Shyampur Siddheswari Mahavidyalaya
Ajodhya, Shyampur, Howrah, Pin-711312. West Bengal

Zoology Honours Syllabus under CBCS (2018)
University of Calcutta

3 Years B.Sc. Honours Programme

- Programme Outcome (PO)
- Programme Specific Outcome (PSO)
- Course Outcome (CO)
- CO-PO Mapping
- CO-PSO Mapping

Shyampur Siddheswari Mahavidyalaya
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Department of Zoology

Program Outcomes, Program Specific Outcomes a nd

Course Outcomes of

B.Sc. in Zoology Programme

Programme Outcomes: B.Sc. in Zoology

In Zoology, the animal Kingdom is studied in terms of their structural diversity, biology, embryology, evolution, habits and distribution for both living and extinct. The subject is modern, interdisciplinary and applied in nature that will help them to have an insightinto various disciplines, so as to apply their knowledge in future endeavor in higher academics and research

PO 1: Disciplinary knowledge: Capable of demonstrating comprehensive knowledge and understanding of one or more disciplines that form a part of an undergraduate programme of study
PO 2: Problem solving (Ap): Capacity to extrapolate from what one has learned and apply their competencies to solve different kinds of non-familiar problems, apply one's learning to real life situations
PO 3: Critical thinking (An): Capability to apply analytic thought to a body of knowledge; analyses and evaluate evidence, arguments, claims
PO 4: Research-related skills / Scientific reasoning: A sense of inquiry and capability for asking relevant/appropriate questions, problematizing, synthesizing and articulating; Ability to recognize cause-and-effect relationships
PO 5: Communication Skills (U/A): Ability to express thoughts and ideas effectively in writing and orally
PO 6: Cooperation/Team work: Ability to work effectively and respectfully with diverse teams; facilitate cooperative or coordinated effort on the part of a group
PO 7: Information/digital literacy: Capability to use ICT in a variety of learning situations
PO 8: Self-directed learning: Ability to work independently, identify appropriate resources required for a project
PO 9: Multicultural competence: Possess knowledge of the values and beliefs of multiple cultures and a global perspective
PO 10: Moral and ethical awareness/reasoning: Ability to embrace moral/ethical values in conducting one's life, formulate a position/argument about an ethical issue from multiple perspectives
PO 11: Leadership readiness/qualities: Capability for mapping out the tasks of a team or an organization, and setting direction, formulating an inspiring vision, building a team
PO 12: Lifelong learning: Ability to acquire knowledge and skills, including „learning how to learn", that are necessary for participating in learning activities throughout life.

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Programme Specific Outcomes: B.Sc.in Zoology

In modern era apart from the classical zoology a zoologist is required to have affair concept on various aspects of zoology.Thisprogrammewillenablethestudentstocompeteglobally with knowledge and skill base for undertaking further studies in modern biology and related areas or multidisciplinary areas.

PSO-1	Acquire comprehensive knowledge and gain skill on variousaspectsof zoology and its subfields like animal diversity, principles of ecology, comparative anatomy and developmental biology of vertebrates, physiology and biochemistry, genetics, molecular biology and evolutionary biology, applied Zoology, aquatic biology, immunology, reproductive biology, and insect, vectors and diseases.
PSO-2	Understand good laboratory practices and safety; Carry out experimental techniques and methods both in field and laboratory for the topics Ecology, Physiology and Biochemistry, Cell biology,Genetics, Applied Zoology, Biological techniques, Toxicology.
PSO-3	Understand theapplicationofbiologicalsciencesinPiscicultue,Poultry farming, Apiculture, Animal husbandry. Skill Enhancement courseswill enable them to think further about Aquarium fish keeping, vermicomposting at professional level.
PSO-4	Get a flavor of research while doing project works using sophisticated instruments for biological work, thus making them able to think independently and interpret as well.
PSO-5	Aware of ethical principles, commitment and responsibility towards the profession with biological practices.
PSO-6	Knowledge in various aspects of environment will enable them to act sustainably towards the future development in biological sciences and society as well.

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Course Outcomes: B.Sc. in Zoology with Honors

Through core courses (CC) students would get in-depth subject knowledge. While studying the discipline specific electives (DSE) they will come to know about the applied aspects of the subject as well as its applicability in both academia and industry. Generic electives(GE) will alsoenablethemtointegratetheirknowledgeamongvariousinterdisciplinarycourses. The skill enhancement courses (SEC) would further incorporate skill in their learning that can be used for proving themselves capable for further academia, entrepreneurship and industry.

SEMESTER–I

CC1-Non- ChordatesI(ZOOACOR01T&ZOOACOR01P)

After Successful completion of this course, students will be able to

CO-1	CharacterizeandclassifyProtista,Parazoa,Metazoa,Porifera,Cnidaria, Ctenophora, Platyhelminthes, Nemathelminthes classes
CO-2	Understand the life cycles of *Giardia intestinalis, Leishmania donovani, Entamoeba histolytica and Plasmodium vivax, Fasciola hepatica and Taenia solium, Ascaris lumbricoides, Ancylostoma duodenale and Wuchereriabancrofti*
CO-3	Know the diversity, biological facts and formation of coralreefs
CO-4	Groupandidentifyanimalsbasedonmorphologicalcharactersandstructure.

