CBCS-based P.G. Course in Geography, 2021

Department of Geography
Nowgong College (Autonomous)

Course Structure Semester 1

Paper Type	Paper Code	Paper Name	Credit	Marks
Core	GEOG-1016	Nature of Geography	6	100
	GEOG-1026	Geomorphology	6	100
	GEOG-1036	Climatology and Biogeography	6	100
	GEOG-1046	Economic Geography	6	100
	GEOG-1054	Practical on Geomorphology, Climatology and Economic Geography	4	100

Course Structure Semester 2

Paper Type	Paper Code	Paper Name	Credit	Marks
Core	GEOG-2066	Geographical Thought	6	100
	GEOG-2076	Geography of Environment and Development	6	100
	GEOG-2086	Population and Settlement Geography	6	100
	GEOG-2096	Geography of Regional Development of India with Special Reference to North-East India	6	100
	GEOG-2104	Practical on Population and Settlement Geography and Regional Development of India and N.E. India	4	100

Course Structure Semester 3

Paper Type	Paper Code	Paper Name	Credit	Marks
Core	GEOG-3116	Quantitative and Cartographic Methods in Geography	6	100
	GEOG-3123	Fundamentals of Remote Sensing, GIS and GPS	3	50
	GEOG-3133	Research Methodology in Geography	3	50
	GEOG-3146	Social, Cultural and Political Geography	6	100
Optional	GEOG-3156	(A) Fluvial Geomorphology (B) Geoinformatics (C) Population Geography (D) Regional Development Planning	6	100
Core	GEOG-3164	Practical on Quantitative and Cartographic Methods	4	100

Course Structure Semester 4

Paper Type	Paper Code	Paper Name	Credit	Marks
Core	GEOG-4176	Environment and Climate Change	6	100
	GEOG-4186	Geography of Nepal, Bangladesh and Myanmar	6	100
	GEOG-4193	Practical on Remote Sensing and GIS	3	50
Optional (Theory)	GEOG-4206	(A) Fluvial Geomorphology (B) Geoinformatics (C) Population Geography (D) Regional Development Planning	6	100
Optional (Practical)	GEOG-4214	(A) Fluvial Geomorphology (B) Geoinformatics (C) Population Geography (D) Regional Development Planning	4	100
Optional (Dissertation)	GEOG-4223	(A) Fluvial Geomorphology (B) Geoinformatics (C) Population Geography (D) Regional Development Planning	3	50

PG Geography Course Structure Semester 1

Paper Type	Paper Code	Paper Name	Credit	Marks
Core	GEOG-1016	Nature of Geography	6	100
	GEOG-1026	Geomorphology	6	100
	GEOG-1036	Climatology and Biogeography	6	100
	GEOG-1046	Economic Geography	6	100
	GEOG-1054	Practical on Geomorphology, Climatology and Economic Geography	4	100

CBCS – Based P.G. First Semester Course in Geography, 2021

Nowgong College (Autonomous)

Course Name: Nature of Geography

Paper Code: GEOG – 1016

(Theory: 80, Internal Assessment: 20)

Course objectives:

The paper Nature of Geography aims at explaining the nature of the subject. It throws light on the importance of geography and attempts to enrich knowledge. The paper illustrates the basic concepts as well as technical terms which are building blocks of geographic knowledge along with understanding of sophisticated models and techniques with space-time dimension. Through this paper an understanding of the pure and applied nature of Geography along with the key elements in the discipline is possible. The paper also focuses on the relationship of Geography with natural and social sciences.

Course outcome:

- Through understanding of the basics of the subject ;
- understanding of sophisticated models and techniques;
- Interdisciplinary field – a field that crosses traditional boundaries between academic disciplines or schools of thought.

[To answer seven questions, three questions carrying 16 marks each and four questions carrying 8 marks each]

1. Defining the field of Geography; Planet earth as the home of man.

2. Place of Geography in the classification of knowledge; relation of geography with natural and social sciences; multi-disciplinary nature of Geography.

3. Geography as a spatial science; Spatial Concepts in Geography: Concept of space and place; Geographic space (Absolute Space and Relative Space); Spatial Process and Pattern; Spatial Organization; Spatial Relationship; Spatial Interaction; Spatial Integration; Spatial Diffusion; Spatial Modelling; Space-Time Dimension in Geography

4. Basic Branches and Approaches in Geography: Physical and Human; Systematic and Regional; Ideographic and Nomothetic.

5. Place/Region/Territory and scale factor (macro, meso, micro and space content)

6. Geography: Pure and Applied; Society-Environment Interface and Applied Geography

7. Scientific Methods in Geography: Routes to scientific Explanation: Induction and Deduction; Key elements in scientific practice.

8. Modes of explanations in Geography: Cognitive explanation, Morphometric explanation, Cause and effect explanation, temporal modes of explanation, Functional explanation, System analysis.

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Books Recommended

1. Abler, R.., Adams, J. and Gould, P.P., 1971: Spatial Organization: The Geographers' View of the World, Prentice-Hall, Englewood Cliff.
2. Ackerman, E.A., et al, 1965: The Science of Geography, Washington D.C., National
3. Academy of Science/ National Research Council Pub. No. 1277.
4. Adhikari, Sudeepta, 2015: Fundamentals of Geographical Thought, Orient Blackswan Pvt. Ltd., New Delhi.
5. Chorley, Richard, J. and Haggett, Peter (eds), 1967: Models in Geography, Methuen, London.
6. Chorley, Richard, J., 1973: Directions in Geography, Methuen, London.
7. Dikshit, R.D., 1994: The Art and Science of Geography, Prentice Hall of India, New Delhi.
8. Haggett, P., 2001: Geography: A Global Synthesis, Pearson Education, Essex, UK.
9. Hartshorne, R., 1939: The Nature of Geography, Association of American Geographers, Lancaster, Penn.
10. Hartshorne, R., 1959: Perspective on the Nature of Geography, Rand Mckully, Chicago.
11. Harvey, D., 1969: Explanation in Geography, St. Martin's Press, New York, 1969.
12. Johnston, R.J. et al. (eds), 1986: The Dictionary of Human Geography, Oxford, Basil Blackwell.

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Course Name: Geomorphology

Paper Code: GEOG – 1026

(Theory: 80, Internal Assessment: 20)

Course objectives:

The paper Principles and Concepts in Geomorphology highlights on the history of development of geographic ideas along with the recent trends in geomorphology. The paper focuses on the theoretical and conceptual bases, the techniques used in applied geomorphology along with quantitative methods and processes. The development of slopes, morphogenetic regions and geomorphic process study are also discussed in this paper.

Course outcome:

- Understanding of Principles and Concepts in Geomorphology;
- Application of geomorphic concepts and techniques in the field;
- Knowledge enrichment of glacial, fluvial and Aeolian processes.

Unit I: Principles and Concepts in Geomorphology

[To answer four questions, two questions carrying 16 marks each and two questions carrying 8 marks each]

1. History of development of geomorphic ideas; recent trends in Geomorphology.

2. Theoretical bases of Geomorphology: Fundamental concepts in geomorphology: uniformitarianism and catastrophism; system concepts in geomorphology; steady state; and dynamic equilibrium. Methods of analysis in Geomorphology

3. Concepts and techniques in applied geomorphology: Fluvial geomorphology, Palaeo-geomorphology, Environmental geomorphology, tropical geomorphology, coastal geomorphology; Structural geomorphology

4. Threshold concepts and applications in geomorphology. Systems concepts in Geomorphology

5. Quantitative methods and techniques in geomorphology.

UNIT II: Processes in Geomorphology

[To answer three questions, one question carrying 16 marks and two questions carrying 8 marks each]

1. Geomorphic processes: endogenetic and exogenetic; Glacial, Fluvial and Aeolian processes.
2. Morphogenetic regions: concept and genesis, differential intensity and rate of operation of geomorphic processes in various morphometric regions
3. Development of slopes: slope forming processes and slope forms.
4. Methods and techniques of geomorphic process study.
5. Geomorphic hazards: genesis and processes with special focus on flood, earthquake, volcano

Books Recommended:

1. Ahmad, E., 1985: Geomorphology, Kalyani Publishers, New Delhi
2. Bloom, Arthur L, 1978: Geomorphology-A Systematic Analysis of Late Cenozoic Landforms, Prentice Hall, Englewood Cliffs, N.J.
3. Chorley, Richard J, 1972: Spatial Analysis in Geomorphology, Harper &Row Publishers, New York, London.
4. Chow, V.T., 1964: Handbook of Hydrology, McGraw Hill
5. Cooke, R.U. and Doornkamp, J.C., 1974: Geomorphology in Environmental Management
6. Cooke, R.U. and Warren, A., 1973: Geomorphology in Deserts, Bats ford, London
7. Cotton, C.A.1945: Geomorphology, John Wiley & sons Inc. New York
8. Crickmay, C.H., 1974: Work of the River, The McMillan Press Ltd. London.
9. Dayal, P. (2nd edition), 1996: A Textbook of Geomorphology, Shukla Book Depot, Patna
10. Doornkamp, J.C. and King, C.A.M. 1971: Numerical Analysis in Geomorphology: An Introduction, St. Martins Press, New York
11. Dury, G.H., 1959: The Face of the Earth, Penguin Books.
12. Embelton, C, Brunsden, D, and Jones, D.K.C., (ed), 1978: Geomorphology: Present Problems and Future Prospects, Oxford University Press, London.
13. Embleton, C. and Thorns, J.1979: Processes in Geomorphology, Arnold Heinemann, First Indian Edition, 1982.
14. Faniran, A. and Jeje, L.R., 1983: Humid Tropical Geomorphology, Longman, London.
15. Gregory, K.J., 1985: The Nature of Physical Geography, Edward Arnold, London.
16. Gregory, K, J. and Walling, D.E., 1973: Drainage Basin- Form and Process, Edward Arnold, London
17. Hails John, R. (ed) 1978: Applied Geomorphology, Elseiver Scientific Publishing Company, Amsterdam, Oxford, New York.
18. King. C.A.M., 1966: Techniques in Geomorphology, Edward Arnold, London.
19. Leopold, L.B., Wolman, M.G. and Miller, J.P., 1964: Fluvial Processes in Geomorphology, Freeman, San Francisco.
20. Lobeek, A.K., 1939: Geomorphology, McGraw Hill, New York.
21. Morisawa, Marie M., 1968: Streams, Their Dynamics and Morphology, McGraw Hills, New York

22. Morisawa, Marie M. (ed), 1981: Fluvial Geomorphology, George Allen & Unwin, London.
23. Morisawa, Marie M., 1985: River Forms and Process, Longman, London and New York.
24. Nelson, J. G. and Chambers, M. J. (ed): Geomorphology: Processes and Methods.
25. Penck, W., 1924: Morphological Analysis of Landforms, Mc Millan, London.
26. Petts, G.E. 1983: Rivers (Sources and Methods in Geography), Butterworths, London-Boston.
27. Petts, G.E. and I. Foster, 1985: Rivers and Landscape, Edward Arnold, London.
28. Pitty, A.F., 1971: Introduction to Geomorphology, Barnes and Nobel, New York
29. Richards, K, 1982: Rivers, Methuen, London.
30. Scheidegger, A.E., 1970: Theoretical Geomorphology, Soringer- Verlag, Berlin, Heidelberg, New Work.
31. Schumm, S.A., (ed), 1977:Drainage Basin Morphology, Dowden Hutchinson & Ross Inc.
32. Schumm, S.A, 1977: The Fluvial Systems, Wiley, New Work
33. Sharma, V.K., 1986: Geomorphology, Earth Surface Processes and Forms, Tata McGraw Hill, New Delhi.
34. Sparks, B.W. 1960: Geomorphology, Longman, London, Second Edition.
35. Strahler, A.N., 1968: The Earth Science, Harper International Edition.
36. Strahler, A.N., 1969: Physical Geography, 3rd edition, Wiley.
37. Thomas, M.F., 1974: Tropical Geomorphology, McMillan, London.

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Course Name: Climatology and Biogeography

Paper Code: GEOG – 1036

(Theory: 80, Internal Assessment: 20)

Course objectives:

The paper Climatology and Biogeography has been divided into two parts. While the first part discusses about the climatology, its field and importance, elements of weather, factors influencing the climate, insolation, global wind system, air masses and fronts along with climatic disturbances, monsoons and classification of world climate among others, the second part concentrates on biogeography in geographic studies. The areas of concern of this part of the paper include the important concepts of biogeography, such as bio-energy cycle, food chain, plant-animal association in varying habitats and ecosystem besides the national forest and environmental policies.

Course outcome:

- Knowledge about different phenomena of weather and climate specially vagaries of Indian monsoon and techniques of weather forecasting;
- Deeper understanding of plant-animal association in varying habitats and environments;
- Practical utility in the field while carrying out research on issues of climate and biogeography.

Unit-I: Climatology

[To answer four questions, two questions carrying 16 marks each and two questions carrying 8 marks each]

1. Defining the field of Climatology; Importance of Climatology in geographical studies.
2. Insolation; atmospheric temperature; horizontal and vertical distribution of temperature
3. Atmospheric Pressure and Global Wind System: Vertical pressure gradient and horizontal pressure system; Surface winds, stratospheric winds, seasonal and local winds.
4. Air masses and Fronts: Characteristics, Origin and modification of air masses, stability and instability and their influence on weather and climate
5. Climatic disturbances: cyclones, anticyclones, cloud bursts, drought
6. Classification of World Climate: Schemes of Koppen and Thornthwaite
7. Techniques of weather forecasting: conventional and modern; introduction to the weather satellites and their data products
8. Global warming and climate change and associated impacts and challenges

Unit-II Biogeography

[To answer three questions, one question carrying 16 marks and two questions carrying 8 marks each]

1. Defining the field of Biogeography; Its significance, development and approaches
2. Soil characteristics and their significance: classification and distribution in India
3. Habitat, Environment, Ecosystem and food chain; Plant-Animal Association in varying habitats and environments; Major gene pool centres
4. Concept of Bio-diversity; Conservation of forest and wild life
5. National forest and environment policies; social forestry and agro forestry

Books Recommended

Climatology

1. Barry, R.G. and Chorley, R.J., 1998: Atmosphere, Weather and Climate, Routledge, New York.
2. Critchfield, H.J., 1975: General Climatology, Prentice Hall of India, New Delhi.
3. Blair, T.A., 1954: Weather Elements, Prentice-Hall.
4. Das, P.K., 1968: The Monsoons, National Book Trust, New Delhi.
5. Griffith, J.F., 1966: Applied Climatology, Oxford University Press.
6. Hobbs, J.E., 1980: Applied Climatology, Butterworths.
7. Lal, D.S., 1998: Climatilogy, Sharda Pustak Bhawan, Allahabad.
8. Lockwood, J.G., 1976: World Climatology: Environmental Approach,
9. Edward Arnold Ltd., 41 Bedford Square, Wc IB 3 Dq.
10. Lydolph, Paul, E., 1985: The Climate of the Earth, Rawman and Totowa, N.J.
11. Miller, A. A.,1953: Climatology, Dutton.
12. Rumney, George, R., 1968: Climatology and World's Climates, McMillan, London.
13. Strahler, A.N., 1971: Physical Geography, John Wiley, New York
14. Stringer, E.T., 1982: Foundations of Climatlogy.
15. Hoirn, L.A., 1980: An Introduction to Climate, International Series.
16. Trewartha, G.T. and Horn, L.A., 1980: An Introduction to Climate, International Series.
17. Oliver, J.E. and Hiddore, J. J., 2002: Climatology: An Atmospheric Science, Pearson Education, Delhi.

