सत्यमेव जयते

THE ADMINISTRATION OF UNION TERRITORY OF LADAKH
LADAKH AUTONOMOUS HILL DEVELOPMENT COUNCIL KARGIL
OFFICE OF THE PRINCIPAL GOVT. DEGREE COLLEGE KARGIL (LADAKH)
NAAC ACCREDITED "B"
Phone No.:-0198-232392 Fax No:-01985-233374
E-mail Id:-Principal-gdck@rediffmail.com

Syllabus of the different courses which are based on experiential learning through project work/ field work during the academic session 2022-2023.

Principal GDC Kargil

Principal
Govt. Degree College
Kargil (Ladakh)

University of Ladakh (UOL)

Syllabus for Geology, CBCS semester 1st to 6th for the year 2020

Semester 1st

Fundamentals of Geology

Credits, Theory-4, Practical -2

Unit 1

1.1 Definition of geology and its relation with other sciences, branches of geology and its applications. Earth as a planet its shape, size, density and atmosphere.
1.2 Origin of earth: Kant- Laplace, Jeans and Jeffery's, Big Bang theories
1.3 Geological time scale, Age of earth: relative and absolute dating methods
1.4 Introduction to rocks and minerals, major rock types, surface and crustal abundance of rocks. Preliminary idea about common rock forming minerals
1.5 Internal structure of earth and its composition: crust, mantle and core

Unit 2

2.1 Isostasy: Pratt 's and Airy's theories
2.2 Fundamental concepts; Catastrophism, uniformitism, cycle of erosion and base level of erosion
2.3 Endogenic and exogenic processes
2.4 Weathering: definition and types, agents of weathering
2.5 Mass wasting: definition and types, factors affecting mass wasting

Unit 3

3.1 Fluvial processes: Erosional and depositional features, drainage patterns
3.2 Glaciers: Definition, types, erosional and depositional features
3.3 Aeolin processes: Erosional and depositional features, karst topography, surface and subsurface features
3.4 Earthquakes: Seismic waves, magnitude and intensity of earthquake, earth quake damages and prediction. Seismic zones of India
3.5 Volcanoes : Types, products and distribution of volcanoes

UNIT 4

4.1 Introduction to Geochemistry: Chemical bonding, coordination number, radius ratio, ionization potential, electro negativity, atomic substitution.
4.2 Cosmic abundance of elements: Major elements, Trace elements and Rare earth elements, large ion lithophile and High field strength elements.
4.3 Gold Schmidt's geochemical classification of elements.
4.4 Geochemical characteristics of Crust, Mantle and Core.
4.5 Earth's thermal history; Heat conduction and heat flow, thermal gradient of earth.

Practical:

Field Geology: Study of landforms:- Erosional and Depositional features, Measurement of Dip and Strike.

Study of megascopic properties of common rock-forming minerals

Field work and field report(compulsory)

Suggested readings

1. A-Holmes- Principles of physical Geology
2. Thompson/Turk- Modern physical Geology
3. K S Valdiya- Physical Geology
4. Brain Mason- Principles of Geochemistry

Semester 3rd

Sedimentology, Hydrogeology and Geophysics **Credits, Theory-4, Practical -2**

Unit 1

1.1 Introduction to sedimentology: Process involved in the formation of sedimentary rocks: erosion, transportation, deposition, lithification and diagenesis.
1.2 Grain Size, grade scale, and method of grain size analysis by sieving method.
1.3 Sedimentary Texture: size, shape, fabrics, roundness, sphericity.
1.4 Composition and Classification of Sedimentary Rocks: Siliciclastic and Carbonates.
1.5 Sedimentary structures: Primaryand Secondary structures, and biogenic structure.

Unit 2

2.1 Introduction to Hydrogeology.Precipitation, Evaporation, Transpiration, Evapotranspiration, Condensation, runoff, infiltration, water balance.
2.2 Hydrological Cycle, Formation of Precipitation, Groundwater, Water table.
2.3 Zone of Aeration and Saturation, storage coefficient of aquifers.
2.4 Aquifer and its types (confined, Unconfined and perched).
2.5 Hydrological properties of Aquifer: porosity, permeability, specific yield, hydraulic conductivity.

