UNIVERSITY OF MUMBAI

Revised Syllabus for the M.A. & M.Sc.

Program: M.A. & M.Sc.

Course: Geography

(Semester I & II)

(As per Choice based Credit System
with effect from the academic year 2016–2017)

Choice Based Credit System Syllabus, 2016-17

- Total No. of Credits offered: 96
- Electives offered in a particular academic year in each group could vary.
- Semester is 15 weeks duration. Credits are defined for a semester

Semester I: Core Courses from Parent Department (Four Courses)

Subject Code (326)	Course Title	Credits	No. of Hours
101	Principles of Geomorphology	4+2*= 6	60+60+ 120
102	Principles of Climatology	4+2*= 6	60+60+ 120
103	Perspectives in Human Geography	4+2*= 6	60+60+ 120
104	Spatial Organisation of Economic Activities	4+2*= 6	60+60+ 120
105	***Practical components based on 101 and 102** Tools and Techniques of Spatial Analysis - I	*	60+60+ 120
106	***Practical components based on 103 and 104** Tools and Techniques of Spatial Analysis- II	*	60+60+ 120
Total		24	720

Semester II: Core Courses from Parent Department (Four Courses)

Subject Code	Course Title	Credits	No. of Hours
201	Oceanography and Hydrology	4+2*= 6	60+60+ 120
202	Geoinformatics	4+2*= 6	60+60+ 120
203	Socio-cultural and Political Geography	4+2*= 6	60+60+ 120
204	Urban Geography	4+2*= 6	60+60+ 120
205	***Practical components based on 201 and 202** Tools and Techniques of Spatial Analysis - III	*	60+60+ 120
206	***Practical components based on 203 and 204** Tools and Techniques of Spatial Analysis- IV	*	60+60+ 120
Total		24	720

Semester III: Elective Courses from Parent Department
(Two electives out of which one will be skill-based)

Subject Code	Course Title	Credits	No. of Hours
301	Ecology and Environment	4+2*= 6	60+60+ 120
302	Regional planning and Development	4+2*= 6	60+60+ 120
303	Elective 1) Digital Image Processing / Theoretical Geography / 2) Coastal Geomorphology /Geography of Soil with special reference to Tropics 3) Geography of Climate change with special reference to India / Geography of water resources 4) Tropical Geomorphology/ Plant Geography with Reference to Tropics 5) GIS in Urban Planning and Management / Thematic Cartography 6) Geography of Resources / Geography of Energy Resources 7) Theoretical and applied perspectives in Geomorphology /Geography of Health /	4+2*= 6	60+60+ 120
304	1) Regional Development in Maharashtra with Special Reference to Konkan / Industrial Geography 2) Geography of trade / Social Geography 3) Geography of Transport / Historical Geography / Development of Modern Geography 4) Geography of Gender / Cultural Geography/ Geography of Tribes with Special Reference to India 5) Contemporary Agriculture in Global South with Special Reference to India / Geography of Work Spaces 6) Geography of Marketing and Consumption/ Geography of Telecommunication and Media 7) Electoral Geography with special reference to India / Geography of Knowledge and Power	4+2*= 6	60+60+ 120
305	***Practical components based on 301 and 302** Tools and Techniques of Spatial Analysis - V	*	60+60+ 120
306	***Practical components based on 303 and 304** Tools and Techniques of Spatial Analysis- VI	*	60+60+ 120
Total		24	720

Semester IV: Elective Courses from Parent Department

Subject Code	Course Title	Credits	No. of Hours
401	Optional (OC - I) 1) Application of Remote Sensing and GIS Techniques / Maritime Studies with Special Reference to India 2) Geography of Hazards and Disaster Management / Climatology of Tropics 3) Advanced Quantitative Techniques / Introduction to Programming Using Python 4) Fluvial Geomorphology / Microclimatology	4+2*= 6	60+60+ 120
402	Electives: 1) Globalising Megacities: Geographical Study of Mumbai and MMR / Geography of Exclusion 2) Geopolitics and International Relations/ Geography of Crime 3) Geography of South Asia with Special Reference to India / Regional Geography of Africa and Central & West Asia 4) Geography of Tourism and Recreation / Geography of Services with Special Reference to India	4+2*= 6	60+60+ 120
403	Research Methodology in Geography	4+2*= 6	60+60+ 120
404	Dissertation / Project	4+2*= 6	60+60+ 120
405	***Practical components based on 401 and 402** Tools and Techniques of Spatial Analysis - VII	*	60+60+ 120
406	***Practical components based on 403** Tools and Techniques of Spatial Analysis- VIII	*	60+60+ 120
Total		24	720
	Audit Course I – Map Reading		
	Audit Course II – Image Analysis		

Note: Theory papers and practical components for core and elective papers will be examined by external and internal examiners.

Semester I

101: Principles of Geomorphology

No. of Credits: 4 Teaching Hours 60 + Notional Hours 60= Total hours 120

1. **Unit - I** **(15 hours)**
   1.1 Nature, scope and content of Geomorphology
   1.2 Geological Evolution of Earth and Geological time scale
   1.3 Development of geomorphic thought, Catastrophism, Uniformitarianism, Neocatastrophism

2. **Unit - II** **(15 hours)**
   2.1 Constitution of the earth's interior
   2.2 Continental Drift Theory - Sea floor spreading - Plate Tectonics
   2.3 Geosynclines: Geosynclinal Theory of Kobber, Holmes' Convection Current Theory Theories of Isostasy
   2.4 Endogenetic movements- types, consequences (earthquakes and volcanoes) and landforms

3. **Unit - III** **(15 hours)**
   3.1 Fluvial Geomorphic system: processes and resulting landforms
   3.2 Glacial Geomorphic system: geomorphic processes and features
   3.3 Karst landscape: development and processes
   3.4 Aeolian Geomorphic system: processes and landforms
   3.5 Coastal Geomorphic system: processes and landforms

4. **Unit - IV** **(15 hours)**
   4.1 Landscape evolution – Davisian Model of Cycle of Erosion, Penck's Morphological System
   4.2 Slope development and related theories

References:

1. Anhert, F., (1996), 'Introduction to Geomorphology', Arnold, London, Sydney, Aukland

2. Bloom, A. L. (2002), 'Geomorphology: A Systematic Analysis of Late Cenozoic Landforms', Pearson Education Pvt. Ltd., and Singapore.

3. Christopherson, R.W. (1994), 'Geosystems : An Introduction to Physical Geography', Macmillan College publishing Company, New York.

4. Dayal, P. (1990), 'A Textbook of Geomorphology', Shukla Book Depot, Patna.

5. Engeln, O. D. Von (1944), 'Geomorphology', The Macmillan Company, New York.

6. Fairbridge R. W. (1968) (ed.), 'Encyclopaedia of Geomorphology', Reinhold, New York.

7. Mitchell, C. E. (1973), 'Terrain Evaluation', Longmans, London.

8. Ritter, D.F., Kochel, R.C., Miller, J.R. (1995), ' Process Geomorphology', Wim. C. Brown Publishers, Chicago.

9. Sparks, B.W. (1988), 'An Introduction to Geomorphology', Longman, London.
10. Strahler A. (1996), 'Physical Geography: Science and System of the Human Environment', John Willey, New York.

11. Thornberry, W.D. (1998), 'Principles of Geomorphology', New Age International Press, New Delhi.
12. Steers, J.A. (2000), 'The Unstable Earth: some recent views in geomorphology', Methuen and co., London.

Further Readings:

1. Davis, W. M., 1909, 'Geographical Essays', Dover, Boston.

2. Holmes, A., 1968. 'Principles of Physical Geology', Nelson, London.

3. King, L.C., 1962, 'The Morphology of the Earth', Hafner, New York.

4. Penck, W., 1953, 'Morphologic Analysis of Landforms', St. Marisip Press, London.

5. Pitty, A. F., 1971, 'Introduction to Geomorphology, Methuen, London.

6. Singh, Savinder, 1998, 'Geomorphology', Prayag, Prakashan, Allahabad.

7. Small, R. J., 1970, 'The Study of Landforms', Cambridge University Press, Cambridge.

8. Twidale, C. R., 1976, 'Analysis of Landforms', John Wiley, London.

9. Twidale, C.R., 1971, 'Structural Landforms', A.N.U. Press, Canberra.

10. Cooke, R. U. and A., Warren, 1973, 'Geomorphology in Deserts', Batsford, London,

11. Embleton, C. and C. A. M., King, 1968, 'Glacial and Periglacial Geomorphology', Arnold, London,

12. Melhorn, W. N. and R. C., Flemal, 1976, 'Theories of Landform Development', State University of New York, Binghamton,
1. Davis, W. M., 1909, 'Geographical Essays', Dover, Boston.