	CC1														
CO	**PO**												**PSO**		
	PO1 Disciplinary knowledge	**PO2 Problem solving**	**PO 3 Critical thinking**	**PO4 Research related skills/Scientific reasoning**	**PO5 Communication skills**	**PO6 Cooperation /team work**	**PO7 Information or digital literacy**	**PO8 Self-directed learning**	**PO9 Multicultural competence**	**PO10 Moral and ethical awareness**	**PO11 Leadership quality**	**PO 12 Lifelong learning**	**PSO1**	**PSO2**	**PSO3**
CO 1	**0**	**1**	**0**	**1**	**0**	**2**	**0**	**1**	**0**	**2**	**0**	**3**	**0**	**3**	**1**
0CO2	**2**	**0**	**3**	**0**	**3**	**0**	**1**	**2**	**1**	**2**	**0**	**1**	**0**	**1**	**1**
CO 3	**3**	**3**	**2**	**1**	**1**	**0**	**2**	**1**	**3**	**1**	**3**	**1**	**3**	**1**	**1**
CO 4	**2**	**1**	**2**	**1**	**1**	**3**	**1**	**0**	**0**	**2**	**1**	**0**	**1**	**2**	**0**
CO	**2.3**	**1.6**	**2.3**	**1**	**1.6**	**2.5**	**1.33**	**1.33**	**2**	**1.75**	**2**	**1.6**	**2**	**1.75**	**1.5**

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CC2-Ecology (ZOOACOR02T&ZOOACOR02P)

After Successful completion of this course, students will be able to

CO-1	Understand the history and basis of animal ecology through studying the levels of organization
CO-2	Understand the characteristics and dynamics of Population while studying different aspects of population ecology ,population interactions and animal to animal relations
CO-3	Understand the ecosystem energetic while studying the energy flow Through the ecosystem
CO-4	Know the characteristics of community while studying different Diversity indices

	CC2														
CO	**PO**												**PSO**		
	PO1 Disciplinary knowledge	**PO2 Problem solving**	**PO 3 Critical thinking**	**PO4 Research related skills/Scientific reasoning**	**PO5 Communication skills**	**PO6 Cooperation /team work**	**PO7 Information or digital literacy**	**PO8 Self-directed learning**	**PO9 Multicultural competence**	**PO10 Moral and ethical awareness**	**PO11 Leadership quality**	**PO 12 Lifelong learning**	**PSO1**	**PSO2**	**PSO3**
CO 1	**0**	**1**	**0**	**1**	**0**	**2**	**0**	**1**	**0**	**2**	**0**	**3**	**0**	**3**	**1**
0CO2	**2**	**0**	**3**	**0**	**3**	**0**	**1**	**2**	**1**	**2**	**0**	**1**	**0**	**1**	**1**
CO 3	**3**	**3**	**2**	**1**	**1**	**0**	**2**	**1**	**3**	**1**	**3**	**1**	**3**	**1**	**1**
CO 4	**2**	**1**	**2**	**1**	**1**	**3**	**1**	**0**	**0**	**2**	**1**	**0**	**1**	**2**	**0**
CO	**2.3**	**1.6**	**2.3**	**1**	**1.6**	**2.5**	**1.33**	**1.33**	**2**	**1.75**	**2**	**1.6**	**2**	**1.75**	**1.5**

SEMESTER-II

CC3-Non-Chordates II(ZOOACOR03T&ZOOACOR03P)

After Successful completion of this course, students will be able to

CO-1	Understand the evolution of coelomate animals
CO-2	Knowthediversity,evolutionandgeneralcharacteristicsofdifferenttaxaof non-chordatefromAnnelidatoHalf-chordate(Hemichordata)
CO-3	Develop ideas on physiological techniques,organizationofbodyplan oh non chordates
CO-4	Understand the phylogenetic relationship between chordate and non Chordate and evolutionary significance of taxon.

CC3															
CO	PO												PSO		
	PO1 Disciplinary knowledge	PO2 Problem solving	PO 3 Critical thinking	PO4 Research related skills/Scientific reasoning	PO5 Communication skills	PO6 Cooperation /team work	PO7 Information or digital literacy	PO8 Self-directed learning	PO9 Multicultural competence	PO10 Moral and ethical awareness	PO11 Leadership quality	PO 12 Lifelong learning	PSO1	PSO2	PSO3
CO 1	0	1	0	1	0	2	0	1	0	2	0	3	0	3	1
0CO2	2	0	3	0	3	0	1	2	1	2	0	1	0	1	1
CO 3	3	3	2	1	1	0	2	1	3	1	3	1	3	1	1
CO 4	2	1	2	1	1	3	1	0	0	2	1	0	1	2	0
CO	2.3	1.6	2.3	1	1.6	2.5	1.33	1.33	2	1.75	2	1.6	2	1.75	1.5

CC4-CellBiology (ZOOACOR04T&ZOOACOR04P)

After Successful completion of this course, students will be able to

CO-1	Get an overview of cells(Prokaryotic and Eukaryotic cells,Virus, Viroids, Mycoplasma, Prions)
CO-2	Understand the importance of cell and cell organelles as structural and functional unit for sustaining life
CO-3	Know the dynamics of plasma membrane and endomembrane Structures and their working mechanism and responsibilities for functioning of cell
CO-4	Acquireknowledgeonthedifferentpathwaysofcellsignalingansapoptosis thusenablingthemtounderstandthebasisandanomaliesin cancer

CC4															
CO	**PO**												**PSO**		
	PO1 Disciplinary knowledge	**PO2 Problem solving**	**PO 3 Critical thinking**	**PO4 Research related skills/Scientific reasoning**	**PO5 Communication skills**	**PO6 Cooperation /team work**	**PO7 Information or digital literacy**	**PO8 Self-directed learning**	**PO9 Multicultural competence**	**PO10 Moral and ethical awareness**	**PO11 Leadership quality**	**PO 12 Lifelong learning**	**PSO1**	**PSO2**	**PSO3**
CO 1	**0**	**1**	**0**	**1**	**0**	**2**	**0**	**1**	**0**	**2**	**0**	**3**	**0**	**3**	**1**
0CO2	**2**	**0**	**3**	**0**	**3**	**0**	**1**	**2**	**1**	**2**	**0**	**1**	**0**	**1**	**1**
CO 3	**3**	**3**	**2**	**1**	**1**	**0**	**2**	**1**	**3**	**1**	**3**	**1**	**3**	**1**	**1**
CO 4	**2**	**1**	**2**	**1**	**1**	**3**	**1**	**0**	**0**	**2**	**1**	**0**	**1**	**2**	**0**
CO	**2.3**	**1.6**	**2.3**	**1**	**1.6**	**2.5**	**1.33**	**1.33**	**2**	**1.75**	**2**	**1.6**	**2**	**1.75**	**1.5**