Unit 3

3.1 Principles of Ground water flow: Hydraulic head, Darcy's Law.
3.2 Ground water quality: Bacteriological quality, Chemical quality, salinisation of ground water, physical quality.
3.3 Quality criteria for ground water use.
3.4 Geological controls of groundwater.
3.5 Artificial recharge methods: spreading method, Induced recharge method, subsurface dams method, waste water recharge method.

Unit 4

4.1 Introduction and scope of geophysics, the earth, size and shape, Geoid.
4.2 Application of geophysics in mineral and energy resource exploration
4.3 Introduction to geophysical method- gravity, Magnetic, seismic method and their applications.
4.4 Geochronology-Estimating the earth's age:
4.5 Geomagnetism and paleo magnetism

Suggested readings

1. Sam Jr Boggs: Principles-of sedimentology and stratigraphy
2. C.W. Fetter: Applied hydrogeology
3. Todd, D.K: Ground Water Hydrogeology
4. William Lowie: Fundamentals of Geophysics
5. Telford, W.N, Geldart, L.P and Sheriff, R.E: Applied Geophysics
6. Milton B Dobrin and Carl H Sabit: Introduction to Geophysical Prospecting

Practical:

Megascopic properties of sedimentary rocks in hand specimen and optical properties under microscope (Mineralogy, textures and structure).

Delineation of hydrological boundaries on water table contour maps, and estimation of aquifer properties as hydraulic conductivity, storage coefficient and transmissivity.

✓ Field work and field report(compulsory)

Semester 5th

Geodynamics and Structural geology **Credits, Theory-4, Practical -2**

UNIT 1

1.1. Plate tectonics: Introduction, the earth's layers
1.2. Continental drift and its evidence, Concept of sea floor spreading
1.3. Plate boundaries: Convergent, divergent and transform fault
1.4. Plate driving forces: mantle plumes and convection current models
1.5. Plate tectonics in relation to seismicity and volcanism

UNIT 2

2.1 Plate tectonics and mountain buildings: ocean-ocean collision, Ocean-Continent collision and Continent- Continent collision.
2.2 Continent –continent collision: Evolution of Himalaya
2.3 Plate tectonics and ocean floor topography; Continental shelf, continental slope and rise, submarine canyon and abyssal fans, oceanic ridges, trenches and island arcs
2.4 Maps : definition, topographical and geological map, dip and strike of stratified rock
2.5 Unconformity: types of unconformities, criteria for recognition of unconformities

UNIT 3

3.1 Stress: definition, magnitude and units, stress at surface (normal stress and shear stress) stress at a point.
3.2 Deformation: translation, rotation and deformation, measurement of strain
3.3 Response of rock to stress change: elastic plastic and brittle behaviour of rocks
3.4 Folds: Definition, geometry and classification of folds, recognition of fold in fields
3.5 Faults: Definition, terminologies and classification (Geometrical)

UNIT 4

4.1 Recognizing of faults in field: discontinuity of structures, repetition and omission of strata, Features characteristic of fault planes (slickensides, drag, breccias, mylonites, gouge) silicification and mineralisation, physiographic criteria (fault scarps, triangular facets, offset streams
4.2 Joints :definition, morphology of joints, geometrical relation with folds
4.3 Lineation: definition and its types (mineral lineations, intersections lineations slickensides, boudinage ,quartz rod, mullion structures)
4.4 Foliation: cleavage ,disjunctive cleavage, pencil cleavage, slaty cleavage, Phyllitic Cleavage and Schistosity, Crenulation Cleavage, Gneissic Layering and Migmatization, Mylonitic Foliation
4.5 Boudinage: introduction, geometry of boudinage

Practical: field work

Study of contours and landforms, strike, true dip and apparent dip problems, drawing of profiles from geological map

Field work and field report(compulsary)

Suggested readings

1. Marland P.Billings — Structural geology
2. Davis and Reynolds — Structural geology of rocks and regions
3. Ben A. van der Pluijm and Stephen Marshak — Earth Structure
4. Haakon Fossen — Structural geology
5. S.K.Ghosh — Structural geology

University Of Ladakh

Semester 6th

Stratigraphy and Paleontology **Credits, Theory-4, Practical -2**

UNIT 1

1.1 Stratigraphy:introduction and principles of stratigraphy, criteria's for correlation of stratas
1.2 Standard stratigraphic time scale. concept of litho, bio and chronostratigraphy
1.3 Physical and structural subdivision of Indian subcontinent and their characteristics
1.4 Brief description of Archean and Preterozioc successions of India;Dharwar, Aravalis, Cuddapah
1.5 Distribution and lithostratigraphic classification of Vindhyan, Salkhala, Dogra/Shimla States

