Savitribai Phule Pune University

(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 following according to specialization from CCTP						
GGUT-237	Tropical Geomorphology	-	-	04	-	04
GGUT-238	Applied Climatology	-	-	04	-	
GGUT-239	Geography of Rural Development	-	-	04	-	
GGUT-240	Urban Geography	-	-	04	-	
Choice Based Optional Paper (CBOP) (1 Theory + 1 Practical)						
		GGDP-241	Practical in Geoinformatics	02	-	04
		GGUT-242	Hydrology	02		
		GGUT-243	Watershed Management	02	-	
		GGDP-244	Practical in Multivariate Statistics	02	-	
One of the following according to specialization from CCPP						
				GGUP-245	Practical in Geomorphology	04
				GGUP-246	Practical in Climatology	
				GGUP-247	Practical in Economic Geography	
				GGUP-248	Practical in Population and Settlement Geography	
Total Credits 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 Optional Paper (CBOP) (1Theory + 1Practical)						
		GGUT-252	Geography of Soils	02		04
		GGDP-253	Practical in Geostatistics	02		
		GGUT-254	Political Geography	02		
		GGUT-255	Regional Planning	02		
		GGDP-256	Practical in Watershed Analysis	02		
		GGDP-257	Interpretation of Topographical Maps and GPS Survey	02		
Core Compulsory Practical Paper (CCPP)						
				GGUT-258	Geography of World	04
				GGUP-259	Dissertation/ Research Project	04
					Total Credits of Semester - IV	**20**

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

Course: GGUT-235 Geoinformatics II

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

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

Reference Books:

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

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Revised Syllabus (from June, 2020)

Course: GGUT-236 Geographical Thoughts

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

Topic No.	Topic	Subtopics	No. of Periods
1	Historical Development of Geographical Thought	i. A brief account of Greek, Roman, and Indian Schools of thoughts ii. Contributions of Herodotus, Eratosthenes, Strabo, Ptolemy iii. brief account of Arab School iv. Contributions of Marco Polo, Columbus, 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.	20
2	Dualism in Geography	i. Determinism and Possibilism ii. Systematic versus Regional Geography iii. Physical versus Human Geography	10
	Paradigms,	i. Hypothesis, Theories and Laws ii. Paradigms in Geography	10

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

Reference Books:

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
3. 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

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

Course: GGUT-237 Tropical Geomorphology

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

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

		nature, development and distribution iv. Tropical Soils: Process of soil formation in Tropics, Clay minerals	
3	Duricursts and Laterites	i. Duricursts and Laterites – Definition ii. Indurated laterites - Properties and world distribution iii. Classification by site, Morphology and chronology 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	10
4	Denudation in Tropics	i. Mass movement: Types & Processes ii. Slope wash iii. Process of chemical denudation iv. Tropical rivers - process of erosion and deposition	08
5	Tropical Landscape	i. Tropical Terrain – Relief characteristics ii. Slope and valley forms iii. Domed and boulder inselbergs iv. Hillslopes and Pediments v. Tropical coasts	08
6	Tropical Planation	i. Formation and Types of planation surfaces ii. Morphology of planation surfaces iii. Peneplains, Pediplains, Etchplains iv. double surface of planation	08
7	Landform development in the tropics	i. Role of tectonics and climatic change ii. Nature of changes during Quaternary changes in climate and vegetation	08

Reference Books:

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.

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

Revised Syllabus (from June, 2020)

Course: GGUT-238 Applied Climatology

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

Topic No.	Topic	Subtopics	No. of Periods
1	Introduction	i. Nature and scope ii. Development of applied climatology iii. Atmospheric concern and awareness iv. Climate impact assessment	06
2	Basic climatic elements	i. Radiation - Basic relations, Radiation laws, distribution, instruments to measure radiation ii. Temperature - Basic relations, distribution, soil temperature, instruments to measure temperature iii. Moisture - Basic relations, humidity, clouds, 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	10
3	Agro-climatology	i. Climate and soil ii. Climate and soil management iii. Climate pests and diseases iv. Micro-meteorological changes and behaviour of pests and diseases v. Climate and livestock vi. Climate and crops vii. Artificial control of plant environment	10
4	Climate and Human behaviour	i. Human bio-meteorology ii. Climate, clothing and human control iii. Climate and health	07
5	Urban Climate	i. Nature of global environmental change ii. Nature of urban climates iii. Impact of urban climate on GEC iv. Urban heat Island v. 5. Urban air Pollution problems	08
6	Climate industry, commerce and engineering	i. Significant climate variables ii. Industrial and commercial activities iii. Construction operations	05

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

Reference Books:

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.

