>• Paradigms in geography.</li></ul>
3	<b>Data Collection</b>	<ul style="list-style-type: none"><li>• Identification of problems from Local geography- Field work- Data collection- primary data</li><li>• Methods of collection - Observation methods, interview, Schedules and Questionnaire and case study method-Secondary data -Published and unpublished sources - Selection of appropriate methods for data collection - problems in data collection</li></ul>
4	<b>Sampling</b>	<ul style="list-style-type: none"><li>• Sampling- purposes and principles of sampling-key terms in sampling.</li><li>• Population, sample, sampling frame, sampling estimate and sampling error- Types of sampling- Probability sampling.</li><li>• Simple random sampling, stratified, systematic, multi-stage, and cluster sampling-Non probability sampling- incidental, purposive, quota, and judgment sampling</li></ul>
5	<b>Geographical Analysis</b>	<ul style="list-style-type: none"><li>• Methods of Geographical analysis- Data analysis - Tabulation, Representation, Diagrams, Thematic Maps, role of Hypothesis, Interpretation, Generalization.</li><li>• Preparation of Report -Layout ,and Types of report.</li><li>• Reference.</li><li>• Bibliography.</li></ul>

## REFERENCES

### 1. Web Resources

- a. <http://www.ccs.neu.edu/course/is4800sp12/resources/qualmethods.pdf>
- b. <http://www.st-andrews.ac.uk/~dib2/science.html>
- c. [http://web.natur.cuni.cz/geografie/vzgr/monografie/modelling/modelling\\_dostal2.pdf](http://web.natur.cuni.cz/geografie/vzgr/monografie/modelling/modelling_dostal2.pdf).
- d. <http://118.97.161.124/perpus-fkip/Perpustakaan/Geography/Metodologi/Metode%20Penelitian%20Geografi.pdf>

### 2. Suggested Readings

#	Book Name	Author
1	Geography - A Modern Synthesis	P. Haggett
2	Geography as a fundamental research discipline	Ackerman -
3	Explanation in Geography	Harvey D
4	Science in Geography Series 1-4	McCullagh
5	Qualitative Research Methods in Human Geography	Iain Hay
6	Handbook of Qualitative Research	Denzin NK, Lincoln YS
7	Research into Social Issues: Methodological Guidelines	Nkwi P, Nyamongo I, Ryan G. Field
8	<i>Nature of Geography: A Critical Survey of Current Thought in the Light of the Past,</i>	Richard Hartshorne
9	The Production of Space.	Henri Lefebvre's
10	Perspective on the Nature of Geography	Hartshorne R
11	Changing nature of Geography	Minshell R
12	Maps and Diagrams	Monkhouse FJ, Wilkinson
<b>Journal</b>		
1	Journal of Geography	

# UNDERGRADUATE PROGRAMME IN GEOGRAPHY (B.Sc. Geography)

## SYLLABUS

### SEMESTER VI

#### GRY6B09 WORLD REGIONAL AND ECONOMIC GEOGRAPHY

Instruction Hours: TWO hours / Week

Credit: 3

Module	Theme	Contents
1	<b>World Regions</b>	Nature and Scope of World Regional Geography - Concept of Region and Types - Natural, Cultural and Functional Regions, Geography and Regional studies. Major Natural regions in Tropical and Temperate Regions: Tropical Rainforests, Tropical Wet and Dry Regions, Tropical Deserts, Mediterranean Region, Temperate Grasslands, Taiga and Tundra.
2	<b>Economic Geography</b>	Economic Geography:- Definitions, Nature, Scope And Recent Trends. Basis of economic processes- Production, exchange and consumption. Classification of economic activities.
3	<b>Agriculture</b>	Agriculture: Agriculture systems of the world- Von Thunen's Model of Agricultural Land Use Distribution and production of Wheat, Cotton, Sugarcane, Tea, Coffee and Jute- Marine resources and Fishing grounds- Animals resources and Grazing grounds.
4	<b>Industries</b>	Theories of Industrial Location- Weber and Losch. Minerals and industries- World distribution and Production of minerals-Iron Ore, Bauxite, Copper-Energy Resources-Coal, Petroleum, Atomic minerals, Hydrel-industries- Industries-Iron and steel and Textiles-Transportation-Railways, Inland Waterways, Sea routes and Airways.
5	<b>Resource Geography and Sustainable Development</b>	Meaning and Significance of resources- Classification of resources. Resource conservation-Concept of Sustainable development- Sustainable environment-Sustainable Agriculture-Sustainable Industry-Sustainable Development approaches.

## REFERENCES

### 1. Web Resources

- [http://www.earthonlinemedia.com/ebooks/tpe\\_3e/contents.html](http://www.earthonlinemedia.com/ebooks/tpe_3e/contents.html)
- [http://en.wikipedia.org/wiki/Regional\\_geography](http://en.wikipedia.org/wiki/Regional_geography)
- <http://www.saylor.org/site/textbooks/World%20Regional%20Geography.pdf>
- <http://www.saylor.org/courses/geog101/>

## 2. Suggested Readings

#	Book Name	Author
1	World Regional Geography	Oliver H Heitzelman & Richard M Highsmith J R
2	e-Study Guide for: Fundamentals of World Regional Geography	Joseph Hobbs
3	The World Today: Concepts and Regions in Geography	H. J.De Blij and Peter O. Muller
4	Geography of the World's Major Regions	John Peter Cole
5	Temperate and Boreal Rainforests of the World: Ecology and Conservation	Dominick A. DellaSala
6	Certificate Physical and Human Geography	Goh Cheng Leong
7	World Regional Geography	Joseph Hobbs
8	The World Today: Concepts and Regions in Geography	H. J.DeBlij and Peter O. Muller, et. al.
9	Human and Economic Geography'	Leong G C and Morgan G C
10	Economic Geography: A Study of Resources'	Roy Prithwish
11	Economic Geography'	Hartshorne T A, Alexander J W,
12	Principles of Economic Geography'	Huntington
13	Economic Geography'	Jones and Drakenwald



