

BARASAT GOVT COLLEGE
POST GRADUATE DEPARTMENT OF ZOOLOGY
B.Sc. Zoology (Hons) CBCS Syllabus
With effect from 2018-19

Program Outcome (PO)

PO 1	Disciplinary knowledge
PO 2	Scientific reasoning
PO 3	Critical thinking
PO 4	Research-related skills
PO 5	Analytical reasoning
PO 6	Information/digital literacy:
PO 7	Cooperation/Team work
PO 8	Sense of inquiry
PO 9	Moral and ethical awareness/reasoning

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Programme Specific Outcomes (PSO)

- **PSO1:** Students gain knowledge and skill in the fundamentals of animal sciences, recognizes the complex interactions among various living organisms
- **PSO2:** Apply the knowledge of internal structure of cell, its functions in control of various metabolic functions of organisms.
- **PSO3:** Analyse complex interactions among the various animals of different phyla, their distribution and their relationship with the environment
- **PSO4:** Understands the physiological processes of animals and relationship of organ systems
- **PSO5:** Gain knowledge of Agro based Small-Scale industries like sericulture, fish farming, etc.
- **PSO6:** Understands about various concepts of genetics, molecular biology and its importance in human health; and the physiological aspects of human and other vertebrates
- **PSO7:** Skill Enhancement Courses develop employable skills in aquarium fish keeping and vermicomposting.
- **PSO8:** This program covers theoretical studies and practical proficiency training which may help in their placement at several pharmaceutical/ biotechnology/ microbiology/ based laboratory and/ or preparation of M.Sc. entrance examination for universities & institutes.
- **PSO9:** The students will get a flavour of research besides improving their writing skills and making them well versed with the current trends, and enable the students to think and interpret individually due to different aspects chosen, after successful completion of this course.

BARASAT GOVERNMENT COLLEGE
Course Outcome or Learning Outcome
Three year B.A. /B.Sc. Degree Course
Under CBCS semester system
HONOURS COURSE IN ZOOLOGY
With effect from the session: 2018 – 2019

Course Name: Core Course-1
Course Code: ZOOACOR01T & ZOOACOR01P
Topic Name: ANIMAL DIVERSITY- NON-CHORDATES I

CO, PO & PSO Mapping					
Course Outcome:	SI No	Course outcome	Knowledge level Blooms Level	POs Mapping	PSOs mapping
	CO1	Students remember and understand the general characters of different groups of invertebrate animals including Protozoa, Porifera, Coelenterate, Platyhelminthes, and Aschelminthes and can classify them up to class.	L2 Understanding	1,2,3,5,6	1,8
	CO2	Comprehend special features, organisation, pathogenecity, life history traits.	L2 Understanding	1,2,3,5,6	2,3,6,8
	CO3	Apply the basic knowledge of classification in advanced taxonomic work.)	L3 Applying	1,2,3,5,6	3,4,8
	CO4	Analyze evolutionary significance of tissue to organ system grade of organization, symmetry, polymorphism and parasitic adaptation.	L4 Analysing	1,2,3, 5,6	3,4,8
	CO5	Appreciate the importance of conservation of these species and can create awareness on disease causing parasites and their mode of infection.	L6 Creating	1, 2,3,,5,6	6,8
	CO6	Prepare a project report on diversity/life cycle of some invertebrates.	L6 Creating	1, 2,3,4,5,6,7	8,9
	CO7				

Program Articulation Matrix (CO-PO Matrix)																			
PO, PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9
CO1	3	3	1		3	3					3							2	
CO2	3	3	1		3	3						3	2			2		2	
CO3	3	3	1		3	3							2	2				2	
CO4	3	3	1		3	3							2	3				2	
CO5	3	3	1		3	3										1		2	
CO6	3	3	2	1	3	3										0		2	3
CO7																			
Average	3.00	3.00	1.17	1.00	3.00	3.00					3.00	3.00	2.00	2.50		1.00		2.00	3.00

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HONOURS COURSE IN ZOOLOGY
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Course Name: Core Course-2
Course Code: ZOOACOR02T & ZOOACOR02P
Topic Name: ECOLOGY

CO, PO & PSO Mapping					
Course Outcome:	SI No	Course outcome	Knowledge level Blooms Level	POs Mapping	PSOs mapping
	CO1	Understand the basic concepts of ecology, biogeochemical cycles & Population Ecology.	L2 Understanding	1,2,3,4,5,6,8,9	8
	CO2	Understand the study of life history pattern, fertility rate and age structure.	L2 Understanding	1,2,3,4,5,6,8,9	3,4,8
	CO3	Understand the types and function of ecosystem, Characteristics of Community; Ecological Succession and Major Biomes of the world. (Level 2)	L2 Understanding	1,2,3,4,5,6,8,9	3,4,8
	CO4	Apply the knowledge in the protection and conservation of nature and natural resources.	L3 Applying	1,2,3,4,5,6,7,8	8
	CO5	Perform various ecological sampling methods and can calculate and analyze species diversity.	L3 Applying	1, 2,3,4,5,6,7,8	8,9
	CO6	Evaluate different ecosystem attributes by using physico-chemical methods.	L5 Evaluating	1,2,3,4,5,6,7,8	5,7,8,9