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SEMESTER – III

CC5-Chordates (ZOOACOR05T&ZOOACOR05P)

After Successful completion of this course, students will be able to

CO-1	Characterize and classify the phylum chordate with a knowledge on homology and homoplasy
CO-2	Understand the origin and evolution of chordate and vertebrates and Their complex organ system
CO-3	Acquire knowledge on zoogeographical realms and distributionof animals all over the world.
CO-4	Group and Identify animals from protochordata to Mammalia basedon their morphological characters.

CC5															
CO	PO												PSO		
	PO1 Disciplinary knowledge	PO2 Problem solving	PO 3 Critical thinking	PO4 Research related skills/Scientific reasoning	PO5 Communication skills	PO6 Cooperation /team work	PO7 Information or digital literacy	PO8 Self-directed learning	PO9 Multicultural competence	PO10 Moral and ethical awareness	PO11 Leadership quality	PO 12 Lifelong learning	PSO1	PSO2	PSO3
CO 1	0	1	0	1	0	2	0	1	0	2	0	3	0	3	1
0CO2	2	0	3	0	3	0	1	2	1	2	0	1	0	1	1
CO 3	3	3	2	1	1	0	2	1	3	1	3	1	3	1	1
CO 4	2	1	2	1	1	3	1	0	0	2	1	0	1	2	0
CO	2.3	1.6	2.3	1	1.6	2.5	1.33	1.33	2	1.75	2	1.6	2	1.75	1.5

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CC6-Physiology: Controlling and Coordinating Systems (ZOOACOR06T&ZOOACOR06P)

After Successful completion of this course, students will be able to

CO-1	Acquire knowledge on Structure, locations, classification and functions of epithelial tissues, connective tissues, muscular tissues and nerve tissues
CO-2	Understand the basis of Structure and types of bones and cartilages and Ossification technique
CO-3	Acquire knowledge on structural and functional aspects of nervous system, Muscular system, Reproductive system and Endocrine system.
CO-4	Get ideas on how simple muscle twitch is recorded with electrical stimulation

CC6															
CO	PO												PSO		
	PO1 Disciplinary knowledge	PO2 Problem solving	PO 3 Critical thinking	PO4 Research related skills/Scientific reasoning	PO5 Communication skills	PO6 Cooperation /team work	PO7 Information or digital literacy	PO8 Self-directed learning	PO9 Multicultural competence	PO10 Moral and ethical awareness	PO11 Leadership quality	PO 12 Lifelong learning	PSO1	PSO2	PSO3
CO 1	0	1	0	1	0	2	0	1	0	2	0	3	0	3	1
0CO2	2	0	3	0	3	0	1	2	1	2	0	1	0	1	1
CO 3	3	3	2	1	1	0	2	1	3	1	3	1	3	1	1
CO 4	2	1	2	1	1	3	1	0	0	2	1	0	1	2	0
CO	2.3	1.6	2.3	1	1.6	2.5	1.33	1.33	2	1.75	2	1.6	2	1.75	1.5

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CC7-Biochemistry (ZOOACOR07T&ZOOACOR07P)

After Successful completion of this course, students will be able to

CO-1	Understand the Fundamentals of biochemical reactions and metabolism
CO-2	Get ideas on the structure and function of biological macromolecules (Carbohydrate, Lipid, Protein, Nucleic acids and enzymes)
CO-3	Knowthemetabolicpathwaysinvolvedinthemetabolismofbiologicalmacromolecules
CO-4	Understand the concept enzymes kinetics and oxidative Phosphorylation (Review of mitochondrial respiratory chain)

CC7															
CO	PO												PSO		
	PO1 Disciplinary knowledge	PO2 Problem solving	PO 3 Critical thinking	PO4 Research related skills/Scientific reasoning	PO5 Communication skills	PO6 Cooperation /team work	PO7 Information or digital literacy	PO8 Self-directed learning	PO9 Multicultural competence	PO10 Moral and ethical awareness	PO11 Leadership quality	PO 12 Lifelong learning	PSO1	PSO2	PSO3
CO 1	0	1	0	1	0	2	0	1	0	2	0	3	0	3	1
0CO2	2	0	3	0	3	0	1	2	1	2	0	1	0	1	1
CO 3	3	3	2	1	1	0	2	1	3	1	3	1	3	1	1
CO 4	2	1	2	1	1	3	1	0	0	2	1	0	1	2	0
CO	2.3	1.6	2.3	1	1.6	2.5	1.33	1.33	2	1.75	2	1.6	2	1.75	1.5

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SEC-1–Aquarium Fish Keeping(ZOOSSEC001-ForHonorsand ZOOSSEC01M – For General)

After Successful completion of this course, students will be able to

CO-1	Obtain knowledge in The potential scope ofAquariumFishIndustryas a Cottage Industry, Exotic and Endemic species of Aquarium Fishes,and problems of releasing aquarium fishes into natural habitats.
CO-2	Gainskilltoraiseaquariumwiththeobtainedknowledgeinbiologyof aquarium fish and their food and feeding behavior
CO-3	Gain skill to considerthispracticeatprofessionallevelwithknowledge on Live fish transport - Fish handling, packing and forwarding techniques and maintenance of aquarium.