# UNDERGRADUATE PROGRAMME IN GEOGRAPHY (B.Sc. Geography)

## SYLLABUS

### SEMESTER VI

#### GRY6B10 GENERAL GEOGRAPHY OF INDIA

Instruction Hours: TWO hours / Week

Credit: 3

Module	Theme	Contents
1	<b>Unity in Diversity</b>	<ul style="list-style-type: none"><li>• India - location and its strategic significance.</li><li>• A land of unity in diversity.</li><li>• Physiographic regions.</li><li>• Drainage systems</li></ul>
2	<b>Climate, Vegetation and Soil</b>	<ul style="list-style-type: none"><li>• Indian climate- characteristics-factors influencing climate.</li><li>• Monsoons- formation and characteristics.</li><li>• El-Nino and La-Nina effect.</li><li>• Rainfall distribution.</li><li>• Western disturbance and seasons.</li><li>• Natural vegetation – types and distribution.</li><li>• Major soil types and distribution.</li><li>• Biogeographical Zones.</li></ul>
3	<b>Indian agriculture</b>	<ul style="list-style-type: none"><li>• Indian agriculture - salient features</li><li>• Production and distribution of major crops- Rice, Wheat, Cotton, Sugarcane, Tea and Coffee.</li><li>• Green revolution and its impacts, problems of Indian agriculture and their solution.</li><li>• Agricultural regions of India.</li></ul>
4	<b>Resources</b>	<ul style="list-style-type: none"><li>• Mineral resources -Metallic minerals- iron ore, manganese, bauxite. Non metallic minerals- mica, limestone and gypsum,</li><li>• Energy resources – Conventional and Non-Conventional</li><li>• Conservation of resources.</li></ul>
5	<b>Peopling India and Trade &amp; Transport</b>	<ul style="list-style-type: none"><li>• Population- growth, distribution, density, Problems.</li><li>• Transportation- Roadways, Railways, Waterways, and Airways.</li><li>• Foreign trade of India and its salient features.</li></ul>

#### REFERENCES

##### 1. Suggested Readings

#	Book Name	Author
1	India a Regional Geography	Singh R L
2	India, Pakistan & Celon	Spate O H K
3	India Year Book	Govt. of India
4	Gazatteer of India	Govt. of India
5	Geography of India	Gopal Singh
6	India-A Comprehensive Geography	Khullar, D

## UNDERGRADUATE PROGRAMME IN GEOGRAPHY (B.Sc. Geography)

### SYLLABUS

#### SEMESTER VI

#### GRY6B11 GEOGRAPHICAL APPRAISAL OF KERALA

**Instruction Hours: TWO hours / Week**

**Credit: 3**

<b>Module</b>	<b>Theme</b>	<b>Contents</b>
<b>1</b>	<b>Land and Climate</b>	<ul style="list-style-type: none"> <li>• Location- Absolute and relative.</li> <li>• Physiographic divisions.</li> <li>• Climate- Temperature and Rainfall distribution, Influence of Arabian Sea and Western Ghats.</li> <li>• Monsoons in Kerala - Distribution and Impact</li> <li>• Geology.</li> <li>• Soil types.</li> <li>• Drainage- Pattern, characteristics.</li> <li>• Major rivers basins.</li> <li>• Natural vegetation - Types and distribution</li> <li>• Biosphere Reserves, National Parks and Wildlife sanctuaries</li> </ul>
<b>2</b>	<b>Agriculture</b>	<ul style="list-style-type: none"> <li>• Agriculture- favourable conditions.</li> <li>• Irrigation- role of reservoirs.</li> <li>• Areas and production of paddy, coconut, rubber, tea, &amp; spices.</li> <li>• Problems of Kerala's agriculture - highlighting Urban and Infrastructure Development, its impact.</li> </ul>
<b>3</b>	<b>Resources</b>	<ul style="list-style-type: none"> <li>• Mineral resources-occurrence, distribution.</li> <li>• Rare earths and their distribution.</li> <li>• Power resources – Conventional and Non Conventional.</li> <li>• Marine resources – fisheries.</li> <li>• Problems in fishing sector.</li> </ul>
<b>4</b>	<b>Industries</b>	<ul style="list-style-type: none"> <li>• Overview of Industrial development in Kerala</li> <li>• Industries in Kerala: Locational factors and Limitation</li> <li>• Major industries - Cottage and small scale industries – SEZ;</li> <li>• IT Sector in Kerala -Opportunities for growth</li> <li>• Tourism Industry- Major tourist centers.</li> <li>• Problems and Prospects in Tourism Sector</li> </ul>
<b>5</b>	<b>Aspects of Population, Urbanization and Infrastructure Development</b>	<ul style="list-style-type: none"> <li>• Population- growth and distribution.</li> <li>• Structure- density, literacy, sex-ratio.</li> <li>• Occupational structure.</li> <li>• Migration and its impacts.</li> <li>• Urbanization- trend, major urban centres, Urban Development Programmes.</li> <li>• Transportation Network - Roads, Railways, Waterways and Airways and Mass Rapid Transport System (MRTS) in Cities of Kerala.</li> </ul>

## REFERENCES

### 1. Suggested Readings

#	Book Name	Author
1	Geography of Kerala	Dr. George Kurian
2	Economy of Kerala	Karunakaran and Sankaranarayanan
3	Resource Atlas of Kerala	CESS, Trivandrum
4	Gazetteer of Kerala	Govt. of Kerala
5	Geology of Kerala	Dr. K. Soman
6	Water Atlas of Kerala	CWRDM

**UNDERGRADUATE PROGRAMME IN GEOGRAPHY (B.Sc. Geography)**

**SYLLABUS**

**CORE COURSE**

**ELECTIVES**

# UNDERGRADUATE PROGRAMME IN GEOGRAPHY (B.Sc. Geography)

## SYLLABUS

### SEMESTER VI

#### GRY6B12E1 MODELS IN GEOGRAPHY

**Instruction Hours: THREE hours / Week**

**Credit:**

**3**

Module	Theme	Contents
1	<b>Model</b>	Definition, Properties, Uses, Functions, Classifications: -
		1. Natural Analogue System Model a) Historical Analogue b) Spatial Analogue model
		2. Physical System Model a) Hardware Model (i) Scale (Iconic) (ii) Analogue b) Mathematical Model (i) Deterministic (ii) Stochastic c) Experimental Design
		3. General System Model a) Synthetic b) Partial c) Black Box
2	<b>Theories</b>	Definition, Structure, Types :-
		Type I: Deductively Complete Theories Type II: Theories with Systematic Presupposition 1. Elliptical Formulation 2. Common Sense Presupposition
		Type III: Quasi - Deductive Theories 1. Inductive systematization 2. Incomplete Deductive Elaboration 3. Theories With Relative Primitives
		Type IV: Non - Formal Theories Verbal Explanations Pseudo-theories/ Speculative statements
3	<b>Models and Theories in Political Geography.</b>	Organic theory
		Mackinder's Heartland Theory
		Spykeman's Rimland Theory
4	<b>Geography of Wellbeing and Development Geography.</b>	Core Periphery Model
		Rostow's Stages of Economic Growth
		Wallersteins World System Theory
5	<b>Models in Urban Geography</b>	Concentric Zonation by Burgess,
		Hoyts Sector Model,
		Harris and Ullmans Multiple Nuclei Model
		G K Zipf's Rank Size Rule.