Program Articulation Matrix (CO-PO Matrix)																			
PO, PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9
CO1	3	3	3	1	1	3		1	2									2	
CO2	3	3	3	1	2	3		1	2			1	1					2	
CO3	3	3	3	1	1	3		1	2				1	1				2	
CO4	3	3	3	2	3	3	1	2	2									2	
CO5	3	3	3	3	2	3	2	2	2									2	1
CO6	3	3	3	3	3	3	2	3	3						1		1	2	1
Average	3.00	3.00	3.00	1.83	2.00	3.00	1.67	1.67	2.17				1.00	1.00	1.00		1.00	2.00	1.00

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HONOURS COURSE IN ZOOLOGY
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Course Name: Core Course-3
Course Code: ZOOACOR03T & ZOOACOR03P
Topic Name: NON-CHORDATE II

CO, PO & PSO Mapping					
Course Outcome:	SI No	Course outcome	Knowledge level Blooms Level	POs Mapping	PSOs mapping
	CO1	Develop an understanding of the characters of coelomate non chordates	L2 Understanding	1,2,3,5,6	1,8
	CO2	Differentiate the organisms belonging to different taxa.	L2 Understanding	1,2,3,5,6	2,3,6,8
	CO3	Understand some special features like torsion of molluscs, water vascular system of Echinodermata, filter feeding of lower chordates, metamorphosis of insects and its hormonal control.	L2 Understanding	1, 2,3,5,6	3,4,8
	CO4	Can analyze functional and structural affinities of non chordates to frame evolutionary relationship among the groups.	L4 Annalysing	1, 2,3,5,6	3,4,8
	CO5	Understand the relative position of individual organs and associated structures through dissection of the invertebrate representatives.	L2 Understanding	1,2,3,5,6	6,8
	CO6	Get a flavor of research by working on different projects besides improving their writing skills. It will further enable the students to think and interpret individually. It also builds up collaborative learning and communication skill among students.	L6 Creating	1, 2,3,4,5,6,7	8,9

Program Articulation Matrix (CO-PO Matrix)																			
PO, PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9
CO1	3	3	1		3	3					3							2	
CO2	3	3	1		3	3						3	2			2		2	
CO3	3	3	1		3	3							2	2				2	
CO4	3	3	1		3	3							2	3				2	
CO5	3	3	1		3	3										1		2	
CO6	3	3	2	1	3	3	3											2	3
Average	3.00	3.00	1.17	1.00	3.00	3.00	3.00				3.00	3.00	2.00	2.50		1.50		2.00	3.00

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Course Name: Core Course-4
Course Code: ZOOACOR04T & ZOOACOR04P
Topic Name: CELL BIOLOGY

CO, PO & PSO Mapping					
Course Outcome:	SI No	Course outcome	Knowledge level Blooms Level	POs Mapping	PSOs mapping
	CO1	Understand the functioning of nucleus and extra nuclear organelles like mitochondria, RER, Golgi bodies, cytoskeleton and comprehend the intricate cellular mechanisms involved.	L2 Understanding	1,2,3,6	2,4,6,8,9
	CO2	Acquire the detailed knowledge of different pathways related to cell signaling and apoptosis, PCD, Necrosis, thus enabling them to understand the anomalies in cancer.	L2 Understanding	1,2,3,6	2,4,6,8,9
	CO3	Can relate clinical aspects, tumor cell metabolism, cancer stem cells, metastasis and therapeutic strategies.	L4 Evaluating	1, 2,3,6	2, 4,6,8,9
	CO4	Can apply the basic concepts of cell biology in future applied research fields such as cancer, signal transduction pathways, cell viability assays, diabetes etc.	L3 Applying	1,2,3,4,5,6	2, 4,6,8,9
	CO5	Skill enhancement in the usage of laboratory microscope and Hands-on experience of different phases of cell division.	L3 Applying	1,2,3,4,5,6,7,8	2,4,6,8,9
	CO6	Perform the cytochemical tests for detecting various cellular components.	L3 Applying	1, 2, 3,4,5,6,7,8	2,4,6,8,9

Program Articulation Matrix (CO-PO Matrix)																			
PO, PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9
CO1	3	3	2			3					3		3		2		3	1	
CO2	3	3	2			3					3		3		3		3	1	
CO3	3	3	1			3					3		3		2		3	1	
CO4	3	3	1	1	1	3					2		3		2		3	1	
CO5	3	3	3	2	2	3	1	2			2		3		2		3	2	
CO6	3	3	3	3	2	3	1	2			3		3		3		3	2	
Average	3.00	3.00	2.00	2.00	1.67	3.00	1.00	2.00				2.67		3.00		2.33		3.00	1.33