2. Holmes, A., 1968. 'Principles of Physical Geology', Nelson, London.

3. King, L.C., 1962, 'The Morphology of the Earth', Hafner, New York.

4. Penck, W., 1953, 'Morphologic Analysis of Landforms', St. Marisip Press, London.

5. Pitty, A. F., 1971, 'Introduction to Geomorphology, Methuen, London.

6. Singh, Savinder, 1998, 'Geomorphology', Prayag, Prakashan, Allahabad.

7. Small, R. J., 1970, 'The Study of Landforms', Cambridge University Press, Cambridge.

8. Twidale, C. R., 1976, 'Analysis of Landforms', John Wiley, London.

9. Twidale, C.R., 1971, ‘Structural Landforms’, A.N.U. Press, Canberra.

10. Cooke, R. U. and A., Warren, 1973, ‘Geomorphology in Deserts’, Batsford, London,

11. Embleton, C. and C. A. M., King, 1968, ‘Glacial and Periglacial Geomorphology’, Arnold, London,

12. Melhorn, W. N. and R. C., Flemal, 1976, ‘Theories of Landform Development’, State University of New York, Binghamton,

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Semester I

102: Principles of Climatology

No. of Credits: 4 Contact Hours 60 + Notional Hours 60= Total hours 120

1. **Unit – I** **(15 hours)**
   - 1.1 Nature and scope of Climatology
   - 1.2 Relationship of Climatology with Meteorology
   - 1.3 Structure and composition of Atmosphere
   - 1.4 Weather elements and climatic controls
2. **Unit – II** **(15 hours)**
   - 2.1 Insolation and heat balance of the Earth
   - 2.2 Temperature - Vertical, horizontal and seasonal variations
   - 2.3 Processes of heat energy transport
   - 2.4 Inversion of temperature
3. **Unit – III** **(15 hours)**
   - 3.1 Atmospheric pressure – vertical and horizontal distribution
   - 3.2 General Circulation of atmosphere
   - 3.3 Types of winds – Geotropic, Gradient and local winds
   - 3.4 Modern views about space wind system, Tricellular meridional circulation, Jet stream
   - 3.5 Origin of Monsoon: classical and recent views
4. **Unit – IV** **(15 hours)**
   - 4.1 Air masses: Origin, classification, types
   - 4.2 Fronts: frontogenesis and frontolysis – classification of fronts
   - 4.3 Extra-tropical cyclones: formation and impacts
   - 4.4 Climatic Classification: Koppen and Thornthwaite, concept of water balance problems and prospects

References:

1. Barry, R.S. & Chorley, R.J. (1971): Atmosphere, Weather and Climate, ELBS, Methuen & Co. Ltd., U.S.A.
2. Griffiths, J.F.(1966): Applied Climatology-An Introduction, Oxford University Press, London.
3. Lal, D.S.(1997):Climatology, Sharda Pustak Bhawan, Allahabad.
4. Mather, J. R.(1974): Climatology: Fundamentals and Applications, McGraw Hill Book Co. New York.
5. McBoyle, G.(1973): Climate in Review, Houghton Mifflin Co., Boston.
6. Subrahmanyam, V.P.(ed)(1983):Contribution to Indian Geography, Heritage Publishers, New Delhi , a) Vol. III - General Climatology b) Vol. IV- Applied Climatology
7. Harp, H.J. and Trinidade, O.D. (eds) (1990): Climate and Development, Springer Verlag, U.S.A.
8. Oliver, J.E. and Hidose, J.J. (1984): Climatology - An Introduction, Charles and Merrill, U.S.A.
9. Robinson, P.J. and Hendersen-Sellers, A.(1999): Contemporary Climatology, Pearson Education, London

Further Reading:

1. Bhutani, Smita, Our Atmosphere, Kalyani Publishers, Ludhiana, 2000.

2. Critchfield, H.J., General Climatology, Prentice Hall, N.J., 1975.
3. Frederick K. and Edward J. Tarbuck, The Atmosphere: An Introduction to Meteorology, Prentice Hall of India Pvt. Ltd., New Delhi, 1995.
4. Strahler, A.N., Modern Physical Geography, John Wiley and Sons, New York, Singapore, 1987.
5. Trewartha, G.T., An Introduction to Climate, McGraw Hill, New York, 1980, Fifth Edition (International Student Edition).
6. Lydolph, P.E., The Climate of the Earth, Rowman Nad Allanheld, Totowa, New Jersey, 1985.
7. Rumney, G.R., Climatology and the World Climates, Macmillan, London, 1968.
8. Thompson Russell D., Applied Climatology - Principles & Practice, John Willey, New York, 1997.

Semester I

103: Perspectives in Human Geography

No. of Credits: 4 Contact Hours 60 + Notional Hours 60= Total hours 120

1. Changing Perspectives in Human geography (16 hours)

1.1 Enviromentalism- Possibilism-Neo-Possibilism - Areal differenciation school
1.2 Post-fifty conceptualisation of Geographic Space-Perception studies- Locational analysis- Quantification- General systems theory: appraisal and criticism
1.3 Behaviouralism – Perception of environment- Humanistic Geography- Sense of place -Landscape studies - Emergence of welfare approach and its social relevance
1.4 Post 1980s trends - Radicalizing process in Geography- neo-Marxist interpretations and extensions- Neohumanism and other contemporary theorisations

2. Evolution of Human Societies and Dynamics of rural and urban societies (15 hours)

2.1 Evolution of Human Societies – Economic, Political and Cultural Transformation
2.2 Rural society: caste hierarchy, segregation in rural settlement – rural social morphology – critical understanding of Agricultural Landuse theory - Contemporary Indian rural society
2.3 Urban society – Various models of urban morphology - Hierarchy of urban settlements- Application of Central Place theory and settlement hierarchy - Indian examples – Contemporary urban society -stratification and occupational divergence-residential segregation-Urban Heterogeneity and cosmopolitanism
2.4 Evolution tribal societies – characteristics – spatial distribution – Indian Examples

3. Interaction of human societies-Socio-Cultural identities- patterns and landscapes (15 hours)

3.1 Emergence and development of early cultural hearth – cultural diffusion, isolation and segregation
3.2 Racial groups– biological divergence-blending-process of assimilation – behavioural and structural- acculturation
3.3 Evolution of language – diffusion over space – evolution of linguistic provinces – relevant issues – language as basis of nation and states- Linguistic division in India
3.4 Religion– contemporary dynamics – spatial pattern of major religions- Role of religion in the formation of nation-states
3.5 Implications of race, religion, language and ethnicity- Contestation, conflicts and negotiations

4. Dynamics of Population Change : Patterns, Processes and spatial distribution (14 hours)

4.1 Components of Population Change – fertility, mortality and associated patterns - Demographic characteristics - developing and developed countries
4.2 Population Growth – Attitudes and Interpretations – Malthusian, Neo-Malthusianism and Marxist viewpoint – Club of Rome - Critical Understanding of Demographic transition theory – concept of Demographic dividend
4.3 Population, Resources and Spatial Pattern of Development - Optimum population, over population and under population – Recent World Views
4.4 Migration- early and subsequent migration – scales of migration – mechanism and laws – major theories - Typology of migration – Political, cultural and economic dimensions - Contemporary Trends in migration

References:

1. Aitken, S and Valentine, G. (2006), Approaches to Human geography, Sage.
2. Johnston, R.J., Gregory D. Pratt G. and Watts M., (2005, 5th ed.), the Dictionary of Human Geography, Blackwell.
3. Kitchin R., Thrift, N, (eds.) (2009), The International Encyclopedia of Human Geography, Elsvier.
4. Benko,G. and Strohmayer, U. (2004), Human Geography, a History for the 21st Century,Arnold, London.
5. Cloke, P., Crang, P., Goodwin, M., (2004), Envisioning Human Geographies, Arnold.
6. Cloke, P. and Johnston, R.,(eds.), (2005), Spaces of Geographical Thought, Deconstructing Human Geography's Binaries, Sage.
7. Atkinson, D., Jackson, P., Sibley, D. and Washbourne, N. (eds.) (2005), Cultural Geography, A Critical Geography of Key Concepts, Tauris, I.B.
8. Norton William, (2002), Human Geography, Oxford, 4th edition
9. Barnes, T. and Gregory, D., 1997, Reading Human geography, Arnold.
10. Smith, D. M. (1977): Human Geography, A Welfare Approach, Arnold
11. Peet, R. (ed) (1987): Radical Geography, Maroufa Press, Rawat, New Delhi, 2003
12. Ambrose, P. G. (1969): Analytical Human Geography, Longman, London
13. De Blij, H. J. (1986): Human Geography, John Wiley & Sons, New York.
14. Vivelo, F. R. (1978): Cultural Anthropology, McGraw Hill, USA.
15. Peet R. and Thrift, N. (eds) (1989): New Models in Geography, Vol. I & II, Unwin Hyman.
16. Ahmed, A. (1999). Social Geography, Rawat Publication, New Delhi.
17. Massey, D, Alien, J, P, Jarre, P (eds) (1999): Human Geography Today, Cambridge Polity Press.
18. Fellman, J (1997): Landscape of Human Activities, Brown and Benchmatric Pub.
19. Coates, B.E., Johnston, R.J. Knox, (1977): Geography and Inequality, Oxford University Press

Further Reading

1. Progress in Geography (1969-76): Volume 1 to 8, Arnold Edwards, London.
2. Hagget, P. (1983), Geography a modern Synthesis, Harper and Row.
3. Cloke, P., Cook, I, Crang, P., Goodwin, M., painter, J., Philo, C., (2004), Practising Human Geography, Sage.
4. Banerjee-Guha, S. (2004), Space, Society and Geography, Rawat, New Delhi.

