Kashipur Michael Madhusudan Mahavidyalaya

(Affiliated to Sidho-Kanho-Birsha University)

Kashipur, P.O. Panchakote Raj, Purulia, West Bengal – 723132, India

e-mail: iqackmmm@gmail.com; website: www.kashipurmmm.org

(NAAC Accredited with Grade "B")

(INTERNAL QUALITY ASSURANCE CELL)

Ref.No.: KMMM/IQAC/49/ 22 *Date: 23.04.2022*

(A) Syllabus of AECC Course on Environmental Studies (ENVS)

Title: Fundamentals of Environmental Studies

Unit 1: Basics of Environmental Studies (05 lectures)

Definition, Nature, Scope and Importance; Components of environment: Environmental education

Unit 2: Natural Resources: Renewable and Nonrenewable Resources (10 lectures)

Nature and natural resources their conservation and associated problems:

- Forest resources: Uses, types and importance, Joint Forest Management & Tribal population, Deforestation and its effects
- Water resources: Distribution of water on Earth; Use, over exploitation of surface and ground water; Dams: Benefits and problems; Flood and Drought
- Mineral resources: Mineral resources in India; Use and exploitation, Social impacts of mining
- Food resources: World food problems and food insecurities.
- Energy resources: Renewable and Nonrenewable energy sources; Use of alternate energy sources - Case studies
- Land resources: Land as a resource; Land degradation, landslides, soil erosion, desertification
- Use of resources for sustainable development

Unit 3: Ecology and Ecosystems (08 lectures)

Concept of ecology, Population ecology, Community ecology

- Concept of an ecosystem, different types of ecosystem
- Food chains, food weds and ecological succession
- Energy flow in the ecosystem and energy flow models

Unit 4: Biodiversity and its conservation (08 lectures)

- Biodiversity: Levels of biological diversity
- Values of biodiversity
- Hot-Spots of biodiversity, Mega-biodiversity countries
- Threat to biodiversity
- Threatened and endemic species of India
- Conservation of biodiversity (*In- situ* and *Ex-situ)*
- Ecosystem services: Ecological, Economical, Social, Ethical, Aesthetical and Informational values

Unit 5: Environmental Pollution and Management (08 lectures)

(a) Nature, Causes, Effects and Control measures of –
(i) Air pollution (ii) Water pollution (iii) Soil pollution (iv) Noise pollution
v) Nuclear hazards

(b) Fireworks Pollution: Definition, Composition/Ingredients, effects, monitoring strategies

- Solid waste management: Causes, effects and disposal methods; Management of biomedical and municipal solid wastes
- Disaster management: Floods, Earthquake, Cyclone and Landslides

Unit 6: Environmental Policies and Practices (10 lectures)

- Constitutional Provisions for protecting environment- Articles 48(A), 51 A (g)
- Environmental Laws: The Environment (Protection) Act, 1986; The Air (Prevention and Control of Pollution) Act, 1981; The Water (Prevention and Control of Pollution) Act 1974; Forest (Conservation) Act, 1980
- The wildlife Protection Act, 1972
- Climate change, Global warming, ENSO, Acid rain, Ozone layer depletion; Montreal and Kyoto Protocols

Unit 7: Human Communities and Environment (06 lectures)

- Human population growth; Impacts on environment
- Population explosion – Family Welfare Programme
- Environment and human health: Concept of health and disease; Common communicable and Non- communicable diseases; Public awareness
- Environment movements in India: Chipko Movements, Silent Valley Movement, Movements in Karnataka

Unit 8: Field Work Report/Project Report/Term paper (based on any one of the following topics and to be evaluated by internal teachers only (05 lectures)

- Environmental assets - River/Forest/Grassland/Hill/Mountain *etc*.
- Environmental pollution - Urban/Rural/Industrial/Agricultural
- Study of common Plants/Insect /Birds/Wild life *etc*.
- Study of simple ecosystems: Pond/River/Hill slope *etc*.
- Municipal solid waste management and handling.

(B) Syllabus of Economics (SEC)

Title: Data Analysis

Unit 1:
1. Sources of data. Population census versus sample surveys. Random sampling.
2. Frequency distribution and summary Statistics. Unit 2
Analysis of Indian Data: Economic Survey, RBI Bulletin on currency and finance, ASI DATA, Foreign Trade Statistics, NSS Consumer surveys.

Reading References:

1. P.H. Karmel and M. Polasek (1978), Applied Statistics for Economists, 4th edition, Pitman.
2. M.R. Spiegel (2003), Theory and Problems of Probability and Statistics (Schaum Series).
3. Official websites of RBI, Government of India, NSS, ASI.