UNIT 2

2.1 Litho and biostratigraphic classification of Paleozoic sequences of Kashmir and Spiti
2.2 Stratigraphy of Jurrasic of Kutch and Cretaceous of Trichnopoly
2.3 Deccan lava flows-distribution and stratigraphic position
2.4 Litho and biostratigraphic classification of Siwalik sequences
2.5 Lithology and age of Karewas of Kashmir

UNIT 3

3.1 Fossil: definition, conditions and mode of preservation, types and their significance.
3.2 Origin of life and life through ages
3.3 Geological distribution and morphological characteristics of Bivalvia , Gastropoda and Cephalopoda
3.4 Geological distribution and morphological characteristics of Brachiopoda and Echinodermata
3.5 Geological distribution and morphological characteristics of Trilobites and Graptolites

UNIT 4

4.1 Elementary ideas about Foraminifera, Ostracoda, Radiolarian and conodonts
4.2 An introduction to vertebrate Paleontology: Evolution of Horse and Elephant
4.3 A brief study of reptiles with special reference to Dinosaurs and theories regarding extinction of Dinosaurs
4.4 .Gondwana Stratigraphy: Litho and biostratigraphic classification, climatic variation and economic importance
4.5 Important characteristics of Gondwana plants: Glossopteris, Gangmopteris, Vetebraria, Thinfeldia, Sigillaria, Nilsonia, Ptylophylum, Lepidodendron, Calamites, Schizoneura

Practical: Study of morphological characteristics of genera Brachiopoda, Bivalvia, Gastropoda, Cephalopoda, Trilobite, Echinoidea, Graptoloida and Anthozoa. Study of plant fossils and field work

Suggested readings

1. H woods — Invertebrate paleontology
2. R.N.Black — The elements of paleontology
3. Davis and stubblefield — An introduction to paleontology
4. Colbert — Evolution of vertebrates
5. Ravinder kumar — Fundamentals of historical geology
6. M.S Krishnen — Geology of India and Burma
7. Weller — Stratigraphic principles and practice

UNIVERSITY OF LADAKH

B.A/B.Sc. **Semester – III**

Skill Enhancement Course

Course Title: ***ENVIRONMENT, CLIMATE CHANGE & SUSTAIBLE DEVELOPMENT***

Course Code: **UG-GG-SEC1**

Credits: **04** Contact Hours: **60** (4 Hrs./week) Max. Marks: **100**

Learning Outcomes

After the completion of the course, the students will have the ability to:

- ✓ Understand the basic concepts related to environment, climate change & sustainable development;
- ✓ Understand the impact of climate change its assessment and implications;
- ✓ Sustainable development; its key indicators and goals.

COURSE CONTENT

THEORY (Credits: 03, Max. Marks: 75)

Unit –I **15 Hours**

1.1 Environmental Geography: Concept and Approaches
1.2 Ecosystem: Concept and Structure: Ecosystem Functions
1.3 Human-Environment Relationship in Desert and Mountain Regions

Unit- II **15 Hours**

2.1 Environmental Problems and Management: Biodiversity Loss
2.2 Concept of Climate Change: Green House Gases and Global Warming
2.3 Impact of Climate Change – Agriculture and Water, Flora and Fauna, Human Health

Unit – III **15 Hours**

3.1 Climate Change Assessment – IPCC; National Action Plan on Climate Change
3.3 Sustainable Development: Definition, Components and Limitations
3.4 Sustainable Development Goal: Concept and Objectives

PRACTICAL (Credits: 01, Max. Marks: 25) **15 Hours**

1. Case study/visit of any affected area in Ladakh related to climate change*.

*Note:

- Students are required to undertake a field visit to any affected area in Ladakh related to climate change and conduct field study.
- A field visit report shall be submitted by the students. The report shall be evaluated by the examiner, and subsequently the students have to appear for viva – voce examination.

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B.A/B.Sc. Semester – IV

Skill Enhancement Course

Course Title: ***FIELD TECHNIQUES & SURVEY*** Course Code: **UG-GG-SEC2**

Credits: **04** Contact Hours: **60** (4 Hrs./week) Max. Marks: **100**

Learning Outcomes

After the completion of the course, the students will have the ability to:

- ✓ Understand the basic of field work in geography, its importance, values and ethics;
- ✓ Understand the concept and importance of questionnaire and interview;
- ✓ Designing and writing of field report.