5. Harvey, D. (1973): Explanation in Geography, Edward Arnold, (Paperback), London.
6. Gregory, D. 1978, Ideology, Science and Geography, Cambridge University Press.
7. Carlestein T., Parkes, D. and Thrift, N., (1978), Making Sense of Time, Edward Arnold.
8. Gale S. and Olson G. (1979), Philosophy in Geography, D. Reidel Publishing co.
9. Pretty, J., Ball, A., Benton, T., et. al. (2007), The Sage Handbook of Environment and Society, Sage.
10. Taffe, E.J. (1970): Geography, Prentice Hall, Englewood Cliffs, New Jersey.
11. Pickles, J. (1985), Phenomenology, Science and Geography, Cambridge University Press.

Semester I

Paper 104: Spatial Organisation of Economic activities

Maximum No. of Credits: **4** Maximum no. of lectures including continuous assessment: **60**

1. **Organisation of an economy as a dynamic spatio-social system: Basic concepts (15 hours)**

   1.1 Economic organization and spatial change- Spatial division of labour and Interdependence
   1.2 Geographic fixity and mobility- typology of distance-Spatial interaction and diffusion
   1.3 Typology of Space - absolute and relative – Time and space convergence- Production of economic space

2. **Spatial Organisation of World Economy (15 hours)**

   2.1 Economic organization of the pre-colonial world - Rise of the Core Economies – industrial revolution in Europe
   2.2 Colonialism and Geographies of inequities and uneven development –neocolonialism and structuration of world economy as core, periphery and semi-periphery
   2.3 Flexibalisation of Production – Role of international Institutions like World Bank, IMF, UNCTAD
   2.4 Evolution and Growth of Multinational Companies - Patterns and Processes of Globalisation

3. **Organisation of Production: Agriculture and Industry - Global Patterns and Trends (15 hours)**

   3.1 Agricultural Patterns-World Agricultural Regions – Theory of Agricultural Landuse and Critique - Technology, modernization and structuring of agrarian regions in colonial and post-colonial periods
   3.2 Crisis of agriculture- Aspects of Food security and world patterns of hunger
   3.3 World Industrial Regions – Factors and processes affecting Location of industries – critical assessment of theories of industrial location
   3.4 Globalisation and shifting location of industries - New Industrial Regions- EPZs and SEZs- South east and East Asian economies

4. **Spatio-social organization of production –Transport, Trade and Services: Global Patterns and trends (15 hours)**

4.1 Organisation of transport - Bases of Spatial Interaction – Theoretical Perspectives on Transport and inter-regional interactions - Role of transport cost- nodes-places, networks and flows- spatio-social accessibility – Indian Examples

4.2 International trade theory- classical, neo-classical and Marxist Perspectives - Critical review – Globalisation and changing structure and composition of International trade – GATT & WTO

4.3 Logic of Regional Integrations- Types and levels - Significance of regional integration as a strategy for the periphery - Case Studies - EU, OPEC, ASEAN, SAARC, BRICS

4.4 New Economic Activities and Globalisation : Finance and Service Industry- The Forth Industrial Revolution

References:

1. Knox Paul, Agnew John and McCarthy Linda, (2008): The Geography of the World Economy, Hodder Education, UK.
2. Sheppard Eric and Barnes Trevor J., (eds.) (2000): A Companion to Economic Geography, Blackwell, Massachusetts.
3. Wood Andrew and Roberts Susan, (2011): Economic Geography- Places, network and flows, Routledge, London and New York.
4 Bryson John, Henry Nick, Keeble David and Martin Ron, (eds.) (1999): The Economic Geography Reader- Producing and Consuming Global Capitalism, John Wiley and Sons Ltd.,New York.
5. Hartshorn A. Truman and Alexander W. John, Third edition, (2010): Economic Geography, PHI Learning Private Ltd., New Delhi
4. Liemt van Gijsbert, (eds.) (1992): Industry on the move- Causes and consequences of International Relocation in the Manufacturing Industry, International Labour Office, Geneva.
5. Harrington J.W. and Warf Barney, (1995): Industrial Location- Principle, Practice and Policy, Routledge, London and New York.
6. Rodrigue Jean-Paul, Comtois Claude and Slack Brian, (2006): The Geography of Transport System, Routledge, London and New York.
7. Harrington J.W. and Warf Barney, (1995): Industrial Location- Principle, Practice and Policy, Routledge, London and New York.
8. Berry, B. J. L. et. Al. (1976): Geography of Economic Systems, Prentice Hall, Englewood Cliff.
9. Boyce, R. D. (1974): Bases of Economic Geography, Holt, Rinehart and Winston, New York
10. Conkling, E. C. & Yeates, M. (1976): Man’s Economic Environment, McGraw Hill, London.
11. Hodder, B. W. and Lee, R. (1974): Economic Geography, Field of Geography Series, Methuen & Co. Ltd, London.
12. Hussain Majid (ed.), (1993): Perspectives in Economic Geography, Vols. 1-6,Anmol Publication, New Delhi.
13. Cole, J. P., (1983): Geography of World Affairs, Butterworths, London.

14. Lloyd, P. E. and Dicken, P. (1972): Location in Space, Harper & Row, San Fancisco.
15. Lowe Moryadas, (1975): The Geography of Movement, Haughton Mifflin & Co.
16. Smith, D. M (1971): Industrial Geography: An Economic Geographic Analysis, John Wiley & Sons.
17. Tarrant, J. R. (1974): Agricultural Geography, Problems in Modern Geography Series, John Wiley & Sons.
18. Willbanks, Thomas J (1980): Location and Well- Being, An Introduction to Economic Geography, Harper & Rowr San Fransisco.

Further Reading:

1. Lee Roger and Wills Jane, (eds.) (1997): Geographies of Economies, Arnold, New York.
2. Scott J. Allen, (2006): Geography and Economy- The Clarendon Lecture in Geography and Environmental Studies, Clarendon Press, Oxford, New York.
3. Castree Noel, Coe M. Neil, Ward Kevin and Samers Michael, (2004): Spaces of Work: Global Capitalism and the Geographies of Labour, Sage, London.
4. Banerjee- Guha Swapna , (eds.) (2004): Space, Society and Geography, Rawat Publication, Jaipur and New Delhi.
5. Brakman Steven, Garretsen Harry and Marrewijk van Charles, (2009): The New Introduction to Geographical Economics, Cambridge University Press, UK.
6. Desai Vandana and Potter B. Robert, (eds.) (2011): The Companion to Development Studies, A Hodder – Viva Edition, London.