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Course Name: Core Course-5
Course Code: ZOOACOR05T & ZOOACOR05P
Topic Name: CHORDATES

CO, PO & PSO Mapping					
Course Outcome:	SI No	Course outcome	Knowledge level Blooms Level	POs Mapping	PSOs mapping
	CO1	Develop understanding on the diversity of life with regard to chordates.	L2 Understanding	1,2,3,5,6	1,8
	CO2	Can group animals on the basis of their morphological characteristics/structures mainly Fishes, Amphibia, Reptilia, Birds and Mammals.	L3 Applying	1, 2,3,5,6	2,3,6,,8
	CO3	Analyze similarities in life form and functions among various groups leading to adaptive radiation and evolution.	L4 Analysing	1, 2,3,5,6,8	3,4,8
	CO4	Analyze differences in life form and functions among various groups leading to adaptive radiation and evolution.	L4 Analysing	1,2,3,5,6,8	3,4,8
	CO5	Identify and classify important vertebrate specimens that are observed in the field, and quantify changes occurring in ecosystems over time.	L3 Applying	1,2,3,5,6	6,8
	CO6	Understand the taxidermic and chemical methods of preservation of chordates.	L2 Understanding	1,2,3,4,5,6,8	8,9

Program Articulation Matrix (CO-PO Matrix)																			
PO, PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9
CO1	3	3	1		3	3		0			3							2	
CO2	3	3	1		3	3		0				3	2			2		2	
CO3	3	3	1		3	3		2					2	2				2	
CO4	3	3	1		3	3		2					2	3				2	
CO5	3	3	1		3	3												2	1
CO6	3	3	2	1	3	3		1										2	3
Average	3.00	3.00	1.17	1.00	3.00	3.00		1.00			3.00	3.00	2.00	2.50		2.00		2.00	2.00

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Course Name: Core Course-6

Course Code: ZOOACOR06T & ZOOACOR06P

Topic Name: PHYSIOLOGY: CONTROLLING AND COORDINATING SYSTEM

CO, PO & PSO Mapping					
Course Outcome:	SI No	Course outcome	Knowledge level Blooms Level	POs Mapping	PSOs mapping
	CO1	Understand how cells, tissues, and organisms function at different levels.	L2 Understanding	1,2,3,5,6	1,2,3,4,6,8
	CO2	Understand the organization of nervous system and process of nerve conduction.	L2 Understanding	1,2,3,5,6	1,2,3,4,6,8
	CO3	Understand the process of muscle contraction.	L2 Understanding	1,2,3,5,6	1, 2,3,4,6,8
	CO4	Explain the coordination of different body system through the action of neural and endocrine pathways.	L4 Analysing	1, 2,3,5,6	1,2,3,4,6,8
	CO5	Apply the theoretical knowledge of tissue organization in identification of histological slides of mammals.	L3 Applying	1, 2,3,4,5,6	1,2,3,4,6,8
	CO6	Describe the histological structure of various exocrine and endocrine glands, their functions and their abnormalities.	L2 Understanding	1, 2,3,4,5,6	1, 2,3,4,6,8,9
	CO7	Develop skill of temporary slide preparation and permanent slide preparation of different tissues using microtome.	L3 Applying	1,2,3,4,5,6,7	1,2,3,4,6,8,9

Program Articulation Matrix (CO-PO Matrix)																			
PO, PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9
CO1	3	3	1		3	3					3	3	2	3		3		3	
CO2	3	3	1		3	3					3	3	2	2		3		3	
CO3	3	3	1		3	3					3	3	2	2		3		3	
CO4	3	3	1		3	3					2	3	2	1		3		3	
CO5	3	3	1	1	3	3					2	3	2	1		3		3	1
CO6	3	3	3	2	3	3					2	3	2	1		3		3	3
CO7	3	3	3	3	3	3	2				2	3	3	1		3		3	3
Average	3.00	3.00	1.57	2.00	3.00	3.00	2.00				2.43	3.00	2.14	1.57		3.00		3.00	2.33

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Course Name: Core Course-7
Course Code: ZOOACOR07T & ZOOACOR07P
Topic Name: BIOCHEMISTRY