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Revised Syllabus (from June, 2020)

Course: GGUT-239 Geography of Rural Development

Credit: 04 **Periods: 60**

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

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

Reference Books:

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

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

Course: GGUT-240 Urban Geography
No. of Credits: 04 **No. of Periods: 60**

Topic No.	Topic	Subtopics	No. of Periods
1	Introduction to Urban Geography	i. Nature of Urban Geography ii. Scope of Urban Geography iii. Significance of Urban Geography iv. Relation to other disciplines	07
2	Urbanization	i. Meaning of Urban settlement and urbanization. ii. Brief review of spatial- temporal variations in urbanization in the world iii. Urbanization curve iv. Contemporary factors of urbanization	07
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	i. Criteria used for classification ii. Functional classification of towns and cities	04

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

Reference Books:

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

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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.	Topic	Subtopics	Practical (3 Hours)
1	Aerial Photography	Measurements and Interpretation i. Scale and height (using parallax bar) ii. Visual Interpretation of single aerial photograph iii. Interpretation of stereo pair using Stereoscope	02
2	Satellite Images	i. Visual interpretation of LISS, PAN, WiFS ii. Cartosat Data, IKONOS and Quick Bird	02
3	Spatial Database	Layer Generation i. Raster: Full Grid, Chain Codes and Run Length Codes ii. Vector: Manual Digitization, Digitization Errors and Topology Building	04
4	GIS operations	i. Raster and vector overlay, map algebra (AND, OR) from a toposheet quadrant ii. Spatial interpolation from a toposheet quadrant iii. GIS operations using open source GIS softwares	02

Reference Books:

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
5. Kang – Tsung – Chang, (2002): Introduction to Geographical Information System, McGraw Hill.
6. J. R. Jensen, (2003) : Remote Sensing of Environment, An Earth Resource Perspective, Pearson Education Pvt. Ltd., New Delhi
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. Vaidyanadhan, R. (1973): Index to a set of 70 aerial stereopairs, UGC, New Delhi.

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Revised Syllabus (from June, 2020)

Course: GGUT-242 Hydrology

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

Topic No.	Topic	Subtopics	No. of Periods
1	Introduction to Hydrology	i. Meaning and definition of Hydrology ii. The hydrologic cycle iii. The hydrologic budget iv. Applications of Hydrology	06
2	Hydrologic Measurements and Data Sources	i. Units of measurement ii. Sources of hydrologic data iii. Measurements hydrologic variables	06
3	Precipitation	i. Water vapor: Measures of atmospheric moisture ii. Precipitation: Forms and Types iii. Global distribution of precipitation iv. Probable Maximum Precipitation (PMP) v. Gross and net precipitation	06
4	Interception and Depression Storage	i. Interception ii. Throughfall iii. Depression storage	06
5	Evaporation and Transpiration	i. Evaporation ii. Method of evaporation control iii. Transpiration iv. Methods of transpiration control v. Evapotranspiration	06

Reference Books:

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.

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

Course: GGUT-243 Watershed Management
No. of Credits: 02 **No. of Periods: 30**

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

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

Reference Books

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.

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

Course: GGDP-244 Practical in Multivariate Statistics

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

Topic No.	Topic	Subtopics	Practical (3 hours)
1	Introduction	i. Bivariate & Multivariate Analysis ii. Objectives of Multivariate Analysis a. Data reduction or simplification b. Sorting and Grouping c. Prediction d. Hypothesis Testing	01
2	Matrix Algebra	i. Matrix : a. Definition, Elements, Order and Types b. Determinant of a matrix c. Addition, subtraction and multiplication of matrices	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	
3	Curvilinear bivariate Relationships	i. Computation, plotting and interpretation of a. Second Degree (Quadratic) equation, $Y= a + b_1 X^1 + b_2 X^2$ b. Third Degree (Cubic) equation $Y= a + b_1 X^1 + b_2 X^2 + b_3 X^3$	02
4	Multivariate Analysis	i. Computation of multiple regression equations involving two and three independent variables (by using variance – covariance matrix) Calculation of Co-efficient of multiple 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, $Y= a + b_1 X_1 + b_2 X_2 + b_3 X_3$	03
5	Trend Surface Analysis	i. Importance of Trend surface analysis in the study of spatially distributed data. Examples of TSA ii. Computation, application and plotting of linear trend surface, Interpolation of trends. iii. Ideas of quadratic and cubic trend surfaces.	02

Reference Books:

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.

