

## Department of Zoology

### Field Study 2021-22

<b>Subject</b>	<b>Semester</b>	<b>Paper</b>	<b>Topic</b>
<b>ZOOLOGY HONS</b>	<b>SEMESTER 6</b>	<b>DSE1. Animal Behaviour and Chronobiology</b>	
		<b>Animal Behaviour and Chronobiology Lab, ZOOA- DSE(B)-6-1-P</b>	<b>Visit to Forest/ Wild life Sanctuary/Biodiversity Park/Zoological Park to study behavioural activities of animals and prepare a short report.</b>

## PART III: SEMESTER 6

### DSE1. Animal Behaviour and Chronobiology

#### ZOOA-DSE(B)-6-1-TH

Full Marks 50	4 Credits	50 Hours
<b>Unit 1: Patterns of Behaviour</b>		10
Stereotyped Behaviours (Orientation, Reflex); Individual Behavioural patterns; Instinct vs. Learned Behaviour; FAP, Associative learning, classical and operant conditioning, Habituation, Imprinting.		
<b>Unit 2: Social and Sexual Behaviour</b>		20
Social organisation in termites; Communication (dance & pheromones in Bees) Social behaviour: Altruism (Hamilton's rule and concept of haplodiploidy), Cooperation and Selfishness Sexual Behaviour: Sexual dimorphism, Mate choice in peacock, Intra-sexual selection (male rivalry in red deer) Kinship theory: Relatedness & inclusive fitness; parental care in fishes (Nest Building & coast benefit), conflict within families: parent offspring conflict and sibling rivalry		
<b>Unit 3: Chronobiology &amp; Biological Rhythm</b>		20
Types and characteristics of biological rhythms: Short- and Long- term rhythms; Circadian rhythms; Tidal rhythms and Lunar rhythms, Circannual rhythms; Photic and non-photic zeitgebers; Role of melatonin. Biological clock and its adaptive significance. Circannual rhythm in bird migration.		

### Animal Behaviour and Chronobiology Lab, ZOOA-DSE(B)-6-1-P

Full Marks 50	60 Hours	2 Credits
<b>List of Practical</b>		
<ol style="list-style-type: none"><li>1. To study nests and nesting habits of the birds and social insects.</li><li>2. To study the behavioural responses of wood lice to dry and humid conditions(demonstration only).</li><li>3. To study geotaxis behaviour in earthworm.</li><li>4. To study the phototaxis behaviour in insect larvae.</li><li>5. Visit to Forest/ Wild life Sanctuary/Biodiversity Park/Zoological Park to study behavioural activities of animals and prepare a short report.</li><li>6. Study of circadian functions in humans (daily eating, sleep and temperature patterns).</li></ol>		

## DEPARTMENT OF BOTANY

### SEMESTER WISE PAPER WISE FIELD WORK SYLLABUS

SEMESTER	PAPER	TOPIC
Semester-II Honours	ARCHAEGONIATE (BOT-A-CC-2-4-P)	Botanical excursion to familiarize the students with the natural habitats of these groups (Bryophyta, Pteridophyta and Gymnosperms) is desirable
Semester-IV Honours	PLANT GEOGRAPHY, ECOLOGY AND EVOLUTION (BOT-A-CC-4-8-P)	Study of community structure by quadrat method and determination of (i) Minimal size of the quadrat, (ii) Frequency, density and abundance of components (to be done during excursion/ field visit)
Semester-VI General	HORTICULTURAL PRACTICES AND POST HARVEST TECHNOLOGY (BOT-G-DSE-B-6-4-P)	Field trips to gardens, standing crop sites, nurseries, vegetable gardens, horticultural fields and cold storages.