SEC1															
CO	PO												PSO		
	PO1 Disciplinary knowledge	PO2 Problem solving	PO 3 Critical thinking	PO4 Research related skills/Scientific reasoning	PO5 Communication skills	PO6 Cooperation /team work	PO7 Information or digital literacy	PO8 Self-directed learning	PO9 Multicultural competence	PO10 Moral and ethical awareness	PO11 Leadership quality	PO 12 Life long learning	PSO1	PSO2	PSO3
CO 1	3	0	2	1	2	3	3	2	3	2	2	0	0	0	0
CO 2	2	1	1	0	2	0	2	2	2	2	2	3	2	1	0
CO 3	2	1	1	0	2	0	2	2	2	2	2	2	0	0	1
CO	2.33	1	2	1	2	3	2.3	2	2.3	2	2	2.5	2	1	1

SEMESTER–IV

CC8- Comparative Anatomy(ZOOACOR08T&ZOOACOR08P)

After Successful completion of this course, students will be able to

CO-1	Acquire knowledge on Structure, function and derivatives of integument in amphibian, birds and mammals
CO-2	Know about axial and appendicular skeleton; Jaw suspension; Visceral arches.
CO-3	Understand the comparative anatomy brain, Cranial nerves in mammals, heart and aortic arches and stomach in mammals.

CC8															
CO	PO												PSO		
	PO1 Disciplinary knowledge	PO2 Problem solving	PO 3 Critical thinking	PO4 Research related skills/Scientific reasoning	PO5 Communication skills	PO6 Cooperation /team work	PO7 Information or digital literacy	PO8 Self-directed learning	PO9 Multicultural competence	PO10 Moral and ethical awareness	PO11 Leadership quality	PO 12 Life long learning	PSO1	PSO2	PSO3
CO 1	3	0	2	1	2	3	3	2	3	2	2	0	0	0	0
CO 2	2	1	1	0	2	0	2	2	2	2	2	3	2	1	0
CO 3	2	1	1	0	2	0	2	2	2	2	2	2	0	0	1
CO	2.33	1	2	1	2	3	2.3	2	2.3	2	2	2.5	2	1	1

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CC9-Physiology: Lifesustainingsystem(ZOOACOR09T&ZOOACOR09P)

After Successful completion Of this course, students will be able to

CO-1	Understand the Structural organisation and functions of Gastrointestinal tract and Associated glands; Mechanical and chemical digestion of food, absorption of Carbohydrates, Lipids, Proteins and Nucleic Acids; Digestive enzymes
CO-2	Get knowledge in Mechanism of Respiration, Respiratory volumes and capacities, transport of Oxygen and Carbon dioxide in blood, Dissociationcurvesandthefactorsinfluencingit,respiratory pigments;Carbonmonoxide poisoning
CO-3	Understandthecomponentsofbloodandtheirstructuraland functional aspects

CC9															
CO	PO												PSO		
	PO1 Disciplinary knowledge	PO2 Problem solving	PO 3 Critical thinking	PO4 Research related skills/Scientific reasoning	PO5 Communication skills	PO6 Cooperation /team work	PO7 Information or digital literacy	PO8 Self-directed learning	PO9 Multicultural competence	PO10 Moral and ethical awareness	PO11 Leadership quality	PO 12 Life long learning	PSO1	PSO2	PSO 3
CO 1	3	0	2	1	2	3	3	2	3	2	2	0	0	0	0
CO 2	2	1	1	0	2	0	2	2	2	2	2	3	2	1	0
CO 3	2	1	1	0	2	0	2	2	2	2	2	2	0	0	1
CO	2.33	1	2	1	2	3	2.3	2	2.3	2	2	2.5	2	1	1

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CC10-Immunology(ZOOACOR10T&ZOOACOR10P)

After Successful completion o fthis course, students will be able to

CO-1	Getideaonbasicconceptofhealthanddiseasesinthelightofimmune response of the body
CO-2	Identifythe major cellularand tissue componentswhich comprise the innateandadaptiveimmunesystem
CO-3	AcquireknowledgeonAntigen,Antigenpresentation&MHC
CO-4	Understandhowimmuneresponsesareinitiatedandregulatedby TcellsandBcells

CC10															
CO	**PO**												**PSO**		
	PO1 Disciplinary knowledge	**PO2 Problem solving**	**PO 3 Critical thinking**	**PO4 Research related skills/Scientific reasoning**	**PO5 Communication skills**	**PO6 Cooperation /team work**	**PO7 Information or digital literacy**	**PO8 Self-directed learning**	**PO9 Multicultural competence**	**PO10 Moral and ethical awareness**	**PO11 Leadership quality**	**PO 12 Lifelong learning**	**PSO1**	**PSO2**	**PSO3**
CO 1	**0**	**1**	**0**	**1**	**0**	**2**	**0**	**1**	**0**	**2**	**0**	**3**	**0**	**3**	**1**
0CO2	**2**	**0**	**3**	**0**	**3**	**0**	**1**	**2**	**1**	**2**	**0**	**1**	**0**	**1**	**1**
CO 3	**3**	**3**	**2**	**1**	**1**	**0**	**2**	**1**	**3**	**1**	**3**	**1**	**3**	**1**	**1**
CO 4	**2**	**1**	**2**	**1**	**1**	**3**	**1**	**0**	**0**	**2**	**1**	**0**	**1**	**2**	**0**
CO	**2.3**	**1.6**	**2.3**	**1**	**1.6**	**2.5**	**1.33**	**1.33**	**2**	**1.75**	**2**	**1.6**	**2**	**1.75**	**1.5**

SEC-2–Vermi compost Production (ZOOSSEC002-ForHonorsand ZOOSSEC02M – For General)

After Successful completion of this course, students will be able to

CO-1	ObtainknowledgeVermicompostandtheneedforitand suitable criteriafortheproductionintermsofsuitablewormspeciesandtheir availability, operational and maintenance procedure.
CO-2	Applytheknowledgetoraiseproductionatlarge/smallscale dependingontheavailablespeciesandrearingcriterias.
CO-3	Developideasonharvesting,propertiesofvermicompost,benefitsof vermicompost and their application.