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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	Direct and indirect measurements i. Using clinometers / profiles from toposheets, ii. Identification of segments iii. Dalrymple et al's nine- unit landsurface model- Understanding nature of processes	04	02
3.	Field Survey	Channel cross sections/ Beach/Hill slope profile Soil/sediment sample collection i. Surveying and plotting of stream or gully channel cross–section or beach profile or slope profile. ii. Quadrat or Traverse survey of sediment size on river bed /beach. iii. Analysis of shape and size of coarse sediment(Zingg's classification) GPS survey Preparation of beach, river channel maps etc. using GPS	07	04
4	Laboratory work	Soil/Sediment analysis i. Analysis of 1 sandy and 1 Clayey sample ii. Plotting of data on probability graph paper and iii. Estimation of grain size parameters iv. Interpretation of results	05	02

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

Reference Books:

1. Aackombe, R. V. and Gardiner, V. (1983): Geomorphological Field Manual
2. 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 andUnwin
5. Kale, V. S. and Gupta, A. (2001): Introduction to Geomorphology, Orient Longman, Culcutta
6. King, C.A.M. (1966): Techniques in Geomorphology, Edward Arnold,London George Allen andUnwin, London

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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)	i. Study and Analysis of IDWR Study of IDWR and analysis of Temperature, Air Pressure, etc. for various stations. Charting of Systems (4 years)	05	04
4	Water Balance	i. Computation of water balance for 4 stations in different rainfall zones and irrigation scheduling	05	04

5	Climate Architecture Analysis	**i.** Sketch design recommendations: The Mahoney tables: Air temperature, humidity, Rain and Wind, Diagnosis of climatic stress	02	03

Reference Books:

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

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

Course: GGUP- 247 Practical in Economic Geography
Credit: 04 **Periods: 60**

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

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

Reference Books:

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

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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.	Topic	Subtopics	Practical (3 Hours)
1	Population Geography	Demographic indices: i. Mean age at marriage and fertility ii. Measures of mortality ,IMR & A.S.D.R Dependency ratio Determinants of Demographic transition: i. Demographic transition: Determinants of demographic transition compared with underdeveloped/developing/developed countries/state ii. Pull-push factors affecting volume of migration- simple correlation matrix iii. Rural urban composition of population	06

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

Reference Books:

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 Credits: 04 **Total Periods: 60**

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

3	Drainage Systems	A) Himalayan drainage systems: i. Ganga ii. Brahmaputra iii. Indus B) Peninsular drainage system 1. East Flowing Rivers: i. Godavari ii. Krishna iii. Mahanadi 2. West Flowing Rivers: i. Narmada ii. Tapi iii. Mahi	06
4	Climate	A) Main Seasons & Associated weather conditions: i. The winter ii. The summer iii. The rainy/monsoon iv. The retreat monsoon B) Origin and mechanism of monsoon: i. Traditional concept: Halley's view ii. Recent Concept: a. Role of Tibet plateau b. ITCZ c. Jet Stream d. El-Nino	06
5	Soils	A) Major soil types and their distribution in India: 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	06
6	Forest	A) Main forest types and their distribution in India: i. Moist Tropical forests ii. Dry Tropical forests iii. Montane Sub-tropical forests iv. Montane Temperate forests v. Alpine forests B) Deforestation and conservation of forest	06
7	Minerals and Energy Resources	A) Distribution and Utilization of Minerals: i. Iron Ore ii. Manganese iii. Bauxite B) Distribution and Utilization of Energy Resources: i. Coal ii. Petroleum iii. Natural gas	06

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

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

Reference Books:

