

# **Savitribai Phule Pune University**

(Formerly University of Pune)

### **Two Year Degree Program in Geography**

(Faculty of Science & Technology)

Revised Syllabi for

# M.A./M.Sc. (Geography) Part-I

(For Colleges Affiliated to Savitribai Phule Pune University)

Choice Based Credit System Syllabus To be implemented from Academic Year 2019-2020

# Title of the Course: M.A./M.Sc. (Geography)

# Preamble

Introduction:

SavitribaiPhule Pune University has decided to change the syllabi of various faculties from June,2019. Taking into consideration the rapid changes in science and technology and new approaches in different areas of Geography and related subjects, Board of Studies in Geography after a thorough discussion with the teachers of Geography from different colleges affiliated to the Savitribai Phule Pune University, Pune has prepared the syllabus of M.Sc./M. A. Semester - I and Semester- II (w.e.f. 2019-20) Geography course under the Choice Based Credit System (CBCS). The model curriculum as developed by U.G.C. is used as a guideline for the present syllabi.

Aims and Objectives of the new curriculum :

i) To maintain updated curriculum.

ii) To take care of fast development in the knowledge of Geography.

iii) To enhance the quality and standards of Geography Education.

iv) To provide a broad common frame work, for exchange, mobility and free dialogue across the Indian Geography and associated community.

v) To create and aptitude for Geography in those students who show a promise for higher studies and creative work in Geography.

vi) To create confidence in others, for equipping themselves with that part of Geography which is needed for various branches of Sciences or Humanities in which they have aptitude for higher studies and original work.

# Structure of the Syllabus :

### Semester – I

Sr. No.	Course Code	Core Compulsory Theory Paper (CCTP)	Choice Based Optional Paper (CBOP)	Theory / Practical	Core Com Practical (CCPP)	ipulsory Paper	Credit
1	GGUT- 111	Principles of Geomorphology	-	-		-	04
2	GGUT- 112	Principles of Climatology	-	-		-	04
3	GGUT- 113	Principles of Economic Geography	-	-		-	04
4			GGDT-114	Principles of Population and Settlement Geography		-	04
5					GGUP- 115	Practical in Physical and Human Geography	04
					Total Ci	redits of Semester I	20

Sr. No.	Course Code	Core Compulsory Theory Paper (CCTP)	Choice Based Optional Paper (CBOP)	Theory / Practical	Credit	Core Comp Practic (CCPF	ulsory cal Paper ?)	Credit
1	GGUT-121	Geoinformatics - I	(0201)					04
		One of the follow	ving accore	ding to specializ	ation from	n CCTP		
2	GGUT-122	Coastal Geomorphology	-	-	04		-	
	GGUT-123	Synoptic Climatology	-	-	04		-	04
	GGUT-124	Agricultural Geography	-	-	04		-	04
	GGUT-125	Population Geography	-	-	04		-	
		One of the follow	ving accore	ding to specializ	ation fror	n CCTP	1	
3	GGUT-126	Fluvial Geomorphology	-	-	04		-	
	GGUT-127	Monsoon Climatology	-	-	04		-	04
	GGUT-128	Industrial Geography	-	-	04		-	
	GGUT-129	Geography of Rural Settlements	-	-	04		-	
		Choice Based Opti	onal Paper	· ( CBOP) ( 1 T	heory + 1	Practica	al )	
4			GGDT- 130	Geography of Tourism	02			
			GGDP- 131	Practical in Surveying	02			
			GGDT- 132	Geography of Disaster Management	02			04
			GGDP- 133	Practical in Map Projections	02			
		Core C	ompulsory	Practical Paper	r (CCPP)			
5						GGUP -134	Practical of Statistical Techniques for Geography	04
				]	Fotal Cree	lits of Se	emester - II	20

Course Code	Core Compulsory Theory Paper (CCTP)	Choice Based Optional Paper (CBOP)	Theory / Practical	Credit	Core Compulsory Practical Paper (CCPP)	Credit
GGUT- 231	Geoinformatics-II	-	-	04	-	04
GGUT- 232	Geographical Thoughts	-	-	04	-	04
	One of the fo	llowing ac	cording to speciali	zation fro	m CCTP	
GGUT- 233	Tropical Geomorphology	-	-	04	-	
GGUT- 234	Applied Climatology	-	-	04	-	04
GGUT- 235	Geography of Rural Development	-	-	04	-	
GGUT- 236	Urban Geography	-	-	04	-	
	Choice Based	Optional P	aper (CBOP) ( 17	Theory + 1	Practical )	
		GGDT- 237	Practical in Geoinformatics	02	-	
		GGDP- 238	Computer -aided Cartography	02		04
		GGDT- 239	Watershed Management	02	-	
		GGDP- 240	Multivariate Statistics	02	-	
	One of the fo	llowing ac	cording to speciali	ization fro	om CCPP	
				GGUP- 241	Practical in Geomorphology	
				GGUP- 242	Practical in Climatology	
				GGUP- 243	Practical in Economic Geography	04
				GGUP- 244	Practical in Population and Settlement Geography	
				Total Cred	its of Semester -III	20

Semester –	IV
Demester	<b>.</b> .

	Core Compulsory Theory Paper (CCTP)	Choice Based Optional Paper (CBOP)	Theory / Practical	Credit	Core Compulsory Practical Paper (CCPP)	Credit
GGUT- 241	Geography of India	-	-	-	-	04
GGUT- 242	Oceanography	-	-	-	-	04
GGUT- 243	Biogeography	-	-	-	-	04
	Choice Based	l Optional 1	Paper (CBOP) ( 1Th	neory + 1P	ractical )	
		GGDT- 244	Geography of Soils	02		
		GGDP- 245	Geostatistics	02		
		GGDT- 246	Political Geography	02		04
		GGDP- 247	Regional Planning	02		04
		GGDT- 248	Tourism Geography	02		
		GGDP- 249	Social Geography	02		
		GGDP- 250	Interpretation of Topographical Maps & Village Survey / Project work	02		
	Со	re Compuls	sory Practical Paper	r (CCPP)		
				GGUP- 251	Dissertation / Research Project	04
			ſ	Total Credi	ts of Semester - IV	20

# Course: GGUT-111:Principles of Geomorphology

Topic No.	Торіс		Sub topics	No. of Periods
		i.	Definitions, Nature and Scope of	
			Geomorphology	
_	Introduction to	11.	History of Geomorphology	0.4
1	Geomorphology	111. ·	Basic concepts in Geomorphology	06
	Geomorphology	1V.	Branches of Geomorphology	
		v.	Hierarchy of spatial and temporal scales in	
			Geomorphology	
		V1.	Geologic time scale	
		1.	Internal structure of the Earth: Layers based on	
		••	physical and chemical properties	
	Geomorphology and Tectonics	11.	Seismic waves and types	
2		111.	Theory of Plate Testonics and associated	
		IV.	Ineory of Plate Tectonics and associated	
		<b>X</b> 7	Idiulolillis Holmos Convoctional Current Theory	12
		v.	Gravity and Isostasy	
		vi. vii	Paleomagnetism	
		viii	Folds: Types and landforms	
		ix	Faults: Types and landforms	
3	Weathering and	i.	Weathering: Types and related landforms	08
	Mass Movement Processes	11.	Mass Movement: Types of mass movement	
4	Hillslopes	i.	Hillslope processes and forms	
-	L	ii.	Models of hillslope evolution	06
		i.	Genetic classification of streams	
		ii.	Playfair's law	10
5	Fluvial Processes and Landforms	iii.	River and stream, drainage basin and drainage network patterns	10
		iv.	River processes: erosion, transportation and	
			deposition	
		v.	Fluvial landforms: erosional and depositional	
		vi.	DavisianCycle of Erosion	
		i.	Glacial system: Types of glaciers	
c.	Glacial Processes	ii.	Glacial processes: erosion, transportation and	06
6	and Landforms		deposition	00
		iii.	Glacial landforms: erosional and depositional	

7	Coastal Processes and Landforms	i. ii. iii.	Sea waves, currents and tides Coastal processes: erosion, transportation and deposition Coastal landforms: erosional and depositional	06
8	Aeolian Processes and Landforms	i. ii. iii. iv	Aeolian environment Wind processes: erosion, transportation and deposition Aeolian landforms: erosional and depositional Work of water in desert and landforms	06

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- Ollier, C.D. (1981): Tectonics and Landforms, Longman, London.
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- Siddhartha, K. (2001): The Earth's dynamic surface, Kisalaya, Delhi.
- Spark, B.W. (1972): Geomorphology, Longman, New York.
- Steers, A. (1958): The Unstable Earth, Methuen, London.
- Strahler, A.H. and Strahler, A.N. (1992): Modern Physical Geography, John Wiley, New York.

# **Course: GGUT- 112:Principles of Climatology**

Topic No.	Topic		Sub topics	No. of Periods
1	Introduction to	i. ii.	Meteorology and Climatology Nature and Scope of Climatology	06
-	Climatology	iii. iv.	Development of Climatology Tropical Climatology	
		i. 	Evolution	
2	Earth's	11. :::	Structure and composition of atmosphere	08
	Atmosphere	iv.	Aurora - types	
		i.	Solar and terrestrial radiation	
		ii.	Electromagnetic spectrum	
2	Insolation	iii.	Factors affecting insolation	
3		iv.	Latitudinal and seasonal variation	10
		v.	Effect of atmosphere	
		V1.	Greenhouse effect	
			Mean Dudgel Machanisms of heat transfor	
		v111. i	Heat and temperature	
		1. ii	Temperature measurements and controls	
4	Temperature	iii.	Lapse rate	06
4	remperature	iv.	Temperature inversion	00
		v.	Types of inversion	
		i	Pressure measurement and distribution	
		ii.	Factors affecting distribution of pressure	
		iii.	Wind observation and measurement	
		iv.	Factors affecting wind	
5	Atmospheric	v.	Geostrophic wind and Gradient wind	12
	Pressure and Winds	vi.	Models of general circulation of the atmosphere	
		vii.	Eddy theory	
		viii.	Local winds	
		ix.	Jet stream	
		х.	Cyclones and Anticyclones	
		i.	Atmospheric moisture	
		ii. 	Hydrologic cycle	
6	Atmospheric	111. ·	Evaporation and condensation	06
	Moisture	1V.	Forms of condensation	
		V.	Precipitation	
		V1.	i ypes of precipitation Measurement of humidity	
		VII.	measurement of numberly	

		i.	Lapse Rate: normal, environmental, dry adiabatic lapse rate and wet adiabatic lapse		
7	Atmospheric		rate	06	
	Stability	ii.	Stable and unstable air		
	j	iii.	Absolute stability		
		iv.	Absolute instability		
		v.	Conditional instability		
0	Air Massas and	i.	Introduction to air masses and fronts	06	
ð	All Masses and Enorth	ii.	Types of air masses	00	
	FIUIIIS	iii.	Types of fronts		

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### Semester I

#### **Course: GGUT-113 :Principles of Economic Geography**

Topic No.	Торіс	Sub topics	No. of Periods
1	Introduction to Economic Geography	<ul><li>i. Definition, nature and scope</li><li>ii. Approaches :traditional and modern</li><li>iii. Recent trends in Economic Geography</li></ul>	06
2	Economic Activities	<ul> <li>i. Definition and classification of economic activities</li> <li>ii. Factors of location of economic activities: physical, social, economic and technical</li> <li>iii. Location of economic activities: Weber's and Von Thunen'smodel</li> </ul>	10
3	Resources	<ul> <li>i. Definition and classification of resources</li> <li>ii. Significance of natural and human resources in economic development</li> <li>iii. Importance of non-conventional energy resources for sustainable development</li> </ul>	08

4	Economic Development	i. ii. iii. iv.	Definition and concept of economic development Measures of economic development Classification of countries on the basis of economic development Rostow's and Myrdal's model	08
5	Transport and Communication	i. ii. iii. iv.	Various modes of transport Geographical factors and transportation Various means of communication Role of transport and communication in economy	06
6	Trade	i. ii. iii.	Definition and types of trade Factors affecting on international trade Problems and prospects of international trade with reference to India	06
7	Economic Development in India	iv. i. ii. iii. iv. v.	E-commerce Pre-and post-independence economic development in India Green revolution in India Need of new green revolution in India Regional disparities in India Impact of globalization and privatization on	06
8	Contemporary Issues	i. ii. iii.	economic development Regional disparities in Maharashtra Role of IT industry in economic development in Maharashtra A case study of one local agro-based industry: Economic analysis, problems and prospects (Sugar factory/ winery/ agro-tourist center etc.)	10

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- Pagar, Thorat& More (2015): Agriculture Geography, (Marathi), Atharv Publication, Pune
- More J. (2014): Geography & Agriculture For MPSC Examination, (Marathi), Atharv Publication, Pune

#### **Course: GGDT-114 :Principles of Population and Settlements Geography**

Горіс No.	Topic		Sub topics	No. of Periods
		i.	Definition, Nature and scope of Population Geography	
1	Introduction to	ii.	Development of Population Geography as discipline	08
-	Population and Settlement	iii.	Approaches to the study of population Geography	
	Geography	iv.	Definition, subject matter and scope of Settlement Geography	
		v.	Development of Settlement Geography	
		vi.	vi. Approaches: genetic, spatial and ecological	
		i.	Population distribution and factors affecting distribution of population	
2	Population	ii.	Density : definition and types	08
	Distribution	iii.	Factors affecting density of population	
		iv.	Population density in India	
		v.	Urbanization: definition and stages	
		V1.	Trend and level of urbanization in India	
		i.	Concept of population growth	
		ii.	Component of population growth (Fertility,	
2	Demolection Conserve		Mortality, and Migration)	00
3	Population Growth	111.	Malthus Theory	08
	and trend	IV.	Deputation growth and trand in India	
		v. vi	Migration: concept of migrant and migration	
		V 1.	immigration, and emigration	

		i. ii.	Age and sex structure Concept of aging of populations,	
4	Population	iii.	Dependency ratio	06
	Structure and	iv.	Sex Ratio: definition and affecting factors of	00
	Characteristics		sex ratio	
		v.	Sex ration in India	
		vi.	Population Composition: religious,	
			linguistics, ethnic, marital and educational	
		vii	. Literacy: definition and measures of literacy	
		vii	i. Literacy in India	
		i.	Concepts: fertility, fecundity, sterility, cohort	
-	Fertility and	ii.	Crude birth rate, Total fertility rate	06
3	Mortality	iii.	Concept of baby boom	06
	5	iv.	Concepts: mortality and morbidity	
		v.	Death rate and its measures	
		vi.	Level and trends of mortality in India	
		i.	Classification: urban and rural	
		ii.	Rural-urban dichotomy	
6	Human Settlement	iii.	Site and situation aspect in settlement	08
		iv.	Types: compact, semi-compact, hamleted and dispersed	
		v.	Patterns of settlement	
		i.	Definition, classification of villages	
		ii.	Size and spacing of villages	
7	Rural Settlements	iii.	Nearest neighbor analysis	08
		iv.	Concepts of dispersion and nucleation	
		v.	Factors affecting dispersion and nucleation	
		i.	Concept: urban place, urban agglomeration,	
			urban sprawl	
0	Urban Settlements	ii.	Urban settlement hierarchy	08
ð		iii.	Urban-rural fringe	00
		iv.	Rank-size rule	
		v.	Central Business District (CBD)	

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### Course: GGUP-115:Practical in Physical and Human Geography