(C) Syllabus of Geography (Honours)

SEMESTER I (GEOH): CC 2 – Cartographic Techniques

SEMESTER III (GEOP): SC 3 – Cartographic Techniques

Concepts in Theory

1. Maps: Classification and types. Components of a map.
2. Concept and application of scales: Plain, comparative, diagonal and vernier
3. Coordinate systems: Polar and rectangular. Concept of geoid and spheroid
4. Concept of generating globe. Grids: angular and linear systems of measurement
5. Bearing: Magnetic and true, whole-circle and reduced.
6. Map projections: Classification, properties and uses. Concept and significance of UTM projection.
7. Basic concepts of surveying and survey equipment: Prismatic compass, dumpy level, theodolite, Abney level, clinometer.
8. Survey of India topographical maps: Reference scheme of old and open series. Information on the margin of maps

List of Practical

A Project File, comprising one exercise each is to be submitted

1. Graphical construction of scales: Plain, comparative, diagonal and vernier
2. Construction of projections: Polar Zenithal Stereographic, Simple conic with two standard parallels, Bonne's, Cylindrical Equal Area, and Mercator's.

3. Delineation of drainage basin from Survey of India topographical map. Construction and interpretation of relief profiles (superimposed, projected and composite), relative relief map, slope map (Wentworth), and stream ordering (Strahler) on a drainage basin.
4. Correlation between physical and cultural features from Survey of India topographical maps. using transect chart.

Reading References:

Anson R. and Ormelling F. J., 1994: International Cartographic Association: Basic Cartographic Vol. Pregmen Press.
Gupta K.K. and Tyagi, V. C., 1992: Working with Map, Survey of India, DST, New Delhi.
Mishra R.P. and Ramesh, A., 1989: Fundamentals of Cartography, Concept, New Delhi.
Monkhouse F. J. and Wilkinson H. R., 1973: Maps and Diagrams, Methuen, London.
Rhind D. W. and Taylor D. R. F., (eds.), 1989: Cartography: Past, Present and Future, Elsevier, International Cartographic Association.
Robinson A. H., 2009: Elements of Cartography, John Wiley and Sons, New York.
Singh R. L. and Singh R. P. B., 1999: Elements of Practical Geography, Kalyani Publishers.
Sarkar, A. (2015) Practical geography: A systematic approach. Orient Black Swan Private Ltd., New Delhi.

SEMESTER II (GEOH): CC 4 – Cartograms and Thematic Mapping

Concepts in Theory

1. Concepts of rounding, scientific notation, logarithm and anti-logarithm, natural and log scales
2. Diagrammatic representation of data: Line, Bar, and Circle
3. Representation of point data: Isopleths.
4. Representation of area data: Dots, proportional circles and choropleth
5. Preparation and interpretation of large scale thematic maps: Geomorphological maps from Toposheet
6. Preparation and interpretation of large scale thematic maps: Climatological maps – Synoptic Chart
7. Preparation and interpretation of large scale thematic maps: Landuse landcover maps – Based on Local Cadastral Map of Village / any Ward map of Munipality
8. Preparation and interpretation of large scale thematic maps: Socio-economic maps using Z-score and LQ techniques.

List of Practical

A Project File, comprising one exercise each is to be submitted

1. Survey using Prismatic Compass and Dumpy Level
2. Thematic maps: Proportional squares, pie diagrams with proportional circles, dots and spheres
3. Thematic maps: Choropleth, isoline map, Chorochromatic map.
4. Geomorphological maps, Synoptic Chart, Landuse landcover maps and Socio-economic maps

Reading References:
Cuff J. D. and Mattson M. T., 1982: Thematic Maps: Their Design and Production, Methuen Young Books
Dent B. D., Torguson J. S., and Holder T. W., 2008: Cartography: Thematic Map Design (6th Edition), Mcgraw-Hill Higher Education
Gupta K. K. and Tyagi V. C., 1992: Working with Maps, Survey of India, DST, New Delhi.
Kraak M.-J. and Ormeling F., 2003: Cartography: Visualization of Geo-Spatial Data, Prentice-Hall.
Mishra R. P. and Ramesh A., 1989: Fundamentals of Cartography, Concept, New Delhi.
Singh R. L. and Singh R. P. B., 1999: Elements of Practical Geography, Kalyani Publishers.
Slocum T. A., Mcmaster R. B. and Kessler F. C., 2008: Thematic Cartography and Geovisualization (3rd Edition), Prentice Hall.
Tyner J. A., 2010: Principles of Map Design, The Guilford Press.
Sarkar, A. (2015) Practical geography: A systematic approach. Orient Black Swan Private Ltd., New Delhi.