COURSE CONTENT

THEORY (Credits: 03, Max. Marks: 75)

Unit – I **15 Hours**

1.1 Field Work in Geographical Studies

1.2 Importance, Merits and Demerits of Field Work'

1.3 Defining the Field and Identifying the Case Study- Rural/Urban/ Physical/ Human/ Environmental

Unit – II **15 Hours**

3.1 Questionnaire: Concept, Types and Applications.

3.3 Interview: Concept and Importance

3.4 Focused Group Discussion

Unit – III **15 Hours**

4.1 Designing of Field Report, Aims and Objectives of Study

4.3 Methodology, Analyses and Interpretation

4.4 Writing of Report

PRACTICAL (Credits: 01, Max. Marks: 25) **15 Hours**

1. Case study/visit to any rural area in Ladakh*.
2. Collect data using structures questionnaire/schedule

*Note:

- Students are required to undertake a field visit to any rural area in Ladakh to study certain aspects of Natural and cultural landscape and on-spot observations under the supervision of teachers who will accompany the students.
- A field visit report shall be submitted by the students. The report shall be evaluated by the examiner, and subsequently the students have to appear for viva – voce examination.

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B.A/B.Sc. **Semester – VI**

Practical

Course Title: ***DISSERTATION (PROJECT) – LADAKH SPECIFIC*** Course Code: **UG-GG-P106**

Credits: **02** Contact Hours: **60** (4 Hrs./week) Max. Marks: **50**

Learning Outcomes

After the completion of course, the students will have ability to:

- ✓ Understand the importance of field work as one of the methodologies in Geography.
- ✓ Understanding about pre-field work preparations, conduct of the field work, post field work based analysis and interpretation

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COURSE CONTENT

Unit – I **30 Hours**

1.1 Selection of topic, aims and objectives
1.2 Questionnaire/Schedule: Meaning & preparation
1.3 Sampling techniques
1.4 Field work and Data Collection
1.5 Data Analysis and Interpretation

Unit – II **30 Hours**

- Preparation and Submission of Final Report

Note:

- ✓ Students are required to undertake a field study tour of a distant area or region in Ladakh to study certain aspects of social, cultural landscape and on-spot observations under the supervision of teachers who will accompany the students.
- ✓ A comprehensive tour report on the area / region shall be submitted by the students within two weeks on their return from the tour. The report shall be sent to the examiner for evaluation, and subsequently the students have to appear for viva – voce examination.

SUGGESTED READINGS

1. Creswell J., 1994: *Research Design: Qualitative and Quantitative Approaches* Sage Publications.
2. Dikshit, R. D. 2003. The Art and Science of Geography: Integrated Readings. Prentice-Hall of India, New Delhi.
3. Evans M., 1988: "Participant Observation: The Researcher as Research Tool" in *Qualitative Methods in Human Geography*, eds. J. Eyles and D. Smith, Polity.
4. Mukherjee, Neela 1993. Participatory Rural Appraisal: Methodology and Application. Concept Publs. Co., New Delhi.
5. Mukherjee, Neela 2002. Participatory Learning and Action: with 100 Field Methods. Concept Publs. Co., New Delhi
6. Special Issue on "Doing Fieldwork" *The Geographical Review* 91:1-2 (2001).
7. Stoddard R. H., 1982: *Field Techniques and Research Methods in Geography*, Kendall/Hunt.
8. Wolcott, H. 1995. The Art of Fieldwork. Alta Mira Press, Walnut Creek, CA.