CO, PO & PSO Mapping					
Course Outcome:	SI No	Course outcome	Knowledge level Blooms Level	POs Mapping	PSOs mapping
	CO1	Understand about the importance and scope of biochemistry.	L2 Understanding	1	1
	CO2	Understand the structure and biological significance of carbohydrates, amino acids, proteins, lipids and nucleic acids.	L2 Understanding	1, 2	1
	CO3	Comprehend the different metabolic pathways; know terminologies and disorders associated with it.	L2 Understanding	1, 2, 5, 6	1, 2
	CO4	Understand the concept of enzyme, its mechanism of action and regulation.	L2 Understanding	1, 2	1
	CO5	Familiarize with the mechanisms involved in oxidative phosphorylation.	L2 Understanding	1, 2	1, 3
	CO6	Perform qualitative biochemical tests to identify protein, lipid and carbohydrates.	L3 Applying	1, 5, 6	2, 6
	CO7	Quantitative Estimation of protein by Lowrys method, separate protein by SDS-PAGE, separation of amino acid by Paper chromatography. (Level 5)	L5 Evaluating	1, 5, 6	1,2, 8

Program Articulation Matrix (CO-PO Matrix)																			
PO, PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9
CO1	3										1								
CO2	3	3				3					1								
CO3	3	3			2	3					1	3							
CO4	3	3									1								
CO5	3	3									1		2						
CO6	3				3	3					0	3				3			
CO7	3				3	3					1	3						3	
Average	3.00	3.00			2.67	3.00					0.86	3.00	2.00			3.00		3.00	

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Course Outcome or Learning Outcome
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HONOURS COURSE IN ZOOLOGY
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Course Name: Core Course-8
Course Code: ZOOACOR08T & ZOOACOR08P
Topic Name: COMPARATIVE ANATOMY

CO, PO & PSO Mapping					
Course Outcome:	SI No	Course outcome	Knowledge level Blooms Level	POs Mapping	PSOs mapping
	CO1	Gain knowledge about Integumentary, skeletal, digestive, respiratory, circulatory, urogenital, nervous system and sense organ in different vertebrate classes.	L2 Understanding	1	1
	CO2	Can compare anatomy of the organs and their development	L3 Applying	1, 2	1, 3
	CO3	Understand how physiology of different organisms becomes modified according to their mode of life.	L2 Understanding	1, 2	1, 4
	CO4	Can relate the similarities and dissimilarities of various skeletons, scales and organs from actual samples and specimens.	L3 Applying	1, 2	1, 4
	CO5	Acquire skill for dissection of pituitary, brain, circulatory and urinogenital systems in Tilapia.	L2 Understanding	1	2, 6, 8
	CO6	Differentiate and compare different skeleton of vertebrates	L4 Annalysing	1, 2	1, 2, 6

Program Articulation Matrix (CO-PO Matrix)																			
PO, PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9
CO1	3										3					3			
CO2	3	3									3		2						
CO3	3	3									3			2					
CO4	3	3									2			1					
CO5	3											3				3		3	
CO6	3	3									2	3				3			
Average	3.00	3.00									2.60	3.00	2.00	1.50		3.00		3.00	

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Course Name: Core Course-9
Course Code: ZOOACOR09T & ZOOACOR09P
Topic Name: PHYSIOLOGY- LIFE SUSTAINING SYSTEM

CO, PO & PSO Mapping					
Course Outcome:	SI No	Course outcome	Knowledge level Blooms Level	POs Mapping	PSOs mapping
	CO1	Gain fundamental knowledge of digestion, circulation and respiration, osmoregulation in different vertebrate life forms.	L2 Understanding	1	1
	CO2	Understand the role of each system in sustaining life. (Level 2)	L2 Understanding	1, 2	1
	CO3	Develop the skills to perform haematological experiments like determination of blood group	L3 Applying	1	2, 6
	CO4	Perform enumeration of blood cells using haemocytometer and haemoglobin estimation.	L3 Applying	1, 2, 5	2, 6
	CO5	Apply the theoretical knowledge for recording different physiological parameters like blood pressure estimation.	L3 Applying	1, 6	2, 6, 8
	CO6	Apply the practical knowledge of physiology for career development in higher education and research and other applied field.	L3 Applying	3, 4	2, 6, 8

Program Articulation Matrix (CO-PO Matrix)																			
PO, PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9
CO1	3										2								
CO2	3	1									2								
CO3	3											2				2			
CO4	3	3			2							2				3			
CO5	3					3						2				3		3	
CO6			2	3								2				3		3	
Average	3.00	2.00	2.00	3.00	2.00	3.00					2.00	2.00				2.75		3.00	

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Course Name: Core Course-10
Course Code: ZOOACOR10T & ZOOACOR10P
Topic Name: IMMUNOLOGY

CO, PO & PSO Mapping					
Course Outcome:	SI No	Course outcome	Knowledge level Blooms Level	POs Mapping	PSOs mapping
	CO1	Understand functioning of the immune system (Molecules, cells and tissue involved in host defence mechanism) and create awareness as how to boost their immune system for good health.	L2 Understanding	1	1
	CO2	Understand the Basic structure, classes and function of Antibodies, Types of immunity (Innate and Adaptive, Humoral and Cellular), Antigen-Antibody interaction, Complements and MHC. (Level 1 & 2)	L2 Understanding	1, 2	1
	CO3	Understand the types of hypersensitivity reactions and autoimmune diseases.	L2 Understanding	1, 2	1
	CO4	Understand the basic immune mechanisms in disease control.	L2 Understanding	1, 2	1
	CO5	Educate common people about the importance of vaccines in public health.	L3 Applying	1, 2	2
	CO6	Perform simple laboratory experiments related to immunology like ABO blood group determination, blood film preparation and cell identification, ELISA etc.	L3 Applying	1, 5, 6	2, 6, 8
	CO7	Apply the concept to pursue research in the field of immunology.	L3 Applying	3, 4	3, 9