Semester I

Tools and Techniques of Spatial Analysis I

(Based on Theory Papers: 101 -102)

No. of Credits **4** Hours of Practical experience **60+** Notional Hours **60**

1. Techniques of Geomorphic Analysis **(30 hours)**

A. Drawing Profiles:

i. Longitudinal

ii. Composite and Projected

B. Methods of Slope Analysis:

i. Wentworth's method of average slope determination

ii. Robison's method of slope analysis'

iii. G. H. Smith's method of slope analysis

iv. Construction of Block Diagram

C. Altimetric Analysis:

i. Ring contour method

ii. Highest grid-cell elevation method

2. Techniques of Soil Analysis **(10 hours)**

i. Textural analysis

ii. Chemical Analysis – pH and moisture determination

3. Techniques of Climatic Data Analysis **(20 hours)**

1. Rainfall dispersion diagrams
2. Wind roses
3. Water surplus-deficiency graphs
4. Climatograph
5. Climograph: Hyther graph, Taylor's climograph
6. Index of aridity and index of moisture
7. Isopleth Maps

References:

1. King, C. A. M. (1978): Techniques in Geomorphology, Edward Arnold, London.

2. Miller, A.A. (1966): The Skin of the Earth, Methuen, London.

3. Monkhouse, F.J. and Wilkinson, H.R. (1971): Maps and Diagrams, Methuen, London.

4. Cole, J.R and King , C.A.M. (1968): Quantitative Geography, John Wiley And Sons, London.

5. Goudie, A. (1981): Geomorphological Techniques, George Alien And Unwin, London.

6. Hammond, R. And McCullagh, P.S. (1974): Quantitative Techniques in Geography: An Introduction, Oxford University Press, London.
Mahmood Aslam (1977): Statistical Methods in Geographical Studies, Rejesh Publication, New Delhi.
7. Singh, Gopal (2001): Map Work and Practical Geography, Vikas Publishing House Pvt. Ltd.
8. Singh, L.R. (2011): Fundamentals of Practical Geography, Sharda Pustak Bhavan, Allahabad.
9. Singh, R.L. and Singh, R. B. (2004): Elements of Practical Geography, Kalyani Publishers, New Delhi – Ludhiana.

Semester I

Tools and Techniques of Spatial Analysis II

(Based on Theory Papers: 103 -104)

No. of Credits: 4 Practical Hours 60 + Notional Hours 60= Total hours 120

1. Statistical Techniques

1.1 Measures of Central Tendency (24 hours)

a) Measures of central tendency: mean centre, weighted mean centre, median centre

b) Z score – different applications and interpretations.

1.2. Network Analysis:

a) Topological graphs -Connectivity- Calculations of Alpha, beta and gamma indices.

b) Mapping of relative accessibility and connectivity – Matrices- point of minimum aggregate travel distance

2. Nature and application of spatial data: (20 hours)

2.1 Data types – qualitative and quantitative

2.2 Aspatial and spatial data

2.3 Scales of measurement of data: nominal, ordinal, interval and ratio – symbolization and representation – interpretation and relationships.

2.4 Sources of data – Primary and secondary

2.5 Designing a questionnaire

3. Computer processing of geographical data (16 hours)

3.1 Symbolisation, Preparation of matrix

3.2 Diagrammatic Representation.

3.3 Compilation of data

3.4 Computation of data: qualitative and quantitative data based on descriptive statistical measures application of computer programmes.

References:

1. Robinson, A. H. and Others (1995): Elements of Cartography, VI Edition, John Wiley & Sons, New York.
2. Anson, R. W. and Ormeling, F. J., (Ed.) (1993): Basic Cartography for Students and Technicians, Vol.I, International Cartographic Association and Elseiver Applied Science Publishers, London.
3. Dickinson, G. C. (1977) Statistical Mapping and the Presentation of Statistics, Edward Arnold Ltd., London.
4. Monkhouse, F. J. and H. R. Wilkinson, (1971): Maps and Diagrams, Methuen & Co. Ltd., London.
5. Hodgkiss, A. G. (1970): Maps for Books and Theses, David and Charles Publishers Ltd., London.
6. Misra R. P. and A. Ramesh, (1969): Fundamentals of Cartography, Prasaranga, University of Mysore

7. Young, P. V. and Schmid, C. F. (1979) : Scientific Social Surveys and Research, ntice Hall, New Delhi.
8 . Mahmood Aslam(1977), Statistical Methods in Geographical Studies, Rajesh Publication, New Delhi.
9**.** Hammond,R. and McCullagh,P.S. (1974), Quantitative Techniques in Geography: An Introduction, Oxford University Press, London.
10. Yeates, M (1974), An Introduction to Quantitative Analysis in Human Geography, McGraw Hill Book Co., New York.
11. Cole, J. P. and King, C. A. M., (1968), Quantitative Geography, John Wiley and Sons, London.
12**.** Fotheringham,A.S., Brunsdon, C., Charlton,M ,(2000) Quantitative Geography: Perspectives on Spatial Data Analysis, Sage Publication Ltd, London,
13 **.** Baily,T.C., and Gatrell, A. C, (1995), Interactive Spatial Data Analysis, Prentice Hall, London
14**.** Griffith ,D. A. , Layne, L.J.,(2002) A Casebook for Spatial Statistical Data Analysis: A Compilation of Analyses of Different Thematic Data Sets , Amazon.com
15. Wicox, P.R. (2003), Applying Contemporary Statistical Techniques, Academic Press, Amsterdam
16. Crang M. and Cook, I. 2007, Doing Ethnographies, Sage.

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Semester II

201: Oceanography and Hydrology

No. of Credits: **4** Teaching Hours **60** + Notional Hours **60**= Total hours **120**

1. **Fundamental Concepts in Oceanography** **(15 hours)**
   1.1 Definition, nature and scope of oceanography- History of Oceanography.
   1.2 Age and origin of oceans, and ocean morphology.
   1.3 Distribution of temperature, salinity and density of oceans.

2. **Ocean Currents and Resources** **(15 hours)**
   2.1 Ocean currents: Atlantic, Pacific and Indian Oceans.
   2.2 Oceanic waves and tsunamis, tides.
   2.3 Marine sediments and deposits
   2.4 Food and mineral resources of the sea.
3. **Introduction to Hydrology** **(15 hours)**
   3.1 Hydrological cycle, Factors affecting movement of water, Patterns of movement
   3.2 Water Budget, World water Resources,
   3.3 World Water Balance, Global Freshwater Resources,
   3.4 History of Hydrology
4. **Watershed, Its Characteristics and Evaporation Process** **(15 hours)**
   4.1 Topographic and Effective Watershed
   4.2 Physiographic characteristics of a Watershed- Geometric & Drainage Network
   4.3 Agro-Pedo Geological Characteristics – Soil Cover, Soil type, Geology
   4.4 Metrological Factors influencing Evaporation- Physical Factors involved in Evaporation Process.

References:

1. Agarwal A. and Narain, S. (1997), “Dying Wisdom: Rise, Fall and Potential of India’s Traditional Water Harvesting System”, CSE, New Delhi.
2. Andre Musy (2011) Hydrology a Science of Nature, Science Publishers, New Hampshire.
2. Centre for Science and Environment (2002), “Citizens Report”, New Delhi.
3. Charlu, T.G.K. and Dutt, D. K. (1982), “Ground Water Development in India” Rural Electrification Corporation, New Delhi.
4. Chorley, R. J. (1967), “Water, Earth and Man”, Methuen, London.
5. Chorley, R. J. (1969), “Introduction to Physical Hydrology”, Methuen, London.
6. Elizabeth M. Shaw (1994) Hydrology in Practice, Taylor & Francis e-Library PublicationNew Hampshire.
7. Jones, J. A. (1997), “Global Hydrology : Processes, Resources and Water Management”, Longman, London.
8. Lvovich, M.I., (2010), Climatology, Hydrology, Glaciology, John Wiley and

Sons, London
9. Mather, J. R. (1984), “Water Resources : Distribution, Use and Management”, John Wiley, Maryland.
10. Singh, R. A. and Singh, S. R. (1972), “Water Management: Principles and Practices”, Tara Publication, Varanasi.
11. Subramanya K (2014) Engineering Hydrology, Mc Graw Hill Publication, New Delhi.
12. Todd, D. K. ((1959), “Ground Water Hydrology”, John Wiley, New York.
13. Stewart, R. H. (2008). *Introduction to Physical Oceanography*.
14. Garrison, T. (2012). *Essentials of Oceanography* (Sixth Edit). Brooks/Cole, Cengage Learning.
15. Singh, S. (2014). *Oceanography*. Allahabad: Pravalika Publications.

Books for Further Reading:

1. Rao, K. L. (1979), “India’s Water Wealth”, Orient Longman, New Delhi.
2. Central Water Commission (1977), “Floods and Their Control in India”, Ministry of Agriculture and Irrigation, Govt. of India, New Delhi.
3. Sain, S. K. (1979), “The Flood Problem in India”, Birla Institute of Scientific Research, Economic Research Division, New Delhi.
4. Sita, K. ,Phadke, V. S. and Rao, K. V. S. (1991), “Koyna Catchment: An Environmental Perspective”, Unpublished Project Report, Department of Geography, University of Mumbai.
5. Tideman, E. M. (1996), “Watershed Management: Guidelines for Indian Conditions”, Omega, New Delhi.