Topic No.	Торіс	Sub topics	Periods (3 hours)
		A Geomorphology	
1	Drainage Network	<ul><li>Stream ordering and Bifurcation ratio</li><li>i. Strahler'smethod</li><li>ii. Horton's method</li></ul>	02
2	Drainage Basin Relief Analysis	<ul> <li>Relief analysis (for a 3 to 5 order drainage basin; based on grid method) <ol> <li>Absolute relief map</li> <li>Relative relief map</li> <li>Hypsometric analysis</li> <li>Basin cross profiles</li> <li>Block diagram (multiple section)</li> </ol> </li> </ul>	03
		B Climatology	
3	Climatic Element Diagrams	<ul><li>i. Climatograph</li><li>ii. Climograph</li><li>iii. Simple wind rose</li><li>iv. Hythergraph</li></ul>	03
4	Climatic Classification	<ul><li>v. Water Budget</li><li>i. Koppen's classification</li></ul>	02
		C Economic Geography	
5	Crop Combination and Crop Diversification	<ul><li>i. Weaver's method</li><li>ii. JasbirSingh</li></ul>	02
6	Measures of Network Structure	<ul><li>i. Ratio measure</li><li>ii. Alpha, beta, gamma, etc.</li><li>iii. Associated number, cyclomatric number</li></ul>	01
	<b>D</b> ]	Population and Settlement Geography	
7	Population Indices and Projection	i. Age-sex pyramid ii. Infant mortality rate iii. Population growth rate iv. Population projection	02
8	Measures of Nucleation and Dispersion	i. Rank size rule ii. Nearest neighbor analysis iii. Calculation of centrality	03

9	Field Visit and	i. One day study tour or long tour of geographical	02
	Report Writing	interest places anywhere in the country and	
		excursion report	

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- Carter, H. (1977): The study of Urban Geography, Edward Arnold, London.
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- Hudson F.S. (1976): Geography of Settlements, Estover, Macdonald& Evans, England.
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### Course: GGUT-121:Geoinformatics-I

### No. of Credits: 04 No. of Periods: 60

Topic No.	Торіс	Sub topics	No. of Periods
1	Introduction to GIS	<ul> <li>i. Definition, potential of GIS, concept of space &amp; time</li> <li>ii. Spatial Information Theory</li> <li>iii. History of GIS</li> <li>iv. Objectives of GIS</li> <li>v. Elements of GIS, hardware &amp; software requirements</li> <li>vi. GIS Applications</li> <li>vii. GIS Tasks- input, manipulation, management, query &amp; analysis, visualization</li> </ul>	14
2	Database	<ul> <li>i. Spatial: spatial relationship, functional relationship, logical relationship</li> <li>ii. Non-spatial: nominal, ordinal, ratio and cyclic</li> </ul>	08
3	Data Models	<ol> <li>Spatial: Geometric primitives, Raster, Vector, Quad tree tessellation, comparative overview of raster and vector models, layers and coverage</li> <li>Non-spatial: DBMS- Advantages, conceptual models; Implementational models- hierarchical, network and relational</li> </ol>	12
4	Structuring of Spatial Data	<ul><li>i. Digitizers: manual, semi-automatic &amp; automatic</li><li>ii. Editing error: detection &amp; correction, topology building</li></ul>	10
5	Data Analysis (I)	<ul><li>i. Attribute databases: operations from algebraic theory</li><li>ii. Operations from set theory SQL: attribute query</li></ul>	08
6	Data Analysis (II)	<ul><li>i. Spatial Databases: map algebra, grid Operations: Local, Focal</li><li>ii. SQL: spatial query</li></ul>	08

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- George J. (2004): Fundamentals of Remote Sensing, Universities Press Pvt. Ltd., Hyderabad.
- Jensen, J. R. (2003): Remote Sensing of Environment, An Earth Resource Perspective, Pearson Education Pvt. Ltd., New Delhi.
- Kang- Tsung-Chang, Introduction to Geographical Information System, 2002, McGraw Hill.
- Lillesand, T. M. and Kiefer R. W. (2002): Remote Sensing and Image Interpretation, John Wiley and Sons, New Delhi.
- Lo C. P. and Yeung, A.K.W. (2002): Concepts and Techniques of Geographic Information System, Prentice Hall, India.
- Paul A. Lonfley, Michel F. Goodchild, D J. Maguire and D W. Rhind, (2002):Introduction to Geographic Information Systems and Science, John Wiley and Sons Ltd.
- Fundamentals of Remote Sensing, A Canada Centre for Remote Sensing Remote Sensing Tutorial.

 $https://www.nrcan.gc.ca/sites/www.nrcan.gc.ca/files/earthsciences/pdf/resource/tutor/fundam/pdf/fundamentals\_e.pdf$ 

# Course: GGUT-122: Coastal Geomorphology

Topic No.	Topic	Sub topics	No. of Periods
1	Introduction: Coasts and Coastal Systems and Shore Zones	<ul> <li>i. The coastal environment: littoral, shore, coastal zones</li> <li>ii. Components of coastal systems processes, sediment transport, morphology, stratigraphy</li> <li>iii. Spatial and temporal scales in Coastal Geomorphology</li> <li>iv. Coastal classification: genetic and</li> </ul>	06
2	Coastal Processes	<ul> <li>morphological</li> <li>Waves: <ol> <li>Definition, wave length, amplitude, depth, period, fetch, frequency</li> <li>Types of waves: sea waves, swell waves, capillary waves, gravity waves, long period tidal waves, storm waves, standing waves</li> <li>Process of shoaling: wave breakers- spilling, plunging and surging, reflection, diffraction and refraction of waves</li> </ol> </li> <li>Tides:</li> </ul>	10
		<ul> <li>i. Equilibrium theory of tides</li> <li>ii. Semidiurnal, diurnal, spring, and neap tides</li> <li>iii. Amphidromic point, co-tidal lines, coastal tides</li> <li>iv. Tides in bays and estuaries</li> <li>v. Tides and coastal landforms</li> <li>Currents: <ol> <li>Wave induced shore normal and longshore currents, rip currents, beach drift</li> <li>Wind induced, river induced and tide induced currents, flood and ebb currents</li> </ol> </li> </ul>	
3	Sea level	<ul> <li>i. Transgression, regression, relative and eustatic sea level change</li> <li>ii. Causes and consequences of sea level change</li> <li>iii. Quaternary sea level changes, glacial eustasy, Staircase theory, Holocene transgression</li> <li>iv. Future sea level changes</li> <li>v. Indicators of former sea levels: Fossil beach ridges, beach rocks, abandoned cliffs, caves , raised features , marine terraces</li> </ul>	10

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	i.	Properties of coastal sediments	
	ii.	Types: clastic and biogenic sediments	
Coastal sediments	iii.	Grain size characteristics	
	iv.	Sources of sediments: coastline erosion and	08
		sea floor	
	v.	Pathways of sediments transport:	
		Factors affecting transport, sediments traps	
		and sinks	
	i.	Fluvial-dominated: Coastal deltas:	
Coastal		classification, formation, morphology of delta	
environments-I		plain, delta front and pro-delta, Fan delta,	06
environments-1		braiddelta, morphodynamics of deltas	
	ii.	Tide-dominated: morphology and	
		hydrodynamics of estuaries and tidal flats	
	i.	Wave-dominated: Process of deposition,	
Coastal		Beaches and spits: profiles, types and	06
environments-II		sediments, barrier islands, coastal sand dunes,	00
		dune systems, sea cliffs and caves: formation	
		and morphology, shore platforms: formation	
		types and morphology, sea arches, stack,	
		stumps, geos and blow holes	
	ii.	Biotic environments: mangrove swamps and	
		salt marshes, corals and coral reefs	
	Curren	t coastal issues:	
Applied coastal	i.	Sea level rise	08
Geomorphology-I	ii.	Storm hazard management	08
	iii.	Tsunami	
	iv.	Coastal erosion and progradation	
	v.	Wetlands, kharlands, estuarine reclamation	
	vi.	Salt intrusion and subsidence of coastal	
		aquifers	
	Coasta	l hazard management:	
	i.	Impact, vulnerability and risk	
Applied coastal	ii.	Shoreline erosion management	06
Geomorphology-II	iii.	Coastal adaptation and resilience	
	iv.	Coastal conservation	
	v.	Coastal policies and plans	
	vi.	Coastal Regulation Zone (CRZ Notification	
		2018)	

vii. Local and international case studies

- Bird, E.C. (2000): Coastal Geomorphology: An Introduction, John Wiley and Sons, Chichester.
- **Bloom, A.L. (2002):** Geomorphology: A Systematic Analysis of Late Cenozoic, Landforms, Prentice-Hall of India, New Delhi.
- Davis, J.L. (1980): Geographical variation in coastal development, Longman, New York
- Goudie, A.S. (Eds.) (2004): Encyclopaedia of Geomorphology, Routledge, London.
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- Masselink, G. Hughes, M. and Knight, J. (2011): Introduction to Coastal Processes and Geomorphology Hodder Education, London.
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### Course: GGUT-123: Synoptic Climatology

Topic No.	Торіс	Sub topics	No. of Periods
1	Introduction to Synoptic Climatology	<ul><li>i. Definition, nature and scope</li><li>ii. Levels of climatological synthesis</li></ul>	03
2	Approaches	<ul><li>i. Analytical approach</li><li>ii. Synoptic approach</li></ul>	03
3	Weather reporting and analysis	<ul> <li>Observing, reporting, collecting and analysis of weather data by India Meteorological Department</li> </ul>	04
4	Tropical Weather Systems	<ul> <li>ii. Synoptic charts and maps, synoptic scale motion, laws of motion</li> <li>i. Easterly Waves- formation and characteristics</li> <li>ii. Tropical Cyclones (Hurricanes)- formation, life cycle, structure and dynamics</li> <li>iii. Thunderstorm- origin, structure and stages of development,</li> </ul>	12
5	Extra-Tropical Weather Systems	<ul> <li>iv. Tornadoes- development and occurrence</li> <li>i. Air masses and fronts</li> <li>ii. Air masses of North America, Europe and Asia</li> <li>iii. Types of fronts</li> <li>iv. Frontal weather, frontogenesis and frontolysis</li> </ul>	12
6	Weather Patterns	<ul> <li>v. Principal zones of frontogenesis</li> <li>vi. Rossbywaves, wave cyclone- formation, <ul> <li>a. life cycle, idealized weather</li> </ul> </li> <li>i. Clouds- classification</li> <li>ii. Precipitation processes</li> <li>iii. Fog- formation and types</li> <li>iv. Heat and cold waves</li> </ul>	10
7	Weather Forecasting	<ul><li>i. Types of weather forecasting</li><li>ii. Methods of weather forecasting</li><li>iii. Role of satellites</li></ul>	08

8

Application of Synoptic Climatology	<ul> <li>Application in pollution studies</li> <li>Marine activities</li> <li>Aviation</li> <li>Disaster prevention and preparedness</li> <li>Agriculture</li> </ul>	08
	v. Agriculture	

### **Reference Books:**

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- Lutgens, Frederic K. and Tarbuck, Edward J. (2010): The Atmosphere: An Introduction to Meteorology, Pearson Prentice Hall, New Jersey.
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### **Semester II**

#### Course: GGUT- 124 : Agricultural Geography

#### No. of Credits: 04

#### No. of Periods: 60

Topic No.	Торіс	Sub topics	No. of Periods
1	Introduction to Agricultural Geography	<ul> <li>i. Definition, nature, scope and significance</li> <li>ii. Approaches: systematic, commodity, regional, recent</li> <li>iii. Recent trends in Agriculture Geography</li> </ul>	08
2	Significance of Agriculture	<ul> <li>i. Significance of agriculture in world</li> <li>ii. Importance of agriculture in the Indian economy</li> <li>iii. Role of agro-based industry in regional development</li> </ul>	06
3	Determinates of Agriculture	<ul><li>i. Physical factors</li><li>ii. Economic factors</li><li>iii. Social factor</li><li>iv. Technological factors</li></ul>	10
4	Agricultural regionalization	<ul> <li>i. Definition and concept</li> <li>ii. Views of Baker and Whittlesey</li> <li>iii. Crop combination techniques: Weaver and Thomas method</li> <li>iv. Agricultural efficiency: Kendall's ranking coefficient, Bhatia's method</li> </ul>	10

		v. Agricultural regions of India	
5	Agricultural Types	<ul> <li>i. Intensive subsistent farming</li> <li>ii. Mixed farming</li> <li>iii. Horticulture</li> <li>iv. Plantation agriculture</li> <li>v. Commercial grain farming</li> <li>vi. Shifting cultivation</li> </ul>	08
6	Problems and Prospects of Agriculture	<ul> <li>i. Problems and prospects with reference to India</li> <li>ii. Droughts and famines</li> <li>iii. Role of irrigation in agriculture development</li> <li>iv. Agricultural productivity in India</li> </ul>	05
7	Sustainable Agricultural Development in India	<ul> <li>i. Waste land management</li> <li>ii. Organic farming concept</li> <li>iii. Crop rotation</li> <li>iv. Group farming</li> <li>v. Pest and weed management</li> <li>vi. Agro-forestry</li> <li>vii. Agro-tourism</li> </ul>	07
8	Characteristics of Indian agriculture	<ul> <li>i. Green revolution in India: problems associated with Indian agriculture</li> <li>ii. National agricultural policy</li> <li>iii. Recent changes in Indian agriculture</li> </ul>	06

- Aiyer, A.K.Y.N. (1949): Agricultural and Allied Arts in Vedic India.
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- Berry, B.J.L. et. al. (1976): The Geography of Economic Systems. Prentice Hall, New York.
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- Symons, Leslie (1970): Agricultural Geography, G. Belt and Sons Ltd., London.
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- Wigley, G. (1981): Tropical Agriculture: The Development of Production, 4th edition, Arnold, London

#### Course: Gg. 213:Population Geography

Topic No.	Торіс		Sub topics	No. of Periods
1.	Introduction	i.	Definitions, nature and scope of Population Geography	08
		ii.	Sources of population data: census, national sample survey, sample registration survey, NFHS, DLHS data	
2.	Population	i.	Population distribution in the world	06
	Dynamics	ii.	Density of population in the world	00
		iii.	Determinates of population growth	
3.	Population Theory	i.	Malthus Theory	08
		ii.	Optimum Population Theory	00
		iii.	Demographic Transition Model	
4.	Fertility	i.	Concepts and measures of Nuptiality and fertility	08
		ii.	Levels and trends of fertility in India	
		iii.	Determinants of fertility	
		iv.	Theories of fertility	
5	Mortality	i.	Concept of mortality & morbidity	08
		ii.	Measures of mortality	00
		iii.	Recent mortality levels in world	
		iv.	Mortality trends in India	
6	Migration	i.	Definition, types (Internal and International)	06
		ii.	Concept: refugee, brain-drain migration	00
		iii.	Determinants and consequences of migration.	

iv. Lee's Theory of Migration Ravenstein's laws of migration v. Push-pull factors of migration vi. 7 Population **Population Composition:** 08 Composition Demographic i. ii. Social iii. Economic Cultural iv. 8 Population **Concept of Population Index:** 08 Development and Human Development Index (HDI) i. Policies Gender Development Index (GDI) ii. iii. Relation between population and development Population policy of India iv. New Population policy of China v.