SEMESTER III (GEOH): CC 7 – Statistical Methods in Geography

Unit 1

1. Importance and significance of Statistics in Geography. Discrete and continuous data, population and samples, scales of measurement (nominal, ordinal, interval and ratio), sources of data
2. Collection of data and formation of statistical tables
3. Sampling: Need, types, and significance and methods of random sampling
4. Theoretical distribution: frequency, cumulative frequency, normal and probability

Unit 2

1. Central tendency: Mean, median, mode, partition values
2. Measures of dispersion range, mean deviation, standard deviation, coefficient of variation
3. Association and correlation: Rank correlation, product moment correlation
4. Regression (linear and non-linear) and time series analysis (moving average)

List of Practical

A Project File, comprising one exercise each is to be submitted

5. Construction of data matrix with each row representing an aerial unit (districts / blocks / mouzas / towns) and corresponding columns of relevant attributes.
6. Based on the above, a frequency table, measures of central tendency and dispersion would be computed and interpreted.
7. Histograms and frequency curve would be prepared on the dataset.
8. From the data matrix a sample set (20%) would be drawn using simple random method of sampling and locate the samples on a map with a short note on the method used.
9. Based on of the sample set and using two relevant attributes, a scatter diagram and regression line would be plotted and residual from regression would be mapped with a short interpretation.

Reading References:

- Berry B. J. L. and Marble D. F. (eds.): Spatial Analysis – A Reader in Geography.

- Ebdon D., 1977: Statistics in Geography: A Practical Approach.
- Hammond P. and McCullagh P. S., 1978: Quantitative Techniques in Geography: An Introduction,
- Oxford University Press.
- King L. S., 1969: Statistical Analysis in Geography, Prentice-Hall.
- Mahmood A., 1977: Statistical Methods in Geographical Studies, Concept.
- Pal S. K., 1998: Statistics for Geoscientists, Tata McGraw Hill, New Delhi.
- Sarkar, A. (2013) Quantitative geography: techniques and presentations. Orient Black Swan Private Ltd., New Delhi
- Silk J., 1979: Statistical Concepts in Geography, Allen and Unwin, London.
- Spiegel M. R.: Statistics, Schaum's Outline Series.
- Yeats M., 1974: An Introduction to Quantitative Analysis in Human Geography, McGraw Hill, New York

SEMESTER IV (GEOH): CC 10 – Remote Sensing

Concepts in Theory

1. Principles of Remote Sensing (RS): Classification of RS satellites and sensors
2. Sensor resolutions and their applications with reference to IRS and Landsat missions, image referencing schemes and data acquisition.
3. Preparation of False Colour Composites from IRS LISS-3 and Landsat TM and OLI data. Principles of image rectification and enhancement.
4. Principles of image interpretation and feature extraction. Preparation of inventories of landuse land cover (LULC) features from satellite images.

List of Practical

A Project File, comprising one exercise each is to be submitted

1. Georeferencing of maps and images
2. Image enhancement. Preparation of reflectance libraries of LULC features across different image bands of IRS L3 or Landsat OLI data
3. Image classification, post-classification analysis and class editing
4. Application of Remotely Sensed data on River Course, Forestry and Urban Growth Mapping

Reading References:

- Campbell J. B., 2007: Introduction to Remote Sensing, Guildford Press.
- Jensen J. R., 2004: Introductory Digital Image Processing: A Remote Sensing Perspective, Prentice Hall.
- Joseph, G. 2005: Fundamentals of Remote Sensing, United Press India.
- Lillesand T. M., Kiefer R. W. and Chipman J. W., 2004: Remote Sensing and Image Interpretation, Wiley. (Wiley Student Edition).
- Nag P. and Kudra, M., 1998: Digital Remote Sensing, Concept, New Delhi.
- Rees W. G., 2001: Physical Principles of Remote Sensing, Cambridge University Press.
- Singh R. B. and Murai S., 1998: Space-informatics for Sustainable Development, Oxford and IBH Pub.
- Wolf P. R. and Dewitt B. A., 2000: Elements of Photogrammetry: With Applications in GIS, McGraw-Hill.
- Sarkar, A. (2015) Practical geography: A systematic approach. Orient Black Swan Private Ltd., New Delhi

SEMESTER IV (GEOH): SEC2 – Advanced Spatial Statistical Techniques

Concepts in Theory

1. Probability theory, probability density functions with respect to Normal, Binomial and Poisson distributions and their geographical applications.
2. Sampling: Sampling plans for spatial and non-spatial data, sampling distributions. Sampling estimates for large and small samples tests involving means and proportions.
3. Correlation and Regression Analysis: Rank order correlation and product moment correlation; linear regression, residuals from regression, and simple curvilinear regression. Introduction to multi-variate analysis.
4. Time Series Analysis: Time Series processes; Smoothing time series; Time series components.

