## Additional Documents of 1.3.3

# Syllabus of the Courses in Metric 1.3.2

Botany -BSc Botany Honours -Semester - II

Course name: Archegoniatae: Bryophytes, Pteridophytes, Gymnosperms Course Code: BSCHBOTC202

Theory -

#### **Unit III: Pteridophytes**

 Introduction to Palaeobotany – Important terminologies and definitions; Types of fossil on the basis of modes of preservation; Nomenclature, Conditions suitable for fossilization; Importance of fossils and their study; Stratigraphy – Law of superposition, Stratigraphic correlation and stratigraphic deduction based on megafossil and microfossil assemblages. Geological time scale and important events of plant life.

Practical -

• Study (including mode of preservation) of the following: *Lepidodendron*, (stem in T. S.), *Calamites* (stem in T. S.), *Bucklandia* (stem, specimen), *Glossopteris* (leaf, specimen), *Lyginopteris* (stem in T. S.), *Vertebraria*(root, specimen).

[NB. Practicals will also include field study with specimen collection, preservation and their submission with proper documentation. It also includes temporary and where ever necessary permanent slide submission.]

#### Objective -

Palaeobotany is the branch of biology that deals with plant fossils. Fossils give us informations about our past environment, past flora and fauns and it also gives us informations about the evolutionary relationships among different groups of plants (or animals). Fossils are also used to explore oil deposits in the strata. Fossils help us to correlate among the strata of a geological region and to build a geological profile.

Fortunately our college is located in coalfield areas which are considered rich source of fossils. Here at this level only macrofossils have been considered but this area is also very good for microfossil studies. Though field visit, specimen identification, collection and storage students develop skill of fossil identification, collection methods and storage. This makes them proficient in this branch of biology which is maily fundamental.

Semester - III Course name: Plant Systematics Course Code: BSCHBOTC303

#### Practical

- Field visit (local or outside depending on situation) -
- Mounting of a properly dried and pressed specimen of any 20 wild plants with Herbarium label (to be submitted in the record book).
- Construction of plant phylogenetic trees using various loci (rbcL, ITS, trnLetc) with various phylogenetic methods (Neibour Joining, Maximum Likelihood etc)

#### **Objective** –

Plant taxonomy or systematics is the basic branch of botany. This particular subject gives you experience on identification of herbs, shrubs and trees of your and distant locality. This subject area may be considered as job oriented as one good in plant identification have scope in the medicinal field.

Through field visit several times to local areas, to Botanical Survey of India, Shibpur Kolkata and AJC Bose botanical Garden and to a distant place (for long excursion) like Darjeeling and Sikkim area gives immense experience of plant identification, their habit and habitats etc. The best way to learn plant taxonomy is through field visit. Students get extremely benefitted by these field visits that we normally do every session.

#### **BSc Botany Program -**

#### **Semester-III**

## Course name: Archegoniatae: Bryophytes, Pteridophytes, Gymnosperms Course Code: BSCPBOTC301

#### Theory -

#### **Unit III: Pteridophytes**

 Introduction to Palaeobotany – Important terminologies and definitions; Types of fossil on the basis of modes of preservation; Nomenclature, Conditions suitable for fossilization; Importance of fossils and their study; Stratigraphy – Law of superposition, Stratigraphic correlation and stratigraphic deduction based on megafossil and microfossil assemblages. Geological time scale and important events of plant life.

#### **Practical** -

• Study (including mode of preservation) of the following: *Lepidodendron*, (stem in T. S.), *Calamites* (stem in T. S.), *Bucklandia* (stem, specimen), *Glossopteris* (leaf, specimen), *Lyginopteris* (stem in T. S.), *Vertebraria*(root, specimen).

## [NB. Practicals will also include field study with specimen collection, preservation and their submission with proper documentation. It also includes temporary and where ever necessary permanent slide submission.]

Palaeobotany is the branch of biology that deals with plant fossils. Fossils give us informations about our past environment, past flora and fauns and it also gives us informations about the evolutionary relationships among different groups of plants (or animals). Fossils are also used to explore oil deposits in the strata. Fossils help us to correlate among the strata of a geological region and to build a geological profile.

Fortunately our college is located in coalfield areas which are considered rich source of fossils. Here at this level only macrofossils have been considered but this area is also very good for microfossil studies. Though field visit, specimen identification, collection and storage students develop skill of fossil identification, collection methods and storage. This makes them proficient in this branch of biology which is maily fundamental.

## Course : SEC-1 (BAHEDCSEC302) : COMPUTER APPLICATION IN EDUCATION Full Marks:50

#### **Objectives:**

After going through this course, the students will be able to-

- Apply various computer applications in the field of education
- Perform fundamental works in MS WORD
- Perform fundamental works in MS EXCEL
- Perform fundamental works in MS POWER POINT
- Make graphical representations

#### Unit I Basics of MS WORD

- Type a word document with the following specifications:
- Text in Times New Roman, font size 12.
- Title in French Script MT, font size 16, bold and underlined.
- Insert a table of 4x4 in between the text.

• Design a colourful merit certificate mentioning the event name, event date, venue, organiser etc. name of the candidate and his/her affiliation, rank/position in landscape orientation with a light coloured background and appropriate design border around the document.

## Unit II Basics of MS EXCEL

- Calculating total and Average
- Mark sheet preparation
- Graphically representing of the data: Pie-Chart & Bargraph
- Graph sheet should have a heading, an index and it should be properly labeled.

#### Unit III Serial Preparation

- Prepare a book list containing ten books on Education
- APA format must be maintained
- Space between the lines will be 1.5.

#### Unit IV Table Preparation

• Design a time table for your departmentThe first line should mention the name of the departmentit should be in 14 points in Times New Roman and should be bold, normal gap between the lines.

- The second line should mention the academic year.
- Leave 1.5 gap between the academic year and the table.
- Create a table specifying rows (denoting periods) and columns (denoting days).
- Type the routine within the timetable mentioning name of the paper and initial of the teacher.
- Footer should contain the date from which the routine will be effective (w.e.f. ------).
- Students can apply their own colour preference for designing the table rows and columns

## Unit V Certificate Preparation

• Create the following one page document and take a print out on A4 size paper:

• Design a colourful merit certificate mentioning the event name, event date, venue, organizer etc. name of the candidate and his/her affiliation, rank/position in landscape orientation with a light coloured background and appropriate design border around the document

## Unit VI Basics of Power Point

- Create a power point presentation:
- Create 10 separate slides containing text matter, graphs, images, animations, tables.
- Select a background.
- Each slide must have a title which must be in capital, bold and centrally aligned.
- Text and title should be of different colour.

Course: SEC-2 (BAHEDCSEC402): ACTION KESEAKCH AND CASE STUDY	Course:SEC-2 (BAHEDCSEC402): ACTION RESEARCH A	ND CASE STUDY
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## **Objectives:**

After completion of the course, the students will be able to-

- develop the concept of action research and its importance in education
- write a report on an action research undertaken by them

## Unit I Introduction to action research

Meaning and objectives of action research Advantages of action research Areas of action research

## Unit II Practicum

The students are required to conduct an action research individually from any **one** of the following topics

1) Any problem related to teaching learning process/ methodology of teaching

- 2) Any problem related to organizing co-curricular activities in school
- 3) Any problem related to administration and management of the school/ educational

system.

OR any other suitable topic(s).

## <u>Format</u>

Writing the report of the practical work

- back ground of the problem - its identification

- planning the research

-theoretical basis of the problem - review of related literature

Procedure of the study

Participants / sample of the study

Gathering of data – Tools used in the study

Analysis of the data - Descriptive analysis/ statistics

Reporting of results, Interpretation of data, identifying the causes of the problem Actions to be taken Follow up Suggestion References

#### Course:CC-2 (BSCHGEOC102) Cartographic Techniques FULL MARKS:50

Course Learning Outcomes:

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

1. Understand the importance of scale in geography.

2. Read and prepare maps, comprehend locational and spatial aspects of the earth surface.

3. Use and importance of maps for regional development and decision making

#### Course Content:

1. Basic concept of Cartography; Concept and Types of Scales; Graphical Construction of Linear, Diagonal and Vernier Scales.

2. Map Projections – Classification, Properties and Uses; Construction of graticules, Merits and Demerits of Polar Zenithal Stereographic, Bonne's and Mercator's Projections; Basic Concept of UTM projection.

3. Topographical Maps (Open and Defence Series maps, RF 1:50,000) – Introduction to numbering system of Topogrpahical Maps, Analysis of Physical and Cultural features and interrelationship, Interpretation using Transect Chart (Plateau/plain region)

4. Slope Analysis (Wentworth's method), Topographic Profiles-Introduction and Plotting of Cross and Longitudinal Profiles along a River.

5. Interpretation of Weather Maps (Monsoon and Post-monsoon seasons)

#### Continuous Assessment:

*i. Practical Record:* A *Project File* / Practical Notebook in pencil comprising one exercise *each*, on scale, map projection, interpretation of topographic sheet and weather map (10 Marks)

*ii. Class Test:* 20 Marks

#### Course:CC-7 (BSCHGEOC303) FUNDAMENTALS OF REMOTE SENSING FULL MARKS:50

Course Learning Outcomes:

After going through this course, the students will be able to -

•Gather fundamental knowledge on various aspects of remote sensing

•Perform basic operations in QGIS

•Acquire huge understanding of visual image interpretation

•Apply various remote sensing applications in the field of geography

•Apply this knowledge for sustainable development from local to global level

Course Content:

1. Remote Sensing: Definition, Development, Platforms and Types.

2. Concept of Aerial Photography and Satellite Remote Sensing: Principles, Types and Geometry of Aerial Photograph; Satellites – geostationary and remote sensing (Landsat and IRS) and Sensors, Resolution (Spectral, spatial and temporal).

3. Introduction to Image Processing and Data Analysis: Geo-Referencing; Editing and Output.

4. Land use/ Land Cover Mapping: Visual Interpretation of Aerial photographs and Satellite Images.

5. Application of Remote Sensing: Forests Monitoring, Water Resources and Natural hazards.

Continuous Assessment:

i. Practical Record: A *project file* consisting of one exercise will be done from aerial photos (scale, orientation and interpretation) and one exercise on using latest version of QGIS software on above mentioned themes in topic 3 and one exercise on topic 4.

ii. Class Test

#### Course: SEC-2 (BSCHGEOSEC401) GEOGRAPHICAL INFORMATION SYSTEM FULL MARKS:50

Course Learning Outcomes:

After going through this course, the students will be able to -

•Understand various components and principles of mapping

•Construct the thematic maps using different digital layers

•Apply GIS in various geographical studies

•Classify digital data and compare them with ground realities

•Map the resources, their location and availability using GIS software

## Course Content:

UNIT I: Traditional and Digital Mapping, Need and advantage of Digital mapping.

UNIT II: Georeferencing of Scanned Maps and Satellite Images applying Reference Spheroids (WGS-84 and Everest) and Projection (Universal Transverse Mercator's and Polyconic) using Open-Source Software.

UNIT III: Digitization and Extraction of Physical and Anthropogenic Features for Change Detection.

UNIT IV: Internal Assessment: Preparation of GIS Map on Crop Productivity/ Population Density.

UNIT V: Laboratory Notebook and Viva-Voce.

#### Course: CC-14 (BSCHGEOC602) TOPOGRAPHICAL SHEET AND WEATHER MAP INTERPRETATION FULL MARKS:50

Course Learning Outcomes:

After going through this course, the students will be able to -

•Read and prepare various kinds of maps

•Comprehend locational and spatial aspects of the earth's surface

•Acquire practical knowledge about meteorological reports

•Relate physical and cultural geographical components

•Use maps for regional development and decision making

Course Content:

UNIT I:Interpretation of topographical maps (Plateau region, 1:50000) Principles of topographical sheet numbering (Defence Series and Open Series Maps) as followed by Survey of India, Construction of profiles: superimposed, projected and composite, Long and cross profiles along and across river, Morphometric analysis in 5\*5 km area:Relative Relief, Drainage Density, Drainage Frequency, Average Slope (Wentworth's Method), Analysis of landforms and vegetation characteristics, Interpretation of settlement, transport and communication, Relation between physical and cultural elements.

UNIT II: Interpretation of daily Weather Report prepared by Indian Meteorological Department.

UNIT III: Internal assessment: **Project work**: Preparation of maps and charts from toposheet and their interpretations (At least two from the given: i. Geomorphic map, ii. Composite morphological map, iii. Index showing toposheet network, iv. Hierarchy of settlement).

UNIT IV: Laboratory Notebook and Viva-Voce.

## BSC PHYSICS (HONOURS) SKILL ENHANCEMENT COURSE (SEC-I) (Sem-III)

## **Course Name: Electrical Circuit Network Skills**

## **Course Code: BSCHPHSSEC 301**

#### Course Learning Outcomes:

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

- 1. Design and trouble shoots the electrical circuits, networks and appliances through hands-on mode.
- 2. Choose proper devices depending upon application considering economic and technology up-gradation.

#### Course Content:

 Basic Electricity Principles: Voltage, Current, Resistance, and Power. Ohm's law, Series, parallel, and series-parallel combinations. AC Electricity and DC Electricity, Familiarization with multimeter, voltmeter and ammeter.

**2. Understanding Electrical Circuits**: Main electric circuit elements and their combination. Rules to analyze DC sourced electrical circuits. Current and voltage drop across the DC circuit elements. Single-phase and three-phase alternating current sources. Rules to analyze AC sourced electrical circuits. Real, imaginary and complex power components of AC source. Power factor. Saving energy and money.

3. Electrical Drawing and Symbols: Drawing symbols. Blueprints. Reading Schematics. Ladder diagrams. Electrical Schematics. Power circuits. Control circuits. Reading of circuit schematics. Tracking the connections of elements and identify current flow and voltage drop.

**4. Generators and Transformers**: DC Power sources. AC/DC generators. Inductance, capacitance, and impedance. Operation of transformers.

**5. Electric Motors**: Single-phase, three-phase & DC motors. Basic design. Interfacing DC or AC sources to control heaters & motors. Speed & power of ac motor.

6. Solid-State Devices: Resistors, inductors and capacitors. Diode and rectifiers.Components in Series or inshunt. Response of inductors and capacitors with DC or AC sources.

**7. Electrical Protection**: Relays. Fuses and disconnect switches. Circuit breakers. Overload devices. Ground-fault protection. Grounding and isolating. Phase reversal. Surge protection. Interfacing DC or AC sourcesto control elements (relay protection device).

**8. Electrical Wiring**: Different types of conductors and cables. Basics of wiring-Star and delta connection. Voltage drop and losses across cables and conductors. Instruments to measure current, voltage, power in

DC and AC circuits. Insulation. Solid and stranded cable. Conduit. Cable trays. Splices: wirenuts, crimps, terminal blocks, split bolts, and solder. Preparation of extension

board.

## SKILL ENHANCEMENT COURSE (Sem-IV)

#### **Course Name: Basic Instrumentation SkillsCourse**

## **Code: BSCHPHSSEC401**

#### Course Learning Outcomes:

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

- 1. Get exposure with various aspects of instruments and their usage through hands-on mode.
- 2. Do experiments listed below in continuation of the topics

#### Course Content:

**1.Basic of Measurement:** Instruments accuracy, precision, sensitivity, resolution range etc. Errors in measurements and loading effects.

**2. Multimeter:** Principles of measurement of dc voltage and dc current, ac voltage, ac current and resistance.Specifications of a multimeter and their significance.

**2.Electronic Voltmeter:** Advantage over conventional multimeter for voltage measurement with respect to input impedance and sensitivity. Principles of voltage, measurement (block diagram only). Specifications of an electronic Voltmeter/Multimeter and their significance.

**3. AC millivoltmeter:** Type of AC millivoltmeters: Amplifier- rectifier, and rectifier- amplifier. Block diagram ac millivoltmeter, specifications and their significance.

**4. Cathode** Ray **Oscilloscope:** Block diagram of basic CRO. Construction of CRT, Electron gun, electrostatic focusing and acceleration (Explanation only– no mathematical treatment), brief discussion on screen phosphor, visual persistence & chemical composition. Time base operation, synchronization. Front panel controls. Specifications of a CRO and their significance.

Use of CRO for the measurement of voltage (dc and ac frequency, time period. Special features of dual trace, introduction to digital oscilloscope, probes. Digital storage Oscilloscope: Block diagram and principle of working.

**6. Signal Generators and Analysis Instruments:** Block diagram, explanation and specifications of low frequency signal generators. pulse generator, and function generator. Brief idea for testing, specifications. Distortion factor meter, wave analysis.

**7. Impedance Bridges & Q-Meters:** Block diagram of bridge. working principles of basic (balancing type) RLC bridge. Specifications of RLC bridge. Block diagram & working principles of a Q-Meter. Digital LCR bridges.

**8. Digital Instruments:** Principle and working of digital meters. Comparison of analog & digital instruments. Characteristics of a digital meter. Working principles of digital voltmeter.

**9. Digital Multimeter:** Block diagram and working of a digital multimeter. Working principle of time interval, frequency and period measurement using universal counter/frequency counter, time- base stability, accuracy and resolution.

The test of lab skills will be of the following test items:

- 1. Use of an oscilloscope.
- 2. CRO as a versatile measuring device.
- 3. Circuit tracing of Laboratory electronic equipment.
- 4. Use of Digital multimeter/VTVM for measuring voltages.
- 5. Circuit tracing of Laboratory electronic equipment.

