

Paper Code: GPH801C
Paper Title: Climatology
Total Credit: 4 (L+T+P= 3+1+0)
No of lectures: 48

Unit	Contents	No. of lectures
1	Atmospheric energy and terrestrial radiation: solar radiation; mechanism of heat transfer; distribution of solar radiation over the earth; global radiation budget; urban heat island	8
2	Atmospheric equilibrium: stability and instability	4
3	Climatic disturbances: cyclone, anticyclone, cloud burst, drought, thunderstorms, El Nino and La Nina phenomena; Jet stream, mechanism of development of monsoon and its distribution.	14
4	Classification of climate: schemes of Koeppen's and Thornthwaite.	6
5	Applied climatology: data collection, archiving, accessing, interpretation and generation of climatic information specially for water balance studies, soils, agriculture activities, house types and health.	8
7	Spatio-temporal perspectives on global climate change :causes, impacts, vulnerabilities and mitigation strategies	8

Reading List:

- Barry R. G. and Carleton A. M., 2001: *Synoptic and Dynamic Climatology*, Routledge, UK.
- Barry R. G. and Corley R. J., 1998: *Atmosphere, Weather and Climate*, Routledge, New York.
- Batten L. J., 1979: *Fundamentals of Meteorology*, Prentice-Hall Inc., Englewood Cliffs, New Jersey.
- Boucher K., 1975: *Global Climates*, Halstead Press, New York.
- Critchfield H. J., 1987: *General Climatology*, Prentice-Hall of India, New Delhi.
- Griffith, J.F., 1966: *Applied Climatology*, Oxford university Press
- Lal, D.S., 2002: *Climatology*, Chaitanya Publishing House, Allahabad
- Lutgens F. K., Tarbuck E. J. and Tasa D., 2009: *The Atmosphere: An Introduction to Meteorology*, Prentice-Hall, Englewood Cliffs, New Jersey.
- Oliver J. E. and Hidore J. J., 2002: *Climatology: An Atmospheric Science*, Pearson Education, New Delhi.
- Singh, S. 2007: *Climatology*, Sharada Pustak Bhawan, Allahabad.

- Thompson D. R. and Perry A. (eds.), 1997: *Applied Climatology: Principles and Practice*, Routledge, USA and Canada.
- Trewartha G. T. and Horne L. H., 1980: *An Introduction to Climate*, McGraw-Hill.

Paper Code: GPH802C

Paper Title: Regional Geography of Assam

Total Credit: 4 (L+T+P= 3+1+0)

No of Lectures: 48

Unit	Content	No. of lectures
1	Assam as a geographical entity: historical evolution, relief, drainage, climate and soil.	8
2	Natural resources: their utilization and development; coal, petroleum, natural gas, water, forests resources in Assam, biodiversity of Assam: status, strategy and action plan for conservation	14
3	Types of agricultural practices: major agricultural products, industries: forest based, agro based and mineral based, cottage and small scale industries. tourism industry, problems and prospects of industrial development in Assam	14
4	Population composition, population dynamics, immigration issues in Assam, trend and process of urbanization	10
5	Geopolitical issues in Assam	2

Reading List:

- (2003). *20-Year Perspective Tourism Plan For the State of Assam*. Final Report, Ministry of Tourism and Culture Department of Tourism Market Research Division, Department of Tourism, Government of India.
- Bhagabati, A. K., Kar, B. K., & Bora, A. K. (2012). *Geography of Assam*. Rajesh Publications.
- Bhattacharya, N. N. (2011). *Assam a systematic geography*. Rajesh Publications.
- Chutia, S. (2015). Prospects and Problems of Tourism Industry in Assam. *International Journal of Innovative Research In Science, Engineering and Technology*, 4 (2nd), 633-638.
- Deb, B. J., & Ray, B. D. (2016). *Changing Agricultural Scenario in North East India*. New Delhi: Concept Publishing Company.
- Hazarika, J. (1996). *Geopolitics of North East India : A Strategical Study*. Gyan Publishing House.

- Saikia, A. (2011). *Forests and Ecological History of Assam, 1826-2000*. Oxford University Press.
- Sen, D. S. (2016). *A socio-cultural and economic history of Assam*. Mahabir Publications.

Paper Code: GPH803C

Paper Title: Cultural and Political Geography

Total Credits: 4 (L+T+P=3+1+0)

No of Lectures: 48

Unit	Content	No. of lectures
1	Meaning of culture, development of cultural geography, themes in cultural geography	6
2	Cultural diffusion, India as a linguistic area, religious groups in India, ethnicity in contemporary India	8
3	Theory of cultural ecology; indigenous knowledge and natural resource management, challenges to community based sustainable development	6
4	Capitalism and culture; cultural pluralism and dilemmas of justice.	4
5	Nature of administrative areas and geography of public policy and finance; geography and federalism; electoral studies in political geography	8
6	Politics of world resources; geopolitical world views.	6
7	Geopolitical problems of India; geopolitical problems of North East India with special reference to the changing political map, interstate issues, insurgency, conflict resolution, demands and emergence of new states	10