Program Articulation Matrix (CO-PO Matrix)																			
PO, PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9
CO1	3										1								
CO2	3	3									1								
CO3	3	3									1								
CO4	3	3									1								
CO5	3	3										1							
CO6	3				3	3						1				3	0	3	
CO7			3	3									2						2
Average	3.00	3.00	3.00	3.00	3.00	3.00					1.00	1.00	2.00			3.00		3.00	2.00

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Course Name: Core Course-11
Course Code: ZOOACOR11T & ZOOACOR11P
Topic Name: MOLECULAR BIOLOGY

CO, PO & PSO Mapping					
Course Outcome:	SI No	Course outcome	Knowledge level Blooms Level	POs Mapping	PSOs mapping
	CO1	Develop an understanding of concepts, mechanisms and relevance of molecular biology in the current scenario.	L2 Understanding	1	1
	CO2	Describe and explain the basic mechanism of replication, transcription and translation.	L2 Understanding	1	1, 2
	CO3	Explain DNA repair mechanisms, describe post transcriptional modification.	L3 Applying	1, 2	1, 2, 6
	CO4	Demonstrate polytene Chromosome from Drosophila /Chironomid larvae, Isolation of genomic DNA.	L3 Applying	1, 2	2, 6, 8
	CO5	Understanding techniques like PCR, Western and Southern blot, Northern Blot, Sanger DNA sequencing, cDNA technology.	L2 Understanding	1, 5	2, 3, 6
	CO6	Apply their knowledge in problem solving and future course of their career development in higher education and research.	L3 Applying	3, 4	2, 3, 6
	CO7	Provide new avenues of joining research in related areas such as therapeutic strategies or related opportunities in industry.	L6 Creating	3, 4	2, 8, 9

Program Articulation Matrix (CO-PO Matrix)																			
PO, PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9
CO1	3										2					3			
CO2	3										2	3							
CO3	3	3									2	3				3			
CO4	3	3										2				3		2	
CO5	3				3							3	2			3			
CO6			3	3								3	2			3			
CO7			3	3								3						3	2
Average	3.00	3.00	3.00	3.00	3.00						2.00	2.83	2.00			3.00		2.50	2.00

BARASAT GOVERNMENT COLLEGE
Course Outcome or Learning Outcome
Three year B.A. /B.Sc. Degree Course
Under CBCS semester system
HONOURS COURSE IN ZOOLOGY
With effect from the session: 2018 – 2019

Course Name: Core Course-12
Course Code: ZOOACOR12T & ZOOACOR12P
Topic Name: GENETICS

CO, PO & PSO Mapping					
Course Outcome:	SI No	Course outcome	Knowledge level Blooms Level	POs Mapping	PSOs mapping
	CO1	Understand the mechanism how DNA encodes genetic information and the function of mRNA and tRNA.	L2 Understanding	1	1
	CO2	Apply the principles of Mendelian inheritance.	L3 Applying	1, 5	1, 2, 6
	CO3	Understand the cause and effect of alterations in chromosome number and structure.	L2 Understanding	1, 2	1, 2, 6
	CO4	Relate the conventional and molecular methods for gene manipulation in other biological systems.	L3 Applying	1, 2, 3	1, 2, 3, 6
	CO5	Discuss and analyse the epigenetic modifications and imprinting and its role in diseases.	L4 Annalysing	1, 3, 5	2, 3, 6
	CO6	Provide new avenues of joining research in related areas such as genetic engineering of cells, cloning, genetic disorders, human fertility program, genotoxicity.	L6 Creating	3, 4	2, 8, 9
	CO7	Apply the gained knowledge to construct genetic map and pedigree from supplied data.	L3 Applying	3, 6	2, 9

Program Articulation Matrix (CO-PO Matrix)																			
PO, PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9
CO1	3										3								
CO2	3				1						3	3				3			
CO3	3	3									3	3				3			
CO4	3	3	2								3	2	1			3			
CO5	3		2		2							3	2			3			
CO6			3	3								3						3	3
CO7			2			3						1							1
Average	3.00	3.00	2.25	3.00	1.50	3.00					3.00	2.50	1.50			3.00		3.00	2.00

BARASAT GOVERNMENT COLLEGE
Course Outcome or Learning Outcome
Three year B.A. /B.Sc. Degree Course
Under CBCS semester system
HONOURS COURSE IN ZOOLOGY
With effect from the session: 2018 – 2019