- 6. Winding a coil / transformer.
- 7. Study the layout of receiver circuit.
- 8. Trouble shooting a circuit.
- 9. Balancing of bridges.

#### **BA (Hons)POLITICAL SCIENCE**

#### SEMESTER VI

#### Course Name: PROJECT

#### Course Code: BAHPLSC602

Course Type: C	Course Details: CC14			L-T-P: 0-0-12		
		CA	Marks	ESE	Marks	
Credit:6	Full Marks:	Practical	Theoretical	Practical	Theoretical	
50		50	-	50	-	

#### **General Guide Lines**

- 1. Students must write their papers from within the discipline of Political Science and its allied subject.
- 2. Total Marks 50. Internal-30 marks and External marks-20.
- 3. External Evaluation will be made through viva-voce.
- 4. External Evaluation will be made through the continuous evaluation process by the respective Supervisor.
- 5. Name of the external examiner will be send by the course coordinator of the university PG department of Political Science to the Controller/Dy. Controller of Examinations of the University and then University will send all the colleges.
- 6. In respect of the preparation of the project special emphasis will be given on Research Methodology.
- 7. Each student will select separate Topic
- Institution will give the priority of the choice of the students regarding the selection of the topic of their choice.

#### Suggest Readings

Kothari, C.R, Research Methodology (New Delhi:PHI).

Ahuja, Ram, Research Methods (New Delhi: Rawat Publications).

Majumder, P.K., Research Methods in Social Sciences (New Delhi, Viva Books,).

1.3.2 Relevant Document for No. of courses that include experimental learning through fieldwork in the year 2021 (UG Sem I Hons & Sem V Hons, PG Dept. of Zoology)

#### SEMESTER - I

Course Name	ECOLOGY				
Course Code		BSCHZOOC102			
Course Type	Core				
Course Details		10.470 Mar 10.42 Mar 11.27	Theory : 10 marks		
	66.1	CC-1 CA (Continuous Assessment)	Practical : 30 marks		
	CC-I		Theory : 40 marks		
		ESE (End Semester Examination)	Practical : 20 marks		
Credits	Theory 4 + Practical 2 = Total 6 credits				

#### About the course :

This course will take students on a journey through the physical workings of the Earth, the interactions between species and their environments. The course highlights on some of the important aspects *viz*. growth and survival of populations and communities in different habitats, energy flow in the ecosystems, interactions between the communities, exclusion of niches and consequences of changing environment on the biodiversity.

Learning outcomes :

After successfully completing this course, the students will be able to:

- > Know the evolutionary and functional basis of animal ecology.
- > Understand what makes the scientific study of animal ecology a crucial and exciting endeavour.
- Engage in field-based research activities to understand well the theoretical aspects taught besides learning techniques for gathering data in the field.
- Analyse a biological problem, derive testable hypotheses and then design experiments and put the tests into practice.
- > Solve the environmental problems involving interaction of humans and natural systems at local or global level.

#### THEORY (CC-2)

#### UNIT I: An overview of Ecology, Ecosystems and Biomes (13 Lectures)

- 1. Introduction and scope of Ecology. Multidisciplinary relevance in current perspective.
- 2. Structure and function of ecosystem;
- Abiotic factors affecting survival and sustenance of organisms e.g., water, temperature, light, pH and salinity.
- 4. Role of limiting factors in survival of biotic components.
- Major ecosystems of the world: Ecological features, limiting factors, zonation and classification of organisms of fresh water and marine ecosystems.
- Introduction to Biome: Ecological features of Tundra, Desert, Savannah and Tropical Rain Forest Biomes.
- 7. Energy flow in ecosystem, food chain and food web.
- 8. Productivity and ecological efficiencies.
- 9. Mineralization and recycling of nutrients: C, N, P & S.

#### **UNIT II: Population ecology (13 Lectures)**

- 1. Ecology of populations: Unitary and Modular populations.
- Unique and group attributes of population: Density, natality, mortality, life tables, fecundity tables, survivorship curves.

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3. Unique and group attributes of population: mortality, age ratio, sex ratio, dispersal.

#### KNU-ZOOLOGY(HONS)

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#### CBCS-LOCF-2020-21

- Concept of carrying capacity, Factors regulating population dispersal and growth: Exponential and logistic growth.
- 5. Population regulation: density-dependent and independent factors; r and K strategies.

#### UNIT III: Biotic community, characteristics and attributes (13 Lectures)

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- 1. Community characteristics: stratification; Dominance, diversity, species richness, abundance, Evenness, Similarity.
- 2. Diversity and food-web indices.
- 3. Ecotone and edge effect;
- 4. Positive interactions: commensalism, proto-cooperation, and mutualism.
- 5. Negative interactions: parasitism and allelopathy; predation and predator-prey dynamics; herbivory.
- 6. Interspecific competition and coexistence, Inter and intra-specific; abundance.
- 7. Niche concept, types, Niche overlap and Resource partitioning.
- 8. Gause's Principle with laboratory and field examples.
- 9. Ecological succession: Definition, Process, types, theories of succession.

#### UNIT IV: Environmental degradation; Biodiversity, Environmental movement etc. (13 Lectures)

- Environmental degradation : Environmental ethics; Pollution: Air, water and noise pollution and their control; Solid Waste management and EIA ; Natural resources: Mineral, water and forest, their significance and conservation.
- Biodiversity : Types and Hotspots of biodiversity. Threat and Major drivers of biodiversity. Conservation strategies ; Biodiversity status in India, monitoring and documentation; Biodiversity mapping using GPS, GIS and remote sensing. Ecosystem and biodiversity services: Ecological, economic, social, ethical, aesthetic and Informational value. Application of ecology in management and Conservation programmes.
- Environmental movement : Role of gender and cultures in environmental conservation. Environmental movements: Bishnois. Chipko, Silent valley, Big dam movements. Environmental education and public awareness, Green bench.

#### PRACTICAL (CC2)

- 1. To measure microclimatic variables viz., temperature, humidity and light conditions in a microhabitat.
- 2. Making an ecosystem in a wide-mouthed bottle.
- 3. Constructing a food web by observing organisms from a given area.
- 4. Preparing an essay (write up) based on few ecology related publications.
- 5. Studying the impact of herbivore on plant species (planted in pots under specific conditions).
- Constructing distribution map of species of a genus through GPS by estimating the coordinates (virtual demonstration).
- 7. Estimation of the ratio of the producers and consumers.
- 8. Determination of pH, and Dissolved 02 (Winkler's Method) and Free CO2 in water.

KNU-ZOOLOGY(HONS)

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#### CBCS-LOCF-2020-21

- 9. Preparation of nested quadrate and estimation of effective quadrate size.
- 10. Study of an aquatic ecosystem: Major Phytoplankton (Up to Family) and zooplankton (Up to Genus).
- 11. Group discussion or Seminar presentation on one or two related topics (Given Below).
- 12. Field study in a biodiversity rich area like national park, biosphere reserve, sea shore or nearby places.

#### DISCIPLINE CENTRIC ELECTIVE COURSES

DSE 1

#### ANIMAL BEHAVIOUR AND CHRONOBIOLOGY

THEORY (Credit	its 4)
Unit 1: Introduction to Animal Behaviour 08 Origin and history of Ethology; Brief profiles of Karl Von Frish, Ivan Pavlov, Konrad Lorenz, Niko Tinbergen, Proximate and ultimate causes of behaviour	
Unit 2: Patterns of Behaviour 14 Stereotyped Behaviours (Orientation, Reflexes); Individual Behavioural patterns; Instinct vs. Learnt Behaviour; Associative learning, classical and operant conditioning, Habituation, Imprinting.	
Unit 3: Social and Sexual Behaviour 16 Social Behaviour: Concept of Society; Communication and the senses; Altruism; Insects' society with Honey bee example; Foraging in honey bee and advantages of the waggle dance.	as
Sexual Behaviour: Asymmetry of sex, Sexual dimorphism, Mate choice, Intra-sexual selection (male rivalry), Inter-sexual selection (female choice), Sexual conflict in parental care.	
Unit 4: Biological Rhythm 16 Types and characteristics of biological rhythms: Short- and Long- term rhythms; Circadian rhythms; Tidal rhythms and Lunar rhythms; Circannual rhythms; Photoperiod and regulation seasonal reproduction of vertebrates; Role of melatonin.	
Unit 5: Biological Clocks 06 Relevance of biological clocks; Adaptive significance of biological clocks	
PRACTICAL (Credit To study nests and nesting habits of social insects (Termites and Ants). To study geotaxis behaviour in earthworm. Visit to Forest/ Wild life Sanctuary/Biodiversity Park/Zoological Park to study behavioural activities of animals and prepare a short report. Study of circadian functions in humans (daily eating, sleep and temperature patterns). Preparation of kinematic diagram / ethogram through ad libitum study.*	ts 2)
<ul> <li>SUGGESTED READINGS</li> <li>David McFarland, Animal Behaviour, Pitman Publishing Limited, London, UK.</li> <li>Manning, A. and Dawkins, M. S, An Introduction to Animal Behaviour, Cambridge,University Press, UK.</li> <li>John Alcock, Animal Behaviour, Sinauer Associate Inc., USA.</li> <li>Paul W. Sherman and John Alcock, Exploring Animal Behaviour, Sinauer Associate Inc., Massachusetts, USA.</li> <li>Chronobiology Biological Timekeeping: Jay. C. Dunlap, Jennifer. J. Loros, Patricia J. DeCoursey (ed). 2004, Sinauer Associates, Inc. Publishers, Sunderland, MA, USA</li> <li>Insect Clocks D.S. Saunders, C.G.H. Steel, X., Afopoulou (ed.) R.D. Lewis. (3rdEd) 2002 Barens and Noble Inc. New York, USA</li> <li>The Clock that times us. 1982. Moore Ed et al.</li> <li>Biological Rhythms: Vinod Kumar (2002) Narosa Publishing House, Delhi/ Springer-Verlag, Germany.</li> </ul>	

## BBA (6<sup>TH</sup> SEMESTER)

## Course Name: Project work Course Code: BBAC601; Course Type: Core; Course Details: CC-13 L-T-P: 0 -0 -12; Course Credit: 6 Marks: Theory [100]: Continuous Assessment-60 & End Semester Examination-40

#### **Course Objective**

To understand the concept of an organization's functions where theoretical knowledge can be made applicable and provide hands on experience.

#### Learning Outcomes

After completing the course, the student shall be able to:

 Implement theoretical knowledge in the organizational context and gain practical experience.

#### Assessment Methods

Internal Examination (40 Marks): Internal Assessment may be conducted by using any one or in combinations of Presentation, Project Writing and Presentation, Assignment and Presentation.

External Examination (40 Marks): End Semester Project presentation

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#### Semester- 1 **Course Name: Fundamentals of Environment Studies** Course Code: AEE-101 Course Type: AE Course Details: AECC-1 L-T-P: 4-0-0 ESE Marks Practical Theoretical CA Marks Practical Theoretical Credit: 4 Full Marks 15 35 50 . Course Learning Outcomes: (After the completion of course, the students will have the ability to): Course outcomes. Course outcomes: 1. Basic knowledge about components of Environment 2. Knowledge about Renewable and Non-renewable energy 3. Understanding the concept of Ecosystem 4. Knowledge about the Biodiversity and conservation of Biodiversity 5. Understanding different types of pollution and its management. LECTURES: 50 Marks: 35 Content: Unit wise course content distribution Theory Unit- 1 Basic of Environmental Studies Definition, Nature, Scope and Importance; Components of environment: Environmental education (05) Unit- 2 Natural Resources: Renewable & Non-renewable Resources Nature and natural resources their conservation and associated problems: (10)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 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 Non-renewable energy sources; Use of alternate energy sources - Case studies • Land resources: Land as a resource; Land degradation, landslides, soil erosion, desertification . Unit- 3 Ecology & Ecosystems Concept of ecology, Population ecology, Community ecology Concept of an ecosystem, different types of ecosystems Food chains, food webs and ecological succession Energy flow in the ecosystem and energy flow models (05) Unit- 4 Biodiversity & Conservation (10) Biodiversity: Levels of biological diversity Values of biodiversity Hot-Spots of biodiversity. Mega-biodiversity countries Threat to biodiversity : Threat to biodiversity Conservation of biodiversity (*In- situ* and *Ex-situ* Unit-5 Environmental Pollution & Management Nature, Causes, Effects and Control measures of – (i) Air pollution; (ii) Water pollution; (iii) Soil pollution; (iv) Noise pollution; v) Nuclear hazards; Fireworks Pollution (10) Solid waste management: Causes, effects and disposal methods Disaster management: Floods, Earthquake, Cyclone and Landslides Unit-6 Environmental Policies & Practices (10)(10) Constitutional Provisions for protecting environment- Articles 48(A), 51 A (g) Environmental Laws: The Environment (Protection) Act, 1986; The Air (Prevention a Control of Pollution) Act, 1981; The Water (Prevention and Control of Pollution) Act 197 Forest (Conservation) Act, 1980 </8 Unit-7 Field Work (Project work) (15 marks) <

#### Course Name: Project Work on Microbiology of Societal Importance Course Code: BSCHMCBDSE601

Course Type:DSE	Course Details: DSEC- 3 & 4			L-T-P: 0 - 0 - 12		
		CA Marks		ESE Marks		
Credit: 6	Full Marks:	Practical	Theoretical	Practical	Theoretical	
	50	30		20		

Course Learning Outcomes: By the conclusion of this course, the students-

Outcome 1. Developed skills to design small project.

**Outcome 2**.Should develop the habit of teamwork and perform experiments related to the project.

**Outcome 3**. Developed basic skills for data retrieval, representation, analysis and interpretation.

#### Guidelines:

- 1. A short term project should be done guided by the dept. of microbiology of the college from where the student registered.
- If required the faculty may collaborate with faculties of microbiology dept of colleges under Kazi Nazrul University through principals of the collaborating institutes.
- 3. Duration of lab work must be restricted within the time span of the corresponding semester.
- 4. Each project may be divided within groups of students
- 5. Project has to be planned depending on the available facility otherwise HOD may request Principals of the respective college for the procurement of chemicals, financial assistance and instruments if it is essential.
- 6. At the end of the seminar each student must submit project report along with other practical of the corresponding semester

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#### Course Name: Horticultural Post-harvest Course Code: BSCHBOTDSE604

Course Type: Core	Course Details: DSE-604			L-T-P: 4-0-4	
Credit: 6		CA Marks		ESE Marks	
	Full Marks: 100	Practical	Theoretical	·Practical	Theoretical
		30	10	20	40

#### Course Learning Outcomes:

At the end of the course the students will be able to,

- > Understand the concept of different types of horticultural practices for value addition
- Visualize the post-harvest problems likely to be confronted
- > Know the tricks of the trade and how to increase the longevity of the produce

#### Unit I: Horticultural Crops - Conservation and Management

 Scope and importance, Branches of horticulture; Role in rural economy. and employment generation; Importance in food and nutritional security; urban horticulture and ecotourism.

#### Unit II: Horticultural Practices

Types, classification (annuals, perennials, climbers and trees); Propagation Methods: asexual (grafting, cutting, layering, budding), sexual (seed propagation), Bonsai Production;

#### Unit III- Ornamental plants, fruits and vegetables, Medicinal and Aromatic plants

- Identification and salient features of some ornamental plants [rose, marigold, tuberose], Ornamental flowering trees (Gulmohar, Lagerstroemia and areca palms).
- Description of plants and their economic products; Management and marketing of vegetable (Potato and Brinjal) and fruit crops (Mango and Banana).
- Cultivation, processing and marketing of products of major medicinal plants (Senna, Ashwagandga, Amla, Vetiver, Aloe vera).

#### Unit IV: Post-harvest Technology

- Importance and overview of post-harvest handling; Principles and methods of preservation and
  processing : Methods of minimizing loses during storage and transportation; Harvesting and
  handling of fruits, cut flowers, vegetables, herbs, storage tissues and organs.
- Food processing: canning, fruit juice beverages, pickles, jam, jellies, candies, Food additives, labeling; Food irradiation and food safety.
- Post-harvest diseases and losses by insects: Types of diseases, Source of infection, Factors
  affecting disease development, Prevention techniques for post -harvest losses, Storage
  techniques, Biorational approaches; Value addition.