Reading list: (Cultural Geography)

- Ahmed, A. (1999). *Social Geography*. Delhi: Rawat Publications.
- Anderson, J. (2010). *In Understanding Cultural Geography: Places and Traces*. New York: Routledge.
- Anderson, K., Domosh, M., Pile, S., & Thrift, N. (2002). *Handbook of Cultural Geography*. Sage Publications.
- BijuKumar, V. (2013). *Social Exclusion and Ethnicity in Northeast India*. *The NEHU Journal*, 19-35.
- Danda, A. K. (1991). *Ethnicity in India*. New Delhi: Inter-India Publications.
- Deveaux, M, *Cultural Pluralism and Dilemmas of Justice*, Cornell University Press, London, 2000

- Duncan, J., Schein, R. H., & Johnson, N. C. (2004). *A Companion to Cultural Geography*. Blackwell Publishing Ltd.
- Jackson, R. H., & Hudman, L. E. (1990). *Cultural Geography*. New York: West Publishing Company.
- Kivinen, O., Mesikammen, J., & Tokila, T. M. (2016, February 11). *ResearchGate*. Retrieved from <http://www.researchgate.net/publication/263594004>
- Leach, M. M., & Scoones, I. (1997). *Challenges to community based sustainable development: dynamics, entitlements and institutions*. *IDS Bulletin*, 28 (4), 4-14.
- Noble, A. G., & Dutt, A. K. (1982). *India: Cultural Pattern and Processes*. Colorado: West View Press.
- Sassen, S., & Lynd, R. S. (2006). *Territory, Authority, Rights: From Medieval to Global Assemblages*. Princeton University Press.
- Sauer, C. O. (1963). *Land and Life*. Berkeley: University of California Press.
- Sennett, R. (2006). *The Culture of the New Capitalism*. New Haven & London: Yale University Press.
- Singh, S., Youssouf, M., Malik, Z. A., & Bussmann, R. W. (2017). Sacred Groves: Myths, Beliefs, and Biodiversity Conservation-A Case Study from Western Himalaya, India. *International Journal of Ecology* .
- Steward, J. (1955). *The Concept and Method of Cultural Ecology*. University of Illinois Press.
- Zelinsky, W. (1973). *The Cultural Geography of America*. Princeton: Princeton University Press.

Political Geography

- Chopra, G. (2006). *Political Geography*. New Delhi: Commonwealth Publishers.
- Dikshit, R. D. (1996). *Political Geography: A contemporary Perspective*. New Delhi: Tata Mc Graw Hill.
- Dikshit, R. D. (1999). *Political Geography: A Century of Progress*, Sage, New Delhi: Sage.
- Mohanty, G. S. (2005). *Political Geography*. Delhi: ISHA Books.
- Pounds, N. J. (1972). *Political Geography*. New York: Mc Graw Hill.
- Sukhwai, B. L. (1985). *Modern Political Geography of India*. New Delhi: Sterling Publishers.

Paper Code: GPH804C

Paper Title: Quantitative Methods in Geography

Total Credits 4(L+T+P =3+0+1)

No of Lectures: 48

Unit	Content	No. of lectures
1	Significance of quantification in geographical analysis; nature and types of geographical data; geographical data matrix.	4

2	Time series analysis- moving average and least square method	5
3	Regression analysis: simple regression, regression line, regression residuals, standard error estimate; non-linear regression-exponential and power function types with reference to distance decay, spatial interaction and gravity potential types; multiple regression and correlation.	12
4	Theoretical distribution – normal, binomial and poisson	6
5	Measures of spatial distribution: point distribution – nearest neighbour analysis, chi square, mean centre; line distribution- network analysis; areal distribution – Lorenz curve, location quotient	12
6	Hypothesis Testing: parametric and non-parametric test- t- test, f-test, ANOVA, chi square.	9
7	Practical: Application of Moving Average method, simple regression analysis, nonlinear regression analysis- allometric growth and exponential curve (population growth), Chi square and t-test in geographical data; Use of MS Excel for regression line.	1 credit

Reading List:

- Berry B.J.L and Marble D. F. (eds) 1968: *Spatial Analysis- A reader in Geography*, Prentice Hall, Englewood Cliffs, N. J.
- Ebdon D. 1977: *Statistics in Geography: A practical Approach*, (2nd edition 1991) Wiley
- FitzGerald, B. P. *et al* 1974: *Science in Geography Series*, Oxford University Press, London
- Gregory, S. 2014: *Statistical Methods and the Geographer*, Routledge
- Hammond R. and McCullagh P. S., 1978: *Quantitative Techniques in Geography*, Oxford University Press
- Johnston R.J. 1973: *Multivariate Statistical Analysis in Geography*, Longman, London
- King L.J. 1969: *Statistical Analysis in Geography*, Prentice Hall
- Mahmood A., 1977: *Statistical Methods in Geographical Studies*, Concept
- Paul, S. K. 1998: *Statistics for Geoscientist*, Tata McGraw Hill, New Delhi
- Robinson, G. M. 1998: *Methods and Techniques in Human Geography*, John Wiley & Sons, Chichester
- Rogerson, P 2006: **Statistical Methods for Geography** (2nd Edition), Sage Publications, London, New Delhi
- Wheeler, D. Shaw, G., Barr, S. 2013: *Statistical Techniques in Geographical Analysis* (3rd edition) Routledge