#### PRACTICAL- PLANT GEOGRAPHY, ECOLOGY AND EVOLUTION (BOT-A-CC-4-8-P) (Credits 2)

1. Workout on ecological parameters
2. Classroom performance: (Lab records)
3. Field Records (Field note book of phytogeographical study and ecological study)
4. Viva

#### PLANT GEOGRAPHY

1. Field visit- at least one long excursion at different phytogeographical region of India.
2. Study of local flora and submission of a project report highlighting phytogeographical characteristics of the region.

#### ECOLOGY

1. Study of community structure by quadrat method and determination of (i) Minimal size of the quadrat, (ii) Frequency, density and abundance of components (to be done during excursion/ field visit).
2. Comparative anatomical studies of leaves from polluted and less polluted areas.
3. Measurement of dissolved O<sub>2</sub> by azide modification of Winkler's method.
4. Comparison of free CO<sub>2</sub> from different sources.

**PRACTICAL- ARCHAEGONIATE (BOT-A-CC-2-4-P)**  
(Credits 2)

1. Workout on Pteridophytes
2. Identification with reasons (Bryophytes, Pteridophytes and Gymnosperms)
3. Classroom performance: (Lab records, slides)
4. Field report
5. Viva

**BRYOPHYTES**

1. Morphological study of the plant body: Genera as mentioned in theoretical syllabus and *Riccia*, *Porella*.
2. Study from permanent slides : *Riccia* (V.S. of thallus with sporophyte), *Marchantia* (L.S. through gemma cup, antheridiophore , archegoniophore) , *Anthoceros* (L.S. of sporophyte) , *Funaria* (L.S. of capsule).

**PTERIDOPHYTES**

1. Morphological study of the sporophytic plant body: Genera as mentioned in the theoretical syllabus and *Lycopodium*, *Ophioglossum* and *Marsilea*.
2. Workout of the reproductive structures: *Selaginella*, *Equisetum*, *Pteris*.
3. Study from permanent slides: *Psilotum* (T.S. of synangium), *Lycopodium* (L.S. of strobilus), *Ophioglossum* (L.S. of spike), *Dryopteris* (gametophyte), *Marsilea* (L.S. of sporocarp).

**GYMNOSPERMS**

1. Morphological study: *Cycas* (microsporophyll and megasporophyll), *Pinus* (female and male cone), *Gnetum* (female and male cone).
2. Study from permanent slides: *Cycas* (L.S. of ovule), *Pinus* (L.S. of male and female cone), *Ginkgo* (L.S. of female strobilus), *Gnetum* (L.S. of male cone and ovule).

**FIELD STUDY**

Botanical excursion to familiarize the students with the natural habitats of these groups is desirable. No individual collection should be allowed. Students should submit only photographs in their field report.

**PRACTICAL- HORTICULTURAL PRACTICES AND POST HARVEST TECHNOLOGY (BOT-G-DSE-8-6-4-P)**  
(Credits 2)

1. Field trips to gardens, standing crop sites, nurseries, vegetable gardens, horticultural fields and cold storages.

## University of Calcutta

### *Under Graduate Curriculum under Choice Based Credit System (CBCS)*

Syllabus for Ability Enhancement Compulsory Course-2 (AECC-2) in  
**Environmental Studies**

Semester-2

**Total Marks-100(Credit -2)**

(50 Theory-MCQ type + 30 Project + 10 Internal Assessment + 10 Attendance)

[Marks obtained in this course will be taken to calculate SGPA & CGPA]