SEC2															
CO	PO												PSO		
	PO1 Disciplinary knowledge	PO2 Problem solving	PO 3 Critical thinking	PO4 Research related skills/Scientific reasoning	PO5 Communication skills	PO6 Cooperation /team work	PO7 Information or digital literacy	PO8 Self-directed learning	PO9 Multicultural competence	PO10 Moral and ethical awareness	PO11 Leadership quality	PO 12 Life long learning	PSO1	PSO2	PSO 3
CO 1	3	0	2	1	2	3	3	2	3	2	2	0	0	0	0
CO 2	2	1	1	0	2	0	2	2	2	2	2	3	2	1	0
CO 3	2	1	1	0	2	0	2	2	2	2	2	2	0	0	1
CO	2.33	1	2	1	2	3	2.3	2	2.3	2	2	2.5	2	1	1

SEMESTER-V

CC11–Molecular Biology (ZOOACOR11T&ZOOACOR11P)

After Successful completion of this course, students will be able to

CO-1	AcquireknowledgeinthebasicstructureandfunctionofDNAandRNA
CO-2	Understand the underlying mechanism in DNA replication, Transcription and Translation
CO-3	KnowaboutPostTranscriptionalModificationsandProcessingof Eukaryotic RNA
CO-4	GetideaonGeneregulationandDNArepairmechanisms

CC11															
CO	PO												PSO		
	PO1 Disciplinary knowledge	PO2 Problem solving	PO 3 Critical thinking	PO4 Research related skills/Scientific reasoning	PO5 Communication skills	PO6 Cooperation /team work	PO7 Information or digital literacy	PO8 Self-directed learning	PO9 Multicultural competence	PO10 Moral and ethical awareness	PO11 Leadership quality	PO 12 Lifelong learning	PSO1	PSO2	PSO3
CO 1	0	1	0	1	0	2	0	1	0	2	0	3	0	3	1
0CO2	2	0	3	0	3	0	1	2	1	2	0	1	0	1	1
CO 3	3	3	2	1	1	0	2	1	3	1	3	1	3	1	1
CO 4	2	1	2	1	1	3	1	0	0	2	1	0	1	2	0
CO	2.33	1.6	2.3	1	1.6	2.5	2	2	2	1.75	2	1.6	2	1.75	3

CC12–Genetics (ZOOACOR12T&ZOOACOR12P)

After Successful completion of this course, students will be able to

CO-1	Acquire knowledge on Mendelian Genetics and its Extension
CO-2	Understand the molecular basis of Linkage, CrossingOverand Chromosomal Mapping
CO-3	Understand the basic concept of genetic mutations and chromosomal aberrations, cause and effect of alteration in chromosome structure and function

CO-4	Know the Mechanisms of sex determination in Drosophila with reference to alternative splicing Sex determination in mammals Dosage compensation in Drosophila & Human

CC-12															
CO	**PO**												**PSO**		
	PO1 Disciplinary knowledge	**PO2 Problem solving**	**PO 3 Critical thinking**	**PO4 Research related skills/Scientific reasoning**	**PO5 Communication skills**	**PO6 Cooperation /team work**	**PO7 Information or digital literacy**	**PO8 Self-directed learning**	**PO9 Multicultural competence**	**PO10 Moral and ethical awareness**	**PO11 Leadership quality**	**PO 12 Lifelong learning**	**PSO1**	**PSO2**	**PSO3**
CO 1	**3**	**0**	**2**	**1**	**2**	**3**	**3**	**2**	**3**	**2**	**2**	**1**	**3**	**0**	**0**
CO 2	**2**	**1**	**1**	**0**	**2**	**0**	**2**	**2**	**2**	**2**	**2**	**3**	**2**	**1**	**0**
CO 3	**2**	**1**	**1**	**0**	**2**	**0**	**2**	**2**	**2**	**2**	**2**	**2**	**0**	**0**	**1**
CO 4	**2**	**0**	**0**	**1**	**0**	**0**	**2**	**1**	**2**	**2**	**1**	**0**	**1**	**1**	**2**
CO	**2.25**	**1**	**2**	**1**	**2**	**3**	**2.23**	**1.75**	**2.23**	**2**	**1.75**	**2**	**2**	**1**	**1.5**

DSE-1 – Animal Behaviour and Chronobiology (ZOOADSE01T & ZOOADSE01P)

After Successful completion of this course, students will be able to

CO-1	Know the history of animal behavior studies including the worksof Renowned scientists In this field
CO-2	Learn various theoretical and practical techniques used to study animal behavior and construct to agramon locomotor activity of suitable animals.
CO-3	Acquire knowledge on the objectives of modern animal behaviour studies: Tinbergen's four questions.

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DSE1															
CO	PO												PSO		
	PO1 Disciplinary knowledge	PO2 Problem solving	PO 3 Critical thinking	PO4 Research related skills/Scientific reasoning	PO5 Communication skills	PO6 Cooperation /team work	PO7 Information or digital literacy	PO8 Self-directed learning	PO9 Multicultural competence	PO10 Moral and ethical awareness	PO11 Leadership quality	PO 12 Lifelong learning	PSO1	PSO2	PSO3
CO 1	0	0	0	1	0	0	3	2	3	0	2	1	0	0	0
CO 2	2	1	1	0	2	3	0	2	2	2	2	3	2	1	0
CO 3	2	2	1	0	0	0	2	2	2	0	2	2	2	0	1
CO	2	1.5	1	1	2	3	2.5	2	2.3	2	2	2	2	1	1

DSE-3– Endocrinology (ZOOADSE03T&ZOOADSE03P)

After Successful completion of this course, students will be able to

CO-1	Get general idea on Endocrine systems, Classification, Characteristic and Transport of Hormones, Neurosecretions and Neurohormones
CO-2	LearnaboutEpiphysis,Hypothalamo-hypophysialAxis,Hypothalamo-hypophysial portal system, hormonal regulation and hormonal disorders
CO-3	Develop concept on Peripheral endocrine glands, hormonal secretion, Function and regulation and associated disorders.

