M.A./M.Sc. Geography

First Semester

Paper – I (M1GEOG1-CT01) Geographical Thought

Unit – I

a) Definition, philosophy and nature of geography
b) Scope and contents of geography
c) Detailed study of Greek and Roman scholars
d) Nature of geographical thought in ancient India

Unit – II

a) Geographical knowledge during the ancient & medieval period
b) Dark age of geography
c) The Arabic period
d) Contribution of Varenius and Kant

Unit – III

a) Main characteristics of German school of thoughts- contribution of Alexander von Humbolt
b) Contribution of Carl Ritter & Ratzel
c) Main characteristics of French school of thought-Contributions of Paul Vidal de la Blache
d) Contribution of Jean Brunhes

Unit – IV

a) Main characteristics of American school of thoughts- Contribution of W. M. Davis
b) Contribution of Carl O. Sauer
c) Main characteristics of British school of thoughts
d) Changing methods & techniques in Geography.

Unit – V

a) Environmental determinism, possibilism and neo-determinism
b) Concept of Region, study of aerial differentiation
c) Dichotomies in geography, systematic and regional, qualitative and quantitative geography
d) Impact of Positivism, Humanism, Radicalism & Behaviouralism in Geography.

References:

1. Abler, Ronald F. et al, Geography's Inner Worlds: Pervasive Themes in Contemporary American Geography, Routledge, New Jersey, 1992
2. Ali, S. M., Arab Geographers, Institute of Islamic Studies
3. Ali. S. M., The Geography of Puranas, People's Publishing House, New Delhi
4. Chatterjee, S. P., Fifty Years of Geography in India, Indian Science Congress, New Delhi
5. Dickinson, R. and O. J. R. Howarth, Making of Geography, Calarendon Press
6. Dickinson, R. E., The Makers of Modern Geography, Routledge and Kegan Paul, London, 1969
7. Dikshit R. D., Geographical Thought: A Contextual History of Ideas, Prentice Hall of India Pvt. Ltd. 2000

8. Dikshit R. D., The Art and Science of Geography: Integrated Readings, Prentice Hall of India, New Delhi, 1994
9. Dohrs, F. E. and Sommers, L. W. (eds.) Introduction to Geography, Thomas Y. Crowell Co., New York, 1967
10. Fischer, E. et al, A Question of Place: The Development of Geographic Thought, R.V. Beatty Ltd., Arlington, 196
11. Freeman, T. W., Hundred Years of Geography, Gerald Duck-Worth & Co
12. Fuson, R. H., A Geography of Geography: Origins and Development of the Discipline, W. M. C. Brown Company
13. Gregory, D., Ideology, Science and Human Geography, Hutchinson, London, 1978
14. Gregory, D., Geographical Imaginations, Blackwell, Oxford, 1994
15. Hartshorne, Richard, The Nature of Geography, Association of American Geographers, Lancaster, Pennsylvania, 1939
16. Hartshorne, Richard, Perspective on the Nature of Geography, Rand McNally and Co., Chicago, 1959
17. Harvey, David, Explanation in Geography, Edward Arnold, London, 1969
18. Harvey, M. E. and B. P. Holly (eds.), Themes in Geographic Thought, Rawat Publications, Jaipur, 1999
19. Holt-Jensen, A., Geography: Its History and Concepts, Longmans, 1980
20. Husain, Majid, Evolution of Geographical Thought, Rawat Publications, Jaipur, 1984
21. James, P. E. and C. F. Jones, American Geography: Inventory and Prospects, Syracuse University Press
22. James, P. E., All Possible Worlds: A History of Geographical Ideas, Sachin Publication, Jaipur, 1980
23. Jensen, A. H., Geography: Its History and Concepts, Harper & Row
24. Johnston, R. J., Philosophy and Human Geography: An Introduction to Contemporary Approaches, Edward Arnold, London, 1983
25. Johnston, R. J. and R. Claval (eds.), Geography Since the Second World War, Croom Heim, London/Bernes and Noble, N. J., 1984
26. Johnston, R. J., Geography and Geographers: Anglo-American Geography Since 1945, Edward Arnold (Publishers) Ltd., London, 1983
27. Jones, P.A., Field Work in Geography, Longmans, 1968
28. Kothari, C. R., Research Methodology, Methods and Techniques, Wiley Eastern Ltd., New Delhi
29. Ley, D. and M. Samuels (eds.), Humanistic Geography: Prospects and Problems, Maarouffa, Press, Chicago, 1978
30. Livingstone, D. N., The Geographical Tradition, Blackwell, Oxford, 1992
31. Lownsburg, J. F. and F. T. Aldrich, Introduction to Geographical Methods and Techniques, Charles Marrill, Columbus, 1979
32. Mandal, R. B. and V. N. P. Sinha, Recent Trends and Concepts in Geography (three volumes), Concept Publishing Company, New Delhi
33. Minshull, R., The Changing Nature of Geography, Hutchinson University Library, London, 1970
34. Mishra, R. P., Contributions to Indian Geography, Heritage Publishers, New Delhi.
35. Peet, R., Modern Geographical Thought, Blackwell, Oxford. 1998
36. Prasad, H., Research Methods and Techniques in Geography, Rawat Publications, Jaipur

37. Preston James, All Possible Worlds: A History of Geographical Ideas, John Wiley & Sons, New York, 1981

38. Raza, Moonis, A Survey of Research in Geography, ICSSR, New Delhi.

39. Soja, E. W., Postmodern Geographies: The Resurrection of Space in Critical Social Theory, Verso, London, 1985.

40. Stoddart, D. R. (ed.), Geography, Ideology and Social Concern, Blackwell, Oxford, 1981

41. Wooldridge, S. W. and E. G. East, The Spirit and Purpose of Geography, Hutchinson University Library, London, 1951

42. Wooldridge, S. W., The Geographer as Scientist, Thomas Nelson and Sons. Ltd., London, 1956

43. जैन, एस.एम. : भौगोलिक चिन्तन का विकास (साहित्य भवन, आगरा)
44. कौशिक, एस. डी. : भौगोलिक विचारधारा एवं विधि तंत्र (रस्तोगी प्रकाषन, मेरठ)
45. माथुर एवं जोशी : भौगोलिक विचारधाराओं का इतिहास (आर.बी.एस. पब्लिशर्स,जयपुर)
46. सिंह, जे. : भौगोलिक चिन्तन के मूलाधार (वसुन्धरा प्रकाशन, नई दिल्ली)
47. सिंह, यू. : भौगोलिक चिन्तन का विकास (कल्याणी पब्लिशर्स, नई दिल्ली)
48. वर्मा एल. एन. : भौगोलिक विचारधाराएँ (राज. हिन्दी ग्रंथ अकादमी, जयपुर)
49. रमेश दत दीक्षित : भौगोलिक चिन्तन का विकास (प्रिन्टिस हाल ऑफ इण्डिया प्राइवेट लिमिटेड, नई दिल्ली)

M.A./M.Sc. Geography
First Semester
Paper – II (M1GEOG2-CT02) Geomorphology

Unit – I

a) Development in geomorphology
b) Concept & scope of geomorphology
c) Development of slopes: approaches to the study of slopes; views of W. Penck, A. Wood and A. N. Strahler
d) Isostasy : concept and theories

Unit – II

a) Continental Drift Theory and Plate Tectonic theory
b) Theories of mountain building
c) Processes: weathering, types of weathering
d) Processes: cycle of erosion, views of Davis and Penck

Unit – III

a) Geomorphic processes and landforms – fluvial
b) Geomorphic processes and landforms – glacial and fluvio-glacial
c) River forms and processes – stream flow, hydrographs and flood frequency analysis
d) Geomorphic processes and landforms – aeolian

Unit – IV

a) Geomorphic processes and landforms – coastal
b) Geomorphic processes and landforms – karst
c) Submarine relief
d) Geomorphometry: geomorphology and topographic analysis

Unit – V

a) Extra-terrestrial geomorphology
b) Environmental change – causes, effects on processes and landforms
c) Soil processes and conservation
d) Dams and reservoirs: geomorphic consideration and environmental impact

References:

1. Dayal, P., A Text Book of Geomorphology, Shukla Book Depot, Patna, 1996
2. Dury, G. H., The Face of the Earth, Penguins, 1980
3. Ernst, W.G., Earth Systems: Process and Issues, Cambridge University Press 2000
4. Hugget, Richard, Fundamentals of Geomorphology, Routledge, Taylor & Francis Group, New York, 2007
5. ICSSR, A Survey of Research in Physical Geography, Concept, New Delhi, 1983
6. Kale, V. and A. Gupta, Elements of Geomorphology, Oxford University Press, Calcutta, 2001
7. King, C. A. M., Beaches and Coasts, E. Arnold, London, 1972
8. Leopold, L. B. et al, Fluvial Processes in Geography, Eurasia Publishing House, New Delhi
9. Pike, R.J., I.S. Evans and T. Hengl, Geomorphometry: A Brief Guide, Developments in Soil Science, Volume 33, Elsevier B.V., 2009
10. Pitty, A., Introduction to Geomorphology, Methuen, London, 1974
11. Ritter, D.F., R.C. Kochel and J.R. Miller, Process Geomorphology, 4th edition, McGraw Hill, New York, 2002
12. Sharma, H. S., Tropical Geomorphology, Concept, New Delhi, 1987
13. Shepard, F. P., Submarine Geology, Harper & Sons, New York, 1948
14. Singh, S., Geomorphology, Prayag Pustakalaya, Allahabad, 1998
15. Small, R. J., The Study of Landforms, McGraw Hill, New York, 1985

16. Sparks, B. W., Geomorphology, Longmans, London, 1960
17. Strahler, A. H., Introducing Physical Geography, 5th Edition, John Wiley & Sons, 2009
18. Summerfield, M. A., Global Geomorphology, Longman, 1991
19. Thornbury, W. D., Principles of Geomorphology, Wiley Eastern, l969

M.A./M.Sc. Geography
First Semester

Paper – III (M1GEOG3-CT03) Economic Geography

Unit –I

a) Definitions, aims and scope of Economic Geography
b) Approaches and recent trends in Economic Geography
c) Classification of economies – sectors of economy- primary, secondary, tertiary & quaternary occupations
d) Relationship between economic activities & environment

Unit –II

a) Location – importance , Christaller – Central Place Theory
b) Movement & interaction in the simplified and heterogeneous economic landscape
c) Significance & elements of production cost – raw materials, labour, capital, technical knowledge –spatial variation in production costs & locational impact
d) Spatial variation in transportation cost-location & structure of transport cost, factors affecting the transportation cost

Unit- III

a) World agricultural regionalization – Whittlesey's classification of agricultural region
b) Subsistence intensive agriculture
c) Mediterranean agriculture & tropical plantation
d) Commercial grain farming and Cohen region of USA

Unit – IV

a) Major industrial regions of the world : study of Great Lake industrial region of USA
b) Study of Ruhr industrial region
c) Study of industrial region of Ukraine
d) Study of industrial belt of Japan

Unit - V

a) Means of transportation : factors affecting the choice of particular means of transport
b) World pattern of water transportation & trade : oceanic transport routes
c) International trade : types of trade
d) Economic regions of the world

References:

1. Alexander, J. W., Economic Geography, Prentice Hall of India, New Delhi
2. Alien, S. W. and Leonard, J. W., Conserving Natural Resources, McGraw Hill
3. Bengston, N. A. and M. W. Royen, Fundamentals of Economic Geography, Prentice Hall
4. Berry J. L. Geography of Market Centres and Retail Distributions, Prentice Hall, New York, 1967
5. Berry, B. J. L., et al, D.M, Economic Geography, Prentice Hall

6. Boesch, H., A Geography of World Economy, D. Van, Nostrand
7. Chatterjee, S. R, Economic Geography of Asia, Allied Book Agency, Calcutta, 1984
8. Chisholm, M., Geography and Economy, G. Bell, London
9. Chorley, R. J. and P. Haggett (ed.), Network Analysis in Geography, Arnold, 1969
10. Chorley, R. J., Water, Earth and Man, Methuen
11. Dreze, J. and A. Sen, India: Economic Development and Social Opportunity, Oxford University Press, New Delhi, 1996
12. Eckarsley, R. (ed.), Markets, the State and the Environment, McMillan, London, 1995
13. Garnier. B. J. and A. Delobez, A Geography of Marketing, Longman, London, 1979
14. Guha and Chatterjee, A New Approach to Economic Geography of Resources
15. Hamilton, F. E. I. (ed.), Resources and Industry, Oxford University Press, New York, 1992
16. Hamilton, F. E. I., Spatial Perspectives on Industrial Organisation and Decision Making, John Wiley, New York, 1974
17. Hurst, E., Transport Geography: Comments and Readings, McGraw Hill, New York, 1974
18. Janaki, V. A., Economic Geography, Concept Publishing Co., New Delhi
19. Jarret, H. R., A Geography of Manufacturing, MacDonald & Evans
20. Jones, G. G. and C. F. Darkenwald, Economic Geography, Mac Milan
21. Learmonth, T. A., Mysore State: Regional Synthesis, Asia Pub. House
22. Lloyd, P. and P. Dicken, Location in Space: A Theoretical Approach to Economic Geography, Harper and Row
23. Me-Carty, M. H. and J. B. Luidberg, A Preface to Economic Geography, Prentice Hall
24. Morgan, W. B. and R. J. C. Munton, Agricultural Geography, Methuen, London, 1977
25. Pachuri, R. K., Energy and Economic Development in India, Praeger, New York, 1977
26. Paterson, J. H., Land Work and Resources: An Introduction to Economic Geography, Arnold
27. Robertson, D. (ed.), Globalisation and Environment, E. Elgar Co., U.K., 2001.
28. Robinson, H., Economic Geography, MacDonald and Evans
29. Rostow, W. W., The Stages of Economic Growth, Cambridge University Press, London, 1960
30. Singh J. and S. S. Dhillon, Agricultural Geography, McGraw Hill, India, New Delhi, 1984
31. Singh, G., Economic and Commercial Geography, Manol Talao
32. Symons. L, Agricultural Geography, Bell and Sons, London, 1972
33. Thomas, R. S., The Geography of Economic Activity, McGraw Hill, New York.
34. Wheeler, J. 0. et al, Economic Geography, John Wiley, New York, 1995
35. Whitbeck, R. S. and Finch, V. L., Economic Geography, McGraw Hill, New York
36. Zimmermann, E. W., World Resources and Industries, Harber
37. श्रीवास्तव, वी. के. एवं राव, बी. पी. : आर्थिक भूगोल के मूल तत्व (वसुन्धरा प्रकाषन, गोरखपुर)
38. जैन, हरकचन्द : सैद्वान्तिक आर्थिक भूगोल (कमलेष प्रकाषन, भीलवाडा)
39. रजा, एम. एवं सिंह, ए. : संसाधन भूगोल
40. नैगी, बी. एस. : संसाधन भूगोल
41. सिंह एवं सिंह : आर्थिक और संसाधन भूगोल