Semester II

202: Geoinformatics

No. of Credits: **4** Teaching Hours **60** + Notional Hours **60**= Total hours **120**

1. Unit – I **(15 hours)**

1.1 Fundamentals of Remote Sensing: Definition and Concept, Process of Remote Sensing, Development of remote sensing – global and Indian
1.2 Electromagnetic Spectrum: Definition and Concept, interactions with atmosphere and earth's surface, Atmospheric window, Black body
1.3 Spectral Reflectance Curve: Concept, curves for land, water bodies/oceans, vegetation In Optical, IR, Thermal and Microwave bands
1.4 Fundamentals of aerial photography: Concept of stereoscopy and photogrammetry, geometric types of aerial photographs, photographic scale, measurements of distance, area and height, relief displacement, stereoscopic parallax, flight planning.

2. Unit – II **(15 hours)**

2.1 Platforms and orbits: types of platforms used for remote sensing, types of orbits (geostationary and polar)
2.2 Sensing of electromagnetic energy: Measurement of radiance, conversion of radiance to digital number
2.3 Resolutions and Sensors: Types of resolutions, Remote Sensors and types based on resolutions and sources of illumination, overview of spaceborne sensors.
2.4 Visual Image Interpretation: Image display and color composites, elements of visual image interpretation

3. Unit – III **(15 hours)**

3.1 Fundamentals of Databases: Data storage, basic file structures, types of database, advantages of database, spatial and non-spatial databases, scales of measurement, Entity – Relationship Model, SQL,
3.2 Geographic Information System: Definition, concept, components, functions and applications.
3.3 Spatial Data Models: Vector and Raster, Vector representation (point, line, area and TIN), Concepts of arc, node, vertices and topology.
3.4 Coordinate Reference Systems: Geographic and Projected, Map Projections and Datum for GIS data.

4. Unit – IV **(15 hours)**

4.1 Vector-based spatial analysis: single layer operations (extraction and proximity) and multilayer operations (overlay operations),

4.2 Raster-based spatial analysis: Georeferencing, Spatial Interpolation and raster generation, raster reclassification, arithmetic, relational and logical operations

4.3 Global Positioning System: Segments of satellite-based positioning systems, main systems – NAVSTAR, GLONASS, Galileo and Indian GPS

4.4 Principles of positioning: Positional Accuracies, Relative Positioning, errors and sources

Reference Books:

1. Agrawal, N.K.(2006), Essentials of GPS (Second Edition), Book Selection Centre, Hyderabad
2. American Society of Photogrammetry (1983): Manual of Remote Sensing, ASP Palis Church,V.A.
3. Barrett, E.G. and Curtis, L.F. (1992): Fundamentals of Remote Sensing in Air Photo-interpretation, McMillan, New York. 7.
4. Bernhardsen, Tor (2002): Geographical Information Systems: An Introduction, Third Edition, John Wiiey & Sons, Inc., New York.
5. Burrough, Peter A and McDonnell, R.A. (1998): Principles of Geographical Information Systems, Oxford University Press, Mumbai.
6. Campbell. J. (1989): Introduction to Remote Sensing, Guilford, New York.
7. Clarke, Keith C. (1998): Getting Started with Geographic Information Systems, Prentice-Hall Series in Geogl. Info. Science, Prentice-Hall, Inc. N.J.
8. Curran, Paul, J, (1988): Principles of Remote Sensing, Longman, London.
9. Heywood, I.et al (2002): An Introduction to Geological Systems, Pearson Education Limited, New Delhi.
10. Iliffe, J.C (2006), Datums and Map Projections for Remote Sensing, GIS and Surveying, Whittles Publishing, New York.
11. Jonson. R. J. (2003): Remote Sensing of the Environment-An Earth Resources Perspective, Pearson Education Series in Geographical Information Science, Keith C. Clarke (Series editor) Pearson Educators Private Limited. (Singapore), New Delhi.
12. Joseph, G. (2009): Fundamentals of Remote Sensing, Universities Press (India) Pvt. Ltd., Hyderabad.
12. Lillesand and Thomand and Relph Kiffer (1994). Remote Sensing and Image Interpretations, John Wiley and Sons, Inc., New York.
13. Parker, R, N. (2008),GIS and Spatial Analysis for the Social Sciences, Routledge, New York.
14. Paul Longley (2005), Geographic Information Systems and Science, John Wiley & Sons.
15. Pickles, John (2006), The Social Implications of geographic Information Systems, Rawat Publications, Jaipur.
16. Star, Jeffrey and John Estes (1996), Geographical Information Systems: An Introduction, Prentice-Hall, inc., N.J.
17. Shekar, S and Chawla, S, (2009), Spatial Databases: A Tour, Pearson Education, Delhi.
18. Tempfli, T. K., Kerle, N., Huurememan, G.C., and Janssen, L.L.F (2009), Principles of Remote Sensing, ITC, Netherlands.

References for further reading:

1. Birkin, Mark et al (1996). Intelligent GIS GeoInformation International, Cambridge.
2. Chrisman, Nicholas (1997), Exploring Geographic Information Systems, John Wiley and Sons Inc, New York
3. Hard, R.M. (1989): Digital Image Processing of Remotely Sensed data, Academic Press, New York.
4. Lo, C.P (1986): Applied Remote Sensing, Longman, Scientific and Technical, Harlow, Essex.

5. Lunder, D. (1959): Aerial Photography Interpretation: Principles and Applications, McGrawHill, New York. 8 6. McCoy, Roger M. (2006), Field methods in Remote Sensing, Rawat Publications, Jaipur.
7. Prater, W.K. (1978): Digital image Processing, John Wiley, New York.
8. Rao, D.P. (eds.)(1988): Remote Sensing for Earth Resources, Association of Exploration Geologist, Hyderabad.
9. Sabins, F. (1982): Remote Sensing: Principles and Applications, Freeman and Co., New York.
10. Spencer, John (2003) Global Positioning System: A Field Guide for the Social Scientists, Blackwell Publishing, Malden, USA.
11. Verrtappen, H., Th. (1977): Remote Sensing in Geomorphology, Elsevier Scientific Publication Company, Amsterdam.
12. Warrin, R. Philipson (1997): Manual of Photographic Interpretations, American Society for Photogrammetry and Remote Sensing, Maryland, U.S.A.

6. McCoy, Roger M. (2006), Field methods in Remote Sensing, Rawat Publications, Jaipur.
7. Prater, W.K. (1978): Digital image Processing, John Wiley, New York.
8. Rao, D.P. (eds.)(1988): Remote Sensing for Earth Resources, Association of Exploration Geologist, Hyderabad.
9. Sabins, F. (1982): Remote Sensing: Principles and Applications, Freeman and Co., New York.
10. Spencer, John (2003) Global Positioning System: A Field Guide for the Social Scientists, Blackwell Publishing, Malden, USA.
11. Verrtappen, H., Th. (1977): Remote Sensing in Geomorphology, Elsevier Scientific Publication Company, Amsterdam.
12. Warrin, R. Philipson (1997): Manual of Photographic Interpretations, American Society for Photogrammetry and Remote Sensing, Maryland, U.S.A.

Semester II

203: Socio-Cultural and Political Geography

No. of Credits: 4 Contact Hours 60 + Notional Hours 60= Total hours 120

1. Social and cultural Geography – Major Perceptions (15 Hours)

1.1 Evolution and development of Social Geography – Major Trends and Approaches- Critical Perspective and associated theoretical developments

1.2 Emergence of cultural Geography as a major branch - Traditional cultural geography – New cultural geography -linguistic and literary studies, Semiotic analysis and 'space' theories - critical social theory

1.3 Human activity and spatial pattern - Production of socio-cultural space – factors, forces and processes – resultant socio-spatial structures - a temporal scale

2. Geography and difference: marginalisation and exclusion (15 Hours)

2.1 Social inequality and Social stratification - the 'difference' between 'self' and 'other' – social execution of 'difference' and exclusion – religious and ethnic identities

2.2 Imagining local, regional and national identities- multicultural spaces – cultural pluralism and identity politics in India.

2.3 Spaces of contestations and conflicts - Poverty and Living in Ghettos and slums in globalizing cities- Gentrification, displacement and right to city – SEZ s in India- Issues of right to livelihood.

3. Gender and Geography (15 Hours)

3.1 Body as place- private and public domains- Role of Patriarchy – State – Capitalist production.

3.2 Space-society perspective- Structuring of sexuality and construction of gender identity – role of socio-cultural forces and processes- stigmas and taboos – resultant gendered spaces-Indian examples – globalization and repositioning of gender

3.3 Spatiality of sex ratios – intra-regional and inter-regional – specific examples of India and China - feminization of labour and status of women workers – experiences from the global periphery.