DSE3															
CO	PO												PSO		
	PO1 Disciplinary knowledge	PO2 Problem solving	PO 3 Critical thinking	PO4 Research related skills/Scientific reasoning	PO5 Communication skills	PO6 Cooperation /team work	PO7 Information or digital literacy	PO8 Self-directed learning	PO9 Multicultural competence	PO10 Moral and ethical awareness	PO11 Leadership quality	PO 12 Lifelong learning	PSO1	PSO2	PSO3
CO 1	2	0	1	0	3	0	0	1	1	2	0	2	1	2	0
CO 2	0	1	1	2	1	3	0	0	2	0	0	1	2	3	3
CO 3	2	0	1	1	1	1	0	0	3	0	1	0	2	0	0
CO	2	1	1	1.5	1.6	2	0	1	2	2	1	1.5	1.6	2.5	3

SEMESTER–VI

CC13–Developmental Biology(ZOOACOR13T&ZOOACOR13P)

After Successful completion of this course, students will be able to

CO-1	Know about Phases of Development, Cell-cell interaction, Differentiation and growth, Differential gene expression
CO-2	Understand the mechanism of Early Embryonic development, Late Embryonic development and Post Embryonic Development
CO-3	Know about the field where the knowledge of developmental biology can be implemented

CO	CC13/PO												PSO		
	PO1 Disciplinary knowledge	PO2 Problem solving	PO 3 Critical thinking	PO4 Research related skills/Scientific reasoning	PO5 Communication skills	PO6 Cooperation /team work	PO7 Information or digital literacy	PO8 Self-directed learning	PO9 Multicultural competence	PO10 Moral and ethical awareness	PO11 Leadership quality	PO 12 Lifelong learning	PSO1	PSO2	PSO3
CO 1	0	0	0	1	0	0	3	2	3	0	2	1	0	0	0
CO 2	2	1	1	0	2	3	0	2	2	2	2	3	2	1	0
CO 3	2	0	1	0	0	0	2	2	2	0	2	2	2	0	1
CO	2	1	1	1	2	3	2.5	2	2.3	2	2	2	2	1	1

CC14– Evolutionary Biology (ZOOACOR14T&ZOOACOR14P)

After Successful completion of this course, students will be able to

CO-1	Understand the basic concept behind origin of life in the light of Chemogeny, RNAworld, Biogeny, Origin of photosynthesis, Evolution of eukaryotes.

CO-2	Know the historical aspect of evolutionary concept through Pre-Darwinian Concepts and theories including Lamarckism, Darwininan Theory, Neo-Darwinian Synthesis
CO-3	Learn the evidences in favor of evolution through fossil records

CC-14															
CO	**PO**												**PSO**		
	PO1 Disciplinary knowledge	**PO2 Problem solving**	**PO 3 Critical thinking**	**PO4 Research related skills/Scientific reasoning**	**PO5 Communication skills**	**PO6 Cooperation /team work**	**PO7 Information or digital literacy**	**PO8 Self-directed learning**	**PO9 Multicultural competence**	**PO10 Moral and ethical awareness**	**PO11 Leadership quality**	**PO 12 Lifelong learning**	**PSO1**	**PSO2**	**PSO3**
CO 1	**2**	**0**	**1**	**0**	**3**	**0**	**0**	**1**	**1**	**2**	**0**	**2**	**1**	**2**	**0**
CO 2	**0**	**1**	**1**	**2**	**1**	**3**	**0**	**0**	**2**	**0**	**0**	**1**	**2**	**3**	**3**
CO 3	**2**	**0**	**1**	**1**	**1**	**1**	**1**	**0**	**3**	**0**	**1**	**0**	**2**	**0**	**0**
CO	**2**	**1**	**1**	**1.5**	**1.6**	**2**	**1**	**1**	**2**	**2**	**1**	**1.5**	**1.6**	**2.5**	**3**

DSE-4–Fish and Fishery (ZOOADSE04T&ZOOADSE04P)

After Successful completion of this course, students will be able to

CO-1	Classify the phylum fish along with their general description and ecology
CO-2	Develop ideas on fish morphology and physiological activities of fish
CO-3	Acquire knowledge techniques and details of aquaculture and Application of remote sensing and GIS in fisheries

DSE4															
CO	**PO**												**PSO**		
	PO1 Disciplinary knowledge	**PO2 Problem solving**	**PO 3 Critical thinking**	**PO4 Research related skills/Scientific reasoning**	**PO5 Communication skills**	**PO6 Cooperation /team work**	**PO7 Information or digital literacy**	**PO8 Self-directed learning**	**PO9 Multicultural competence**	**PO10 Moral and ethical awareness**	**PO11 Leadership quality**	**PO 12 Lifelong lear**	**PSO1**	**PSO2**	**PSO3**

												ning			
CO 1	2	0	1	0	3	0	0	1	1	2	0	2	1	2	0
CO 2	0	1	1	2	1	3	0	0	2	0	0	1	2	3	3
CO 3	2	0	1	1	1	1	0	0	3	0	1	0	2	0	0
CO	2	1	1	1.5	1.33	2	0	1	2	2	1	1.5	1.66	2.5	3

DSE-6–Wildlife and Conservation (ZOOADSE06T&ZOOADSE06P)