### **Theory**

<b>Unit 1</b>	<b>Introduction to environmental studies</b>	2 lectures
	<ul style="list-style-type: none"><li>•Multidisciplinary nature of environmental studies;</li><li>•Scope and importance; Concept of sustainability and sustainable development.</li></ul>	
<b>Unit 2</b>	<b>Ecology and Ecosystems</b>	6 lectures
	<ul style="list-style-type: none"><li>•Concept of ecology and ecosystem, Structure and function of ecosystem; Energy flow in an ecosystem; food chains, food webs; Basic concept of population and community ecology; ecological succession.</li><li>•Characteristic features of the following:<ol style="list-style-type: none"><li>a) Forest ecosystem</li><li>b) Grassland ecosystem</li><li>c) Desert ecosystem</li><li>d) Aquatic ecosystems (ponds, streams, lakes, wetlands, rivers, oceans, estuaries)</li></ol></li></ul>	
<b>Unit 3</b>	<b>Natural Resources</b>	8 lectures
	<ul style="list-style-type: none"><li>• Concept of Renewable and Non-renewable resources</li><li>• Land resources and land use change; Land degradation, soil erosion and desertification.</li><li>•Deforestation: Causes, consequences and remedial measures</li><li>•Water: Use and over-exploitation of surface and ground water, floods, droughts, conflicts over water (international &amp; inter-state).</li><li>•Energy resources: Environmental impacts of energy generation, use of alternative and nonconventional energy sources, growing energy needs.</li></ul>	
<b>Unit 4</b>	<b>Biodiversity and Conservation</b>	8 lectures
	<ul style="list-style-type: none"><li>•Levels of biological diversity: genetic, species and ecosystem diversity;</li><li>• Biogeographic zones of India; Biodiversity patterns and global biodiversity hot spots</li><li>•India as a mega-biodiversity nation; Endangered and endemic species of India</li><li>•Threats to biodiversity: Habitat loss, poaching of wildlife, man-wildlife conflicts, biological invasions;</li><li>•Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.</li><li>•Ecosystem and biodiversity services: Ecological, economic, social, ethical, aesthetic and Informational value.</li></ul>	
<b>Unit 5</b>	<b>Environmental Pollution</b>	8 lectures
	<ul style="list-style-type: none"><li>• Environmental pollution: concepts and types,</li><li>• Air, water, soil, noise and marine pollution- causes, effects and controls</li><li>• Concept of hazardous waste and human health risks</li><li>• Solid waste management: Control measures of Municipal, biomedical and e-waste.</li></ul>	

<b>Unit 6 Environmental Policies and Practices</b>	7 lectures
<ul style="list-style-type: none"> <li>•Climate change, global warming, ozone layer depletion, acid rain and their impacts on human communities and agriculture</li> <li>•Environment Laws: Wildlife Protection Act; Forest Conservation Act. Water (Prevention and control of Pollution) Act; Air (Prevention &amp; Control of Pollution) Act; Environment Protection Act; Biodiversity Act.</li> <li>•International agreements: Montreal Protocol, Kyoto protocol and climate negotiations; Convention on Biological Diversity (CBD).</li> <li>•Protected area network, tribal populations and rights, and human wildlife conflicts in Indian context.</li> </ul>	
<b>Unit 7 Human Communities and the Environment</b>	6 lectures
<ul style="list-style-type: none"> <li>•Human population growth: Impacts on environment, human health and welfare.</li> <li>•Case studies on Resettlement and rehabilitation.</li> <li>• Environmental Disaster: Natural Disasters-floods, earthquake, cyclones, tsunami and landslides; Manmade Disaster- Bhopal and Chernobyl.</li> <li>•Environmental movements: Bishnois, Chipko, Silent valley, Big dam movements.</li> <li>•Environmental ethics: Role of gender and cultures in environmental conservation.</li> <li>•Environmental education and public awareness</li> </ul>	
<b>Project/ Field work</b>	Equal to 5 lectures
<ul style="list-style-type: none"> <li>•Visit to an area to document environmental assets: Natural resources/flora/fauna, etc.</li> <li>•Visit to a local polluted site-Urban/Rural/Industrial/Agricultural.</li> <li>•Study of common plants, insects, fish, birds, mammals and basic principles of identification.</li> <li>•Study of ecosystems-pond, river, wetland, forest, estuary and agro ecosystem.</li> </ul>	
<b>Total</b>	<b>50 Lectures</b>