#### REFERENCES

##### 1. Web Resources

a. [http://ags.geography.du.ac.in/Study%20Materials\\_files/Lalita%20Rana\\_SC.pdf](http://ags.geography.du.ac.in/Study%20Materials_files/Lalita%20Rana_SC.pdf)

##### 2. Suggested Readings

#	Book Name	Author
1	Models in Geography	Chorley Richard J.&, Haggett P
2	Models in Geography	Majid Hussain
3	Modern Geographical Thought.	Peet, R
4	New Models in Geography	Richard Peet and Nigel Thrift
5	Economic and Social Geography	John Wareing and Richard Knowles

# UNDERGRADUATE PROGRAMME IN GEOGRAPHY (B.Sc. Geography)

## SYLLABUS

### SEMESTER VI

#### GRY6B12E2 - BIOGEOGRAPHY

Instruction Hours: THREE hours / Week

Credit:

3

Module	Theme	Contents
1	<b>Basic Principles</b>	<ul style="list-style-type: none"><li>• Biogeography- content and scope.</li><li>• Meaning of ecology, ecosystem, environment.</li><li>• Basic Ecological Principles.</li><li>• Darwin's theory of Evolution.</li></ul>
2	<b>Ecosystem</b>	<ul style="list-style-type: none"><li>• Concepts of Habitat, Biome, community, Ecotone and ecological niche.</li><li>• Biosphere and energy: Energy sources, energy flow, food chains and food webs.</li></ul>
3	<b>Biomes</b>	<ul style="list-style-type: none"><li>• Concept of biodiversity- Types of diversity- Species diversity, ecosystem diversity and genetic diversity.</li><li>• Hotspots; Biomes- definition, types.</li><li>• Major biomes- distribution and characteristics of i) forest biome, ii) grassland biome, iii) desert biome and iv) icecap biome.</li></ul>
4	<b>Conservation</b>	<ul style="list-style-type: none"><li>• Conservation of biodiversity- need for conservation;</li><li>• Causes for destruction- natural and manmade, effect on biodiversity due to global climatic change, desertification, deforestation, overgrazing, modern agriculture and industries.</li></ul>
5	<b>Conservation Methods</b>	<ul style="list-style-type: none"><li>• Conservation methods-national parks, sanctuaries, biosphere reserves and international laws.</li><li>• Biodiversity conservation strategies in India.</li><li>• Case Study</li></ul>

#### REFERENCES

##### 1. Web Resources

- a. <http://www.biogeography.org/>
- b. <http://en.wikipedia.org/wiki/Biogeography>
- c. <http://onlinelibrary.wiley.com/journal/10.1111/%28ISSN%291365-2699>

##### 2. Suggested Readings

#	Book Name	Author
1	Geography as a fundamental discipline	Ackerman E A
2	The Citizen's Fifth Report on Environment	CSE India
3	Biogeography	Brett R. Riddle, James H. Brown, Robert J. Whittaker, Mark V. Lomolino
4	Frontiers of Biogeography	Mark V. Lomolino, Lawrence R. Heaney
5	Biogeography Of Microscopic Organisms: Is Everything Small Everywhere?	Fontaneto

# UNDERGRADUATE PROGRAMME IN GEOGRAPHY (B.Sc. Geography)

## SYLLABUS

### SEMESTER VI

#### GRY6B12E3 CULTURAL GEOGRAPHY

**Instruction Hours: THREE hours / Week**

**Credit:**

**3**

Module	Theme	Contents
1	<b>Introducing Cultural Geographies</b>	• Definitions
		• Content and Scope of Cultural Geography
		• Nature and Culture
		• Cultural Realms
		• Cultural Hearth
		• Cultural Ecology
2	<b>Theoretical Intersections</b>	• Historical Materialism and Marxism
		• Feminisms
		• Poststructuralism
		• Psychoanalytic Approaches
		• Performance and Performativity: A Geography of Unknown Lands
3	<b>Culture and Identity</b>	• Nationalism
		• Critical 'Race' Approaches to Cultural Geography
		• Social Class
		• Sexuality
		• The Body
		• Consumption
4	<b>Cultural Landscapes</b>	• Economic Landscapes
		• Political Landscapes
		• Religious Landscapes
		• Landscapes of Home
		• Landscapes of childhood and Youth
		• Transnationalism
5	<b>Colonial and Post Colonial Geographies</b>	• Imperial Geographies
		• Post Colonial Geographies
		• Transnationalism

## REFERENCES

### 1. Suggested Readings

#	Book Name	Author
1	Handbook of Cultural Geography	Kay Anderson
2	Cultural Geographies: An Introduction	John Horton and Peter Kraftl
3	The Cultural Geography Reader	Timothy S Oakes
4	Doing Cultural Geography	Pamela Shurmer- Smith
5	Cultural Geography	Naula C Jhonson, Richard H Schein