1. Agrawal A. N. (2019): "Indian economy, Developmental Problems and policies" New Age International Pvt. Ltd.
2. Bhende, Asha A and Kanitkar Tara (2015): "Principles of Population Studies", Himalaya Pub. House, New Delhi.
3. Chandana R. C. (2016): "Geography of population", Kalyani Publishers, New Delhi.
4. Chopra S. N. - India, an Area Study.
5. Deshpande C. D. (1992): "India: A Regional Interpretation", Indian Council of Social Science Research and National Book Centre, New Delhi
6. Dubey and Negi - Economic Geography of India.
7. Gopal Singh (1976): Geography of India" Atma Ram Pub., Delhi
8. Khullar D. R. (2018) : "India: a Comprehensive Geography" Kalyani Publishers
9. Majid Husain (2008): "Geography of India", Tata McGraw Hill, New Delhi
10. Mathur, S. M. (1994): Physical Geology of India, National Book Trust, New Delhi, India.
11. Memoria, I. B. - Geography of India.
12. Singh R. L. (1971): "India-A Regional Geography". NGSI, Varanasi.

13. Randhawa, M. S. (1947): The Birth of the Himalayas.
14. Saigal, Umesh (1994): Lakshadweep, National Book Trust, New Delhi, India.
15. Sharma and Continuo - Economic and Commercial Geography of India.
16. Singh, R. L. et. al. (1971): India: A Regional Geography, National Geographical Society of India, Varanasi.
17. Tamta, B. R. (1994): Andaman and Nicobar Islands, National Book Trust, New Delhi, India.
18. Wadia D. N. (1993): Geology of India, Tata McGraw Hill, New Delhi
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. of Credits: 04 **Total Periods: 60**

S.N.	Topic	Sub-Topic	Periods
1	Introduction to Oceanography	i. Definition and Meaning of Oceanography ii. Foundation of Modern Oceanography iii. Contribution of Oceanographers in the subject iv. Post-war Oceanography v. Modern Trends	08
2	Origin of the Ocean Basins	i. Continental Drift ii. Seafloor Spreading iii. Plate Tectonics iv. World Oceans, their origin and distribution	08
3	The Ocean Floor	Relief of the Ocean Bottom i. Continental Margin: Continental shelves and slopes ii. Oceanic Ridges and Rises iii. Abyssal Plains iv. Oceanic Trenches v. Volcanoes on ocean floor vi. Coral Reefs and Atolls vii. Offshore Islands	08
4	Properties of Sea Water	i. Factors affect temperature on water and distribution ii. Factors affecting density iii. Origin and composition of sea salt and residence time iv. Carbon dioxide and carbonate cycles v. Viscosity vi. Surface tension	12
5	Marine Sediments	i. Lithogenous particles (Derived from Rocks) ii. Biogenous particles (derived from organisms) iii. Hydrogenous particles (derived from Water iv. Distribution of sediment deposits v. Oceanic ooze vi. Correlation and age determination	08

6	Ocean resources	i. Natural resources- gaseous, liquefied and solid chemical parameters ii. Available resources iii. Exploited resources iv. Unexploited resources v. Account of known but unexploited oceanic reserves	08
7	Oceanic Pollution	Causes and measures i. Etiology of marine & oceanic pollution ii. Possible natural disturbances causing pollution in oceans 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	08

Reference Books:

1. Basu S.K. (2003) (ed): Handbook of Oceanography, Global Vision, Delhi.
2. Davis Richard A. (1972): Oceanography, Addition Wesley Publishing Co.
3. Garrison Tom (1999): Oceanography, Brooks/ Cole Wadsworth, New York.
4. Garrison Tom (2004): Essentials of Oceanography. Thompson, Australia.
5. Grant Gross M. (1982): Oceanography, Prentice hall, Ince, New Jersey.
6. King Cuchlain A. M (1962): Oceanography for Geographers (ED) Edward Arnold.
7. Sharma & Vatal (1962): Oceanography for Geographers. Chaitanya Publishing House, Allahabad
8. Thurman Harold V. (1985): Introductory Oceanography. Bell & Howell Co. London.
9. Weisberg J. and Howard P. (1974): Introductory Oceanography. McGraw Hill, Kogakusha, Tokyo

SAVITRIBAI PHULE PUNE UNIVERSITY

Geography MA/MSc-II (Credit System)

Revised Syllabus (From June-2020)