Biogeography

1. Bhattacharyya, N.N., 2003: Biogeography, Rajesh Publications, New Delhi.
2. Bradshaw, M.J., 1979: Earth and Living Planet, ELBS, London. Bunting,
3. Goudie, Andrew, 1981: The Human Impact, Basil Blackwell, Oxford.
4. Hussain, M. (ed), 1994: Biogeography (Part I&II), Anmol Publications Pvt. Ltd. New Delhi. Newbegin: Plant and Animal Geography. Odum, E.P., 1977: Ecology.

5. Robinson, H., 1982: Biogeography, E.L.B.S., Mc Donald & Evans, London.
6. Russell, E.W., 1973: Soil Condition and Plant Growth, Long man, London.
7. Smith, R.L., 1977: Ecology of Man-An Ecosystem Approach.
8. Simmons, I.G., 1974: Biogeography: Natural and Cultural, London.
9. Tiby, 1982: Biogeography, Longman.

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Course Name: Economic Geography

Paper Code: GEOG – 1046

(Theory: 80, Internal Assessment: 20)

Course objectives:

The paper Economic Geography aims at explaining the significance and theoretical development of this sub branch of geography along with the approaches, concepts and models. Understanding of technology and economic development, economic geography and primary activity, power resources, international trade in selected commodities are key areas of concern in this paper. Besides, the paper also highlights on pattern and problems of manufacturing of selected commodities in USA, UK and Japan.

Course outcome:

- Understanding of location, distribution and spatial organization of economic activities across the world;
- Knowledge of geographical and other factors which influence man's productivity;
- Knowledge of different farming techniques and modernization of agriculture;
- Practical utility in the field while carrying out research on agriculture and economic geography.

[To answer seven questions, three questions carrying 16 marks each and four questions carrying 8 marks each]

1. Field of Economic Geography: Meaning, significance and theoretical development
2. Approaches to Economic Geography: Theoretical, Institutional and Problem solving
3. Concepts and Models in Economic Geography: Von Thunen's theory of geographic rent, Spatial Demand Cone, Weberian industrial location model, Growth Pole model
4. Technology and Economic Development: Relation between technology and development, regional disparities in technology applications, levels of economic development-global perspective.
5. Economic Geography of Primary activity: Geography of pastoral farming, Geography of agriculture, place of agriculture in global economy, critical study of large-scale & small-scale agriculture, Regional pattern of agriculture in the world with special reference to USA, Israel and China
6. Modernization of Agriculture: Intensification, Crop diversification, Mixed farming, green revolution and its socio-economic and ecological implications.

7. Economic geography of power resources: Global pattern of energy production; Conventional sources of energy - water, coal and petroleum; and non-conventional sources of energy - solar, wind and nuclear. Energy crisis
8. Economic Geography of manufacturing: industrial regionalization and new industrial policy; Patterns and problems of manufacturing (mainly iron and steel and textiles) in the world with special reference to USA, UK, Japan
9. Economic geography of International trade in selected commodities: Food grain (Rice and Wheat), Tea, Iron and Steel, Petroleum.

Books Recommended

1. Alexander, 1986: Economic geography, Prentice Hall Inc. (E.E.Edition)
2. Bhalla, G.S. and Tyagi, D.S., 1989: Indian Agricultural Development, I.S.I.D., New Delhi.
3. Chaudhury, M.R., 1970: Indian Industries: Development and Location, Oxford and IBH, Calcutta.
4. Das, M.M., 1984: Peasant Agriculture in Assam, EBH (India) Publishers, Guwahati.
5. Forbes, D.K., 1984:Geography of under Development, John Hopkins Univ. Press, Baltimore.
6. Gunner, Alexanderson, 1988: Geography of Manufacturing, Prentice Hall Inc, (E.E. Edition)
7. Isard, W.,1956: Location and Space Economy, MIT Press, Cambridge.
8. Isard, W., 1975: Introduction to Regional Sciences, Engel wood, Cliffs.
9. Leong, G.C. and Morgan, G.C., 1992: Human and Economic Geography, Oxford University Press, New York.
10. Losch, A., 1954: The Economics of Location, New Haven.
11. Miller, E.W., 1977: Manufacturing: A study of Industrial Location, Pennsylvania State University Press, Pennsylvania.
12. Mohammad, N. (ed), 1992: New Destinations in Agricultural Geography, Concept Publishing Co., New Delhi
13. Pryde, P.R., 1983: Non -Conventional Energy Resources, Wiley, New York.
14. Rostov, W. W., 1960: The Stages of Economic Growth, Cambridge University Press, New York.
15. Roy, P. K. and Mukherjee, S., 1993 (2nd Edition): Economic Geography: An Appraisal of Resources, New Central Book Agency, Calcutta.
16. Roy, P. (2007): Economic Geography: A Study of Resources, New Central Book Agency (P) Ltd, Kolkata.
17. Sharma, T.C., 2013: Economic Geography of India, Rawat Publications, Jaipur.
18. Sushkin, Yulian, G., 1980: Economic Geography: Theory and Models, Progress Publishers, Moscow.
19. Smith, David M., 1981: Industrial Location: An Economic Geographical Analysis, Wiley, New York
20. Symons, L., 1979: Agricultural Geography, West view Press, Colorado.
21. Tarrant, J.R., 1980: Agricultural Geography, Wiley, New York.

22. Thomas, R.S. and Corbin, P.B., 1974: The Geography of Economic Activity, McGraw Hill, New York
23. Wheeler, J.O. and Muller, P.O., 1981: Economic Geography, John Wiley & Sons, New York.

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Course Name: Practical on Geomorphology, Climatology and Economic Geography

Paper Code: GEOG – 1054

(Practical: 80, Internal Assessment: 20)

Course objectives:

The paper highlights on Practical utility in the field while carrying out research on issues of climate and bio-geography. This paper has been divided into three sections. The first part - practicals on Geomorophology helps in developing a deeper understanding about the morphometric analysis, analysis of basin morphology and area-height relationship study. The second part is devoted towards Climatology, here, ways and techniques of climatic data analysis have been discussed. The third part of this paper addresses the practical exercises on mapping and analysis of diverse issues of Economic geography like trend analysis, spatial analysis of crop concentration, determination of level of economic development among many others.

Course outcome:

Practical utility in the field while carrying out research on geomorphology, climatology and economic geography.

Unit I: Geomorphology

(To attempt 4 questions carrying 10 marks each)

1. Morphometric Analysis:

(i) Profile drawing (2 Assignments)

(ii) Relative relief maps based on Smith's method (2 Assignments)

(iii) Slope maps using Wentworth's method (2 Assignments)

2. Analysis of Basin Morphology:

(i) Drainage ordering, calculation of bifurcation ratio, length ratio, basin circularity ratio, Analysis of laws of stream number, stream length and drainage basin area

(6 Assignments)

(ii) Preparation of drainage density, drainage frequency and drainage texture maps

(3 Assignments)

3. Area-Height Relationship:

(i) Hypsometric curve and hypsometric integral (2 Assignments)

(ii) Altimetric frequency curve and histogram (2 Assignments)

Unit II: Climatology

(To attempt 2 questions carrying 8 marks each)

1. Climograph, Hythergraph and Ergograph (3 Assignments)
2. Rainfall dispersion graph, rainfall variability and equipluve maps. (3Assignments)

Unit III: Economic Geography

(To attempt 3 questions carrying 8 marks each)

1. Spatial variation in land use and cropping pattern of North-East India using pie graph (2 Assignments)
2. Trend analysis of production of different commodities with the help of band graph and using moving average and least squares methods. (3 Assignments)
3. Choropleth mapping of cropping intensity of N.E. India (2 Assignments)
4. Spatial analysis of crop concentration in N.E. India and Assam (2 Assignments)

Unit IV: Practical Note Book

1. Evaluation of Practical Note-book (15 Marks)

2. Viva-voce (5 Marks)

Books Recommended

1. Chorley, Richard J. (ed), 1969: Water, Earth and Man, Methuen & Co. London.
2. Chorley, R.J. (ed), 1968: Models in Geography, Methuen & Co. London.
3. Doornkamp, J.C. and King, C.A.M. 1971: Numerical Analysis in Geomorphology: An
4. Introduction, St. Martins Press, New York.
5. Fairbridge, R.W. (ed), 1968: Encyclopedia of Geomorphology, Reinhold, New York.
6. Faniran, A. and Jeje, L.R., 1983: Humid Tropical Geomorphology, Longman, London.
7. Goudie, Andrew, et. Al. (eds), 1981: Geomorphological Techniques, George Allen & Unwin, London.
8. Gregory, K, J. and Walling, D.E., 1973: Drainage Basin-Form and Process, Edward Arnold, London.
9. King. C.A.M., 1966: Techniques in Geomorphology, Edward Arnold, London.
10. Leopold, L.B., Wolman, M.G. and Miller, J.P., 1964: Fluvial Processes in Geomorphology,Freeman, San Francisco.

11. Misra, R.P., and Ramesh, A., 1989: Fundamentals of Cartography, Concept Publishing co. New Delhi.
12. Monkhouse, F.J., and Wilkinson, H.R., 1989: Maps and Diagrams, B. I., Publications Pvt. Ltd., New Delhi.
13. Petts, G.E. and I. Foster, 1985: Rivers and Landscape, Edward Arnold, London.
14. Singh, R.L. and Singh Rana, P.B., 1998: Elements of Practical Geography, Kalyani Publishers, New Delhi.
15. Strahler, A.N., 1969: Physical Geography, 3rd edition, Wiley.
16. Anderson, T.W., 1958: Introduction to Multivariate Statistical Method, John Wiley & sons, New York.
17. Berry, B.J.L. and Marble, D.F., 1968: Spatial Analysis: A Reader in StatisticalGeography, Prentice-Hall, Inc.
18. Chorley, R.J. and Haggett, P., (ed), 1968: Models in Geography, Methuen & Co. Ltd.
19. Fitgerald, Brian, P., (General editor): Science in Geography,Series 1 to 4, Oxford University Press.
20. Gregory, S., 1978: Statistical Methods and the Geographers, Longman.
21. Hammond, R. and McCullagh, P., 1977: Quantitative Techniques in Geography: An Introduction, Clarendon Press.
22. Johnston, R.J., 1978: Multivariate Statistical Analysis in Geography, Longman.
23. King, L.J., 1969: Statistical Analysis in Geography, Prentice Hall. Inc.
24. Mahmood, A., 2005: Statistical Methods in Geographical Studies, Rajesh Publications, New Delhi.
25. Sarkar, Ashis., 2008: Practical Geography :A Systematic Approach, Orient BlackSwan, New Delhi.

PG Geography Course Structure Semester 2

Paper Type	Paper Code	Paper Name	Credit	Marks
Core	GEOG-2066	Geographical Thought	6	100
	GEOG-2076	Geography of Environment and Development	6	100
	GEOG-2086	Population and Settlement Geography	6	100
	GEOG-2096	Geography of Regional Development of India with Special Reference to North-East India	6	100
	GEOG-2104	Practical on Population and Settlement Geography and Regional Development of India and N.E. India	4	100

CBCS – Based P.G. Second Semester Course in Geography, 2021

Nowgong College (Autonomous)

Course Name: Geographical Thought

Paper Code: GEOG – 2066

(Theory: 80, Internal Assessment: 20)

Course objectives:

- Introduce the discipline geography and its theoretical development over time.
- Present contemporary and post-modern perspectives, along with the models that act as a guiding force of the discipline.

Course outcome:

This course helps students to

- Develop a comprehensive understanding of the discipline.
- Apply the historic and contemporary perspective to explain and approach the real world geographic problems.

[To answer seven questions, three questions carrying 16 marks each and four questions carrying 8 marks each]

1. Geography through the ages; general character of geographic knowledge during the ancient and mediaeval period; impact of explorations and discoveries and European renaissance on the emergence of modern geography.
2. Foundations of modern geography: contribution of German (Humboldt, Ritter, Ratzel), French (Paul Vidal de la Blache), British and American geographers.
3. Evolution of geographic thought (Determinism, Possibilism, Human Ecology, Morphology of Landscape, Areal differentiation) and their impact in the development of the field.
4. Dualisms in Geography: physical vs human, regional vs systematic, qualitative vs quantitative
5. Emergence of New Geography: quantitative revolution, school of locational analysis, perspectives in geography: positivism, behaviouralism, radical and humanistic approaches, welfare approach, feminism
6. Postmodern geography: socio-spatial dialectic and gender perspective, new environmentalism
7. Present trend in Indian Geography

Books Recommended:

1. Abler, R., Adams, J. and Gould, P.P., 1971: Spatial Organization: The Geographers'View of the World, Prentice-Hall, Englewood Cliff.
2. Ackerman, E.A., et al, 1965: The Science of Geography, Washington D.C.
3. Adhikari, S., 1992: Geographical Thought, Chaitanya Pub. House, Allahabad.
4. Adhikari, Sudeepta, 2015: Fundamentals of Geographical Thought, OrientBlackswan Pvt. Ltd., New Delhi.
5. Ahmad, A. (ed), 1996: Progress in Indian Geography (1992-1996), INSA, New Delhi.
6. Berry, B.J.L.,1973: 'A Paradigm for Modern Geography', in R.J. Chorley (ed)., Directionsin Geography, London Methuen.
7. Brunhes, J., 1920: Human Geography, Chicago tens T.C. le and edited by Isaisah Bowman.
8. Bunge, W.,1962: Theoretical Geography, Lund Studies in Geography, Lund, C.W.K. Gleerup.
9. Buttimar, A., 1978: 'On People, Paradigms and Progress in Geography', in D.R. Stoddart (ed),
10. Geography, Ideology and Social Concern, Oxford, Blackwell.
11. Chorley, Richard, J.,1973: Directions in Geography, Methuen, London.
12. Chorley, Richard, J. and Hagget, Peter (eds), 1967: Models in Geography, Methuen, London.
13. Dickinson, R.E.,1969: Makers of Modern Geography, Routledge and Kegan Paul, London.
14. Dikshit, R.D., 1994: The Art and Science of Geography, Prentice Hall of India, New Delhi.
15. Dikshit, R.D., 1997: Geographical Thoughts: A Contextual History of Ideas, Prentice Hall of India, New Delhi.
16. Gold, J.R.,1980: An Introduction to Behavioural Geography, Oxford University Press.
17. Gosal, G.S.(ed),1999: Fourth Survey of Research in Geography, Rawat Publishers,Jaipur and New Delhi.
18. Haggett, P.,1965: Locational Analysis in Human Geography, Arnold, London/ St. martin's press, New York
19. Haggett, P.,1979: Geography - A modern synthesis, Harper and Row, New York.
20. Hartshorne, R.,1939: The Nature of Geography, Association of American Geographers,Lancaster, Penn.
21. Hartshorne, R.,1959: Perspective on the Nature of Geography, Rand Mckully, Chicago.
22. Harvey, D., 1989: The Connection of Post modernity, Oxford, Basil Blackwell.
23. Harvey, D., 1969: Explanation in Geography, St. Martin's Press, New York.
24. Harvey, Milton and Holly, Brian P.,1989: Themes in Geographic Thought, Routledge,London.
25. Hussain, M., 1989: Evolution of Geographic Thought, Rawat Publications, Jaipur.
26. James, P.E., 1972: All Possible World: A History of Geographic Ideas, The Odyssey Press, New York.
27. Johnston, R.J. et al.(eds), 1986: The Dictionary of Human Geography, Oxford, Basil Blackwell.
28. Johnston, R.J. (ed),1983: Geography and Geographers, Edward Arnold, London.
29. Knox, P.L., 1975: Social Well-being: A Spatial Perspective, Oxford University Press, London.