- Agarwala, S.N. (1977): India's population Problems, Tata McGraw Hill publishing Co. Ltd., New Delhi.
- Bose Ashis et.al. (1974): Population in India's Development Vikas Publishing House, New Delhi, 1974.
- **ChandnaR.C.** (1986) :Geography of Populationconcepts, Determinants and Patterns, Kalyani Publishers, New Delhi
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- Pathak, K.B. and F.Ram, (1992) : Techniques of Demographic analysis. Bombay: Himalaya Publishing house
- Sundaram K.V. and SudeshNangia (Ed) (1986): Population Geography, Heritage Publications, Delhi
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- MusmadeArjun, SonawaneAmit and Jyotiram More, (2015): Population & Settlement Geography (Marathi) -Diamond Publication Pune.

# Course: GGUT-126: Fluvial Geomorphology

No. of Credits: 04		No. of Periods: 60		
Topic No.	Торіс		Sub topics	No. of Periods
		i.	Definition and scope	
	Introduction to	ii.	Drainage basin and streamnetwork	
1	FluvialGeomorphol	iii.	The drainage basin as a geomorphicunit	4
	ogy	iv.	Horton's laws of drainagecomposition	
		v.	Laws of allometric growth	
		vi.	Phases of drainage network development- Glock's model	
		i.	Runoff generation and types (infiltration-	
			excess overland flow, throughflow, pipeflow	
			and saturation-excess overland flow)	
	Drainage Basin	ii.	Channel initiation	
2	Hydrology	iii.	Gully and channel formation	4
		iv.	Discharge and magnitude/frequency of flows	
			in river system (flood stages and hydrographs,	
			discharge measurement methods)	
		i.	Types of flows- steady and unsteady flow,	
			uniform and non-uniform flow, and Laminar	
			and turbulent flow	
3	Open Channel	ii.	Flow behaviour- sub-critical, critical and	06
	Hydraulics		supercritical flow	
		111.	Flow velocity variations and measurement methods	
		iv.	Shear stress and stream power	
		i.	River categories- alluvial, bedrock and mix alluvial-bedrock	
		ii.	Cross-section morphology and reach	
			morphology- width-depth ratio, channel	
			capacity, wetted perimeter, hydraulic radius	
4	Channel		and gradient	10
	Morphology	iii.	Controls on channel morphology-	
			morphologic and hydrologic controls	
		iv.	Channel bed configuration- ripples, dunes,	
			anti-dunes, riffle-pool sequence, steps and	
			pools	
		v.	Channel patterns or planforms- straight,	
			meandering, braided, anabranching and	
			anastomosing	
		vi.	Concept of grade- long profile: below, near	
			and above grade conditions	

5	Hydraulic Geometry	i. ii. iii. i.	At-a-station hydraulic geometry Downstream hydraulic geometry (Relation of discharge with width, depth, velocity and gradient) Types of erosion- vertical, lateral and	6
6	Fluvial Erosion	ii. iii.	headword erosion Erosional Processes- solution, abrasion, cavitation, attrition, impaction, hydraulic action Erosionallandforms of bedrock channels-	8
7	Sediment Transport	i. ii. iii.	gorge, canyon, incised meanders, rapids, waterfalls, potholes, inner channels, grooves, etc. Types of river load- solution and particulate load Capacity and competence Entrainment of sediment- forces acting on a submerged particle, critical shear stress and	8
		iv. v. vi. i.	critical velocity Modes of sediment transport in rivers- dissolved load, wash load, bedload and suspended load Measurement of sediment load Sediment yield Floodplains and associated features- meanders, point bars, ox-bow lakes, natural levees, backswamps, yazoo streams, etc.	
8	Fluvial Deposition	ii. iii. iv. v. i. ii.	River terraces- formation and classification Alluvial fans and bajadas Delta- formation and types Mid-channel and bank attached channel forms Definition, environmental change Evidences of metamorphism (direct	8
9	River Metamorphosis	iii. iv.	observations, historical records, sedimentary evidence and dating techniques) Long-term and short-term adjustments Quaternary fluvial systems	6

- Charlton, R. (2008): Fundamentals of fluvial Geomorphology, Routledge, New York.
- Fryirs, K.A. and Brierley, G.J. (2013): Geomorphic Analysis of River Systems: An approachto reading the landscape, Wiley-Blackwell.
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### Course: GGUT-127: Monsoon Climatology

### No. of Credits: 04 No. of Periods: 60

Topic No.	Торіс	Sub topics	No. of Periods
1	Monsoon	i. Introduction and scope of Monsoon	05
1		Climatology	05
		11. Historical background and economic	
		importance of monsoon	
	i. Different concepts related to origi	1. Different concepts related to origin of	
2	Origin of Monsoon	Monsoon – Thermal concept, Flohn's	12
-	origin of Monsoon	ii The Asian Managany East and South Asian	12
		II. The Asian Monsoon: East and South Asian Monsoon	
		iii Classical Theory of Indian Monsoon	
		iv Tibetan Plateau and Monsoon	
		IV. Thetan Flateau and Monsoon	
3	Mongoon Model	i. Driving mechanism	08
3		ii. Monsoon on non-rotating and rotating Earth	08
		iii. Realistic Monsoon Model	
	Monsoon	i. Normal temperature, wind and pressure,	
4	Climatology	ii. Datesof onset and withdrawal of monsoon	06
	Climatology	rainfall	
_	Regional Aspects of Indian Monsoon	i. Semi-permanent systems- heat low, Monsoon	0.5
5		trough,	06
		ii. Easterly Jet, Tibetan High	
	Intra-seasonal	i. Active and break period, depressions, trough	
6	Variation	of low Pressure	06
		11. Mid-tropospheric disturbances, offshore and	
		onshore vortices	
		111. Effect of topography	
	Interannual	1. Variability of summer monsoon rainfall	
7	Variation	11. Show cover iii Mataorological Talaconnactions: El Niño	10
		Southern Oscillation (ENSO)	
		iv Indian Ocean Dipole (IOD)	
		v North Atlantic Oscillation (NAO)	
		vi Walker Circulation	
		vii Role of ocean and upper atmosphere	
		i. Different time scales	
	Forecasting of	ii. Factors for forecasting	
c	wonsoon	iii. Power regression and parametric model	07
8		iv. Current monsoon forecasting system of India	07
		Meteorological Department	
		v. MONEX and IIOE	

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#### Course: GGUT-128:Industrial Geography

Topic No	Торіс	Sub topics	No. of
INO.			Periods
1	Introduction to Industrial Geography	<ul> <li>i. Definition, nature and scope</li> <li>ii. Manufacturing and regional economies</li> <li>iii. Importance of industries in India's economic development</li> </ul>	06
2	Industrial Location	<ol> <li>Factors of industrial location:physical, economic, political and socio-cultural</li> <li>Centralization and decentralization of industries</li> <li>Agglomeration of industries</li> <li>Industrial linkages</li> <li>Footloose industry</li> </ol>	08
3	Models in Industrial Geography	<ul> <li>i. Weber's model</li> <li>ii. Losch's model</li> <li>iii. Greenhut's model</li> <li>iv. Israd's model</li> <li>i. Iron and steel</li> </ul>	08
4	Problems and Prospects of Industries in India	<ul><li>ii. Cotton textile</li><li>iii. Sugar industries</li><li>iv. Automobile</li><li>v. Chemical</li><li>vi. Tourism industry</li></ul>	10
5	Industrial Regions of India	<ul> <li>i. Industrial regions of India</li> <li>ii. Characteristics of industrial regions</li> <li>iii. India's industrial policy</li> <li>iv. Agro-based industries in India</li> <li>v. SEZ</li> <li>vi. Small Scale Industries in India</li> </ul>	06

-	St	udy of two industrial from each region	0.0
6	Industrial Degions	i. Western Europe	08
	Industrial Regions	ii. Anglo-America	
		iii. Japan	
		iv. China	
		i. Currents scenario of IT Industry in India	
7	IT Industriesin	ii. Major IT hubs in India	00
,	India	iii. Problems and prospects of IT industry in India	08
		iv. Impact of globalization on IT industry in India	
		i. Role of MIDC in economic development of	
		Maharashtra.	
~	Currents Scenario	ii. Role of FDI in development of Indian	06
8	of Industry Sector	Industry	00
	in India	iii. Problems and prospects of agro-based	
		industries in Maharashtra	

- Alexander, JW. (1973): Economic Geography, Prentice Hall, New Jersey.
- Baghla, S. (2017): Industrial Geography, Book Enclave Publication.
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- Robinson, H. (1996): Geography of Tourism, Macdonald and Evans, London.

# Course: GGUT-129: Geography of Rural Settlements

Topic No.	Торіс		Sub topics	No. of Periods
		i.	Definition	
1	Introduction to Geography of	ii.	Evolution ofsettlements	07
-	Rural Settlements	iii.	Sequence of occupancy from	
			Neolithic to modern period	
		iv.	Historical, cultural and	
			geographical aspects ofsettlements	
			reflected in place names	
		i.	Site, situation, location	
2		ii.	Various factors affecting on	10
2	Growth and Distribution		settlement site and situations	12
		iii.	Dispersion and nucleation	
		iv.	Factors affecting dispersion and	
			nucleation	
		v.	Methods of the measuringdegree of	
			dispersion	
		vi.	Factors affecting growth of	
			settlements	
		vii.	System of land division	
		viii.	Water rights system of agriculture	
		ix.	Land tenancy system	
3	Theories of	i.	Intensity of land use	10
5	Rural Land Use	ii.	Labour cost	10
		iii.	Marketing of product	
		iv.	Von Thunen Theory	
		v.	Ricardo Theory	
		i.	Functional analysis of service	0.4
4	Rural Economic Activities		village and	06
			a. trading Center	
		ii.	Centrality and hierarchy of rural	
			service centers	
		iii.	Central Place Theory	
		Morp	hogenesis:	
5	Morphogenesis of Rural	i.	Social	06
5	SettlementsandTransformation	ii.	Cultural	06
		iii.	Economic organization within	
			villages	
		iv.	Functional growth	
		v.	Socio-economic transformation in	
			rural areas	

б	Demographic Characteristics ofRural Settlement	i.	Age-Sex, Education, Occupation, Caste	07
	Settlement	11.	migration in rural areas	
		iii.	Seasonal migration	
		iv.	Commuting patterns	
		i.	Primitive, vernacular and modern	
7	Rural House Types		high rise	06
/		ii.	Physical, social, cultural and economic factors	00
		iii.	Size, functional use and architectural style	
		iv.	Building material	
		i.	Various patterns	
8	Rural Settlementsin Maharashtra	ii.	House types and settlement patterns in the Maharashtra	06
		iii.	Modern forms of rural settlements	

- Alam, S.M. et.al. (1982): Settlement System of India Oxford and IBH Publication Co., New Delhi.
- Chisholm M. (1967): Rural Settlement and Land use. John Wiley, New York.
- Clout, H.D. (1977): Rural Geography, Pergamon, Oxford.
- Doniel, P. and Hopkinson, M. (1986): The Geography of settlement Oliver & Byod, Edinburgh.
- Grover, N. (1985): Rural Settlement: A Cultural Geographical Analysis. Inter India Publication, Delhi.
- Hudson, F.S. (1976): A Geography of Settlements, Macdonald and Evans, New York.
- Ramchandran, H. (1985): Village clusters and Rural Development. Concept Publication, New Delhi.
- Rao R. N. (1986): Strategy for Integrated Rural Development. B.R. Publication, Delhi.
- Sen, L.K. (1972): Readings in Micro-level Planning and Rural Growth Centers, National Institute of Community Development, Hyderabad.
- Srinivas M.N. (1968): Village India, Asia Publication House, Bombay.
- Wanmati S. (1983): Service Centers in Rural India, B.R. Publication Corporation, Delhi.
- Musmade AH, Sonawane AE, More JC, (2015): Population & Settlement Geography, (Marathi), Diamond Publication, Pune

### Course: GGDT-130: Geography of Tourism

#### No. of Credits: 02No. of Periods: 30

Topic No.	Topic		Sub topics	No. of Periods
	Introduction to	i.	Definition: tourist and tourism	
1	Geography of	ii.	Concept of recreation and leisure	02
	tourism	iii.	Importance of tourism	02
		iv.	Impact of tourism on economy of nation	
2	Classification and	i.	Classification on the basis of: nationality	10
2	Recent Concepts of		time of travel, number of tourist and	10
	Tourism		purpose	
		ii.	Recent concepts: agro-tourism, eco-	
			tourism, heritage tourism and adventure	
			tourism	
3	Factors of Tourism	i.	Physical factors:relief, climate, vegetation,	08
5			wild life and water bodies	00
		ii.	Socio-cultural factors:religious,	
			historical and cultural, economic,	
			transportation and accommodation	
	Role of	i.	Hotels, motels, inn, saraies, dharmashalas	
4	Accommodation in	ii.	Governmentaccommodation, tourist homes	06
	Tourism	iii.	Youth hostels, cottages, tents, caravans	00
		iv.	Rail yatribhavan, house boats	
		v.	Private accommodations and unrecognized accommodations	
	Indian Tourism	Case	studies	
5		i.	Hill stations: Manali, Mahabaleshwar	<u></u>
5		ii.	Beaches: Kalangut (Goa), Ganpatipule	04
		iii.	Historical centres: Agra. Pratapgad	
		iv.	Caves : Badami, Ajanta	
		v.	Religious Centres: Pravagrai (Allahabad).	
			Shirdi	
		vi.	National Parks: Kaziranga, Tadoba	
		vii.	Dams: SardarSarovar, Koyna	
		viii.	Waterfalls: Nohkalikai Fall, Thoseghar	

- Bhatia A.K. (1996): Tourism Development: Principles and Practices, Sterling Publishers, New Delhi
- Bhatiya, A.K.(1991): International Tourism Fundamentals and Practices, Sterling, New Delhi,

- Chandra, R.H.(1998): Hill Tourism: Planning and Development, Kanishka Publishers, New Delhi,
- Hunter, C and Green, H.(1995): Tourism and the Environment: A Sustainable Relationship, Routledge, London,
- Inskeep, E. (1991): Tourism Planning: An Integrated and Sustainable Development Approach, Van Nostrand and Reinhold, New York,
- Kaul, R.K.(1985): Dynamics of Tourism & Recreation. Inter-India, New Delhi.
- Kaur, J.(1985): Himalayan Pilgrimages & New Tourism Himalayan Books, New Delhi,
- Lea, J.(1988): Tourism and Development in the Third World, Routledge, London,
- Milton, D.(1993): Geography of World Tourism Prentice. Hall, New York,
- Pearce, D.G.(1987): Tourism To-day: A Geographical Analysis, Harlow, Longman, Pratap,
   R. and Prasad, K. (2005): Tourism Geography, Shree Publishers & Distributors, New Delhi.
- Robinson, H.A.(1996): Geography of Tourism. Macdonald and Evans, London,
- Sharma, J.K. (ed.)(2000): Tourism Planning and Development A new perspective, Kanishka Publishers, New Delhi,
- Suryawanshi, R.S.(2012): Assessment of Potential for Eco- Tourism, Northern Thane District, Maharashtra. Lap Lambert Academic Publishing, Germany
- Shaw, G. and Williams, A.M.(1994): Critical issues in Tourism-A Geographical Perspective, Oxford: Blackwell,
- Sinha P. C. (ed.)(1998): Tourism Impact Assessment, Anmol Publishers, New Delhi,
- Theobald, W. (ed.)(1994): Global Tourism: The Next decade, Oxford, Butterworth, Heinemann, Oxford,
- Voase, R.(1995): Tourism: The Human Perspective Hodder& Stoughton, London

### **Course: GGDP-131: Practical in Surveying**

### No. of Credits: 02No. of Periods: 30

Topic No.	Торіс	Sub topics	Periods (3 hours)
1	Introduction to Surveying	<ul> <li>i. Definitions and methods</li> <li>ii. Benchmarks</li> <li>iii. Spot heights</li> <li>iv. Reduced levels</li> <li>v. Interpolation and contouring</li> </ul>	01
2	Dumpy/Auto level	<ul><li>i. Various components and common terms used in dumpy level survey</li><li>ii. Collimation method and Rise and Fall method</li><li>iii. Profile drawing and block contouring</li></ul>	02
3	Transit Theodolite	<ul><li>i. Various components and common terms used in Theodolite</li><li>ii. Intersection method and Tachometric method</li></ul>	02
4	Total Station	<ul><li>i. Various components and common terms used in Total Station</li><li>ii. Area and profile drawing</li></ul>	03
5	Field Visit	i. Dumpy level/Theodolite /Total Station Survey of a Beach, River Profiles and Slope	02

- AsisSarkar (2015): Practical Geography, A Systematic Approach, Orient Black Swan
- Duggal, S.K. (2013): Surveying Vol. 2, McGraw Hill Publication, New York.
- Kanetkar, T.P. and Kulkarni, S.V. (2010): Surveying and Leveling Vol. II, Pune Vidyarthi Publication, Pune.
- Maslov, AV., Gordeev, A.V. and Batrakov, Yu.G. (1984): Geodetic surveying, Mir Publishers, Moscow.
- Rangwala, S.C. (2011): Surveying and Leveling, Charotar Publishing HousePvt. Ltd. Anand, (Gujarat), India.
- Punmia, B.C., Jain A. and Jain A. (2011): Surveying, Vol. II. and III, Laxmi Publication New Delhi.