After Successful completion of this course, students will be able to

CO-1	Learn the Values of wildlife, Importance of conservation, Causes of Depletion of Wildlife in India management and restoration of habitats
CO-2	Estimate forest covers through the application of remote sensing and GIS
CO-3	Develop ideas on different ecological methods for Population and population density estimations

DSE6															
CO	PO												PSO		
	PO1 Disciplinary knowledge	PO2 Problem solving	PO 3 Critical thinking	PO4 Research related skills/Scientific reasoning	PO5 Communication skills	PO6 Cooperation /team work	PO7 Information or digital literacy	PO8 Self-directed learning	PO9 Multicultural competence	PO10 Moral and ethical awareness	PO11 Leadership quality	PO 12 Lifelong learning	PSO1	PSO2	PSO3
CO 1	0	1	0	1	0	2	0	1	0	2	0	3	0	3	1
0CO2	2	0	3	0	3	0	1	2	1	2	0	1	0	1	1
CO 3	3	3	2	1	1	0	2	1	3	1	3	1	3	1	1
CO	1.6	1.3	1.6	1	1.3	2	1.5	1.3	2	1.6	3	1.6	1.5	1.6	1

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AECC-1: Bengali

CO1: Students can define the cultural development of Bengalis from the emergence of the Bengali language to modern times

CO2: Students can produce practical knowledge useful for careers in drama, movies, serials, or recitation

CO3: Students can interpret about the structural methods of various literary forms, spelling, IPA, and Roman scripts

CO PO MPPING

AECC1															
CO	PO												PSO		
	PO1 Disciplinary knowledge	PO2 Problem solving	PO 3 Critical thinking	PO4 Research related skills/Scientific reasoning	PO5 Communication skills	PO6 Cooperation /team work	PO7 Information or digital literacy	PO8 Self-directed learning	PO9 Multicultural competence	PO10 Moral and ethical awareness	PO11 Leadership quality	PO 12 Life long learning	PSO1	PSO2	PSO3
CO 1	3	0	2	1	2	3	3	2	3	2	2	0	0	0	0
CO 2	2	1	1	0	2	0	2	2	2	2	2	3	2	1	0
CO 3	2	1	1	0	2	0	2	2	2	2	2	2	0	0	1
CO	2.33	1	2	1	2	3	2.3	2	2.3	2	2	2.5	2	1	1

AECC-2: Environmental Science

Every student can able to

CO1: Describe the structure and function of ecosystems.

CO2: Understand international agreements (e.g., Montreal Protocol, Kyoto Protocol).

CO3: Discuss land resources, land use change, and soil degradation.

CO PO MPPING

AECC2															
CO	PO												PSO		
	PO1 Disciplinary	PO2 Problem solving	PO 3 Critical thinking	PO4 Research related skills/Scie	PO5 Communication skills	PO6 Cooperation /team work	PO7 Information or digital literacy	PO8 Self-directed	PO9 Multicultural competence	PO10 Moral and ethical	PO11 Leadership quality	PO 12 Life long	PSO1	PSO2	PSO3

	knowledge			ntific reasoning				learning		awareness		learning			
CO 1	3	0	2	1	2	3	3	2	3	2	2	0	0	0	0
CO 2	2	1	1	0	2	0	2	2	2	2	2	3	2	1	0
CO 3	2	1	1	0	2	0	2	2	2	2	2	2	0	0	1
CO	2.33	1	2	1	2	3	2.3	2	2.3	2	2	2.5	2	1	1

ANTHROPOLOGY (ANT GE1/CC1TH and PR)

After Successful completion of this course, students will be able to

CO-1	Acquire knowledge on biological anthropology, social culture, concept of society, political system and social control.
CO-2	Understand the human related morphology, human skeleton, and types of cell.
CO-3	Acquire knowledge on structural and functional aspects about archeological anthropology.

CC1/GE1															
CO	PO												PSO		
	PO1 Disciplinary knowledge	PO2 Problem solving	PO 3 Critical thinking	PO4 Research related skills/Scientific reasoning	PO5 Communication skills	PO6 Cooperation /team work	PO7 Information or digital literacy	PO8 Self-directed learning	PO9 Multicultural competence	PO10 Moral and ethical awareness	PO11 Leadership quality	PO 12 Life long learning	PSO1	PSO2	PSO 3
CO 1	3	0	2	1	2	3	3	2	3	2	2	0	0	0	0
CO 2	2	1	1	0	2	0	2	2	2	2	2	3	2	1	0
CO 3	2	1	1	0	2	0	2	2	2	2	2	2	0	0	1
CO	2.33	1	2	1	2	3	2.3	2	2.3	2	2	2.5	2	1	1

ANTHROPOLOGY (ANT GE2/CC2TH and PR)

After Successful completion of this course, students will be able to

CO-1	Acquire knowledge on Human Genetics and population variation, Mendelian Genetics.
CO-2	Understand the molecular basis of DNA , RNA, Chromosomal variation.
CO-3	Understand the basic concept of genetic mutations and chromosomal aberrations, cause and effect of alteration in chromosome structure and function
CO-4	Have idea on past culture of human society.