3.4 Women and human development status – Human rights and legal space for women- Indian context.

4. Spatial Dynamics of Political Processes (15 Hours)

4.1 Concepts and images of territoriality, state, nation and nation- state - colonialism and post-colonial context

4.2 Theoretical perspectives on global political structure- critical analysis of heartland and rim land theories - Relevance of World Systems approach- Core-periphery structure

4.3 Boundary and Frontier concepts- Terrestrial and maritime context- Processes of boundary formation- cultural and ethnic identities.

4.4 Dynamics of electoral politics- Indian context - Globalisation and contemporary geopolitics - Politics of resources – oil resources and West Asia – water Resources and South Asia

References:

1. Peet, R. (1998), Modern Geographical Thought, Blackwell
2. Peet, R. and Thrift, N. (eds.) (2002), New Models in Geography, Unwin Hymann.
3. Barnes Trevor and Gregory Derek, (eds.) (1997): Reading Human Geography- The Poetic and Politics of Inquiry, Arnold, London.
4. Daniels Stephen and Lee Roger, (eds.) (1996): Exploring Human Geography- A Reader, Arnold, London.
5. Cloke, P. and Johnston, R., (eds.), (2005), Spaces of Geographical Thought, Deconstructing Human Geography's Binaries, Sage.
5. Aitken, S and Valentine, G. (2006), Approaches to Human geography, Sage.
6. Soja E., (1997), Postmodern Geographies- The Reassertion in Critical Theory, Rawat, New Delhi.
7. Johnston, R.J., Gregory D. Pratt G. and Watts M., (2005, 5th ed.), the Dictionary of Human Geography, Blackwell.
8. Kitchin R., Thrift, N, (eds.) (2009), The International Encyclopedia of Human Geography, Elsvier.
10. Dear J. Michael and Flusty Steven, (eds.) (2002): The Spaces of Post Modernity, Blackwell, Massachusetts.
11. Benko Georges and Strohmayer Ulf, (eds.) (2004): Human Geography- A History for the 21st Century, Arnold, London.
12. Atkinson, D., Jackson, P., Sibley, D. and Washbourne, N. (eds.) (2005), Cultural Geography, A Critical Geography of Key Concepts, Tauris, I.B.
13. Cloke, P., Crang, P., Goodwin, M.,(2004), Envisioning Human Geographies, Arnold.
14. Cloke Paul, Crang Philip and Goodwin Mark, (eds.) (1999): Introducing Human Geographies, Arnold, London.
15. Banerjee-Guha, S. (2004), Space, Society and Geography, Rawat, New Delhi.
16. Banerjee- Guha Swapna: Space, Spatiality, Human Geography and Social Science: Politics of the production of Space, Published in Transaction Institute of Indian Geographers, Vol.33, No.1, Winter 2011, pp 3-22, Pune.
17. Cloke Paul, Cook Ian, Crang Philp, Goodwin Mark, Painter Joe and Philo Chris, (2004): Practising Human Geography, Sage, London.
18. Glassner, M L, De Blij, H, J, Yacher, L. (1980): Systematic Political Geography, John Wiley.
19. Hanson, J and Pratt, G. (1995) Gender, Work and Space, Routledge, New York.
20. Massey, D., Allen, J., Sarre, P. (eds.), (1999), Human Geography Today, Polity Press.
21. Massey, D (1994): Space Place and Gender, University of Minnesota Press, Minneapolis.
22. Moss, P., (2002), Feminist Geography in Practice: Research and Methods, Blackwell.
23. Agnew John A., Livingstone, David, J., Rogers Alisdair, (1996): Human Geography: An Essential Anthology, Wiley-Blackwell, ISBN: 978-0-631-19461-3
24. Benko Georges and Strohmayer Ulf, (Edts.), (1997): Space and Social Theory: Interpreting Modernity and Postmodernity, Wiley-Blackwell, ISBN: 978-0-631-19466-8.
25. Cresswell Tim, (2004): Place: A Short Introduction, Wiley-Blackwell.
26. Cox Kevin, (2002): Political Geography: Territory, State and Society, Wiley-Blackwell, ISBN: 978-0-631-22678-9

Further Reading:

1. Progress in Geography (1969-76): Volume 1 to 8, Arnold Edwards, London.
2. Taffe, E.J. (1970): Geography, Prentice Hall, Englewood Cliffs, New Jersey.
3. Harvey, D. (1973): Explanation in Geography, Edward Arnold, (Paperback), London.
4. Gregory, D. 1978, Ideology, Science and Geography, Cambridge University Press.

5. Carlestein T., Parkes, D. and Thrift, N., (1978), Making Sense of Time, Edward Arnold.
6. Gale S. and Olson G. (1979), Philosophy in Geography, D. Reidel Publishing co.

7. Mitchell, B. and Draper, T. (1982), Relevance and Ethics in Geography, Longman.
8. Hagget, P. (1983), Geography a modern Synthesis, Harper and Row.
9. Pickles, J. (1985), Phenomenology, Science and Geography, Cambridge University Press.
10. Paterson, J,L. (1984), David Harvey's Geography, Croom Helm.
11. Johnston, R.J.,(1985), Future of Geography, Methuen.
12. Stoddard, D. R. (1986), On Geography, Basil Blackwell.
13. Harvey D. (1989), The Condition of Postmodernity, Blackwell.
15. Unwin, T. (1992), The Place of Geography, Longman.
16. Livingstone D. N. (1992), The Geographical Tradition, Oxford: Basil Blackwell.
17. Husain, M. (ed.), (1993), Perspectives and Nature of Geography, Vol.1-5, Anmol.
18. Harvey D., (2001), Spaces of Capital, Towards a Critical Geography, Edinburgh University Press.
19. Johnston R.J., Taylor, P.J. and Watts, M.J. (2002), Geographies of Change, Remapping the World,
Blackwell.
20. Hoggart, K., Lorretta Lees and davies, A., (2002), Researching Human Geography, Arnold.
21. Pretty, J., Ball, A., Benton, T., et. al. (2007), The Sage Handbook of Environment and Society, Sage.

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Semester II

Paper 204: Urban Geography

No. of Credits: **4** Teaching Hours 60 + Notional Hours 60= Total hours **120**

1. Urbanisation Process and Urban Systems (15 Hours)

1.1 The bases of urbanisation- Demographic, economic and social aspects- Origins of the cities- Urbanisation Trends – urban fringe, urban sprawl and suburbanisation

1.2 Urban Landuse – various approaches – Classical, Neo-classical approaches - Human Ecology, land economics, activity systems

1.3 Urban location of economic activities – Urban morphology and landuse- Critical perspective

1.4 Urban System- Evolution, growth and organisation - Primacy, hierarchy and balance – urban functions and Town classification

2. Urbanisation Process, Capitalism and development (15 Hours)

2.1 Capitalism and urban development - Urbanisation in the industrialised world -Political economy of urbanisation.

2.2 Urbanisation in the Third World - Concept of peripheral urbanisation - Salient characteristics- slums and Urban poverty- Capitalism and urban development - Urbanisation in the industrialised world

2.3 Colonial and post-colonial structure – Concepts of dualism and urban economic base in Third World Cities

2.4 Theoretical Perspectives on role of Cities in regional and national development – cumulative Causation- Core and Periphery and growth pole theory - Top-down and bottom-up approach of urban and regional Planning

3. Perspectives on Urban Planning with Special Reference to India (15 Hours)

3.1 Indian experience of urban planning through 5 Year Plans – First Five Year Plan To Sixth Five Year Plan - Primate urban structure and associated problems – growth poles – policies of decongestion, decentralisation and planned towns – successes and failures

3.2 Changing Perspective on city planning – Seventh, Eighth and Ninth Five Year Plan – Intersection of global processes – Flexibilised urban economy – Changing Economic Base and International Capital - Informalisation and Feminisation of urban economy

3.3 Recentralisation – international capital and formation of global city - Processes and patterns of urban renewal- Crisis in urban space- Gentrification and other Emerging issues.