30. Ley, S. and Samuels, M.S. (eds), 1978: Humanistic Geography: Prospects and Problems, Maaronfa Press, Chicago.
31. Peet, R., 1977: Radical Geography, Methuen, London.
32. Sauer, C.O., 1969: Land and Life, University of California Press, Berkeley and Los Angles.
33. Singh, J. (ed), 2000: Progress in Indian Geography (1996-2000), INSA, New Delhi. Smith,
34. David.M.,1977: Human Geography: A Welfare Approach, Edward Arnold,London.
35. Soja, E.W., 1990: Postmodern Geography, Verso, London.
36. Yeates, M., 1968: An Introduction to Quantitative Analysis in Economic Geography, McGraw Hill Inc.

CBCS – Based P.G. Second Semester Course in Geography, 2021

Nowgong College (Autonomous)

Course Name: Geography of Environment and Development

Paper Code: GEOG – 2076

(Theory: 80, Internal Assessment: 20)

Course objectives:

- To address various issues associated with environment.
- To related developmental agenda by maintaining pace with environment so that the sole of sustainable development can be achieved.

Course outcome:

- It provides the scope to develop a better understanding of environment from local to global perspectives.
- Increasing awareness towards environment and to equip with the methodologies of need based sustainable developmental plan.

[To answer seven questions, three questions carrying 16 marks each and four questions carrying 8 marks each]

1. Meaning of environment; Components of environment and their interrelationship and functioning; Natural and Human environment.
2. Defining Environmental Geography: emergence of environmental geography as a branch of geography; scope and significance of environmental geography.
3. Man-Environment Relationship: historical perspectives on man's interaction with environment; approaches to the study of man environment relationship.
4. Man and Atmosphere: man as a factor of climate change; industrialization-urbanization and climate; greenhouse effect and global warming.
5. Development processes: Nature and trend of development-global and national perspective
6. Environment and Development: concept of environment and development; sustainable development.
7. Global Environmental Problems: types and extent of environmental problems, area specific major environmental issues and problems; Environmental degradation: management and conservation
8. Environmental Pollution: factors of environmental pollution; types of pollution; major areas of environmental pollution; effects of environmental pollution.

9. Environmental Hazards and Disaster: meaning and types; tectonic disasters; climatic hazards; flood hazards with special reference to floods of Brahmaputra and Barak valleys, Assam.
10. Environmental Management: concept of environmental management; environmental Impact assessment; approaches of environmental management; global and regional Environmental programs and policies. Environmental education and legislation in India

Books Recommended:

1. Park,C.,1997: The Environment, Routledge, London.
2. Pickering, K.T. & L.A. Owne, 1994: An Introduction to Global Environmental Issues, Routledge, London.
3. Singh, S., 1991: Environmental Geography, Prayag Pustak Bhawan, Allahabad.
4. Goudie, A., 1984: The Nature of Environment, Basil Blackwell, London.
5. Strahler, A.N.and A.H.Strahler,1976: Geography and Man's Environment, John Willey, New York.
6. Simon, I.G.,1982: Biogeographical Process, Allen & Unwin, London.
7. Newson, M., 1992: Land, Water and Development, Routledge, London.
8. Varma, P.S. & V.K.Agarwal,1989: Principles of Ecology, S. Chand& Co., New Delhi.
9. Ress, J., 1985: Natural Resources, Routledge, London.
10. Cantledge, B (ed), 1992: Monitoring the Environment, Oxford University Press, Oxford.

CBCS – Based P.G. Second Semester Course in Geography, 2021

Nowgong College (Autonomous)

Course Name: Population and Settlement Geography

Paper Code: GEOG – 2086

(Theory: 80, Internal Assessment: 20)

Course objectives:

- Enable the students to understand the issues associated with population phenomena both in development and developing world.
- Understand the field of settlement geography in respect of different settlement models, growth of settlement and rural urban dichotomy.

Course outcome:

- The course enables the students to understand population issue in spatial dimension to diagnose the problem issue arise out of population growth.
- Understanding the settlement, both in urban and rural context equip students to prepare need based sustainable settlement plans and policies.

Unit I: Population Geography

[To answer four questions, two questions carrying 16 marks each and two questions carrying 8 marks each]

1. Defining the field of Population Geography; its emergence, trend of development and Significance.

2. Population theories: Malthus theory of population growth; Demographic transition theory.

3. Population Data: Nature, Sources and associated problems.

4. Components of population growth: fertility, mortality and migration; trend of population growth in the world and its different parts; patterns, processes and consequences of migration.

5. Demographic and socio-economic characteristics of population and associated issues: Global perspective and comparison between developed and developing countries;

6. Social wellbeing and quality of life; population as social capital, conceptual bases of under population, optimum population, over population and population explosion, population- resource regions; world population policies

Unit II: Settlement Geography

[To answer three questions, one question carrying 16 marks and two questions carrying 8 marks each]

1. Defining the field of settlement of geography; its development trend, significance and approaches

2. Origin and growth of rural and urban settlements; Characteristics of rural and urban settlements; Spatial patterns of settlements.

3. Morphology of rural and urban settlements; theories related to internal structure of urban settlements; distance-decay rule in urban context; problems and prospects of urbanization; sustainable development of cities

4. Rural-urban relationship: settlement hierarchy with reference to central place theory; rank-size rule; concept of urban fringe and smart city

Books Recommended

1. Ahmad, A., et. al (eds), 1997: Demographic Transition: The Third Third-World Scenario, Rawat Publications, Jaipur and New Delhi.
2. Chandna, R.C., 1986: A Geography of Population, Kaylani Publishers, New Delhi.
3. Clarke, J.I., 1972: Population Geography, Pergamon Press, Oxford.
4. Carter, H., 1972: The Study of Urban Geography, Edward Arnold, London.
5. Haggett, P., 1972: Geography: A Modern Synthesis, Harper & Row, New York.
6. Money, D.C., 1972: Patterns of Settlement, Evan Brothers, London.
7. Peters, G.L. and Larkin, R.P., 1979: Population Geography: Problems, Concepts and Prospects, Kendall/ Hunt Iowa.
8. Robinson, H., 1981: Population and Resources, Macmillan Press, London.
9. Singh, R.L. and Singh, K.N., (eds), 1975: Readings in Rural Settlement Geography, BHU, Varanasi.
10. Singh, R.Y., 1994: Geography of Settlements, Rawat Publications, Jaipur and New Delhi.
11. Sandram, K.V. and Nangia, S., (eds): Population Geography, Heritage Publishers, New Delhi.
12. Trewartha, G.T., 1969: A Geography of Population: World Pattern, John Wiley & Sons, Inc., New York.
13. Woods, R., 1979: Population Analysis in Geography, Longman, London.
14. Zelinsky, W., 1966: A Prologue to Population Geography, Prentice-Hall, Englewood Cliffs.

CBCS – Based P.G. Second Semester Course in Geography, 2021

Nowgong College (Autonomous)

Course Name: Geography of Regional Development of India with Special Reference to North-East India

Paper Code: GEOG – 2096

(Theory: 80, Internal Assessment: 20)

Course objectives:

This course enables the students to development an understanding of India in spatial context, along with its resource based, population, regional disparities of development and India's geographical significance. To develop a better understanding of the North-eastern part of India in respect of its problem and prospects of development.

Course outcome:

Development of a better spatial perspective of a country like India with greater physical and social disparity. Such issues have both utilitarian and applied aspects in a broader context.

Unit I: Geography of Regional Development of India

[To answer four questions, two questions carrying 16 marks each and two questions carrying 8 marks each]

1. India as a geographical entity; unity in diversity; locational significance.

2. Physical background of regional development: relief, drainage, climate, soil and vegetation.

3. Resource development: iron ore, coal, petroleum and water power potential, forest; groundwater

4. Population and development issues: population growth and its socio-economic implications, literacy, urbanization, occupation and social structure and development inequalities.

5. Regional disparities in economic development: agriculture, industry; transport and Communication.

6. India's geo-economic position in Asia and the world; Resource potentials; its economic development policies and international relations.

Unit II: Geography of Regional Development of North-East India

[To answer three questions, one question carrying 16 marks and two questions carrying 8 marks each]

1. North-East India: location and strategic significance

2. Physical characteristics and their relation to development: relief, drainage, climate, soil and vegetation.

3. Natural resources, their utilization and development: forests, coal, petroleum, natural gas and water and development scenario.

4. Population and development: population growth and distribution, Migration, population characteristics and their socio-economic implications.

5. Agriculture and development: problems of agriculture; agricultural modernization and economic development.

Books Recommended

1. Agarwala, S.N., 1988(First reprint): India's Population Problems, Tata McGraw Hill Publishing Co. Ltd. New Delhi
2. Barua, P.C., 1990:Development Planning of North East India, Mittal Publications, New Delhi.
3. Bhagabati, A.K. et al, 2001: Geography of Assam, Rajesh Publications, New Delhi.
4. Bhatt, L.S., 1973: Regional Planning in India, Statistical Publishing Society, Calcutta.
5. Bhattacharyya, N.N. (2010): North-East India: A Systematic Geography, Rajesh Publications, New Delhi.
6. Bose, A., (ed) 1967: Pattern of population Changes in India- 1951-61, Allied Publishers,Bombay.
7. Census of India Publications on India and North-Eastern States.
8. Das, H.P., 1971: Geography of Assam, NBT, New Delhi.
9. Das, M.M., 1984: Peasant Agriculture in Assam, Inter India Publications, New Delhi.
10. Dutta Ray, B., et. al (eds), 2000: Population, Poverty and Environment in North EastIndia,Concept Publishing Co., New Delhi.
11. Davis, K., 1951: Population of India and Pakistan, Princeton University Press, Princeton.
12. Despande, C.D., 1992: India: A Regional Interpretation, ICSSR, New Delhi.
13. Dhar, P.K., 1988 (2nd Edition): The Economy of Assam, Ashomi Prakashani
14. Duncan, G., 1967: Resource Utilization and the Conservation, Concept in Readings in Economic Geography, New York.
15. Gananathan, V.S., 1967: Economic Geography of India, NBT, India, New Delhi.
16. Govt. of India, 1965: The Gazetteers of India, Publication Division, Ministry of Information and Broadcasting, New Delhi.
17. Isard, Walter, 1960: Methods of Regional Analysis, MIT Press.
18. Kundu, A and RazaMoonis, 1982: Indian Economy: Regional Dimension, Center for Study of Regional Development, JNU, New Delhi.
19. Mohapatra, A.C.andRoutrey, J.K. (eds) 1998: Regional Development and Planning, Rawat Publications, New Delhi.

20. Misra, R.P.: Regional Planning: Concepts, Techniques and Policies, University of Mysore, Mysore.
21. Misra, et. al, 1974: Regional Development Planning in India- A Strategy, Institute of Development Studies, Mysore.
22. Mitra, Ashok, 1967: Levels of Regional Development in India, Vol. I, Census of India Publications, New Delhi.
23. Nag, P. and Sengupta, S.: Geography of India, Concept Publications, New Delhi.
24. N.E.C.: Basic Statistics for North Eastern Region, Shillong, 1990-91 onwards.
25. North East India Geographical Society: North Eastern Geographer, Department of Geography, Gauhati University.
26. Rao, V.L.S.P., 1964: Regional Planning, Indian Statistical Institute and Asia Publishing House, Calcutta.
27. Richardson, H.W., 1969: Regional Economics, Weidenfield and Nelson, London.
28. Sdasyuk, G. and Sengupta, P., 1968: Economic Regionalization of India, Census of India Publications, New Delhi.
29. Singh, R.L., (ed), 1968: India- Regional Studies, 21st IGC, New Delhi
30. Singh, R.L., (ed), 1971: India: A Regional Geography, National Geographical Society of India, Varanasi.
31. Sharma, T.R., 1949: Location of Industries in India, Hind Kitab, Bombay.
32. Spate, O.H.K. and Learmonth, A.T.A., 1967: India and Pakistan- Land, People and Economy, Methuen &Co. London.
33. Srivastava, M.A., 1967: Trade of India, S. Chand & Co. Delhi.
34. Taher M. and Ahmed, P., 2000: Geography of North East India, Mani-Manik Prakash, Guwahati.
35. The Geographical Society of North Eastern Hill Region (India): Hill Geographer, Shillong

CBCS – Based P.G. First Semester Honours Course in Geography, 2021

Nowgong College (Autonomous)

Course Name: Practical on Population and Settlement Geography and Regional Development of India and N.E. India

Paper Code: GEOG – 2104

(Practical: 80, Internal Assessment: 20)

Course objectives:

This course enables the students to add a spatial perspective to population and settlement issues through maps and diagrams.

Course outcome:

Practical on these issues help the students to portray problems as well as resource based in spatial perspectives and encourage the students to accommodate the significance of dimension in planning and policy making.