M.A./M.Sc. Geography
First Semester

Paper – IV (M1GEOG4-CT04) Climatology and Oceanography

Unit-1: ***Basic Concepts and Atmospheric Phenomenon***

a) Nature and scope of Climatology

b) Composition and layered structure of the atmosphere

c) Insolation; energy balance of the Earth; horizontal and vertical distribution of temperature

d) Atmospheric pressure and pressure belts

Unit-2: Atmospheric Circulation

a) Winds: forces-PGF, CF, FF

b) Planetary, periodic and local winds; jet streams

c) Atmospheric humidity–process and forms of precipitation: types of rainfall; world distribution of rainfall.

d) Air masses and fronts; tropical and temperate cyclones

Unit-3: Climate Types and Climate Change

a) Approaches to classification of world climates; Koppen's classifications

b) Major climates of the world: Characteristics of Equatorial, Tropical Monsoon, Savanna, Hot Desert, Mediterranean and Mountain type of climate

c) Ocean atmosphere interaction: El Nino- La Nina; Walker's circulation & El Nino Southern Oscillation (ENSO)

d) Ozone depletion; greenhouse effect; global warming

Unit-4: Oceans-Physical Characteristics

a) Nature and scope of Oceanography

b) Ocean bottom relief; relief of Indian and Atlantic oceans

c) Ocean temperature and salinity: factors and distribution patterns

d) Coral reefs: types and theories of formation

Unit-5: Dynamics of Ocean Water and Human-marine Interface

a) Tides: types, theories of origin of tides

b) Ocean currents: currents of Indian, Atlantic and Pacific ocean

c) Marine resources: food, mineral and energy resources

d) Sea level changes; human impact on marine communities

References:-

1. Barry, R.G. and Chorley P.J., 1998. Atmosphere, Weather and Climate.Routledge, London andNew York.

2. Chorley, R.J., 1995: Atmosphere, Weather and Climate. Methuen, London.

3. Critchfield, H.J., 1983. General Climatology, Prentice -Hall of India, New Delhi

4. Das, P.K., 2013. The Monsoons, National Book Trust, New Delhi.

5. Garrison, Tom, 2014. Essentials of Oceanography, Cengage Learning, Canada

6. Gerald S., 1980. General Oceanography: An Introduction, John Wiley & Sons

7. Glantz, M.H., 2001. Currents of Change: Impacts of El Nino and La Nina on Climate and Society, Cambridge University Press, Cambridge

8. Gross M. Grant, 1987. Oceanography: A View of the Earth, 4th Ed., Prentice Hall Inc., NewJersey.

9. King, C.A.M., 1962. Oceanography for Geographers, Edward Arnold, London.

10. Lal, D.S., 2011. Climatology and Oceanography, ShardaPustakBhawan, Allahabad

11. Oliver, J.E. and Hidore, J.J., 2011. Climatology: An Atmospheric Science, Dorling KinderskyIndia Pvt. Ltd, Licensees of Pearson Education in South Asia, New Delhi

12. Robinson, P.J. and Henderson, S., 1999. Contemporary Climatology, Henlow

13. Sharma, R.C. and Vatal, M., 1999. Oceanography for Geographers, Chaitanya PublishingHouse, Allahabad.

14. Siddartha, K., 2000. Atmosphere, Weather and Climate, Kisalaya Publications Pvt. Limited, NewDelhi

15. Siddartha, K., 2000. Oceanography: A Brief Introduction, Kisalaya Publications Pvt. Limited,New Delhi

16. Singh Savindra, 2007. Climatology, PrayagPustakBhawan, Allahabad

17. Singh Savindra, 2008. Oceanography, PrayagPustakBhawan, Allahabad

18. Thurman, Harold V. & Trujillo, Alan P., 2004. Introductory Oceanography, Prentice Hall

19. Trewartha, G.T. and Horn, L.H., 1980. An Introduction to Climate, International Students' Edition, McGraw Hill, New Delhi

20. Ummerkutty, A.N.P., 1985. Science of the Oceans and Human Life, National Book Trust, NewDelhi

HINDI BOOKS

1. Banerjee R.C. and Upadhyaya D.S., 1978.MausamVigyan, Rajasthan Hindi Granth Academy,Jaipur

2. Bansal, S.C., 2006. Jalvayutatha Samudra Vigyan, KedarNath Ram Nath & Co., Meerut

3. Gupta L. S., 2000. Jalvayu Vigyan, Hindi Madhyam Karyanvay Nidishalya, Delhi Vishwa Vidhyalaya, Delhi

4. Lal, D S , 2006. JalvayuVigyan ,Prayag Pustak Bhavan, Allahabad

5. Negi B.C., 2003. JalvayuVigyantatha Samudra Vigyan, KedarNath Ram Nath & Co., Meerut

6. Singh Savindra, 2006. Jalvayu Vigyan Prayag Pustak Bhawan, Allahabad

7. Singh Savindra, Samudra Vigyan, Prayag Pustak Bhawan, Allahabad

8. Vatal, M.,1986. Bhautik Bhugol, Central Book Depot, Allahabad

9. नेगी, बी. सी.: जलवायु विज्ञान तथा समुद्र विज्ञान, केदारनाथ रामनाथ, मेरठ

10. बनर्जी, आर.सी. एव ं उपाध्याय, डी.एस : मौसम विज्ञान (राजस्थान हिन्दी ग्रन्थ अकादमी, जयपुर)

M.A./M.Sc. Geography
First Semester
Practical -I (M1GEOG2-CP01) Surveying & Leveling

Unit – I Introduction

a) Surveying as an art and science, principles of surveying
b) General errors and inaccuracies in surveying
c) Precautions in using survey instruments
d) Trignometrical methods of solution of triangles and computation of lengths

Unit – II Plane table

a) Use of Plane Table in composite surveys and related methods, methods of resectioning
b) General planning of large area plane surveys
c) A composite survey of college campus or village/neighborhood
d) Drawing of control points and surveyed plan

Unit – III Theodolite and Tacheometer

a) Theodolite as an instrument of surveying and leveling, adjustment of Theodolite
b) Computation of Theodolite bearings
c) Computation of length of triangles and plotting of control points
d) Telemetry: stadia and tangential

Unit – IV Clinometer

a) Use of Clinometer as instrument of leveling
b) Measuring spot heights
c) Contouring and interpolation of contours
d) Drawing of profiles

Unit – V Dumpy level

a) Use of Dumpy level as an instrument of leveling and adjustment of the dumpy level
b) Principles: calculation of difference of level, series leveling, back sights, foresights, intermediate sights
c) Level book and computation of reduced level: Rise and Fall and collimation method
d) Plotting of profiles

Note:

1. Candidates will submit following exercises as record work:
   i. Resectioning: 3 exercises of geographical methods of Llano's, Bessel's and trial and error
   ii. Profiles: 2 exercises based on leveling measurements obtained with dumpy level
   iii. Contouring: 1 exercise based on leveling measurements obtained with dumpy level
   iv. Contouring: 1 exercise based on leveling measurements obtained with clinometers
   v. Measuring and plotting reduced levels using tacheometer: 2 exercises
   vi. Triangulation survey based on a minimum of 15 control points using theodolite: 2 exercises including one related to composite survey
   vii. Plan of un-surveyed campus/neighbourhood/village area based on composite survey: 1 exercise (10 day's camp)
   viii. Thematic maps showing characteristics of the surveyed area: form of built-up area, and building material: 6 exercises

2. All exercises will be based on surveying and leveling work done by the candidates themselves for areas hitherto un-surveyed

References:

1. Clark, D., Plane and Geodetic Surveying, Constable
2. Davis, R. E. and F. S. Foot, Surveying: Theory and Practice, McGraw Hill
3. Hinks, H.R., Map and Survey, Cambridge
4. Kanetkar, T. P., Surveying and leveling, Volume I & II, A. U. Grah Prakashan
5. Kiley, P. T., Surveying and leveling, Volume I & II, A. U. Grah Prakashan
6. Survey Manual, Volume I-VIII, Survey of India
7. Williamson, J. T., Surveying and Field Work, Constable

Practical Exam Scheme

Distribution of Marks: - Total Marks (100) = Internal marks (20) + External marks (80)

Internal marks- 20

1. Test paper - 10 Marks
2. Objective paper - 10 marks (10 objective questions)

External marks-80

Candidates will be examined by an external examiner in consultation with the internal examiner

The distribution of 80 marks will be as follows:

A. Test paper - 20 Marks
B. Survey exercise - 25 Marks
C. Record work - 15 Marks
D. Viva-voce - 10 Marks
E. Performance in survey camp - 10 marks

A- Test Paper – 20 marks

The practical test paper of two hours duration and candidates will be required to answer two questions out of four questions.

B- Survey exercise – 25 marks

Working on each instrument with following distribution of marks:

Instrument	Exercise	Marks	Time (minutes)
A. Plane Table	Resectioning	5	35
B. Theodolite	Measurement of angle between two points	5	10
C. Dumpy Level	Measuring level difference between two distant points	5	10
D. Clinometer	Measuring heights of and level difference between two distant points	5	10
E. Tacheometer	Measurement distance of any distant point	5	10

The practical exercise, record work and viva-voce examination shall be conducted by external examiner in consultation with the internal examiner.

M.A./M.Sc. Geography
First Semester
Practical -II (M1GEOG2-CP02) Air Photo Interpretation

Unit – I: Introduction

a) Definition
b) Scope
c) Development of aerial photography
d) Interpretation techniques

Unit – II: Types and quality of aerial photographs

a) Types of aerial photographs
b) Factors affecting quality of aerial photographs
c) Aerial photographs versus maps
d) Usages of aerial photographs in interdisciplinary research

Unit – III: Tools and geometry of air photography and interpretation:

a) Pocket stereoscope and mirror stereoscope
b) Aerial camera, lens and filters
c) Geometry of aerial photographs
d) Stereogram, stereo triplet and mosaic

Unit – IV: Basic air photo measurements:

a) Photographic scale
b) Measuring height of object
c) Calculation of area, number of strips and number of air photos
d) Measuring angles, direction and slope measurement

Unit – V

a) Elements of object identification,
b) Interpretation and mapping of natural landscapes
c) Interpretation and mapping of cultural landscapes
d) Field checking

Practical Exercises

Notes:
Students are required to perform one experiment from each unit during examination.

1) Stereo test
2) Orientation of stereo model under mirror stereoscope (1 exercise)
3) Calculate the photo base & flight line. (2 exercises)
4) Determination of photo/image scale (1exercise)
5) Determination of heights using single photograph (1exercise)
6) Objects identification by Pocket Stereograph (1 exercises)
7) Interpretation and mapping of natural landscapes :physical aspects, drainage patterns, river basins, and vegetation (8 exercises)
8) Interpretation and mapping of cultural landscapes: land use, agricultural utilisation, field patterns, cultural aspects, settlements and transportation lines (8 Exercises)

One local field trip will be conducted for field verification of aerial photographs of Udaipur city and nearby areas. Students will be required to prepare a Field Report and submit along with the Record Work.

References

1. American Society of photogrammetry: Manual of remote sensing, ASP, Falls Church, VA, 1983
2. Avery, T. E., Interpretation of Aerial Photographs, Burges
3. Barrett, E. C. and L. F. Curtis, Fundamentals of Remote Sensing and Air Photo Interpretation, Macmillan, New York, 1992
4. Compbell, J., Introduction to Remote Sensing, Guilford, New York, 1989
5. Curran, Paul J., Principles of Remote Sensing, Longman, London, 1985
6. Hord, R. M., Digital Image Processing of Remotely Sensed Data, Academic, New York, 1989
7. Kennie and Methue, Remote Sensing in Civil Engineering Survey, University Press, London
8. Luder, D., Aerial Photograph Interpretation: Principles and Applications, McGraw Hill, New York, 1959
9. Plates, J. E. and L. W. Snagery, remote Sensing Techniques for Analysis, Hamilton Publishing Company
10. Robert, G. Reeves et al, Manual of Remote Sensing, Volume I & II
11. Smith, H. T. V., Aerial Photographs and their Applications, Appleton Century Crofts
12. Spurr, S. H., Photogrammetry and Photo Interpretation, Ronald Press
13. Talbut, A. Essentials of Aerial Surveying and Photo Interpretation
14. Thomas, M. Lillesand and Ralf W. Kefer, Remote Sensing and Image Interpretation, John Wiley and Sons, New York, 1994
15. Tomar, M. S. and A. R. Maslekar, Aerial Photographs in Land use and Forest Surveys, Kishore and Company, Dehradun

Practical Exam Scheme

Distribution of marks: - Total marks (100) = Internal marks (20) + External marks (80)

Internal marks - 20

1. The identification of objects (at least 10) on the air photo pairs shall be of 30 minutes duration and will carry 10 marks
2. Objective paper -10 marks (10 objective questions)

External marks - 80

Candidates will be examined by an external examiner in consultation with the internal examiner.

The distribution of 80 marks will be as follows:

A.	Test paper	-	25 Marks
B.	Lab exercise	-	30 Marks
C.	Record work	-	15 Marks
D.	Viva-voce	-	10 Marks

A- Test Paper – 25 marks

The Practical test paper of two hours duration and candidates will be required to answer two questions out of four questions.

B- Lab exercise – 30 marks

Practical exercise shall be of three hours duration and candidates will be required to attempt any 2 exercises out of 4 exercises based on aerial photographs.

C- Record work – 15 marks

D- Viva-Voce - 10 marks

The practical exercise, record work and viva-voce examination shall be conducted by external examiner in consultation with the internal examiner.

M.A./M.Sc. Geography
Second Semester
Paper – I (M2GEOG1-CT05) Geography of India

UNIT I: Physical Aspects

a) Historical/administrative background of India, Physical divisions of India
b) Climate: seasonal variations in climate; mechanism of Indian monsoon; climatic regionalization by Koppen
c) Forests: types and distribution
d) Soil regions; problem of soil erosion

UNIT II: Human Aspects

a) Population distribution, density and growth
b) Population problems
c) Population policy of India
d) Tribal population: distribution pattern and belts

UNIT III: Economic Aspects: Resource Base

a) Water resources: status and problems
b) Agriculture: major characteristics and problems; green revolution; agro-climatic regions
c) Minerals: distribution, production and development potential with special reference to Iron-ore, Manganese, Bauxite and Copper
d) Power resources: distribution, production and potential with respect to coal, petroleum, natural gas, hydel, solar and atomic power.

UNIT IV: Industrial Development and Transportation

a) Major industries: mineral based- Iron & Steel, cement; agro based – cotton textile, sugar industry
b) Industrial regions of India
c) Industrial development in five year plans
d) Transportation development-road, rail, air, ports.