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#### **KAZI NAZRUL UNIVERSITY**

Nazrul Road, Kalla Bypass More, P.O- Kalla (C.H.) P.S.- Asansol (North), Dist- Burdwan, Pin- 713340 E-mail- sccknuasnl@gmail.com, website:- www.knu.ac.in

Minutes of the Online Meeting of the Joint Faculty Councils of Arts, Commerce, Law and Science held on 12 May 2020 (Tuesday) at 2 p.m. through the Webex Meeting Platform, Kazi Nazrul University

#### **Members Present:**

- Prof. Sadhan Chakraborti, The Hon'ble Vice-Chancellor- Chairman
   Prof. (Dr.) Susanta Mitra, Dean (Comm. & Mgt) and Dean (Law-Addl.
  - Charge)
- 3. Prof. (Dr.) Vijay Kumar Bharty, Dean (Arts)
- 4. Dr. Sk. Nazmul, Head, Department of Mathematics
- 5. Mr. Biswajit Saha, Librarian
- 6. Dr.Golam Ali Sekh, Coordinator, Department of Physics
- 7. Dr. Roshan Lal Devangan, Coordinator, Department of Applied
- Psychology 8. Dr. Rajat Saha, Coordinator, Department of Chemistry
- Dr. Agar Sana, Coordinator, Department of Chemistry
   Dr. Asamanja Chattoraj, Head, Department of Animal Science and Zoology
- 10. Dr. Paramita Roychowdhury, Head, Department of Geography
- 11. Dr. Arghya Mazumdar, Director, School of Mines
- 12. Dr. Soumya Mukherjee, Coordinator, Department of
- Metallurgy Dr. Arindam Biswas, Coordinator, Department of Metallurgy
- Dr. Moitreyee Banerjee, Coordinator, P.G. Department of Conservation Biology Dr. Prabir Dasgupta, Coordinator, P.G. Dept. of Geology, Dgp Govt College Dr. Subrata Mukherjee, Asst Prof, Law College Dgp, Dept of M.S.W.
- Mr. Bhrigu Vishwakarma, Coordinator, Department of Law Dr. Mukul Mandal, Coordinator, B.Com LLB
- 15. Dr. Baneswar Kapasi, Head, Department of Commerce
- 16. Dr. Monalisa Das, Head, Department of Bengali Represented by Dr. Sritam Mazumdar Dr. Pradip Kumar Das, Head, Department of History
- Prof. (Dr.) Ayub Mallick, Head, Department of Political Science Dr. Santosh Kumar Behera, Head, Department of Education Dr. Debabrata Saha, Head, Department of Philosophy Ms. Akta Kumari, Co-ordinator, Department of Hindi
- 18. Dr. Farooque Azam, Coordinator, Post Graduate Urdu course
- Prof. (Dr.) Santanu Kumar Ghosh, Registrar (Addl. Charge) and Director, IQAC Prof. (Dr.) Anindya Sekhar Purakayastha, Professor, Dept of English
- Dr. Dipendra Nath Ghosh, Controller of Examinations, KNU Dr. Nikhilesh Barik, Deputy Controller of Examinations, KNU
- Mr. Shuvabrata Poddar, Assistant Professor, Dept of Applied Psychology Mr. Maheswar Malo Das, DPO and ICT KNU Application Head, Mr. Asif Ahmed, System Administrator

#### Member Absent and leave of absence not prayed for:

Dr. Santanu Banerjee, Coordinator, Department of English Robult Wyanda

Secretary College Council KAZI NAZRUL UNIVERSITY 101 - 11 2012 - 11 2012 - 11 50

C.K.C.L. Registrar (Addl. Charge) Kazi Nazrul University Asansol-713340



**KAZI NAZRUL UNIVERSITY** 

Nazrul Road, Kalla Bypass More, P.O- Kalla (C.H.) P.S.- Asansol (North), Dist- Burdwan, Pin- 713340 E-mail- <u>sccknuasnl@gmail.com</u>, website:- <u>www.knu.ac.in</u>

#### Action to be taken:

- The KNU ICT Application Head be requested to take necessary actions in preparing the Minor Elective Paper Registration Portal within 21.05.2020.
- Secretary, College Councils be requested to collect the intake capacity of each Department under the Faculty of Science for onward transmission to the ICT Team for preparing the Minor Elective Paper Registration Portal.

Item 2 - Implementation/Adoption of Learning Outcome Based Framework (LOCF) in Syllabus for PG courses as per UGC mandate

**Resolution:** The Quality Mandate of the UGC has given thrust on Curriculum Reforms on Learning Outcome based approach with an aim to equip the students with knowledge, skill, values and attitude.

UGC has initiated development of Learning Outcomes based Curriculum Framework (LOCF) at Undergraduate and Post graduate level. The fundamental premise of LOCF is to specify what graduates completing a particular programme of study are expected to know, understand and be able to do at the end of their programme of study. This approach of learning makes the student an active learner; the teacher a good facilitator and together they lay the foundation for lifelong learning.

The members of the Joint Faculty Councils approved the proposal and initiated preparation for syllabus in LOCF format

## Item 3: To consider the proposal of instituting Value Added Course by the academic departments and the Centres for fulfilling the NAAC Accreditation requirement

**Resolution:** The importance of introduction of value added course by each academic department and Centre, which is a crucial NAAC Requirement, was explained elaborately by the Coordinator of the NAAC Committee, Prof. (Dr.) Anindya Sekhar Purakayastha, Professor, Dept of English and the member of the NAAC Committee, Mr. Shuvabrata Poddar, Assistant Professor, Dept of Applied Psychology. They had pointed that introduction of value added courses will have a holistic impact over the students, their career will get uplifted.

It was decided in the Online Meeting of the Joint Faculty Councils for Post-Graduate Studies in Arts, Commerce, Law and Science held on 12 May 2020 (Tuesday) at 2 p.m. through the Online Meeting

Rahul Magunda Secretary College Council

KAZI NAZRUL UNIVERSITY Asansol - 713340

S.K.G.L. Registrar (Addl. Charge) Kazi Nazrul University Asansol-713340



## পশ্চিমবঞ্জা पश्चिम बंगाल WEST BENGAL

## AA 102085

## THE MEMORANDUM OF UNDERSTANDING

THIS Memorandum Of Understanding is made on this 21 st day of

Janword 2021 at CMERI, DURGAPUR between

COUNCIL OF SCIENTIFIC & INDUSTRIAL RESEARCH, a Society registered under the Societies Registration Act (XXI of 1860) and having its Registered Office at Anusandhan Bhavan, 2, Rafi Marg, New Delhi – 110 001 (hereinafter called CSIR which expression shall include its successors-in-interest and assigns) of the one part;

#### AND

BANWARILAL BHALOTIA COLLEGE located at ASANSOL, India and having its campus atGT ROAD, USHAGRAM, ASANSOL, WEST BENGAL, PIN-713303, India (hereinafter called 'BB COLLEGE' which expression shall unless repugnant to the context includes its successors and assigns, of the second part;

However for any reference on execution of this agreement on behalf of the CSIR on all developmental matters, CSIR-Central Mechanical Engineering Research Institute, a constituent laboratory under CSIR having its office at Mahatma Gandhi Avenue, Durgapur-713 209 (hereinafter called CSIR-CMERI) may be referred in the first instance.







#### 1. PREAMBLE

1.1 **CSIR-CMERI** is one of the constituent laboratories of **CSIR** having expertise in Advanced Manufacturing, Near Net-shape Manufacturing, Micro-system Technologies, Advanced Materials Processing, Advanced Design & Analysis, Surface Engineering and Tribology, Robotics and Automation, Energy Research & Technology, NDT and Metallurgy, Condition Monitoring, Residual Life Assessment, Drives & Control & Electronics with proven track record in product and process development for engineering applications, is also engaged in the high end technology areas.

1.2 BB COLLEGE is a Government sponsored UG and PG College established in 1944 and presently is one of the leading educational institutions of Asansol with a student strength of nearly 6500 in each academic session. It is affiliated to the Kazi Nazrul University and has been re-accredited with B+ by NAAC in 2020. At present there are 26 departments with post-graduation facilities with professional courses like BBA and BCA to meet the requirements of the changing times.

To promote great learning opportunity for the students who would be able to gain first-hand knowledge in the applicative fields of environment and to extend the knowledgebase and infrastructure of CSIR-CMERI as a part of the CSIR Integrated Skill Initiative, the two institutions, i.e. CSIR-CMERI and BB COLLEGE agree to the following broad terms of co-operation.

## NOW IT IS HEREBY AGREED AND DECLARED BY AND BETWEEN THE INSTITUTIONS HERETO AS FOLLOWS:

## 2.0 SCOPE OF MoU

2.1 Both the Institutions will support each other's endeavors in delivery of industry ready skilled youth force through the following though not limited to:

- a. Hands-on skill promotion to~ 100 no. of students per year on "Water Quality Assessment"
- Jointly organize skill development programmes and events such as seminars, workshop, conferences
- c. Exchange of information for conduction of need based skill development programmes in response to students requirements
- d. Any other matter(s) as agreed which are not covered

2.2 Both Institutions acknowledge and understand that all financial arrangements would be borne by the students (training fee = Rs 800/student) and deposited by the college to CMERI on prior to each training program on Water Quality assessment.

2.3 No Institution shall have the right to use the name or logo of another Institution without the prior approval of that Institution in writing.





The terms of this MoU may be modified / amended at any time 2.4 subject to mutual written agreement. Such modifications/changes shall be effective from the date on which both the Institutions execute them in writing.

## 3.0 RESPONSIBILITIES OF BOTH THE INSTITUTIONS

Both Institutions mutually agree to promote skill promotion and 3.1 skill development programmes on "Water Quality Assessment" and depute students as per the requirements (- 100 no / year) with mutual consent.

CSIR-CMERI shall conduct the skill development programmes 3.2 at CSIR-CMERI premises and shall also make available the necessary infrastructure and facilities for accomplishing the above laid down objectives.

BB COLLEGE shall depute batches of UG and PG students for 3.3 undergoing training at CSIR-CMERI at mutually identified time periods throughout the year.

BB COLLEGE shall also pay the training fees to CSIR-CMERI in 3.4 a consolidated manner prior to the commencement of each training programme.

BB COLLEGE shall also ensure requisite discipline within the 3.5 deputed student batches and financially compensate for any damage to machine and property, if any, incurred during the training.

CSIR-CMERI shall provide accommodation for the students, if 3.6 required, during their period of training at CSIR-CMERI and shall extend the canteen facilities to the students on a paid basis.

#### 4.0 VALIDITY

This MoU shall be in full force and effect from the date of signature hereof for a period of 3 years. Either organization may terminate this MoU at any time by giving six months notice in writing to the other. In the event of termination, programmes under way shall be allowed to be completed according to the terms that have been agreed upon.

#### ARBITRATION AND JURISDICTION 5.0

In the event of any dispute or difference between the Institutions hereto, such disputes or differences shall be resolved amicably by mutual consultation or through the good offices of empowered agencies of the Government of India. If such resolution is not possible, then, the unresolved dispute or difference shall be referred to Delhi International Arbitration Centre (DIAC), Delhi High Court, New Delhi.



age 3 of 4

IN WITNESS WHEREOF the parties have caused this MoU to be executed by their duly authorized officers on the respective dates and at the respective places hereinafter set forth.

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Signed for and on behalf of CSIR	Signed for and on behalf of BB COLLEGE
Council of Scientific & Industrial Research, Anusandhan Bhawan, 2, Rafi Marg, New Delha 110 001 Ei aisteil Sciff / DR. An Well Guattara II Scial and Sciff / DR. An Well Guattara II Scial and Sciff / DR. An Well Guattara II Scial and Science and Science and Science and Science Research and a science of Science and the and and and a science and Science and the and and a science and Science and the and and a science and Science and the and and a science and Science and Science and Science and Science and Science and Science and the and and a science and science and science and the science and science and science and science and science and the science and science and science and science and science and the science and science and science and science and science and the science and science and science and science and science and the science and	GT ROAD, USHAGRAM, ASANSOL, WEST BENGAL, PIN- 713303, India Seal: B.B. College Seal: B.B. B.B. Bardinaman Principal, B.B. B. Bardinaman
Date: 21.01.2021	Date: 21.02.2121
Signed at: @MERI, Durrapio	Signed at: CMERI, Duyapur
1. Witness (Name & Address)	1. Witness (Name & Address) hundeforgeth DR ARWAR GARGALI B-B-CELLEGE ASANSOL
Durgspur-7 to ger B ) Incha Durgspur-7 to ger B ) Incha De R. R. Schoo 21/01/201	2. Witness (Name & Address) Say and July . 21/1/2021 MR. SAY AN TON DUTTA B.B. CILLEGE, ASDNSOL

## BANWARILAL BHALOTIA COLLEGE Report on Educational Excursion Department of Botany Date:- 14.06.2022

	6 <sup>th</sup> Sem Hons list		6 <sup>th</sup> Sem Program list
1	Amisha Bhagat	1	Sonali Biswas
2	Keser Kumari	2	Salu Halder
3	Shafakat Parveen	3	Supriya Ruidas
4	Bindi Shaw	4	Chandan Kumar
5	M D Sultan	5	Rajib BAuri
6	Subraneel Roy	6	Abhijit Murmu
7	Promita Mondal	7	Atba Aijaz
8	Ronit Kumar Yadav	8	Soumya Tewari
9	Sweta Shaw	9	Avisha Nandy
10	Bidisha Roy	10	

## Participating Students:- 6<sup>th</sup> Semester Honours and Programme

Place:- Beharinath Forest and a Vermicomposting Unit.

Participating Teachers:- Dr Sanjeev Pandey, Dr Chanchal Kumar Biswas, Dr Animesh Mondal, Dr Sunrit Basu Sarbadhikari, Dr Sucheta Mondal and Dr Sabina Pradhan

Brief Description Of the tour: A one day educational excursion is organized by the Department on 14.06.2022 with all the students. Majority of the students of all semester including hons and program participate in this educational tour. We start our journey nearly 7 am in the morning from the college campus by some hired vehicles.

Description of Place:- Biharinath Hill resides at a distance of 57 km from Bankura district and 24 km from Raniganj. It is considered that the hill is a witness of old Jain culture. The tallest hill of Bankura District, Biharinath 1449 feet welcomes you with its mesmerizing beauty and religious vibes.

A rich casing of lively green, flowing river Damodar and unspoiled Nature are embracing the hill so affectionately that you will definitely fall in love with the trio of 'Jal-Jungle-Pahar'. The hill changes its color with the seasons. During the season of Monsoon, it becomes green from all sides. Wet leaves, rain-drops on branches and soft sunshine make an ambience that loves the dominating hue of green. In Spring, you will see blooming 'Palash' accompanying by 'Shimul' everywhere. It seems like you are breathing under a canopy of orange leaves. Impressive tribal cultural and village-stories add an extra charm to this place. Biharinath Hill is blessed with a rich collection of fauna and flora as well. Not only flowers, colorful birds and dancing butterflies are waiting here to walk hand in hand only with you. You may get a glimpse of wildlife in the hill. Biharinath is an attractive place for trekkers for its figure. You can start your journey as a rock climber from here.

After completion of our observation in the hill surrounding and its forest we go a pre planned hotel for our refreshment and after completion we back to another place i.e. the Vermicomposting Unit. It is about 15 Km away from this hill region and that composting unit is maintain by a modern farmer named Nemai Layek. All students minutely listen the demonstration by the lucid language of the farmer. Students also note the important parts of his lecture and correlate it with their theoretical knowledge.



Photograph of our Upward movement in Beharinath Hill.





Photograph in the Vermicomposting Unit.

## Department of BBA

## Project Work as a part of course curriculum

The final semester students of our dept undertake academic project work in different organizations as a part of their course curriculum in various specialization as per their choice. These projects are guided by all the teachers of our dept. project completion certificate of some students are given below.



## B. B. College, Asansol Department of Business Administration

Date: 27.05.2022

## <u>Certificate of Completion of The Academic Project</u> <u>For</u> <u>BBA 6th. Semester Examination, 2022</u>

This is to certify that **Md. Haris Alqma** has successfully completed the academic project on <u>"Marketing Project On Computer Industry"</u> for the partial fulfilment of the BBA (Hons.) Programme under Kazi Nazrul University.

His University Roll: 102190612800, No.: 7029 and Registration No. KNU19102004015 of 2019-2020.

He has done the original project work on the above subject for completing the academic project.

I wish him all success in his professional endeavour.

Buddha Prasad 6100 27

(Sri Buddha Prasad Ghatak) Project Guide Department of Business Administration B. B. College, Asansol




Date: 03rd May 2022

#### TO WHOMSOEVER IT MAY CONCERN

This is to certify that *Pratik Ganeriwala* pursuing *BBA(H)* from *Banwarilal Bhalotia College Asansol* 2019-2022 batch, has successfully completed a Project based internship with us from 07th Mar' 2022 to 07<sup>th</sup> April' 2022

Project Title: "Compensation Management at Asansol Regal Plaza Mall Pantaloons"

Throughout the internship, we found him to be sincere and hardworking.

We wish him all the best in all his future endeavors.

For Aditya Birla Fashion & Retail Ltd

Sushmita Dey Human Resources

## pantaloons

Aditya Bita Fashion and Retail Limited (formerly known as Pantaloons Fashion & Retail Limited) Asansol : Regal Plaza, G. T. Road (East), Ushagram, P.S. Asansol (South), District : Burdwan , West Bengal - 713 303, India T : +91 0341 2274074 Regd. Office.Piramal Agastya Corporate Park, Building 'A', 4th and 5th Floor, Unit No. 401, 403, 501, 502, L.B.S. Road, Kurla, Mumbal - 400 070, In T :+91 - 8652905000 | F :+91 - 8652905400 | E : abfri@adityabirla.com | W: www.abfri.com Corporate ID No.: L18101MH2007PLC233901

## B. B. College, Asansol Department of Business Administration

Date: 24.05.2022

### <u>Certificate of Completion of The Academic Project</u> <u>For</u> <u>BBA 6th. Semester Examination, 2022</u>

This is to certify that **Pratik Ganeriwala** has successfully completed the academic project on <u>"Compensation Management From Pantaloons Pvt. Ltd., Asansol"</u> for the partial fulfilment of the BBA (Hons.) Programme under Kazi Nazrul University.

His University Roll: 102190612800, No.: 7039 and Registration No. KNU19102003212 of 2019-2020.

He has done the original project work on the above subject for completing the academic project.