Course: GGUT – 251 Research Methodology

No. of Credits: 04 **Total Periods: 60**

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

4	Sampling Design	i. Sampling Design – Definition of Population, Sample and Sampling Design ii. Advantages and disadvantages of Sampling iii. Characteristics of a good sample iv. Types or method of sampling	08
5	Methods of Data Collection	A) Primary Data Questionnaire Method i. Questionnaire – definition ii. Characteristics of a good questionnaire iii. Merits and demerits Questionnaire Method Interview Method i. Interview – definition ii. Characteristics of an interview iii. Merits and demerits of Interview iv. Difference between Interview and Questionnaire Observation Method/Field Work Method B) Secondary Data	06
6	Data Analysis	i. Variables and their types 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	12
7	Technical writing and reporting of research	Types of research report i. Dissertation and thesis, research paper, review article, short communication, conference 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	06
8	Research ethics, plagiarism and funding agencies	i. Research ethics ii. Plagiarism iii. Use of plagiarism detection softwares iv. Research opportunities and funding agencies	06

Reference Books:

1. Gaum, Carl G., Graves, Harod F., and Hoffman, Lyne, S.S., (1950): Report Writing, 3rd ed., New York: Prentice-Hall.
2. Kothari, C.R. (2004): Research Methodology: Methods and Techniques, New Age International (P) Ltd.,New Delhi – 110002.
3. Kothari, C.R., (1984): Quantitative Techniques, 2nd ed., New Delhi: Vikas Publishing House Pvt. Ltd.
4. Mishra Shanti Bhushan and Shashi A. (2011): Handbook of Research Methodology,Educreation Publishing, New Delhi – 110075.
5. Pandey, P. and Pandey, M.M. (2015): Research Methodology: Tools and Techniques,Bridge Center, Romania, European Union.

6. Tandon, B.C., (1979): Research Methodology in Social Sciences. Allahabad, Chaitanya Publishing House.
7. Ullman, Neil R. (1978): Elementary Statistics, New York: John Wiley & Sons, Inc.
8. Yamane, T., Statistics (1973): An Introductory Analysis, 3rd ed., New York: Harper and Row.

SAVITRIBAI PHULE PUNE UNIVERSITY
Geography MA/MSc-II (Credit System)
Revised Syllabus (From June-2020)

Course: GGUT- 252: Geography of Soil

Credit: 02 **Periods: 30**

Topic No.	Topic	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	i. Factors of Soil formation: Parent Material, Climate, Biota, Time, Topography. ii. Soil Profile : Definition and Structure	6
3	Components and Characteristics of Soil	i. Soil component: Minerals, Organic Matter, Air and Water. ii. Physical, Chemical and Biological characteristics of soil. iii. Nutrients in Soils: Primary, Secondary and Micronutrients	6
4	Classification and types of Soil	i. Land Capability Classification ii. Land Suitability Classification iii. Types of Soil with reference to India	6
5	Problems related to soil and Soil Conservation	i. Soil Problems: Soil Pollution, Acidification, salinization and Soil health ii. Soil Conservation: Definition and various methods of Soil Conservation, iii. Soil Conservation in India iv. Role of RS and GIS in Soil Conservation	8

References Books:

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.
4. Birkeland, P. W (1999): Soils and Geomorphology, Oxford University Press, New York.
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).
11. V. B. Kale (2020): Soil Geography, Himalaya Publishing House, Mumbai.

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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 **No. of Periods: 30**

Topic No.	Topic	Subtopics	Practical (3 hours)
1	Exploratory spatial data analysis	i. Univariate descriptors: Frequency tables, Histogram, Cumulative frequency table, Normal probability plots, Summary / Descriptive Statistics ii. Bivariate descriptors: Scatter plot, correlation, covariance, correlation-coefficient, linear regression *(Attempt at least two discrete problems plotting/obtaining the univariate and bivariate descriptors and interpreting them.)*	2
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

Reference Books:

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.	Topic	Sub-Topic	Periods
1	Introduction to PoliticalGeography	i. Definition, nature and scope ii. Historical Development of Political Geography iii. Recent trends inPolitical Geography iv. Importance of Political Geography	6
2	Concepts of Nations and State	i. Definition of Nation and State ii. Origin of state and Elements of state iii. Nation building/Nationalism iv. Difference between Nation and State	6
3	Frontiers & Boundaries	i. Definition of Frontiers & Boundaries ii. Difference between frontiers & boundaries iii. Genetic, functional & Morphological classification of boundaries	4
4	Geopolitics	i. Concept of Geopolitics ii. Heartland Theory of Mackinder iii. Concept of Modern Geopolitics iv. Geopolitical importance of Indian ocean	6
5	Contemporary Issues related to India	i. Changing political map of India. ii. Interstate water dispute in India iii. Problems of border states of India iv. Dispute of India boarder with neighbouring countries	8

REFERENCES:

1. Alexander L.M (1963): World Political Patterns, Ram McNally, Chicago.
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.