UNIT V: Regionalization and Problems

a) Geographical regions of India- outline of scheme proposed by R.L.Singh
b) Resources regions of India
c) Regional disparities in socio-economic development in India
d) Geographical problems of India; cyclones, earthquake, floods, drought

References:

1. Blandford, H. F., Climate and Weather of India, Ceylon and Burma, Meteorological Department of India
2. Brown, C. and Dey, India's Mineral Wealth, Oxford University Press, London
3. Chandrashekhar, S., India's Population: Facts and Policy, Allen and Unwin
4. Chatterjee, S. D., Climatology of India, Calcutta University, Calcutta
5. Chhibber, H. L., India, Part-III, Nand Kishore and Bros
6. Davis, K., The Population of India, Princeton
7. Deshpande, C. D., India - A Regional Interpretation, Northern Book Centre, New Delhi, 1992

8. Drez, Jean and AmartyaSen (eds.), India Economic Development and Social Opportunity, Oxford University Press, New Delhi, 1996
9. Dubey, R. N., Economic Geography of Indian Republic, KitabMahal, New Delhi.
10. Farmer, B. H., An Introduction to South Asia, Methuen, London, 1983
11. Govt. of India, India: Reference Annual, Pub. Div, New Delhi, (latest edition)
12. Govt. of India, National Atlas of India, NATMO Publication, Calcutta
13. Govt. of India, The Gazetteer of India, Vol. I & III Publication Division, New Delhi, 1965
14. Joshi, H., Industrial Geography of India: A Case Study of Fertiliser Industry, Rawat Publication, Jaipur
15. Khullar, D. R., India: A Comprehensive Geography, Kalyani Publishers, Ludhiana, 2000
16. Krishnan, M. S., Geology of India and Burma , Law Jr. Office
17. Kumar, L. S. et al, Agriculture in India Vol. I & II, Asia Publishing House, New Delhi
18. Kundu, A. and MoonisRaza, Indian Economy: The Regional Dimension, Spectrum Publishers, New Delhi, 1982
19. Learmonth, A. T. A. et al (ed), Man and Land of South Asia, Concept, New Delhi
20. Mamoria, C. B., Agricultural Problems of India, KitabMahal, New Delhi
21. Manorama Press, Manorma Year Book, Kottayam (Kerala), (Latest Edition)
22. Mitra, A., Levels of Regional Development of India, Census of India, Vol. 1, Part I-A (i) and (ii), New Delhi, 1967
23. Publication Division, Govt. of India, Gazetteer of India, Volume I and II, New Delhi, latest edition
24. Robinson, Francis, The Cambridge Encyclopaedia of India, Pakistan, Bangladesh, Sri Lanka, Nepal, Bhutan and Maldives, Cambridge University press, London, 1989
26. Shafi, M, Geography of South Asia, McMillan & Co., Calcutta, 2000
27. Singh, G., Geography of India. Atmaram& Sons, Delhi
28. Singh, R. L. (ed), India: A Regional Geography, National Geographical Society, India
29. Spate, O. H. K. and A. T. A. Learmonth, India and Pakistan: Land, People and Economy Methuen & Co., London, 1967
30. Times of India Press, Times of India Year Book, Bombay (Latest Edition)
31. Tirtha, R. and Gopal Krishna, Emerging India, Rawat Publications, Jaipur, 1996
32. Vaidiya, K. S., Dynamic Himalaya, University Press, Hyderabad, 1998
33. Wadia, D. N., Geology of India, McMillan & Co., London, 1967
34. बंसल, एस.सी. : भारत का वृहत् भूगोल, मिनाक्षी प्रकाशन, मेरठ, नईदिल्ली
35. मामोरिया, सी. बी. : भारत का भूगोल (साहित्य भवन, आगरा)
36. मामोरिया, सी. बी. : भारत का वृहद् भूगोल (साहित्य भवन, आगरा)
37. चौहान, टी. एस. : भारत का भूगोल (विज्ञान प्रकाशन, जयपुर)
38. सिंह एवं सिंह : भारत एक भौगोलिक समीक्षा (वसुन्धरा प्रकाशन, गोरखपुर)

M.A./M.Sc. Geography
Second Semester
Paper – II (M2GEOG2-CT06) Geography of Resources

Unit – I

a) Meaning, scope of Resource Geography
b) Approaches and recent trends of resource geography
c) Resources: meaning & clarification
d) Concepts of resources

Unit –II

a) Conservation of resources : concept & aims
b) World distribution, production and problems of conservation of Iron & Manganese
c) World distribution, production and problems of conservation of Coal, Petroleum & Hydroelectricity
d) Forest & water resources : world distribution, utility & conservation

Unit –III

a) Human as a sources and a resources
b) World distribution, density and growth of human resources
c) Distribution, density and growth of human resources of India
d) Population –resource equilibrium & population resource region of world

Unit - IV

a) Problems of resource utilization
b) Resource conservation and preservation
c) Problems of conservation & trends of resource development
d) Planning of conservation of natural resources

Unit –V

a) Resource region - meaning & determinant elements of resource region
b) Major resource region of the World
c) Region of bounty resources & region of resource scarcity
d) Indian resource region – a case study of Aravali region

References:

1. Alien, S. W. and Leonard, J. W., Conserving Natural Resources, McGraw Hill
2. Chisholm, M., Geography and Economy, G. Bell, London
3. Chorley, R. J., Water, Earth and Man, Methuen
4. Dreze, J. and A. Sen, India: Economic Development and Social Opportunity, Oxford University Press, New Delhi, 1996
5. Guha and Chatterjee, A New Approach to Economic Geography of Resources
6. Learmonth, T. A., Mysore State: Regional Synthesis, Asia Pub. House
7. Paterson, J. H., Land Work and Resources: An Introduction to Economic Geography, Arnold Heineman
8. Robertson, D. (ed.), Globalisation and Environment, E. Elgar Co., U.K., 2001.
9. Thomas, R. S., The Geography of Economic Activity, McGraw Hill, New York.
10. Wheeler, J. 0. et al, Economic Geography, John Wiley, New York, 1995
11. Whitbeck, R. S. and Finch, V. L., Economic Geography, McGraw Hill, New York
12. Zimmermann, E. W., World Resources and Industries, Harber

13. श्रीवास्तव, वी. के. एवं राव, बी. पी. : आर्थिक भूगोल के मूल तत्व (वसुन्धरा प्रकाषन, गोरखपुर)
14. रजा, एम. एवं सिंह, ए. : संसाधन भूगोल
15. नैगी, बी. एस. : संसाधन भूगोल
16. सिंह एवं सिंह : आर्थिक और संसाधन भूगोल

M.A./M.Sc. Geography
Second Semester
Paper – III (M2GEOG2-CT07) Regional Development and Planning

Unit – I

a) Concept of space, area and locational attributes
b) Development: concepts and indicators; planning: concept need and levels
c) Region: concept, types and delineation
d) Planning regions: Planning regions of India

Unit – II

Main themes of regional development theories

a) Economic growth doctrines and their impact on regional development
b) Theories of transmission of economic growth: (G. Myrdal, A.O. Hirschmann, Friedmann
c) Debate on the relevance of development theories: D. Seers, Marxists
d) Multifaceted paradigms of regional development: Eco-development, sustainable development

Unit – III

Regional planning strategies

a) Urban-industrial growth pole strategies as a tool of diffusion of modernisation
b) Neo-populist regional development strategies: Integrated rural development, basic need approach, target area and target group approach
c) Multi-level regional planning
d) Peoples participation in the planning process; Panchayati Raj system; role and relationship of Panchayati Raj Institutions (Gram Panchayat, Panchayat Samiti and Zila Parishad) and administrative structure (village, block and district)

Unit – IV

a) Delineating regions for planning: planning regions v/s geographical regions
b) Schemes of regionalization V. Nath, L.S. Bhat, P. Sengupta, territorial production complexes
c) The role of cities and the urbanization process in regional development in India; Planning for supra-urban spaces
d) The state and regional policy in India; the status of regional planning in the Five Year Plans

Unit – V

a) National plans: South East resource region plan and The Western Ghat plan
b) Administrative machineries of regional planning in India: The Planning Commission, the Town and Country Planning Organization, district level planning
c) Regional social movements in India and their linkages with state regional policy and development strategies
d) The New Economic Policy and its impact on the regional structure and regional planning problems in India

References:

1. Abler, R., et al, Spatial Organization, The Geographer's View of the World, Prentice Hall, Englewood Cliffs, N. J., 1971
2. Alden, Jeremy and Robert Morgan, Regional Planning: A Comprehensive View, Leonard Hill Books, Beds, 1974
3. Bhat, L. S. et al., Micro-Level Planning: A Case Study of Karnal Area, Haryana, K. B. Publications, New Delhi, 1976
4. Bhat, L. S., Regional Planning in India, Statistical Publishing Society, Calcutta, 1973
5. Chandna, R. C., Regional Planning: A Comprehensive Text, Kalyani Publishers, Ludhiana, 2000
6. Chorley, R. J. and R. Hagget, Models in Geography, Methuen, London, 1967
7. Christaller, W., Central Places in Southern Germany, Translated by C. W. Baskin, Prentice Hall, Englewood Cliffs, New Jersey, 1966
8. Friedmann, J. and W. Alonso, Regional Development Policy- A Case Study of Venezuela, M.I.T Press Cambridhge, Mass, 1966
9. Friedmann, J. and W. Alonso, W., Regional Development and Planning - A Reader, M. I. T. Press, Cambridge, Massachusetts, 1967
10. Glasson, John, An Introduction to Regional Planning – Concepts, Theory, and Practice, Hutchinson Educational Ltd., London, 1974
11. Glikson, Arthur, Regional Planning and Development, Netherlands Universities foundation for International Co-operation, London, 1955
12. Gosal, G. S. and Krishan, G., Reclional Disparities in Levels of Socio-Economic Development in Punjab, Vishal Publications, Kurukshetra, 1984
13. Government of India, Planning Commission, Third Five Year Plan, Chapter on Regional Imbalances in Development, New Delhi, 1961
14. Indian Council of Social Science Research, Survey of Research in Geography, Popular Prakashan, Bombay, 1972
15. Johnson, E. A. J., The Organisation of Space in Developing Countries, Harvard University Press, Cambridge, 1 970
16. Kuklinski, A. R. (ed.), Growth Poles and Growth Centres in Regional Planning, Mouton, The Hague, 1972
17. Kundu, A. and Moonis Raza, Indian Economy - The Regional Dimension, Spectrum Publishers, New Delhi, 1982
18. Losch, A., The Economics of Location, University Press, Yale, New Haven, 1954.
19. Mishra, R. P. et al, Multi-Level Planning, Heritage Publishers, Delhi, 1980
20. Misra, R. P. (ed.), Regional Planning: Concepts, Techniques, Policies & Case Studies, University of Mysore, Mysore, 1969
21. Misra, R. P. et al (eds.), Regional Development Planning in India - A Strategy, Institute of Development Studies, Mysore, 1974
22. Mitra, A., Levels of Regional Development, Census of India, Vol. 1, Part IA (i) and (ii), New Delhi 1965
23. Myrdal, G., Economic Theory and Under-Development Regions, Gerald Duckworth, London, 1957
24. Nangia, Sudesh, Delhi Metropolitan Region, Rajesh Publication, Delhi, 1976
25. Raza, Moonis (ed.), Regional Development, Heritage Publishers, Delhi, 1988
26. Richardson, H. W., Elements of Regional Economics, Weidenfeld and Nicolson, London, 1969
27. Singh, Tarlok, India's Development Experience, McMillan, New Delhi, India, 1974
28. Vyas P.R.,Social Amenities and Regional Development(1991)Rural Publications,Jaipur
29. Sundaram, K. V. (ed.), Geography and Planning: Essays in Honour of V. L. S. Prakasa, Concept Publishing Company, New Delhi, 1985

M.A./M.Sc. Geography
Second Semester
Paper – IV (M2GEOG4-CT08) Political Geography

Unit – I

a) Nature, scope and subject matter of political geography
b) Geopolitics: meaning and contributions of Emmanuel Kant, Karl Ritter, Friedrick Ratzel, H. V. Tritischke, Rudolf Kjellen and Karl Haushofer
c) Development of political geography
d) Contributions of Alfred Thayer Mahan, H. J. Mackinder and Alexander-de-Seversky, D.W. Meining, N.J. Spykman and Hooson

Unit – II

a) Recent trends in political geography
b) The functional approach in political geography
c) The unified field theory of political geography
d) Nature of administrative areas and geography of public policy and finance

Unit – III

a) Concept of nation, state and nation state
b) The state as a politico-geographical region: location, shape, size
c) Resources of state: natural, cultural and human
d) Frontiers and boundaries: types and functions, boundary making and boundary problems

Unit – IV

a) Core areas and capitals
b) Unitary and federal states
c) The impress of government on landscape
d) Politics of world resources; globalization and WTO

Unit – V

a) Electoral studies in political geography
b) Conceptual model of voting decision; Gerrymandering: gerrymandering in relation to India
c) Geographical influence on voting behavior of the electors in India
d) Spatial pattern of voting behavior in Rajasthan

References:

1. Alexander, L. M., World Political Patterns, Ran McNally, Chicago, 1963
2. Boggs, S. W., International Boundaries: A Study of Boundary Function and Problems, Columbia University Press, New York
3. Busteed, M. A., Geography and Voting Behavior, Oxford University Press, London
4. Carlson, L., Geography and World Politics, Prentice Hall, New York
5. de Blij, H. J. and Glassner, Martin Systematic Political Geography , John Wiley, New York, 1968
6. Deshpande C. D., India: A Regional Interpretation, Northern Book Centre, New Delhi, 1992
7. Dikshit, R. D., Political Geography: A Century of Progress, Sage, New Delhi, 1999
8. Dikshit, R. D., Political Geography: A Contemporary Perspective, Tata McGraw Hill, New Delhi, 1996
9. Fawceet, C. B., Frontiers: A Study in Political Geography, Oxford University Press, London
10. Fisher Charles A., Essays in Political Geography, Methuen, London, 1968
11. Horradin, J. F., An Outline of Political Geography, Autred A. Knohs, New York
12. Jackson, W. A. D., Politics and Geographic Relationships: Readings on the Nature of Political Geography, Prentice Hall, New York
13. John R. Short, An introduction to Political Geography, Routledge, London, 1982

14. Jonson, R. L., Political, Electoral and Spatial Systems: An Essay in Political Geography, Oxford University Press, Oxford & New York
15. Kasperson, R. E. and J. V. Minghi, Structure of Political Geography, University of London Press, London
16. Mackinder, H. J., Democratic Ideals and Reality, Norton & Company, New York
17. Moodie, A. E., Geography Behind Politics, Hutchinson University Press, London
18. Panikkar K. M., Geographical Factors in Indian History, 2 volumes, Asia Publishing House, Bombay, 1959
19. Pearcy, G. E. and R. H. Fifield, World Political Geography, Thomas Y. Crowell Co., London
20. Pounds N. J. G., Political Geography, McGraw Hill, New York, 1972
21. Prescott, J. R. V., Political Geography, Methuen & Co., London
22. Prescott. J. R. V., The Geography of Frontiers and Boundaries, Aldine, Chicago
23. Sukhwal, B. L., Modern Political Geography of India, Sterling Publishers, New Delhi. 1986
24. Taylor, P. J. and R. J. Johnston, Geography of Elections, Penguin London, Hammond Worth
25. Taylor, Peter and John House, Political Geography: Recent Advances, Barnes and Nobel Books Totowa, New Jersey
26. Taylor, Peter; Political Geography Longman, London. 1985
27. Wigert, H. W. et al, Principles of Political Geography, Appleton Century-Crofts Inc. New York
28. चौहान, पी.आर. : राजनीतिक भूगोल (वसुन्धरा प्रकाषन, गोरखपुर)
29. भट्टाचार्य, ए.एन. एवं आच्छा, एस. एल : राजनीतिक भूगोल (राजस्थान हिन्दी ग्रन्थ अकादमी जयपुर)
30. दीक्षित, आर. डी. : राजनीतिक भूगोल – समसामयिक परिदृप्टि (प्रेन्टिस हॉल आफ इण्डिया)
31. सक्सेना, एच. एम.: राजनीतिक भूगोल (रस्तोगी पब्लिकेषनस, मेरठ)
32. कपूर कालीदास : भारतीय भू–नीति (हिन्दी समिती सूचना विभाग)
33. कोलोषोव, वी. : राजनीतिक भूगोल (प्रगति प्रकाषन, मास्को)
34. दीक्षित श्रीकान्त : राजनीतिक भूगोल (ज्ञानोदय प्रकाषन, गोरखपुर)

M.A./M.Sc. Geography
Second Semester
Practical -I (M2GEOG1-CP03) Cartography I
Basics of Cartography and Physical Aspects

Unit – I

Introduction

a) Definition and nature of cartography
b) Scope & history of cartography
c) Cartographic techniques.
d) Cartographic materials and tools

Unit – II

Maps and Diagrams

a) Map: definition and basic concepts
b) Classification of maps
c) Distributional maps and cartograms
d) Representation of statistical data: Diagrams- one, two, three dimensional **(3 exercises)**

The representation of data, information, features related to the following geographical aspects through maps and diagrams and their interpretation (To be submitted along with the record work)

Unit – III

Geomorphic aspects based on toposheets of 1:50000 or 1:25000 (5 exercise)

a) Stream orders and basin demarcation
b) Drainage density and texture
c) Slope : average slope maps according to Wentworth's method
d) Profiles : serial, composite, super- imposed & projected Profiles

Unit – IV

Climatic aspects: I (4 exercises)

a) Rainfall variability graphs (running average, cumulative deviation & trend line).
b) Rainfall dispersion diagram
c) Isohyets or isotherms
d) Temperature variation graph.