I wish him all success in his professional endeavour.

Jonne Puller

(Dr. Souvik Dutta) Project Guide Department of Business Administration B. B. College, Asansol





## We understand your world

Burnpur Court more, GT Road, , Asansol- 703303

22<sup>nd</sup> April 2022

### TO WHOME SO EVER IT CONCERN

This is to certify that Miss Rimi Chartterjee, a student of Banwarilal Bhalotia college, Asansol did his project training at HDFC Bank, Asansol from 2<sup>nd</sup> of February 2022 to 10<sup>th</sup> of march 2022.

During this period Rimi Chatterjee successfully completed her project on "FINANCIAL STATEMENT ANALYSIS ON HDFC BANK".

We wish her all the best for his future endeavors.



## B. B. College, Asansol Department of Business Administration

Date: 19.05.2022

### Certificate of Completion of The Academic Project For BBA 6th. Semester Examination, 2022

This is to certify that **<u>Rimi Chatterjee</u>** has successfully completed the academic project on "Financial Project Report On Financial Statement Analysis On HDFC Bank" for the partial fulfilment of the BBA (Hons.) Programme under Kazi Nazrul University.

Her University Roll: 102190512800, No.: 7046 and Registration No. KNU19102003524 of 2019-2020

She has done the original project work on the above subject for completing the academic project.

I wish her all success in her professional endeavour.

GH=== 19.05.2022.

(Sri Gunamoy Hazra) Project Guide Department of Business Administration Department of Business Administration B. B. College, Asansol



ABon

(Dr. Amitava Basu) Principal & Co-ordinator B. B. College, Asansol

> Principal Banwarilal Bhalotta College Asansol-713303

BRITANNIA

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#### TO WHOM IT MAY CONCERN

This is to certify that Kundan Kr Yadav pursuing B.B.A(H) from Banwarilal Bhalotia College, Asansol 2019-2022 batch, has successfully completed a Project based Internship with us from 15th April to 15th May, 2022.

Project Title - "TRAINING AND DEVELOPMENT PROGRAMME" at Kolkata, West Bengal.

Throughout the internship, we found him to be sincere and hardworking. We wish him all the best in all his future endeavours.

For, BRITANNIA INDUSTRIES LIMITED

FACTORY HR MANAGER

tannia Industries Limited xx, Sarutezpur, Dist. Karmup, Guwahati, Assam - 781132

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Registered Office: 5/1A Hungerford Street, Kolkata 700017, West Bengal, CIN No.: L15412WB1918PLC002904 website : www.britannia.co.in

## B. B. College, Asansol Department of Business Administration

Date: 26.05.2022

### <u>Certificate of Completion of The Academic Project</u> <u>For</u> <u>BBA 6th. Semester Examination, 2022</u>

This is to certify that **Kundan Kr. Yadav** has successfully completed the academic project on <u>"Training and Development Programme"</u> for the partial fulfilment of the BBA (Hons.) Programme under Kazi Nazrul University.

His University Roll: 102190612800, No.: 7025 and Registration No. **KNU19102002470 of 2019-2020**.

He has done the original project work on the above subject for completing the academic project.

I wish him all success in his professional endeavour.

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Gunn Dur?

(Dr. Souvik Dutta) Project Guide Department of Business Administration B. B. College, Asansol





#### TO WHOM SO EVER IT MAY CONCERN

This is to certify that *ISHIKA BEGUM* student of BBA (Hons.)  $6^{TH}$  Semester (Session 2019-2022) of B.B. College, Asansol has done her internship in the field of Marketing from our esteemed concern.

During her internship period she had done online/telephonic market survey.

We wish her all the best in her future endeavors.



General Manager (sales) Srinathji Motors Pvt. Ltd.

## B. B. College, Asansol Department of Business Administration

Date:

### Certificate of Completion of The Academic Project For BBA 6th. Semester Examination, 2022

This is to certify that **Ishika Begum** has successfully completed the academic project on **"Business Strategies of TATA Motors"** for the partial fulfilment of the BBA (Hons.) Programme under Kazi Nazrul University.

Her University Roll: 102190112800, No.: 7019 and Registration No. KNU19102003884 of 2019-2020.

She has done the original project work on the above subject for completing the academic project.

I wish her all success in her professional endeavour.

Buddha Prasad Ghatak 25/05/2022 (Sri Buddha Prasad Ghatak)

Project Guide Department of Business Administration B. B. College, Asansol





## Name: ARITRA ROUTH

## Enrolment Number: KNU19102002352

Subject: Environmental Studies

Subject Code: AECC

Project Topic: <u>Air Pollution and its impact on the</u> <u>health status of urban India</u>

### Certificate

This is to certify that **ARITRA ROUTH**, a student of **Banwarilal Bhalotia College**, **Asansol** has successfully completed the college project titled:

### Air Pollution and its impact on the health status of urban India

under the guidance of Mr. Sayantan Dutta, Dept. of Environmental Science, BB College, Asansol, WB.

The college project was undertaken as a part of the **BA program curriculum** and was completed with diligence and dedication. The project involved [Briefly describe the main objectives and scope of the project].

Throughout the duration of the project, **ARITRA ROUTH** demonstrated a profound understanding of the subject matter and exhibited exceptional problem-solving skills. The final deliverables presented by **ARITRA ROUTH** showcased ingenuity and creativity in approaching the project's challenges.

On behalf of **Banwarilal Bhalotia College**, **Asansol**, we extend our heartiest congratulations to **ARITRA ROUTH** for the successful completion of this project. The hard work and commitment demonstrated during this endeavour are commendable and reflect the high standards of our institution.

We wish **ARITRA ROUTH** the best for their future endeavours and have no doubt that they will continue to excel in their academic and professional pursuits.

Mr. Sayantan Dutta

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Air pollution and its impact on the health status of urban India

Air pollution is a significant environmental issue that has a profound impact on the health status of urban India. The country's rapid urbanization, industrialization, and increased vehicular traffic have led to elevated levels of air pollution, especially in major cities. The primary sources of air pollution in urban areas include vehicular emissions, industrial activities, construction dust, burning of waste, and emissions from power plants.

The health effects of air pollution are diverse and can affect people of all age groups, but certain vulnerable populations such as children, the elderly, and individuals with pre-existing health conditions are at a higher risk. Here are some of the major health impacts of air pollution on urban India:

- 1. <u>Respiratory problems:</u> Air pollution is strongly linked to various respiratory issues, including asthma, chronic obstructive pulmonary disease (COPD), bronchitis, and exacerbation of existing respiratory conditions. Particulate matter (PM), nitrogen dioxide (NO2), sulfur dioxide (SO2), and ozone (O3) are major air pollutants responsible for respiratory problems.
- 2. <u>Cardiovascular diseases</u>: Long-term exposure to air pollution has been associated with an increased risk of cardiovascular diseases, including heart attacks, strokes, and hypertension. Fine particulate matter (PM2.5) and black carbon are particularly harmful to cardiovascular health.
- 3. <u>Reduced lung function</u>: Prolonged exposure to air pollution can lead to reduced lung function, especially in children whose lungs are still developing. This reduction in lung function can have long-term consequences on respiratory health throughout life.

- 4. <u>Allergies and skin problems</u>: Air pollution can exacerbate allergies and skin conditions, leading to symptoms like itching, redness, and rashes.
- 5. <u>Mental health impacts</u>: Studies have suggested a link between air pollution and mental health issues, such as anxiety and depression. The association is likely due to the neuroinflammatory effects of air pollutants.
- 6. <u>Adverse pregnancy outcomes:</u> Pregnant women exposed to high levels of air pollution are at an increased risk of premature birth, low birth weight, and developmental issues in their children.
- 7. <u>Increased mortality</u>: Long-term exposure to high levels of air pollution has been associated with increased mortality rates, primarily due to its effects on cardiovascular and respiratory health.

To combat air pollution and improve the health status of urban India, several measures have been suggested and implemented:

- 1. <u>Improving public transportation</u>: Encouraging the use of public transportation, cycling, and walking can reduce vehicular emissions and improve air quality.
- 2. <u>Promoting clean energy:</u> Transitioning to cleaner and renewable energy sources for power generation can significantly reduce emissions from power plants.
- 3. <u>Implementing stricter emission norms</u>: Enforcing stricter emission standards for vehicles and industries can help curb pollution at the source.

- <u>Waste management:</u> Proper waste management practices, including waste segregation, recycling, and reducing open burning, can help decrease air pollution caused by waste.
- 5. **Urban planning:** Incorporating green spaces, parks, and trees in urban planning can act as natural air purifiers and provide healthier living environments.
- Public awareness and education: Raising awareness about the health impacts of air pollution and promoting individual actions to reduce pollution can have a positive impact.

While progress has been made in addressing air pollution in some cities, more comprehensive and sustained efforts are required to protect the health of urban India's growing population. Public health policies and coordinated actions at the local, regional, and national levels are crucial to mitigating the adverse health effects of air pollution.









## Name: REKHA KUMARI

## Enrolment Number: KNU19102003185

Subject: Environmental Studies

Subject Code: AECC

Project Topic: Water Borne Diseases- Approaches to prevention and treatment

### Certificate

This is to certify that **REKHA KUMARI**, a student of **Banwarilal Bhalotia College**, **Asansol** has successfully completed the college project titled:

### Water Borne Diseases- Approaches to prevention and treatment

under the guidance of Mr. Sayantan Dutta, Dept. of Environmental Science, BB College, Asansol, WB.

The college project was undertaken as a part of the **BA program curriculum** and was completed with diligence and dedication. The project involved [Briefly describe the main objectives and scope of the project].

Throughout the duration of the project, **REKHA KUMARI** demonstrated a profound understanding of the subject matter and exhibited exceptional problem-solving skills. The final deliverables presented by **REKHA KUMARI** showcased ingenuity and creativity in approaching the project's challenges.

On behalf of **Banwarilal Bhalotia College**, **Asansol**, we extend our heartiest congratulations to **REKHA KUMARI** for the successful completion of this project. The hard work and commitment demonstrated during this endeavour are commendable and reflect the high standards of our institution.

We wish **REKHA KUMARI** the best for their future endeavours and have no doubt that they will continue to excel in their academic and professional pursuits.

Mr. Sayantan Dutta

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### Water borne diseases: Approaches to prevention and treatment

Waterborne diseases are illnesses that are transmitted through contaminated water sources. These diseases are a significant public health concern worldwide, particularly in areas with poor water quality and sanitation. Prevention and treatment of waterborne diseases require a multi-faceted approach that addresses both the source of contamination and the health impact on affected individuals. Here are some key approaches to prevention and treatment:

1. Prevention:

**a. Water Source Protection:** Ensuring a clean and safe water supply is crucial to preventing waterborne diseases. Protecting water sources from contamination through proper watershed management and monitoring is essential.

**b. Water Treatment:** Implementing effective water treatment processes is vital to remove or kill pathogens from the water supply. Common methods include filtration, chlorination, UV irradiation, and ozonation.

**c. Improved Sanitation:** Proper disposal of human waste and waste water is essential to prevent water contamination. Promoting the use of sanitary facilities and wastewater treatment can significantly reduce the risk of waterborne diseases.

**d. Education and Awareness:** Public awareness campaigns and educational programs are essential to inform communities about the importance of clean water, proper sanitation, and personal hygiene.

e. Water Quality Monitoring: Regular monitoring of water quality in both rural and urban areas helps identify contamination sources and ensures that treated water meets safety standards.

2. Treatment:

a. Oral Rehydration Therapy (ORT): For mild to moderate cases of waterborne diseases, oral rehydration solutions are essential to replace lost fluids and electrolytes. ORT can be lifesaving, especially for diarrheal diseases.

**b. Antibiotics:** In more severe cases of certain waterborne infections, such as cholera or dysentery, antibiotics may be prescribed by healthcare professionals to treat the underlying bacterial infection.

**c. Intravenous Fluids:** In severe cases with significant dehydration, intravenous (IV) fluid therapy may be required to restore fluid and electrolyte balance rapidly.

**d. Anti-parasitic Medications:** Some waterborne diseases are caused by parasites, and specific antiparasitic medications are used to treat infections caused by organisms like Giardia or Cryptosporidium.

**e. Hospitalization:** In severe cases, hospitalization may be necessary for close monitoring and appropriate medical intervention.

3. Vaccination:

Vaccination plays a crucial role in preventing certain waterborne diseases, such as cholera and typhoid fever. Vaccination campaigns can be effective in high-risk areas and during outbreaks to control the spread of the diseases.

#### 4. Community Health Programs:

Community engagement and participation are essential in implementing effective prevention and treatment strategies. Community-based health programs can help raise awareness, promote proper hygiene practices, and ensure access to clean water and sanitation facilities.

#### 5. International Collaboration:

Waterborne diseases are often more prevalent in regions with limited resources and infrastructure. International organizations and collaborations can provide support, expertise, and resources to improve water quality and reduce the burden of waterborne diseases in vulnerable communities.

In conclusion, preventing and treating waterborne diseases require a comprehensive and multi-faceted approach involving water source protection, proper water treatment, improved sanitation, education, vaccination, and community involvement. By addressing both the root causes of water contamination and the health impact on affected individuals, we can make significant progress in reducing the prevalence of waterborne diseases and improving public health worldwide.



Leptospirosis

# How to prevent infection in places where cholera is found





drink bottled water or water that been treated



foods should be thoroughly cooked



Individuals shopuld peel their own fruits



be wary if ice, raw foods, ice cream and street food



wash hands frequently and thoroughly



## Name: RIYA MARODIA

## Enrolment Number: *KNU19102003671*

Subject: Environmental Studies

Subject Code: AECC

Project Topic: The menace of municipal solid waste – Glimpses of urban India

### Certificate

This is to certify that *RIYA MARODIA*, a student of **Banwarilal Bhalotia College**, **Asansol** has successfully completed the college project titled:

### The menace of municipal solid waste – Glimpses of urban India

under the guidance of Mr. Sayantan Dutta, Dept. of Environmental Science, BB College, Asansol, WB.

The college project was undertaken as a part of the **BCOM Hons** curriculum and was completed with diligence and dedication. The project involved [Briefly describe the main objectives and scope of the project].

Throughout the duration of the project, **RIYA MARODIA** demonstrated a profound understanding of the subject matter and exhibited exceptional problem-solving skills. The final deliverables presented by **RIYA MARODIA** showcased ingenuity and creativity in approaching the project's challenges.

On behalf of **Banwarilal Bhalotia College**, **Asansol**, we extend our heartiest congratulations to **RIYA MARODIA** for the successful completion of this project. The hard work and commitment demonstrated during this endeavour are commendable and reflect the high standards of our institution.

We wish **RIYA MARODIA** the best for their future endeavours and have no doubt that they will continue to excel in their academic and professional pursuits.

Mr. Sayantan Dutta

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#### The menace of municipal solid waste: Glimpses of urban India

The issue of municipal solid waste (MSW) is a significant challenge in urban India. As cities continue to grow, the generation of waste increases, and the management of this waste becomes a critical concern. Here are some glimpses of the challenges posed by MSW in urban India:

**1. Rapid Urbanization and Increasing Waste Generation:** With the rapid urbanization and population growth in India, the amount of municipal solid waste generated has been escalating. As people migrate to cities in search of better opportunities, the waste generation per capita increases, putting tremendous pressure on existing waste management systems.

**2. Inadequate Waste Collection and Segregation:** One of the primary issues is the inadequate collection and segregation of waste at the source. Many cities lack a comprehensive waste collection system, resulting in improper disposal of waste, including dumping in open spaces, rivers, and other water bodies.

**3.Limited Waste Treatment and Disposal Infrastructure:** The treatment and disposal infrastructure for solid waste in urban areas is often insufficient and outdated. Landfills, which are commonly used for waste disposal, can cause environmental and health hazards due to leachate and methane gas generation.

**4. Recycling and Informal Waste Sector:** While the informal waste sector plays a crucial role in recycling and waste management, it often lacks proper regulations and infrastructure. Waste pickers and recyclers often work under harsh conditions without adequate protection or support from the government.

**5. Health and Environmental Impacts:** Improper waste management leads to health and environmental hazards. Open dumping and burning of waste release harmful pollutants into the air and water, contributing to air pollution and contaminating soil and water sources.

**6.** Public Awareness and Behavior Change: There is a need for increased public awareness regarding waste management and responsible waste disposal practices. Behavioral changes, such as waste segregation at source and reduced single-use plastic consumption, are essential to tackle the waste problem effectively.

**7. Policy and Governance Challenges:** Solid waste management in India involves multiple stakeholders, including municipal bodies, state governments, and various private players. Coordination among these entities and clear policies are necessary to address the issue efficiently.

**8. Financial Constraints:** Adequate funding for waste management projects is often a challenge, particularly for smaller cities and towns with limited financial resources.

**9. Technology and Innovation:** Embracing modern waste management technologies and innovative solutions can significantly improve waste handling, recycling, and waste-to-energy conversion.

**10. Waste-to-Energy Projects:** Waste-to-energy projects, such as waste incineration and biogas generation, have the potential to convert waste into useful energy. However, they must be carefully planned to ensure environmental sustainability and social acceptance.

Addressing the menace of municipal solid waste in urban India requires a comprehensive approach involving improved waste collection and segregation, enhanced treatment and disposal infrastructure, public awareness and behavior change, better policy frameworks, and sustainable financial models. By tackling these challenges collectively, India can move towards a cleaner and more sustainable urban environment.