CO PO MPPING

CC2/GE2															
CO	PO												PSO		
	PO1 Disciplinary knowledge	PO2 Problem solving	PO 3 Critical thinking	PO4 Research related skills/Scientific reasoning	PO5 Communication skills	PO6 Cooperation /team work	PO7 Information or digital literacy	PO8 Self-directed learning	PO9 Multicultural competence	PO10 Moral and ethical awareness	PO11 Leadership quality	PO 12 Life long learning	PSO1	PSO2	PSO3
CO 1	3	0	2	1	2	3	3	2	3	2	2	0	0	0	0
CO 2	2	1	1	0	2	0	2	2	2	2	2	3	2	1	0
CO 3	2	1	1	0	2	0	2	2	2	2	2	2	0	0	1
CO 4	2	0	0	1	0	0	2	1	2	2	1	0	1	1	2
CO	**2.25**	**1.00**	**1.25**	**1.00**	**2.00**	**1.00**	**2.25**	**1.65**	**2.25**	**1.00**	**2.10**	**2.5**	**1.5**	**1.78**	**1.25**

BOTANY
CC3/GE3 (Cell Biology, Genetics and Microbiology, BOTG CC3 TH and PR)

After Successful completion of this course, students will be able to

CO-1	Acquire knowledge on Mendelian Genetics and its Extension
CO-2	Understand the molecular basis of Linkage, Crossing Over and Chromosomal Mapping
CO-3	Understand the basic concept of genetic mutations and chromosomal aberrations, cause and effect of alteration in chromosome structure and function

CO-4	Have idea on Recombination methods in bacteria and viruses and Transposons in bacteria,Ac-DselementsinmaizeandPelementsin Drosophila, LINE, SINE, Alu elements in humans

CO PO MPPING

CC-3/GE3															
CO	PO												PSO		
	PO1 Disciplinary knowledge	PO2 Problem solving	PO 3 Critical thinking	PO4 Research related skills/Scientific reasoning	PO5 Communication skills	PO6 Cooperation /team work	PO7 Information or digital literacy	PO8 Self-directed learning	PO9 Multicultural competence	PO10 Moral and ethical awareness	PO11 Leadership quality	PO 12 Life long learning	PSO1	PSO2	PSO3
CO 1	3	0	2	1	2	3	3	2	3	2	2	0	0	0	0
CO 2	2	1	1	0	2	0	2	2	2	2	2	3	2	1	0
CO 3	2	1	1	0	2	0	2	2	2	2	2	2	0	0	1
CO 4	2	0	0	1	0	0	2	1	2	2	1	0	1	1	2
CO	2.25	1.00	1.25	1.00	2.00	1.00	2.25	1.65	2.25	1.00	2.10	2.5	1.5	1.78	1.25

BOTANY
CC4/GE4 (Plant physiology and metabolism, BOTG CC4 TH and PR)

After Successful completion of this course, students will be able to

CO-1	Acquire knowledge on Structure, classification and functions of proteins, enzymes
CO-2	Understand the basis of Structure and types xylem and phloem
CO-3	Acquire knowledge on structural and functional aspects photosynthesis .

CC4/GE4															
CO	PO												PSO		
	PO1 Disciplinary knowledge	PO2 Problem solving	PO 3 Critical thinking	PO4 Research related skills/Scientific reasoning	PO5 Communication skills	PO6 Cooperation /team work	PO7 Information or digital literacy	PO8 Self-directed learning	PO9 Multicultural competence	PO10 Moral and ethical awareness	PO11 Leadership quality	PO 12 Life long learning	PSO1	PSO2	PSO 3
CO 1	3	0	2	1	2	3	3	2	3	2	2	0	0	0	0
CO 2	2	1	1	0	2	0	2	2	2	2	2	3	2	1	0
CO 3	2	1	1	0	2	0	2	2	2	2	2	2	0	0	1
CO	2.33	1	2	1	2	3	2.3	2	2.3	2	2	2.5	2	1	1

AECC-1: English

CO1: After undergoing this course, the students will be able to Rectify grammatical errors in sentences using appropriate grammatical rules.
CO2: Transform the sentences from one form to another.
CO3: Identify true/false statements from a given passage.
CO-PO-PSO Mapping:

Course Outcome	Programme Outcome												Program Specific Outcome		
	PO 1: Disciplinary knowledge :	PO 2: Problem solving	PO 3: Critical thinking	PO 4.Research-related skills / Scientific reasoning	PO 5: Communication Skills	PO 6: Cooperation/Team work	PO 7: Information/digital literacy:	PO 8: Self-directed learning	PO 9: Multicultural competence	PO 10: Moral and ethical awareness /reasoning	PO 11: Leadership readiness/qualities	PO 12: Lifelong learning	PS 01	PS 02	PS 03
CO1	3	3	1	2	1	3	0	2	1	3	3	3	3	2	1
CO2	1	2	0	1	2	3	0	1	3	0	2	2	2	0	0
CO3	3	3	3	3	1	2	3	0	3	1	0	1	3	3	0
CO4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CO5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CO6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CO	2.33	2.67	2.00	2.00	1.33	2.67	3.00	1.50	2.33	2.00	2.50	2.00	2.67	2.50	1.00

AECC-2: Environmental Science

CO1: After undergoing this course, the students will be able to Develop the concept of ecology and ecosystem using various characteristics features.

CO2: Differentiate renewable and non-renewable sources of energy with their effect on the land and the waterbodies.

CO3: Understand the need of biodiversity conservation to save the environment.

CO-PO-PSO Mapping:

Course Outcome	Programme Outcome												Program Specific Outcome		
	PO 1: Disciplinary knowledge :	PO 2: Problem solving	PO 3: Critical thinking	PO 4.Research-related skills / Scientific reasoning	PO 5: Communication Skills	PO 6: Cooperation/Team work	PO 7: Information/digital literacy:	PO 8: Self-directed learning	PO 9: Multicultural competence	PO 10: Moral and ethical awareness /reasoning	PO 11: Leadership readiness/qualities	PO 12: Lifelong learning	PS 01	PS 02	PS 03
CO1	2	2	3	3	1	0	1	2	3	3	1	0	1	1	1
CO2	2	3	1	2	2	1	1	1	1	2	1	0	0	2	3
CO3	1	2	1	0	1	3	1	2	3	3	2	0	1	1	2
CO4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CO5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CO6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CO	1.67	2.33	1.67	2.50	1.33	2.00	1.00	1.67	2.33	2.67	1.33	0.00	1.00	1.33	2.00