Any statistical Software Package (e.g., SPSS, MS Excel, R, etc.) may be used for practice. A project file consisting of four exercises on the above themes is to be submitted.

Reading References:

- Bart James E and Gerld M.Barber, 1996: Elementary Statistics for Geographers, The Guieford Press, London.

- Eldon, D., 1983: Statistics in Geography: A Practical Approach, Blackwell, London.
- Cressie, N.A.C., 1991: Statistics for Spatial Analysis, Wiley, New York.
- Gregory, S., 1978: Statistical Methods and the Geographer (4th Edition), Longman, London.
- Haining, R.P., 1990: Spatial Data Analysis in the Social and Environmental Science, Cambridge University Press, Cambridge.
- Mc Grew, Jr. and Cahrles, B. M., 1993: An Introduction to Statistical Problem Solving in Geography,
- W.C. Brocan Publishers, New Jersey.
- Mathews, J.A., 1987: Quantitative and Statistical Approaches to Geography: A Practical Manual Pergamon, Oxford.
- S.K., 1998: Statistics for Geoscientists: Techniques and Applications, Concept Publishing Company, New Delhi.
- Wei, W.S., 1990: Time Series Analysis: Variate and Multivariate Methods, Addison Wesley Publishing.
- Yeates, Mauris, 1974: An Introduction to Quantitative Analysis in Human Geography, Mc Grawhill, New York

SEMESTER V (GEOH): CC 12 – Research Methodology and Field Work

SEMESTER IV (GEOP): SEC – Research Methodology and Field Work

Unit 1: Research Methodology

1. Research in Geography: Meaning, types and significance
2. Literature review and formulation of research design
3. Defining research problem, objectives and hypothesis. Research materials and methods
4. Techniques of writing scientific reports: Preparing notes, references, bibliography, abstract and keywords

Unit 2: Field Work

1. Fieldwork in Geographical studies – Role and significance. Selection of study area and objectives. Pre-field preparations. Ethics of fieldwork
2. Field techniques and tools: Observation (participant, non-participant), questionnaires (open, closed, structured, non-structured). Interview with special reverence to focused group discussions.
3. Field techniques and tools: Landscape survey using transects and quadrants, constructing a sketch, photo and video recording.
4. Positioning and collection of samples. Preparation of inventory from field data. Post-field tasks.

List of Practical

5. ***Each student will prepare an individual report based on primary data collected form field survey*** and secondary data collected from different sources for either a rural area (mouza) or an urban area (municipal ward) based on cadastral or municipal maps to study specific problems.
6. The duration of the field work shall not exceed 10 days.
7. The report should be hand written in English on A4 size paper in candidate's own words within 5,000 to 8,000 words excluding figures, tables, photographs, maps, references and appendices
8. A copy of the bound report, duly signed by the concerned teacher, should be submitted.

Reading References:

- Creswell J., 1994: Research Design: Qualitative and Quantitative Approaches Sage Publications.
- Dikshit, R. D. 2003. The Art and Science of Geography: Integrated Readings. Prentice-Hall of India, New Delhi.
- Evans M., 1988: "Participant Observation: The Researcher as Research Tool" in Qualitative Methods in Human Geography, eds. J. Eyles and D. Smith, Polity.
- Mukherjee, Neela 2002. Participatory Learning and Action: with 100 Field Methods. Concept Publs. Co., New Delhi.
- Robinson A., 1998: "Thinking Straight and Writing That Way", in Writing Empirical Research Reports: A Basic Guide for Students of the Social and Behavioural Sciences, eds. by F. Pryczak and R. Bruce Pryczak, Publishing: Los Angeles.
- Special Issue on "Doing Fieldwork" The Geographical Review 91:1-2 (2001).
- Stoddard R. H., 1982: Field Techniques and Research Methods in Geography, Kendall/Hunt.
- Wolcott, H. 1995. The Art of Fieldwork. Alta Mira Press, Walnut Creek, CA

SEMESTER V (GEOP): SEC 3 – Statistical Techniques in Geography

1. Data Sources and Types of Data; Sampling: Sampling plans for spatial and non-spatial data.
2. Study of Frequency Distribution; Measures of Central Tendency: Mean, Median and Mode
3. Correlation and Regression Analysis: Rank order correlation and linear regression
4. Time Series Analysis: Time Series processes; Time series components.