## Name: AVISHA NANDY

## Enrolment Number: KNU19102004004

Subject: Environmental Studies

Subject Code: AECC

Project Topic: India's Forest Wealth with special reference to West Bengal

### Certificate

This is to certify that **AVISHA NANDY**, a student of **Banwarilal Bhalotia College**, **Asansol** has successfully completed the college project titled:

### India's Forest Wealth with special reference to West Bengal

under the guidance of Mr. Sayantan Dutta, Dept. of Environmental Science, BB College, Asansol, WB.

The college project was undertaken as a part of the **BSC Hons** curriculum and was completed with diligence and dedication. The project involved [Briefly describe the main objectives and scope of the project].

Throughout the duration of the project, **AVISHA NANDY** demonstrated a profound understanding of the subject matter and exhibited exceptional problem-solving skills. The final deliverables presented by **AVISHA NANDY** showcased ingenuity and creativity in approaching the project's challenges.

On behalf of **Banwarilal Bhalotia College**, **Asansol**, we extend our heartiest congratulations to **AVISHA NANDY** for the successful completion of this project. The hard work and commitment demonstrated during this endeavour are commendable and reflect the high standards of our institution.

We wish **AVISHA NANDY** the best for their future endeavours and have no doubt that they will continue to excel in their academic and professional pursuits.

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### India's forest wealth with special reference to West Bengal

India's forest wealth is significant and diverse, providing various ecological, economic, and social benefits to the country. Forests in India are classified as Reserved Forests, Protected Forests, and Unclassed Forests, each serving specific purposes for conservation and utilization.

When it comes to the state of West Bengal, it is situated in the eastern part of India and shares its borders with Bangladesh, Nepal, Bhutan, and the Indian states of Sikkim, Assam, Bihar, and Odisha. West Bengal has a mix of forest types, including tropical evergreen, deciduous, and mangrove forests. The state's forest cover has been facing challenges due to urbanization, industrialization, and agricultural expansion.

As of 2019, the total forest cover in West Bengal was about 12,120 square kilometers, which is approximately 15.68% of the state's geographical area. This forest cover includes both reserved and protected forests.

Some of the notable forest areas in West Bengal include:

- 1. Sundarbans: The Sundarbans is the largest mangrove forest in the world and is spread across West Bengal and Bangladesh. It is a UNESCO World Heritage Site and home to the Royal Bengal Tiger. The mangrove ecosystem of the Sundarbans is crucial for protecting coastal areas from natural disasters and preserving biodiversity.
- 2. Buxa Tiger Reserve: Located in the northern part of West Bengal, Buxa Tiger Reserve is an essential part of the Buxa National Park. It is known for its diverse flora and fauna and plays a crucial role in the conservation of the Bengal tiger and other endangered species.
- 3. Jaldapara National Park: Situated in the Alipurduar district of West Bengal, Jaldapara National Park is famous for its population of Indian one-horned rhinoceros, elephants, and other wildlife species.
- 4. Neora Valley National Park: Located in the Kalimpong district, this national park is known for its unique and fragile ecosystem. It is home to a variety of flora and fauna, including several rare and endangered species.

The West Bengal government, along with various environmental organizations, has been making efforts to conserve and protect these forests from deforestation, illegal logging, and encroachments. They also strive to promote sustainable practices and ecotourism to balance conservation and local livelihoods.





## Name: SONU PASWAN

## Enrolment Number: KNU19116000984

## Subject: Environmental Studies

## Subject Code: AECC

## **Project Topic: Exploring the Indian Biodiversity**

### Certificate

This is to certify that **SONU PASWAN**, a student of **Banwarilal Bhalotia College**, **Asansol** has successfully completed the college project titled:

### **Exploring the Indian Biodiversity**

under the guidance of Mr. Sayantan Dutta, Dept. of Environmental Science, BB College, Asansol, WB.

The college project was undertaken as a part of the **BA Hons** curriculum and was completed with diligence and dedication. The project involved [Briefly describe the main objectives and scope of the project].

Throughout the duration of the project, **SONU PASWAN** demonstrated a profound understanding of the subject matter and exhibited exceptional problem-solving skills. The final deliverables presented by **SONU PASWAN** showcased ingenuity and creativity in approaching the project's challenges.

On behalf of **Banwarilal Bhalotia College**, **Asansol**, we extend our heartiest congratulations to **SONU PASWAN** for the successful completion of this project. The hard work and commitment demonstrated during this endeavour are commendable and reflect the high standards of our institution.

We wish **SONU PASWAN** the best for their future endeavours and have no doubt that they will continue to excel in their academic and professional pursuits.

Mr. Sayantan Dutta

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#### **Exploring Indian Biodiversity**

Exploring Indian biodiversity can be an incredibly rewarding experience due to the country's vast and diverse ecosystems. India is home to a wide array of landscapes, climates, and habitats, ranging from the towering Himalayan mountains in the north to the tropical rainforests in the south. Here are some key aspects of Indian biodiversity worth exploring:

- 1. Flora and Fauna Diversity: India is one of the world's 17 megadiverse countries, boasting an impressive variety of plant and animal species. It is estimated to harbor around 7-8% of the world's recorded species. From the Royal Bengal Tiger to the Indian Elephant, Indian wildlife is truly captivating.
- 2. Western Ghats: This mountain range along the western coast of India is a UNESCO World Heritage site and a biodiversity hotspot. It's renowned for its rich floral diversity and endemic species.
- 3. Eastern Himalayas: The eastern region of the Himalayan mountain range, including states like Sikkim, Arunachal Pradesh, and parts of West Bengal, are biologically diverse and home to rare species like the Red Panda and Snow Leopard.
- 4. Western India: The Thar Desert in Rajasthan and the unique Rann of Kutch in Gujarat offer a glimpse into desert biodiversity, showcasing adaptations of life to arid conditions.
- Eastern India: The Sundarbans mangrove forest in West Bengal is famous for being the largest mangrove ecosystem in the world and is a critical habitat for the Bengal Tiger.

- 6. Marine Biodiversity: India has an extensive coastline, making its marine biodiversity a significant area of interest. The Andaman and Nicobar Islands and Lakshadweep are known for their diverse marine life and coral reefs.
- 7. National Parks and Wildlife Sanctuaries: India has numerous national parks and wildlife sanctuaries dedicated to the conservation of its unique biodiversity. Some prominent ones include Jim Corbett National Park, Ranthambore National Park, Kaziranga National Park, and Sundarbans National Park.
- 8. Sacred Groves and Traditional Knowledge: India's cultural heritage is intertwined with biodiversity through sacred groves and traditional knowledge systems that promote conservation practices.
- 9. **Birdwatching**: India is a haven for birdwatchers, with over 1,300 bird species. Bird sanctuaries like Bharatpur Bird Sanctuary and Nal Sarovar in Gujarat are popular birdwatching destinations.
- 10. Heritage Trees and Forests: India also boasts several heritage trees, some of which have cultural and historical significance.

When exploring Indian biodiversity, it's essential to do so responsibly and sustainably, respecting the environment and local communities. Consider hiring local guides and tour operators who prioritize eco-friendly practices to minimize your impact on these delicate ecosystems. Also, be mindful of wildlife conservation and the importance of preserving these habitats for future generations.



# **INDIA'S BIODIVERSITY HOTSPOTS IN BRIEF**




## Name: SOUVIK KUMBHAKAR

## Enrolment Number: KNU20102005190

Subject: Environmental Studies

Subject Code: AECC

Project Topic: Global Warming and the ongoing Climate Change- Who is responsible?

#### Certificate

This is to certify that *SOUVIK KUMBHAKAR*, a student of **Banwarilal Bhalotia College**, **Asansol** has successfully completed the college project titled:

#### Global Warming and the ongoing Climate Change- Who is responsible?

under the guidance of Mr. Sayantan Dutta, Dept. of Environmental Science, BB College, Asansol, WB.

The college project was undertaken as a part of the **BA Hons curriculum** and was completed with diligence and dedication. The project involved [Briefly describe the main objectives and scope of the project].

Throughout the duration of the project, **SOUVIK KUMBHAKAR** demonstrated a profound understanding of the subject matter and exhibited exceptional problem-solving skills. The final deliverables presented by **SOUVIK KUMBHAKAR** showcased ingenuity and creativity in approaching the project's challenges.

On behalf of **Banwarilal Bhalotia College**, **Asansol**, we extend our heartiest congratulations to **SOUVIK KUMBHAKAR** for the successful completion of this project. The hard work and commitment demonstrated during this endeavour are commendable and reflect the high standards of our institution.

We wish **SOUVIK KUMBHAKAR** the best for their future endeavours and have no doubt that they will continue to excel in their academic and professional pursuits.

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#### Global Warming and the ongoing climate change: Who is responsible?

Global warming and ongoing climate change are complex issues with multiple factors contributing to their occurrence. It is important to recognize that responsibility for these problems is shared among various actors, including countries, industries, individuals, and other entities. Here are some key contributors to global warming and climate change and their respective responsibilities:

- Greenhouse Gas Emissions: The primary driver of global warming is the increase in greenhouse gas emissions, particularly carbon dioxide (CO2), methane (CH4), and nitrous oxide (N2O). The major sources of these emissions include the burning of fossil fuels (coal, oil, and natural gas) for energy, deforestation, agriculture (especially livestock), and industrial processes. Both developed and developing countries are responsible for greenhouse gas emissions, with developed nations historically having higher cumulative emissions.
- 2. **Fossil Fuel Industry:** The fossil fuel industry has played a significant role in the rise of greenhouse gas emissions. Companies involved in the extraction, production, and distribution of fossil fuels have a responsibility to transition to cleaner energy sources and invest in renewable energy technologies.
- 3. **Governments:** Governments have a crucial role in shaping policies and regulations that can address climate change. They are responsible for setting emission reduction targets, implementing climate mitigation and adaptation strategies, supporting renewable energy development, and encouraging sustainable practices across various sectors.

- 4. **Consumers:** Individuals and households also bear some responsibility as consumers of energy and goods. Choices regarding energy use, transportation, diet, and consumption habits can collectively influence greenhouse gas emissions. Raising awareness and making environmentally conscious choices can have a positive impact.
- 5. Deforestation and Land Use Change: Activities like deforestation, particularly in tropical regions, contribute to increased carbon dioxide levels in the atmosphere. Governments, companies involved in agriculture and logging, and consumers who demand products linked to deforestation share responsibility for curbing these practices.
- Industrial Processes: Certain industrial processes release potent greenhouse gases.
  For instance, the production of cement, certain chemicals, and refrigerants can be significant contributors. Industries need to adopt cleaner production methods and technologies.
- 7. International Cooperation: Climate change is a global issue, and international cooperation is essential. Countries need to work together to set ambitious emission reduction goals, support climate-vulnerable nations, and share clean technologies and knowledge.

It is vital to emphasize that no single entity is solely responsible for global warming and climate change. Tackling these challenges requires collective action, involving governments, businesses, communities, and individuals, to make significant strides in reducing emissions, adopting sustainable practices, and mitigating the impacts of climate change.



## Temperature change in the last 50 years



2011–2021 average vs 1956–1976 baseline -1.0 -0.5 -0.2 +0.2 +0.5 +1.0 +2.0 +4.0 °C -1.8 -0.9 -0.4 +0.4 +0.9 +1.8 +3.6 +7.2 °F



## Name: SUBHAJIT MONDAL

## Enrolment Number: KNU20102005594

Subject: Environmental Studies

Subject Code: AECC

Project Topic: International Environmental Agreements – How successful are they?

#### Certificate

This is to certify that **SUBHAJIT MONDAL**, a student of **Banwarilal Bhalotia College**, **Asansol** has successfully completed the college project titled:

#### International Environmental Agreements – How successful are they?

under the guidance of Mr. Sayantan Dutta, Dept. of Environmental Science, BB College, Asansol, WB.

The college project was undertaken as a part of the **BA program** and was completed with diligence and dedication. The project involved [Briefly describe the main objectives and scope of the project].

Throughout the duration of the project, **SUBHAJIT MONDAL** demonstrated a profound understanding of the subject matter and exhibited exceptional problem-solving skills. The final deliverables presented by **SUBHAJIT MONDAL** showcased ingenuity and creativity in approaching the project's challenges.

On behalf of **Banwarilal Bhalotia College**, **Asansol**, we extend our heartiest congratulations to **SUBHAJIT MONDAL** for the successful completion of this project. The hard work and commitment demonstrated during this endeavour are commendable and reflect the high standards of our institution.

We wish **SUBHAJIT MONDAL** the best for their future endeavours and have no doubt that they will continue to excel in their academic and professional pursuits.

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#### International Environmental Agreements: How successful they are?

The success of international environmental agreements varies depending on several factors, including the level of commitment and cooperation among participating countries, the effectiveness of the agreements' mechanisms, the extent of compliance with the agreed-upon targets, and the specific environmental challenges being addressed. Here are some key points to consider:

- Success Stories: There have been some notable success stories in international environmental agreements. For instance, the Montreal Protocol (1987) aimed at phasing out ozone-depleting substances has been highly successful, leading to a gradual recovery of the ozone layer. Similarly, the Paris Agreement (2015) brought together nearly all countries to combat climate change, encouraging countries to set voluntary emission reduction targets.
- 2. Challenges and Weaknesses: However, many agreements face significant challenges. Some agreements lack the enforcement mechanisms needed to ensure compliance, making it difficult to hold countries accountable when they fail to meet their commitments. Additionally, some nations may prioritize short-term economic interests over long-term

environmental concerns, leading to inadequate implementation of the agreements.

- 3. **Global Cooperation:** The success of international environmental agreements largely depends on global cooperation. Issues like climate change and biodiversity loss require a collective effort from all countries to be truly effective. When major players, such as the United States, China, and the European Union, demonstrate strong commitment and cooperation, the chances of success improve
- 4. Different Perspectives and Priorities: Countries have diverse economic and social priorities, making it challenging to find common ground in some negotiations. Developing nations, for example, may argue that their economic growth should take precedence over environmental concerns, while developed nations may emphasize the need for shared responsibility and greater contributions from all.
- 5. Changing Political Landscapes: The success of international environmental agreements can also be influenced by changing political landscapes within countries. Leadership changes and shifts in political priorities may impact a country's commitment to an agreement.
- 6. **Adaptive Nature**: Some agreements have an adaptive nature, meaning they can be revised and updated over time based on new scientific

evidence and changing circumstances. This allows for continuous improvement and increased effectiveness.

7. **Non-Binding Nature**: Some agreements are non-binding, meaning countries are not legally obligated to meet the set targets. While they may foster cooperation and encourage voluntary actions, non-binding agreements lack the same level of accountability as legally binding ones.

Overall, international environmental agreements play a crucial role in raising awareness, fostering cooperation, and setting common goals to address global environmental challenges. While they may not always achieve all desired outcomes, they provide a framework for nations to work together toward a more sustainable future. To enhance their success, it is essential for countries to strengthen enforcement mechanisms, increase funding and technical support for developing nations, and promote a broader understanding of the interconnectedness of environmental issues with other global challenges.

Agreement	Date	Issue addressed
International Convention for		
the Regulation of Whaling	1946	Whale depletion
Nuclear Test Ban Treaty	1962	Atmospheric nuclear weapons testing
Biological and Toxic Weapons Treaty	1972	Chemical and biological weapons
London Convention	1972	Ocean pollution
Montreal Protocol	1987	Ozone-layer depletion
Basel Convention	1989	Transport of hazardous wastes
Convention on Biological Diversity	1992	Biodiversity loss
Kyoto Protocol	1997	Carbon emissions and global climate change
Mine Ban Treaty	1997	Landmines



## QUALITATIVE ASSAY AND BACTERIAL ISOLATION, CHARACTERIZATION OF WATER SAMPLE COLLECTED FROM RAILWAY TRACK

#### SUBMITTEED FOR PARTIAL COMPLETION OF B.SC (HONS.) IN MICROBIOLOGY SEMESTER VI EXAMINATION – 2023

BY

#### PRAMIT CHAKRABORTI

REG- KNU20102005385, SESSION- 2020-2023

UNDER THE SUPERVISION OF MS. MONAMI MONDAL DEPT. OF MICROBIOLOGY

BANWARILAL BHALOTIA COLLEGE, ASANSOL



Banwarilal Bhalotia College

Constituent College of the KAZI NAZRUL UNIVERSITY, Asansol (GOVT. SPONSORED U. G. & P. G. College)



Banwarilal Bhalotia College Constituent College of the KAZI NAZRUL UNIVERSITY, Asensol (GOVT. SPONSORED U. G. & P. G. College)

## WATER QUALITY ASSESSMENT OF MUNICIPAL WATER

SUBMITTEED FOR PARTIAL COMPLETION OF B.SC (HONS.) IN MICROBIOLOGY SEMESTER VI EXAMINATION – 2023

BY

#### ASISH PATRA

REG-KNU20102004911, SESSION- 2020-2023

UNDER THE SUPERVISION OF MRS. SANGHAMITA DAS GUPTA DEPT. OF MICROBIOLOGY

BANWARILAL BHALOTIA COLLEGE, ASANSOL



Constituent College of the KAZI NAZRUL UNIVERSITY, Asansol (GOVT. SPONSORED U. G. & P. G. College)

## Project on:Water quality and assessment of municipal corporation water.

Semester VI examination - 2023

By

Vivek Dutta Singh KNU20102006666 of 2020-21 Under the supervision of Sanghamita Das Gupta Dept. of Microbiology QUALITATIVE ASSAY AND BACTERIAL ISOLATION, CHARACTERIZATION OF WATER SAMPLE COLLECTED FROM RAILWAY TRACK.