Course Name: Core Course-13
Course Code: ZOOACOR13T & ZOOACOR13P
Topic Name: DEVELOPMENTAL BIOLOGY

CO, PO & PSO Mapping					
Course Outcome:	SI No	Course outcome	Knowledge level Blooms Level	POs Mapping	PSOs mapping
	CO1	Develop critical understanding how a single celled fertilized egg transforms into an embryo and then a fully formed adult by complex processes of cell division, cell differentiation and morphogenesis.	L2 Understanding	1	1, 3
	CO2	Understand the initial developmental procedures involved in frog and chick.	L2 Understanding	1	1
	CO3	Appreciate the mechanisms that support growth and development and process of gene function.	L5 Evaluating	1, 2	1
	CO4	Learn interesting and unique postembryonic development that happens in vertebrates.	L2 Understanding	1, 2	1, 3
	CO5	Identify whole mounts of developmental stages of chick embryo growth and differentiation in different hours of incubation through permanent slides.	L3 Applying	1, 2, 5	2, 8
	CO6	Gain a basic knowledge on the lifecycle of the model organism Drosophila and its developmental stages.	L2 Understanding	1, 2	2
	CO7	Illustrate the techniques of Drosophila culture and chick embryo development through short term project.	L6 Creating	1, 3, 6	2, 9

Program Articulation Matrix (CO-PO Matrix)																			
PO, PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9
CO1	3										3		1						
CO2	3										3								
CO3	3	3									3								
CO4	3	3									3		1						
CO5	3	3			3							3						3	
CO6	3	3										3							
CO7	3		3			3						3							3
Average	3.00	3.00	3.00		3.00	3.00					3.00	3.00	1.00					3.00	3.00

BARASAT GOVERNMENT COLLEGE
Course Outcome or Learning Outcome
Three year B.A. /B.Sc. Degree Course
Under CBCS semester system
HONOURS COURSE IN ZOOLOGY
With effect from the session: 2018 – 2019

Course Name: Core Course-14
Course Code: ZOOACOR14T & ZOOACOR14P
Topic Name: EVOLUTIONARY BIOLOGY

CO, PO & PSO Mapping					
Course Outcome:	SI No	Course outcome	Knowledge level Blooms Level	POs Mapping	PSOs mapping
	CO1	Understand the origin and evolution of universe and earliest life.	L2 Understanding	1	1
	CO2	Develop the historical concept of the process and theories in evolutionary biology and the role of evidences in support of evolution.	L2 Understanding	1	1, 2
	CO3	Develop knowledge about sources of variation and concept of population genetics and can apply them in relevant experimentation.	L2 Understanding	1, 2	1, 2
	CO4	Understand species concept, extinction and molecular phylogeny and able to apply it in their lives and community analysis.	L2 Understanding	1, 2, 5	1, 3
	CO5	Examine the evolutionary changes in different taxa based on statistical analysis.	L5 Evaluating	1, 2, 5, 6	1, 3
	CO6	Learn how to study a fossil from model or photograph and analyze homology and analogy of structures from suitable specimens. They can observe and interpret about the events that took place in geologic past.	L2 Understanding	1, 5	1, 3
	CO7	Verify Hardy-Weinberg equilibrium in a population by learning the chi- square calculation method and other statistical analysis from collected data.	L5 Evaluating	1, 5	1, 3

Program Articulation Matrix (CO-PO Matrix)																			
PO, PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9
CO1	3										3								
CO2	3										3	3							
CO3	3	3									3	2							
CO4	3	3			3						3		1						
CO5	3	3			3	3					3		1						
CO6	3				3						3		2						
CO7	3				3						3		1						
Average	3.00	3.00			3.00	3.00					3.00	2.50	1.25						

BARASAT GOVERNMENT COLLEGE
Course Outcome or Learning Outcome
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Under CBCS semester system
HONOURS COURSE IN ZOOLOGY
With effect from the session: 2018 – 2019

Course Name: Discipline Specific Elective-1
Course Code: ZOOADSE01T & ZOOADSE01P
Topic Name: ANIMAL BEHAVIOUR AND CHRONOBIOLOGY

CO, PO & PSO Mapping					
Course Outcome:	SI No	Course outcome	Knowledge level Blooms Level	POs Mapping	PSOs mapping
	CO1	Remember and understand a wide range of theoretical and practical techniques used to study animal behaviour.	L2 Understanding	1	1, 2, 6
	CO2	Develop skills, concepts and experience to understand all aspects of animal behaviour.	L3 Applying	1, 2, 5	1, 7, 8
	CO3	Objectively understand information about biological rhythm and their type in synchronization of activity of animals.	L2 Understanding	1, 2	1, 2, 3
	CO4	Understand and objectively evaluate the role of behavior in the protection and conservation of animals in the wild.	L5 Evaluating	1, 2	1, 3
	CO5	Consider and evaluate behavior of all animals, including humans, in the complex ecological world, including the urban environment.	L5 Evaluating	1, 4, 7,	1, 3
	CO6	Perform field study and laboratory test on behavioural biology of animals.	L3 Applying	1, 5, 6, 7	1, 2, 8