Unit I: Population and Settlement Geography

[To attempt three questions carrying 12marks each]

1. Population concentration and density pattern in North East India and Assam

(6Assignments)

2. Trend of population growth (Exponential and Non-Linear methods) and population projection of India, N.E. India/Assam/India (6Assignments)

3. Determination of spatial mean center of population, spatial mean center of urban population and settlements of selected areas. (4Assignments)

4. Distribution pattern of services/economic activities/settlements using Nearest Neighbour Analysis Statistic. (2 Assignments)

5. Population Density Gradient Analysis (2 Assignments)

6. Mapping volume and direction of population migration in North East India

(2 Assignments)

Unit II: Regional Development of India and North East India

[To attempt two questions carrying 12marks each]

1. Analysis of trend of population growth and food production in India. (3Assignments)

2. Spatial pattern of population density in Assam (district level) and dispersion of population density in India (state level). (3Assignments)

3. Mapping of population distribution of North-East India and analysis of its relationship with relief. (2Assignments)

4. Analysis of connectivity and centrality of transport networks in North East India.

(4Assignments)

5. Flow pattern of selected commodities of India and N.E. India using standard carto-statistical techniques. (2 Assignments)

Unit III: Field work (10 Marks)

Unit IV: Practical Note-Book and Viva-voce (10 Marks)

1. Evaluation of Practical Note-Book (5 marks)

2. Viva-voce (5 marks)

Books Recommended

1. Berry, B.J.L. and Marble, D.F., 1968: Spatial Analysis: A Reader in Statistical Geography, Prentice-Hall, Inc.

2. Chorley, R.J. and Haggett, P., (ed), 1968: Models in Geography, Methuen & Co. Ltd.

3. Fitgerald, Brian, P., (General editor): Science in Geography, Series 1 to 4, Oxford University Press.

4. Gregory, S., 1978: Statistical Methods and the Geographers, Longman.

5. Hammond, R. and McCullagh, P., 1977: Quantitative Techniques in Geography: An Introduction, Clarendon Press.

6. King, L.J., 1969: Statistical Analysis in Geography, Prentice Hall. Inc.

7. Mahmood, A., 2005: Statistical Methods in Geographical Studies, Rajesh Publications, New Delhi.

8. Misra, R.P., and Ramesh, A., 1989: Fundamentals of Cartography, Concept Publishing co. New Delhi.

9. Monkhouse, F.J., and Wilkinson, H.R., 1989: Maps and Diagrams, B. I., Publications Pvt. Ltd., New Delhi.

10. Sarkar, Ashis., 2008: Practical Geography :A Systematic Approach, Orient BlackSwan, New Delhi.

11. Singh, R.L. and Singh Rana, P.B., 1998: Elements of Practical Geography, Kalyani Publishers, New Delhi.

PG Geography Course Structure Semester 3

Paper Type	Paper Code	Paper Name	Credit	Marks
Core	GEOG-3116	Quantitative and Cartographic Methods in Geography	6	100
	GEOG-3123	Fundamentals of Remote Sensing, GIS and GPS	3	50
	GEOG-3133	Research Methodology in Geography	3	50
	GEOG-3146	Social, Cultural and Political Geography	6	100
Optional	GEOG-3156	(A) Fluvial Geomorphology (B) Geoinformatics (C) Population Geography (D) Regional Development Planning	6	100
Core	GEOG-3164	Practical on Quantitative and Cartographic Methods	4	100

CBCS – Based P.G. Third Semester Course in Geography, 2021

Nowgong College (Autonomous)

Course Name: Quantitative and Cartographic Methods in Geography

Paper Code: GEOG – 3116

(Theory: 80, Internal Assessment: 20)

Course objectives:

Students will be given exposure to the use of quantitative and qualitative techniques in geographical analysis including sampling, inferential statistics and analysis of special data. The second part of this course will equip students with mapping and field surveying skills.

Course outcome:

At the end of the course students should be able to:

- Understand what methods to use for geographical data analysis.
- Understand the principles of surveying and mapping.

Unit I: Quantitative Methods in Geography

[To answer one question carrying16marks and three questions carrying 8marks each.]

1. Methodological developments in geography: quantitative and qualitative; significance of quantification in geographical analysis; limitations of quantitative techniques.
2. Geographic data matrix; nature and types of geographic data, levels of measurement, data source and acquisition techniques.
3. Sampling and its need in geographical data collection; Sampling techniques (Probability and Non-Probability sampling); application of probability in samples selection and sample data analysis.
4. Application of inferential statistics in hypothesis testing; parametric and non-parametric tests, selection of significance level.
5. Application of quantitative methods in physical and human geography

Unit II: Cartographic Methods in Geography

[To answer one question carrying16marks and three questions carrying 8 marks each.]

1. Significance of cartography in geography; traditional and digital cartography.
2. Principles of mapping; base map preparation; concept of point, line and area; concept to generalization; scale; choice of map projection (Zenithal, Conical, Cylindrical) map design

and layout.

3. Thematic mapping: meaning and type; principles of thematic mapping; basic ideas of isopleth, choropleth and choro-chromatic mapping; concept of three dimensional representation of geographical data.
4. Techniques of physical and socio-economic data representation and mapping.

Books Recommended

1. Berry, B.J.L. and Marble, D.F., 1968: *Spatial Analysis: A Reader in Statistical Geography*, Prentice-HallInc., Englewood Cliff,J.N.
2. Chorley,R.J .and Haggett,P.(eds),1967:*ModelsinGeography*,Methuen,London.
3. Cole, J.P. and King, C.A.M., 1968: *Quantitative Methods in Geography*, Willey and Sons, NewYork.
4. Duncan, O.D., et al, 1961: *Statistical Geography: Problems in Analysing Areal Data*, Free Press ofGlencee, NewYork.
5. Davis, P., 1988: *Data Description and Presentation (Science in Geography series)*, OxfordUniversityPress, Oxford.
6. Elhance,D.N.,1972:*FundamentalofStatistics*,KitabMahal,Allahabad.
7. Eyles, J. and Smith, D.M.(eds),1988: *Quantitative Methods in Human Geography*, Polity Press,Oxford.
8. Gregory,S.,1963:*StatisticalMethodsandtheGeographers*,Longman,London.
9. Hagget, P. and McCullagh, P., 1965: *Locational Analysis in Human Geography*, Arnold, London.
10. Hammond, R. and McCullagh,P.,1965:*QuantitativeTechniquesin Geography*, Clarendon Press, Oxford.
11. Jonston, R.J., 1978: *Multivariate Statistical Analysis in Geography*, Longman, London.
12. King,L.J.,Statistical Analysisin Geography, Prentice Hall, Engle wood cliff, N.J.
13. Campbell,J.,1984:*IntroductoryCartography*,PrenticeHallInc.,EnglewoodChiffs,N.J.
14. Cuff, D.J. and Mattson, M.T., 1982: *Thematic Maps: Their Design and Production*, Methuen,NewWork.
15. Kanetkar,T.P.andKulkarni,S.U.:*SurveyingandLevelling*,Vol.I&II,VidyarthiGrithaPrakashan,Pune.
16. Kellaway,G.P.:*Map Projections*, Methuen & Co.,London
17. Lawrence,G.R.P.,1964:*Cartographic Methods*, Oxford University Press, London.
18. Lewis,P.,1967:*Maps andStatistics*, Methuen &Co.Ltd., London
19. Misra, R.P and Ramesh, A.,1995: *Fundamentals of Cartography*, Concept Publishing Company, New Delhi.
20. Monkhouse, F.J. and Wilkinson, H.R.,1989: *Maps and Diagrams*, B.I. Publications, New Delhi.Nag, P., 1992: *Thematic Cartography and Remote Sensing*, Concept publishing Co., New Delhi.
21. Nag,P.andKudra,M.,1998:*Digital Remote Sensing*,ConceptPublishingCo.,NewDelhi.
22. Patel,A.N.andSingh,S.,1999:*Principles of Remote Sensing*, Scientific Publishers (India), Jodhpur.
23. Raisz,E.:*General Cartography*, McGraw Hill Co., London.
24. Raisz,E.: *Principles of Cartography*,McGraw Hill Co.,London.
25. Robinson,A.H.,*etal*: *Elements of Cartography*, John Wiley &Sons,New York.
26. Singh,R.L.:*Elements of Practical Geography*, Kalyani Publishers, New Delhi.

CBCS – Based P.G. Third Semester Course in Geography, 2021

Nowgong College (Autonomous)

Course Name: Fundamentals of Remote Sensing, GIS and GPS

Paper Code: GEOG – 3123

(Theory: 40, Internal Assessment: 10)

Course objectives:

This is part of the M.A./ M.Sc. Geography and provides students with an introduction to remote sensing, GIS and GPS methodologies.

- Students will learn data acquisition and principles of interpretation of remotely sensed data.
- They will be instructed in how GIS/GPS facilitate the analysis of RS data.

Course outcome:

At the end of the course students should be able to:

- Understandtherationalebehinduseofremotelysenseddataitsadvantagesanddisadvantages.
- UnderstandhowGIS/GPSmethodologiescanbeusedtoaddressspatialanalysisfromthetheoret icalperspective.

Group I: Remote Sensing

[To answer two questions, one question carrying 10 marks and another 5 marks]

1. Basic Concepts and Principles of Remote Sensing
2. Significance of remote sensing in geography as spatio-temporal data acquisition tool
3. Airborne and Satellite Remote Sensing: Data products and characteristics
4. Remote Sensing Data Interpretation: Visual and digital techniques; digital image processing
5. Application of Remote Sensing in geomorphology, water resources , forestry, rural and urban Planning

Group II: GIS

[To answer two questions, one question carrying 10 marks and another 5 marks]

1. Field of GIS: Basic concepts, principles, components and functions
2. Data types and structure of GIS: Raster and Vector data structure
3. Spatial analysis techniques and thematic representation of data in GIS
4. GIS Software; Commercial and Open Source
5. Application areas of GIS in geographical study

Group C: GPS
[To answer two questions carrying 10 marks each]

1. Introduction to GPS technology and its working principles
2. GPS elements and types of signals and receivers and data acquisition techniques; Accuracy of GPS data;
3. Applications of GPS in geographical study

Books Recommended

1. Burrough, P. A., 1986: Principles of Geographical Information Systemsin Land Resources Assessment, Clarendon Press, Oxford.
2. Burrough, P.A .and McDonnel, R.A., 1998: Principles of Geographical Information Systems, Oxford University Press.
3. Colwell,R.N.,1983:ManualofRemoteSensing,Vol.I&II,AmericanSocietyofPhotogram metry.
4. Curran, Paul, J., 1985: Principles of Remote Sensing, Longman Group Ltd.
5. Gautam, N.C., 1970: Urban Land use Study through Aerial Photo-interpretation Techniques, Pink Publishing House, Mathura.
6. Star, J. and Ester, J.,1990: Geographic Information System, Prentice-Hall.
7. Lilesand, T. M. and Kiefer, R. W., 1987: Remote Sensing and Image Interpretation, John Wiley.
8. Hord, R. Michael., 1986: Remote Sensing: Methods and Applications, John Wiley. Maguire,
9. D.J., Goodchild, M. and Rhind, D. J.,1990: Geographical Information Systems: Principles and Applications, Longman Science and Technology Publications. Robinson,
10. A. H., et al.,1995: Elements of Cartography, John Wiley.
11. Sabins,Floyd F., 1987: Remote Sensing Principles and Interpretation, W.H. Freeman and Company, New York.

CBCS – Based P.G. Third Semester Course in Geography, 2021

Nowgong College (Autonomous)

Course Name: Research Methodology in Geography

Paper Code: GEOG – 3133

(Theory: 40, Internal Assessment: 10)

Course Objectives

This course will enable students to:

- Understand how to approach a research problem
- Understand how to collect data, review literature and analyse data

Course outcome:

This course will help students how to proceed with tackling a research problem and the steps one should adopt and the tools and craft a geographer usually employs.

[To answer 6 questions, two question carrying 10 marks and 4 questions of 5 marks]

1. Meaning of research and geographic research; types of research; Introduction to research methodology in geography.
2. Formulation of a research problem.
3. Research design: statement of the problem, objectives, and hypothesis/ research questions, methodology, significance, review of research works and referencing.
4. Inductive and deductive approaches in geographic research, concept development, model building and hypothesis testing.
5. Questionnaire design, data collection, data processing and analysis.
6. Preparation

Books Recommended

1. Creswell J., 1994: Research Design: Qualitative and Quantitative Approaches Sage
2. Publications.
3. Dikshit, R. D. 2003. The Art and Science of Geography: Integrated Readings. Prentice-
4. Hall of India, New Delhi.
5. Evans M., 1988: "Participant Observation: The Researcher as Research Tool" in
6. Qualitative Methods in Human Geography, eds. J. Eyles and D. Smith, Polity.
7. Misra, R.P. (2002) Research Methodology, Concept Publications, New Delhi.
8. Stoddard R. H., 1982: Field Techniques and Research Methods in Geography,
9. Kendall/Hunt.
10. Wolcott, H. 1995. The Art of Fieldwork. Alta Mira Press, Walnut Creek, CA.

CBCS – Based P.G. Third Semester Course in Geography, 2021

Nowgong College (Autonomous)

Course Name: Social, Cultural and Political Geography

Paper Code: GEOG – 3146

(Theory: 80, Internal Assessment: 20)

Course objectives:
This course will equip students to:

- Comprehend the social aspects of geographical phenomena and their interface within the area of cultural geography.
- Understand how geography influences political issues and their spatial dimensions.

Course outcome:
To appreciate socio-cultural and political dimensions of geographic phenomena

- To understand how language, religion, ethnicity tangent with lebensruam, frontiers and boundaries and influence the geography of a region.

Unit I: Social and Cultural Geography
[To answer four questions, one carrying 16 marks and three carrying 8 marks each]

1. Defining the field of social geography; development of social geography
2. Concept of social space, social group, social structure, social differentiation, social diversity, plurality, socio-spatial inequalities, social well-being.
3. Defining the field of cultural geography; its trend of development and significance.
4. Sauer's Morphology of Landscape School.
5. Themes and concepts in cultural geography: cultural hearth, cultural area, cultural region, cultural landscape, cultural history, cultural ecology, cultural diffusion and cultural integration
6. Patterns of world cultural regions with reference to (a) language,(b) religion and (c) ethnicity.

Unit II: Political Geography
[To answer four questions, one carrying 16 marks and three carrying 8 marks each]

1. Defining the field of political geography and its significance
2. Historical development of political geography; schools of thought: Landscape school,

ecology school and organismic school

3. Approaches to the study of political geography: historical, morphological and functional.
4. Concepts in political geography: lebensraum, state and nation, core periphery and capital, frontier and boundary, buffer zone, rim-land, geopolitics, heartland and its theory and political economy.
5. International relations; India's relations with neighbors; Act East Policy.
6. Political Geography and Geopolitics; Mackinder's heartland theory and its present day context and relevance

Books Recommended

Social Geography

1. Ahmad,A.,1999: *Social Geography*, Rawat Publications, Jaipur and New Delhi.
2. Ahmad,A.,(ed),1993:*Social Structure and Regional development: A Social Geography Perspective*, Rawat Publications, Jaipur.

3. Carter, Johnand Trevor, Jones. 1989: *Social Geography: An Introduction to Contemporary Issues*, Edward Arnold, London.
4. Eyles, J.: '*Social Geography'*, in Johnston, R.J.,etal, *The Dictionary of Human Geography*.
5. Jones,E. and Eyles,J., 1977: *An Introduction to Social Geography*, Oxford University Press, Oxford and New York.