Practicals:(Credits 2)
Course Code: UGBO-L 201
Maximum Marks: 50 (Internal Continuous Assessment=25 and External Practical Exam= 25)

1. Determination of pH, and analysis of two soil samples for carbonates, chlorides, nitrates, sulphates, organic matter and base deficiency by rapid fieldtest.
2. To determine the moisture content and water holding capacity of of grassland and forestsoil
3. Determination of minimal quadrat size for the study of herbaceous vegetation in the college campus by species area curve method. (species to be listed)
4. Quantitative analysis of herbaceous vegetation in the college campus for frequency and comparison with Raunkiaer's frequency distributionlaw.
5. Studyofvegetativeandfloralcharactersofthefollowingfamilies(Description,V.S.flower, section of ovary, floral diagram/s, floral formula/e and systematic position according to Bentham & Hooker's system of classification):Brassicaceae -Brassica, Alyssum / Iberis; Asteraceae -Sonchus/Launaea, Vernonia/Ageratum, Eclipta/Tridax; Solanaceae -*Solanumnigrum;* Lamiaceae-Salvia, *Ocimum*; Liliaceae - Asphodelus / Lilium /Allium.
6. Botanical exploration/Plant collection tour.
7. Mounting of a properly dried and pressed specimen of any wild plant with herbarium label (to be submitted in the recordbook).

Suggested Readings

1. Kormondy, E.J. (1996). Concepts of Ecology. Prentice Hall, U.S.A. 4thedition.
2. Sharma, P.D. (2010) Ecology and Environment. Rastogi Publications, Meerut, India. 8th edition.
3. Chapman, JL and Reiss, MJ; (1997) Ecology Principals and Applications.Cambridge University Press,London
4. ColinvauxP(1993), Ecology. John Wiley, NewYork.
5. Simpson, M.G. (2006). Plant Systematics. Elsevier Academic Press, San Diego, CA,U.S.A.
6. Judd, S, Walter et al. (2008), Plant Systematics: A Phylogenetic Approach. Sinauer Associates, Inc. SunderlandUSA
7. Singh, G. (2012). Plant Systematics: Theory and Practice. Oxford & IBH Pvt. Ltd., New Delhi. 3rdedition
8. Wilkens GE (2004), Economic Botany, Principals and Practices. Kluwer Publishers, Niethelands
9. Stilling P (2001), Ecology:Theories and Applications. Printice Hall Inc.

UNIVERSITY OF LADAKH

Approved Vide: NO:UOL/2020/DDA-01-398 Dated: 1st of Dec.,2020

Syllabus of Botany for Undergraduate course under Choice Based Credit System

Subject: Botany
Subject Code:UGBO **Credits: 6**
Semester: II **Core Course Botany Paper -II**

Course title: Plant Ecology and Taxonomy

Course Code: UGBO-C 201 **Credits: 4**
Maximum marks: 100 (External = 90 and Attendance= 10)

UNIT 1: Ecology and Plant communities [14 lectures]

Introduction to Ecology, Concept of habitat and niche, Soil formation and Soil Profile.
Characteristics of population, Growth curves, Species interaction.
Plant communities: Characteristics, Ecotone and edge effect.
Succession: Processes and types

UNIT 2: Ecosystem and Phytogeography [16 lectures]

Structure of Ecosystem; energy flow trophic organisation; Food chains and food webs, Ecological pyramids production and productivity;
Biogeochemical cycling; Cycling of carbon, nitrogen and Phosphorous
Phytogeography: Biogeographical zones of India; Concept of Endemism

UNIT 3: Plant Taxonomy and Classification [16 lectures]

Introduction to plant taxonomy;
Types of classification: artificial, natural and evolutionary
Classification system: Bentham Hooker (up to series), Angiosperm Phylogeny Group (APG) up to order level
Numerical Taxonomy: Operational Taxonomic Units (OTUs), Character Weighing and Coding, Cluster Analysis; phonograms and Cladograms (definitions and differences)
Roles of Herbarium, important herbaria and botanical gardens of the world and India;

UNIT 4: Identification and Nomenclature [14 lectures]

Documentation: Flora, Keys: single access and multi-access, taxonomic evidences from cytology phytochemistry and molecular data
Taxonomic hierarchy- ranks, categories and taxonomic groups;
Botanical Nomenclature: History and principals of ICN, Binomial system of nomenclature, Typification, author citation, valid publication, principal of priority.