3.4 Global city and global city-region – new regionalism - transformation of the peri-urban regions of the Global South

4 Understanding the Urban Transformation with Special Reference to Mumbai Metropolitan Region (15 Hours)

4.1 Gentrification in the Mill-land of Mumbai and the plight of the textile workers
4.2 Slum redevelopment in Mumbai- the case of Dharavi
4.3 Issues of urban planning and environment in Vasai- Virar Subregion
4.4 Mumbai a reclaimed city and challenges in urban planning.
4.5 The Planned City of New Mumbai: A Critical Perspective

Reference Books:

1. Carter, H (1972): The Study of Urban Geography, Edward Arnold.
2. A. Latham, D. McCormack, K. McNamara, D. McNeill (2009): Key Concepts in Geography, Sage.
2. Knox, P.L. and Taylor. P.J.(1995): World Cities in a World System, Cambridge University Press, U.K.
3. Harvey, D.(1973): Social Justice and the City, Arnold
4. Abu-Lughod, J. and Hay, R. Jr. (1977): Third World Urbanisation, Maarouta Press.
5. Gugler. J. (ed.)(1988): The Urbanisation of the Third World, O.U.P
6. Sassen, S. (1991): The Global City, Princeton University Press.
7. Clarke, D. (1982): Urban Geography: An Introductory Guide, Groom Helm.
8. Marcuse, P. and Kempen, R.V. (eds.),(2000): Globalizing Cities: A New Spatial Order, Blackwell,
9. Short, J. R. (1996): The Urban Order, Basil Bleckwell.
10 Smith, N. (1996): The New Urban Frontier, Routledge
11. King A. D. (1990): Global Cities, Routledge.
12. Simmonds, R. and Hack, G. (2000): Global City Regions, Spon Press.
13. Markusen, A.R., et al. (1991): Second Tier Cities- Rapid Growth beyond the Metropolis, University of Minnesota Press.
14. Allen J. Scott (ed.), (2001): Global City Regions, Trends, Theory & Policy, Oxford University Press.
15. David Harvey (1985): The Urbanization of Capital, John Hopkins University Press.
16. Edward Soja (2000): Postmetropolis, Critical Studies of cities and Regions, Blackwell Publisher Ltd.
17. G. P. Chapman, A.K. Dutt and R.W. Bradnock (ed.) (1999): Urban growth & Development in Asia, Vol.2: Living in the Cities, Ashgate Publishing Ltd.
18. G. P. Chapman, A.K. Dutt and R.W. Bradnock (ed.) (1999): Urban growth & Development in Asia, Vol.1: Making the Cities, Ashgate Publishing Ltd.
19. Edgar Pieterse, (2008), City Futures- Confronting the Crisis of Urban development, Zed Books, London.
20. R. Paddison, Bill Lever, and J.Money, (eds.) (1993): International Perspective in Urban Studies , Jessica Kingsely Publicaton, London and Philadephia.
21. Brenner N. and Keil R, (ed). (2006), 'The Global Cities Reader' Routledge.
22. R. J. Johnston, Derek Gregory, Geraldine Pratt, and Michael Watts, (eds.), 5th edition, (2005): The Dictionary of Human Geography, Blackwell Publishing.
23. Massey D. (2005): For Space, Sage Publications, London, Thousand Oaks, New Delhi.
24. Carmona M. and Wunderlich F. (2012): Capital Spaces, The Multiple complex Public Spaces of a Global City, Routledge, Taylor and Francis Group, London and New York.

25. Oatley N (ed.) (1998): Cities, Economic Competition and Urban Policy, Paul Chapman Publishing Ltd, London.
26. Pieterse E, (2008): City Futures, Confronting the Crisis of Urban Development, Zed Books Ltd, London and New York.
27. Latham A, et.al. (2009): Key Concepts in Urban Geography, Sage, Los Angeles, London, New Delhi, Singapore, Washington.

Books for further reading:

1. P. Hall (1996): Cities of Tomorrow, Basil Blackwell.
2. Walton, J. (ed.), (1985): Capital and Labour in the Urbanised World1, Sage.
3. Szelenyi, J. (ed.), (1984): Cities in Recession, Sage.
4. Cox, K. and Johnston, RJ. (eds.)(1982): Conflict, Politics and Urban Scene, Longman.
5. McGee, T.G. (1975): The Urbanisation Process in the Third World, G. Bell & Sons.
6. Saunders, P. (1981): Social Theory and the Urban Question, Unwin Hymer.
7. Castells. M, (1977): The Urban question, Edward Arnold
8. Castells, M., (1983): The City & the grassroots, A Cross-Cultural Theory of Urban Social Movements, Edward Arnold Publisher Ltd.
9. Castells, M., (1989): The Informational City, The information technology, Economic Restructuring and the Urban Regional Process, Blackwell Publication Ltd.
10. R. Paddison, Bill Lever, and J.Money (edi.) (1993): International Perspective in Urban Studies , Jessica KingselyPublicaton, London and Philadephia.
11. Raymonds Williams (1985): The Country and the City, The Hogarth Press, London.
12. Diddee, J. and Rangaswamy, V. 1993): Urbanisation: Trends Perspectives and Challenges, Rawat Publications.
13. Dunleavy, P. (1980): Urban Political Analysis, Macmillan.
14. Patel, S. and Thorner, A. (eds.) (1995): Bombay: Metaphor for Modern India, Oxford University Press.
15. Watson, S. & Gibson, K.(1995): Postmodern Cities and Spaces, Basil and Blackwell.
16. Amin, A. and Thrift, N.(2000):Cities: Reimagming the Urban, Polity Press.
17. A.R. Cuthbert, (edi.) (2003): Designing Cities, Critical Reading in Urban Design, Blackwell Publication Ltd.
18. Allen J. Scott (2000): The Cultural Economy of Cities, Essays on the Geography of image Producing industries, SAGE Publication Ltd.
19. Dunleavy, P. (1980): Urban Political Analysis, Macmillan.
20. Misra, R.P. (ed.), (2013): Urbanisation in South Asia- Focus on Mega Cities, Foundation Books
21. Waquar Ahmad, Amitabh Kundu, Richard Peet, (eds.), (2010),: India's New Economic Policy, A Critical Analysis, Rawat
22. Oatley, Nick (ed.) (1998): Cities, Economic Competition and Urban Policy, Paul Chapman Publishing Ltd.
23. Hazareesingh Sandip, 2007,: The Colonial City and the Challenge Modernity- Urban Hegemonies and the Civi Contestations in Bombay (1099-1925), Orient Longman.
24. Nandarajah M., Ann Tomoko Yamamoto, (eds.), (2007), Urban Crisis- Culture and the Sustainable Cities, Rawat.
25. Sujata Patel, Kushal Deb, (eds.), (2006): Urban studies, Oxford.
22. Rod Burgess, Marisa Carmona and Theo Colstee (eds.), (1997): The Challenge of Sustainable Cities, Zed Books, London.
23. David Pinder, (2005): Visions of the City, Edinburgh
24. John Eade and Christopher Mele, (eds.), (2002): Understanding the City- Contemporary and future Prospectives, Blackwell Publishing.

25. L. Hoffman, S. Fainstein and Dennis R. Judd (edi.),(2003): Cities and Visitors, Regulating People, Markets and City space, Blackwell Publishing Ltd.
26. S. Watson & K. Gibson (1995): Postmodern Cities and Spaces, Blackwell Oxford UK and Cambridge USA.
27. Tim Hall (2006): Urban Geography (3rd Edn.), Routledge Contemporary Human Geography Series, Routledge Talyor and Francis Group, London and New York.
28 Amar Farooqui, 2006: Opium City The making of early Victorian Bombay, Three Essays collective.
29. Banerjee-Guha, S., (1985), 'From Colonial Dual Economy to Modern Bi-polar Economy - Some Thoughts on Third World Urbanisation', in Sen, P.K. (ed.), 'The Concepts and Methods in Geography', Institute of Geography, University of Burdwan.
30. Deshpande, S. and Deshpande, L. (1991), 'Problems of Urbanisation and Growth of Large Cities in Developing Countries, A Case Study of Bombay', Population and Labour Policies Programme, Working Paper No. 177, World Employment Programme Research, ILO, Geneva.
31. Janaki Nair, (2007): The Promise of the Metropolis Bangalore's Twentieth Century, Oxford university press.
32. Jeremy Seabrook, (1987): Life and labour in a Bombay Slum, Quartet books, London.
33. Jutta k. Dikshit, (2011): The Urban Fringe of Indian Cities , Rawat Publication.
34. M. Gottdienter and Leslie Budde, (2005): Key Concepts in Urban Studies, Sage publication.
35. Mark Abrahamson, 2004: Global cities, Oxford University Press.
36. Neuwirth R. (2005), 'Shadow Cities: A Billion Squatters, A New Urban World', Routledge.
37. Nicholas R. Fyfe and Judith T. Kenny, 'The Urban Geography Reader' The Routeledge Urban Reader Series.
38. Oberai, A.S. (1993),'Population Growth, Employment and Poverty in Third World Mega Cities, Analytical and Policy Issues', St. Martin's Press, New York, ILO, Geneva.
39. T. S. Papola, 1986: Urban Informal Sector in a Developing Economy,Vikas Publishing house
40. Scott A (2001) : *Global City-Regions: Trends, Theory,Policy* , Oxford University Press, US.
41. Batra, L. (2009) : 'A Review of Urbanisation and Urban Policy in Post-Independent India', Working paper series, Centre for the Study of Law and Governance, Jawaharlal Nehru University, New Delhi.
42. Williams, R. (1974) : *The Country and the City*, Chatto and Windus, London.