6. Jones,E, (ed),1975: *Readingsin Social Geography*, Oxford University Press, Oxford.
7. Sharma, H. N.,2000: '*Social Geography'* in Singh,J.(ed.) *Progress in Indian Geography(1996-2000)*,INSA, New Delhi.

8. Smith, D.M., 1977: *Human Geography: A Welfare Approach*, Edward Arnold, London.
9. Sopher, D.E. (ed),1980: *An Exploration of India :Geographical Perspectives on Society and Culture*, Longman, London.

10. Srinivas,M. N.,1986: *India: Social Structure*, Hindustan Publishing Corporation, Delhi.
11. Taher, M., 1994: *A*n Introduction to *Social Geography: Concept and Theories*, NEIGS, Guwahati.

Cultural Geography

1. Crans, Mike,1998: *Cultural Geography*, Routledge, London.
2. Dancan, J. and Ley, D.(eds),1992: *Place/ Culture/ Representation*, Routledge, London.

3. Gritzer, Charion, F., 1984: 'The Scope of Cultural Geography', *Journal of Geography*, Volume 65, pp.4-11.
4. Jackson, Richard. H. and Hudman, Lloyel. E., 1990 :*Cultural Geography*, West Publishing Company, New York.
5. Johnston, R.J., Gregory, Derek and Smith, David M. (eds), 1994: *The Dictionary of Human Geography*, Blackwell, Oxford.
6. Jordan,T.G. and Rowntree,L.: *The Human Mosaic: A Thematic Interpretation in Cultural Geography*.
7. Noble,A.G. and Dutt,A.K.(eds), 1982: *India: Cultural Pattern and Processes*, West View Press/ Boulder, Colorado.
8. Sauer, Carl. O.,1963: *Land and Life*, University of California Press, Berkley.
9. Thomas,W.L.(ed.),1959: *Man'sRole in Changing the Face of the Earth*, University of Chicago Press, Chicago.
10. Zelinsky,W.,1973: *TheCultural Geography of America*, Princeton University Press, Princeton, N. J.

Political Geography

1. Adhikari , S., 1996 : *Political Geography*, Rawat Publications, Jaipur and New Delhi.
2. De Blij,H.J.,1972 :*Systematic Political Geography*, John Wiley, New York.
3. Dikshit,R.D.,1982: *Political Geography: A Contemporary Perspective*, Tata McGraw Hill Publishing Co. Ltd., New Delhi.
4. Muir, R.,1975 : *Modern Political Geography* , Macmillan Ltd., London. Pounds,
5. N.J.G.,1972 :*Political Geography*, McGraw Hill , New York.
6. Prescott, J. R.V.,1972: *Political Geography*, Methuen, London.
7. Sukhwal, B. L.,1979: *Modern Political Geography of India*, Sterling, New Delhi.
8. Taylor, P.J. 1989: *Political Geography*, Longman, London.

CBCS – Based P.G. Third Semester Course in Geography, 2021

Nowgong College (Autonomous)

Course Name: Fluvial Geomorphology

Paper Code: GEOG – 3156 (A)

(Theory: 80, Internal Assessment: 20)

Course objectives:

To enable the student to understand:

- Methods and techniques of fluvial geomorphology including sediment to logical techniques, remote sensing and GIS
- Methods of channel and flood plain morphology

Course outcome:

After attending this course students would be able to:

- Understand concepts of fluvial geomorphology such as run-off estimation, hydrograph analysis channel equilibrium and channel dynamics.

Unit I: Concepts and Techniques in Fluvial Geomorphology

[To answer four questions, one carrying 16 marks and three carrying 8 marks each]

1. Meaning, scope and evolution of fluvial geomorphology; Relation between fluvial geomorphology and hydrology.
2. Methods and techniques in fluvial geomorphological studies: sedimentological techniques, remote sensing, GIS and computer applications, Digital representations of hydrologic parameters.
3. Drainage basin as a fluvial system: inputs and outputs in the basin; drainage basin as a fundamental geomorphic unit.
4. Runoff estimation in the basin and factors controlling runoff; Rainfall-runoff relationship, Hydrograph analysis
5. Chanel at Grade: Concept of grade, attainment of grade, Channel equilibrium

Unit II: Channel and Flood plain Morphology

[To answer four questions, one carrying 16 marks and three carrying 8 marks each]

1. Channel types: development and morphological characteristics.
2. Classification and analysis of the plangeometry of channels, channel patterns: straight, meandering and braided; geometry of meanders, development and causes

of meandering; mechanics and causes of braiding

3. Channel changes, Dimension of Channel Changes, Nature of Channel changes in time and over space, Factors of Channel change, Channel changes in meandering and braided rivers with examples from Brahmaputra and its tributaries of Assam.
4. Floodplain: genesis, morphology, characteristic features and associated processes.

Books Recommended

1. Bhagabati, A. K., Bora, A. K. and Kar, B. K. (eds), 2001: *Geography of Assam*, Rajesh Publications, New Delhi.
2. Chorley, Wolman and Millerm, 1969: *Fluvial Processes in Geomorphology*, W.H. Freeman and Company, San Francisco.
3. Chorley, R.J.(ed), 1969:*Water, Earth and Man*, Methuen, London.
4. Chouhan,T.S.,1995:*Remote Sensing: Principles and Interpretation*, H.W. Freemanand Company, San Francisco.
5. Chow,V.T.,1964: *Handbook of Applied Hydrology*, McGraw Hill Book Company, NewYork.
6. Folk,R.L., 1980: *Petrology of Sedimentary Rocks*, Hemphill Publishing Co. Austin, Tx.
7. Garde,R.J.and Ranga Raju,K .G.:*Mechanism of Sediment Transportation*.
8. Gregory, K. J. and Walling, D. E., 1973: *Drainage basin Form and Processes*, Arnold, London.Kanidhton,D., 1984:*Fluvial Formsand Processes*, Edward Arnold, London.
9. Leopold, Wolman and Miller, 1964: *Fluvial Processes in Geomorphology*, W. H. Freeman and Company, San Francisco.
10. Morisawa,M.,1968:*Streams: Their Dynamics and Morphology*, McGraw Hill Book Company, New York.
11. Mutreja,K.N.,1986: *Applied Hydrology*, McGraw Hill Book Company, New York.
12. Petti john,F,J.,1975: *Sedimentary Rocks*, Harper and Raw Publishers, New York.
13. Petts, G. E. and Foster, I., 1985: *Rivers and Landscape*, Edward Arnold, London.
14. Rao, K. L., 1975: *India's Water Wealth*, Orient Longman, New Delhi.
15. Sabnis,Floyd.F.,1978:*Remote Sensing: Principles and Interpretation*, H. W. Freeman and Company, San Francisco.
16. Schumm, S. A.,1977: *The Fluvial System*, Wiley Inter science, NewYork.

CBCS – Based P.G. Third Semester Course in Geography, 2021

Nowgong College (Autonomous)

Course Name: Geoinformatics

Paper Code: GEOG – 3156 (B)

(Theory: 80, Internal Assessment: 20)

Course Objectives:

Students should be able to grasp:

- Remote Sensing methodologies including sensors, platforms and data products from USA, ESA and India
- Integration of RS with GIS & GPS data and new tools such as UAVs and micro satellites

Course outcome:

After this course students should be able to:

- Derive a comprehensive understanding of the use of RS/GIS/GPS techniques and their integration

Unit I: Remote Sensing

[To answer four questions, one carrying 16 marks and three carrying 8 marks each]

1. Remote Sensing System/ technology: Definition, principles and field of study; Types of Remote Sensing (Aerial and Satellite Remote Sensing)
2. Electromagnetic spectrum, energy radiation principles, energy interactions in atmosphere and with earth surface features
3. Fundamentals of aerial photography: aerial cameras, spectral and radiometric characteristics.
4. Geometric characteristics of aerial photographs; scale and ground coverage; classification of aerial photographs; tilt and relief displacement.
5. Remote Sensing Systems-Sensors, Platforms, CCDs and resolution
6. Earth models, datum, coordinate systems, UTM zones
7. Satellite data products from USA, ESA and India.

Unit II: Geographic Information System

[To answer three questions, one question carrying 16 marks and two questions Carrying 8 marks each.]

1. Defining the field of GIS; components of GIS; development trend.
2. Data input, storage and maintenance; manipulation, analysis and output.
3. GIS data models and spatial data structure; Raster and vector data formats and raster to vector and vector to raster conversion.
4. GIS databases, RDBMS and queries
5. Integration of remote sensing data and GIS.

Unit III: Global Positioning System

[To answer two questions carrying 8 marks each.]

1. GPS concepts, navigation principles, GPS receivers, DGPS, errors and accuracy
2. Real world GPS applications: Spatial data updating, Urban planning, forestry, disaster management and infrastructure planning.
3. Drones, UAVs and micro satellites: Applications in smart agriculture, environmental conservation, urban planning and climate studies.

Books Recommended

1. Bolstad, Paul. 2012. GIS Fundamentals: A First Texton Geographic Information Systems, Xan Edu.
2. Publishing Inc. Ann Arbor.
3. Dessers. E.2014. Spatial Data Infrastructures at Work: Analysing the Spatial Enablement of Public Sector Processes. Leuven University Press, Belgium.
4. DeMers, Michael. N.2008. Fundamentals of Geographic Information Systems. Wiley.
5. Fazal, S. 2008. GIS Basics. New Age International Pvt. Ltd Publishers.
6. Jensen, John R. 2015. Introductory Digital Image Processing: A Remote Sensing Perspective, Pearson Education.
7. Lilesand,T. M. and Kiefer, R. W.,1987. Remote Sensing and Image Interpretation, John Wiley.
8. Lo,C. P. and Yeung, A.K.W.2006. Concepts and Techniques of Geographic Information Systems. Prentice Hall.
9. Misra, Pratap and Enge, Per. 2010. Global Positioning System: Signals, Measurements, and Performance. Ganga-Jamuna Press, Lincoln, MA.
10. Nedovic Budic,Z., Crompvoets, J.and Georgiadou, Y.2011. Spatial Data Infrastructures in Context: North and South. CRC Press: Taylor &Francis.
11. Steinberg, Sheila L & Steinberg, 2015. Steven J. GIS Research Methods: Incorporating Spatial Perspectives, ESRI Press: Redlands.

CBCS – Based P.G. Third Semester Course in Geography, 2021

Nowgong College (Autonomous)

Course Name: Population Geography

Paper Code: GEOG – 3156 (C)

(Theory: 80, Internal Assessment: 20)

Course Objectives:

To allow students to understand:

- The nature and approaches to population geography and the underlying theories therein
- The population-resource relationships in developed and developing contexts
- Factors affecting the distribution and growth of population in different parts of the world.

Course outcome:

Students should be able to:

- Develop an understanding of the theories and "laws" in population geography
- Interpret the problems and prospects of population growth, distribution, composition and rural-urban differences in diverse areal contexts

Population Geography

[To answer seven questions, three questions carrying 16 marks each and four questions carrying 8 marks each]

1. The field of population geography: nature, development and approaches; its relation with demography.
2. Sources of population data; problems associated with reliability and comparability of data; problems of mapping population data; and techniques of Population projection.
3. Population theories: ideas of Malthus, Ricardo and Marx.
4. Models and theories: vital rates, migration and population growth; demographic transition; laws of migration –Raveinstein and Lee; and theories of migration – Hagerstrand and Wolpert.
5. Population and resource relationship: concept of under population, optimum population, over population, population explosion and population pressure; Population – Resource regions.
6. Growth and distribution of population in the world and in its different parts.
7. International migration–push and pull factors and consequences of migration.
8. Comparative study of population characteristics of the developed and less

developed countries: vital rates, infant mortality rates, age and sex composition, life expectancy and demographic transition; literacy and education, rural and urban composition, and occupational structure.

9. Population policies in developed and developing countries (India, China and USA).

Books Recommended

1. Agarwal,S.N.,1988: India's Population Problems, Tata McGraw Hills Publishing Co.Ltd. NewDelhi.
2. Ahmad,A.etal(eds), 1997: Demographic Transition: The Third World Scenario, Rawat Publications, Jaipur and New Delhi.
3. Beaujeu-Garnier,J.,1966:GeographyofPopulation,Longman,London.
4. Bhende,A.andKanitkar,T.:Principles of Population Studies, Himalaya Publishing House, Bombay.
5. Chandna,R. C.,1988:AGeographyof Population, Kalyani publishers, New Delhi.
6. Clark, J.I., 1971: Population Geography and Developing Countries, Pergamon Press, Oxford. Clark,J. I., 1972: Population Geography, Pragamon Press, Oxford.
7. Demko,G.J. et al,1970: Population Geography: A Reader, McGraw Hill, New York.
8. Gosal,G.S., 1984: Population Geography in India, in Geography and Population, Approaches and Applications, John I. Clarke (ed), Pergamon Press, Oxford.
9. Mehta, S.,1990:Migration, A Spatial Perspective, Rawat Publications, Jaipur and New Delhi.
10. Raza, M. and Ahmad, A., 1990: An Atlas of Tribal India, Concept Publishing Company, New Delhi.
11. Robinson, H., 1983:Population and Resources, Macmillan Press, London.
12. Trewartha,G. T.,1969: A Geography of Population: World Pattern, John Wiley, New York.
13. Woods, R.,1979: Population Analysis in Geography, Longman, London.
14. Zelinsky, W., 1966: A Prologue to Population Geography, Prentice-Hall, Englewood Cliffs.

CBCS – Based P.G. Third Semester Course in Geography, 2021

Nowgong College (Autonomous)

Course Name: Regional Development Planning

Paper Code: GEOG – 3156 (D)

(Theory: 80, Internal Assessment: 20)

Course Objectives:

Students should be able to:

- Understand the concept of a region from a Geographic perspective and its ramifications in planning.
- Gain and understanding of the various theories and techniques of regionalization and multi-level planning.

Course outcome:

Students would be able to

- Derive and understanding of regional development, its approaches, regionalization techniques and the need for conservation and management of resources for development.

Regional Development Planning

[To answer seven questions, three questions carrying 16 marks each and four questions carrying 8 marks each]

1. The Concept of region and regional development
2. Identification of regions: Resource regions, Functional Regions, Problem Regions
3. Means of achieving regional development; management of resources for regional development
4. Approaches to regional planning: Synoptic, functional and ad-hoc or specific
5. Theories of spatial distribution: Central place theory of Christaller, Growth Pole theory of Perroux and Boudeville, Core-periphery theory of Frederick, Cumulative causation theory of Gunnar Myrdal, Multi-level Growth Foci concept of R. P. Misra
6. Methods of regionalization and techniques of regional planning.
7. Decentralization and Multi-level planning.
8. Town and Country Planning.