### Course: GGDT-132: Geography of Disaster Management

#### No. of Credits: 02No. of Periods: 30

Topic No.	Торіс	Sub topics	No. of Periods
		Concepts and definitions	
1	Introduction	i. Disaster, Hazard, Vulnerability,	02
		Resilience, Risks	02
		ii. Classification of disasters	
2	Natural Disasters	Causes and effects:	10
2		i. Earthquake, Volcano, Landslide, Tsunam	i 10
		ii. Cyclone, Flood, Drought	
3	Man-made disaster	Causes and effects:	08
5		i. Fire, Terrorism, Food poisoning	00
		ii. Strike and lockouts, accidents, stampedes	5
		iii. Major man-made disaster examples in	
		India	
	Disastermanagement	i. Phases of disaster cycle	
4	Disastermanagement	ii. First aid	06
·		iii. Role of Armed forces, police forces and	00
		NGO'S in disaster management	
	Technologies for	i. Application of Modern Technologies for	
5	Disaster	the emergency communication	04
	Management	ii. Uses of remote sensing, GIS and GPS in	04
		disaster management	

- Agarwal, A. and Narain S. (Ed) (1999): State of India's Environment. The Citizens Report, Centre for Science and Environment, New Delhi
- Bryant Edward (2000): Natural Hazards, Cambridge University Press
- Daly, H.E. (1996): Beyond Growth, Beacon Press, Boston
- Daly, H.E and Twonseed K.N. (Ed) (1993): Valuing the earth Economics, Ecology and Ethics, MIT Press, London
- Dupont, R.R. Baxter, T.E. and Theodore, L. (1998): Environmental Management: Problems and Solutions, CRC Press
- Hart M. G. (1986): Geomorphology, Pure and Applied, George Allen and Unwin, London
- Morrisawa M (Ed) (1994): Geomorphology and Natural Hazards, Elsevier, Amsterdam
- Singh Savindra (2000): Environmental Geography, ParagPustakBhavan, Allahabad
- Smith, K. (2001): Environmental Hazards: Assessing Risk and Reducing Disaster, Routledge
- Turk J. (1985): Introduction to Environmental Studies, Saunders, College Publication, Japan
- Saptarshi PG, More JC, Ugale VR, (2009): Geography and Natural Hazads, (Marathi), Diamond Publishing
- Musmade AH, More JC (2014): Geography of Disaster Management, (Marathi), Diamond Publication, Pune
### **Semester II**

### **Course: GGDP-133: Practical in Map Projections**

### No. of Credits: 02No. of Periods: 30

Topic No.	Торіс		Sub topics	Periods (3 hours)
1	Map projections	iv. v.	Definition and necessity of projections Types- Perspective and non- perspective, conventional	01
		vi.	Classification based on a) Developable surfaces used b) Position of source of light c) Properties	
2	Zenithal Projections	iii. iv.	Zenithal Polar Gnomonic Projection Zenithal Polar Stereographic Projection	03
3	Conical Projections	vi. vii.	Polyconic Projection International Map Projection (Modified Polyconic )	02
4	Cylindrical Projections	i. ii.	Mercator's Projection Universal Transverse Mercator (UTM) Projection	02
5	Conventional Map Projections	i. ii.	MollweideProjection Sinusoidal Projection	02

### Graphical construction, properties and uses of following projections (2 exercise of each)

- AsisSarkar (2015): Practical Geography, A Systematic Approach, Orient Black Swan
- Maling, DH. (1973): Coordinate systems and map projections, George Philip, London.
- Richardus, P. and Adler Ron, K. (1972): Map projections, North Holland publ. Co., Amsterdam.
- Saha, P. and Basu, P. (2007): Advanced Practical Geography, Books and Allied (P) Ltd. Kolkatta.
- Steers, J.A. (1970): An Introduction to Study of Map Projections. University of London Press Ltd., London.

# **Semester II**

### Course: GGUP-134:Practical of Statistical Techniques for Geography

### No. of Credits: 04 No. of Periods: 60

Topic No.	Торіс	Sub topics	Periods (3 hours)
		i. Introduction and applications of statistical	01
		techniques in Geography	
		ii. Types of statistics: descriptive and	
	<b>.</b>	inferential statistics	
1	Introduction to	111. Geographical data	
1	Statistical	a) Primary and secondary data	
	Techniques in	b) Spatial and temporal data	
	Geography	c) Discrete and continuous data	
		iv Scales of measurement; nominal ordinal	
		interval and ratio	
	Descriptive	i Introduction to descriptive statistics	03
	Statistics	ii Central tendency: mean mode median	05
2	Statistics	iii. Dispersion: variance and standard deviation	
2		iv. Skewness and kurtosis	
		(Calculations of above parameters for	
		ungrouped and grouped data)	
	Duch chility and	i. Introduction to probability	03
3	Probability and Probability	ii. The Normal Probability Distribution	
	Distributions	iii. The Binomial Probability Distribution	
	Distributions	iv. The Poisson Probability Distribution	
		i. Introduction to inferential statistics	05
	Inferential	ii. Population and sample	
4	Statistics	iii. Hypothesis testing: Null and alternate	
		hypothesis	
		iv. The Chi-square test (Two sample case)	
		v. Student's 't' test (Two sample tests)	
		vi. ANOVA (Analysis of variance)/ F ratio test	05
	Completion and	1. Introduction to bi-variate correlation and	05
	Correlation and	ii The product moment correlation coefficient	
	Analysis	iii. Significance testing in correlation analysis	
5	Analysis	iv. Linear regression equation	
5		v Exponential regression equation	
		vi Power-law regression equation	
		vii. Concept of residuals and explained variance	
		i. Introduction and definition of time series	02
		ii. Applications of time series analysis	
6	Time Series	iii. Components of time series	
	Analysis	iv. Calculation and plotting of moving averages	
	-	(3 and 5)	
		v. Curve fitting by method of least squares	

		i.	Collection of primary and/or secondary data	01
	Fieldwork and Data		by fieldwork or field visit	
7	Collection	ii.	Analysis of data by using appropriate	
		statist	tical technique(s)	
		iii.	Report writing	

- AsisSarkar (2015): Practical Geography, A Systematic Approach, Orient Black Swan
- David, E. (1989): Statistics for Geographers.
- Elhance, D.L., Elhance, V. and Aggarwal B.M. (2014): Fundamentals of Statistics, KitabMahal, Allahabad.
- Hammond, R. and McCullagh, P. (1978): Quantitative Techniques in Geography, Clarendon Press. Oxford, London.
- Karlekar, S. and Kale, M. (2006): Statistical Analysis of Geographical Data, Diamond Publication, Pune.
- Liendsor, J. M. (1997): Techniques in Human Geography, Routledge.
- Norcliffe, G.B. (1977): Inferential Statistics for Geographers, Hutchinson, London.
- Rogerson, P.A. (2015): Statistical Methods for Geography, SAGE Publication, London.
- Wheller, D., Shaw, G. and Barr, S. (2010): Statistical Techniques in Geographical Analysis, David Fulton, Routledge, New York.
- Yeats, M. H. (1974): An Introduction to Quantitative Analysis in Human Geography.



(Formerly University of Pune)

M.A./M.Sc.-II (Geography)

Choice Based Credit System Syllabus To be implemented from Academic Year 2020-2021

### Title of the Course: M.A./M.Sc. (Geography)

### Preamble

### Introduction:

Savitribai Phule Pune University has decided to change the syllabi of various faculties from June 2020. Taking into consideration the rapid changes in science and technology and new approaches in different areas of Geography and related subjects, Board of Studies in Geography after a thorough discussion with the teachers of Geography from different colleges affiliated to the Savitribai Phule Pune University, Pune has prepared the syllabus of M.Sc. /M. A. Semester - III and Semester- IV (w.e.f. 2020-21) Geography course under the Choice Based Credit System (CBCS). The model curriculum as developed by U.G.C. is used as a guideline for the present syllabi.

Aims and Objectives of the new curriculum:

- i) To maintain updated curriculum.
- ii) To take care of fast development in the knowledge of Geography.
- iii) To enhance the quality and standards of Geography Education.
- iv) To provide a broad common frame work, for exchange, mobility and free dialogue across the Indian Geography and associated community.
- v) To create and aptitude for Geography in those students who show a promise for higher studies and creative work in Geography.
- vi) To create confidence in others, for equipping themselves with that part of Geography which is needed for various branches of Sciences or Humanities in which they have aptitude for higher studies and original work

### Savitribai Phule Pune University Faculty of Science and Technology Geography MA/MSc – II Semester – III

Course Code	Core Compulsory Theory Paper (CCTP)	Choice Based Optional Paper (CBOP)	Theory / Practical	Credit	Core Compulsory Practical Paper (CCPP)	Credit
GGUT- 235	Geoinformatics-II	-	-	04	-	04
GGUT- 236	Geographical Thoughts	-	-	04	-	04
	One of the fo	llowing ac	cording to speciali	ization fro	om CCTP	
GGUT- 237	Tropical Geomorphology	-	-	04	-	
GGUT- 238	Applied Climatology	-	-	04	-	04
GGUT- 239	Geography of Rural Development	-	-	04	-	-
GGUT- 240	Urban Geography	-	-	04	-	
	Choice Based (	Optional P	aper (CBOP) ( 1 7	Theory + 1	Practical )	
		GGDP- 241	Practical in Geoinformatics	02	-	
		GGUT- 242	Hydrology	02		04
		GGUT- 243	Watershed Management	02	-	_
		GGDP- 244	Practical in Multivariate Statistics	02	-	
	One of the fo	llowing ac	cording to special	ization fro	om CCPP	
				GGUP- 245	Practical in Geomorphology	
				GGUP- 246	Practical in Climatology	
				GGUP- 247	Practical in Economic Geography	04
				GGUP- 248	Practical in Population and Settlement Geography	
			]	Fotal Cred	its of Semester - III	20

#### Savitribai Phule Pune University Faculty of Science and Technology Geography MA/MSc – II Semester - IV

	Core Compulsory Theory Paper (CCTP)	Choice Based Optional Paper (CBOP)	Theory / Practical	Credit	Core Compulsory Practical Paper (CCPP)	Credit
GGUT- 249	Geography of India	-	-	-	-	04
GGUT- 250	Oceanography	-	-	-	-	04
GGUT- 251	Research Methodology	-	-	-	-	04
	Choice Based	d Optional	Paper (CBOP) ( 1Th	eory + 1Pi	ractical)	
		GGUT- 252	Geography of Soils	02		
		GGDP- 253	Practical in Geostatistics	02		
		GGUT- 254	Political Geography	02		04
		GGUT- 255	Regional Planning	02		
		GGDP- 256	Practical in Watershed Analysis	02		
		GGDP- 257	Interpretation of Topographical Maps and GPS Survey	02		
	Со	re Compuls	sory Practical Paper	(CCPP)		
				GGUT- 258	Geography of World	04
				GGUP- 259	Dissertation/ Research Project	04
			Т	otal Credi	ts of Semester - IV	20

**Savitribai Phule Pune University, Pune** MA/MSc - II Syllabus in Geography (Credit System) Revised Syllabus (from June, 2020)

### **Course: GGUT-235 Geoinformatics II**

### No. of Credits: 04

Topic No.	Торіс		Subtopics	No. of Periods
1	Introduction to Remote Sensing	i. ii.	Remote Sensing: definition, concept and principles History and development of Remote Sensing in India	05
2	EMR and EMS	i. ii. iii. iv.	EM Radiation and EM Spectrum Interaction of EMR with atmosphere Interaction of EMR with Earth's surface Black body radiation, Laws of radiation	10
3	Platforms and Satellites	i. ii. iii. iv.	Platform: Types and characteristics Satellites: Geo-stationary and Sun synchronous Earth Resources Satellites: LANDSAT, SPOT, IRS, IKONOS satellite series Meteorological satellites: INSAT, NOAA, GOES	15
4	Sensors	i. ii.	Sensors: Across track (whiskbroom) and Along track (pushbroom) scanning Optical mechanical scanners: MSS, TM, LISS, WiFS, PAN	08
5	Resolution	i. ii. iii. iv.	Spatial Resolution Spectral Resolution Temporal Resolution Radiometric Resolution	05
6	Image Interpretation Techniques	i. ii.	Basic principles, types, steps and elements of image interpretation Techniques of visual interpretation and interpretation keys	05
7	Aerial Photography	i. ii. iii. iv. v.	Aerial camera: Components Aerial Photography: Definition and characteristics Types of aerial photographsTypes of Aerial Photographs Based on the Position of the Cameral Axis Types of Aerial Photographs Based on Scale Geometry of an aerial photograph	12

- 1. Anji Reddy, M. (2004): Geoinformatics for environmental management.B.S. Publications
- 2. Campbell, J.B. (2002): Introduction to Remote sensing. Taylor Publications.
- 3. Chang.T.K. (2002): Geographic Information Systems. Tata McGrawHill
- 4. Drury, S.A. (1987): Image Interpretation in Geology. Allen and Unwin.
- 5. Francis Tar Bernhardsen. Geographical Information Systems. John Wiley.
- 6. Gupta, R.P. (1990): Remote Sensing Geology. Springer Verlag.
- 7. Heywood.I, Cornelius S, CrverSteve. (2003): An Introduction to Geographical Information Systems. Pearson Education
- 8. Jensen, J.R. (2000): Remote Sensing of the Environment: An Earth resource Perspective Prentice Hall.
- 9. Joseph George (2003): Fundamentals of remote sensing. Universities Press.
- 10. Lillesand, T.M., and Kieffer, R.M. (1987): Remote Sensing and Image Interpretation, John Wiley.
- 11. Ram Mohan Rao. (2002): Geographical Information Systems. Rawat Publication.
- 12. Sabbins, F.F. (1985): Remote sensing Principles and interpretation. W.H.Freeman and company
- 13. Skidmore A., (2002): Environmental modeling with GIS and Remote Sensing. Taylor and
- 14. Wise S., (2002): GIS Basics. Taylor Publications