### Suggested Reading:

- Asthana, D. K. (2006). *Text Book of Environmental Studies*. S. Chand Publishing.
- Basu, M., Xavier, S. (2016). *Fundamentals of Environmental Studies*, Cambridge University Press, India
- Basu, R. N., (Ed.) (2000). *Environment*. University of Calcutta, Kolkata
- Bharucha, E. (2013). *Textbook of Environmental Studies for Undergraduate Courses*. Universities Press.
- De, A.K., (2006). *Environmental Chemistry*, 6th Edition, New Age International, New Delhi.
- Mahapatra, R., Jeevan, S.S., Das, S. (Eds) (2017). *Environment Reader for Universities*, Centre for Science and Environment, New Delhi.
- Masters, G. M., & Ela, W. P. (1991). *Introduction to environmental engineering and science*. Englewood Cliffs, NJ: Prentice Hall.
- Odum, E. P., Odum, H. T., & Andrews, J. (1971). *Fundamentals of ecology*. Philadelphia: Saunders.
- Sharma, P. D., & Sharma, P. D. (2005). *Ecology and environment*. Rastogi Publications.



# UNIVERSITY OF CALCUTTA

## Notification No. CSR/ 12 /18

It is notified for information of all concerned that the Syndicate in its meeting held on 28.05.2018 (vide Item No.14) approved the Syllabi of different subjects in Undergraduate Honours / General / Major courses of studies (CBCS) under this University, as laid down in the accompanying pamphlet:

### List of the subjects

Sl. No.	Subject	Sl. No.	Subject
1	Anthropology (Honours / General)	29	Mathematics (Honours / General)
2	Arabic (Honours / General)	30	Microbiology (Honours / General)
3	Persian (Honours / General)	31	Mol. Biology (General)
4	Bengali (Honours / General /LCC2 /AECC1)	32	Philosophy (Honours / General)
5	Bio-Chemistry (Honours / General)	33	Physical Education (General)
6	Botany (Honours / General)	34	Physics (Honours / General)
7	Chemistry (Honours / General)	35	Physiology (Honours / General)
8	Computer Science (Honours / General)	36	Political Science (Honours / General)
9	Defence Studies (General)	37	Psychology (Honours / General)
10	Economics (Honours / General)	38	Sanskrit (Honours / General)
11	Education (Honours / General)	39	Social Science (General)
12	Electronics (Honours / General)	40	Sociology (Honours / General)
13	English ((Honours / General/ LCC1/ LCC2/AECC1)	41	Statistics (Honours / General)
14	Environmental Science (Honours / General)	42	Urdu (Honours / General /LCC2 /AECC1)
✓ 15	Environmental Studies (AECC2)	43	Women Studies (General)
16	Film Studies ( General)	44	Zoology (Honours / General)
17	Food Nutrition (Honours / General)	45	Industrial Fish and Fisheries – IPFV (Major)
18	French (General)	46	Sericulture – SRTV (Major)
19	Geography (Honours / General)	47	Computer Applications – CMAV (Major)
20	Geology (Honours / General)	48	Tourism and Travel Management – TTMV (Major)
21	Hindi (Honours / General /LCC2 /AECC1)	49	Advertising Sales Promotion and Sales Management –ASPV (Major)
22	History (Honours / General)	50	Communicative English –CMEV (Major)
23	Islamic History Culture (Honours / General)	51	Clinical Nutrition and Dietetics CNDV (Major)
24	Home Science Extension Education (General)	52	Bachelor of Business Administration (BBA) (Honours)
25	House Hold Art (General)	53	Bachelor of Fashion and Apparel Design – (B.F.A.D.) (Honours)
26	Human Development (Honours / General)	54	Bachelor of Fine Art (B.F.A.) (Honours)
27	Human Rights (General)	55	B. Music (Honours / General) and Music (General)
28	Journalism and Mass Communication (Honours / General)		

The above shall be effective from the academic session 2018-2019.

