

Kotshila Mahavidyalya

Department of Geography

Syllabus

Course Type: **MAJ-3**

Semester: **3**

Course Code: **BGEOMAJ03C**

Course Title: **Course Title: Introduction to Climate, Soil and Biogeography & Geographical Survey through Instruments**

(L-P-Tu): **4-2-0**

Credit: **6**

Practical/Theory: **Combined**

Course Objective:

1. To introduce about basic concepts of climate, soil and biogeography.
2. To perceive the spatial distribution of biotic and abiotic components. able to record weather data
3. To analysed soil and water quality.
4. To learn about surveying and levelling techniques.

Learning Outcome:

1. Students will develop fundamental understandings of the atmosphere.
2. Students can evaluate different aspects of floral and faunal distribution on the earth.
3. Students will be able to analyse soil and water quality, and suggest measures for the sustainable utilization.

Course Title: Introduction to Climate, Soil and Biogeography

Paper Type: Theoretical Course Credit: 4

Unit I: Introduction to Climatology [26 Hours]

1.1 Concept of atmospheric sciences; Composition and Structure of the Atmosphere; Forms of Energy in the Atmosphere. (5 lectures)

1.2 Insolation and its influencing factors; Global Heat Budget; Horizontal and Vertical distribution of Temperature. (5 lectures)

1.3 Concept of Atmospheric Pressure; Pressure belts; factors influencing Air Motion; General Wind Circulation of the atmosphere with reference to Tri-cellular model and Jet stream.

1.4 Condensation, Precipitation, classification of climate (Koppen & Thornthwaite) (8 lectures)

Unit II: Introduction to Soil and Bio Geography [26 Hours]

2.1 Soil as a natural body; Physical and chemical properties of soils; Soil forming factors; Profile development (6 lectures)

2.2 Development of Soils: Laterite, Podzol, and Chernozem soil. Soil classification: genetic and USDA. Soil degradation and management. .(6 lectures)

2.3 Concepts and principles of ecology. Components of ecosystem; Ecosystem Hierarchy: individual, population, species, community. Concept and type of Trophic structure; food chain, food web; energy flow models in ecosystem. (7 lectures)

2.4 Biomes: Tropical Rain Forest, Grassland and Taiga. Bio-geochemical cycles: oxygen, carbon and nitrogen. Biodiversity: types, significance, threats and conservation (7 lectures)

Selected References:

1. Lal, D.S. (2006). Climatology. Chaitanya Publishing House.
2. Siddhartha, K. (2012). Atmosphere, Weather and Climate: A Text Book of Climatology. Kisalaya Publications Pvt. Ltd.
3. Oliver, J.E., and J. J. Hidore, J.J. (2011). Climatology: An Atmospheric Science,. Pearson.

4. Wild, A. (2006). Soils and the Environment.. Cambridge University Press.
5. Brady, N.C., and R. R. Weil, R.R. (1996). The Nature and Properties of Soils,. Prentice-Hall, Inc.
6. Kormondy, E.J. (1996). Concepts of Ecology. PHI Learning Pvt. Ltd.
7. Critchfield 2011 General Climatology , PHI

Course Title: Geographical Survey through Instruments

Paper Type: Practical Course Credit: 2

Unit I: Weather Instruments and Soil-Water Analysis [20 Hours]

- 1.1 Six's Maximum & Minimum Thermometer, Barometer and Hygrometer. (5 lectures)
- 1.2 Climograph (After G. Talyor), Identification of Continental-Maritime Climate from Climatic data/ Graph, Synoptic Chart. (5 lectures)
- 1.3 Collection of soil samples from field and develop Soil Nutrient Map. (5 lectures)
- 1.4 Collection of water samples from field and develop Water Quality Map. (5 lectures)

Unit II: Relief and Height Determination [32 Hours]

- 2.1 Definition scope and type of surveying, Survey instrument to measure angle direction, area and distance of object on ground. Measurement and mapping of a plot by Chain Survey (6 lectures)
- 2.2 Prismatic compass: The instrument; Method of taking reading; correction of data observed; Open traverse; plotting; closed traverse; plotting; correction of plotting error (Bowditch's correction); interior angles and whole circle bearing; calculation of area of closed traverse; advantages and disadvantages. (8 lectures)
- 2.3 Leveling: definition; instrument used; dumpy level; the staff; taking reading through a dumpy level, determination of reduced level by rise and fall method and by collimation method; checking of data; plotting of data; drawing of profile. Contouring: contouring by radial lines; contouring by cross sections. (10 lectures)
- 2.4 Theodolite: components; measurement of article angles; measurement of horizontal angle (only for traversing); Measurement of high transistence-1. Base accessible. 2. Base inaccessible – (a) same vertical plan and (b) oblique plan methods (8 lectures)

Project File

- a) Recording and tabulation of data on atmospheric temperature, pressure and humidity. Construction and interpretation of Climograph. Preparation of synoptic chart.
- b) Preparation of soil nutrient map and water quality map based on primary data collection.
- c) Mapping a Closed Traverse by Prismatic Compass, Profile and Contouring by Dumpy Level Survey.
- d) Determination of Height of an Object by Theodolite survey.

Selected References:

1. Manual, International Cartographic Association, Elsevier Science Publishers.
2. Mishra, R.P., Ramesh, A. 1989. Fundamentals of Cartography, Concept, New Delhi.
3. Sarkar, A. 2015. Practical Geography: A Systematic Approach, 3rd ed. Orient Blackswan Private Ltd.
4. Singh, R.L., Singh, R.P.B. 2008. Elements of Practical Geography, Kalyani Publisher
5. Subramanian, R. 2012. Surveying and Levelling, 2nd ed. Oxford University Pres