**UNDERGRADUATE PROGRAMME IN GEOGRAPHY (B.Sc. Geography)**

**SYLLABUS**

**CORE PRACTICALS**



# UNDERGRADUATE PROGRAMME IN GEOGRAPHY (B.Sc. Geography)

## SYLLABUS

### CORE PRACTICAL I

#### GRY4B01 (P) REPRESENTATION OF GEOGRAPHICAL DATA AND WEATHER MAP ANALYSIS

No. of contact hours: 2hrs (1st &2nd Sem.), 4hrs (3rd &4th Sem.)/week

Credit: 4

Module	Contents
1	<ul style="list-style-type: none"><li>• Maps - classification - components - map preparation - Isopleths, Choropleth, chorochromatic and Choroshematic Map - using recent socio-economic data.</li></ul>
2	<ul style="list-style-type: none"><li>• Scales - Definition - Representation of scales - Plain, Diagonal, Comparative, Time scale &amp; Vernier Scale</li></ul>
3	<ul style="list-style-type: none"><li>• Direction- Latitude and Longitude-Time calculation - Longitude and time, IST and date line Grid of latitudes and longitudes and location of places on maps.</li><li>• Enlargement and Reduction (Mechanical or Graphical methods)</li><li>• Basin area or Administrative area measurement (Using planimeter or graphical method).</li></ul>
4	<ul style="list-style-type: none"><li>• Reading recording and analysis of data obtained from Barometer, Hygrometer and Maximum-minimum Thermometer.</li><li>• Weather map analysis<ol style="list-style-type: none"><li>a. Analysis and interpretation of pressure and wind system, temperature</li><li>b. Distribution, precipitation and sky condition</li><li>c. Preparation of weather maps of India for different seasons of the year</li><li>d. Drawing of isobaric patterns and associated weather- cyclone, e. anticyclone, ridge, trough, wedge, secondary depression, col.</li></ol></li></ul>
5	<ul style="list-style-type: none"><li>• Data Representation Using Spreadsheet: Arrangement into Ascending and Descending Order; Cartograms Construction of climatic &amp; statistical diagrams<ol style="list-style-type: none"><li>a. Line graph</li><li>b. Poly graph</li><li>c. Simple bar diagram</li><li>d. Compound bar diagram</li><li>e. Pie Diagram</li><li>f. Doughnut Chart</li><li>g. Band graph</li><li>h. Ergo graph</li><li>i. Pyramid diagram</li><li>j. Wind Rose diagram</li><li>k. Hythergraph</li><li>l. Taylors Climograph</li><li>m. Radar Diagram</li><li>n. Three dimensional Representation - Sten-de-Geer &amp; Stil Gen Baur Method</li></ol></li></ul>

# UNDERGRADUATE PROGRAMME IN GEOGRAPHY (B.Sc. Geography)

## SYLLABUS

### CORE PRACTICAL II

#### GRY6B02 (P) MAP PROJECTIONS AND GEOINFORMATICS

No. of contact hours: SIX hrs. (V Sem.) and SIX hrs. (VI Sem.) / Week

Credit: 5

Module	Contents
<b>Map Projections</b>	
1	<ul style="list-style-type: none"><li>i. Maps – grids of latitude and longitudes.</li><li>ii. The globe and maps – their merits and demerits.</li><li>iii. Developable and non-developable surfaces.</li><li>iv. Classification of map projections.</li><li>v. Types – Graphical construction – Properties and uses of :-<ul style="list-style-type: none"><li>a. Zenithal – Equi-distant &amp; Equal area projection – Gnomonic, Stereographic, Orthographic</li><li>b. Conical – Simple conical, Two standard parallel</li><li>c. Cylindrical – Equi-distant, Equal-area</li></ul></li></ul>
<b>Application of GIS and GPS</b>	
2	<ul style="list-style-type: none"><li>i. Capturing Location of a Place Using GPS;</li><li>ii. Georeferencing and Vectorization of a Map</li><li>iii. Creating Polygon, Network and TIN Topology table and diagram</li></ul>
3	Finding Attribute Values of a Raster (using Open Source Software)
4	Spatial Analysis - Buffer, Network and Overlay Preparing Thematic Map
<b>Interpretation of Remote Sensing data</b>	
5	<ul style="list-style-type: none"><li>i. Interpretation of Aerial Photograph</li></ul> Preparing Land use Map

# UNDERGRADUATE PROGRAMME IN GEOGRAPHY (B.Sc. Geography)

## SYLLABUS

### CORE PRACTICAL III

#### GRY6B03 (P) TOPOGRAPHIC MAP ANALYSIS AND SURVEYING

No. of contact hours: SIX hrs. (V Sem.) and SIX hrs. (VI Sem.) / Week

Credit: 5

Modules	Content
<b>Methods of relief representation.</b>	
1	a. Qualitative- hachure's, hill shading, layer tint b. Quantitative- contours, form lines, spot height, bench mark, triangulation station
<b>Representation of following features by contours</b>	
2	Representation of following features by contours- uniform slope, concave slope, convex slope, terraced slope, conical hill, plateau, ridge, V-shaped valley, U-shaped valley, waterfall cliff.  Concept of slopes - Gradient - Significance of Horizontal & vertical scales Calculation of gradient from topographic sheets. a. Identification of ground features using local area toposheet b. Measurement of Area by Graphical Method / Planimeter c. Construction of Profiles: Superimposed, Projected and Composite d. Stream Frequency and Drainage Density e. Average Slope (Wentworth's method) f. Interpretation of Relief, Drainage and Vegetation Characteristics g. Interpretation of Settlement, Transport and Communication Systems h. Relationship between Physical and Cultural Elements
<b>Surveying and Mapping</b>	
3	Preparation of plan - Chain and Tape Survey - Open traverse, closed traverse and area calculation
4	Plane Table Survey - Radiation and Intersection Methods - Prismatic Compass Survey - Open Traversing and Intersection Methods
5	Dumpy Leveling - Profile drawing Instruments & Determination of Height by Indian Clinometer

## REFERENCES

### 1. Suggested Readings

#	Book Name	Author
1	Elements of Practical Geography	R L Singh
2	Fundamentals of Cartography	Rameshwar Prasad Misra, A. Ramesh
3	Advanced Practical Geography	Pijushkanti Saha, Partha Basu