Unit – V

Climatic aspects: II (5 exercises)

a) Ergograph & Ogilvie's ergograph
b) Climatograph
c) Climograph
d) Hythergraph

References:

1. Arthur G., Advance Practical Geography, Heinemann.
2. Campbell, J., Introductory Cartography, Prentice Hall Inc., New York.
3. Govt. of Rajasthan, District Census Handbooks, latest as well as of previous Census,
4. Keates, J. S., Cartographic Design and Production, Longman, London.
5. Loxton, J., Practical Map Production, John Wiley & Sons, New York.
6. Mishra, R. P. and A. Ramesh, Fundamentals of Cartography, Concept Publishers, New Delhi.
7. Monkhouse, F. J. and H. R. Wilkinson, Maps and Diagrams, Methuen & Co., London.
8. Raisz, E., General Cartography, McGraw Hill Book Co., New York.
9. Robinson, A. H., Elements of Cartography, Chapman & Hall.
10. Sing, R. L., Elements of Practical Geography, Kalyani Publishing.
11. Singh, R. N., Map Work and Practical Geography, Central Book Depot.
12. शर्मा, जे. पी.: प्रयोगात्मक भूगोल (रस्तोगी पब्लिशर्स, मेरठ)

Practical Exam Scheme

Distribution of Marks: Total marks (100) = Internal marks (20) + External marks (80)

Internal marks- 20

1. Test paper - 10 marks
2. Objective paper - 10 marks (10 objective questions)

External marks-80

Candidates will be examined by an external examiner in consultation with the internal examiner.

The distribution of 80 marks will be as follow:

A. Test paper - 25 Marks
B. Lab exercise - 30 Marks
C. Record Work - 15 Marks
D. Viva-voce - 10 Marks

A- Test Paper – 25 marks

The practical test paper of two hours duration and candidates will be required another two question out of four questions.

B- Lab exercise – 30 marks

Practical exercise shall be of three hours duration and candidates will be required to attempt any 2 exercises out of 4 exercises.

C- Record work – 15 marks

D- Viva-Voce - 10 marks

The practical exercise, record work and viva-voce examination shall be conducted by external examiner in consultation with the internal examiner.

M.A./M.Sc. Geography
Second Semester
Practical -II (M2GEOG2-CP04) Basics of Remote Sensing and Image Interpretation

UNIT I Basics of Remote Sensing

a) Historical development; significance of remote sensing in geographical studies
b) Electromagnetic Radiation (EMR) Spectrum; Laws of radiation
c) Stages of Remote Sensing, EMR interaction with earth's surface
d) Spectral signatures, typical spectral reflectance curves of vegetation, soil and water

UNIT II Remote Sensing Satellites and Platforms

a) Orbits and platforms for earth observation; Swath, Row, Path
b) Satellite and sensor types: geo-synchronous and polar satellites, active and passive systems
c) Sensor types: Along Track, Across Track
d) Sensor specifications of IRS and Landsat satellite series

UNIT III Image Characteristics

a) Image formats - BIL, BIP, BSQ; Image display, color composites
b) Fundamental image statistics, image histogram
c) Image resolutions - spatial, spectral, radiometric and temporal resolution
d) Characteristics of major satellite systems: IRS, Landsat, NOAA, IKONOS, World-View satellite System

UNIT III Image Preparation

a) Geometric errors: Types
b) Geometric corrections: Image to map rectification, georeferencing
c) Resampling techniques
d) Contrast enhancement techniques: stretching, histogram equalization, density slicing

Unit V Image Interpretation and Thematic Map Generation

a) Visual Image Interpretation: principles, elements, interpretation keys
b) Manual Digitization and map composition
c) Interpretation and mapping of natural landscapes using satellite image.
d) Interpretation and mapping of cultural landscapes using satellite image.

Practical Exercises:

1. Familiarization with the software –ILLWIS/ Erdas Imagine/ ENVI/ SAGA
2. Data acquisition-accessing satellite data of area of interest, digital referencing system
3. Data import and subset

4. Observation and identification of earth's features in various spectral bands and different types of images (PAN/ multi-spectral)
5. Observation of spectral profiles of water, soil and vegetation
6. Analysis of image histograms
7. Image display – Grey scale, pseudo color, TCC, FCC
8. Georeferencing toposheets
9. Geometric correction- Image to map rectification: NN, Bi-linear and Cubic interpolation
10. Image enhancement: Stretching, interpretation of results
11. Image enhancement: Histogram Equalization, interpretation of results
12. Image enhancement: Density Slicing, interpretation of results
13. Identification of features using elements of visual interpretation
14. Thematic map generation using visual interpretation and on-screen manual digitization/ analog multi-spectral images: Natural landscape
15. Thematic map generation using visual interpretation and on-screen manual digitization/ analog images: Cultural landscape
16. Computation of area of different classes

Exercises will be implemented in ERDAS, ENVI, ILLWIS, SAGA or any other DIP Software as per availability. One computer system will be provided to each student for conducting practical exercises.

One local field trip will be conducted for field verification of satellite image of Udaipur city and nearby areas. Students will be required to prepare a Field Report and submit along with the Record Work.

Suggested Readings

1. American Society of Photogrammetry, 1983. *Manual of Remote Sensing*, ASP, Falls Church, VA
2. Barrett, E. C. and L. F. Curtis, 1992. *Fundamentals of Remote Sensing and Air Photo Interpretation*, Macmillan, New York
3. Campbell, J., 1989. *Introduction to Remote Sensing*, Guilford, New York
4. Chauniyal, D.D., 2004. *Remote Sensing and Geographical Information Systems* **(in Hindi)**, Sharda Pustak Bhawan, Allahabad
5. Curran, Paul J., 1985. *Principles of Remote Sensing*, Longman, London
6. Jenson J.R., 1996. *Introductory Digital Image Processing: A Remote Sensing Perspective*, Prentice Hall, New Jersey
7. Jenson, J.R., 2000. *Remote Sensing of the Environment: An Earth Resource Perspective.* Perason Education
8. Lillesand, T.M., Keifer R.W. & Chipman, J.W., 2008. *Remote Sensing and Image Interpretation*. John Wiley & Sons, New Delhi
9. Pratt W.K., 1978. *Digital Image Processing*. Wiley, New York
10. Vyas P.R., Remote sensing and Geographical Information System : basics and Applications 2014

WEB RESOURCES

1. *Ebook on Remote Sensing Applications,* www.**nrsc**.gov.in/Learning_Centre_**EBook**.html
2. *E-Tutorial on Fundamentals of Remote Sensing*, Canada Centre for Mapping and Earth Observation, Natural Resources Canada, accessible at http://www.nrcan.gc.ca/earth-sciences/geomatics

Practical Exam Scheme

Distribution of Marks: Total marks (100) = Internal marks (20) + External marks (80)

Internal marks - 20

1. The identification of objects (at least 10) on the satellite imagery shall be of 30 minutes duration and will carry 10 marks.
2. Objective paper – 10 marks (10 objective questions)

External marks -80

Candidates will be examined by an external examiner in consultation with the internal examiner.
The distribution of 80 marks will be as follows:

A- Test paper - 25 Marks
B- Lab exercise - 30 Marks
C- Record work - 15 Marks
D- Viva-voce - 10 Marks

A- Test paper – 25 marks

The practical test paper of two hours duration and candidates will be required another two question out of four questions.

B- Lab exercise – 30 marks

Practical exercise shall be of three hours duration and candidates will be required to attempt any 2 exercises out of 4 exercises one based on the satellite imagery.

C- Record work – 15 marks

D- Viva-Voce - 10 marks

The practical exercise, record work and viva-voce examination shall be conducted by external examiner in consultation with the internal examiner.

M.A./M.Sc. Geography
Second Semester
Skill-I (M2GEOG1-SKILL-01) Digital Cartography

Unit-I: Introduction

a) Nature & Scope
b) Concepts in Digital Cartography
c) Cartographic Visualization
d) Geo-visualization

Unit II: Overview of Software Packages

a) ArcGIS
b) QGIS
c) Microsoft Excel, SPSS
d) AUTOCAD

Unit-III: Maps

a) Introduction to maps: types
b) Cartographic communication – virtual, cognitive, temporal and permanent maps
c) Mapping techniques: preparation of dot, choropleth, isopleths chorochromatic and choroschematic maps
d) Map composition: symbolization, map layout, labeling and annotation

Unit IV: Diagrams

a) Construction of simple line, poly line, trend graphs
b) Construction of simple, multiple, compound bar diagrams, histograms
c) Construction of cartograms, value area cartograms
d) Preparation of maps using proportional squares, circles, spheres

Unit V: Cartographic Modeling

a) Cartographic modeling and its types
b) 3D modeling
c) TIN
d) DEM

Lab exercises

a) Preparation and editing of data in microsoft excel
a) Preparation and editing of data in SPSS
b) Generation of vector point, line, polygon map and cartographic symbolization
c) Map composition

References

1. Allpress, J.D., Visual geography, Part-I [George Harrap]
2. Bagrew,L.: History of Cartography, C.A.Watts and Co., London, 1964.
3. Barrett,E.C. and Curtis,L.F.: Introduction to Environmental Remote Sensing, Chapman and Hall Ltd., London, 1976.

4. Bernhardsen, Tor, Geographic Information Systems, Viak IT, Longum Park, Norway, 1992
5. Lobeck, A.K. and Tellington, W.J., Military Maps and Air-Photographs [Mc Graw Hill]
6. Lobeck, A.K., Block Diagrams [John Wiley]
7. Mather, Paul M., 1991: Computer Applications in Geography, John Wiley & Sons, Inc., New York.
8. Monkhouse, F.J. and Wilkinson, H.R., Maps and Diagrams [Methuen]
9. Raisz, E., Principles of Cartography [Mc Graw hill]
10. Robinson, A.H., Elements of Cartography [John Wiley]
11. Stamp. L.D., Models
12. Sylvester, D., Maps and Landscape [George Philip and sons] Allpress, J.D., Visual geography, Part-I [George Harrap]

Practical Exam Scheme

Distribution of Marks: - Total marks (100) = Internal marks (20) + External marks (80)

Internal marks- 20

1. One assignment based on computer – 10 marks
2. Objective Paper- 10 marks (10 objective questions)

External marks-80

Candidates will be examined by an external examiner in consultation with the internal examiner.

The distribution of 80 marks will be as follows:

A. Test paper - 25 Marks
B. Lab exercise - 30 Marks
C. Record work - 15 Marks
D. Viva-voce - 10 Marks

A- Test Paper – 25 marks

The Practical test paper of two hours duration and candidates will be required another two question out of four questions.

B- Lab exercise – 30 marks

Practical exercise shall be of three hours duration and candidates will be required to attempt any 2 exercises out of 4 exercises based on computer.

C- Record work – 15 marks

D- Viva-Voce - 10 marks

The practical exercise, record work and viva-voce examination shall be conducted by external examiner in consultation with the internal examiner.

M.A./M.Sc. Geography
Third Semester
Paper – I (M3GEOG1-CT09) Agricultural Geography

Unit – I

a) The nature and development of agricultural geography
b) Approaches recent trends in agricultural geography
c) Origin and dispersal of agriculture
d) Sources of agricultural data

Unit – II

a) Factors affecting agriculture: physical, institutional and technological
b) Agricultural systems of the world
c) Critical review of classification of agricultural types of Whittlesy
d) Detailed study of intensive subsistence, commercial grain farming and tropical plantation agriculture

Unit – III

a) Land use classification; landuse pattern in India; and land capability classification
b) Von Thunen's agricultural model of agricultural land use and recent modification in it
c) Nutrition and food balance sheet; food surplus and food deficient regions of India
d) Diffusion model

Unit – IV

a) Concept and techniques of delimitation of agricultural regions; agricultural regions of India and their characteristics
b) Measures of agricultural productivity and efficiency levels and other characteristics
c) Crop combination methods: Weaver's, Doi's and Rafiullah's methods and their applications
d) Agricultural typology: concept and methodology; patterns with special reference to the world and Rajasthan

Unit – V

a) Sustainable development of agriculture
b) Green and white revolutions: their components, impact and consequences
c) Specific problems in Indian agriculture and their management and planning
d) Agricultural policy of India

References:

1. Bayliss Smith, T. P., The Ecology of Agricultural Systems, Cambridge University Press, London, 1987
2. Berry, B. J. L. et al, The Geography of Economic Systems, Prentice hall, New York, 1976
3. Brown, L. R., The Changing World Food Prospects: The Nineties and Beyond, World Watch Institute, Washington D. C., 1990
4. Coppock, J. K. , An Agricultural Atlas of England and Wales, Faber and Haber, London
5. Cox, K. R., Man, Location and Behaviour: An Introduction to Human Geography, John Willey and Sons, London
6. Dyson, T., Population and Food: Global Trends and Future Prospects, Routledge, London, 1996
7. George, H. F., Geography of Agriculture: Themes in Research, Prentice Hall, New York
8. Gregor, H. P., Geography of Agriculture, Prentice Hall, New York, 1970
9. Grigg, D. B. The Agricultural Systems of the World, Cambridge University Press, New York, 1974
10. Hartshorne, T. N. and J. W. Alexander, Economic Geography, Prentice Hall, New Delhi, 1988
11. Kostrowicki, J., World Types of Agriculture, Warsaw, Poland
12. Mannion, A. M., Agriculture and Environment Change, John Wiley and Sons, London, 1995
13. Morgan, W. B. R. and J. C. Norton, Agricultural Geography, Methuen, London, 1971