# Savitribai Phule Pune University, Pune

MA/MSc - II Syllabus in Geography (Credit System) Revised Syllabus (from June, 2020)

### **Course: GGUT-236 Geographical Thoughts**

### No. of Credits: 04

### No. of Periods: 60

Topic No.	Торіс	Subtopics	No. of Periods
		i. A brief account of Greek, Roman, and Indian	
		Schools of thoughts	
		ii. Contributions of Herodotus, Eratosthenes,	
	Historical	Strabo, Ptolemy	
1	Development of	iii. brief account of Arab School	20
	Geographical	iv. Contributions of Marco Polo, Columbus,	
	Thought	Vasco-Da-Gama and Captain Cook	
		v. A brief account of different schools of	
		thought – German, French, British and	
		American	
		vi. Contributions of Kant, Humboldt, Ritter,	
		W. M. Davis.	
		i. Determinism and Possibilism	
2	Dualism in	ii. Systematic versus Regional Geography	10
2	Geography	iii. Physical versus Human Geography	10
	Paradigms.	i. Hypothesis, Theories and Laws	10
		ii. Paradigms in Geography	10

Savitribai Phule Pune University

3	System approaches and Models in Geography	iii. iv.	System approaches in Geography Types of Models used in Geographical Studies	
4	Recent Trends in Geography	i. ii. iii.	Field survey process studies and experimental studies Quantification and application of statistical techniques in Geography Computer based Cartography, Remote Sensing, GIS and Geo-informatics	10
5	Applied Geography	i. ii.	Definition, Need and Significance Application in land-use planning, regional planning and urban planning, resource management, environmental management, natural hazards, scenic evaluation	10

- 1. Cooke, R. U. and Doornkamp, J. C. (1974): Geomorphology in Environmental Management, Clarendon Press, Oxford.
- 2. Coffey, W. J. (1981): Geography : Towards a general spatial systems approach, Mathuen, London
- Dikshit, R. D. (1997): Geographical Thought: A Contextual History of Ideas, Pub. By A. K. Ghosh, Prentice – Hall of India Pvt. M 97, New Delhi.
- 4. Frazire, J. W. (1982): Applied Geography, Prentice Hall, Englewood Cliffs.
- 5. Hertshone, R. (1959): Perspectives of Nature of Geography, Rand Mac Nally and Co.
- 6. Hussain, M. (1995) : Evolution of Geographical Thought, Rawat Pub., Jaipur
- 7. Singh I. (2006): Diverse aspect of Geographical Thought, ALFA Publications, New Delhi

# Savitribai Phule Pune University, Pune

MA/MSc - II Syllabus in Geography (Credit System) Revised Syllabus (from June, 2020)

### Course: GGUT-237 Tropical Geomorphology

### No. of Credits: 04

Topic No.	Торіс	Subtopics	No. of Periods
1	Introduction to Tropics	<ul> <li>i. Tropical Environment – Definition</li> <li>ii. Peculiarities of tropical climate</li> <li>iii. Classification of Tropics</li> <li>iv. Morphogenetic regions - Temperature, rainfall, humidity, vegetation</li> </ul>	06
2	Tropical Weathering	<ul> <li>i. Factors influencing the weathering - climatic, geomorphic, biotic, geologic, chronological and site factors</li> <li>ii. Solubility and Mobility of minerals in Tropics</li> <li>iii. Weathering profile: Deep weathering profiles -</li> </ul>	12

		nature, development and distribution	
		iv. Tropical Soils: Process of soil formation in	
		Tropics, Clay minerals	
		i. Duricursts and Laterites – Definition	
		ii. Indurated laterites - Properties and world	
		distribution	
2	Duricursts and	iii. Classification by site, Morphology and	10
3	Laterites	chronology	10
		iv. A complete account of various division of	
		Lateritic Profile	
		v. Landform development on laterites	
		vi. Distribution of laterites in India	
		vii. Theories of origin of iron in laterites	
		i. Mass movement: Types & Processes	
4	Denudation in Tropics	ii. Slope wash	
		iii. Process of chemical denudation	08
		iv. Tropical rivers - process of erosion and	
		deposition	
	Tropical	i. Tropical Terrain – Relief characteristics	
_	Landscape	ii. Slope and valley forms	
5		iii. Domed and boulder inselbergs	08
		iv. Hillslopes and Pediments	
		v. Tropical coasts	
		i. Formation and Types of planation	
6	Tropical	surfaces	00
6	Planation	ii. Morphology of planation surfaces	08
		iii. Peneplains, Pediplains, Etchplains	
		iv. double surface of planation	
	<b>T</b> 10	i. Role of tectonics and climatic change	
7	Landform	ii. Nature of changes during Quaternary	00
/	development in	changes in climate and vegetation	08
	the tropics		

- 1. Andrew Goudie, (1985): Duricrusts in tropical and subtropical landscapes, Allen Unwin, London.
- 2. Andrew Goudie, (1987): Environmental change.
- 3. Budel J. (1982) Climatic geomorphology, Princeton University Press.
- 4. Douglas j. & Spencer, (1985): Environmental change & Tropical geomorphology, George Allen & Unwin.
- 5. Feniran A. 7 Jeje L.K. (1983): Humid tropical geomorphology
- 6. Thomas, M. F. (1994): Geomorphology in the Tropics, John Wiley and Sons, Chichester
- 7. Thomas M.F. (1974): Tropical geomorphology, McMillan, London.
- 8. Tricart J. (1972): Landforms of the humid tropics, forests and Savanna, Longman, London.

# Savitribai Phule Pune University, Pune

MA/MSc - II Syllabus in Geography (Credit System)

### Revised Syllabus (from June, 2020)

# Course: GGUT-238 Applied Climatology

### No. of Credits: 04

Topic No.	Торіс		Subtopics	No. of Periods
		i.	Nature and scope	
1	Introduction	ii.	Development of applied climatology	06
1	milouuenon	iii.	Atmospheric concern and awareness	00
		iv.	Climate impact assessment	
		i.	Radiation - Basic relations, Radiation laws,	
			distribution, instruments to measure radiation	
		ii.	Temperature - Basic relations, distribution,	
			soil temperature, instruments to measure	
			temperature	
2	Basic climatic	iii.	Moisture - Basic relations, humidity, clouds,	10
	elements		precipitation, rain, snow, sleet, hail, rime,	
			dew, distribution and instruments to measure	
			Precipitation	
		iv.	Evaporation and evapo-transpiration –	
			Basic relations, soil plant relationship,	
			empirical methods to estimate evapo-	
			transpiration, distribution and Instruments	
		v.	Pressure – Basic relation, distribution and	
			instruments to measure pressure	
		vi.	Wind - Basic relations, turbulence, gustiness	
			Instruments	
		i.	Climate and soil	
		ii.	Climate and soil management	
		iii.	Climate pests and diseases	10
3	Agro-climatology	iv.	Micro-meteorological changes and behaviour	10
			of pests and diseases	
		v.	Climate and livestock	
		V1.	Climate and crops	
		V11.	Artificial control of plant environment	
	Climate and	1. 	Human bio-meteorology	
4	Human	11. 	Climate, clothing and human control	07
	behaviour	111.	Climate and health	
		i.	Nature of global environmental change	
5	Urban Climata	ii.	Nature of urban climates	08
5	Ulban Chinate	iii.	Impact of urban climate on GEC	08
		iv.	Urban heat Island	
		V.	5. Urban air Pollution problems	
	Climate	i.	Significant climate variables	
6	ındustry,	11.	Industrial and commercial activities	05
0	commerce and	iii.	Construction operations	05
	engineering			

7	Engineering applications	i. ii.	Heating degree-days. cooling towers Traction ability	03
8	Climate and Transportation	i. ii. iii.	Effect of climate on land transport Effect of climate on water transport Effect of climate on air transport – clear air turbulence	06
9	Use of Remote sensing in agroclimatology	i. ii. iii. iv.	Satellite programming for crop condition Meteorological study monitoring Detection of plant stress Canopy transpiration and crop stress	05

- 1. Geiger, Rudolf (1966): The Climate near the Ground, Hardward University Press.
- 2. Hobbs, John E. (1980): Applied Climatology, Dawson West View Press.
- 3. Lal, M. (ed.) (1993): Global Warming, Tata McGraw Hill, New York.
- 4. Mather, J.R. (1974): Climatology: Fundamentals and Applications, McGraw Hill, New York.
- 5. Oliver, John E. (1973): Climate and Man's Environment, John Wiley and Sons, New York.
- 6. Oliver, John E. (1981): Climatology, Selected Applications, V.H. Winston and Sons, London.

# Savitribai Phule Pune University, Pune

MA/MSc - II Syllabus in Geography (Credit System) Revised Syllabus (from June, 2020)

# **Course: GGUT-239 Geography of Rural Development**

Credit: 04		Periods:	
Topic No.	Торіс	Subtopics	Periods
1	Introduction to Rural Development	<ul> <li>i. Concept of Rural Development</li> <li>ii. Geography and Rural Development</li> <li>iii. Nature and Scope of Rural Development</li> <li>iv. Amis and Objectives of Rural Development</li> </ul>	06
2	Factors affecting on Rural Development	<ul><li>i. Geographical factors</li><li>ii. Social Factors</li><li>iii. Economic Factors</li><li>iv. Rural Demography</li></ul>	04

3	Rural Basic Services and Infrastructures	<ul> <li>i. Rural housing and Rural health</li> <li>ii. Drinking water and Sanitation</li> <li>iii. Rural electrification and Energy</li> <li>iv. Rural Education</li> <li>v. Rural Connectivity (Transportation and Communication)</li> </ul>	08
4	Rural Development Planning	<ul> <li>i. Planning for Rural Development</li> <li>ii. Planning Process- Level and Types of planning</li> <li>iii. Multilevel planning, District Planning, Grassroots Planning</li> <li>iv. Rural Development Planning in India</li> <li>v. Integrated Rural Development Programme (IRDP), MGNREGA &amp; NRLM</li> </ul>	10
5	Government Policies and Rural Development	<ul> <li>i. Role of Government in Rural Development</li> <li>ii. Major Issues and Challenges in context to India</li> <li>iii. Green Revolution and Rural Development</li> </ul>	06
6	Role of Rural Institutions in Development	<ul> <li>i. Definition, Types, Structure and Characteristics of Rural Institutions</li> <li>ii. Panchayati Raj Institutions : Structure, Functions and Problems</li> <li>iii. Cooperatives, NABARD, Regional Rural Bank, Primary Agricultural Credit Societies and SHGs: Structure and Functions</li> <li>iv. Non-Govt. Organizations (NGOs) &amp; Rural Development</li> </ul>	10
7	Application of computer and information technology in Rural Development	<ul> <li>i. E-Governance, e-agriculture, Generation of Resource data Sources acquisition, structure, transformation into map/diagram/visual presentation for better comprehension. Application of Cartographic techniques</li> <li>ii. Application IT and GIS in rural development like smart village</li> </ul>	08
8	Rural Management	<ul> <li>i. Smart Village Concept and structure</li> <li>ii. Watershed Management and Rural Development</li> <li>iii. Problems and Prospects of Rural development in India</li> <li>iv. Management of Tribal Village</li> <li>v. Case study of Rural Development (Ralegan Shiddi or Hiware Bazar)</li> </ul>	08

- 1. Chamola, S. D. and Bharati Anirudh, "Agriculture and Rural Development in India", Global Vision Publishing House.
- 2. Desai V. (1991): "Fundamentals of Rural Development", New Delhi: Rawat Publications

- 3. Economic Survey of India: 2019
- 4. Katar Singh "Rural Development: Principles, Policies and Management", (Sage Texts) 3rd Edition
- 5. Khullar, R.D. (2019): "India: A Comprehensive Geography" Kalyani Publishers
- 6. Lekhi, R.K.: "The Economics of Development and Planning", Kalyani Publishers, New Delhi
- 7. Manual on municipal solid waste management Govt. of India Publication
- 8. Meier, Gerald (1987): Leading Issues in Economic Development New Delhi: Oxford Uni. Press
- 9. Nelson Nemerow: "Theories and Practices of Industrial waste treatment"
- 10. Prasad, B.K. (2003): "Rural Development: Concept, Approach and Strategy", New Delhi: Sarup & Sons
- 11. Rau, S.K. (2001): Global Search for Rural Development Hyderabad: NIRD
- 12. Satya Sundaram, I. (2002): "Rural Development" Mumbai: Himalaya, 2002

MA/MSc - II Syllabus in Geography (Credit System) Revised Syllabus (from June, 2020)

#### Course: GGUT-240 Urban Geography No. of Credits: 04

Topic No.	Торіс	Subtopics	No. of Periods
1	Introduction to Urban Geography	<ul> <li>i. Nature of Urban Geography</li> <li>ii. Scope of Urban Geography</li> <li>iii. Significance of Urban Geography</li> <li>iv. Relation to other disciplines</li> </ul>	07
2	Urbanization	<ul> <li>i. Meaning of Urban settlement and urbanization.</li> <li>ii. Brief review of spatial- temporal variations in urbanization in the world</li> </ul>	07
		iii. Urbanization curve iv. Contemporary factors of urbanization	
3	Urban Morphology	Models of urban structure:         i.       Park and Burgess Model         ii.       Homer Hoyet Model         iii.       Harris and Ullman Model         iv.       Characteristics and demarcation of CBD	07
4	Urban Classification	<ul><li>i. Criteria used for classification</li><li>ii. Functional classification of towns and cities</li></ul>	04

		Chara	cteristics of urban population:	
5	Urban	i.	Growth of Urban population	08
	Demography	ii.	Density of population in cities	
		iii.	Age, sex and occupational structure	
		i.	Concepts of city region and various	
6	City and its Region		synonymous terms used	04
		ii.	Criteria used to demarcate the city region	
		i.	Christaller's Central Place Theory	
7	Central Place	ii.	Rank-size relationship and rank- size rule	08
		iii.	Hierarchy of urban settlements	
		i.	Price of land and vertical and horizontal	
8	Contemporary		growth of cities	
Ŭ	Urban issues	ii.	Scarcity of housing and growth of slums	08
	eroun issues	iii.	Problems of civic amenities	00
		iv.	Urban transport problem	
		v.	Urban Environmental pollution	
		vi.	Urban floods, health and hygiene	
		i.	Urban development policy in India	
9	Urban policy and	ii.	Need ∈ of city plan	07
	planning	iii.	Use of GIS in Urban Planning	
		1		

- 1. Bhattacharya: Urban Development in India, Shree publication
- 2. Brian, R.K. (1996): Landscape of Settlement Prehistory to present, Routledge, London
- 3. Careter (1972): Fourth edition: The study of Urban Geography, Arnold, London
- 4. Gadakh B.L. and Jaybhaye R. G. (2017): Urban Sprawal Analysis of Nashik City. Scholar press
- 5. Hall P. (1992): Urban and Regional Planning, Routedge, London
- 6. K. Siddharth and S. Mukherji : Cities, Urbanization and Urban Systems
- 7. Kundu, A. (1992): Urban Development and Urban Research in India, Khanna Publication
- 8. Mayer and Kohan: Readings in Geography
- 9. Northam: Urban Geography
- 10. Roy Turner: Indian's Urban Future
- 11. R.B Mandal-V.G A Textbook ( Concept publishing Company
- 12. Shah Manzooor Alam: Urbanization in Developing Countries
- 13. Singh.K.and Steinberg.F. (eds)(1998): Urban India in Crisis. New Age Interns
- 14. Urban Geography: Tim Hall
- 15. Verma: Urban Geography, Rawat, Jaipur