**UNDERGRADUATE PROGRAMME IN GEOGRAPHY (B.Sc. Geography)**

**SYLLABUS**

**COMPLEMENTARY COURSE**

**UNDERGRADUATE PROGRAMME IN GEOGRAPHY (B.Sc. Geography)**

**SYLLABUS**

**COMPLEMENTARY I**

**GRY1C01.1 - DEVELOPMENT OF GEOGRAPHICAL THOUGHT**

**No. of contact hours: TWO Hours / week**

**Credit: 2**

<b>Module</b>	<b>Theme</b>	<b>Contents</b>
<b>1</b>	<b>Introduction to Geography</b>	<ul style="list-style-type: none"><li>• Meaning and definition of Geography</li><li>• Nature and scope of Geography</li><li>• Approaches and themes in Geography</li><li>• Traditions in Geography</li></ul>
<b>2</b>	<b>Evolution of Geography - Ancient Period</b>	<ul style="list-style-type: none"><li>• Contribution of Greeks</li><li>• Contribution of Roman</li><li>• Contribution of Arabs</li><li>• Contribution of Indians</li></ul>
<b>3</b>	<b>Dichotomies in Geography</b>	<ul style="list-style-type: none"><li>• Determinism</li><li>• Possibilism</li><li>• Neo determinism</li><li>• Positivism</li><li>• Radicalism</li></ul>
<b>4</b>	<b>Quantitative Revolution and Spatial Thinking</b>	<ul style="list-style-type: none"><li>• Quantitative Revolution</li><li>• Kunh's Model of Scientific Revolution</li><li>• Concept of Spatial Thinking</li><li>• Evolution of Spatial Concept and theories</li></ul>
<b>5</b>	<b>Models in Geography</b>	<ul style="list-style-type: none"><li>• Models and modeling in Geography</li><li>• Typology of Models</li><li>• Systems Approach in Geography</li></ul>

**REFERENCES**

**1. Web Resources**

- <http://www.physicalgeography.net/fundamentals/1a.html>
- [http://en.wikipedia.org/wiki/History\\_of\\_geography](http://en.wikipedia.org/wiki/History_of_geography)
- <http://www.eolss.net/sample-chapters/c01/e6-14-01-01.pdf>
- <http://people.wku.edu/charles.smith/essays/SMITH89.htm>
- [http://meta-carto-semiotics.org/uploads/mcs\\_vol5\\_2012/MCS\\_Vol5\\_2012\\_Hess.pdf](http://meta-carto-semiotics.org/uploads/mcs_vol5_2012/MCS_Vol5_2012_Hess.pdf)
- [https://www.academia.edu/1824398/Spatial\\_Thinking](https://www.academia.edu/1824398/Spatial_Thinking)

## 2. Suggested Readings

#	Book Name	Author
1	Perspectives on Nature of Geography	Hartshone, R
2	Evaluation of Geographical thought	Husain, M
3	Philosophy and Human Geography	Johnston, R.J.;
4	The Arts and Science of Geography Integrated Readings	Dikshit, R. D
5	The Geography of Puranas	Ali, S.M
6	Spatial Organization : The Geographer's View of the world	Abler, Ronald; Adams, John S. Gould, Peter
7	Introduction to scientific Reasoning in Geography	Amedeo, Douglas
8	The future of Geography	Johnston, R. H
9	The Changing Nature of Geography	Mishull, R

**UNDERGRADUATE PROGRAMME IN GEOGRAPHY (B.Sc. Geography)**

**SYLLABUS**

**COMPLEMENTARY I**

**GRY2C01.2 - SOIL GEOGRAPHY**

**No. of contact hours: TWO Hours / week**

**Credits: 2**

<b>Module</b>	<b>Theme</b>	<b>Contents</b>
<b>1</b>	<b>Introduction to Soil Geography</b>	<ul style="list-style-type: none"><li>• Meaning, scope and content of soil geography</li><li>• Nature of soil Geography</li><li>• Relationship of Soil Geography with Pedology</li><li>• Significance of Soil Geography</li></ul>
<b>2</b>	<b>Formation and Properties of Soil</b>	<ul style="list-style-type: none"><li>• Factors influencing soil formation.</li><li>• Process of soil formation and development.</li><li>• Characteristics of soil profile</li><li>• Components of soil.</li><li>• Physical properties of soil - texture and structure.</li><li>• Chemical properties of soil - pH, Organic Matter, NPK and other soil properties.</li></ul>
<b>3</b>	<b>Soil classification</b>	<ul style="list-style-type: none"><li>• Soil classifications</li><li>• Zonal system of classification</li><li>• Comprehensive system of classification - Marbut's &amp; USDA</li><li>• Classification Soils of India</li><li>• Major soil groups in Kerala</li></ul>
<b>4</b>	<b>Soil erosion and Conservation</b>	<ul style="list-style-type: none"><li>• Soil erosion types - Mass Wasting</li><li>• Soil conservation and its importance</li><li>• Principles of soil conservation</li></ul>
<b>5</b>	<b>Soil Management</b>	<ul style="list-style-type: none"><li>• Concept of Soil Management</li><li>• Need of Soil Management</li><li>• Methods of Soil Management</li></ul>

**REFERENCES**

**1. Web Resources**

- a. <http://www.physicalgeography.net/fundamentals/10t.html>
- b. [http://en.wikipedia.org/wiki/Soil\\_science](http://en.wikipedia.org/wiki/Soil_science)
- c. <http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/survey/geo/>
- d. <http://www.iiss.nic.in/index.html>
- e. <http://www.nbsslup.in/>
- f. <http://www.pedosphere.com/resources.cfm#cssc>
- g. <http://www.fao.org/soils-portal/soil-survey/soil-classification/en/>

## 2. Suggested Readings

#	Book Name	Author
1	Geography And Soil Properties	Pitty A.F.
2	Introduction to The Principles And Practice of Soil Science	White R.E.
3	Soils - Process and Response	Fenwick I. M. and Knapp B.J
4	Soil And Geomorphology	Birkeland P.W
5	The Nature And Properties of Soils. Macmillan Publishing Company	Brady N.C
6	Geomorphology And Time	Thomas J.B. and Brunsden
7	Geography of Soil	Bunting B.T. (
8	Soil Geography, David and Charles	Cruickshank J.
9	Fundamentals of Soil Science	Foth H.D and Turk L.M
10	Soils : Their Properties and Management	Charman P.E.V and Murphy B.W