14. Morgan, W. B. R., Agricultural in the Third World: A spatial Analysis, West View Press, Boulder, 1978
15. Preston, E. James, American Geography: Inventory and Prospects, Syracuse University Press
16. Sauer, Carl O., Agricultural Origin and Dispersals, M. I. T. Press, Massachusetts, 1969
17. Shafi, Mohammed, Agricultural Geography, Dorling Kindersley (India), Delhi, 2006
18. Singh, Jasbir, An Agricultural Atlas of India: A Geographical Analysis, Vishal, Kurukshetra
19. Singh, Jasbir, An Agricultural Geography of Haryana, Vishal Kurukshetra
20. Singh, Jasbir and S. S. Dhillon, Agricultural Geography, Tata McGraw Hill Publishing Company Ltd., New Delhi, 1988
21. Symones, Lesli, Agricultural Geography, G. Bell & Sons, London
22. Tarrant, J. R., Agricultural Geography, John Wiley and Sons, New York, 1974
23. Whittlesey, D., Major Agricultural Region of the Earth, AAAG, Vol.26, pp.199 and 240-296
24. Whyle, R. O., Land, Livestock and Human Nutrition in India, F. A. Paragon

M.A./M.Sc. Geography
Third Semester
Paper – II (M3GEOG2-CT10) Urban Geography & Planning

Unit – I

a) Nature, scope and development of urban geography; urban concepts
b) Origin and growth of urban centers: ancient and medieval age
c) Process of urbanization: trends of urbanization in the world
d) Urbanization In India , development of metropolitan cities in India

Unit – II

a) Classification of urban centers: views of Mum ford and Griffith Taylor
b) Development of conurbation and megalopolises : North Eastern Sea board of USA , Rhine-Ruhr conurbations, Mumbai and Kolkata conurbations in India
c) Theories of urban system: the law of primate city and the rank-size rule
d) Central place theories: Christaller's central place system, Losch's economic landscape

Unit – III

a) Urban land use: human ecology and urban land use models of Burgess, Harris-Ullman and Hoyt; land economics and urban land use
b) Central business district (CBD): criteria and methods of areal definition, historical process and CBD; the zone in transition
c) Functional classification of cities: empirical and statistical methods
d) Centripetal and centrifugal forces of urban growth

Unit – IV

a) Rural urban fringe : concept, criteria's of delimitation and characteristics
b) Morphology of Indian cities : ancient , medieval and modern planned cities of India with special studies of Jaipur and Chandigarh cities
c) Concept of basic and non-basic functions, internal functional structure of urban centers
d) Social structure in urban areas of India , social segregation in Indian cities

Unit – V

a) Urban problems: development of slums in urban areas and their problems, problems of housing and social infrastructure
b) Urban planning: principles of urban planning , layout plans of cities
c) Urban environment: industrial pollution and environmental panning
d) Sustainable urban development: studies of master plans of Udaipur and Jaipur cities.

References:

1. Alam, S.M.: Hyderabad - Secunderabad Twin Cities Asia Publishing House, Bombay, 1964
2. Bansal, S. C., Urban Geography, Minakshi Publication, Meeruth, 2000, (Hindi)
3. Beaujeu-Garnier, J. and G. Chabot, Urban Geography, Longman, London
4. Berry, B. J. L. and F. E. Horton, Geographic Perspectives on Urban Systems, Prentice Hall, New York, Englewood Cliffs, New Jersey, 1970
5. Carter, Harlod, The Study of Urban Geography, Arnold-Hienemann Publishers (India) Private Ltd., New Delhi, 1982
6. Chapin, F. Stuart, Urban Land Use Planning, University of Illinois Press
7. Chorley, R. J. and P. Haggett (eds.), Models in Geography, Methuen, London, 1966
8. Davis, Kingsley and Hertz, Patterns of World Urbanisation, Columbia University Press

9. Dickinson, R. E., City and Region, Routledge, London, 1964
10. Duncan, O. D., Metropolis and Region, John Hopkins Press, Baltimore
11. Dwyer, D. J. (ed.), The City as a Centre of Change in Asia, University of Hong Kong Press, Hong Kong, 1971
12. Forrester, Jay W., Urban Dynamics, M. I. T. Press, Cambridge
13. Gallion, Arthur B. and Simon Eisner, The Urban Pattern: City Planning and Design, Affiliated East-West Press Private Ltd., New Delhi, 1969
14. Gibbs J. P., Urban Research Methods, D. Van Nostrand Co. Inc. Princeton, New Jersey, 1961
15. Gottmann, Jean, Megalopolis: The Urbanised Northeastern Seaboard of the United States, M. I. T. Press, Cambridge, Massachusetts, New York, 1961
16. Hagget, P., Geography: A Modern Synthesis, Harper & Row, New York
17. Hall P., Urban and Regional Planning, Penguin, London, 1974
18. Hauser, Philip M. and Schnore Leo F. (ed.), The Study of Urbanisation, Wiley, New York, 1965
19. Herbert, David T. and Colin J. Thomas, Urban Geography: A First Approach, John Wiley and Sons, New York, 1982
20. James, P. E. and C. F. Jones, (eds.), American Geography: Inventory and Prospect, Syracuse University Press, Syracuse, 1954
21. Johnson, J. H., Urban Geography: An Introductory Analysis, Pergamon Press, London, 1968
22. Kundu, A., Urban Development and Urban Research in India, Khanna Publication, 1992
23. Losch, August, The Economics of Location, Yale University Press, London, 1973
24. Meyor, H. M. and C. F. Kohn, (eds.), Readings in Urban Geography, University of Chicago Press, Chicago, 1955
25. Mumford, L., Culture of Cities, McMillan & Co., London, 1958
26. Mumford, L., The City in History, Secker and Warburg, London, 1961
27. Mumford, L., The Cultures of Cities, Harcourt, Brace and Co. Inc., London, 1938
28. Murphy, R. E., The American City: An Urban Geography, McGraw Hill Book Co., New York, 1966
29. Nangia, Sudesh, Delhi Metropolitan Region: A Study in Settlement Geography, Rajesh Publication, 1976
30. Pacione, M., Progress in Urban Geography, Croom Helm, London
31. Rao, V. L. S. Prakasa, The Structure of an Indian Metropolis: A Study of Bangalore, Allied Publishers, Bangalore, 1979
32. Rao, V. L. S. Prakasa, Urbanisation in India: Spatial Dimensions, Concept Publishing Co., New Delhi
33. Robson, B. T., Urban Analysis, Cambridge University Press, London, 1969
34. Singh, K. and F. Steinberg, (eds.), Urban India in Crisis, New Age Interns, New Delhi, 1998
35. Singh, O. P., Urban Geography, Tara Book Agency, Varanasi, 1987, (Hindi).
36. Smailes, A. E., The Geography of Towns, Hutchinson, London, 1953
37. Tewari, Vinod K., Jay A. Weinstein and V. L. S. Prakasa Rao (eds.), Indian Cities: Ecological Perspectives, Concept Publishing Co., New Delhi, 1986
38. Wingo, L. et al, Cities and Space: The Future Use of Urban Land, Johns Hopkins, London

M.A./M.Sc. Geography
Third Semester
Paper – III-A (M3GEOG3-ET11-A) Environmental Geography

Unit – I

a) Environment: meaning, elements, and types
b) Human ecology: meaning, scope and concepts
c) Principles of environmental geography
d) Man-environment relationship: review of different perspectives

Unit – II

a) Ecosystem: concept, definitions, characteristics and types
b) Components and functioning of ecosystem
c) Trophic level, food chain and ecological pyramids; energy flow in ecosystem
d) Geo-chemical cycles and circulation of element in the ecosystem: carbon cycle, nitrogen cycle and oxygen cycle

Unit – III

a) Fresh water ecosystems: meaning, types and their properties
b) Marine ecosystems: meaning, types and their properties
c) Terrestrial ecosystems: meaning, types and their properties
d) Biomes: concept, types, characteristics and distribution; detail study of tropical desert biomes

Unit – IV

a) Environmental hazards and disasters: meaning, types and impacts
b) Environmental degradation and pollution: meaning, process, causes, types and impacts
c) Environmental planning and management: concept, objectives and strategies
d) Sustainable development: concept, need, problems and strategies

Unit – V

a) Ecology of tropical farming systems
b) Mountain ecosystem with special reference to Aravalli hills
c) The Stockholm Conference and the Earth Summit
d) Environmental laws in India related to wild life, water, forest and environment

References:

1. Ackerman, E.A., Geography as a Fundamental Research Discipline, University of Chicago Research Papers, 1958
2. Agarwal, A. and S. Sen, The Citizens Fifth Report. Centre for Science and Environment New Delhi 1999
3. Arwill, R., Man and Environment, Pelican
4. Barry, C., Biogeography: An Ecological and Evolutionary Approach, Cox Blackwell, Oxford, 1977
5. Bertalanffy, L., General Systems Theory, George Bragiller New York, 1958
6. Bodkin, E., Environmental Studies, Charles E. Merril Publishing Co., Columbus, Ohio, 1982
7. Chandna, R.C., Environmental Awareness, Kalyani Publishers, New Delhi, 1998

8. Chorley, R. J., Geomorphology and General Systems Theory, U.S.G.S. Professional Paper, 500 B, 1962
9. Eyre, S. R. and G. R. J. Jones (eds.), Geography as Human Ecology, Edward Arnold, London, 1966
10. Haggett, R. J., Fundamentals of Biogeography, Routledge, London, 1988
11. Haggett, R. J., Geo-ecology: An Evolutionary Approach, Routledge, London, 1995
12. Joy, T., Biogeography: A Study of Plants in the Ecosphere, Longman Science & Tech., U. K., 1993
13. Kormondy, E. J., Concepts of Ecology, Prentice Hall, 1989
14. Manners, I.R. and M. W. Mikesell (eds.), Perspectives on Environment, Commission on College Geography, Publication No. 13, Washington, D.C., 1974
15. Moore, R., Man in the Environment, McGraw Hill
16. Murphy, E. F., Man and His Environment, Harper & Row
17. Nobel and Wright, Environmental Science, Prentice Hall, New York 1996
18. Odum, E. P., Fundamentals of Ecology, W. B. Saunders, Philadelphia, 1971
19. Odum-Fugene, P., Fundamentals of Ecology, W. B. Sounders Company
20. Ramade Francois, Ecology of Natural Resource, John Wiley & Sons, New York, 1984
21. Russwurm, L.H. and E. Sommerville (eds.), Man's Natural Environment: A Systems Approach, Duxbury, Massachusetts, 1985
22. Sharma, H.S., Ranthambhore Sanctuary: Dilemma of Eco-Development, Concept Publishing Company, New Delhi, 2000
23. Sharma, P. D., Elements of Ecology, Rastogi Publication
24. Simmons, I. G., Ecology of Natural Resources, Edward Arnold, London, 1981
25. Singh, S., Environmental Geography, Prayag Publications, Allahabad, 1991
26. Singh, Savinder, Environmental Geography, Prayag Pustak Bhavan, Allahabad, 2000
27. Smith, R. L., Ecology of Man: Ecosystem Approach, Harper and Row
28. Smith, R.L., Man and His Environment: An Ecosystem Approach, Harper & Row, London, 1992
29. Spellrberg, I. F. and J. W. D. Sawyer, An Introduction to Applied Biogeography, Cambridge, University Press, 1999
30. Stoddart, D. E., Geography and the Ecological Approach, Geography, Vol. 50, pp 242-51, 1965
31. Strahler, A. N., Geography of man's Environment, John Wiley & Sons Inc. New York
32. Tiwari, Vijai Kumar, Environment and Ecology, Himalaya Publishing House, Mumbai, 1998, (Hindi)
33. U. N. E. P., Global Environmental Outlook, U. N. Publication, New York, 1998
34. Verma, P. S., and V. K. Agrawal, Principles of Ecology, S. Chand & Company, New Delhi, 1996
35. World Resources Institute, World Resources 2000-01, People and Ecosystems, Washington, 2001
36. World Watch Institute, State of the World, (Latest Report), Washington D C
37. Vyas P.R. & Somani L.L., Ecological crisis and Environmental Protection (1996)Agcoteen Publications ,Dungarpur road,Udaipur
38. सक्सेना, एच. एम. : पर्यावरण एवं पारिस्थितिकी भूगोल, राज. हिन्दी ग्रन्थ अकादमी, जयपुर।
39. सक्सेना, एवं उपाध्याय : मानव एवं पर्यावरण, के.डी. प्रकाषन, अजमेर।
40. राव, बी. पी. एवं बी. के. श्रीवास्तव : पारिस्थितिकी विज्ञान, वसुन्धरा प्रकाशन, गोरखपुर।
41. नेगी, बी. एस. : पारिस्थितिकी एवं पर्यावरण भूगोल, रस्तोगी प्रकाशन, मेरठ।
42. रघुवंशी, अरूण एवं चन्द्रलेखा : पर्यावरण एवं प्रदूशण, मध्यप्रदेश हिन्दी ग्रन्थ अकादमी, भोपाल।

M.A./M.Sc. Geography
Third Semester
Paper – III-B (M3GEOG3-ET11-B) Geography of Rajasthan

UNIT I: Physical Aspects

- **a)** Geographical and political introduction of Rajasthan
- **b)** Physical divisions of Rajasthan
- **c)** Climate: seasonal variations in climate; monsoon; climatic regions
- **d)** Water resources: status and problems

UNIT II: Resources

- **a)** Forests: types and distribution
- **b)** Soil regions; problems of soil
- **c)** Demographic characteristics: distribution, density, growth rate, literacy, sex ratio
- **d)** Major tribes of Rajasthan; Bhil, Meena, Sahriya, Kathodi (distribution and socio-economic characteristics)

UNIT III: Economic Aspects: Resource Base

- **a)** Agriculture: major characteristics, problems, solutions and agro-climatic regions
- **b)** Livestock and dairy development
- **c)** Minerals: distribution, production and development potential with special reference to zinc-lead, copper, marble, lime stone and rock phosphate
- **d)** Power resources: distribution, production and potential with respect to coal, petroleum, natural gas, solar and wind power.