SUBMITTED FOR PARTIAL COMPLETION OF B.SC (HONS) IN MICROBIOLOGY SEMESTER VI EXAMINATION - 2023

BY

## KRITI DAS

REGISTRATION NO- KNU20102004966

## SESSION- 2020-2023

UNDER THE SUPERVISION OF MS. MONAMI MONDAL.

DEPT.OF MICROBIOLOGY



Banwarilal Bhalotia College Constituent College of the KAZI NAZRUL UNIVERSITY, Asansol (GOVT. SPONSORED U. G. & P. G. College)



Constituent College of the KAZI NAZRUL UNIVERSITY, Asansol (GOVT. SPONSORED U. G. & P. G. College)

## **Practical File**

On

## **Basic Computer and Bioinformatics**

(Subject Code - BSCHMCBDSE602)

Branch/Year - Microbiology (2023)

Session:

Submitted To:

Submitted By:

Mitpumpy Kunder

# isolation, Characterization of Water sample Collected from

## **Railway Track**

SUBMITTED BY PARTIAL COMPLEMENTTION OF B.SC (HONS) IN MICROBIOLOGY

Semester VI examination - 2023

#### Ву

Bikramaditya Maji

#### KNU20102006643 of 2020-21

Under the supervision of Monami Mondal

Dept. of Microbiology

Banwarilal Bhalotia College, Asansol- 713303



## Banwarilal Bhalotia College

Constituent College of the KAZI NAZRUL UNIVERSITY, Asansol (GOVT. SPONSORED U. G. & P. G. College)

## Water Quality Assessment Of Municipal Water

Submitted for partial completion of B.Sc. (Hons.) in Microbiology Semester VI examination - 2023

By

Md Afroz Anwar Reg:KNU20102006589 Session:2020-23

> Under the Supervision of Mrs.Sanghamita Das Gupta

**Department of Microbiology** 

**B.B College, Ushagram** 



Banwarilal Bhalotia College Constituent College of the KAZI NAZRUL UNIVERSITY, Asansol (GOVT. SPONSORED U. G. & P. G. College)



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# Banwarilal Bhalotia College Constituent College of the KAZI NAZRUL UNIVERSITY, Asansol

(GOVT. SPONSORED U. G. & P. G. College)

## WATER QUALITY ASSESSMENT OF MUNICIPAL CORPORATION WATER

## B.SC HONOURS IN MICROBIOLOGY SEMESTER VI EXAMINATION -2023

#### BY

NAME- RITU MONDAL REG. NO- KNU20202005915(2020-21) UNDER THE SUPERVISION OF MRS. SANGHAMITRA DASGUPTA MA'AM DEPT. OF MICROBIOLOGY BANWARILAL BHALOTIA COLLEGE ASANSOL-713303, WEST BENGAL (INDIA)

#### **Pond Water Quality Assessment**

Submitted for partial completion of B.Sc. (Hons.) in Microbiology Semester VI examination - 2023

By

Eshita Chatterjee Registration Number: KNU20102005335 of 2020-2021

## Under the supervision of Dr. Mahua Sinha Chakraborty Project Supervisor

Dept. of Microbiology Banwarilal Bhalotia College GT Road, Ushagram, Asansol, West Bengal

713303



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## WATER QUALITY ASSESSMENT OF MUNICIPAL WATER

SUBMITTEED FOR PARTIAL COMPLETION OF B.SC (HONS.) IN MICROBIOLOGY SEMESTER VI EXAMINATION – 2023

BY

#### SOVAN KUMAR SHOW

REG- KNU20102005841, SESSION- 2020-2023

UNDER THE SUPERVISION OF MRS. SANGHAMITRA DAS GUPTA DEPT. OF MICROBIOLOGY

BANWARILAL BHALOTIA COLLEGE, ASANSOL



## **Banwarilal Bhalotia College**

Constituent College of the KAZI NAZRUL UNIVERSITY, Asansol (GOVT. SPONSORED U. G. & P. G. College)

Physicochemical and biochemical assessment of hospital waste water at urban area of Paschim

Bardhhaman.W.B. India

Submitted for partial completion of B.Sc. (Hons.) in Microbiology Semester VI examination-2023

By

## PARUMITA BHANDARY

Registration number - KNU20102005416, Session -2020 -2023

Under the supervision of Mrs. SUDESHNA MITRA

Dept. of Microbiology

BanwarilalBhalotia College, Ushagram, Asansol-713303





Constituent College of the KAZI NAZRUL UNIVERSITY, Asansol (GOVT. SPONSORED U. G. & P. G. College)

#### <u>Qualitative Assay and Bacterial Isolation, Characterization of</u> <u>Water Sample Collected From Railway Track</u>

Semester VI Examination - 2023

By

#### KUSHAL MUKHERJEE

KNU20102005732 of 2020-21

Under the supervision of Monami Mondal

**Department of Microbiology** 

Banwarilal bhalotia College, Asansol- 713303

## Qualitative Assay and Bacterial Isolation, characterization of Water Sample Collected from Railway Track

Submitted for partial completion of B.Sc. (Hons.) in Microbiology

Semester VI examination - 2023

By

Chandni kumari KNU20102005745.,2020-2023

Under the supervision of Ms. Monami Mondal

Dept. of Microbiology

B.B College, Ushagram Asansol, West Bengal



# Banwarilal Bhalotia College

Constituent College of the KAZI NAZRUL UNIVERSITY, Asansol (GOVT. SPONSORED U. G. & P. G. College)



## WATER QUALITY ASSESSMENT OF MUNICIPAL WATER

SUBMITTEED FOR PARTIAL COMPLETION OF B.SC (HONS.) IN MICROBIOLOGY SEMESTER VI EXAMINATION – 2023

BY

#### SAZMA SHAHAR

REG-KNU20102004459, SESSION- 2020-2023

UNDER THE SUPERVISION OF MRS. SANGHAMITA DAS GUPTA DEPT. OF MICROBIOLOGY

# NAZRUL UNIVERSI

AULUNIVER

शहायाऽमृतम् १

Name - Sehba Ghaffar Mallick Department - Microbiology (Hons) Course Code - BSCHMCBDSE601

Course Name

**Project Work On Microbiology Of Societal Importance** 

**Project Topic Pond Water Quality Assessment** 

Registration No.- KNU20102005511 Roll No.- 1022006122026029 Semester - VI Session - 2020-2021



## PHYSICOCHEMICAL AND BIOCHEMICAL ASSESSMENT OF HOSPITAL WASTE WATER AT URBAN AREA OF PASCHIM BARDHAMAN, W.B, INDIA

Submitted for partial completion of B.Sc. (Hons.) in Microbiology Semester VI examination – 2023

> By BINOD KUMAR YADAV Registration No: KNU20102005120 Session: 2020-2021

Under the supervision of Mrs. SUDESHNA MITRA Dept. of Microbiology

> Banwarilal Bhalotia College Ushagram, Asansol-713303



Constituent College of the KAZI NAZRUL UNIVERSITY, Asansol (GOVT. SPONSORED U. G. & P. G. College)

## Physicochemical and Biochemical Assessment of Hospital Waste Water at Urban Area of Paschim Bardhhaman, W.B, India

Submitted for partial completion of B.Sc. (Hons.) in Microbiology Semester VI examination – 2023

> By ANKITA KUMARI

Registration number - KNU20102005254, Session - 2020-2021

Under the supervision of Mrs. SUDESHNA MITRA Dept. of Microbiology Banwarilal Bhalotia College, Ushagram, Asansol-713303



Constituent College of the KAZI NAZRUL UNIVERSITY, Asensol (GOVT SPONSORED U. G & P. G. College)

Qualitative Assay and Bacterial Isolation, Characterization of Water Sample Collected from Railway Track

Submitted for Partial Completion of B.Sc. (Hons.) in Microbiology Semester VI Examination - 2023

#### BY

Saria Amrin

Registration no.- KNU20102004676, Session -2020 -2021

Under the Supervision of Ms. Monami Mondal

**Department of Microbiology** 

Banwarilal Bhalotia College, Ushagram, Asansol- 713303



Constituent College of the KAZI NAZRUL UNIVERSITY, Asansol (GOVT. SPONSORED U. G. & P. G. College)

## PROJECT: - WATER QUALITY ASSESSMENT OF MUNICIPAL WATER Semester VI examination – 2023

By

AFIFA SIDDIQA KNU20102004476 of 2020-21 Under the supervision of SANGHAMITA DASGUPTA Dept. of Microbiology



Constituent College of the KAZI NAZRUL UNIVERSITY, Asansol (GOVT. SPONSORED U. G. & P. G. College)

#### PHYSIOCHEMICALANDBIOCHEMICALASSESMENTOFH OSPITALWASTEWATERAT URBANAREAOFPASCHIMBARDHAMAN,W.B.INDIA

SemesterVIExamination-2023

### BY

PANTHIK SAHA KNU20102006159of2020-21

Under the supervision of

SudeshnamitraDepartmentofMicrobiology BanwarilalbhalotiaCollege,Asansol-713303

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Estd. -1944

## PHYSICOCHEMICAL AND BIOCHEMICAL ASSESMENT OF HOSPITAL BASED WATER AT URBAN AREA OF PASCHIM BARDDHAMAN, W.B. INDIA

Submitted for partial completion of B.Sc. (Hons.) in Microbiology Semester VI examination - 2023

By

SOUMIK NANDI

Registration Number: KNU20102006440 of 2020-2021

Under the supervision of Ms. SUDESHNA MITRA

Dept. of Microbiology

**Banwarilal Bhalotia College** 

Ushagram, Asansol, West Bengal

713303



Constituent College of the KAZI NAZRUL UNIVERSITY, Asansol (GOVT. SPONSORED U, G. & P. G. College)

#### PHYSIOCHEMICAL AND BIOCHEMICAL ASSESMENT OF HOSPITAL WASTE WATER AT URBAN AREA OF PASCHIM BARDHAMAN, W.B, INDIA

Semester VI Examination - 2023

By

GOURAB MONDAL

KNU20102005868 of 2020-21

Under the supervision of Sudeshna mitra

Department of Microbiology

Banwarilal bhalotia College, Asansol- 713303

## POND WATER QUALITY ASSESSMENT

## SUBMITTED FOR PARTIAL COMPLETION OF B.SC. (Hons.) IN MICROBIOLOGY

**SEMESTER VI EXAMINATION -2023** 

BY

# NAME :- ISHITA GHANTY

## **REGISTRATION NO :- KNU20102004716**

## SESSION :- 2020-2023

## UNDER THE SUPERVISION OF

## **Dr. MAHUA SINHA CHAKRABORTY**

## DEPARTMENT OF MICROBIOLOGY



Constituent College of the KAZI NAZRUL UNIVERSITY, Asanso (GOVT. SPONSORED U. G. & P. G. College)


Estd. -1944

### **Pond Water Quality Assessment**

Submitted for partial completion of B.Sc. (Hons.) in Microbiology Semester VI examination - 2023

By

**Tathagata Dutta** 

Registration Number: KNU20102005098 of 2020-2021

Under the supervision of Dr. Mahua Sinha Chakraborty

Dept. of Microbiology

**Banwarilal Bhalotia College** 

GT Road, Ushagram, Asansol, West Bengal

713303

### POND WATER QUALITY ASSESSMENT

SUBMITTEED FOR PARTIAL COMPLETION OF B.SC (HONS.) IN MICROBIOLOGY SEMESTER VI EXAMINATION – 2023

BY

### ARUNAVA SENGUPTA

REG- KNU20102005888, SESSION- 2020-2023

UNDER THE SUPERVISION OF Dr. MAHUA SINHA CHAKRABORTY DEPT. OF MICROBIOLOGY

BANWARILAL BHALOTIA COLLEGE, ASANSOL



# Banwarilal Bhalotia College

Constituent College of the KAZI NAZRUL UNIVERSITY, Asansol (GOVT. SPONSORED U. G. & P. G. College)

#### POND WATER QUALITY ASSESSMENT

Submitted for partial completion of B.Sc. (Hons.) in Microbiology

### Semester VI examination - 2023

By

**Chandan Mondal** 

### Reg. No - KNU20102004428 , 2020-21

#### Under the supervision of Dr. Mahua Sinha Chakraborty

### Dept. of Microbiology

#### Banwarilal Bhalotia College, Ushagram, Asansol, 713303



# WATER QUALITY ASSESSMENT OF MUNICIPAL WATER

SUBMITTEED FOR PARTIAL COMPLETION OF B.SC (HONS.) IN MICROBIOLOGY SEMESTER VI EXAMINATION – 2023

BY

### SOUVICK MONDAL

REG- KNU20102004737, SESSION- 2020-2023

UNDER THE SUPERVISION OF MRS. SANGHAMITRA DAS GUPTA DEPT. OF MICROBIOLOGY

BANWARILAL BHALOTIA COLLEGE, ASANSOL



# Banwarilal Bhalotia College

Constituent College of the KAZI NAZRUL UNIVERSITY, Asansol (GOVT. SPONSORED U. G. & P. G. College)

### POND WATER QUALITY ASSESSMENT

Submission for partial completion of B.Sc.(hons) in microbiology

Semester VI examination - 2023

<u>By</u>

### TITLI SADHU

Registration no : KNU20102005496 , 2020-21

Under the supervision of Dr. Mahua Sinha Chakraborty

Dept. of Microbiology

Banwarilal Bhalotia College, Ushagram, Asansol





# PHYSIOCHEMICAL AND BIOCHEMICAL ASSESSMENT OF HOSPITAL WASTE WATER AT URBAN AREA OF PASCHIM BARDHAMAN,W.B.,INDIA

Submitted for partial completion of B.SC. (Hons.) in Microbiology

Semester VI examination -2023

By

### SHIVAM KUMAR SAW

Registration No-KNU20102004629, 2020-2021

Under the supervision of Mrs. SUDESHNA MITRA

**Department of Microbiology** 

**Banwarilal Bhalotia College** 

Ushagram, Asansol - 713303

# WATER QUALITY ASSESSMENT OF MUNICIPAL WATER

SUBMITTEED FOR PARTIAL COMPLETION OF B.SC (HONS.) IN MICROBIOLOGY SEMESTER VI EXAMINATION – 2023

BY

### SOVAN KUMAR SHOW

REG- KNU20102005841, SESSION- 2020-2023

UNDER THE SUPERVISION OF MRS. SANGHAMITRA DAS GUPTA DEPT. OF MICROBIOLOGY

BANWARILAL BHALOTIA COLLEGE, ASANSOL



Banwarilal Bhalotia College

Constituent College of the KAZI NAZRUL UNIVERSITY, Asansol (GOVT. SPONSORED U. G. & P. G. College)

# Banwarilal Bhalotia College

Constituent College of the KAZI NAZRUL UNIVERSITY, Asansol (GOVT. SPONSORED U. G. & P. G. College)

### **Practical File**

On Basic Computer and Bioinformatics (Subject Code-BSCHMCBDSE602)

Branch/Jear- MICROFILOGY (2023)

Session: 2020-2023

Submitted To:

Submitted By:

KNU20102004966

PARTICIPAL INAL

## Banwarilal Bhalotia College

Constituent College of the KAZI NAZRUL UNIVERSITY, Asansol (GOVT. SPONSORED U. G. & P. G. College)

### **Practical File**

### On

### **Basic Computer and Bioinformatics**

(Subject Code - BSCHMCBDSE602)

Branch/Year - Microbiology (Hons.), 3rd year

Session: 2020-21

Submitted To: Sachin Maj:

Submitted By: Titli Sadhu

# Qualitative Assay and bacterial isolation, Characterization of Water sample Collected from Railway Track

SUBMITTED BY PARTIAL COMPLEMENTTION OF B.SC (HONS) IN MICROBIOLOGY Semester VI examination – 2023

By

Debobrata Das KNU20102005555 of 2020-21 Under the supervision of Monami Mondal Dept. of Microbiology

Banwarilal Bhalotia College, Asansol- 713303



# Banwarilal Bhalotia College

Constituent College of the KAZI NAZRUL UNIVERSITY, Asansol (GOVT. SPONSORED U. G. & P. G. College)



# Banwarilal Bhalotia College

Constituent College of the KAZI NAZRUL UNIVERSITY, Asansol (GOVT. SPONSORED U. G. & P. G. College)

### **Practical File**

On

### **Basic Computer and Bioinformatics**

(Subject Code - BSCHMCBDSE602)

Branch/Year - MICROBIOLOGY (2023)

Session:

Submitted To: Sachin Maji

Submitted By: Kushal Mulcheoger



## Physicochemical and biochemical assessment of hospital waste water at urban area of Paschim Bardhhaman, W.B,

### India

Submitted for partial completion of B.Sc. (Hons.) in Microbiology

Semester VI examination - 2023

By NAUSHIN FATMI

Registration No., Session: KNU20102004666 2022-2023

Under the supervision of Mrs. SUDESHNA MITRA

Dept. of Microbiology

Banwarilal Bhalotia College, Ushagram, Asansol-713303

# **Pond Water Quality Assessment**

Submitted for partial completion of B.Sc. (Hons.) in Microbiology Semester VI examination - 2023