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Approved Vide: NO:UOL/2020/DDA-01-398 Dated: 1st of Dec.,2020

Syllabus of Zoology for Undergraduate course under Choice Based Credit System
Subject: Zoology
Subject Code: UGZO
Semester: III

Course title: Developmental Biology, Evolution and Animal Behavior (Theory) Core Course III **Credits: 4**
Course Code: UGZO-C 301
Maximum marks: 100 (External = 90 and Attendance= 10)

Unit 1

1.1 Gametogenesis: spermstogenesis, oogenesis, structure of sperm and egg
1.2 Fertilization: types and mechanism of fertilization
1.3 Types and pattern of cleavage
1.4 Blastulation and gastrulation (Frog and chick)

Unit 2
2.1 Primary organizer
2.2 Extra embryonic membrane
2.3 Placenta: structure, types and function
2.4Basic processes in embryonic development

Unit 3
3.1 Theories of evolution: Lamarckism, Darwinism, Neo-Darwinism
3.2 Evidence of evolution: fossils, dating of fossils, phylogeny of horse.
3.3 Isolating mechanism, industrial melanism, directional/ stabilizing and destructive selection.
3.4 Speciation: allopatric and sympatric

Unit 4
4.1 Social organization in honey bee
4.2 Animal communication
4.3 Biological clock
4.4 Migration in birds and fishes

Approved Vide: NO:UOL/2020/DDA-01-398 Dated: 1st of Dec., 2020

Practical: **Credits 2**
Course Code: UGZO-L 301
Maximum Marks: 50 (Internal Assessment =25 and External Practical Exam=25)

1. Study of permanent slides of different stages of frog and chick embryo
2. Study of different types of placenta through permanent slides or photomicrographs.
3. Study of available spacemen of fossil records
4. Project on study of parental care in any member of mammal.

Books Recommended

1. A.K Berry:Introduction to embryology
2. V.B. Rastogi: Introduction to evolution
3. Rena Mathur: Animal behaviour
4. Moody: Introduction to evolution
5. Gilbert, S. F. (2010), Developmental Biology.
6. Slack, J. M. W. (2013), essential Developmental Biology.
7. Ridley, M. (2004), Evolution.
8. Douglas, J. Futuyma (1997). Evolutionary Biology.
9. Vinod Kumar (2002), Biological rhythms.
10. Alcock J. Animal Behavior.

3rd SEMESTER
SKILL ENHANCEMENT COURSE (SEC)

Title: Environmental Impact Assessment **CREDITS - THEORY-2, PRACTICAL-2**

Objectives/Expected Learning Outcomes: The students will be sensitized about the issues related to proposed developmental projects on the environment and shall be expertise about available techniques/technologies for minimizing the negative effects of these projects.

THEORY (2 CREDITS: 30 HOURS) MINIMUM MARKS: 12

UNIT-I

EIA: General introduction

1.1 EIA- concept and Historical background.
1.2 General process of EIA.
1.3 Environmental Impacts to be considered in EIA process and their types.
1.4 Overview of EIA notifications (1994,2006 and 2010)
1.5 Prediction and assessment of various Environmental Impacts- General Concept.

UNIT-II:

EIA Methodologies; Documentation and Reporting

2.1 EIA methodologies
a) Adhoc and Checklist method
b) Matrix method
c) Overlay method
d) Cost- Benefit Analysis
e) Network and Modelling methods
2.2 Environmental Impact Statement
2.3 Environmental Audit.
2.4 Reviewing of EIA/EIS
2.5 People Participation in EIA
2.6 Environmental Management Plan

PRACTICAL (2 CREDITS- 60 HOURS) **MAXIMUM MARKS: 30**
MINIMUM MARKS: 12

List of practicals for the examinations to be held in

1. Rapid Environmental Assessment checklists (REA) of proposed project
2. To study baseline data collection for EIA.
3. Study of Environmental sensitive places of respective areas.
4. To study the impacts of any two developmental projects (Mining/industries/Transport sector/Hydroelectric project) by:
   a. Checklist method
   b. Adhoc method
   c. Matrix method
5. To study the EMP of any two developmental projects. (Mining/industries/Transport sector/Hydroelectric project)
6. Rehabilitation plan of small project
7. Mitigation measures of any area specific project

Literature Recommended:

1. Anjaneyulu, Y.(2002),Environmental Impact Assessment Methodologies.BSP BS Publications. Hyderabad.

3. Shukla S.K and Shrivastav P.R.(1992). Methodology of Environmental Monitoring and Assessment. Commonwealth Publishers, New Delhi.
4. Srivastav A.K (2011).Environmental Impact Assessment. A.P.H. Publishing Corporation New Delhi.
5. Trivadi P.R (2009), Environmental Impact Assessment. A.P.H. Publishing Corporation, New Delhi.
6. Vankhede G .(2012),Environmental Impact Assessment. Biotech Books New Delhi.

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