Books Recommended

1. Banerjee ,A. and Kar. B., 1999: Economic Planning and development of North Eastern States, Kanishka Publications, New Delhi.
2. Choud, M. and Puri, V. K., 1983: Regional Planning in India, Allied Publications, New Delhi.
3. Deb,B.J.,1995: Regional Development in North East India, Reliance Publications, New Delhi.
4. Friedman, J. and William Alonso(eds),1964: Regional Development and Planning, Cambridge, Mass. M.I.T. Press.
5. Friedman, J., 1973: Utilization, Planning and National Development, Bererly Hills, Sage Publications.
6. Gallion,A.B. and SimonEisner,1974:The Urban Pattern: City Planning and Design, East West Press Pvt.Ltd., New Delhi and Van Norstrand Reinhold Co.
7. Glasson, J.,1974: An Introduction to Regional Planning, Hutchinson Educational Ltd., London.
8. Gogoi, J. K.,1978: The Government of India's Policy for Regional Development-A Summing Upanda Critique, North Eastern Econ. Rev.II(3),July-Sept.
9. Goswami, A., 1981: Assam's Industrial Development: Urgency of New Direction, Econ. Pol. Weekly, VI(21)
10. Hilhorst ,J.G.M. and Dunham,D.M., 1971: Issues in Regional Planning, Institute of Social Studies, The Hague.
11. Holier,G. P., 1988: Regional Development, in Michael Pacione(ed.), The Geography of the Third World: Progress and Prospect, Rutledge, London and New York.
12. Isard, Walter et al, 1998: Methods of Interregional and Regional Analysis, Ashgate Publishing Ltd., Aldershot.
13. Kidwai, A. H.,1985: Disparities in the Levels of Regional Development and Spatial Differentiation in India in the Historic Context, CSRD,JNU, Mimeo.
14. Mishra, R. P.,Sundaram, K.V.and Rao,P.,V.L.S.,1974: Regional evelopment Planningin India; A New Strategy, Vikas Publications, New Delhi.
15. Mishra, R.P., 1992: Regional Planning; Concept, Techniques, Policies and Case Studies, Concept Publications, New Delhi.
16. Mohapatra,A.C.,1985: The Concept of region, Hill Geographer, IV(1)
17. Mohapatra, A.C. and Rootray, J.K., 1998: Regional Development and Planning, Rawat, Jaipur.
18. Mukherjee, A., 1991: Methodology and Database for Decentralized Planning, Heritage, New Delhi.
19. Mukherjee,A., 1993:A Perspective Plan for A Hill District, Heritage, New Delhi.
20. Pannerselvam, A., 1999:Regional Development in the Developing Countries: A Search for Appropriate Theory, Space, 12 (2).

CBCS – Based P.G. Third Semester Course in Geography, 2021

Nowgong College (Autonomous)

Course Name: Practical on Quantitative and Cartographic Methods

Paper Code: GEOG – 3164

(Practical: 80, Internal Assessment: 20)

Course objectives:

- To provide students with skills to use quantitative techniques in data analysis and use multivariate analysis.
- Students will put skills learnt in a previous course to practical use in constructing various projections and in understanding surveying using standard equipment.
- Students on finishing this course will be equipped with the knowledge of several quantitative techniques applicable to geographic data.
- Develop skills in map reading, data interpretation of physical geographic and socio-economic data.

Course outcome:

Students will be able to learn the different quantitative, cartographic and surveying techniques and its applications in geographical studies.

Unit I: Practical Work son Quantitative Methods
[To attempt 3 Questions carrying 12 marks each]

1. Application of elementary matrix algebra in multivariate data analysis. (3 Exercises)
1. Application of probability distributions (normal, poisson and binomial) in geographical analysis. (3 Exercises)
2. Application of relevant hypothesis testing techniques (parametric and nonparametric) in geographical data analysis; use of z, t, f and x^2 (Chi-square) statistics. (4 Exercises)
3. Simple and multiple correlation and regression analysis; non-linear relationship (rank-size relationship and distance decay) analysis. (4 Exercises)
4. Spatial interaction, population potential surface, spatial diffusion, shape index and transport network analysis (Alpha, Beta, Gama) (4 Exercises)
5. Techniques of multivariate analysis in areal classification and regionalisation:

Triangular graph and combination analysis, Composites scores-composite z score and principal component analysis. (3 Exercises)

6. Data Grouping Techniques for Choropleth mapping: Equal step, parameters of normal distribution, nested means, quartiles and equal-area. (2 Exercises)

Unit II: Practical Works on Cartographic Methods

[To attempt 2 Questions carrying 12 marks each]

1. Traversing and topographic surveying with the help of prismatic compass and the Total stations (3 Exercises)
2. Contouring and profile leveling with the help of dumpy level. (2 Exercises)
3. Construction of map projections (5 Exercises)
   a) Zenithal gnomonic (Equatorial case)
   b) Lambert's conical equal-area projection
   c) Mercator's projection
   d) Mollweide's projection
   e) Universal Transverse Mercator
4. Map reading and analysis, preparation of base map. (2 Exercises)
5. Representation of physical and socio-economic data using band graph, sphere diagram, flow chart, isolines and transect chart. (4 Exercises)
6. Representation of land and population by topological space diagram (grid cells) for comparative study. (2 Exercises)

Unit III: Practical Note Book and Viva-voce

1) Evaluation of Practical Note-book (15 Marks)
2) Viva-voce (5 Marks)

Books Recommended

1. Berry, B.J.L. and Marble, D.F., 1968: Spatial Analysis: A Reader in Statistical Geography, Prentice-HallInc., Englewood Cliff,J.N.
2. Chorley,R.J .and Haggett,P.(eds),1967:Models in Geography, Methuen, London.
3. Cole, J.P. and King, C.A.M., 1968: Quantitative Methods in Geography, Willey and Sons, NewYork.
4. Duncan, O.D., et al, 1961: Statistical Geography: Problems in Analysing Areal Data, Free Press ofGlencee, NewYork.
5. Davis, P., 1988: Data Description and Presentation (Science in Geography series), OxfordUniversityPress, Oxford.

6. Elhance,D.N.,1972:Fundamental of Statistics, Kitab Mahal,Allahabad.
7. Eyles, J. and Smith, D.M.(eds),1988: Quantitative Methods in Human Geography, Polity Press,Oxford.
8. Gregory,S.,1963:StatisticalMethodsandtheGeographers,Longman,London.
9. Hagget, P. and McCullagh, P., 1965: Locational Analysis in Human Geography, Arnold, London.
10. Hammond, R. and McCullagh,P.,1965:QuantitativeTechniquesin Geography, Clarendon Press, Oxford.
11. Jonston, R.J., 1978: Multivariate Statistical Analysis in Geography, Longman, London.
12. King,L.J.,Statistical Analysisin Geography, Prentice Hall, Engle wood cliff, N.J.
13. Campbell,J.,1984:IntroductoryCartography,PrenticeHallInc.,EnglewoodChiffs,N.J.
14. Cuff, D.J. and Mattson, M.T., 1982: Thematic Maps: Their Design and Production, Methuen,NewWork.
15. Kanetkar,T.P.andKulkarni,S.U.:SurveyingandLevelling,Vol.I&II,VidyarthiGrithaPrakashan,Pune.
16. Kellaway,G.P.:Map Projections, Methuen & Co.,London
17. Lawrence,G.R.P.,1964:Cartographic Methods, Oxford University Press, London.
18. Lewis,P.,1967:Maps andStatistics, Methuen &Co.Ltd., London
19. Misra, R.P and Ramesh, A.,1995: Fundamentals of Cartography, Concept Publishing Company, New Delhi.
20. Monkhouse, F.J. and Wilkinson, H.R.,1989: Maps and Diagrams, B.I. Publications, New Delhi.Nag, P., 1992: Thematic Cartography and Remote Sensing, Concept publishing Co., New Delhi.
21. Nag,P.andKudra,M.,1998:Digital Remote Sensing,ConceptPublishingCo.,NewDelhi.
22. Patel,A.N.andSingh,S.,1999:Principles of Remote Sensing, Scientific Publishers (India), Jodhpur.
23. Raisz,E.:General Cartography, McGraw Hill Co., London.
24. Raisz,E.: Principles of Cartography,McGraw Hill Co.,London.
25. Robinson,A.H.,etal: Elements of Cartography, John Wiley &Sons,New York.
26. Singh,R.L.:Elements of Practical Geography, Kalyani Publishers, New Delhi.

PG Geography Course Structure Semester 4

Paper Type	Paper Code	Paper Name	Credit	Marks
Core	GEOG-4176	Environment and Climate Change	6	100
	GEOG-4186	Geography of Nepal, Bangladesh and Myanmar	6	100
	GEOG-4193	Practical on Remote Sensing and GIS	3	50
Optional (Theory)	GEOG-4206	(A) Fluvial Geomorphology (B) Geoinformatics (C) Population Geography (D) Regional Development Planning	6	100
Optional (Practical)	GEOG-4214	(A) Fluvial Geomorphology (B) Geoinformatics (C) Population Geography (D) Regional Development Planning	4	100
Optional (Dissertation)	GEOG-4223	(A) Fluvial Geomorphology (B) Geoinformatics (C) Population Geography (D) Regional Development Planning	3	50

CBCS – Based P.G. Fourth Semester Course in Geography, 2021

Nowgong College (Autonomous)

Course Name: Environment and Climate Change

Paper Code: GEOG – 4176

(Theory: 80, Internal Assessment: 20)

Course objectives

This course emphasize on sensitization of climate change. It explores various aspects of climate and associated subject matter. The course is divided into three parts, mechanism of climate change; impacts, adaptation, and mitigation to climate change; Organization and Policies relatedto climate change. The main objectives are:

- To understand the mechanism of climate system
- To explore the impacts, adaptation and mitigation to climate change
- To assess objectives, policies and reports of various organizations working on climate change

Course outcome

The course will sensitize the student about the mechanism of climate and its drivers. Learners will explore the impacts on various sectors viz. hydrosphere, cryosphere, and biosphere. Students further learn different organizational setup and policies related to climate change.

Unit I: Ecology, Environment and Society (40 Marks)

[To answer one question carrying16 marks and three questions carrying 8 marks each.]

1. Introduction to ecology and the scientific methods: using observation, experiments andmodels to understand ecological patterns and processes
2. Ecology and society: livelihood opportunities and development, environmental valuation andaccounting.
3. Ideologies of environmentalism, Issues of environment and equity.
4. Environment of land, water and forest in North east India.
5. Traditional Ecological Knowledge and belief system.

Unit II Environment and Climate Change

[To answer one question carrying16 marks and three questions carrying 8 marks each.]

1. Climate change: concepts and dimension; Impacts, vulnerabilities, adaptation and mitigations strategies: global,sectorial, regional)

2. Anthropogenic (green house-Kyoto gases) and natural radioactive forcing (Solar cycles-Milankovich cycle)
3. Atmospheric circulation, El Niño Southern Oscillation (ENSO), Walker Circulation, Indian Ocean dipole clouds, aerosols.
4. Evaluation of climate models, climate projection and prediction
5. Organization and policies: IPCC, UNCOP, ISA, NAPCC, INCCA

Recommended reading:

1. Bryant Edwards (2005): Natural Hazards, Cambridge University Press, U.K.
2. Schmidt, G., Wolfe, J., & Sachs, J. D., (2009). Climate Change: Picturing the Science, 1stEdition, W. W. Norton & Company.
3. Framer, G. T., & Cook, J. (2013). Climage Change Science: A Modern Synthesis-The Physical Climate (Vol. 1): Springer Netherlands.
4. IPCC. (2013). Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth AR of the IPCC in T.F. Stocker, et al., (Eds.), (pp. 1535). CUP, Cambridge and New York.
5. IPCC. (2014). Climate Change 2014: Synthesis Report. Contribution of Working Groups I, II and III to the Fifth AR of the IPCC In R.K. Pachauri and L.A. Meyer/ Core Writing Team IPCC, Geneva.
6. IPCC. (2014). Summary for policymakers. In: Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part A: Global and Sectoral Aspects. Contribution of Working Group II to the Fifth AR of the IPCC. In C.B. Field, et al., (eds.) pp. 1-32. CUP, Cambridge and New York.
7. IPCC. (2014). Climate Change 2014: Mitigation of Climate Change. Contribution of Working Group III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change. In O. Edenhofer, et al., (Eds.). CUP, Cambridge and New York.
8. Sumi, A., Fukushi, K., &Hiramatsu, A. (2010). Adaptation and mitigation strategies for climate change. Japan: Springer Science & Business Media.
9. Eccleston, Charles H. (2011). Environmental Impact Assessment: A Guide to Best Professional Practices. Chapter 5. ISBN 978-1439828731
10. Sahni, Pardeep et.al. (eds.) 2002, Disaster Mitigation Experiences and Reflections, Prentice Hall of India, New Delhi.
11. Websites: www.wri.org/wri/biodiv; www.earthwatch.org; www.canari.org http://cavehill.uwi.edu/cermes/CLMEPub/ENG/Brochure_Eng. ; www.panda.org

CBCS – Based P.G. Fourth Semester Course in Geography, 2021

Nowgong College (Autonomous)

Course Name: Geography of Nepal, Bangladesh and Myanmar

Paper Code: GEOG – 4186

(Theory: 80, Internal Assessment: 20)

Course objectives:
To have a basic understanding of the regional geography of selected south Asian countries in the context of growing importance of the region and India's look east policy.

Course outcome:
Students will learn the scope of south-east Asian countries in regional collaboration, cooperation, in sustainable environmental and resource management.