**UNDERGRADUATE PROGRAMME IN GEOGRAPHY (B.Sc. Geography)**

**SYLLABUS**

**COMPLEMENTARY I**

**GRY3C01.3 - GEOGRAPHY OF WATER RESOURCE**

**No. of contact hours: TWO Hours / week**

**Credits: 2**

<b>Module</b>	<b>Theme</b>	<b>Contents</b>
<b>1</b>	<b>Fundamentals of Water Resources</b>	<ul style="list-style-type: none"><li>• Meaning and Scope- What is Water and how it is a Resource?</li><li>• Scope - Geography of Water Resources</li><li>• Occurrences and Forms of Water &amp; Characteristics of Water</li><li>• Natural Water Cycle - Dynamics of Hydrological Cycle</li><li>• Components and Processes of Hydrological Cycle (Precipitation, Interception, Evapotranspiration, Infiltration, Run Off and Storage)</li><li>• Water in system of Soil, Vegetation and Atmosphere</li><li>• Heat balance and water budget</li></ul>
<b>2</b>	<b>World Distribution of Surface Water Resources - Surface Water</b>	<ul style="list-style-type: none"><li>• World Distribution of Surface Water Resources</li><li>• Types and Significance</li><li>• Watershed as a Geohydrological Unit, River/Drainage basin, Catchment Area</li><li>• Watershed as a planning unit and review IWMP</li><li>• Wetlands and their significance</li><li>• Surface water pollution and Environmental</li></ul>
<b>3</b>	<b>World Distribution of Surface Water Resources - Groundwater</b>	<ul style="list-style-type: none"><li>• Groundwater - Porosity and Permeability</li><li>• Water table, Saturated and unsaturated zones, Perched water table, Springs, Artisan Wells and Basins</li><li>• Aquifer (types and significance), Aquitard, Aquiclude</li><li>• Human dependence on Groundwater - Over extraction and Environmental issues</li></ul>
<b>4</b>	<b>Water conservation</b>	<ul style="list-style-type: none"><li>• Traditional water harvesting and management</li><li>• Rainwater harvesting</li><li>• Forest Management and Water conservation</li></ul>
<b>5</b>	<b>Governance and Management</b>	<ul style="list-style-type: none"><li>• Water and Climate Change</li><li>• Water conflicts - Between states and neighbouring countries</li><li>• Water Parliament (Alwar, Rajasthan) - A Case Study on participatory water management</li><li>• Interlinking of Rivers - India</li><li>• National Water Policy</li></ul>

## REFERENCES

### 1. Web Resources

- a. <http://video.nationalgeographic.com/video/env-freshwater-whycare>
- b. [http://en.wikipedia.org/wiki/Water\\_resources](http://en.wikipedia.org/wiki/Water_resources)
- c. <http://www.cwrddm.org/>
- d. <http://www.cwc.nic.in/>

### 2. Suggested Readings

#	Book Name	Author
1	Hydrology: Principles, Analysis and Design	Raghunath, H.M
2	Hydrology in Practice	Van Nostrand Reibhold
3	Modern Physical Geography	Strahler, A.A. and Strahler
4	Introduction to Hydrology	Viessman, W. and Lewis
5	Hydrology: An Introduction.	Wilfried, B.,
6	Handbook of Applied Hydrology	Chow, V.T

**UNDERGRADUATE PROGRAMME IN GEOGRAPHY (B.Sc. Geography)  
SYLLABUS**

**COMPLEMENTARY I**

**GRY4C01.4 - INTRODUCTION TO DISASTER MANAGEMENT**

**Instruction Hours: TWO hours / Week**

**Credit: 2**

<b>Module</b>	<b>Theme</b>	<b>Contents</b>
<b>1</b>	<b>Natural Hazards</b>	<ul style="list-style-type: none"> <li>• Introduction to Natural hazards.</li> <li>• Definitions.</li> <li>• Classification.</li> <li>• Impact on the environment and society.</li> <li>• Geography and Disaster Management (scope from Geographers perspective).</li> <li>• National and international Institutions.</li> <li>• An overview of Anthropogenic Disasters.</li> </ul>
<b>2</b>	<b>Geo-tectonic hazards</b>	<ul style="list-style-type: none"> <li>• Earthquakes.</li> <li>• Volcanoes.</li> <li>• Landslides.</li> <li>• Distribution, Vulnerability and Risk.</li> <li>• Consequences, Impact and Challenges.</li> <li>• Planning for Resilience.</li> </ul>
<b>3</b>	<b>Hydrological Extremes</b>	<ul style="list-style-type: none"> <li>• Introduction to Hydrological Extremes.</li> <li>• What are Floods?.</li> <li>• Describing Floods and Impact (how and why - including floods caused by geological activities like earthquake, landslides, volcanic activity and manmade).</li> <li>• Vulnerability &amp; risk (natural regions Perspective).</li> <li>• Describing Floods (with example of flood prone regions of India), Consequences.</li> <li>• Drought -Characteristics, Types.</li> <li>• Describing Droughts - (with example of drought prone regions of India).</li> <li>• Flood and Drought Mitigation.</li> <li>• Tropical Cyclones, Tsunami</li> <li>• Planning for Resilience.</li> </ul>
<b>4</b>	<b>Mitigation and Management</b>	<ul style="list-style-type: none"> <li>• Disaster Preparedness</li> <li>• Disaster Response and Disaster Management.</li> <li>• Rehabilitation, Reconstruction and Recovery</li> <li>• Risk Assessment and Vulnerability Analysis.</li> <li>• Community Awareness and Participation.</li> <li>• Role of Government - National Disaster Management Framework (India).</li> <li>• Role of voluntary organizations and Individuals.</li> </ul>
<b>5</b>	<b>Geo-information Technology and Disasters</b>	<ul style="list-style-type: none"> <li>• Predicting Natural Hazards and Technology</li> <li>• Applications of Remote Sensing</li> <li>• Applications of Global Positioning System</li> <li>• Applications of Geographic Information System.</li> <li>• Warning Systems.</li> <li>• Case Studies from India</li> </ul>

## REFERENCES

### 1. Web Resources

- a. [http://en.wikipedia.org/wiki/Emergency\\_management](http://en.wikipedia.org/wiki/Emergency_management)
- b. <http://www.wcpt.org/disaster-management/what-is-disaster-management>
- c. <http://www.ndmindia.nic.in/>
- d. <http://www.ndma.gov.in/en/>

### 2. Suggested Readings

#	Book Name	Author
1	Geographical Hazard	Majid Hussain
2	Environmental Education And Disaster Management	Pandey S K
3	Disaster Science And Management	Tushar Bhattacharya
4	Disaster Management Future Challenges and Opportunities	Jagbir Singh
5	Introduction to Environmental Impact Assessment	John Glasson