Reading References:

- Bart James E and Gerld M.Barber, 1996: Elementary Statistics for Geographers, The Guieford Press, London.
- Eldon, D., 1983: Statistics in Geography: A Practical Approach, Blackwell, London.
- Cressie, N.A.C., 1991: Statistics for Spatial Analysis, Wiley, New York.
- Gregory, S., 1978: Statistical Methods and the Geographer (4th Edition), Longman, London.
- Haining, R.P., 1990: Spatial Data Analysis in the Social and Environmental Science, Cambridge University Press, Cambridge.
- Mc Grew, Jr. and Cahrles, B. M., 1993: An Introduction to Statistical Problem Solving in Geography,
- W.C. Brocan Publishers, New Jersey.
- Mathews, J.A., 1987: Quantitative and Statistical Approaches to Geography: A Practical Manual Pergamon, Oxford.
- S.K., 1998: Statistics for Geoscientists: Techniques and Applications, Concept Publishing Company, New Delhi.
- Wei, W.S., 1990: Time Series Analysis: Variate and Multivariate Methods, Addison Wesley Publishing.
- Yeates, Mauris, 1974: An Introduction to Quantitative Analysis in Human Geography, Mc Grawhill, New York

SEMESTER VI (GEOH): CC 14 – Geographical Information System

Concepts in Theory

1. Nature of Geographic Information System, Measuring Systems: Location – Coordinate Systems
2. Data Representation: Topology and Attributes, Spatial Data Models: Raster and Vector data models
3. GIS Database Creation and Maintenance, DBMS and its use in GIS, GIS-based Modelling and Spatial Overlay
4. Spatial Modelling with GIS: Application in Physical Geography and Human Geography, Web-GIS.

List of Practical

A Project File, comprising one exercise each is to be submitted

1. Georeferencing of maps and images, Topology Creation
2. Data attachment and Creation of DBMS
3. Thematic Mapping: Morphometric Analysis and Choropleth Mapping
4. Application of Web-GIS for Creation of Information Layer.

Reading References:

- Jatin Pandey and Darshana Pathak, 2013, Geographic Information System, TERI Publishing House.
- Chor Pang Lo, 2009, Concepts and Techniques of Geographic Information System, Prentice Hall.
- Michael N. Demers, 2012, Fundamentals of Geographic Information Systems, Willy.

(D) Syllabus of Music (Program)

Title: Knowledge of Basic Instruments

SEC 1 – (Those who have music in their first preference)

Syllabus: Tanpura, Harmonium & Tabla

Ability development course:- Harmonium

Course 1 Sem to 3rd semester syllabus choose an item and perform it with Harmonium

Reading References:

(E) Syllabus of Physical Education

Title: Track and Field

1. Track Events

1.1. Starting Techniques: Standing start and Crouch start (its variations) use of Starting Block.

1.2. Acceleration with proper running techniques.

1.3. Finishing Technique: Run Through, Forward Lunging and Shoulder Shrug.

1.4. RelayRace: Starting, Baton Holding/Carrying, Baton Exchange in between zone, and Finishing.

2. Field Events (Any three; Students' choice)

2.1. Long Jump: Approach Run, Take-off, Flight in the air (Hang Style/Hitch Kick) and Landing.

2.2. High jump: Approach Run, Take-off, Bar Clearance/Flight (Straddle Roll) and Landing.

2.3. Shot put: Holding the Shot, Placement, Initial Stance, Glide, Delivery Stance and Recovery (Perry O'Brien Technique).

2.4. Discus Throw: Holding the Discus, Initial Stance, Primary Swing, Turn, Release and Recovery (Rotation in the circle).

2.5. Javelin Throw: Grip, Carry, Release and Recovery (3/5 Impulse stride).

3. Officiating

3.1. Running (any one)

3.2. Jumping (any one)

3.3. Throwing (any one)

3.4. Viva on rules and regulations on track and field events.

Project-cum-Practical Record Book

1. Introduction of the Sport, History of Development

Performance status of India and renowned personalities – Indian & International

1. Fundamental Skills
2. Rules & regulations with Field/Court diagram

Reading References:

1. Saha, A. K. SarirSiksherRitiniti, Rana Publishing House, Kalyani.
Bandopadhyay, K. SarirSikshaParichay, Classic Publishers, Kolkata.
Petipus, et al. Athlete's Guide to Career Planning, Human Kinetics.
Dharma, P.N. Fundamentals of Track and Field, Khel Sahitya Kendra, New Delhi.

Dr. Suvranshu Pan
(IQAC Coordinator & Convenor, Exam Monitoring Cell)

Dr. Bibhas Kanti Mandal
(Principal)