UNIT IV: Industrial Development and Transportation

- **a)** Major industries: mineral based- zinc, cement and marble
- **b)** Agro based industries- cotton textile and sugar industry
- **c)** Major problems in industrial development
- **d)** Transportation development-road, rail, air

UNIT V: Tourism, Regionalization and Problems

- **a)** Tourism: basis of tourism in Rajasthan and major destinations
- **b)** Geographical regions of Rajasthan- outline of scheme proposed by R.L. Singh
- **c)** Special area development programs in Rajasthan (ADP, DPAP, DDP, IGC)
- **d)** Geographical problems of Rajasthan; desertification, drought, water logging, depleting ground water and flood

References

1.Mishra, V.C., Geography of Rajasthan, National Book Trust, India, New Delhi

2. Bhalla, L.R., Geography of Rajasthan. Kuldeep Publication, Jaipur

3. Census of India, Rajasthan Series, General Population Tables of 1961 to 2011.

4. DST (Govt. of Rajasthan), Resource Atlas of Rajasthan, Jaipur

5. Govt. of Rajasthan, Statistical Abstract (Latest Edition), Jaipur

6. NCEAR. Tecno-economic Survey of Rajasthan, Vol. 1 & 2, New Delhi

7. Spate, O.H.K., India and Pakistan, Methoen, 1960

8. शर्मा, एच,एस., शर्मा, एम.एल., राजस्थान का भूगोल, पंचशील प्रकाशन, जयपुर

9. चौहान, तेज सिंह, राजस्थान का भूगोल, विज्ञान प्रकाशन जोधपुर

10. लोढ़ा, राजमल एवं माहेश्वरी, दीपक, राजस्थान का भूगोल, हिमांशु पब्लिकेशन्स, उदयपुर

11. मामोरिया, चतुर्भुज एवं जैन, शैषमल, राजस्थान का भूगोल, साहित्य भवन पब्लिकेशन्स, आगरा

12. सक्सेना, एच.एम., राजस्थान का भूगोल, राजस्थान ग्रन्थ अकादमी, जयपुर

13. विजयवर्गीय, राम रक्षपाल, राजस्थान का भू–विज्ञान एवं खनिज सम्पदा, राजस्थान हिन्दी ग्रन्थ अकादमी, जयपुर

M.A./M.Sc. Geography
Third Semester
Paper – IV-A (M3GEOG4-ET12-A) Cultural Geography

Unit – I

a) Definition, nature, development and scope of cultural geography
b) Cultural elements, environment and culture, components of culture
c) Divergence process and convergence process
d) Cultural changes: perception, behaviouralism and cultural relativism

Unit – II

a) Races of mankind: origin, traits and classification
b) Cultural diversity: nature and bases
c) Language: evolution, dispersion, classification and distribution
d) Religion: evolution, dispersion, classification and distribution

Unit – III

a) Origin and dispersion of agriculture
b) Industrial revolution and cultural development
c) Economy and society of tribal groups, theories of tribal groups; dwelling places as cultural explorations
d) Economy and cultural landscape

Unit – IV

a) Human settlements: relation to ideology
b) Social structure and technology
c) Pattern of rural & urban society
d) Social process in the city

Unit – V

a) World cultural realms and regions
b) Cultural regions of Europe
c) Cultural regions of Indian Sub-continent
d) Globalization and culture conflicts

References

1. Broek, J.C. and J.W. Webb, Geography of Mankind, McGraw Hill, New York, 1978
2. Crang, Mike, Cultural Geography, Routledge Publications, London, 1998
3. Harmandorf, Tribes of India, Oxford University Press, Delhi, 1989
4. Hazra, (ed.), Dimensions in Human Geography, Rawat Publication, Jaipur, 1997
5. Hutchinson and D. Smith, Ethnicity, Oxford University Press, Oxford, 1996
6. Massey, D and Jess P., A place in the World: Places, Cultures and Globalization, Oxford University Press, New York, 1995
7. Massey, D. et al (ed), Human Geography Today, Polity Press, Cambridge, 1999
8. Mukherjee, A.B. and A. Aijazuddin, India: Culture, Society and Economy, Inter-India Publication, New Delhi, 1985
9. Singh, A.K., Approaches to Tribal Development, Swarup and Sona, New Delhi, 1994

10. Sopher, D.E., Exploration of India: Geographical Perspectives on Society and Culture, Longman, London, 1980
11. Spencer, J.E. and William L. Thomas, Cultural Geography, John Willey and Sons, Inc., London, 1969
12. Wagner, Philip L. and Marvin W. Mikesell, Readings in Cultural Geography, The University of Chicago Press, Chicago, 1962

M.A./M.Sc. Geography
Third Semester
Paper – IV-B (M3GEOG4-ET12-B) Transport Geography

Unit – I

a) Meaning, scope and development of transportation geography
b) Factors associated with the development of transport system: historical, technological, physical, economic, political and social
c) Spatial interaction: ideas of Edward Ullman; functional approach of M. E. Hurst
d) Concepts of distance: point to point distance and distance in a group of points; measures of distance

Unit – II

a) The functional region, linkages and nodes, diagrammatic representation of hinterlands and hierarchies
b) Transportation and spatial processes: regional specialization and agglomeration economies
c) Cost of overcoming distance: transportation cost, price and rate structure; transport costs as factor of production
d) An idealized process of transport development

Unit – III

a) Graph theoretic concepts; networks as models
b) Types of connectivity: concept and indices of connectivity
c) Measures of nodal accessibility: the network as a matrix; degree of connectivity: direct and indirect connectivity
d) Indices of accessibility: accessibility matrix, matrix T, shortest path matrix and valued matrix; sinuosity

Unit – IV

a) Spatial patterns of flow
b) Gravity model: basic model and its modifications related to traffic and commodity flow
c) Allocation model: transportation problem and optimum solution
d) Flow in a capacitated network

Unit – V

a) Negative impacts of transportation: social, accidents and other impairments
b) Economic and environmental aspects of urban transport problems and their control
c) Alternative transport systems in mega cities; transport systems in the developing countries
d) Development of the Indian surface transport system

References:

1. Abler, Adams and Gould, Spatial Organization: The Geographer's View of the World, Prentice Hall, New York
2. Buchannan, C. D., Traffic in Towns, Buchannan Report, HMSO, London
3. Hagget, P. et al, Locational Analysis in Human Geography, Edward Arnold, London, 1977
4. Haggett, P. and R. J. Chorley, Network Analysis in Geography, Arnold, London, 1968
5. Hay, A. Transport Economy, Macmillan, London, 1973

6. Hensher, David A. (ed), Handbook of Transport Geography and Spatial Systems, Emerald Group Publishing, 2004
7. Hoyle, B. S. (edt.). Transport and Development, Macmillan, London, 1973
8. Hoyle, B. S. and R. Knowles, Modern Transport Geography, Wiley Europe
9. Hurst, M. E. E., Transportation Geography: Comments and Readings, McGraw Hill, New York, 1974
10. Hussain, M. et al, Transport Geography: Perspective in Economic Geography Series, Anmol Publications Pvt. Ltd., New Delhi
11. James, P. E. and C. F. Jones, (eds.), American Geography: Inventory and Prospect, Syracuse University Press, Syracuse, 1954
12. Johnston, R. J., Multivariate Statistical Analysis in Geography: A Premier on The General Linear Model, Longman, London, 1978
13. Kansky, K. J., Structure of Transportation Network, Research Paper No.48, Department of Geography, University of Chicago
14. Knowles, R. and J. Wareing, Economic and Social Geography, Heinemann
15. Lowe, J. C. and S Moriyadas, The Geography of Movement, Houghton Mifflin Co., Boston
16. Munby, D., Transport, Penguin
17. Patankar, P. G., Urban Transport in Distress, Central Institute of Road Transport, Pune
18. Raza, Moonis and Y. P. Agrawal, Transport Geography of India, Concept Publishing Company, New Delhi, 1985
19. Robinson, H. and C. G. Bamford, Geography of Transportation, McDonald and Evans, London, 1978
20. Taaffe, E. J. and et al, Geography, Prentice Hall Inc
21. Taaffe, E. J. and H. L. Gauthier, Geography of Transportation, Prentice Hall Inc., New Jersey, 1973
22. Taaffe, Edward James, Howard L. Gauthier, Morton E. O'Kelly, Geography of transportation, Prentice-Hall Foundations of Economic Geography Series, 2nd edition, Morton O'Kelly, 1996
23. Ullman, E. L., American Commodity Flow, University of Washington Press, 1957
24. White H. P. and M. L. Senior, Transport Geography, Longman, London, 1983
25. Woodcock, R. G. and M. J. Baily, Quantitative Geography, McDonald & Evans
26. Yeates, Maurice, An Introduction to Quantitative Analysis in Human Geography, McGraw-Hill Book Company, New York

M.A./M.Sc. Geography
Third Semester
Practical – I (M3GEOG1-CP05) Advanced Cartography II
Techniques of Demographic Data Analysis and Projections (Mathematical)

Unit – I

a) Quantitative & qualitative symbols.
b) Sources of geographic data (India)
c) Rules of constructing diagram & graphs
d) Special diagrams – star, triangular, scatter (3 exercises)

Unit – II

Map projections – classification, characteristics, use and mathematical constriction along with outline maps of the following projections (4 Exercises)

a) Bonne,s projection
b) Conical projection –two standard parallel
c) Gall's projection
d) Mollweide's projection

Unit – III

Demographic aspects - at least with 20 administrative units (4 Exercises)

a) Population distribution (Dot method)
a) Density of population (Choropleth maps)
b) Age and sex composition (Pyramid)
b) Urban and rural composition/population by religion

Unit – IV

Economic and social aspects (at least 20 administrative units):

a) Occupational structure.
b) Crop production and area.
c) SC and ST population distribution
d) Literacy rate

Unit – V

Transport and settlement aspects (at least with 20 administrative units)

a) Traffic flow cartogram
b) Isochronic cartogram (speed of travel)
c) Nearest neighbor analysis
d) Histogram – based on human settlement distribution

References:

1. Arthur G., Advance Practical Geography, Heinemann.
2. Campbell, J., Introductory Cartography, Prentice Hall Inc., New York.
3. Govt. of Rajasthan, District Census Handbooks, latest as well as of previous Census,
4. Keates, J. S., Cartographic Design and Production, Longman, London.
5. Loxton, J., Practical Map Production, John Wiley & Sons, New York.
6. Mishra, R. P. and A. Ramesh, Fundamentals of Cartography, Concept Publishers, New Delhi.

7. Monkhouse, F. J. and H. R. Wilkinson, Maps and Diagrams, Methuen & Co., London.
8. Raisz, E., General Cartography , McGraw Hill Book Co., New York.
9. Robinson, A. H., Elements of Cartography, Chapman & Hall.
10. Sing, R. L., Elements of Practical Geography, Kalyani Publishing.
11. Singh, R. N., Map Work and Practical Geography, Central Book Depot.
12- शर्मा, जे. पी.: प्रयोगात्मक भूगोल (रस्तोगी पब्लिशर्स, मेरठ)

Practical Exam Scheme

Distribution of Marks: Total marks (100) = Internal marks (20) + External marks (80)

Internal marks- 20

1. Test paper - 10 marks
2. Objective paper- 10 marks (10 objective question)

External marks-80

Candidates will be examined by an external examiner in consultation with the internal examiner Distribution of 80 marks will be as follows:

A. Test paper - 25 Marks
B. Lab exercise - 30 Marks
C. Record work - 15 Marks
D. Viva-voce - 10 Marks

A- Test Paper – 25 marks

The Practical test paper of two hours duration and candidates will be required another two question out of four questions.

B- Lab exercise – 30 marks

Practical exercise shall be of three hours duration and candidates will be required to attempt any 2 exercises out of 4 exercises.

C- Record work – 15 marks

Note: Record work will comprised of a minimum of 20 exercises drawn on one fourth of a full drawing sheet and with methodological and analytical interpretation of each one.

D- Viva-Voce - 10 marks

The practical exercise, record work and viva-voce examination shall be conducted by external examiner in consultation with the internal examiner.

M.A./M.Sc. Geography
Third Semester
Practical – II (M3GEOG2-CP06) Basics of Geographical Information System

UNIT I: Introduction to GIS

a) Definition, evolution and components of GIS
b) Representation of geographical data in GIS
c) Geospatial data structure and formats
d) Data models: raster and vector data models

UNIT II: Coordinate Systems and Transformation

a) Datums, ellipsoid , geoid
b) Projected and Geographic Coordinate Systems, UTM coordinate system
c) Geometric transformation: map to map, image to map
d) Resampling, Root Mean Square Error

UNIT III: Data Generation and Database Management

a) Data Input, Spatial data editing
b) Topology
c) Attribute data input and management: data types, data entry, joining and relating tables
d) Attribute data manipulation

UNIT IV: Data Exploration

a) Descriptive statistics
b) Spatial data query, attribute data query, raster data query
c) Data generalization; data classification; zonal statistics
d) Data visualization and map composition

UNIT V: Introduction to Web Data Sources

a) Google Earth
b) Bhuvan
c) Water Resources Information System (India-WRIS)
d) Open Street Maps (OSM)

Practical exercises will be done using available GIS software - QGIS & ArcGIS - any other GIS software available in the department. One computer per student will be provided. Students will be required to prepare a record work of the outputs of all exercises conducted in the lab. In addition the students will also be required to submit the outputs in soft copy in a CD.

Lab Exercises (No. of exercises):

1. Familiarization with the software (1)
2. Importing raster data in GIS (1)
3. Geo-referencing and projecting a toposheet (1)

4. Geo-referencing and projecting a scanned map (1)
5. Generation of vector- point, line & polygon data - generating attribute data -GIS software (3)
6. Generation of vector- point, line & polygon data - generating attribute data - Google Earth (3)
7. Linking spatial and aspatial data- Table join (Excel file) (1)
8. Data visualization (2)
9. Computation of descriptive statistics (2)
10. Attribute data query (1)
11. Spatial data query (1)
12. Raster data query (1)
13. Data generalization (1)
14. Data classification (1)
15. Map composition (1)
16. Use of web sources for data acquisition using Bhuvan/ Google Earth/ India-WRIS/ OSM (3)

Suggested Readings

1. Bernhardsen, Tor, 1992. *Geographic Information Systems: An Introduction*. Wiley India
2. Burrough, P.A. and McDonnell, R., 1998. *Principles of Geographic Information Systems*. Oxford University Press, Oxford
3. Chang, Kang-tsung, 2003. *Introduction to Geographical Information Systems*. Tata McGraw Hill Publ. Co., New Delhi
4. Chauniyal, D.D., 2004. *Remote Sensing and Geographical Information Systems* (**in Hindi)**, Sharda Pustak Bhawan, Allahabad
5. Clarke, Keith C., 2003. *Getting Started with Geographical Information Systems*. Prentice Hall
6. Demeers, Michael N., 2000. *Fundamentals of Geographical Information Systems*, John Wiley, Singapore
7. Heywood, Ian, 2003. *An Introduction to Geographical Information Systems*. 2nd Ed. Pearson Publ. Co., Singapore
8. Lo, C.P. and Yeung, Albert K. W. 2002. *Concepts and Techniques of Geographic Information Systems*. Prentice Hall of India, New Delhi.
9. Longley, P., Goodchild, M.F., Maguire, D. and Rhind, D. 1999. *Geographic Information Systems. Principles, Techniques, Management, Applications*. John Wiley, New York.
10. Reddy, M. Anji 2001. *Textbook of Remote Sensing and Geographic Information Systems*. B. S. Publs., Hyderabad.
11. Vyas P.R.,Remote Sensing and Geographical Information System and Remote Sensing : Basics and Applications, Rawat Publications, Jaipur, New Delhi-2014

WEB RESOURCES

1. www.qgistutorials.com
2. http://www.pasda.psu.edu/tutorials/gisbasics.asp
3. https://earth.google.com
4. bhuvan.nrsc.gov.in
5. india-wris.nrsc.gov.in

6. https://openstreetmap.org
7. http://openstreetmap.in

Practical Exam Scheme

Practical exercise will be done using GIS software – QGIS, ArcGIS, Arc View, TNTMips, ERDAS or any other GIS Software available in the department. One computer per student will be provided.

Distribution of Marks: Total marks (100) = Internal marks (20) + External marks (80)

Internal marks- 20

1. One assignment based on computer – 10 marks
2. Objective paper- 10 marks (10 objective questions)

External marks-80

Candidates will be examined by an external examiner in consultation with the internal examiner
The distribution of 80 marks will be as follows:

A-	Test paper	-	25 Marks
B-	Lab exercise	-	30 Marks
C-	Record work	-	15 Marks
D-	Viva-voce	-	10 Marks

A- Test paper – 25 marks
The Practical test paper of two hours duration and candidates will be required another two question out of four questions.