Paper Code: GPH805L
Paper Title: Geoinformatics
Total Credits: 4 (L+T+P, 0+0+4)
No. of practical classes: 60

Unit	Content	No. of practical classes
1.	<ul style="list-style-type: none"> - Georeferencing a part of topographical maps by using standard GIS software package. - Extraction of point, line and polygon features from topographical maps - Digitization of administrative boundaries (India/ North Eastern India/ Assam) as polygons and adding any two socio-economic attributes and preparing two thematic maps 	18
2.	<ul style="list-style-type: none"> - Satellite remote sensing: understanding the principles, EMR interaction with atmosphere and earth surface, Landsat and IRS satellite data products and applications, visual interpretation keys - Introduction to online platforms for generation of satellite data - Visual interpretation of satellite data using any GIS software. - Digital image processing and classification to generate land use/ land cover- 	

	supervised and unsupervised digital image classification and derivation of statistics of classified data.	20
3.	Introductory idea on DGPS– working principles and application, campus / field survey along with the location of important features using DGPS	8
4.	Designing a Digital Elevation Model (DEM) for a very small watershed in the hilly terrain using topographical map/ SRTM data, its 3-D visualization.	6
5.	Geo-processing of data: (a) point buffering and the points and their attributes within various range of buffer distances (b) line buffering and the points and their attributes within various range of buffer distances.	4
6.	Determination of scale, relief displacements, use of stereo-pair for mapping attributes.	4

Reading List:

- Burrough, P. A., 1986: *Principles of Geographical Information Systems in Land Resources Assessment*, Clarendon Press, Oxford.
- Burrough, P.A. and McDonnel, R. A., 1998: *Principles of Geographical Information Systems*, Oxford University Press.
- Curran, Paul, J., 1985: *Principles of Remote Sensing*, Longman Group Ltd.
- Curtis, H., 2000: *The GPS Accuracy Improvement Initiative*, GPS World, June, 2000.
- De Mars, M. N., 1999: *Fundamentals of Geographic Information Systems*, John Wiley & Sons Inc., New York.
- Gonzalez, R. C., Woods, R. E., 2000: *Digital Image Processing*, Fifth Indian Reprint, Addison Wesley Longman, Delhi.
- Gopi, S., 2005: *Global Positioning System Principles and Applications*, Ta McGraw Hill, New Delhi.
- Jensen, J. R., 2011: *Remote Sensing of the Environment – An Earth Resource Perspective*, 3rd Impression, Chapter-14, Pearson, New Delhi.
- Langley, R. B., 1991: *The GPS Receiver – An Introduction*, GPS World, 2(1).
- Maguire, D. J., Goodchild, M. and Rhind, D. J., 1990: *Geographical Information Systems: Principles and Applications*, Longman Science and Technology Publications.
- Sabins, Floyd F., 1987: *Remote Sensing Principles and Interpretation*, W.H. Freeman and Company, New York.

- Colwell, R. N., 1983: *Manual of Remote Sensing*, Vol. I & II, American Society of Photogrammetry.
- Gautam, N. C., 1970: *Urban Land use Study through Aerial Photointerpretation Techniques*, Pink Publishing House, Mathura.
- Lillesand, T. M. and Kiefer, R. W., 1987: *Remote Sensing and Image Interpretation*, John Wiley.
- Star, J. and Ester, J., 1990: *Geographic Information System*, Prentice-Hall.
- Hord, R. Michael., 1986: *Remote Sensing: Methods and Applications*, John Wiley.
- Robinson, A. H., et al., 1995: *Elements of Cartography*, John Wiley.

Paper Code: GPH806

Paper Title: Fundamentals of Geographical Information System

Total Credits: (L+T+P= 1+0+1)

No. of Lectures: 16

Unit	Contents	No. of lectures
1.	Geographical Information System (GIS) – definition, components, data types and structure; earth models and referencing systems; data sources.	16
2	<p>PRACTICAL:</p> <p>- Georeferencing an atlas map by using a GIS.</p> <p>-Digitization of administrative boundaries (India/ North Eastern India/ Assam) as polygons and adding socio-economic attributes and preparing thematic maps.</p>	1 credit

Reading List:

- Burrough, P. A., 1986: *Principles of Geographical Information Systems in Land Resources Assessment*, Clarendon Press, Oxford.
- Burrough, P.A. and McDonnel, R. A., 1998: *Principles of Geographical Information Systems*, Oxford University Press.
- De Mars, M. N., 1999: *Fundamentals of Geographic Information Systems*, John Wiley & Sons Inc., New York.