MA/MSc - II Syllabus in Geography (Credit System) Revised Syllabus (from June, 2020)

### **Course: GGDP-241 Practical in Geoinformatics**

#### No. of Credits: 02

#### No. of Periods: 30

Topic No.	Торіс	Subtopics	Practical (3 Hours)
1	Aerial Photography	<ul> <li>Measurements and Interpretation <ul> <li>i. Scale and height (using parallax bar)</li> <li>ii. Visual Interpretation of single aerial photograph</li> <li>iii. Interpretation of stereo pair using Stereoscope</li> </ul> </li> </ul>	02
2	Satellite Images	<ul> <li>i. Visual interpretation of LISS, PAN, WiFS</li> <li>ii. Cartosat Data, IKONOS and Quick Bird</li> </ul>	02
3	Spatial Database	<ul> <li>Layer Generation</li> <li>i. Raster: Full Grid, Chain Codes and Run Length Codes</li> <li>ii. Vector: Manual Digitization, Digitization Errors and Topology Building</li> </ul>	04
4	GIS operations	<ul> <li>i. Raster and vector overlay, map algebra (AND, OR) from a toposheet quadrant</li> <li>ii. Spatial interpolation from a toposheet quadrant</li> <li>iii. GIS operations using open source GIS softwares</li> </ul>	02

- 1. Burrough, P.A. and R.A. McDonnell (2000): Principles of Geographical Information System, Oxford University Press.
- 2. Chang Kang-tsung. (2002): Introduction to GIS, Tata McGraw Hill, New Delhi.
- 3. C. P. Lo and Albert, K. W. Yeung (2002): Concepts and Techniques of Geographic Information System, 2002Prentice –Hall, India.
- 4. George Joseph (2003): Fundamentals of Remote Sensing, Universities Press, Hyderabad
- Kang Tsung Chang, (2002): Introduction to Geographical Information System, McGraw Hill.
- J. R. Jensen, (2003) : Remote Sensing of Environment, An Earth Resource Perspective, Pearson Education Pvt. Ltd., New Delhi
- P. A. Burrough and R. A. McDonnell, (2000): Principles of Geographical Information System, Oxford University Press.

- 8. Paul A. Lonfley, Michel F. Goodchild, D J. Maguire and D.W. Rhind (2002): Introduction to Geographic Information Systems and Science, John Wiley and Sons Ltd.
- 9. Vaidyanadhan, R. (1973): Index to a set of 70 aerial stereopairs, UGC, New Delhi.

MA/MSc - II Syllabus in Geography (Credit System) Revised Syllabus (from June, 2020)

### Course: GGUT-242 Hydrology

No. of Credits: 02

### No. of Periods: 30

Topic No.	Торіс	Subtopics		No. of Periods
	Introduction to	i. ::	Meaning and definition of Hydrology	
1	Hydrology	11. :::	The hydrologic cycle	06
	Trydrology	111. 	Applications of Hydrology	
	Undenla ain	IV.	Applications of Hydrology	
	Hydrologic	1.	Contract of Incoherence deter	
2	Measurements and	11. 	Sources of hydrologic data	06
	Data Sources	111.	Measurements hydrologic variables	
		i.	Water vapor: Measures of atmospheric	
	Drecinitation		moisture	
	recipitation	ii.	Precipitation: Forms and Types	06
3		iii.	Global distribution of precipitation	00
5		iv.	Probable Maximum Precipitation (PMP)	
		v.	Gross and net precipitation	
		i.	Interception	
4	Interception and	ii.	Throughfall	06
-	Depression Storage	iii.	Depression storage	00
		•	Presente metion	
	Evenoration and	1. 	Evaporation	
5	Transpiration	11. 	Method of evaporation control	06
		111.	I ranspiration	00
		1V.	Methods of transpiration control	
		<b>v.</b>	Evapotranspiration	

- 8. Baker, V.R., Kochel, R.C. and Patton, P.C., (1988): Flood Geomorphology, Wiley, New York.
- 9. Bedient, P.B. and Huber, W.C., (1989): Hydrology and floodplain analysis, Addison-Wesley Publication Company, New York.
- 10. Chow, V.T., (1964): Handbook of Applied Hydrology. McGraw-Hill, New York.
- 11. Eagleson, P.S., (1970): Dynamic Hydrology, McGraw-Hill Book Company, New York.
- 12. Hamblin, W.K., (1989): The Earth's Dynamic Systems, MacMillan Publishing Company, New York.

- 13. Kale, V.S. and Gupta, A., (2001): Introduction to Geomorphology, Orient Longman, Calcutta.
- 14. Kazmann, R.G., (1972): Modern Hydrology, Harper and Row Publishers, New York.
- 15. Linsley, R.K. (Jr), Kohler, M. A. P. and Joseph L. H., (1975): Applied Hydrology, Tata McGraw-Hill Publishing Company Ltd., New Delhi.
- 16. Mutreja, K.N., (1995): Applied Hydrology. Tata McGraw-Hill Publishing Company Ltd. New Delhi.
- 17. Raghunath, H.M., (1985): Hydrology: Principles, Analysis and Design. Wiley Eastern Ltd, New Delhi.
- 18. Rodda, J.C., Downing, R. A. and Law, F.M., (1976): Systematic Hydrology, Newnes-Butterworths, London.
- 19. Shaw, E.M., (1988): Hydrology in Practice. Van Nostrand Reibhold Int. Co. Ltd, London.
- 20. Strahler, A.A. and Strahler, A. N., (2002): Physical Geography: Science and Systems of the Human Environment, John Wiley & Sons, INC.
- 21. Strahler, A.H. and Strahler, A. N., (1992): Modern Physical Geography, John Wiley & Sons, INC.
- 22. Strahler, A.N., (1965): Introduction to Physical Geography, John Wiley & Sons, INC.
- 23. Viessman, W. and Lewis, G., (2003): Introduction to Hydrology, Pearson Education, Singapore.
- 24. Ward, R., (1978): Floods. A Geographical Perspective. The Mac Millan Press Ltd, London.
- 25. Wilfried, B., (2005): Hydrology: An Introduction. Cambridge University Press, Cambridge.
- 26. Wisler, C.O. and Brater, E. F., (1959): Hydrology, John Wiley and Sons, Tokyo.

MA/MSc - II Syllabus in Geography (Credit System) Revised Syllabus (from June, 2020)

### **Course: GGUT-243 Watershed Management** No. of Credits: 02

Topic No.	Торіс	Sub topics	Periods
1	Concept of watershed management	<ul> <li>i. Definition, concepts of watershed; watershed management, Principle of watershed management</li> <li>ii. Necessity of watershed management</li> <li>iii. Problems in watershed management</li> </ul>	06
2	Characteristics of watershed	<ul> <li>i. Delineation of Watershed</li> <li>ii. Characteristics: Size , Shape , Physiography , Climate, Drainage, Land use, Vegetation, Geology and Soils, Hydrology, Socioeconomics</li> </ul>	06

3	Hydrological process in watershed	i. ii.	Precipitation, interception, infiltration, evaporation, evapo-transpiration, surface runoff, ground water-flow, water budget Hydrological cycle	06
4	Water and soil conservation in watershed	i. ii.	Water conservation: Nala Bunding, Check dams, Farm ponds, Percolation tanks, Artificial recharge Soil conservation- Contour Bunding, Gully plugging, Trench cum mound, Levelling	06
5	Watershed development	i. ii. iii.	Application of Remote Sensing and GIS in watershed management Integrated watershed development plans Importance of watershed management in national development.	06

- 1. Dhruvanarayana, V.V., Sastry, G., Patnaik, U.S.: Watershed Management
- 2. Kakde, B.K.: Watershed Manual A Guide for Watershed Development Practitioners and Trainers, BAIF Development Research Foundation, Pune.
- 3. Murthy, JVS: Watershed Management, New age International Publishers.
- 4. Rajesh Rajora: Integrated Watershed Management- A Field Manual for Equitable, Productive and Sustainable Development, Rawat Publication, Jaipur.
- 5. Singh Rajvir: Watershed Planning and Management, 2nd Edition, Yash Publishing House, Bikaner, India.
- 6. Suresh,R.: Soil and Watershed Conversation Engineering, 2nd Edition, Standard Publication Distributors, Delhi.
- 7. Schwab,G.O. et al: Soil and Water Conservation Engineering, 4th Edition, John Wiley & Sons.

# Savitribai Phule Pune University, Pune

MA/MSc - II Syllabus in Geography (Credit System) Revised Syllabus (from June, 2020)

# Course: GGDP-244 Practical in Multivariate Statistics

### No. of Credits: 02

Topic No.	Торіс	Subtopics	Practical (3 hours)
1	Introduction	<ul> <li>i. Bivariate &amp; Multivariate Analysis</li> <li>ii. Objectives of Multivariate Analysis <ul> <li>a. Data reduction or simplification</li> <li>b. Sorting and Grouping</li> <li>c. Prediction</li> <li>d. Hypothesis Testing</li> </ul> </li> </ul>	01
2	Matrix Algebra	<ul> <li>Matrix :</li> <li>a. Definition, Elements, Order and Types</li> <li>b. Determinant of a matrix</li> <li>c. Addition, subtraction and multiplication of matrices</li> </ul>	02

		d. Transpose, adjoint and inverse of matrix	
		e. Determination of unknowns in a	
		simultaneous equation by matrix solution	
		using	
		(i) – Crammer's rule and (ii) Inverse method	
	Curvilinear	i. Computation, plotting and interpretation of	02
	bivariate	a. Second Degree (Quadratic) equation,	02
3	Relationships	$\mathbf{Y} = \mathbf{a} + \mathbf{b}_1 \mathbf{X}^1 + \mathbf{b}_2 \mathbf{X}^2$	
	r~	b. Third Degree (Cubic) equation	
		$Y = a + b_1 X^1 + b_2 X^2 + b_3 X^3$	
		i. Computation of multiple regression equations	
		involving two and three independent variables	
4	Multivariate	(by using variance – covariance matrix)	03
-		Calculation of Co-efficient of multiple	05
	7 mary 515	determination (R^2) and Explained Variance (EV)	
		a. Second order multiple regression equation,	
		$Y = a + b_1 X_1 + b_2 X_2$	
		b. Third order multiple regression equation,	
		$Y = a + b_1 X_1 + b_2 X_2 + b_3 X_3$	
		i Importance of Trend surface analysis in the study	
		of spatially distributed data Examples of TSA	
_	<b>T</b> 10 0	ii Computation application and plotting of linear	
5	Trend Surface	trend surface. Interpolation of trends	02
	Analysis	iii Ideas of quadratic and cubic trend surfaces	
		In recus of quadratic and cubic trond suffaces.	

- 1. Clark W. A. V. and Hosking P. L. (1986): Statistical methods of geographers.
- 2. Collins (1984): Introduction to multivariate analysis, Edward Arnold.
- 3. Fortheringham, A.S., Brunsdon, G., and Charlton, M., (2000): Quantitative Geography, Perspectives on Spatial Data Analysis, SAGE.
- 4. Jonston, R. J. (1979): Multivariate statistics in Geography, Longman, London.
- 5. Karlekar S. N. and Kale M. (2005): Statistical Analysis of Geographical Data, Diamond Publication, Pune.
- 6. Shaw G. and Wheller D. (1985): Statistical techniques in geographical analysis. John Wiley and Sons, New York.
- 7. Sumner G. J. (1978): Mathematics of Physical Geographers, Edward Arnold.

MA/MSc Syllabus in Geography (Credit System) Revised Syllabus (from June, 2020)

Code No: GGUP-245 Practical in Geomorphology

No. of Credits: 04

### **Total Periods:60**

Topic No	Topics	Subtopics	Practical (3 Hours)	No. of Sheets (Minimum)
1.	Geomorphological mapping	Use of symbols (Hert, 1986) i. Chart showing symbols ii. Preparing a geographic map of a small area / basin -toposheets / field iii. Interpretation of the map in terms of forms and processes	04	02
2.	Hill slope Analysis	<ul> <li>Direct and indirect measurements</li> <li>i. Using clinometers / profiles from toposheets,</li> <li>ii. Identification of segments</li> <li>iii. Dalrymple et al's nine- unit landsurface model- Understanding nature of processes</li> </ul>	04	02
3.	Field Survey	<ul> <li>Channel cross sections/ Beach/Hill slope profile Soil/sediment sample collection <ol> <li>Surveying and plotting of stream or gully channel cross—section or beach profile or slope profile.</li> <li>Quadrat or Traverse survey of sediment size on river bed /beach.</li> <li>Analysis of shape and size of coarse sediment(Zingg's classification)</li> </ol> </li> <li>GPS survey Preparation of beach, river channel maps etc. using GPS</li></ul>	07	04
4	Laboratory work	<ul> <li>Soil/Sediment analysis</li> <li>i. Analysis of 1 sandy and 1 Clayey sample</li> <li>ii. Plotting of data on probability graph paper and</li> <li>iii. Estimation of grain size parameters iv. Interpretation of results</li> </ul>	05	02

(*Note : Fieldwork / Field Visit for a duration of not more than 5 days should be undertaken for the course selected*)

- 1. Aackombe, R. V. and Gardiner, V. (1983): Geomorphological Field Manual
- Chorley, R. J., Schumm, S. A. and Sugden, D.E. (1984) : Geomorphology, Methuen, London
- 3. Goudie, A. (1990): Geomorphological Techniques, Unwin Hyman, London
- 4. Hart, M. G. (1986): Geomorphology, Pune and Applied George Allen and Unwin
- Kale, V. S. and Gupta, A. (2001): Introduction to Geomorphology, Orient Longman, Culcutta
- King, C.A.M. (1966): Techniques in Geomorphology, Edward Arnold,London George Allen andUnwin, London

# Savitribai Phule Pune University, Pune

MA/MSc Syllabus in Geography (Credit System) Revised Syllabus (from June, 2020)

**Code No: GGUP-246 Practical in Climatology No. of Credits: 04** 

### **Total Periods: 60**

Topic No	Topics	Subtopics	Practical (3 Hours)	No. of Sheets (Minimum)
1.	Weather Elements	i. Instrumentation and measurement techniques of weather elements and processing of weather data (5-10 years data)	05	04
2.	Station Model	i. Synoptic data: Coding, decoding and plotting of synoptic data	03	03
3.	Indian Daily Weather Report (IDWR)	<ul> <li>Study and Analysis of IDWR</li> <li>Study of IDWR and analysis of</li> <li>Temperature, Air Pressure, etc.</li> <li>for various stations.</li> <li>Charting of Systems (4 years)</li> </ul>	05	04
4	Water Balance	i. Computation of water balance for 4 stations in different rainfall zones and irrigation scheduling	05	04

- 1. Indian Daily Weather Report, IMD, Pune.
- 2. Oliver, John E. (1973): Climate and Man's Environment, John Wiley and Sons, New York.
- 3. Thornthwaite, C. W. and Mather, J. R. (1957): Instructions and Tables for computing potential evapo-transpiration and water balance, Drexel Institute of Technology, Laboratory of Climatology.
- 4. WMO No. 8 (1983): Guide to meteorological instruments and methods of observations

# Savitribai Phule Pune University, Pune

MA/MSc - II Syllabus in Geography (Credit System) Revised Syllabus (from June, 2020)