B- Lab exercise – 30 marks
Practical exercise shall be of three hours duration and candidates will be required to attempt any 2 exercises out of 4 exercises based on different GIS Software.

C- Record work – 15 marks
Student will be required to prepare a record work of the output of all exercise conducted in the lab. In addition the students will also be required to submit the output in soft copy in a CD.

D- Viva-Voce - 10 marks
The practical exercise, record work and viva-voce examination shall be conducted by external examiner in consultation with the internal examiner.

M.A./M.Sc. Geography
Fourth Semester
Paper – I (M4GEOG1-CT13) Industrial Geography

Unit – I

a) Nature and scope of industrial geography, recent development in industrial geography
b) Classification of industries: bases and characteristics
c) Elements and factors of industrial localization, centralization and decentralization of industrial enterprises
d) Horizontal, vertical and diagonal linkages of industries

Unit – II

Basic economic concepts, theories and models of industrial locations:

a) Demand, supply and price; marginal cost and average cost
b) Economies of scale and agglomeration and related concepts
c) A. Weber, E. M. Hoover, August Losch, A. Fetter, G. T. Renner
d) A. Pred, Palander Tord, D. M. Smith, E. M. Rawstron, Bos H. C. & Hamilton

Unit – III

Geographical analysis of selected industries in the world with reference to India:

a) Copper, aluminum and iron and steel
b) Pulp and paper, textile
c) Oil refining, shipbuilding and software industries
d) Locational analysis of zinc and cement industries of Rajasthan

Unit – IV

a) Industrial location and spatial distribution analysis and measures: coefficients of localisation, specialisation, geographic association and index of diversification
b) Delimitation of industrial regions: indices and methods
c) Study of major industrial regions of the world: Great Lakes region and Lancashire region
d) Major industrial regions of India

Unit – V

a) Environmental degradation and hazards caused by manufacturing industries
b) Impact of industries on economic development
c) Role of globalization on manufacturing sector in less developed countries
d) Shifting of industries and its impact on the urban fringe

References:

1. Adam, Watter, Structure of American Industry, Macmillan & Co., New York
2. Alexander, J. W., Economic Geography, Prentice Hall, New York
3. Alexanderson, G., Geography of Manufacturing, Prentice Hall, New York, 1967
4. Bengston, N. A. and V. L. Royen, Fundamental of Economic Geography, Prentice Hall, New York
5. Boesch, H., A Geography of World Economy, D. Van-Nostrand Co., New York, 1964
6. Britton, John N. H., Regional Analysis and Economic Geography, G. Bell & Sons
7. Carlson, A. S., Economic Geography of Industrial Materials, Rinchart Publishing Corporation
8. Eastall, R. C. and R. O. Buchanan, Industrial Activity and Economic Geography, Hutchinson, London
9. Hoover, E. M., The Location of Economic Activity, McGraw Hill, New York, 1948
10. Joshi, Hemlata , Industrial Geography of India: A Case History of Fertiliser Industry, Rawat Publishers, Jaipur

11. Lloyd, P. and P. Dicken, Location in Space: A Theoretical Approach to Economic Geography, Harper and Row, New York, 1978
12. Losch, August, The Economics of Location, Yale University Press, London, 1973
13. McCarty, Harold H. and Lindberg, A Preface to Economic Geography, Prentice Hall, New York
14. Miller, E. W., A Geography of Manufacturing, Prentice Hall, New York, 1962
15. Renner, G. T., Geography of Industrial Localisation, Economic Geography, Vol. 23, 1947
16. Riley, R. C., Industrial Geography, Chatto and Windus, London, 1973
17. Saushkin, Yu. G., Economic Geography: Theory and methods, Progress Publishers, Moscow, 1980
18. Smith, D. M., Industrial Location: An Economic Geographical Analysis, Wiley, New York, 1971
19. Weber, Alfred, Alfred Weber's Theory of Location of Industries, Chicago University Press, Chicago, 1929
20. Yaseen, Leonard, Plant Location, American Research Council, New York
21. कुमार, प्रमिला एवं शर्मा, श्रीकमल : औद्योगिक भूगोल, मध्यप्रदेश हिन्दी ग्रन्थ अकादमी
22. लोढा, राजमल : औद्योगिक भूगोल, राजस्थान हिन्दी ग्रन्थ अकादमी

M.A./M.Sc. Geography

Fourth Semester
Paper – II (M4GEOG2-CT14) Population and Settlement Geography

Unit – I

a) Meaning, scope and development of population geography
b) Sources of data: population counts and census; sample data; reliability of data and problems of mapping population data; data errors and their detection and correction
c) Measures of population distribution; world pattern of population distribution; determinants of population distribution
d) Population distribution in India: patterns and determinants

Unit – II

a) Population growth since prehistoric period; demographic transition theory and population growth models
b) Mortality analysis, patterns and its determinants
c) Fertility analysis, fertility patterns and its determinants
d) Growth of population in India: patterns, components and determinants

Unit – III

a) Age structure and sex composition
b) Educational composition; urbanization
c) Economic characteristics and occupational structure
d) Population composition of India: characteristics and problems

Unit – IV

a) Migration: types and determinants
b) Population and development; population-resource regions
c) Population and environment
d) Population policies in developed and less developed countries; population policy of India

Unit – V

a) Evolution, size and spatial distribution pattern of human settlements and related theories and models
b) Physical structure of settlements; internal characteristics and external forms
c) Functional structure of settlements; functional classification of towns and functional typology of villages; functional landscape of settlements
d) Settlement hierarchy: concept and contributing factors

References:

1. Bhende, Asha A. and Tara Kanitkar, Principles of Population Studies, Himalaya Publishing House
2. Bilasborrow, Richard E. and Daniel Hogan, Population and Deforestation in the Humid Tropics, International Union for the Scientific Study of Population, Belgium, 1999
3. Bogue, D. J., Principles in Demography, John Wiley and Sons, New York, 1969
4. Bose, Ashish et al, Population in India's Development: 1947-2000, Vikas Publishing House, New Delhi, 1974
5. Census of India, India: A State Profile, 1991
6. Chandana, R. C., Introduction to Population Geography, Kalyani Publishers, Ludhiana, 2000
7. Chisholm, M. (1962): 'Rural Settlements and Land use', London
8. Clarke, John I., Population Geography and the Developing Countries, Pergamon Press Inc., Oxford, 1971
9. Clarke, John I., Population Geography, Pergamon Press Inc., Oxford, 1973

10. Crook, Nigel, Principles of Population and Development, Pergamon Press, New York, 1997
11. Daugherty, Helen Gin, and Kenneth C. W. Kammeyir, An Introduction to Population, The Guilford Press, New York, 1998
12. Demko, Geogre, J. et al, Population Geography, A Reader, McGraw Hill, New York, 1970
13. Garnier, Beaujeu J., Geography of Population, Longman, London, 1970
14. Hudson, R. S. (1970): 'A Geography of Settlements', McDonald and Sons, London
15. Kochhar, Rajesh, The Vedic People: Their History and Geography, Orient Longman Ltd., New Delhi, 2000
16. Mamoria, C. B., India's Population Problems, Kitab Mahal, New Delhi, 1981
17. Mitra, Asok, India's Population: Aspects of Quality and Control, Volume I & II, Abhinav Publications, New Delhi, 1978
18. Pathak, K. B. and F. Ram, Techniques of Demographic Analysis, Himalaya Publishing House
19. Peterson, William, Population, Macmillan Publishing Company, Inc., New York, 1975
20. Premi, M. K., India's Population: Heading Towards a Billion, S. R. Publishing Corporation, New Delhi, 1991
21. Shryock, Honry, S et al, The Methods and Materials of Demography, Volume I & II, U. S. Bureau of the Census
22. Srinivasan, K. and M. Vlassoff, Population Development Nexus in India: Challenges for the New Millennium, Tata McGraw Hill, New Delhi, 2001
23. Srinivasan, K., Basic Demographic Techniques and Applications, Sage Publications, New Delhi, 1998
24. Sundaram K. V. and Sudesh Nangia (eds.), Population Geography, Heritage Publications, Delhi, 1986
25. Trewartha, G. T., A Geography of Population: World Patterns, John Wiley & Sons, New York, 1973
26. Trewartha, Glenn T. (ed.), The More Developed Realm, A Geography of its Population, Pergamon Press, Oxford, 1978
27. UNDP, Human Development Report, Oxford University Press, Oxford, 2000
28. United Nations, Methods for Projections of Urban and Rural Populations, No VIII, New York 1974
29. United Nations, The Determinants and Consequences of Population Trends, Volume I, Population Studies No 50
30. Woods, Robert, Population Analysis in Geography, Longman, London, 1979
31. Zelinsky, Wilbur, A Prologue to Population Geography, Prentice Hall, 1966

M.A./M.Sc. Geography
Fourth Semester
Paper – III A (M4GEOG3-ET15 A) Geographical Research Methodology

Unit – I Research Methodology: An Overview

a) Research methodology- an overview; procedure of scientific research
b) Some methodological controversies and explanation in geography
c) Selection and relevance of research theme, defining research problem
d) Formulation of hypothesis, objectives, nature, type and characteristics of hypothesis

Unit II : Research Design

a) Research design, methodology and data base, outline of the research; research design.
b) Sources and types of data: primary and secondary data, published and unpublished sources, toposheet, satellite imageries
c) Methods of data collection: observation, questionnaire, schedule and interview
d) Sampling: need for sampling methods, size of sampling

Unit III: Measurement

a) Measurement in research, measurement scales
b) Scales of measurement: nominal, ordinal, interval and ratio
c) Sources of error in measurement; scaling: meaning of scaling
d) Scale of classification bases, important scaling techniques

Unit-IV: Processing and Analysis of Data

a) Processing-editing, coding
b) Classification and tabulation
c) Significance of quantitative techniques
d) Descriptive and inferential statistics - overview

Unit-V: Interpretation and Preparation of Research Reports

a) Meaning and techniques of interpretation, steps & layout
b) Types of reports
c) Appendices, notes, references, citation and bibliography
d) Writing of the dissertation/ thesis & defense of the thesis at viva voce

References:

1. Chou, Ya-Lun, Statistical Analysis: With Business and Economic Applications, Holt, Rinehart and Winston, New York, 1975
2. Cole, J. P. and C. M. A. King, Quantitative Geography: Techniques and Theories in Geography, John Wiley and Sons Ltd., London, 1970
3. Gregory, S., Statistical Methods and the Geographer, Longman Group Ltd. London, 1978
4. Hammond, Robert and Patrick McCullagh, Quantitative Techniques in Geography: An Introduction, Oxford University Press, London, 1978
5. Hebden, Julia, Statistics for Economists, Heritage Publishers, London, 1990
6. Johnston, R. J. , Multivariate Statistical Analysis in Geography, Longman Group Ltd. London, 1978
7. Kundu, Amitabh, Measurement of Urban Processes: A study of Regionalisation, Popular Prakashan Private Ltd., Bombay, 1980
8. Silk, J., Statistical Concepts in Geography, George Allen and Unwin, London, 1980
9. Wilson, A. H. and M. J. Kirkby, Mathematics for Geographers and Planners, Oxford University Press London 1982

M.A./M.Sc. Geography
Fourth Semester
Paper – III B (M4GEOG3-ET15 B) Social Geography

Unit – I

a) Nature, scope and development of social geography, philosophical bases of social geography
b) Positivist, structuralist and radical
c) Humanist, post-modern, and post-structuralist
d) Social geography in the realm of social sciences

Unit – II

a) Space and society
b) Understanding society and its structure and processes
c) Geographical bases of social formations; power relations and space
d) Contribution of social geography to social theory

Unit – III

a) Towards a social geography of India; nature and problems of social geographic data
b) Social differentiation and region formation; evolution of socio-cultural regions in India
c) Bases of social region formation; role of caste, ethnicity, religion, dialect and languages
d) Indian unity and diversity; social transformation and change in India.

Unit IV

a) Concepts of social well-being and physical quality of life
b) Human development: concept, components, indices and measurement
c) Patterns and bases of rural and urban society; rural-urban deprivation with respect to shelter, health and education
d) Social exclusion, deprivation and discrimination issues relating to women and underprivileged groups

Unit – V

a) Spatial distribution of social groups: tribes, castes, religious and language groups
b) Social groups and power relations in India
c) Review of five-year plans and area plans towards social policy in India
d) Strategies to improve social well-being in tribal, hill and drought prone areas; social and environmental impact assessment of development projects

References:

1. Ahmad, Aijazuddin, Social Geography, Rawat Publication, New Delhi, 1999
2. Casino, Vincent J. Del, Social Geography: A Critical Introduction, Wiley-Blackwell, 2009
3. Churye, B. S., Caste and Class in India, Popular Prakashan
4. Davis, K., Population of India and Pakistan, Princeton University Press
5. de Blij, H. J., Human Geography, John Wiley and Sons, New York
6. Dreze, Jean and Amartya Sen, Economic Development and Social Opportunity, Oxford University Press, New Delhi, 1996
7. Dubey, S. C., Indian Society, National Book Trust, New Delhi, 1991
8. Geddes, A. and A. T. A. Learmonth (eds.), Man and Land in South Asia, Concept Publishing Co., New Delhi
9. Government of India, Economic and Socio-Cultural Dimensions of Regionalization, Census of India, Census Centenary Monograph No.7, 1974
10. Government of India, Report on Development of Tribal Areas, Planning Commission, 1981
11. Gregory, D and J. Larry, (eds.) Social Relations and Spatial Structures, McMillan, 1985

12. Guha, B. S., Racial Elements in India's Population, Oxford University Press, London
13. Haq, Mahbubul, Reflections on Human Development, Oxford University Press, New Delhi
14. Jones, E. (ed.), Readings in Social Geography, Oxford University Press, London
15. Jones, E. and J. Eyles, An Introduction to Social Geography, Oxford University Press, London
16. Maloney, Clarence, People of South Asia, Winston, New York, 1974
17. Rao, M. S. A., Urban Sociology in India, Orient longman, 1970
18. Rao, M. S. A., Urbanisation and Social Change, Orient Longman
19. Rao, Subba, Personality of India: Pre and Proto Historic Foundation of India and Pakistan, M. S. University Baroda, Vadodara, 1958
20. Risley, H., The People of India, Reprint Corporation
21. Schwartzberg, Joseph, An Historical Atlas of South Asia, University of Chicago Press, Chicago, 1978
22. Sen, Amartya and Dreze Jean, Indian Development: Selected Regional Perspectives, Oxford University Press, London, 1996
23. Singh, K. S., Tribal Situation in India, IIAS, Shimla
24. Smith, David, Geography: A Welfare Approach, Edward Arnold, London, 1977
25. Sopher, David: An Exploration of India, Cornell University Press, 1980

M.A./M.Sc. Geography
Fourth Semester
Paper – IV A (M4GEOG4-ET16 A) Quantitative Methods in Geography

Unit –I

a) Definition & history of Quantitative Geography
b) Significance & utilization of quantitative methods in geography
c) Nature & levels of measurement – qualitative and quantitative
d) Graphical presentation of data –bar, pie, ogive (cumulative histogram), frequency curve

Unit –II

a) Measure of central tendency – mode, median & mean
b) Skewness and kurtosis
c) Measures of deviation – types
d) Mean deviation, standard deviation, Coefficient of variation, Z-scores

Unit –III

a) Gini coefficient of concentration and Lorenz Curve
b) Geographic relationship- correlation
c) Carl Pearson correlation; Spearman's rank correlation
d) Regression analysis – linear regression

Unit –IV

a) Assessment of probability –Z Score
b) Tests of statistical significance : T-test ,Chi-Square test , ANOVA
c) Composite indices analysis
d) Matrices – types and inversion of matrices

Unit –V

a) Advantages of using software for quantitative analysis; Interface
b) Data entry and manipulation, generation of graphs
c) Data analysis in statistical software – computation of descriptive statistics
d) Regression and Correlation using software

******Available statistical software with introduction to SPSS*

Suggested Readings

1. Chou, Ya-Lun, Statistical Analysis: With Business and Economics Application, Holt, Rinehart and Winston, New York, 1975.
2. Cole, J. P. And C. M. A. King, Quantitative Geography: Techniques and Theories in Geography, John Willey and Sons Ltd., London, 1970.
3. Gregory, S., Statistical Method and the Geographer, Longman Group Ltd. London, 1978.
4. Hammond, Robert and Patrick McCullagh, Quantitative Techniques in Geography: An Introduction, Oxford University Press, London, 1978.
5. Hebden, Julia, Statistics for Economists, Heritage Publishers, London, 1990.
6. Johnston, R. J.,Multivariate Statistical Analysis in Geography, Longman Group Ltd. London, 1978.
7. Kundu, Amitabh, Measurement of Urban Processes: A Study of Regionalisation, Popular Prakashan Private Ltd., Bombay, 1980.
8. Silk, J., Statistical Concept in Geography, George Allen and Unwin, London, 1980.
9. Wilson, A. H. And M. J. Kirkby, Mathematics for Geographers and Planners, Oxford University Press London 1982.
10. Nagar, Kailashnath: Basic Elements of Statistical, Meenaxi Publications.