**UNDERGRADUATE PROGRAMME IN GEOGRAPHY (B.Sc. Geography)**

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**PRACTICAL**

**UNDERGRADUATE PROGRAMME IN GEOGRAPHY (B.Sc. Geography)**

**SYLLABUS**

**COMPLEMENTARY COURSE I**

**PRACTICAL I**

**GRY4C01 (P) RESOURCE MAPPING TECHNIQUES**

**No. of contact hours: TWO Hours / (I to IV Semester)/Week**

**Credit: 4**

<b>Modules</b>	<b>Content</b>
<b>1</b>	<ul style="list-style-type: none"><li>• Introduction Survey Methods</li><li>• Chain Survey- Open traverse and triangulation, Field Measurement Book preparation</li><li>• Resource Mapping - Manual cadastral mapping of local area resources (Field Work)<ul style="list-style-type: none"><li>a. Physical features</li><li>b. Cultural Features</li></ul></li></ul>
<b>2</b>	<ul style="list-style-type: none"><li>• Community Resource Mapping</li><li>• Preparation of Schedule /questionnaire</li><li>• Conducting survey (Field Work)</li><li>• Analyzing Data</li><li>• Preparing Thematic maps and diagrams</li><li>• Identifying community assets and resources</li></ul>
<b>3</b>	<ul style="list-style-type: none"><li>• Watershed demarcation</li><li>• Preparation of drainage map</li><li>• Stream order Classification - Strahler and Horton</li></ul>
<b>4</b>	<ul style="list-style-type: none"><li>• Recording groundwater data - (Field Work - well based water table measurement)</li><li>• Representing groundwater data using interpolation method</li><li>• Water Quality Analysis - (field Work - Ph, turbidity, Conductivity and BOD)</li><li>• Soil Sampling Methods</li></ul>
<b>5</b>	<ul style="list-style-type: none"><li>• Significance of Resource Mapping in Land Use Planning</li><li>• Local area land use Map preparation (final product of Module 1 exercises)</li></ul>

**REFERENCES**

**1. Web Resources**

- a. <http://www.nios.ac.in/media/documents/316courseE/E-JHA-30-10A.pdf>
- b. <http://mnre.gov.in/sec/solar-assmnt.htm>
- c. <https://openknowledge.worldbank.org>
- d. <http://www.bercyproject.org/Mobilization.aspx>
- e. [http://nrdms.gov.in/panchayat\\_level\\_resource.asp](http://nrdms.gov.in/panchayat_level_resource.asp)

## 2. Suggested Readings

#	Book / Report /Scientific Paper	Author
1	Panchayat Resource Mapping to Panchayat-level Planning in Kerala: An Analytical Study (can be downloaded from <a href="http://www.cds.ac.in/krpcds/publication/downloads/chatto.pdf">http://www.cds.ac.in/krpcds/publication/downloads/chatto.pdf</a> )	Srikumar Chattopadhyay, P. Krishna Kumar & K. Rajalekshmi
2	Participatory Natural Resources Mapping- A case study of Bhitara Panchayat in Banni Grassland, Kachchh, Gujarat (can be downloaded from <a href="http://www.cabi.org/isc/FullTextPDF/2011/2011)3189201.pdf">http://www.cabi.org/isc/FullTextPDF/2011/2011)3189201.pdf</a> )	J B Shah, A M Patel & P N Joshi
3	Standards For Bio-Geo Database Vol I & II	Nisha Mendiratta R Siva Kumar K S Rao
4	Application of GIS in decentralised planning - A free software approach. (can be downloaded from <a href="http://www.spc.tn.gov.in/SLUB_STUDIES_PDF/Study_11.pdf">http://www.spc.tn.gov.in/SLUB_STUDIES_PDF/Study_11.pdf</a> )	Jaisen. N.D. Centre for Ecological Sciences, IISc, Bangalore.

**UNDERGRADUATE PROGRAMME IN GEOGRAPHY (B.Sc. Geography)**

**SYLLABUS**

**OPEN COURSE**



**UNDERGRADUATE PROGRAMME IN GEOGRAPHY (B.Sc. Geography)**

**SYLLABUS**

**Semester V - OPEN COURSE**

**GRY5D01 PHYSICAL GEOGRAPHY**

**Instructional hours: THREE Hours/week**

**Credit: 3**

<b>Module</b>	<b>Theme</b>	<b>Contents</b>
<b>1</b>	Evolution Geography	<ul style="list-style-type: none"><li>• Geography- Definition and scope</li><li>• Major Branches- physical, human, regional, economical and environmental.</li></ul>
<b>2</b>	Geomorphology	<ul style="list-style-type: none"><li>• Origin of the earth.</li><li>• Interior of the earth.</li><li>• Earth movements- epirogenic and orogenic.</li><li>• Folding and Faulting.</li><li>• Volcanoes.</li><li>• Earthquakes.</li><li>• Weathering.</li><li>• Denudation-Agents</li></ul>
<b>3</b>	Climatology	<ul style="list-style-type: none"><li>• Atmosphere and its importance.</li><li>• Composition and structure.</li><li>• Temperature.</li><li>• Pressure belts and Wind systems.</li><li>• Clouds and rainfall types.</li><li>• Cyclones and anti-cyclones.</li><li>• Major climatic types.</li></ul>
<b>4</b>	Oceanography	<ul style="list-style-type: none"><li>• Major oceans, distribution.</li><li>• Relief of ocean floor.</li><li>• Physical properties of ocean water- Temperature.</li><li>• Salinity.</li><li>• Ocean deposits.</li><li>• Ocean currents, El Nino and La Nino.</li><li>• Waves and tides.</li></ul>
<b>5</b>	Biogeography	<ul style="list-style-type: none"><li>• Biogeography- Origin and types of soils.</li><li>• Major biomes of the world.</li><li>• Ecosystem and food chain.</li><li>• Environmental degradation and conservation.</li></ul>

**REFERENCES**

**1. Web Resources**

- a. <http://www.physicalgeography.net/>
- b. [http://en.wikipedia.org/wiki/Physical\\_geography](http://en.wikipedia.org/wiki/Physical_geography)
- c. <http://www.geography-site.co.uk/pages/physical.html>
- d. <http://ppg.sagepub.com/>
- e. [http://www.earthonlinemedia.com/ebooks/tpe\\_3e/contents.html](http://www.earthonlinemedia.com/ebooks/tpe_3e/contents.html)