> Submitted by: RISHABHA KUMAR RAUTH Registration no: KNU20102005573 Session: 2020-2021

Under the supervision of Dr. Mahua Sinha Chakraborty DEPARTMENT OF MICROBIOLOGY

> B. B. COLLEGE Ushagram, Asansol, 713303



# Pond Water Quality Assessment

9

Submitted for partial completion of B.Sc. (Hons.) in Microbiology Semester VI examination - 2023

> Submitted by: RISHABHA KUMAR RAUTH Registration no: KNU20102005573 Session: 2020-2021

Under the supervision of Dr. Mahua Sinha Chakraborty DEPARTMENT OF MICROBIOLOGY

> B. B. COLLEGE Ushagram, Asansol, 713303



### Department of Physics, B. B. College, Asansol Project Distribution of MSc 4<sup>th</sup> Semester 2021

S1.	Project Guide	Project Students			
No.		_			
1	Dr. A. K. Mukherjee	Narayan Ram			
2	Dr. P. Ghosh	Humaira			
3	Dr. K. Mukherjee	Swarnendu Banerjee			
4	Shri J. K. Majhi	Debojyoti Dey			
5	Dr. R. K. Roy	Anupam Mukherjee			
6	Dr. K. K. Dey	Koustav Bhandary			
7	Dr. Shilpi S Mandal	Sunanda Ray			
8	Dr. Abhik Ghosh	Subhranil Mukherjee			

RKROL

PG – In Charge

Department of Physics,

B. B. College, Asansol.

### Department of Physics, B. B. College, Asansol

### List for Project Supervision of M.Sc. 4<sup>th</sup> semester students 2022

Sl. No.	Teacher	Name of the Student	Registration No.
1	DR A. K. MUKHERJEE	BULTI ROY	KNU20007497
2	DR P. GHOSH	BISHNU CHAKRABORTY	KNU20002056
3	DR K. MUKHERJEE	TANUSHREE CHAKRABORTY	KNU20001407
		SUBHAJIT PANDA	KNU20000532
4	DR J. K. MAJHI	AVIJIT SADHU	KNU20007012
5	DR R. K. ROY	MEGHALI PAUL	KNU20000820
6	DR K. K. DEY	SRAYOSI CHATTERJEE	KNU20009367
7	SRI K. MAJI	SOUMAVA MONDAL	KNU20003448
8	DR S. MONDAL	KEYA GHOSH	KNU20004757
9	DR S. S. MANDAL	SUMAN SHAW	KNU20009282
10	DR A. GHOSH	RICKTA PAUL	KNU20001394
11	DR A. BISWAS	SUBHRADIPA PAUL	KNU20000343

K K Dey

PG Coordinator

# <u>PHASE DEPENDENCES OF OPTICAL</u> <u>DISPERSION & GROUP VELOCITY IN A</u> <u>CLOSED THREE LEVEL SYSTEM</u>

# PROJECT WORK SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENT FOR THE DEGREE OF MASTER OF SCINECE IN PHYSICS

OF

### KAZI NAZRUL UNIVERSITY



2022

BY

### **SRAYOSI CHATTERJEE**

ROLL NO: 1022004332032010

**REGISTRATION NO : KNU20009367 OF 2020 - 2022** 

### **UNDER THE GUIDENCE OF**

### Dr. KAJAL KRISHNA DEY

### **DEPARTMENT OF PHYSICS**

**BANWARILAL BHALOTIA COLLEGE** 

ASANSOL-713303



### **Banwarilal** Bhalotia College

Affiliated to Kazi Nazrul University Govt. Sponsored (U.G & P.G.) Asansol-713303, West Bengal (India)

Date: 01-08-2022

### CERTIFICATE

This is to certify that the projectwork entitled 'Phase dependences of optical dispersion and group velocity in a closed three level system' submitted by Srayosi Chatterjee with Reg. No. KNU20009367 of 2020-'22 in partial fulfilment for obtaining the degree of Master of Science in Physics, Kazi Nazrul University, Asansol is absolutely based on her own work under my supervision and guidance.

AK IN \_

(Dr. Kajal Krishna Dey) Associate Professor in Physics Department of Physics B. B. College, ASANSOL-713303

### NANOMATERIALS : A REVIEW

### PROJECT WORK SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENT FOR THE DEGREE OF MASTER OF SCIENCE IN PHYSICS

OF

#### KAZI NAZRUL UNIVERSITY



2012

**MEGHALI PAUL** 

ROLL NO- 1022004332032006 REGISTRATION NUMBER – KNU20000820 OF 2020-2021

UNDER THE GUIDANCE OF

Dr. RITWIK ROY

**DEPARTMENT OF PHYSICS** 

**BANWARILAL BHALOTIA COLLEGE** 

ASANSOL- 713303



### DEPARTMENT OF PHYSICS (PG & UG) BANWARILAL BHALOTIA COLLEGE

Constituent College of the Kazi Nazrul University Govt. Sponsored (U.G & P.G)

Asansol – 713303, West Bengal, India

#### **CERTIFICATE**

This is to certify that the project entitled **"NANOMATERIALS : A REVIEW"** submitted by **MEGHALI PAUL** having Roll number **1022004332032006**, Registration number **KNU20000820** for the partial fulfilment of M.SC semester IV in Physics under Banwarilal Bhalotia College, Asansol has been carried out under my guidance and supervision.

I wish her all success in life.

RKRoz

Supervisor,

Dr. Ritwik Kumar Roy, Assistant Professor Department of Physics B.B College, Asansol





Carbon Nanotube: A Review

### M.Sc. 4<sup>th</sup> Semester Research Project

Submitted By – Anupam Mukherjee

**Registration No. – KNU19004756 of 2019-2021** 

Roll No. – 1021904332032006

Under the guidance of-

**DR. Ritwik Kumar Roy** 

**Department of Physics** 

**Banwarilal Bhalotia College** 

Dissertation Submitted for the partial fulfilment of the requirement of the Degree of Master of Science in Physics, B.B College, Kazi Nazrul University.

# Kazi Nazrul University

### ACCELERATED EXPANSION OF UNIVERSE: DISCOVERY OF DARK ENERGY USING TYPE la SUPERNOVAE

### PROJECT WORK SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENT FOR THE DEGREE OF MASTER OF SCIENCE IN PHYSICS

OF

KAZI NAZRUL UNIVERSITY



2021

BY

SUBHRANIL MUKHERJEE

ROLL NO.: 1021904332032008 REGN NO.: KNU19004563 OF 2019-20 UNDER THE GUIDANCE OF DR. ABHIK GHOSH DEPARTMENT OF PHYSICS BANWARILAL BHALOTIA COLLEGE (KAZI NAZRUL UNIVERSITY) The 1.4 GHz radio luminosity function of high and low-excitation radio galaxies and their redshift evolution to z=0.75

PROJECT WORK SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENT FOR THE DEGREE OF MASTER OF SCIENCE IN PHYSICS OF KAZI NAZRUL UNIVERSITY



2022

BY

### **RICKTA PAUL**

#### ROLL NO.: 102202332032007

### REGN. NO.: KNU20001394 OF 2020-2021

UNDER THE GUIDANCE OF DR. ABHIK GHOSH

#### **DEPARTMENT OF PHYSICS**

**BANWARILAL BHALOTIA COLLEGE, ASANSOL** 

#### **BANWARILAL BHALOTIA COLLEGE**



ESTD: 1945

Affiliated to Kazi Nazrul University Government Sponsored (UG & PG) ASANSOL-713303, WEST BENGAL

#### **CERTIFICATE**

This is to certify that project work entitled "ACCELERATED EXPANSION OF UNIVERSE: DISCOVERY OF DARK ENERGY USING TYPE Ia SUPERNOVAE" submitted by SUBHRANIL MUKHERJEE, ROLL NO.: -1021904332032008 in partial fulfilment for obtaining the degree of Masters of Science in Physics, Kazi Nazrul University, Asansol is based on his work under my supervision and guidance.

Ablike Ghosy

Department of Physics B.B.COLLEGE, Asansol – 713303

### **BANWARILAL BHALOTIA COLLEGE**



ESTD: 1945 Affiliated to Kazi Nazrul University Government Sponsored (UG & PG) ASANSOL-713303, WEST BENGAL

### **CERTIFICATE:**

This is to certify that project work entitled "THE 1.4GHz RADIO LUMINOSITY FUNCTIONS OF HIGH AND LOW EXCITATION RADIO GALAXIES AND THEIR REDSHIFT EVOLUTION TO Z=0.75" submitted by RICKTA PAUL, ROLL NO.: - 102202332032007

in partial fulfillment for obtaining the degree of Masters of Science in Physics, Kazi Nazrul University, Asansol is based on his work under my supervision and guidance.

Ablike Gloss

Department of Physics

B.B.COLLEGE, Asansol - 713303



# **DEPARTMENT OF PHYSICS (PG & UG)**

**Banwarilal Bhalotia College** 

Constituent College of the Kazi Nazrul University

Govt. Sponsored (U.G & P.G.)

Asansol-713303, West Bengal, India

## TO WHOM IT MAY CONCERN

This is to certify that the project entitled "INTRODUCTION TO NANOMATERIALS & STUDY OF X-RAY DIFFRACTION PATTERN" submitted by KEYA GHOSH having Roll Number 1022004332032005, Registration number KNU20004757 for the partial fulfillment of M.SC Semester IV in Physics under Banwarilal Bhalotia College, Asansol has been carried out under my guidance and supervision.

I wish her all success in life.

Supervisor, Dr. Shrabani Mondal Assistant Professor **Department of Physics** B B College, Asansol





# On synthesis, characterization and application of nanoparticles

PROJECT WORK SUBMITTED BY IN PARTIAL FULFILMENT OF THE FOR THE DEGREE OF MASTERS OF PHYSICS OF

KAZI NAZRUL UNIVERSITY



BY SUMAN SHAW REG. NO:- KNU20009282(2020-21) ROLL NO:-1022004332032013 UNDER THE GUIDANCE OF Dr. SHILPI SHOW MANDAL DEPARTMENT OF PHYSICS

**BANWARILAL BHALOTIA COLLEGE** 





#### BANWARILALA BHALOTIA COLLEGE (HINDI-SHIFT) Routine for On line Hons classes: B. B. College: For Hindi shifts, 2021

Day	Time								
	Semester	8AM- 9AM	9AM- 10AM	10AM- 11AM	1PM- 2PM	2PM- 3PM	3PM- 4PM	7PM- 8PM	8PM- 9PM
		Hons Classes Only		GE Classes Only for I &III Sem		Hons Classes Only			
Mon	11			QS	РВ	ENVS(A)			1
				C-3	GE-2				
	IV		PB	SB				31	
			C-10	C-9					
	VI		QS				PG/SB		
			C-13				C-14		
							Project	n norden der	
Tue	Ш		SB	QS	РВ				
			C-4	C-3	GE-2				
	IV	NB	PB		PG			QS	
Ĩ		SEC-2	C-10		GE-4			C-8	
	VI		QS	PG			PG/SB	SB	
			C-13	DSE-4			C-14	DSE-3	
							Project	5	
Wed	п		SB	QS		РВ			
			C-4	C-3		GE-2			
	IV			SB	PG	5-1 -		QS	
				(C-9)	GE-4			C-8	
	VI		QS	PG			PG/SB	SB	
			C-13	DSE-4			C-14	DSE-3	
							Project		
Thurs	Ш		SB	QS		РВ			
			C-4	C-3		GE-2			

IV	NB		SB	PG		QS	
	SEC-2		C-9	GE-4		C-8	
VI					PG/SB	SB	
					C-14	DSE-3	
					Project		
II		SB					
		C-4					
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NB: Please consider the following information at the time of preparation of departmental online Routine.

(i) Allocate at most two classes for core papers and one class for GE paper of first semester per day

(ii) Allocate at most three classes for core papers and one class for GE paper of third semester per day

(iii) Allocate at most three/four classes for core papers of Fifth semester per day

(iv) Allocate at least four to five classes per paper per week for each sem

- PG Pawan Gurung
- PB Piyali Banerjee
- SB Santosh Bhagat
- NB Nabanita Banerjee

#### **General Guide Lines for Project Writing**

- 1. Students must write their papers from within the discipline of Political Science and its allied subject.
- 2. Total Marks 50. Internal-30 marks and External marks-20.
- 3. External Evaluation will be made through viva-voce.
- 4. External Evaluation will be made through the continuous evaluation process by the respective Supervisor.
- 5. Name of the external examiner will be send by the course coordinator of the university PG department of Political Science to the Controller/Dy. Controller of Examinations of the University and then University will send all the colleges.
- 6. In respect of the preparation of the project special emphasis will be given on Research Methodology.
- 7. Each student will select separate Topic
- 8. Institution will give the priority of the choice of the students regarding the selection of the topic of their choice.










































### **BA HONOURS IN POLITICAL SCIENCE VI SEMESTER 2022**







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Pawan Sir February 18, 2022

Sab log kripaya c14 project ke liye apna apna topic chun Kar is whats group mein forward kare, topic should be chosen from the political science syllabus, lekin dhyan rahe sab ka topic alaag hona chahiye. Aur manlijiye kisika topic kisi student se same to same match ho raha hey is usi student ko preference diya jayega jo topic pehley group mein submit kiye gaye hey. All the best