Program Articulation Matrix (CO-PO Matrix)																			
PO, PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9
CO1	3										3	1				1			
CO2	3	3			3						3						1	1	
CO3	3	3									3	2	3						
CO4	3	3									3		3						
CO5	3			3			3				3		3						
CO6	3				3	3	3				3	1							3
Average	3.00	3.00		3.00	3.00	3.00	3.00				3.00	1.33	3.00			1.00	1.00	2.00	

BARASAT GOVERNMENT COLLEGE
Course Outcome or Learning Outcome
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Under CBCS semester system
HONOURS COURSE IN ZOOLOGY
With effect from the session: 2018 – 2019

Course Name: Discipline Specific Elective-2

Course Code: ZOADSE03T & ZOADSE03P

Topic Name: ENDOCRINOLOGY

CO, PO & PSO Mapping					
Course Outcome:	SI No	Course outcome	Knowledge level Blooms Level	POs Mapping	PSOs mapping
	CO1	Understand neurohormones and neurosecretions.	L2 Understanding	1	1
	CO2	Learn about hypothalamo and hypapophysialaxis.	L2 Understanding	1	1
	CO3	Understand about different endocrine glands.	L2 Understanding	1, 2	1
	CO4	Analyse reasons behind different disorders of endocrine glands	L3 Applying	1, 2, 5	1, 3
	CO5	Understand the mechanism of hormone action.	L2 Understanding	1, 2, 6	1
	CO6	Distinguish various endocrine glands and mechanism of action of steroidal & non-steroidal hormone.	L4 Annalysing	1, 2, 3	1, 3

Program Articulation Matrix (CO-PO Matrix)																			
PO, PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9
CO1	3										3								
CO2	3										3								
CO3	3	3									3								
CO4	3	3			3						3		3						
CO5	3	3				1					3								
CO6	3	3	2								3		3						
Average	3.00	3.00	2.00		3.00	1.00					3.00		3.00						

BARASAT GOVERNMENT COLLEGE
Course Outcome or Learning Outcome
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Under CBCS semester system
HONOURS COURSE IN ZOOLOGY
With effect from the session: 2018 – 2019

Course Name: Discipline Specific Elective-3

Course Code: ZOOADSE05T & ZOOADSE05P

Topic Name: PARASITOLOGY

CO, PO & PSO Mapping					
Course Outcome:	SI No	Course outcome	Knowledge level Blooms Level	POs Mapping	PSOs mapping
	CO1	Understand parasitism, diversity of symbiotic associations and the biology behind host-parasite interactions.	L2 Understanding	1	1
	CO2	Learn about epidemiological concepts of parasitic infections of global importance.	L2 Understanding	1, 2	1
	CO3	Gain knowledge of numerous diseases which have significant impact on human health.	L2 Understanding	1, 2, 5	1, 2
	CO4	Diagnose, identify and detect some important protozoan, helminth and arthropod parasites of human and livestock.	L3 Applying	1, 2	1, 2
	CO5	Analyze challenges in diagnosis, treatment and control of parasitic infections in humans and in veterinary context. Also learn pathological changes associated with parasite infections.	L4 Annalysing	1, 2, 3, 5	1, 3
	CO6	Identify, describe and contrast different protozoan, helminth and arthropod parasites responsible for causing various human and veterinary diseases through permanent slides or micrphotographs.	L3 Applying	1, 2	1, 2, 3
	CO7	Prepare and observe live parasitic specimens from fish gills and intestine of poultry birds. This gives them an idea of size, shape, colour pattern and unique morphological features and location of important external and internal pathogens and parasites from different phyla.	L3 Applying	1, 4, 6	1, 2, 8

Program Articulation Matrix (CO-PO Matrix)																			
PO, PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9
CO1	3										3								
CO2	3	3									3								
CO3	3	3			1						3	3							
CO4	3	3									3	3							
CO5	3	3	1		3						3		3						
CO6	3	3									3	3	3						
CO7	3			3		3					3	2							3
Average	3.00	3.00	1.00	3.00	2.00	3.00					3.00	2.75	3.00						3.00

BARASAT GOVERNMENT COLLEGE
Course Outcome or Learning Outcome
Three year B.A. /B.Sc. Degree Course
Under CBCS semester system
HONOURS COURSE IN ZOOLOGY
With effect from the session: 2018 – 2019