Unit I: Geography of Nepal

[To answer three questions, one question carrying 15 marks and two questions carrying 5 marks each]

1. Location and situation of Nepal; locational significance in relation to India; geo-political history
2. Physical Framework: Physiography, climate, vegetation, forest policy and biodiversity
3. Socio-Cultural Background: Population, ethno-religious and linguistic composition, literacy and educational pattern, urbanization level
4. Economic Geography: Resource potential, agriculture, industry, transport system, tourism development, trade relations with India, patterns of economic development

Unit II: Geography of Bangladesh

[To answer four questions, one question carrying 15 marks and three questions carrying 5 marks each]

1. Location and situation of Bangladesh; locational significance in relation to India; geo-political history
2. Physical Framework: Physiography, climate, soil, vegetation and environmental problems
3. Socio-Cultural Background: Population, ethno-religious composition, literacy and educational pattern, urbanization level, population problems and policies
4. Economic Geography: Resource potential, agriculture, place of consumer goods

industry, transport system, tourism development, trade relations with India, problems and prospects of economic development

Unit III: Geography of Myanmar

[To answer three questions, one question carrying 15 marks and two questions carrying 5 marks each]

1. Location and situation of Myanmar; locational significance in relation to India; geo-political history
2. Physical Framework: Physiography, climate, vegetation, biodiversity and environmental policies
3. Socio-Cultural Background: Population, ethno-religious and linguistic composition, literacy and educational pattern, urbanization level
4. Economic Geography: Resource potential, agriculture, industry, transport system, nature of tourism development, trade relations with India, problems and prospects of economic development

Books Recommended:

1. Hugh Brammer, *Bangladesh: Landscapes, Soil Fertility and Climate Change*, The UniversityPress Limited (UPL), 2016.
2. Ahmed Choudhury, Giasuddin and Anwar Ali, *Storm Surges in Bangladesh : An Introduction toCEGIS Storm Surge Model*, The University Press Limited (UPL), 2014.
3. Ahmed Choudhury, Giasuddin, Ken'ichiNakagami, Jianhua Li, Kensuke Fukushi , *StrategicAdaptation Towards Water Crisis*, The University Press Limited (UPL), 2014.
4. Philip Gain, *The Chittagong Hill Tracts Man-Nature Nexus Torn*, Society for Environmentand Human Development (SHED), 2013.
5. Hugh Brammer, *The Physical Geography of Bangladesh*, The University Press Limited(UPL, 2012.
6. Hugh Brammer, *Land Use and Land Use Planning in Bangladesh*, The University PressLimited (UPL), 2002.
7. Anonym, Geo-spatial Tools for Analysis of Flood plain Resources, Environment and GIS Support Project for Water Sector Planning (EGIS), The University Press Limited (UPL), 2000.
8. Muhammad Z Mamun and A T M Nurul Amin, Densification: A Strategic Plan to MitigateRiver bank Erosion Disaster in Bangladesh, The University Press Limited (UPL), 1999.
9. Hugh Brammer, The Geography of the Soils of Bangladesh, The University Press Limited(UPL), 1996.
10. A Atiq Rahman , SaleemulHuq and Gordon R Conway, Environmental Aspects of SurfaceWater Systems of Bangladesh, The University Press Limited (UPL), 1990.

11. Hugh Brammer, Climate Change: Sea-level Rise and Development in Bangladesh,The University Press Limited (UPL), 2014.
12. Tawhidul Islam and AnantaNeelim, Climate change in Bangladesh: A Closer Look intoTemperature and Rainfall Data, The University Press Limited (UPL), 2010.
13. Hugh Brammer, Can Bangladesh be Protected from Floods?, The University Press Limited(UPL), 2004.
14. Anonym, Manorama Year Book, 2017, Mammen Mathew, MalayalaManorama Press, 2016.
15. Fraser, Bhattacharya and Bhattacharya, Geography of Himalayan Kingdom: Bhutan, ConceptPublishing Company, New Delhi, 2011.
16. Henry Francis Blanford, An Elementary Geography of Burma, India and Shillong,
17. RanjitTirtha, Geography of Asia, Rawat Publications, Jaipur.

CBCS – Based P.G. Fourth Semester Course in Geography, 2021

Nowgong College (Autonomous)

Course Name: Practical on Remote Sensing and GIS

Paper Code: GEOG – 4193

(Practical: 40, Internal Assessment: 10)

Course objectives:
This paper aims at imparting knowledge to the students in the field of technological development of the subject with special reference to Remote Sensing, GIS and GPS.

Course outcome:
The students will learn and acquire the skills in applying the advanced techniques of Remote Sensing, GIS and GPS in their study and research, which will lead them to quality research.

Unit 1: Practical Works
(To attempt 3 questions carrying 10 marks each)

1. Fundamentals of Photogrammetry: determination of photo scale, object height, slope between two points and relief displacement (4 exercises)
2. Interpretation of aerial photographs and preparation of land use map, settlement map and road map (4 exercises)
3. Interpretation of satellite imagery and preparation of land use/ land for urban and fluvial- geomorphic maps (4 exercises)
4. Digitization of different layers of spatial information (Point, line and polygon) taking example from each and their thematic representation (5 exercises)
5. Study of changing land use and river course using remote sensing and GIS techniques (4exercises)
6. GPS data collection (Point, Line and Polygon) and plotting (4 exercises)

Unit II: Practical Notebook and Viva-voce

1. Practical Notebook Assessment (5 marks)
2. Viva-voce (5 marks)

Books Recommended

1. Burrough, P.A.,1986: Principles of Geographical Information Systems in Land Resources Assessment,Clarendon Press, Oxford.
2. Burrough, P.A. and McDonnel, R.A.,1998: Principles of Geographical Information Systems,Oxford University Press.
3. Colwell, R.N.,1983: Manual of Remote Sensing, Vol. I & II, American Society ofPhotogrammetry.
4. Curran, Paul, J., 1985: Principles of Remote Sensing, Longman Group Ltd.
5. Gautam, N.C.,1970: Urban Land use Study through Aerial Photo- interpretation Techniques, PinkPublishing House, Mathura.
6. Star, J. and Ester, J., 1990: Geographic Information System, Prentice-Hall. Lilesand, T.M. andKiefer, R.W., 1987: Remote Sensing and Image Interpretation, John Wiley.
7. Hord, R. Michael., 1986: Remote Sensing: Methods and Applications, John Wiley.
8. Maguire, D. J., Goodchild, M. and Rhind, D. J.,1990: Geographical Information Systems: Principles and Applications, Longman Science and Technologv Publications. Robinson,
9. H., et al., 1995: Elements of Cartography, John Wiley.
10. Sabins, Floyd F., 1987: Remote Sensing Principles and Interpretation, W.H. Freeman and Company,New York.

CBCS – Based P.G. Fourth Semester Course in Geography, 2021

Nowgong College (Autonomous)

Course Name: Fluvial Geomorphology

Paper Code: GEOG – 4206 (A)

(Theory: 80, Internal Assessment: 20)

Course objectives:

To train the students for the scientific study of rivers and their works. To make the students ***understand about the fluvial actions and processes and their resultant landforms.***

Course outcome:

The students will know how and why the fluvial system should be made sustainable for the both physical and social environments. Also acquire the techniques to study the forms and processes of fluvial landforms.

Unit I: Channel Form and Processes

[To answer four questions, one question carrying 16 marks and three questionscarrying 8 marks each]

1. Channel process: forces acting in channel, velocity distribution pattern and factors affecting velocity, flow types
2. Water discharge in channel: mechanics of water flow, estimation of water discharge, effect of water discharge on channel variables.
3. Sediment discharge in channel: Forces on sediment particles, sediment transport mechanics and processes- dissolved load, suspended load, bed load; sediment dischargeand deposition – their effects on channel morphology
4. Processes of channel erosion and deposition, channel aggradation and degradation-theireffects on river morphology with examples from Brahmaputra and its tributaries, Assam

Unit II: River Basin management

[To answer four questions, one question carrying 16 marks and three questionscarrying 8 marks each]

1. Human impact on river basins and fluvial systems: effects of land use/Land cover changes and dam construction on channel hydrology, morphology and catchment

ecosystem.

2. Fluvial geomorphic hazards: flood and bank erosion, sedimentation, landslides and soilerosion.
3. Fluvial Geomorphology of the Brahmaputra Valley, floodplain characteristics, channelbars and islands, geomorphology of Majuli Island.
4. Fluvial Geomorphology of wetlands of Brahmaputra floodplain
5. Eco-geomorphology: catchment ecosystem and restoration, riparian vegetation and hydrological processes, river basin planning and development
6. Climate change, basin hydrology and river processes

CBCS – Based P.G. Fourth Semester Course in Geography, 2021

Nowgong College (Autonomous)

Course Name: Fluvial Geomorphology

Paper Code: GEOG – 4214 (A)

(Practical: 80, Internal Assessment: 20)

Course objectives:

To know the different skills and methods used in fluvial geomorphology with special reference to India and Assam.

Course outcome:

The students will be able to know the methods associated with the analysis of different geomorphological systems. The students will also learn the problems and prospects of fluvial characteristics in a region withsome practical exposure trips.

Unit I: Practical Works

(To attempt 5 questions carrying 12 marks each)

1. Preparation and interpretation of stage discharge hydrographs. (4 exercises)
2. Analysis of rainfall –runoff relationship and unit hydrograph. (4 exercises)
3. Analysis of the relationship between (6 exercises)

i) Basin area and stream discharge and

ii) Water discharge and sediment load (sediment rating curves) taking examples from theBrahmaputra and its tributaries

4. Flood frequency analysis using (6 exercises)

i) Plotting position method

ii) Log Pearson Type III distribution and

iii) Gumbel's Extreme value distribution Method

5. Grain-size analysis of alluvial sediments in the laboratory and Fluvio-geomorphic interpretationof the results. (5 exercises)
6. Measurement and analysis of channel Valley, changes with satellite image taking meandering andbraiding reaches of rivers in Brahmaputra Assam (2 exercises)
7. Application of computer and software in fluvial geomorphology (3 exercises)

i) Watershed delineation from DEM

ii) Sediment output analysis using RUSLE/ USLE

iii) Analysis of gridded rainfall data

Unit II: Practical Notebook and Viva-voce

1. Practical Notebook Assessment (15 marks)
2. Viva-voce (5 marks)

CBCS – Based P.G. Fourth Semester Course in Geography, 2021

Nowgong College (Autonomous)

Course Name: Fluvial Geomorphology

Paper Code: GEOG – 4223 (A)

(Dissertation: 40, Internal Assessment: 10)

Course objectives:

To get acquainted with dissertation writing methods and processes

Course outcome:

Students will write a dissertation on suitable topic related to special paper applying all requiredmethodology and dissertation writing procedure.

Unit- 1: Dissertation

1. Each student will have to prepare a dissertation under the guidance of respective teacher as per specialization following appropriate methodology, data base and literature review.
2. The dissertation duly signed by the guide concerned has to be submitted to the department at least one week before the scheduled date of examination.
3. The marks distribution of dissertation in the final semester examination is as follows:

i) Total marks: 40

ii) Evaluation of Content: 25 (average between external and internal examiners)

iii) Viva-voce: 15 (exclusively by the external examiner)

Books Recommended for GEOG – 4206 (A) & GEOG – 4214 (A)

1. Chorley, Wolman and Millerm, 1969: *Fluvial Processes in Geomorphology*, W.H. Freeman and Company, San Francisco.
2. Chorley, R. J. (ed), 1969: *Water, Earth and Man*, Methuen, London.
3. Chouhan,T. S.,1995: *Remote Sensing: Principles and Interpretation*, H.W. Freeman andCompany, San Francisco.
4. Chow, V. T., 1964: *Handbook of Applied Hydrology*, McGraw Hill Book Company, NewYork.
5. Folk, R. L., 1980: *Petrology of Sedimentary Rocks*, Hemphill Publishing Co. Austin, Tx.
6. Garde, R. J. and Ranga Raju, K.G.: *Mechanism of Sediment Transportation*.
7. Gregory, K. J. and Walling, D. E., 1973: *Drainage basin Form and Processes*,

Arnold,London.
8. Knighton, D., 1984: *Fluvial Forms and Processes*, Edward Arnold, London.
9. Leopold, Wolman and Miller, 1964: *Fluvial Processes in Geomorphology*, W. H. Freeman and Company, San Francisco.
10. Morisawa, M., 1968: *Streams: Their Dynamics and Morphology*, McGraw Hill BookCompany, New York.
11. Mutreja, K. N., 1986: *Applied Hydrology*, McGraw Hill Book Company, New York.
12. Pettijohn, F, J., 1975: *Sedimentary Rocks*, Harper and Raw Publishers, New York.
13. Petts, G. E. and Foster, I., 1985: *Rivers and Landscape*, Edward Arnold, London.
14. Rao, K. L., 1975: *India's Water Wealth*, Orient Longman, New Delhi.
15. Sabnis, Floyd. F., 1978: *Remote Sensing: Principles and Interpretation*, H. W. Freemanand Company, San Francisco.
16. Schumm, S. A., 1977: *The Fluvial System*, Wiley Interscience, New York.
17. Schumm, S. A. (ed), 1977: *Drainage Basin Morphology*. Smith, D.I. and Stopp, P., 1978:
18. Goudie, Andrew, et. Al. (eds), 1981: *Geomorphological Techniques*, George Allen &Unwin, London.
19. Gregory, K.J., 1985: *The Nature of Physical Geography*, Edward Arnold, London.
20. Gregory, K, J. and Walling, D.E., 1973: *Drainage Basin- Form and Process*, EdwardArnold, London
21. Ro Charlton: Fundamentals of Fluvial Geomorphology, Taylor and Fransis, 2008
22. Andre, R. 2003: River Processes: An introduction to fluvial dynamics, Arnold Publication.

CBCS – Based P.G. Fourth Semester Course in Geography, 2021

Nowgong College (Autonomous)

Course Name: Geoinformatics

Paper Code: GEOG – 4206 (B)

(Theory: 80, Internal Assessment: 20)

Course objectives:

To train the students in the emerging field of advanced technology, i.e., Geo-informatics whichinclude the applications of Remote Sensing, GIS and GPS.

Course outcome:

The students will enrich themselves with the techniques and skills of Remote Sensing, GIS andGPS and be able to apply these in quality study and research in geography

Unit I: Spatial Analysis in GIS

[To answer four questions, one question carrying 16 marks and three questionscarrying 8 marks each]

1. Spatial Data and their geometric attributes including topology
2. Attribute Data in GIS and their management principles and techniques
3. Thematic representation of attributes in GIS
4. Integration of spatial and non- spatial data in GIS
5. Geo processing and spatial analysis tools in GIS
6. Vector based and raster based spatial analysis tools
7. Network and spatial analysis tools
8. DEM/ DTM preparation
9. Spatial Decision Support Systems, Environmental Impact Analysis and Spatial Data Infrastructure, Clearinghouse Networks and Geo-portals.

Unit II: Image Analysis, Interpretation and Processing

[To answer two questions, one question carrying 10 marks and another questioncarrying 5 marks]

1. Introduction to image interpretation

2. Basic Principles of image interpretation
3. Elements of image interpretation
4. Image rectification and registration
5. Image enhancement techniques: filtering

Unit III: Digital Image Classification

[To answer two questions, one question carrying 10 marks and another questioncarrying 5 marks]

1. Principles of Image classification: Image space, feature space, image classification
2. Image classification process, preparation, unsupervised and supervised classification
3. Classification algorithms
4. Post classification analysis, ground truthing and accuracy assessment and validating theresult.

Unit IV: Application of GIS and Remote Sensing in Modeling the Environment

[To answer one question carrying 10 marks]

1. Applications of remote sensing with special reference to land, water, forests, settlementsand urban areas and climate change.
2. Land governance and GIS.

CBCS – Based P.G. Fourth Semester Course in Geography, 2021

Nowgong College (Autonomous)

Course Name: Geoinformatics

Paper Code: GEOG – 4214 (B)

(Practical: 80, Internal Assessment: 20)

Course objectives:

To know the different skills and methods used in mapping purpose by the help of geoinformatics techniques.

Course outcome:

The students will be able to know the methods associated with the analysis of different geoinformatics techniques and its applications.