SENATE HOUSE  
KOLKATA-700073  
The 4<sup>th</sup> June, 2018

*Paul*  
4/6/18  
(Dr. Santanu Paul)  
Deputy Registrar

## DEPARTMENT OF GEOGRAPHY

### SYLLABUS THAT CONTAINS FIELD WORK/PROJECT WORK

<b>SEMESTER</b>	<b>PAPER/COURSE</b>	<b>DETAILS</b>
<b>SEM-V(HONS)</b>	<b>CC-11</b>	<b>Research methodology and field work</b>
<b>1+1+1 SYSTEM (HONS)</b>	<b>PAPER-07,MODULE-14</b>	<b>GIS RS and field Report</b>
<b>1+1+1 SYSTEM (GEN)</b>	<b>PAPER-03,MODULE-06</b>	<b>Applied Geographical Techniques</b>



This is part of the syllabus of B.Com. (Honours & General) courses of Studies under CBCS, from the academic session 2017-18 and onwards. The paper Project Work comes under the syllabi of sixth semester Honours .

### Year 3: Semester VI

		Marks	Credit Hours
AECC 6.1Chg	Environmental Studies	<b>100</b>	<b>2</b>
SEC 6.1Chg	Computerised Accounting and e-Filing of Tax Returns (70+30)	<b>100</b>	<b>4</b>
<b>CC 6.1 Ch</b>	<b>Project Work</b>	<b>100</b>	<b>6</b>
DSE 6.1 A**	Financial Reporting and Financial Statement Analysis	<b>100</b>	<b>6</b>
DSE 6.2 A**	Financial Management	<b>100</b>	<b>6</b>

**CC 6.1 Ch**  
**Project Work**  
**Full Marks 100**

<b>Project Work</b>	<b>Marks Allotted</b>
<b>Project Report</b>	<b>50</b>
<b>Viva-Voce Examination</b>	<b>50</b>

DEPARTMENT OF PHYSIOLOGY

SYLLABUS CONTAINING FIELD/PROJECT WORK (2021-2022)

	SEMESTER	COURSE PAPER	
1	PHYA SEM 6 HONS	SEM VI DSEA4	FIELD WORK ON COMMUNITY HEALTH
2	PHYA SEM 6 HONS	SEM VI DSE B3	PROJECT WORK ON CHRONOBIOLOGY
3	PHYA SEM 4 HONS	SEM IV CC10	DIET SURVEY (ICMR METHOD)
4	PHYG SEM6 GENERAL	SEM VI DSE B2	DIET SURVEY (ICMR METHOD)

**PHYA SEM 6 DSEA4 :**

**DSE A4P**

1. Calculation of Body Surface Area (using nomogram), Body Mass Index and Ponderal Index from anthropometric measurements.
2. A report (hand-written) on the basis of field survey from ONE of the followings:
  - a) Physiological parameters of human (at least three parameters).
  - b) Anthropometric measurements on human (at least three parameters).
  - c) Epidemiological studies on human.

**PHYA SEM6 DSEB3:**

**DSE3P**

1. Project work on assessment of individual differences in human circadian rhythms (chronotype in human population) by questionnaire method among school children and college students.
2. Assessment of environmental heat load.
3. Assessment of noise level using noise level meter.
4. Determination of diurnal and /or circalunar rhythm of body temperature of college going students. (2)

**PHYA SEM4 CC10:**

**CC10P.**

**□ Nutrition and Dietetics :**

1. Composition and nutritional value of common foodstuff.
2. Diet survey report of a family as per ICMR specification. (2)
3. Qualitative analysis of milk, potato, flour, rice, pulses.

**PHYG SEM6 DSEB2:**

**DSE B2P:**

Diet survey report (hand-written) of a family (as per ICMR specification): Each student has to submit a report on his/her own family. (2)

**Suggested Readings**

1. Essential Food and Nutrition, by M. Swaminathan. The Bangalore Printing & Publishing Co.
2. Biochemistry, U. Satyanarayan, NCBA