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Semester II

Tools and Techniques of Spatial Analysis III

(Based on Theory Papers: 201-202)

No. of Credits: **4** (Practical Hours **60**+ Notional Hours **60**)

1. Unit – I (Hours 20)

1.1 Aerial Photography: Preparation of stereo card, Photo Interpretation and preparation of photo map, preparation of stereogram using stereo pairs, Calculation and application of scale for distance, area and height measurements. Image Interpretation

1.2 Georeferencing: Map to map, image to map and assigning projection and choosing datum

1.3 Digitization: preparation of vector layers, vector editing, linking of spatial and attribute data.

1.4 Thematic mapping techniques: symbolization, labeling, representation of quantitative data, vector layer classification.

2. Unit – II (Hours 20)

2.1 Vector overlay, buffer, extraction

2.2 Point in polygon, line in polygon,

2.3 Data retrieval – Attribute and Spatial query

2.4 Map Composition

3. Unit – III (Hours 20)

3.1 Spatial Interpolation and raster reclassification

3.2 Application of Raster calculator

3.3 Drainage Network Analysis

3.4 GPS practical

Reference Books:

1. Bhatta, Basudeb, (2008), Remote Sensing and GIS, Oxford University Press.
2. Jones, C. B., (1997), Geographical Information Systems and Computer Cartography, Adddison, Wesley Longman Ltd., U.K.
3. Albrecht J. (2007), Key Concepts and Techniques in GIS, Sage.
4. Kemp Karen (ed.), (2008), Encyclopedia in Geographical Information Science, Sage.
5. Huxhold, W.E., (1991), An Introduction to Urban Geographical Information systems, Oxford University Press, New York.
6. Pickles, J., (1995), Ground Truth: The social Implications of Geographical Information Systems, The Guilford Press, New York.
7. Martin D., (1996), Geographical Information Systems: Socio-economic Applications, 2nd edition, Routledge, London, New York.
8. Morraine S. (1998), GIS Solutions in Natural Resource Management: Balancing The Technical-Political Equations, Onward Press, London.
9. Fazal Sahab**,** (2008), GIS Basics, New Age International Publishers Ltd, New Delhi
10. Petersen, G.N., (2009), GIS Cartography- A Guide to Effective Map Design, Taylor and Francis Group.
11. Vallentine G. Clifford N. (2010), Key Methods in Geography, Sage.

12. Birkin, Mark et al (1996). Intelligent GIS Geo Information International, Cambridge.
13. Chrisman, Nicholas (1997), Exploring Geographic Information Systems, John Wiley and Sons Inc, New York
14. Hard, R.M. (1989): Digital Image Processing of Remotely Sensed data, Academic Press, New York.
15. Lo, C.P (1986): Applied Remote Sensing, Longman, Scientific and Technical, Harlow, Essex.
16. Lunder, D. (1959): Aerial Photography Interpretation: Principles and Applications, McGrawHill, New York.
17. McCoy, Roger M. (2006), Field methods in Remote Sensing, Rawat Publications, Jaipur.
18. Prater, W.K. (1978): Digital image Processing, John Wiley, New York.
19. Rao, D.P. (eds.)(1988): Remote Sensing for Earth Resources, Association of Exploration Geologist, Hyderabad.
20. Sabins, F. (1982): Remote Sensing: Principles and Applications, Freeman and Co., New York.
21. Spencer, John (2003) Global Positioning System: A Field Guide for the Social Scientists, Blackwell Publishing, Malden, USA.
22. Verrtappen, H. Th., (1977): Remote Sensing in Geomorphology, Elsevier Scientific Publication Company, Amsterdam.
23. Warrin, R. Philipson (1997): Manual of Photographic Interpretations, American Society for Photogrammetry and Remote Sensing, Maryland, U.S.A.

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Semester II

Tools and Techniques of Spatial Analysis IV

Based on Theory Papers: (203-204)

No. of Credits: **4** (Hours of doing Practicals **60**+ Notional Hours **60**)

1. Settlement Hierarchy and population studies: (25 Hours)

1.1 Settlement Hierarchy

a. Nearest neighbor analysis

b. Population and functional – rank- size rule – application and interpretation - degree of primacy - Construction- Interpretation – application of triangular graph

1.2 Population Studies

a. Construction and interpretation of Demographic transition graph and Population Pyramids

b. Thematic map interpretation – NATMO ATLAS, Population Atlas

2. Mental Maps and diagrams (15 Hours)

2.1 Typology of distance and direction of space- Construction of Maps

2.2 Imagining Place and space: Perception – mapping and interpretation.

2.3 Interpreting political context of maps, cartographic techniques, diagrams, pictures and cartoons.

3. Statistical Techniques to understand the spatial pattern (20 Hours)

3.1 Index of concentration: location quotient and concentration.

3.2 Index of similarity and dissimilarity and inequality- Construction and applicability of Lorenz curve- Interpretations

3.3 Calculation of Ginni's co-efficient of concentration

References:

1.Gregory, S. (1971): Statistical Methods and Geographer, Longman, London.

2. King, C. A. M. (1978): Techniques in Geomorphology, Edward Arnold, London.

3. Taylor, Peter J. (1977): Quantitative Methods in Geography, Houghton and Mifflin co., Boston

4. Monkhouse. F.J. and Wilkinson, H.R. (1971): Maps and Diagrams, Methuen, London

5. Cole, J.R and King , C.A.M. (1968): Quantitative Geography, John Wiley And Sons, London.

6. Goudie, A. (1981): Geomorphological Techniques, George Alien And Unwin, London.

8. Hammond, R. And McCullagh, P.S., (1974): Quantitative Techniques in Geography: An Introduction, Oxford University Press, London.

9. Yeates, M, (1974): An Introduction to Quantitative Analysis in Human Geography, McGraw Hill Book Co., New York.

10. Mahmood Aslam, (1977): Statistical Methods in Geographical Studies, Rejesh Publication, New Delhi.

11. Rogerson P.A. (2010), 3rd Ed. Statistical Methods for Geography, a Students Guide, Sage.

12.Ebdon, David, (1985): Statistics in Geography: A Practical Approach , Wiley-Blackwell, New York.

13.Fotheringham,A.S., Brunsdon, C., Charlton,M : (2000) Quantitative Geography:

Perspectives on Spatial Data Analysis, Sage Publication Ltd, London,
14.Baily, T.C., and Gatrell, A. C, (1995): Interactive Spatial Data Analysis, Prentice Hall, London
15. Griffith , D. A. , Layne, L.J.,(2002): A Casebook for Spatial Statistical Data Analysis: A Compilation of Analyses of Different Thematic Data Sets , Amazon.com
16. Chen, Y.Q. and Lee Y.C., (ed.) (2003): Geographical Data Acquisition , New York
17. Vallentine G. Clifford N. (2010), Key Methods in Geography, Sage.
18.. Delyser D., Herbert S., Aitken S. (eds.) (2010), The Sage Handbook of Qualitative Research, Sage.
19. Cloke, P., Cook, I, Crang, P., et.al. (2004), Practising Human Geography, Sage.

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Annexure I

Department of Geography

University of Mumbai

Two Year Degree Course of M. A./M.Sc. in Geography

As per Choice Based Credit System (CBCS)
(With effect from the academic year 2016-2017)

Question Paper Pattern for Semester I and II

Theory Paper: 100 marks for each paper (Total papers 4)

Internal examination: Total marks 40 (in each theory paper)
External examination: Total marks 60 (in each theory paper)

i) Total no. of questions to be framed for theory paper in external examination: 6; 15 marks each.
ii) Out of the 6 questions, students are required to attempt **any four** questions.

Practical Paper: 100 marks for each paper (Total papers 2)

I & II End Semester Question Paper in Practicals-
A: External examination: Total Marks- **100**

i) Students are expected to attempt **total four** questions of **20 marks** each i.e. **80 marks**
ii) Marks for Journal – **10**
iii) Marks for Viva-voice **- 10**
iv **All questions are compulsory**
v) No of questions would correspond with number of major modules in the respective practical Course syllabus.

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