## 2. Suggested Readings

#	Book Name	Author
1	Certificate Physical and Human Geography	Goe Cheng Leong
2	Physical Geography through Diagrams	R B Bunnet
3	A Text book of Geomorphology	Dayal, P
4	Climatology	Lal, D.S.,
5	Modern Physical Geography	Strahler. A.H., and Strahler.A.N
6	Biogeography	Robinson, H.,
7	Human and Economic Geography	Leong, G. C. and Morgan, G. C
8	Physical Basis of Geography	Woolridge & RS Morgan
9	The Earth, its origin & physical composition	H Jeffrey
10	Physical Geography	F J Monkhouse
11	Physical Geography	Lake P
12	Physical Geography	Morris Davis
13	Elements of Geography	Finch & Trewartha

# UNDERGRADUATE PROGRAMME IN GEOGRAPHY (B.Sc. Geography)

## SYLLABUS

### Semester V: OPEN COURSE GRY5D02 GEOGRAPHY OF INDIA

Instruction Hours: THREE hours / Week

Credit: 3

Module	Theme	Contents
1	<b>Unity in Diversity</b>	<ul style="list-style-type: none"><li>• India - location and its strategic significance.</li><li>• A land of unity in diversity.</li><li>• India and its neighbours</li><li>• States of India</li></ul>
2	<b>Physical Setting and Drainage</b>	<ul style="list-style-type: none"><li>• Physiography</li><li>• Drainage</li></ul>
3	<b>Climate</b>	<ul style="list-style-type: none"><li>• Indian climate- characteristics-factors influencing climate.</li><li>• Monsoons- formation and characteristics.</li><li>• Rainfall distribution.</li><li>• Floods and Droughts</li></ul>
4	<b>Vegetation and Soil</b>	<ul style="list-style-type: none"><li>• Natural vegetation - types and distribution.</li><li>• Conserving Natural Spaces- Biosphere reserves, National Parks, Wildlife Sanctuaries</li><li>• Major soil types and distribution.</li><li>• Biogeographical Zones.</li></ul>
5	<b>Peopling India</b>	<ul style="list-style-type: none"><li>• Population - growth, distribution, density, Major Problems.</li></ul>

## REFERENCES

### 1. Suggested Readings

#	Book Name	Author
1	India a Regional Geography	Singh R L
2	India, Pakistan & Celon	Spate O H K
3	India Year Book	Govt. of India
4	Gazatteer of India	Govt. of India
5	Geography of India	Gopal Singh
6	India-A Comprehensive Geography	Khullar, D

# UNDERGRADUATE PROGRAMME IN GEOGRAPHY (B.Sc. Geography)

## SYLLABUS

### Semester V: OPEN COURSE

#### GRY5D03 FUNDAMENTALS OF REMOTE SENSING

Instructional hours: THREE hours / Week

Credit: 3

Module	Theme	Contents
1	<b>Overview of Remote Sensing</b>	<ul style="list-style-type: none"><li>• Definition and Overview of Remote Sensing</li><li>• History and Evolution of Remote Sensing</li><li>• Remote Sensing Systems</li><li>• Electromagnetic Radiation (EMR) - Terms and Definitions, Laws of Radiation, EM Spectrum, Sources of EMR</li><li>• Interaction between EMR and matter - Reflection, Absorption and</li><li>• Interactions between EM Radiation and Atmosphere, Atmospheric windows</li></ul>
2	<b>Remote Sensing Systems</b>	<ul style="list-style-type: none"><li>• Remote Sensing Systems - Active and Passive Systems</li><li>• Concept of Resolutions in Remote Sensing - Spatial, Spectral, Radiometric and Temporal</li></ul>
3	<b>Earth Observation</b>	<ul style="list-style-type: none"><li>• Platforms for Earth Observation</li><li>• Earth Observation Satellites (LANDSAT, SPOT, IRS, IKONOS) and their characteristics</li><li>• Data Products: Aerial Photos , Satellite Imageries</li></ul>
4	<b>Indian's eyes in the Sky</b>	<ul style="list-style-type: none"><li>• Satellite based Indian Remote Sensing Programme</li><li>• Indian Remote Sensing Satellites</li></ul>
5	<b>Applications of Remote Sensing</b>	<ul style="list-style-type: none"><li>• Introduction to Application of Remote Sensing</li><li>• Application of Remote Sensing in Agriculture</li><li>• Application of Remote Sensing in Disaster Management</li><li>• Application of Remote Sensing in Environment Conservation</li></ul>

## REFERENCES

### 1. Web Resources

- m. <http://www.itc.nl/~bakker/rs.html>
- n. [www.ccrs.nrcan.gc.ca/resource/tutor/fundam/index\\_e.php](http://www.ccrs.nrcan.gc.ca/resource/tutor/fundam/index_e.php)
- o. [www.rst.gsfc.nasa.gov/](http://www.rst.gsfc.nasa.gov/)
- p. <http://www.r-s-c-c.org/rscc/v1m1.html>
- q. [www.isprs.org](http://www.isprs.org)
- r. [www.spaceimaging.com](http://www.spaceimaging.com)
- s. [www.landsat.usgs.gov](http://www.landsat.usgs.gov)
- t. [www.spotimage.fr](http://www.spotimage.fr)
- u. [www.nrsa.gov.in](http://www.nrsa.gov.in)
- v. IRS 1C handbook: [http://www.euromap.de/docs/doc\\_013.html](http://www.euromap.de/docs/doc_013.html)
- w. IRS P6 Users handbook. [http://www.nrsa.gov.in/IRS\\_Documents/Handbook/Resourcesat-1\\_handbook\\_HTML](http://www.nrsa.gov.in/IRS_Documents/Handbook/Resourcesat-1_handbook_HTML)
- x. [asterweb.jpl.nasa.gov](http://asterweb.jpl.nasa.gov)

## 2. Suggested Readings

#	Book Name	Author
1	Remote Sensing and Image Interpretation	Lillesand Thomas M. & Kiefer Ralph
2	Introduction to Remote Sensing	Campbell John B
3	Remote Sensing and Principles and Image Interpretation	Floyd F. Sabins
4	Manual of Remote Sensing	-
5	Fundamentals of Remote Sensing	George Joseph
6	Computer Processing of Remotely sensed Images: An Introduction	Paul M. Mather

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