M.A./M.Sc. Geography
Fourth Semester
Paper – IV B (M4GEOG4-ET16 B) World Geography

Unit – I: Asia

a) Asia in the context of the world
b) Terrain and drainage
c) Climate, natural vegetation and soils
d) Spatial distribution of population and economic base of the continent in general; regional study - West Asia

Unit- II: Europe

a) Europe in the contest of Asia and Africa
b) Terrain and drainage
c) Climate, natural vegetation and soils
d) Demographic and economic characteristics; regional study -Western Europe

Unit- III: Africa

a) Africa in the context of Europe and North America
b) Terrain and drainage
c) Climate, natural vegetation and soils
d) Demographic and economic characteristics; regional study -Southern Africa

Unit- IV: North and South America

a) North and South America in the context of the Atlantic and Pacific Rim states
b) Terrain and drainage
c) Climate, natural vegetation and Soils
d) Demographic and economic characteristics; regional study of Middle America

Unit- V: Oceania; Global issues

a) Australia & New Zealand in the context of Polynesia, Micronesia and South Asia
b) Terrain and drainage
c) Climate, natural vegetation and soils
d) Demographic and economic characteristics; globalization and W. T. O.; population, environment and sustainable development

Reference:

1. Cole, J., A Geography of the World's Major Regions, Routledge, London, 1996
2. Cole. M.M. , South Africa, Dutton, New York, 1961
3. Blij, H.J. , Geography: Regions and Concepts, John Wiley & Sons Inc., New York, 1994
4. Dickenson, J.P. et al, The Geography of the Third World Routledge, London, 1996
5. Jackson, R.H. and L. E. Hudman, World Regional Geography: Issues for Today, John
6. Kolb, A., East Asia : Geography of a Cultural Region, Methuen, London, 1977
7. Minshull, G. N., Western Europe, Hoddard & Stoughton, New York, 1984
8. Patterson, J. H., Geography of Canada and the United States, Oxford University Press, 1985
9. Songquiao, A., Geography of China, John Wiley & Sons Inc., New York, 1994
10. Ward, R. W. and A. Miller, World Regional Geography; A Question of Place, John Wiley & Sons Inc. , New York, 1989

M.A./M.Sc. Geography
Fourth Semester
Practical - I (M4GEOG1-CP07)

GEOSPATIAL TECHNIQUES FOR APPLIED GEOGRAPHICAL RESEARCH

UNIT I: Digital Image Processing: Data Preparation

a) Data preparation: geometric corrections, reprojection
b) Radiometric errors & corrections - image normalization, Dark Object Subtraction
c) Contrast enhancement - linear stretching techniques, non-linear -histogram equalization
d) Band ratioing- NDVI & NDWI

UNIT II: Thematic Map Generation

a) Image statistics, feature space
b) Unsupervised classification- Minimum distance
c) Supervised classification - training, signature evaluation, parametric (Maximum Likelihood) and non-parametric classifiers (Parallelepiped, Minimum Distance)
d) Accuracy assessment - overall, user's & producer's accuracy, Kappa

UNIT III: Spatial Analysis in GIS

a) Types of spatial analytical functions in GIS
b) Buffer, clip, update, union, intersection
c) Map overlay
d) Remote sensing and GIS data integration; sources of error

UNIT IV: Statistical Surfaces

a) Generation of statistical surfaces
b) Methods of spatial interpolation: linear, nonlinear- IDW
c) DEM, TIN and their derivatives
d) Terrain analysis

UNIT IV: Spatial Pattern Analysis

a) Point pattern analysis: Nearest Neighbour analysis
b) Spatial auto-correlation
c) Global indices (Geary's *c,* Global Moran's I & Getis-Ord General G Index)
d) Local indices (Local Moran's I & Getis- Ord Gi * index)

* Laboratory Practical Exercises (No. of exercises)

1 Introduction to Bhuvan/NASA portal (2)

2 Acquisition of satellite data and DEM (2)
3 Geo-referencing of toposheets (1)
4 Image to map rectification (1)
5 Radiometric correction of satellite images- DOS (1)
6 Contrast enhancement (2)
7 Image ratioing - generation and interpretation of NDVI image (1)
8 Thematic map generation using supervised classification (1)
9 Thematic map generation using unsupervised classification (1)
10 Extraction of topographic attributes and landscape features using DEM (3)
11 Spatial interpolation of point data using IDW and evaluation of results (4)
12 Settlement pattern analysis- Nearest Neighbor technique (1)
13 Computation of Geary's *c,* Global Moran's I & Getis-Ord General G Index and interpretation of results - population data (3)
14 Computation of Local Moran's I & Getis- Ord Gi * index and interpretation of results - population data (2)

Exercises will be implemented in ERDAS, ENVI, Illwis, QGIS, TNT Mips, Arc View, ArcGIS or any other DIP and GIS Software as per availability. One computer per student will be provided.

Suggested Readings

1. Chang, Kang-tsung, 2003: Introduction to Geographical Information Systems. Tata McGraw Hill Publ. Co., New Delhi
2. Chauniyal, D.D., 2004. *Remote Sensing and Geographical Information Systems* (**in Hindi)**, Sharda Pustak Bhawan, Allahabad
3. Dobesch Hartwig, Dumolard Pierre & Dyras Izabela, 2007. *Spatial Interpolation for Climate Data* (Ed.), Geographical Information Systems Series, ISTE Ltd., USA
4. Goodchild, M.F., Park, B.O. and Steyaert, L.T. (Ed.) 1993, Environmental Modelling with GIS. Oxford University Press, Oxford.
5. Jenson J.R., 1996. *Introductory Digital Image Processing: A Remote Sensing Perspective*, Prentice Hall, New Jersey
6. Jenson, J.R., 2000. *Remote Sensing of the Environment: An Earth Resource Perspective.* Perason Education
7. Lillesand, T.M., Keifer R.W. & Chipman, J.W., 2008. *Remote Sensing and Image Interpretation*, John Wiley & Sons, New Delhi
8. Lloyd, Christopher D., 2010. *Spatial Data Analysis: An Introduction for GIS Users,* Oxford University Press
9. Longley, P. And Batty, M. (eds.) 1996. Spatial Analysis: Modelling in a GIS Environment. Geo-Information International, Cambridge
10. Longley, P., Goodchild, M.F., Maguire, D. and Rhind, D. 1999. Geographic Information Systems. Principles, Techniques, Management, Applications. John Wiley, New York.
11. Maguirre, David J.; Michael F. Goodchild and David W. Rhind 1999. Geographical Information Systems: Principles and Application. Geo Information International, Vol.2, Longman Pub., N.Y.
12. Martin, D. 1996, Geographic Information Systems: Socio-economic Applications. Routledge, London
13. Mitchell Andy, 1999. *The ESRI Guide to GIS Analysis (Volume I) Geographic Patterns and Relationships*. ESRI Press, California.

14. Mitchell Andy, 2009. *The ESRI Guide to GIS Analysis (Volume II) Spatial Measurements and Statistics*. ESRI Press, California.
15. American Society of Photogrammetry, 1983. *Manual of Remote Sensing*, ASP, Falls Church, VA
16. Barrett, E. C. and L. F. Curtis, 1992. *Fundamentals of Remote Sensing and Air Photo Interpretation*, Macmillan, New York
17. Campbell, J., 1989. *Introduction to Remote Sensing*, Guilford, New York
18. Chauniyal, D.D., 2004. *Remote Sensing and Geographical Information Systems* **(in Hindi)**, Sharda Pustak Bhawan, Allahabad
19. Curran, Paul J., 1985. *Principles of Remote Sensing*, Longman, London
20. Jenson J.R., 1996. *Introductory Digital Image Processing: A Remote Sensing Perspective*, Prentice Hall, New Jersey
21. Jenson, J.R., 2000. *Remote Sensing of the Environment: An Earth Resource Perspective.* Perason Education
22. Lillesand, T.M., Keifer R.W. & Chipman, J.W., 2008. *Remote Sensing and Image Interpretation*. John Wiley & Sons, New Delhi
23. Pratt W.K., 1978. *Digital Image Processing*. Wiley, New York

WEB RESOURCES

1. *Ebook on Remote Sensing Applications,* www.**nrsc**.gov.in/Learning_Centre_**EBook**.html
2. *E-Tutorial on Fundamentals of Remote Sensing*, Canada Centre for Mapping and Earth Observation, Natural Resources Canada, accessible at http://www.nrcan.gc.ca/earth-sciences/geomatics

Practical Exam Scheme

Distribution of Marks: Total marks (100) = Internal marks (20) + External marks (80)

Internal marks- 20

1. One assignment based on computer - 10 marks
2. Objective paper - 10 marks (10 objective questions)

External marks-80

Candidates will be examined by an external examiner in consultation with the internal examiner
The distribution of 80 marks will be as follows:

A-	Test paper	-	25 Marks
B-	Lab exercise	-	30 Marks
C-	Record work	-	15 Marks
D-	Viva-Voce	-	10 Marks

A- Test paper – 25 marks
The practical test paper of two hours duration and candidates will be required answer two questions out of four questions.

B- Lab exercise – 30 marks
Practical exercise shall be of three hours duration and candidates will be required to attempt any 2 exercises out of 4 exercises based on different GIS Software.

C- Record work – 15 marks
Student will be required to prepare a record work of the outputs of all exercises conducted in the lab. In addition the students will also be required to submit the output in soft copy in a CD.

D- Viva-Voce - 10 marks
The practical exercises, record work and viva-voce examination shall be conducted by external examiner in consultation with the internal examiner.

M.A./ M.Sc. Geography
Fourth Semester
Practical - II (M4GEOG2-CP08)

PROJECT WORK ON NATURAL RESOURCE MANAGEMENT USING RS-GIS

UNIT I: Overview of Applications of Remote Sensing and GIS

a) Natural resource evaluation and management
b) Urban planning and management
c) Land use planning and management
d) Environmental management & hazard mapping

UNIT II: Overview of Applications of Remote Sensing and GIS

a) Socio-economic applications
b) Health GIS
c) Water resource management
d) Agricultural studies

UNIT III-V: Project Planning, Execution and Writing of Project Report

Theme of project may be selected from any of the fields outlined in Unit I & II or any other problem of student's/ supervisor's choice with a geographical perspective analysed using geo-spatial methodology. The theme may range from methodological issues to real world geographical applications. Students will be required to get the selected theme approved by the concerned supervising faculty by way of presentation of synopsis in a class seminar.

The paper is divided into two parts. Part 1 (Unit I & II) comprises class room teaching. The students will be introduced to applications of RSGIS technology for applied geographical research. Subsequently, students will be required to take up a small case study as Part 2 (Unit III -V), essentially applying the geospatial tools for decision making and analysis. The case study will be carried out under supervision of internal faculty of the department. The project report will be of approximately 30-50 pages.

References

1. *Ebook on Remote Sensing Applications,* www.**nrsc**.gov.in/Learning_Centre_**EBook**.html
2. Chauniyal, D.D., 2004. *Remote Sensing and Geographical Information Systems* (**in Hindi)**, Sharda Pustak Bhawan, Allahabad
3. Lillesand, T.M., Keifer R.W. & Chipman, J.W., 2008. *Remote Sensing and Image Interpretation*. John Wiley & Sons, New Delhi
4. Vyas P.R.,Remote Sensing and Geographical Information System and Remote Sensing : Basics and Applications, Rawat Publications, Jaipur, New Delhi-2014

Practical Exam Scheme

Distribution of Marks: Total marks (100) = Internal marks (20) + External marks (80)

Internal marks- 20

Seminar presentation: 20 marks

External marks-80

The project will be based and analysed by using RS data in any of the GIS Software.
Project report will be examined by external examiner.
Project report: 80 marks

M.A./M.Sc. Geography
Fourth Semester
Skill -II (M4GEOG1-Skill-02) Statistical Analysis Using Software

UNIT I – Data

a) Measurement levels
b) Data types, database file formats
c) Cases and variables
d) Defining variables

UNIT II – Data Entry

a) Data import
b) Data entry
c) Data editing
d) Data manipulation

UNIT III – Data Distribution

a) Preparation of line graphs
b) Preparation of bar diagrams
c) Preparation of histograms
d) Preparation of pie diagrams

UNIT IV – Data Analysis: Computation of Fundamental Descriptive Statistics

a) Mean, median, mode
b) Measures of dispersion – standard deviation, Z-Scores, box plots
c) Measures of symmetry – skewness
d) Kurtosis

UNIT V – Analyzing Relationships

a) Preparation of scatter plot
b) Computation of correlation
c) Computation of regression
d) Output generation and export in different formats

**Exercises will be done in available statistical software – Microsoft Excel and SPSS*

Practical Exam Scheme

Distribution of marks: Total marks (100) = Internal marks (20) + External marks (80)

Internal marks- 20

3. One assignment based on statistical software using valid data – 10 marks.
4. Objective paper – 10 marks (10 objective questions)

External marks - 80

Candidates will be examined by an external examiner in consultation with the internal examiner.
The distribution of 80 marks will be as follow:

A. Test paper - 25 Marks
B. Lab exercise - 30 Marks
C. Record work - 15 Marks
D. Viva-voce - 10 Marks