7. Dixit R. D., 1982: Political Geography. Tata McGraw Hill New Delhi.
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.
10. Moor R., 1981: Modern Political Geography. McMillan, London.
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.
17. Jay Kumar Magar (1994), Rajkiy Bhugol (Marathi) Vidhya Prakashan Nagpur

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 No	Topic	Sub-Topic	Periods
1	Introduction to Regional Planning	i. Concept and Need of Regional Planning ii. Role of Geography in Regional Planning iii. Hierarchy of Planning iv. Types of Planning v. Levels of Planning	7
2	Region	i. Concept of a Region ii. Type of a Region iii. Concept of Planning Region iv. Indicators of Developments v. Measurement of Regional Development	7
3	Surveys of Regional Planning	i. Regional Survey ii. Techno-Economic Survey iii. Diagnostic surveys Survey	4
4	Regional Policies	i. Regional disparities in India 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).	7
5	Regionalisation	i. Concept of Regionalisation ii. Planning of Metropolitan regions iii. Planning of tribal, command areas and river basins iv. National Capital Region.	5

Reference Books:

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.
3. Dube K.N. (ed) (1990): Planning and Development in India, Asia Publishing House, New Delhi.
4. Friedmann, J., Alanso, W. (1967): Regional Development and planning - A Reader, MITPress Mass.
5. Govt. of India (1986): Regional Plan 2001 - National Capital Region, NCRPB, Ministry of Urban Development, New Delhi.
6. Mishra R.P. (Ed.) (1992): Regional Planning, Concepts, Techniques, Policies and Case Studies, Concept Pub. New Delhi.

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**

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

Reference Books:

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.

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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.	Topic	Sub topics	Practical (3 hours)
1	Study of Topographical Maps	i. Indexing systems and conventional signs and symbols of S.O.I. toposheets ii. Grid references: 4-figure grid, 6-figure grid and International grid reference iii. Introduction to US and OS sheets	02
2	Interpretation of S.O.I toposheets.	i. Relief: Distribution of Spot heights, bench marks, Trigonometrical Points etc., Types of Slopes (convex, concave, uniform etc.) and Major landforms from contour patterns ii. Drainage network: Types-trellis, dendritic, radial, etc., Streams with water, without water and Influence of relief on drainage iii. Natural Vegetation: Types of vegetation, Association of relief and drainage, Reserved Forest and Protected Forest iv. Land Use: Agriculture, mining etc, areal distribution and impact of Physical landscape. v. Settlements: Types settlements, amenities, etc, Distribution, relative size, relative distance (dispersed, nucleated etc) vi. Transport and Communication: Types of roads, railway lines, facilities of communication **(3 sheets of S.O.I. toposheets)**	04

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

Reference Books

1. Archer J. E and Dalton T. H. (1968), Field work in Geography B.T. Batsford Limited London
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.	Topic	Subtopics	Practical (3 hours)
1	The Earth	i. Introduction (Earth and solar system) ii. Origin and Evolution of the Earth- Big-bang theory iii. Geological Time scale iv. Continents and Oceans, Major natural regions	08
2	Regional geography of : 1. Europe 2. North America 3. South America 4. Africa 5. Australia	i. Location ii. Physical features – (Physical Division and main rivers) iii. Climate iv. Agriculture v. Natural vegetation and wild life vi. Mineral resources vii. Population	30

	6. Asia 7. Antarctica	viii. Important countries	
3	World contemporary issues	i. Major political issues (Border and Water) ii. Health issues – (COVID-19) iii. Environmental issues – (Global warming) iv. Population issues – (Growth, Religious conflict, Poverty, Migration) v. Role of WTO and IMF	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.

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 3rd 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)

4 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.