### **Course: GGUP- 247 Practical in Economic Geography Credit: 04**

or call or		10	
Topic	Торіс	Subtopics	Practical
No.			(3 Hours)
1	Techniques in Agricultural Geography	<ul> <li>i. Crop Combination: Thomas Method</li> <li>ii. Crop Diversification: Bhatia method</li> <li>iii. Crop Concentration : Jasbir Singh method</li> <li>iv. Measurement of Agriculture Efficiency : Kendall method</li> <li>v. Productivity Index: Enyedi Method</li> <li>vi. Cropping Intensity and Irrigation Intensity</li> </ul>	05
2	Techniques in Industrial Geography	<ul><li>i. Lorenz Curve: Calculation and Plotting</li><li>ii. Location Quotient: Calculation and Plotting</li><li>iii. Gini's Co-efficient</li></ul>	04
3	Techniques in Trade and Transportation Geography	<ul> <li>i. Measures in Network Structure: Ratio Measure, Alpha, Beta, Gamma, Associate Number and Cyclomatric numbers</li> <li>ii. Gravity Potential Population Surface</li> <li>iii. Breaking Point Theory</li> <li>iv. Law of Retail Trade Gravitation</li> </ul>	05

Periods: 60

4	Cartographic Techniques in Economic Geography	<ul><li>i. Use of Thematic Maps in Economic Geography</li><li>ii. Use of Choropleth Maps in Economic Geography</li><li>iii. Use of GIS in Economic Geography</li></ul>	03
5	Industrial Visit	i. Visit to one Agro-based Unit (Industry) and report writing	03

- 1. C. P. Lo and Albert, K. W. Yeung (2002): Concepts and Techniques of Geographic Information System, 2002Prentice –Hall, India.
- 2. Kansky, N. T. (1965): Structure of Transport Network
- 3. Liendsor, J. M. (1997): Techniques in Human Geography, Routledge
- 4. Lloyd, P. and B. Dicken (1972): Location in Space A theoretical approach to economic geography. Harper and Row, New York.
- 5. Majid Hussein, "Agricultural Geography", Rawat Publication.
- 6. Monkhouse, F. J. and Wilkison, H. R. (1976): Map and Diagrams, Methuen and Co.
- 7. P. A. Burrough and R. A. McDonnell, (2000): Principles of Geographical Information System, Oxford University Press.
- 8. Paul A. Lonfley, Michel F. Goodchild, D J. Maguire and D.W. Rhind (2002): Introduction to Geographic Information Systems and Science, John Wiley and Sons Ltd.
- 9. Singh & Kanujia : Map work and Practical Geography
- 10. Singh. J. and Dhillon S.S. (1994): Agricultural Geography. Tata McGraw Hill, Publishing Co. Ltd.
- 11. Yeats, M. H. (1974): An introduction to Quantitative Analysis in Human Geography

# Savitribai Phule Pune University, Pune

MA/MSc - II Syllabus in Geography (Credit System) Revised Syllabus (from June, 2020)

### Course: GGUP-248 Practical in Population and Settlement Geography No. of Credits: 04 No. of Periods: 60

Topic No.	Торіс	Subtopics	Practical (3 Hours)
1	Population Geography	Demographic indices:i.Mean age at marriage and fertilityii.Measures of mortality ,IMR & A.S.D.RDependency ratioDeterminants of Demographic transition:i.Demographic transition: Determinants of demographic transition compared with underdeveloped/developing/developed countries/stateii.Pull-push factors affecting volume of migration- simple correlation matrix	06
		iii. Rural urban composition of population	

		iv.	Age-sex and literacy	
2	Settlement Geography	i. ii. iii. iv.	Gravity model by W.J.Reilly and Zipf, its application (potential population surfaces) Indices of C.B.D Stages according to urbanization curve Rank size rule Gini's Coefficient concentration index	06
3	Village Survey/ Urban Survey	i. ii. iii.	Preparation of questionnaire Collection of Population and settlement data Data analysis and preparation of report	08

- 1. Economic and Political weekly-Special issue of population survey
- 2. Liendzore J.M Techniques in Human Geography
- 3. Martin Cad: Analytical Urban Geography
- 4. Siddharth, K and Mukherjee, S (1999): Cities urbanization and urban systems
- 5. Chandana, R, C. Population, Geography
- 6. Yeats, M.H. (1978): An introduction to quantitative analysis in human Geography.
- 7. Carter Harold: Urban Geography
- 8. John R.Weeks: Population an introduction to concepts and issues.

# SAVITRIBAI PHULE PUNE UNIVERSITY

Geography MA/MSc-II (Credit System)

Revised Syllabus (From June-2020)

### Semi -IV

#### **Course: GGUT-249 Geography of India** No. of Credite: 04

No. of Credits: 04		01	Total Periods: 6		
Topic No.	Торіс		Sub-Topic	Periods	
1	Introduction	i. ii. iii. iv.	Geographical and relative location of India Frontiers of India Strategic Significance Geological Structure	06	
2	Physiography	Main j i. ii. iii.	physiographic divisions & their importance The northern mountains The north Indian Plain The peninsular plateau	06	
		iv. v.	The coastal lowlands The islands		

			1
		A) Himalayan drainage systems:	
		i. Ganga	
		ii. Brahmaputra	
3	Drainage	iii. Indus	06
5	Systems	B) Peninsular drainage system	00
	Systems	1. East Flowing Rivers:	
		i. Godavari	
		ii. Krishna	
		iii. Mahanadi	
		2. West Flowing Rivers:	
		i. Narmada	
		ii. Tapi	
		iii. Mahi	
		A) Main Seasons & Associated weather conditions:	
		i The winter	
		i. The summer	
		iii The rainy/monsoon	
4	Climate	in. The ratio monopole	06
		IV. The fetteat monsoon	
		b) Origin and mechanism of monsoon.	
		1. If additional concept: Halley's view	
		11. Recent Concept:	
		a. Role of Tibet plateau	
		b. IICZ	
		c. Jet Stream	
		d. El-Nino	
5	Soils	A) Major soil types and their distribution in India:	06
		i. Alluvial soil	
		ii. Black soil	
		iii. Red soil	
		iv. Laterite and Lateritic soils	
		v. Forest and Mountain soils	
		vi. Arid and Desert soils	
		vii. Saline and Alkaline soils	
		viii. Peaty and Marshy soils	
		B) Soil degradation and soil conservation	
		A) Main forest types and their distribution in India:	
		i. Moist Tropical forests	
		ii. Dry Tropical forests	
6	Forest	iii. Montane Sub-tropical forests	06
		iv. Montane Temperate forests	
		v. Alpine forests	
		B) Deforestation and conservation of forest	
		A) Distribution and Utilization of Minerals:	
		i. Iron Ore	
		ii. Manganese	
		iii. Bauxite	
7	Minerals and	B) Distribution and Utilization of Energy Resources	06
	Energy	i Coal	
	Resources	ii Petroleum	
		iii Natural gas	
	1	111. I valutat zao	1

		C) Major power projects in India:	
		i. Hydro electric	
		ii. Thermal Power	
		iii. Atomic power	
		1	
		A) Distribution and Production of Major Crops:	
		i. Rice	
		ii. Wheat	
		iii. Cotton	
8	Agriculture	iv. Sugarcane	06
0	Agriculture	B) Agriculture revolution in India:	00
		i. Components of the Green Revolution	
		ii. Merits and demerits of Green Revolution in India	
		C) Factors affecting Indian Agriculture:	
		i. Environmental Factors	
		ii. Technological Factors	
		iii. Institutional Factors	
		A) Major Industries in India:	
		i. Cotton Textile	
		ii. Sugar	
9	Industries	iii. Iron and Steel	06
		B) Major Industrial Regions in India	
		C) Problems of Industrial development	
		A) Growth and distribution of population in India	
		B) Composition and structure of Population:	
		i. Rural-Urban	
10	Population	ii Age-sex	06
		iii Religious	
		iv Marital status	
		v Occupational structure	
		v. Occupational structure	

N.B.: According need of topics, maps are expected.

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- 19. Census of India Report website- http://censusindia.gov.in/
- 20. Earth Science India- www.earthscienceindia.info

### SAVITRIBAI PHULE PUNE UNIVERSITY

Geography MA/MSc-II (Credit System) Revised Syllabus (From June-2020)

# Course: GGUT-250 Oceanography

No. o	f Credits: 04	Total Periods: 60		
S.N.	Торіс	Sub-Topic	Periods	
		i. Definition and Meaning of Oceanography		
1	Introduction to	ii. Foundation of Modern Oceanography	08	
1	Oceanography	iii. Contribution of Oceanographers in the subject	00	
	occunography	iv. Post-war Oceanography		
		v. Modern Trends		
2	Origin of the	i. Continental Drift	08	
	Ocean Basins	ii. Seafloor Spreading		
		iii. Plate Tectonics		
		iv. World Oceans, their origin and distribution		
		Relief of the Ocean Bottom		
		i. Continental Margin: Continental shelves and slopes		
3	The Ocean Floor	ii. Oceanic Ridges and Rises	08	
		iii. Abyssal Plains		
		iv. Oceanic Trenches		
		v. Volcanoes on ocean floor		
		vi. Coral Reefs and Atolls		
		vii. Offshore Islands		
		i. Factors affect temperature on water and distribution		
		ii. Factors affecting density		
		iii. Origin and composition of sea salt and	12	
4	Properties of	residence time		
	Sea Water	iv. Carbon dioxide and carbonate cycles		
		v. Viscosity		
		vi. Surface tension		
		i. Lithogenous particles (Derived from Rocks)		
		ii. Biogenous particles (derived from organisms)		
5	Marine	iii. Hydrogenous particles (derived from Water	08	
_	Sediments	iv. Distribution of sediment deposits		
		v. Oceanic ooze		
		vi. Correlation and age determination		

		i.	Natural resources- gaseous, liquefied and solid	
	Ocean		chemical parameters	
6	resources	ii.	Available resources	08
		iii.	Exploited resources	
		iv.	Unexploited resources	
		v.	Account of known but unexploited oceanic reserves	
		Cause	s and measures	
		i.	Etiology of marine & oceanic pollution	
		ii.	Possible natural disturbances causing pollution in	
7	Oceanic		oceans	08
	Pollution	iii.	Anthropogenic activities resulting in oceanic	
			pollution	
		iv.	Oceanic pollutants and their characteristics for	
			human benefits	
		v.	Known remedial measures for pollution at sea &	
			oceanic level	

- 1. Basu S.K. (2003) (ed): Handbook of Oceanography, Global Vision, Delhi.
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- 3. Garrison Tom (1999): Oceanography, Brooks/ Cole Wadsworth, New York.
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### SAVITRIBAI PHULE PUNE UNIVERSITY

Geography MA/MSc-II (Credit System) Revised Syllabus (From June-2020)

Total Pariods: 60

#### Course: GGUT – 251 Research Methodology No. of Credits: 04

1 (of of circuits) of				
Topic	Topic		Sub-Topic	Periods
No.				
		i.	Meaning and objectives of research	
1	Introduction	ii.	Characteristics of Research	10
1	to Research	iii.	Types of Research	10
	Methodology	iv.	Various steps in Research Process	
	Methodology	v.	Research Methods versus Methodology	
2	Research	i.	Research Design - definition	06
	Design	ii.	Purpose of a Research Design	
	_	iii.	Characteristics of Good Research Design	
3	Research	i.	Definitions of the Research Problem	06
	Problem	ii.	Identification of a Research Problem	
		iii.	Technique involved in defining a problem	

4	Sampling	i.	Sampling Design – Definition of Population,	08
	Design		Sample and Sampling Design	
		ii.	Advantages and disadvantages of Sampling	
		iii.	Characteristics of a good sample	
		iv.	Types or method of sampling	
5	Methods of	A) Pri	mary Data	06
	Data	Questi	ionnaire Method	
	Collection	i.	Questionnaire – definition	
		ii.	Characteristics of a good questionnaire	
		iii.	Merits and demerits Questionnaire Method	
		Interv	iew Method	
		i.	Interview – definition	
		ii.	Characteristics of an interview	
		iii.	Merits and demerits of Interview	
		iv.	Difference between Interview and Questionnaire	
		Obser	vation Method/Field Work Method	
		B) Sec	condary Data	
6	Data	i.	Variables and their types	12
	Analysis	ii.	Hypothesis- definition and types	
		iii.	Measure for Central Tendency and Dispersion	
		iv.	Correlation and Regression Analysis	
		v.	Time series analysis	
		vi.	T test, Z test, Chi-square test	
7	Technical	Types	of research report	06
	writing and	i.	Dissertation and thesis, research paper, review	
	reporting of		article, short communication, conference	
	research		presentation, meeting report, etc.	
		ii.	Structure and organization of research reports-	
			Title, abstract, key words, introduction,	
			methodology, results, discussion, conclusion,	
			acknowledgements, references, footnotes, tables	
			and illustration	
		iii.	Literature Review	
8	Research	i.	Research ethics	06
	ethics,	ii.	Plagiarism	
	plagiarism	iii.	Use of plagiarism detection softwares	
	and funding	iv.	Research opportunities and funding agencies	
	agencies			

- 1. Gaum, Carl G., Graves, Harod F., and Hoffman, Lyne, S.S., (1950): Report Writing, 3rd ed., New York: Prentice-Hall.
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### SAVITRIBAI PHULE PUNE UNIVERSITY

Geography MA/MSc-II (Credit System) Revised Syllabus (From June-2020)

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### **Course: GGUT- 252: Geography of Soil Credit: 02**

Credit: 02		Periods: 30	
Topic No.	Торіс	Subtopics	Periods
1	Introduction to Geography of Soil	i.Definition ii. Nature and Scopeof Soil Geography iii.Development of Geography of Soil iv. Soil as a Natural Resource	4
2	Soil Formation and Soil Profile	<ul><li>i. Factors of Soil formation: Parent Material, Climate, Biota, Time, Topography.</li><li>ii. Soil Profile : Definition and Structure</li></ul>	6
3	Components and Characteristics of Soil	<ul> <li>i. Soil component: Minerals, Organic Matter, Air and Water.</li> <li>ii. Physical, Chemical and Biological characteristics of soil.</li> <li>iii. Nutrients in Soils: Primary, Secondary and Micronutrients</li> </ul>	6
4	Classification and types of Soil	<ul><li>i. Land Capability Classification</li><li>ii. Land Suitability Classification</li><li>iii. Types of Soil with reference to India</li></ul>	6
5	Problems related to soil and Soil Conservation	<ul> <li>i. Soil Problems: Soil Pollution, Acidification, salinization and Soil health</li> <li>ii. Soil Conservation: Definition and various methods of Soil Conservation,</li> <li>iii. Soil Conservation in India</li> <li>iv. Role of RS and GIS in Soil Conservation</li> </ul>	8

- 1. A.S. Gustafson, (2007): "Soils and Management" Published by Agrobios (India).
- 2. Brady, N. C., and Weil, R. R. (2008): The Nature and Properties of Soils, Prentice Hall, New Jersey
- 3. Bridges, E. M. and Davidson, D. A. (1982): Principles and Applications of Soil Geography, Longman Group, London.
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- 5. C. E. Miller, L.M. Turk, (2001): "Fundamental of soil Science" Biotech Books Delhi.