Course Name: Discipline Specific Elective-4

Course Code: ZOOADSE06T & ZOOADSE06P

Topic Name: WILDLIFE AND CONSERVATION

CO, PO & PSO Mapping					
Course Outcome:	SI No	Course outcome	Knowledge level Blooms Level	POs Mapping	PSOs mapping
	CO1	Develop an understanding of general principles of ecology and how animals interact with each other and their natural environment.	L2 Understanding	1	1
	CO2	Apply knowledge to solve problems related to wildlife conservation and management.	L3 Applying	1, 2, 3	1, 2
	CO3	Identify common local flora and fauna and how they related to terrestrial and /or aquatic plant and animal conservation and management. (Level 3 & 4)	L4 analysing	1, 2, 4, 5, 7	1, 2
	CO4	Critically evaluate current events and public information related to man animal conflict and other wildlife conservation issues.	L5 Evaluating	3, 4, 5, 7	1, 3
	CO5	Understand conservation ethics and acts practice in India.	L2 Understanding	1, 9	1, 2
	CO6	Develop skills for field study and biodiversity analysis.	L3 Applying	1, 5, 7	1, 8
	CO7	Identify common local flora and fauna like mammalian, avian and herpeto fauna and their normal habitat.	L3 Applying	1, 2, 6	1, 2

Program Articulation Matrix (CO-PO Matrix)																			
PO, PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9
CO1	3										3								
CO2	3	3	3								3	1							
CO3	3	3		3	3		3				3	2							
CO4			3	3	2		1				3		3						
CO5	3								3		3	1							
CO6	3				3		3				3								
CO7	3	3				3					3	2							
Average	3.00	3.00	3.00	3.00	2.67	3.00	2.33		3.00		3.00	1.50	3.00						

BARASAT GOVERNMENT COLLEGE
Course Outcome or Learning Outcome
Three year B.A. /B.Sc. Degree Course
Under CBCS semester system
HONOURS COURSE IN ZOOLOGY
With effect from the session: 2018 – 2019

Course Name: Skill Enhancement Course-1

Course Code: ZOOSSEC01M

Topic Name: AQUARIUM FISH KEEPING

CO, PO & PSO Mapping					
Course Outcome:	SI No	Course outcome	Knowledge level Blooms Level	POs Mapping	PSOs mapping
	CO1	Learn the scientific method of setting an aquarium.	L2 Understanding	1	1, 5, 7
	CO2	Learn the culture, breeding and marketing techniques of common indigenous ornamental fishes.	L2 Understanding	1, 2, 8	1, 5, 7
	CO3	Learn the basic principles, themes to maintain an aquarium.	L2 Understanding	1, 2, 4	1, 5, 7
	CO4	Able to identify and differentiate the different aquarium/ornamental fishes.	L2 Understanding	1, 2	1, 5, 7
	CO5	Understand their growth and feed pattern.	L2 Understanding	1, 2	1, 5, 7
	CO6	Understand their transport and packaging techniques.	L2 Understanding	1, 2	1, 5, 7

Program Articulation Matrix (CO-PO Matrix)																			
PO, PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9
CO1	3										3				3		3		
CO2	3	3						3			3				3		3		
CO3	3	3		2							3				3		3		
CO4	3	3									3				3		3		
CO5	3	3									3				3		3		
CO6	3	3									3				3		3		
Average	3.00	3.00		2.00				3.00			3.00				3.00		3.00		

BARASAT GOVERNMENT COLLEGE
Course Outcome or Learning Outcome
Three year B.A. /B.Sc. Degree Course
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HONOURS COURSE IN ZOOLOGY
With effect from the session: 2018 – 2019

Course Name: Skill Enhancement Course-2

Course Code: ZOOSSEC02M

Topic Name: VERMICOMPOST PRODUCTION

CO, PO & PSO Mapping					
Course Outcome:	SI No	Course outcome	Knowledge level Blooms Level	POs Mapping	PSOs mapping
	CO1	Understand the role of worm farming in Modern Farming.	L2 Understanding	1	1, 5
	CO2	Understand the potential of vermicompost as an alternative to chemical fertilizers.	L2 Understanding	1, 2	1, 7
	CO3	Understand the role of vermiculture in maintaining the health of soil.	L2 Understanding	1, 2	1, 7
	CO4	Learn the economic importance of vermiculture.	L2 Understanding	1, 2, 3	1, 5
	CO5	Understand the role of Vermiculture in protecting the environment and managing the waste.	L2 Understanding	1,2, 3, 4	1, 5
	CO6	Understand and study the Scopes and Opportunities for vermicompost production.	L2 Understanding	3, 4, 5	1, 5, 7

Program Articulation Matrix (CO-PO Matrix)																			
PO, PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9
CO1	3										3				3				
CO2	3	3									3						3		
CO3	3	3									3						3		
CO4	3	3	3								3				3				
CO5	3	3	3	1							3				3				
CO6			3	1	3						3				3		3		
Average	3.00	3.00	3.00	1.00	3.00						3.00				3.00		3.00		