	DANO		SC (HONE)	
REG NO	BOLL NO	NAME	SUBJECT(CORE-2)	Name of the Supervisor
NUREG18116000395	1161806121034001	AANCHAL MAHATO	Project	SANTOSH BHAGAT
NUREG18116000614	1161806121034003	ANITA GUPTA	Project	SANTOSH BHAGAT
NUREG18116000201	1161806121034004	ANJALI SHARMA	Project	SANTOSH BHAGAT
UREG18116000489	1161806121034005	ANU KUMARI	Project	SANTOSH BHAGAT
UREG18116000760	1161806121034006	ARSHITA SINGH	Project	SANTOSH BHAGAT
UREG18116000429	1161806121034007	ARTI KUMARI GOPE	Project	SANTOSH BHAGAT
UREG18116000842	1161806121034008	BANDANA SINGH	Project	SANTOSH BHAGAT
NUREG18116000045	1161806121034009	BHARTI MANDAL	Project	SANTOSH BHAGAT
NUREG18116000528	1161806121034010	BIKASH MANDAL	Project	SANTOSH BHAGAT
NUREG18116000096	1161806121034011	CHANCHAL RAJAK	Project	SANTOSH BHAGAT
NUREG18116000238	1161806121034012	DEEPA KUMARI	Project	SANTOSH BHAGAT
NUREG18116000808	1161806121034013	DIBYA CHOUHAN NONIA	Project	SANTOSH BHAGAT
NUREG18116000235	1161806121034014	GAYATRI MONDAL	Project	SANTOSH BHAGAT
NUREG18116000199	1161806121034015	GULABSHA KHATUUN	Project	SANTOSH BHAGAT
NUREG18116000761	1161806121034017	KARITA KUMARI NONIA	Project	SANTOSH BHAGAT
NUREG18116000240	1161806121034018	KAIAI KUMARI	Project	SANTOSH BHAGAT
NUREG18116000239	1161806121034019	KAJAL KUMARI SHAW	Project	SANTOSH BHAGAT
NUREG18116000270	1161806121034020	KAJAL SHARMA	Project	SANTOSH BHAGAT
NUREG18116000570	1161806121034021	KHUSBOO KUMARI NONIA	Project	SANTOSH BHAGAT
NUREG18116000139	1161806121034022	USHBOO KUMARI BURNW	Project	SANTOSH BHAGAT
NUREG18116000468	1161806121034023	KHUSHBU SHARMA	Project	SANTOSH BHAGAT
NUREG18116000033	1161806121034024	KOMAL RAJAK	Project	SANTOSH BHAGAT
NUREG18116000262	1161806121034025	LAXMI KUMARI SINGH	Project	SANTOSH BHAGAT
NUREG18116000054	1161806121034026	MANISHA ROUTH	Project	SANTOSH BHAGAT
NUREG18116000211	1161806121034027	MANISHA TIAWARI	Project	SANTOSH BHAGAT
NUREG18116000576	1161806121034028	MUSKAN KHATOON	Project	SANTOSH BHAGAT
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NUREG18116000196	1161806121034030	NANDITA KUMARI	Project	SANTOSH BHAGAT
NUREG18116000418	1161806121034031	NEELAM PARWEEN	Project	SANTOSH BHAGAT
NUREG18116000834	1161806121034032	NEHA PANDET	Project	SANTOSH BHAGAT
NUREG18116000858	1161806121034035	BRACVA KUMARI DHARI	Project	SANTOCH BHAGAT
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UREG18116000841	1161806121034037	PRITI KUMARI YADAV	Project	PAWAN GURUNG
NUREG18116000431	1161806121034038	PRITY GOPE	Project	PAWAN GURUNG
NUREG18116000396	1161806121034039	PRITY KUMARI THAKUR	Project	PAWAN GURUNG
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NUREG18116000123	1161806121034043	RADHIKA PANDEY	Project	PAWAN GURUNG
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NUREG18116000276	1161806121034046	RAMBHA ROY	Project	PAWAN GURUNG
NUREG18116000806	1161806121034047	RANI SHARMA	Project	PAWAN GURUNG
NUREG18116000284	1161806121034048	RANU KUMARI	Project	PAWAN GURUNG
NUKEG18116000609	1161806121034049	KEEMA KUMARI RAJAK	Project	PAWAN GURUNG
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UREG18116000212	1161806121034058	SANGITA THAKUR	Project	PAWAN GURUNG
UREG18116000538	1161806121034059	SARWAN MAHATO	Project	PAWAN GURUNG
NUREG18116000593	1161806121034060	SEEMA KUMARI SHARMA	Project	PAWAN GURUNG
UREG18116000434	1161806121034061	SHEETAL KEWAT	Project	PAWAN GURUNG
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UREG18116000472	1161806121034063	SIMA KUMARI	Project	PAWAN GURUNG
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NUREG18116000159	1161806121034069	SUHANA SINGH	Project	PAWAN GURUNG
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REG . NO	NAME	MOBILE NO	SUBJECT-2	Name of the Supervisor
KNU19116000898	SILOCHANA KUMARI RABIDAS	7679895452	Project	Pawan Gurung
KNU19116000902	TANISHA THAKUR	6294468530	Project	Pawan Gurung
KNU19116000919	NEHA SHAW	6296960297	Project	Pawan Gurung
KNU19116000925	MD SAZID ANSARI	9093100546	Project	Pawan Gurung
KNU19116000941	PREETI SHARMA	9609620125	Project	Pawan Gurung
KNU19116000942	ARUN KUMAR RAM	8597153461	Project	Pawan Gurung
KNU19116000943	VANDANA JAISWAL	8617558522	Project	Pawan Gurung
KNU19116000945	SUMINTRI SHAW	6296871776	Project	Pawan Gurung
KNU19116000967	CHANDA KUMARI	7908505093	Project	Pawan Gurung
KNU19116000981	ASHA KUMARI SHARMA	8900105212	Project	Pawan Gurung
KNU19116000986	SANDHYA RAJAK	8972114200	Project	Pawan Gurung
KNU19116000992	SABA FIRDOSH	8348649038	Project	Pawan Gurung
KNU19116000993	KHUSHBOO MALAKAR	9775218555	Project	Pawan Gurung
KNU19116000995	MONIKA RAJAK	7908739059	Project	Pawan Gurung
KNU19116000998	SALEHA EKRAM	9679116811	Project	Pawan Gurung
KNU19116001000	SHADIYA PARWEEN	9643098630	Project	Pawan Gurung
KNU19116001003	AYUSH PANDEY	8670835216	Project	Pawan Gurung
KNU19116001009	SWEETA KUMARI SAH	8293199954	Project	Pawan Gurung
KNU19116001010	PRIYANKA RAWANI	9749156567	Project	Pawan Gurung
KNU19116001017	AMIT HARIJAN	8617338056	Project	Pawan Gurung
KNU19116001022	PAMMI KUMARI	9474485335	Project	Pawan Gurung
KNU19116001043	SRIDHAR BHAGAT	7001327095	Project	Pawan Gurung
KNU19116001052	PRIYA KUMARI	6294545419	Project	Pawan Gurung
KNU19116001053	PRIYANKA KUMARI	8436220873	Project	Pawan Gurung
KNU19116001063	RUPESH KUMAR YADAV	8927278446	Project	Pawan Gurung
KNU19116001067	SHEWANI THAKUR	8509299623	Project	Pawan Gurung
KN019116001070	PAMI KUMARI	7478147776	Project	Pawan Gurung
KN019116001072	ARTI KUMARI	8918478170	Project	Pawan Gurung
KN019116001073	SUMEDHA PRASAD	8250887763	Project	Pawan Gurung
KN019116001074	NAZMA KHATOON	7029498032	Project	Pawan Gurung
KN019116001075	KARISHMA KUMARI NONIA	7602085085	Project	Pawan Gurung
KN019116001076	SIWANI KUMARI NUNIA	9932474033	Project	Pawan Gurung
KN019116001079	POJA LOHAR	3436522254	Project	Pawan Gurung
KN019116001080		2500000661	Project	Fawan Gurung
KNU19116001088	SACHIN TORI	9637033039	Project	Santosh Kumar Bhagat
KN019116001108		6206920054	Project	Santosh Kumar Bhagat
KNU19116001110		9627976039	Project	Santosh Kumar Bhagat
KN019116001112		7407050950	Project	Santosh Kumar Bhagat
KNU19116001114	DEETIKA VEDMA	6296715450	Project	Santosh Kumar Bhagat
KNU19116001124		7076014030	Project	Santosh Kumar Bhagat
KNU19116001130	RESHAV PASWAN	9775422438	Project	Santosh Kumar Bhagat
KNU19116001133	RESHMA PANDEY	8670636240	Project	Santosh Kumar Bhagat
KNU19116001136	SANDHYA PASWAN	7001503667	Project	Santosh Kumar Bhagat
KNU19116001138	PRITI SINGH	7047760017	Project	Santosh Kumar Bhagat
KNU19116001139	NIKETA PARAMANIK	8927032274	Project	Santosh Kumar Bhagat
KNU19116001140	ANJALI KUMARI SINGH	8927450299	Project	Santosh Kumar Bhagat
KNU19116001142	PRIYANGSHU SHAW	9635895799	Project	Santosh Kumar Bhagat
KNU19116001145	PRITI NONIA	8927894845	Project	Santosh Kumar Bhagat
KNU19116001146	SHIKHA KUMARI	7718751924	Project	Santosh Kumar Bhagat
KNU19116001147	TULSI KUMARI BIND	9749248378	Project	Santosh Kumar Bhagat
KNU19116001148	GANGA UPADHYAY	9749972771	Project	Santosh Kumar Bhagat
KNU19116001149	NANDINI KUMARI	9083173584	Project	Santosh Kumar Bhagat
KNU19116001151	KRITI BURMAN	9832542001	Project	Santosh Kumar Bhagat
KNU19116001152	TANNU PRIYA BURNWAL	8509005536	Project	Santosh Kumar Bhagat
KNU19116001153	NISHA KUMARI	9382176343	Project	Santosh Kumar Bhagat
KNU19116001154	MUSKAN KUMARI MONDAL	8961860838	Project	Santosh Kumar Bhagat
KNU19116001155	ANITA KUMARI SAW	9641505887	Project	Santosh Kumar Bhagat
KNU19116001156	VISHAL KUMAR RABIDAS	8172009686	Project	Santosh Kumar Bhagat
KNU19116001163	KOMAL KUMARI RAJAK	6297476431	Project	Santosh Kumar Bhagat
KNU19116001168	PUJA KUMARI	7479263055	Project	Santosh Kumar Bhagat
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KNU19116001176	PUNAM JAISWAL	7029024011	Project	Santosh Kumar Bhagat
KNU19116001191	PRABHAT GOSWAMI	7679929672	Project	Santosh Kumar Bhagat
KNU19116001203	RUKHSHAR KHATOON	7432089985	Project	Santosh Kumar Bhagat
KNU19116001285	ANJALI PASWAN	7908566799	Project	Santosh Kumar Bhagat
KNU19116001362	SANTOSH SHAW	6296943418	Project	Santosh Kumar Bhagat
KNU19116001367	CHARANDEEP KAUR	9382739250	Project	Santosh Kumar Bhagat



### ASANSOL – 713303, WEST BENGAL (INDIA) Department of Political Science (Hindi Shift)

#### Report of Project Work of Departmental Student, Session 2018-2021 and 2019-2022

Department of Political Science (Hindi Shift) successfully supervise 72 project work done by BA Honours in Political Science VI Semester students of 2018-21 session during April 2021 – June 2021 under the supervision of Pawan Gurung and Santosh Kumar Bhagat. These project work were done on the various topic, for instance World Bank, Contemporary Farmers Agitation, Discourse on Indian Secularism, Global Initiative to Address Climate Change, Local Self Governance in West Bengal, Women Empowerment among others of discipline of Political Science and its allied subject.

### **Report on CSIR-CMERI Training**

In continuation of the MoU between Banwarilal Bhalotia College, Asansol and The Central Mechanical Engineering Institute (CMERI), Durgapur, 50 students from our college have taken training on *"Analytical Techniques and Instrumentation for Water Quality Assessment"* at the laboratory of the Environmental Engineering Group" at CMERI, Durgapur between June, 2021 and August, 2022.

Students were sent in two sessions – one during the winter of 2021(November 25<sup>th</sup> and 26<sup>th</sup>) and the other in the summer of 2022 (27<sup>th</sup> to 29<sup>th</sup> April). 23 students of our college had taken the training in November, 2021 and the remaining 27 students had acquired their training in April, 2022. The aforementioned training programme in association with CMERI, Durgapur is very much a part of our institution's skill development initiative. Such trainings will definitely help to augment the wet laboratory related skills of our students thereby increasing their acceptability in the job market.

The training programme was initially designed for a couple of days but on analysing the feedback from the learner's community the programme was extended to a three day schedule instead of two which gives the learners a greater acquaintance time in the laboratory. At the onset the students are taken to the MM Suri Hall at CMERI, Durgapur for their registration and refreshments post which an inaugural session is held which is often chaired by the Director of CSIR-CMERI, Durgapur (subject to his/her availability), Dr. Biswajit Ruj, Head of the EEG of CMERI, Durgapur, Dr. RR Sahoo, Principal Scientist, EEG of CMERI, Durgapur and other dignitaries. Teachers of our college who accompany the students are also invited to the inaugural programme. Henceforth the theoretical lecture sessions begin. After the lunch break the students are taken to the laboratories for practical sessions. On successful completion of the tenured training, the students are requested for their feedback and subsequently participation certificates are distributed.

In conclusion it can be aptly said that skill development will definitely help our students to gain an edge over other competitors in the job arena and hence such programmes will definitely find further incorporations in our institution's future academic policies.













# **BANWARILAL BHALOTIA COLLEGE**

Asansol, West Bengal-713304

# Session-2021-22 Zoology Field Work

Topic- Measurement of Turbidity by Secchi Disc



## **INSTRUCTOR-** Pankaj Dutta

DONE BY- Jiya Sen, Ishani Roy ,Tania Bharttacharjee, Shreejita Mukherjee, Monalisa Das, Rima Mondal, Riya Banerjee, Srimonty Ghosh ,Ankan Bhowmick , Shreyasi Adhikary,Manav Chatterjee ,Aniket Dawn , Debraj Mondal , Sana Parween , Jyotirmoy Banerjee ,Soma Ghosh , Sourakar Biswas, Kazi Naser Rahman, Rubab Fatima , Noor Fatima ,Bushra Rahman, Rooqaiya Khatun, Anjishnu Mukherjee , Atul kumar Lal ,Mantu Singha Babu , Dev Khan

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### MEASUREMENT OF TURBEDITY BY SECCHI DISC :-

DUTRODUCTION :- The Secdue die, as created in 1865 by the Hallan Astronomers, Father Pietro Angelo Secchi, is a place will the Cruitar dec, 30 cm in diamiter and used to measure meater transparincy a tusbidity in bodies of water. The dive is mounted on a pole or line and lowered Movely down in the water. The depth at which the dive is no longer visible is taken as a measure of the transparency of the water. This measure is known as the Secchi depth, and is related to water turbidity. Since, Ho Envention, The die has also be used in a modified, maller (20cm in diamiter). Black and welvite provides the manimum contract regardless of the colour of the light transmitted by the mater body . The diec is most easily used from a boat or a bridge. Materials Required :- ) Secchi Diec 2) Pole or Cord 3) Measuring tape. Procedure :-A Cord is attached to the side lecche disc with black and white quadsants. 1) Die is lowered Mouly in water until it disappears. The depth on the lord is noted. III) Sugaret time ( appron · 2 min) is allound when looking at the dree near to entirection point for the eyes to adapt completily to the prevalling luminance level.

Teacher's Signature .....



Fig - Seechi dise 

Page No. Date. iv) The else & lowered a few more certimeter and then is douby raised again until it reappears. This second reading of depth is also noted. Cilculate the average of the depths at two points (the depth of diappeasance and reappeasance). This measure is known a secchi V) depth . RESULTS (SEICHT DIEC READENGIS) =-Dath at while dre reappears Doth at uelvel die disappear Average Value (Such 2 Depth Reading number 25 cm 22\_ 28 25.5 31 28.25 cm 2 36 3 22 29 cm 25+28-25+29 82.25 Common depth = - 27.41 COMMENTS :-27.41 Hence, the turbedity of the weater is en 2 Teacher's Signature .....
Relevant Document for Students Undertaking Fieldwork in the Year 2021(UG Sem I Hons, PG Dept. Of Zoology)

# SEMESTER - I

Course Name	ECOLOGY		
Course Code	BSCHZOOC102		
Course Type	Core		
Course Details	CC-1	CA (Continuous Assessment)	Theory : 10 marks
			Practical : 30 marks
		ESE (End Semester Examination)	Theory : 40 marks
			Practical : 20 marks
Credits	Theory 4 + Practical 2 = Total 6 credits		

#### About the course :

This course will take students on a journey through the physical workings of the Earth, the interactions between species and their environments. The course highlights on some of the important aspects *viz*, growth and survival of populations and communities in different habitats, energy flow in the ecosystems, interactions between the communities, exclusion of niches and consequences of changing environment on the biodiversity.

Learning outcomes :

After successfully completing this course, the students will be able to:

- > Know the evolutionary and functional basis of animal ecology.
- > Understand what makes the scientific study of animal ecology a crucial and exciting endeavour.
- Engage in field-based research activities to understand well the theoretical aspects taught besides learning techniques for gathering data in the field.
- > Analyse a biological problem, derive testable hypotheses and then design experiments and put the tests into practice.
- > Solve the environmental problems involving interaction of humans and natural systems at local or global level.

# THEORY (CC-2)

### UNIT I: An overview of Ecology, Ecosystems and Biomes (13 Lectures)

- 1. Introduction and scope of Ecology. Multidisciplinary relevance in current perspective.
- 2. Structure and function of ecosystem;
- 3. Abiotic factors affecting survival and sustenance of organisms e.g., water, temperature, light, pH and salinity.
- 4. Role of limiting factors in survival of biotic components.
- Major ecosystems of the world: Ecological features, limiting factors, zonation and classification of organisms of fresh water and marine ecosystems.
- Introduction to Biome: Ecological features of Tundra, Desert, Savannah and Tropical Rain Forest Biomes.
- 7. Energy flow in ecosystem, food chain and food web.
- 8. Productivity and ecological efficiencies.
- 9. Mineralization and recycling of nutrients: C, N, P & S.

### UNIT II: Population ecology (13 Lectures)

- 1. Ecology of populations: Unitary and Modular populations.
- Unique and group attributes of population: Density, natality, mortality, life tables, fecundity tables, survivorship curves.
- 3. Unique and group attributes of population: mortality, age ratio, sex ratio, dispersal.

## KNU-ZOOLOGY(HONS)

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- Concept of carrying capacity, Factors regulating population dispersal and growth: Exponential and logistic growth.
- 5. Population regulation: density-dependent and independent factors; r and K strategies.

### UNIT III: Biotic community, characteristics and attributes (13 Lectures)

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- 1. Community characteristics: stratification; Dominance, diversity, species richness, abundance, Evenness, Similarity.
- 2. Diversity and food-web indices.
- 3. Ecotone and edge effect;
- 4. Positive interactions: commensalism, proto-cooperation, and mutualism.
- 5. Negative interactions: parasitism and allelopathy; predation and predator-prey dynamics; herbivory.
- 6. Interspecific competition and coexistence, Inter and intra-specific; abundance.
- 7. Niche concept, types, Niche overlap and Resource partitioning.
- 8. Gause's Principle with laboratory and field examples.
- 9. Ecological succession: Definition, Process, types, theories of succession.

### UNIT IV: Environmental degradation; Biodiversity, Environmental movement etc. (13 Lectures)

- Environmental degradation : Environmental ethics; Pollution: Air, water and noise pollution and their control; Solid Waste management and EIA ; Natural resources: Mineral, water and forest, their significance and conservation.
- Biodiversity : Types and Hotspots of biodiversity. Threat and Major drivers of biodiversity. Conservation strategies ; Biodiversity status in India, monitoring and documentation; Biodiversity mapping using GPS, GIS and remote sensing. Ecosystem and biodiversity services: Ecological, economic, social, ethical, aesthetic and Informational value. Application of ecology in management and Conservation programmes.
- Environmental movement : Role of gender and cultures in environmental conservation. Environmental movements: Bishnois. Chipko, Silent valley, Big dam movements. Environmental education and public awareness, Green bench.

# PRACTICAL (CC2)

- 1. To measure microclimatic variables viz., temperature, humidity and light conditions in a microhabitat.
- 2. Making an ecosystem in a wide-mouthed bottle.
- 3. Constructing a food web by observing organisms from a given area.
- 4. Preparing an essay (write up) based on few ecology related publications.
- 5. Studying the impact of herbivore on plant species (planted in pots under specific conditions).
- Constructing distribution map of species of a genus through GPS by estimating the coordinates (virtual demonstration).
- 7. Estimation of the ratio of the producers and consumers.
- 8. Determination of pH, and Dissolved 02 (Winkler's Method) and Free CO2 in water.

KNU-ZOOLOGY(HONS)

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- 9. Preparation of nested quadrate and estimation of effective quadrate size.
- 10. Study of an aquatic ecosystem: Major Phytoplankton (Up to Family) and zooplankton (Up to Genus).
- 11. Group discussion or Seminar presentation on one or two related topics (Given Below).
- 12. Field study in a biodiversity rich area like national park, biosphere reserve, sea shore or nearby places.