- 6. Daji, J. A. (1970): A Textbook of Soil Science, Asia Publication House, New York.
- 7. Lal, R. (ed.), (2002): Encyclopedia of soil science. Marcel Dekker, New York.
- 8. Miller, R. W. and Donahue, R. L. (1992): Soils: An Introduction to Soils and Plant Growth, Prentice-Hall of India, New Delhi.
- 9. Pitty, A. F. (1978): Geography and Soil Properties, Methuen and Co., London.
- 10. S. C. Panda, (2007): "Soil water conservation and dry farming" Published by Agrobios (India).
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MA/MSc - II Syllabus in Geography (Credit System) Revised Syllabus (from June, 2020)

### **Course: GGDP-253 Practical in Geostatistics**

No. of Credits: 02

Topic No.	Торіс	Subtopics	Practical (3 hours)
1	Exploratory spatial data analysis	<ul> <li>i. Univariate descriptors: Frequency tables, Histogram, Cumulative frequency table, Normal probability plots, Summary / Descriptive Statistics</li> <li>ii. Bivariate descriptors: Scatter plot, correlation, covariance, correlation- coefficient, linear regression</li> </ul>	2
		(Attempt at least two discrete problems plotting/obtaining the univariate and bivariate descriptors and interpreting them.)	
2	Structural analysis	Variogram: Definition and concept i. Plotting of variogram using GIS software	2
3	Spatial interpolation	Local Interpolation Thiessen polygon (Vornoii plots) (manual and software) i. Inverse Distance Weighting (IDW)* ii. Spline* iii. Kriging* (*use of software)	2
4	Cluster Analysis	Problems and interpretation of results	2
5	Markov Chain Analysis	Problems and interpretation of results	2

- 1. Cressie, N.A.C. (1993): Statistics for Spatial Data, New York: John Wiley & Sons, Inc.
- 2. Duetsch, C.V. and Journel, A.G. (1992): GSLIB: Geostatistical Software Library and User's Guide, New York: Oxford University Press.
- 3. Hohn, M.E. (1988): Geostatistics and Petroleum Geology, New York: Van Nostrand Reinhold.
- 4. Simon W. Houlding (2000): Geostatistics: Modeling and Spatial Analysis, Springer; Har/Cdr edition (8 June 2000), CD-ROM: 161 pages

# SAVITRIBAI PHULE PUNE UNIVERSITY Geography MA/MSc-II (Choice Based Credit System)

Semester: IV

Revised Syllabus (From June-2020)

Course: GGUT – 254 Political Geography No. of Credits: 02

	Total Periods: 30			
Sr. No.	Торіс	Sub-Topic	Periods	
1	Introduction to	i. Definition, nature and scope		
	PoliticalGeography	ii. Historical Development of Political		
		Geography	<i>.</i>	
		iii. Recent trends inPolitical Geography	6	
		iv. Importance of Political Geography		
2	Concepts of Nations	i. Definition of Nation and State		
	and State	ii. Origin of state and Elements of state		
		iii. Nation building/Nationalism	6	
		iv. Difference between Nation and State		
3	Frontiers &	i. Definition of Frontiers & Boundaries		
	Boundaries	ii. Difference between frontiers & boundaries	4	
		iii. Genetic, functional & Morphological	4	
		classification of boundaries		
4	Geopolitics	i. Concept of Geopolitics		
		ii. Heartland Theory of Mackinder	6	
		iii. Concept of Modern Geopolitics	0	
		iv. Geopolitical importance of Indian ocean		
5	Contemporary Issues	i. Changing political map of India.		
	related to India	ii. Interstate water dispute in India		
		iii. Problems of border states of India	8	
		iv. Dispute of India boarder with neighbouring		
		countries		

### **REFERENCES**:

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- 2. Adhikari (2008) Political Geography of India, Sharda Pustak Bhavan Allahabad
- 3. Adhikari S., 1997: Political Geography, Rawat Publication, Jaipur.
- 4. Blij De H.J., 1972: Systematic Political Geography. Wiley, New York.
- 5. Cohen S.B., 1973: Geography and Politics in a divided world. Oxford, New York.
- 6. Cox Kevin: Political geography: Territory, State and Society, Blackwell Publishers ltd, 108, Cowely Road, Oxford, UK.

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- 8. Dikshit R.D. (2000) Political Geography: The Spatiality of Politics ,Tata McGraw New Delhi
- 9. Dwivedi R.L., 1996: Political Geography. Chaitanya Prakashan Allahabad.
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- 11. Pounds N.G., 1972: Political Geography. McGraw Hill, London.
- 12. Painter J and Jeffery A (2009) Political Geography, Sage Publication
- 13. Taylor P. (2001): Political Geography, New Delhi, Pearson
- 14. Valkenberg S.U. & Stoz C., 1963: Elements of Political Geography. Prentice Hall of India, New Delhi.
- 15. K Siddhartha (1998) Nation Sate theory and Geopolitics: An introductory Political Geography, Kisalaya Publication, Patana
- 16. Vitthal Gharpure (2013) Rajkiy Bhugol (Marathi) Pimpalapure Publishers Nagpur.
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### SAVITRIBAI PHULE PUNE UNIVERSITY

Geography MA/MSc-II (Credit System)

Revised Syllabus (From June-2020)

#### **Course: GGUT – 255 Regional Planning** No. of Credits: 02Total Periods: 30

Topic	Торіс	Sub-Topic		Periods
No	_		_	
1	Introduction to	i.	Concept and Need of Regional Planning	
	Regional	ii.	Role of Geography in Regional Planning	7
	Planning	iii.	Hierarchy of Planning	,
		iv.	Types of Planning	
		v.	Levels of Planning	
2	Region	i.	Concept of a Region	
		ii.	Type of a Region	7
		iii.	Concept of Planning Region	,
		iv.	Indicators of Developments	
		v.	Measurement of Regional Development	
3	Surveys of	i.	Regional Survey	4
	Regional	ii.	Techno-Economic Survey	
	Planning	iii.	Diagnostic surveys Survey	
4	Regional	i.	Regional disparities in India	7
	Policies	ii.	Regional Policies in India's Five Year Plans	
		iii.	Experience of Regional Planning in India	
		iv.	Multilevel planning (State, District and	
		Block Level Planning).		
5	Regionalisatio	i.	Concept of Regionalisation	5
	n	ii.	Planning of Metropolitan regions	
		iii.	Planning of tribal, command areas and river basins	
		iv.	National Capital Region.	

- 1. Bhat, L.S. (1973): Regional Planning in India, Statistical Publishing Society, Kolkata.
- 2. Chandana, R.C. (2000): Regional Planning A Comprehensive Text, Kalyani Publishers,Ludhiana.
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### SAVITRIBAI PHULE PUNE UNIVERSITY

Geography MA/MSc-II (Credit System) Revised Syllabus (From June-2020)

#### Course: GGDP – 256 Practical in Watershed Analysis No. of Credits: 02. Total Periods: 30

				Dra ati a a l
<b>S.N.</b>	Горіс		Sub-Topic	Practical
				(3
				Hours/practic
1		•		al)
1	Delineation of	1.	Delineation of Watershed/Drainage basin	02
	Watershed/Drainage		from toposheets (3 to 5 th order)	
	Basin	ii.	Calculation of Basin perimeter, shape and	
			area	
2	Linear Aspects of	i.	Stream ordering (Strahler's method)	02
	Drainage Basin	ii.	Bifurcation ratio	
		iii.	Measurement and calculation of Stream	
			length	
		iv.	Mean stream length,	
		v.	Stream length ratio	
3	Relief Aspects of	i.	Calculation of Relief ratio	02
	Drainage Basin	ii.	Relative relief	
		iii.	Ruggedness number	
		iv.	absolute relief map	
		v.	Relative relief map	
4	Software based	i.	Delineation of watershed (DEM based)	04
		ii.	Physiographic map	
		iii.	Watershed map	
		iv.	Drainage network map	
		v.	Contour map	
		vi.	Slope map	

- 1. King, C. A. M (1966): Techniques in Geomorphology, Edward Arnold, London
- 2. Savindra Singh (2002): Geomorphology, Prayag Pustak Bhawan, Allahabad
- 3. Miller, Austin (1953): The skin of the Earth, Methuen & Co. Ltd. London
- 4. Strahler: Physical Geography
- 5. Wilson, J., Gallant, J., (2000): Terrain Analysis: Principles and Applications. New York: JohnWiley and Sons.
- 6. Rajvir Singh, (2008): Watershed Planning and Management, 2nd Edition, Yash PublishingHouse, Bikaner, India.
- 7. B. K. Kakde, (2004) Watershed Manual A Guide for Watershed Development Practitionersand Trainers, BAIF Development Research Foundation, Pune.
- 8. R. Suresh (2006) Soil and Watershed Conversation Engineering, 2nd Edition, StandardPublication Distributors, Delhi.

# Savitribai Phule Pune University, Pune

MA/MSc - II Syllabus in Geography (Credit System) Revised Syllabus (from June, 2020)

### Course: GGDP-257 Interpretation of Topographical Maps and GPS Survey No. of Credits: 02 No. of Periods: 30

Topic No.	Торіс	Sub topics	Practical (3 hours)
1	Study of Topographical Maps	<ul> <li>i. Indexing systems and conventional signs and symbols of S.O.I. toposheets</li> <li>ii. Grid references: 4-figure grid, 6-figure grid and International grid reference</li> <li>iii. Introduction to US and OS sheets</li> </ul>	02
2	Interpretation of S.O.I toposheets.	<ul> <li>i. Relief: Distribution of Spot heights, bench marks, Trigonometrical Points etc., Types of Slopes (convex, concave, uniform etc.) and Major landforms from contour patterns</li> <li>ii. Drainage network: Types-trellis, dendritic, radial, etc., Streams with water, without water and Influence of relief on drainage</li> <li>iii. Natural Vegetation: Types of vegetation, Association of relief and drainage, Reserved Forest and Protected Forest</li> <li>iv. Land Use: Agriculture, mining etc, areal distribution and impact of Physical landscape.</li> <li>v. Settlements: Types settlements, amenities, etc, Distribution, relative size, relative distance (dispersed, nucleated etc)</li> <li>vi. Transport and Communication: Types of roads, railway lines, facilities of communication (3 sheets of S.O.I. toposheets)</li> </ul>	04

3	GPS Survey of Village	i. ii.	Introduction of GPS : Space segment, Control segment and user segment GPS Survey (GPS Reading and Area Measurement ): One day field visit and excursion report	04
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### **Reference Books**

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- 2. Dury G.H. (1960): Map Interpretation. Sir Isaac Pitman and Sons Limited, Pitman House, Bath.
- 3. Gupta, K. K. and Tyagi, V. C. (1992): Working with maps, Survey of India Publication, Dehradun.
- 4. Jones P. A. (1968): Field work in Geography. Longmans, Green and Company Limited.
- 5. Meux A. H. (1960): Reading Topographical Maps. University of London Press Limited.
- 6. Petrie N. (1992): Analysis and Interpretation of Topographical Maps. Orient Longman Limited Calcutta.
- 7. Ramamurthy, K. (1982): Map interpretation, Madras.
- 8. Tamaskar B.G. and Deshmukh V.M. (1974): Geographical Interpretation of Indian Topographical Maps. Orient Longman Limited, Bombay.
- 9. Vaidyanadhan. R. (1968): Index to a set of 60 topographical maps, CSIR, New Delhi.
- 10. Wheeler K.S. Ed (1970): Geography in the field. Blond Educational, London.

## Savitribai Phule Pune University, Pune

MA/MSc - II Syllabus in Geography (Credit System) Revised Syllabus (from June, 2020)

**Course: GGUT-258 Geography of World** No. of Credits: 04

No. of Periods: 60

Topic No.	Торіс	Subtopics	Practical (3 hours)
1	The Earth	<ul> <li>i. Introduction (Earth and solar system)</li> <li>ii. Origin and Evolution of the Earth- Big-bang theory</li> <li>iii. Geological Time scale</li> </ul>	08
		iv. Continents and Oceans, Major natural regions	
2	Regional geography of : 1. Europe 2. North America 3. South America 4. Africa 5. Australia	<ul> <li>i. Location</li> <li>ii. Physical features – (Physical Division and main rivers)</li> <li>iii. Climate</li> <li>iv. Agriculture</li> <li>v. Natural vegetation and wild life</li> <li>vi. Mineral resources</li> <li>vii. Population</li> </ul>	30

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	<ul><li>6. Asia</li><li>7. Antarctica</li></ul>	viii. Important countries	
3	World contemporary issues	<ul> <li>i. Major political issues (Border and Water)</li> <li>ii. Health issues – (COVID-19)</li> <li>iii. Environmental issues – (Global warming )</li> <li>iv. Population issues – (Growth, Religious conflict, Poverty, Migration)</li> <li>v. Role of WTO and IMF</li> </ul>	12
4	21st century challenges and opportunities in the world	Challenges i. Food security ii. Climate change iii. Global Public Health (Pandemics) iv. Terrorism Opportunities i. Globalization ii. Tourism	10

### **Reference Books:**

- 1. Ashworth, L. M. (2013). Mapping a new world: Geography and the interwar study of international relations. International Studies Quarterly, 57(1), 138-149.
- 2. Baerwald, T. J., Fraser, C., & Bednarz, S. (2003). World geography: Building a global perspective. Prentice-Hall.
- 3. Berglee, R. (2012). World regional geography: People, places and globalization.
- 4. Bradshaw, M. J. (2000). World Regional geography: The new global order. McGraw Hill.
- 5. Cole, J. P. (1996). Geography of the world's major regions. Psychology Press.
- 6. George, B. P., & Nedelea, A. (2007). International Tourism: World Geography and Developmental Perspectives. Abhijeet Publications.
- 7. Haggett, P. (Ed.). (2002). Encyclopedia of World Geography (Vol. 24). Marshall Cavendish.
- 8. Jackson, R. H., & Hudman, L. E. (1990). World regional geography: issues for today. Wiley.
- 9. Krätke, S., & Taylor, P. J. (2004). A world geography of global media cities. *European Planning Studies*, *12*(4), 459-477.
- 10. Majid Husain (2013) World Geography, Rawat Publications.
- 11. McColl, R. W. (2014). Encyclopedia of world geography (Vol. 1). Infobase Publishing.
- 12. Sager, R. J., Helgren, D. M., & Israel, S. (1989). World geography today. Holt, Rinehart and Winston.
- 13. Schmidt, B. (2015). Inventing exoticism: geography, globalism, and Europe's early modern world. University of Pennsylvania Press.

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### SAVITRIBAI PHULE PUNE UNIVERSITY

Geography MA/MSc-II (Credit System) Revised Syllabus (From June-2020)

**Course: GGUP – 259 Dissertations No. of Credits: 04** 

### **Total Periods: 60**

- 1 The students shall declare the option of dissertation at the beginning of the 3<sup>rd</sup> semester.
- 2 A Post Graduate recognized teacher in the department is eligible to guide maximum two students per year.
- 3 General Guide Lines :
  - i. Introduction to the problem
  - ii. Aims and objectives of the study
  - iii. Data and Methodology
  - iv. Analysis, description and interpretation
  - v. Results and Conclusions
  - vi. References/Bibliography
    - (Fieldwork/data collection/field visits wherever necessary)
  - Every table, figure, photograph should have a caption and with references.
- 5 The list of references should be given at the end and all the references should be complete in all respects (author(s)) name, year, title of the article or book, name of the journal, name of the publisher of the book and place of publication, volume of journal and page numbers)
- 6 The minimum page limit for the dissertation is 50, including text, figures, tables, photographs, references, and appendices.
- 7 At the time of viva-voce, presentation must be given with the help of power point.