Unit I: Practical works

(To attempt 5 question carrying 12 marks each)

1. Design of work-plan /schematic chart / flow-chart (geoinformatics components and functions, geo-referencing procedure, Geo-referencing a part or whole topographical map and satellite Imagery Creation of a relational data model. Spatial data types – comparison of different satellite imageries (6 exercises)
2. Digitization of maps using standard GIS package – point, line and polygon features from small and large scale maps Revenue Circle / Block / District level map of the state /region or from topographical sheets on 1:250,000 or 1:50,000 or 1:63,360 scales) (4 exercises)
3. Adding attributes by joining and relating data, display of attribute data through cartographic methods (2exercises)
4. Decision support mapping for point and line features (4exercises)
5. Extraction of polyline and polygon features of specific themes from a georeferenced imagery (2 exercises)
6. Preparation of thematic maps from various attributes(demographic, climatic, socioeconomic) of point, line and polygon features (2 exercises)
7. Preparation of thematic maps from nominal data – such as soils, vegetation types / administrative units (2 exercises)

8. Digital Image Processing – Enhancement principles and techniques (6 exercises)
9. Image Classification techniques – Unsupervised and Supervised: Integration of remote sensing data in GIS environment – Land Use/Land Cover (LULC) (2 exercises)
10. Usage of established models such as USLE/ RUSLE (2 exercises)

Unit II: Practical Notebook and Viva-voce

1. Practical Notebook Assessment (15 marks)
2. Viva-voce (5 marks)

CBCS – Based P.G. Fourth Semester Course in Geography, 2021

Nowgong College (Autonomous)

Course Name: Geoinformatics

Paper Code: GEOG – 4223 (B)

(Dissertation: 40, Internal Assessment: 10)

Course objectives:

To get acquainted with dissertation writing methods and processes

Course outcome:

Students will write a dissertation on suitable topic related to special paper applying all required methodology and dissertation writing procedure.

Unit- 1: Dissertation

4. Each student will have to prepare a dissertation under the guidance of respective teacher as per specialization following appropriate methodology, data base and literature review.
5. The dissertation duly signed by the guide concerned has to be submitted to the department at least one week before the scheduled date of examination.
6. The marks distribution of dissertation in the final semester examination is as follows:

iv) Total marks: 40

v) Evaluation of Content: 25 (average between external and internal examiners)

vi) Viva-voce: 15 (exclusively by the external examiner)

Books Recommended for GEOG – 4206 (B) & GEOG – 4214 (B)

1. Bolstad, Paul. 2012. GIS Fundamentals: A First Text on Geographic Information Systems. XanEdu PublishingInc.Ann Arbor.
2. Dessers. E.2014. Spatial Data Infrastructures at Work: Analysing the Spatial Enablement of Public Sector Processes. Leuven University Press, Belgium.
3. DeMers, Michael. N.2008. Fundamentals of Geographic Information Systems. Wiley. Fazal,S.2008. GIS Basics. New Age International Pvt Ltd Publishers.
4. Jensen, John R. 2015. Introductory Digital Image Processing: A Remote Sensing

Perspective.
5. Pearson Education.
6. Lilesand, T.M. and Kiefer, R.W., 1987. Remote Sensing and Image Interpretation, John Wiley
7. Lo, C. P. and Yeung, A.K.W.2006. Concepts and Techniques of Geographic Information Systems. Prentice Hall.
8. Misra, Pratap and Enge, Per.2010. Global Positioning System: Signals, Measurements, and Performance. Ganga-Jamuna Press, Lincoln, MA.
9. Nedovic-Budic, Z., Crompvoets, J. and Georgiadou, Y. 2011. Spatial Data Infrastructures in Context: North and South. CRC Press: Taylor & Francis.
10. Steinberg, Sheila L & Steinberg,2015. Steven J. GIS Research Methods: Incorporating Spatial Perspectives, ESRI Press: Redlands.

CBCS – Based P.G. Fourth Semester Course in Geography, 2021

Nowgong College (Autonomous)

Course Name: Population Geography

Paper Code: GEOG – 4206 (C)

(Theory: 80, Internal Assessment: 20)

Course objectives:

To enable the students to realize the population as resource and burden for a country or nation inits geographical context/framework

Course outcome:

The students will show the problems and prospects associated with population and also knowhow population problem can be managed using the applied knowledge of geography.

Unit – 1: Population Geography of India

[To answer seven questions, three questions carrying 16 marks each and four questions carrying 8 Marks each]

1. Demographic and socio-economic characteristics of India's population: vital rates, population growth, population projections, age-sex composition, literacy and education, social composition and occupational structure; socio-economic well-being of populationand population regions.
2. Rural-Urban composition of population, differential characteristics of rural-urban population
3. International and internal migration; consequences of migration; migration problems inIndia and North East, changing population composition in the region
4. Population growth and associated problems in demographic, social and economic fronts, population growth and food security problems with special reference to North East India.
5. Population pressure and growing environmental, housing and unemployment problems.

CBCS – Based P.G. Fourth Semester Course in Geography, 2021

Nowgong College (Autonomous)

Course Name: Population Geography

Paper Code: GEOG – 4214 (C)

(Practical: 80, Internal Assessment: 20)

Course objectives:

To know the different skills and methods used in population geography with special reference to India and Assam.

Course outcome:

The students will be able to know the methods associated with the analysis of different demographic characteristics. The students will also learn the problems and prospects of demographic characteristics in a region with some practical exposure trips.

Unit 1: Practical Works

(To attempt 5 questions carrying 12 marks each)

1. Mapping of population distribution, density and concentration in South Asia and India. (8 exercises)
2. Population growth trend analysis and population projections in South Asia and India. (8 exercises)
3. Mapping of Rural-Urban population and population potential surfaces in India. (8 exercises)
4. Representation of demographic, social and economic characteristics of population. (8 exercises)
5. Population- Resource Regions in the World. (2 exercises)
6. Levels of socio-economic well-being and demographic zones in India. (3 exercises)
7. Application of field survey methods in population studies (3 exercises)

Unit II: Practical Notebook and Viva-voce

1. Practical Notebook Assessment (15 marks)
2. Viva-voce (5 marks)

CBCS – Based P.G. Fourth Semester Course in Geography, 2021

Nowgong College (Autonomous)

Course Name: Population Geography

Paper Code: GEOG – 4223 (C)

(Dissertation: 40, Internal Assessment: 10)

Course objectives:

To get acquainted with dissertation writing methods and processes

Course outcome:

Students will write a dissertation on suitable topic related to special paper applying all required methodology and dissertation writing procedure.

Unit- 1: Dissertation

7. Each student will have to prepare a dissertation under the guidance of respective teacher as per specialization following appropriate methodology, data base and literature review.
8. The dissertation duly signed by the guide concerned has to be submitted to the department at least one week before the scheduled date of examination.
9. The marks distribution of dissertation in the final semester examination is as follows:

vii) Total marks: 40

viii) Evaluation of Content: 25 (average between external and internal examiners)

ix) Viva-voce: 15 (exclusively by the external examiner)

Books Recommended for GEOG – 4206 (C) & GEOG – 4214 (C)

1. Agarwal, S. N., 1988: *India's Population Problems*, Tata McGraw Hills Publishing Co. Ltd. New Delhi.
2. Ahmad, A. et al (eds), 1997: *Demographic Transition: The Third World Scenario*, Rawat Publications,Jaipur and New Delhi.
3. Beaujeu- Garnier, J., 1966: *Geography of Population*, Longman, London.
4. Bhende, A. and Kanitkar, T.: *Principles of Population Studies*, Himalaya Publishing House,Bombay.

5. Chandna, R. C., 1988: *A Geography of Population*, Kalyani publishers, New Delhi.
6. Clarke, J.I., 1971: *Population Geography and Developing Countries*, Pergamon Press,
7. Oxford.Clarke, J. I., 1972: *Population Geography*, Pragamon Press, Oxford.
8. Demko, G. J. et al, 1970: *Population Geography: A Reader*, McGraw Hill, New York.
9. Gosal, G. S., 1984: *Population Geography in India*, in *Geography and Population, Approaches andApplications*.
10. Mehta, S., 1990: *Migration, A Spatial Perspective*, Rawat Publications, Jaipur and New Delhi.
11. Raza, M. and Ahmad, A., 1990: *An Atlas of Tribal India*, Concept Publishing Company, New Delhi.
12. Robinson, H., 1983: *Population and Resources*, Macmillan Press, London.
13. Trewartha, G. T., 1969: *A Geography of Population: World Pattern*, John Wiley,New York.
14. Woods, R., 1979: *Population Analysis in Geography*, Longman, London.
15. Zelinsky, W., 1966: *A Prologue to Population Geography*, Prentice- Hall,Englewood Cliffs.

CBCS – Based P.G. Fourth Semester Course in Geography, 2021

Nowgong College (Autonomous)

Course Name: Regional Development and Planning

Paper Code: GEOG – 4206 (D)

(Theory: 80, Internal Assessment: 20)

Course objectives:

To provide requisite knowledge on the various issues on development and also the planning process. Also to impart concepts and ideas how regional development can be attained through proper planning of the resources.

Course outcome:

The students will acquire applied knowledge how any region can be development through properplanning of the resources and other potentials.

Unit – 1: Regional Development Planning in India and Selected Countries

[To answer seven questions, three questions carrying 16 marks each and four questions carrying 8 marks each]

1. Regional Development Planning for sustainable development: Some perspectives from the globe.
2. Development indicators: Per capita income, energy consumption, resource and infrastructurebase, and demographic indicators.
3. Pattern of World economic development: agriculture, industrial, commercial and technological
4. Regional Planning in India in relation to Five Year Plans
5. Regional development perspectives in Israel, USA and Japan.
6. Urban policy and urban planning in India
7. Planning for problems areas, depressed regions: Case study from India
8. Case studies of regional development planning exercises - National Capital Region; North East Council; Components of Physical Plan: Neighborhood planning

CBCS – Based P.G. Fourth Semester Course in Geography, 2021

Nowgong College (Autonomous)

Course Name: Regional Development and Planning

Paper Code: GEOG – 4214 (D)

(Practical: 80, Internal Assessment: 20)

Course objectives:

To know the different skills and methods used in regional development planning with special reference to India and Assam.

Course outcome:

The students will be able to know the methods associated with the analysis of different regional development planning. The students will also learn the problems and prospects of regional development planning in a region with some practical exposure trips.

Unit I: Practical Works

(To attempt 5 questions carrying 12 marks each)

1. Regionalization using methods of: (10 exercises)

i) Overlapping of different themes

ii) Ranking using mean and standard deviation.

iii) Factor analysis.

2. Network analysis (10 exercises)

i) Application of aggregate connectivity for regional Development using alpha, beta, gamma and cyclomatic Number

ii) Application of shape and tortuosity indices fordeveloping planning strategy

3. Delimiting influence areas of nodal centers using: (6 exercises)

i) Breaking point method

ii) Gravity potential method and potential surface mapping

4. Application of input-output analysis for prediction of short-range change in regional development. (8 exercises)

5. Exercises on shift share analysis for regional studies. (6 exercises)

Unit II: Practical Notebook and Viva-voce

1. Practical Notebook Assessment (10 marks)
2. Viva-voce (5 marks)

CBCS – Based P.G. Fourth Semester Course in Geography, 2021

Nowgong College (Autonomous)

Course Name: Regional Development and Planning

Paper Code: GEOG – 4223 (D)

(Dissertation: 40, Internal Assessment: 10)

Course objectives:

To get acquainted with dissertation writing methods and processes

Course outcome:

Students will write a dissertation on suitable topic related to special paper applying all required methodology and dissertation writing procedure.

Unit- 1: Dissertation

10. Each student will have to prepare a dissertation under the guidance of respective teacher as per specialization following appropriate methodology, data base and literature review.
11. The dissertation duly signed by the guide concerned has to be submitted to the department at least one week before the scheduled date of examination.
12. The marks distribution of dissertation in the final semester examination is as follows:

x) Total marks: 40

xi) Evaluation of Content: 25 (average between external and internal examiners)

xii) Viva-voce: 15 (exclusively by the external examiner)

Books Recommended for GEOG – 4206 (C) & GEOG – 4214 (C)

1. Banerjee, A. and Kar. B., 1999: *Economic Planning and development of North Eastern States*, KanishkaPublications, New Delhi.
2. Choud, M. and Puri, V. K., 1983: *Regional Planning in India*, Allied Publications, New Delhi. Deb, B. J., 1995: *Regional Development in North East India*, Reliance Publications, New Delhi.
3. Friedman, J. and William Alonso (eds), 1964: *Regional Development and Planning*, Cambridge, Mass. M.I.T. Press.

4. Friedman, J., 1973: *Utilization, Planning and National Development*, Beverly Hills, Sage Publications.
5. Gallion, A. B. and Simon Eisner, 1974: *The Urban Pattern: City Planning and Design*, East West Press Pvt. Ltd., New Delhi and Van Norstrand Reinhold Co.
6. Glasson, J., 1974: *An Introduction to Regional Planning*, Hutchinson Educational Ltd., London.
7. Gogoi, J. K., 1978: The Government of India's Policy for Regional Development- A Summing Up and aCritique, *North Eastern Econ*. Rev. II (3), July- Sept.
8. Goswami, A., 1981: Assam's Industrial Development: Urgency of New Direction, *Econ. Pol. Weekly,*XVI (21)
9. Hilhorst, J.G.M. and Dunham, D.M., 1971: *Issues in Regional Planning*, Institute of Social Studies, TheHague.
10. Holier, G. P., 1988: Regional Development, in Michael Pacione (ed.), *The Geography of the ThirdWorld: Progress and Prospect*, Rutledge, London and New York.
11. Isard, Walter et al, 1998: *Methods of Interregional and Regional Analysis*, Ashgate PublishingLtd., Aldershot.
12. Kidwai, A. H., 1985: *Disparities in the Levels of Regional Development and Spatial Differentiation inIndia in the Historic Context*, CSRD, JNU, Mimeo.
13. Mishra, R. P., Sundaram, K.V. and Rao, P., V.L.S., 1974: *Regional Development Planning in India; ANew Strategy*, Vikas Publications, New Delhi.
14. Mishra, R.P., 1992: *Regional Planning*; *Concept, Techniques, Policies and Case Studies*, ConceptPublications, New Delhi.
15. Mohapatra, A.C., 1985: The Concept of region, *Hill Geographer*, IV (1)
16. Mohapatra, A.C. and Rootray, J.K., 1998: *Regional Development and Planning*, Rawat, Jaipur.
17. Mukherjee, A., 1991: *Methodology and Database for Decentralized Planning*, Heritage, New Delhi.
18. Mukherjee, A., 1993: *A Perspective Plan for A Hill District*, Heritage, New Delhi.
19. Pannerselvam, A., 1999: Regional Development in the Developing Countries: A Search for AppropriateTheory, *Space*, 12 (2).
20. Ridell, R., 1985: *Regional Development Policy*, St. Martin's Press, New York.
21. Sandesara, J.C., 1992: *Industrial Policy and Planning, 1947-91*: *Tendencies, Interpretations and Issues*,Sage Publications, New Delhi.