

B.Sc.Wild Life Biology

Syllabus

AFFILIATED COLLEGES

Program Code: 22G

2023 – 2024 onwards

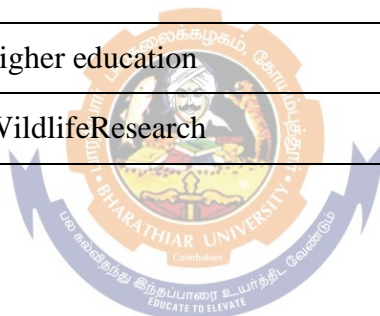


BHARATHIAR UNIVERSITY

**(A State University, Accredited with “A++” Grade by NAAC,
Ranked 21st among Indian Universities by MHRD-NIRF)**

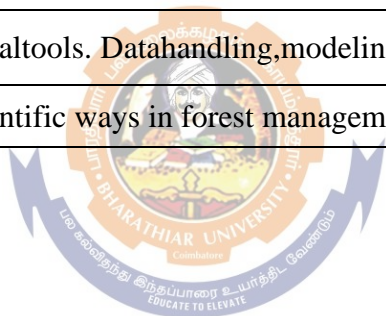
Coimbatore - 641 046, Tamil Nadu, India

Program Educational Objectives(PEOs)	
The B.Sc. Wildlife Biology program describe accomplishments that graduates are expected to attain within five to seven years after graduation.	
PEO1	Conservation and Biodiversity as passion
PEO2	Self-involvement in Ecological issues
PEO3	As biologist in conservation units
PEO4	As biologist in Environment Impact Assessment
PEO5	As base level conservation staffing governmental and non-governmental agencies
PEO6	As conservation managers or leaders
PEO7	Conservation oriented education programs
PEO8	Opportunities as civil servants
PEO9	Opportunities in higher education
PEO10	Opportunities in Wildlife Research



Program Specific Outcomes (PSOs)	
After the successful completion of B.Sc., Wildlife Biology program, the students are expected to	
PSO1	Apply knowledge of Biodiversity, in view of Conservation.
PSO2	Capable of Identify, formulate, and solve complex environmental issues
PSO3	Capable of design and evaluate solutions for environment issues
PSO4	Capable of using research-based knowledge and research methods in Wildlife Conservation.
PSO5	Capable of creating, selecting, adapting and applying appropriate techniques in area of Wildlife.
PSO6	Understand and commit to professional ethics
PSO7	Capable of engaging in independent learning and understanding of nature & natural resources
PSO8	Capable of demonstrating knowledge and skills.
PSO9	Capability as team leader in managing projects and conflict issues
PSO10	Capability to communicate with society and aware society about the need of Conservation.

Program Outcomes (POs)	
On successful completion of the B.Sc. Wildlife Biology program	
PO1	Distribution and diversity of Non-chordates.
PO2	Distribution and diversity of Chordates.
PO3	Ecology of various habitats.
PO4	Concepts of systematic, evolution & natural history.
PO5	Identification of Butterflies, Birds, Amphibians, Reptiles & Mammals.
PO6	In situ and Ex situ conservation.
PO7	Modern techniques in biological sciences.
PO8	Understanding research tools in wildlife.
PO9	Usage of Geo-spatial tools. Data handling, modeling, interpretation & prediction
PO10	Understanding scientific ways in forest management.



BHARATHIARUNIVERSITY:COIMBATORE641 046

B.Sc. Wild life Biology Curriculum

(For the students admitted during the academic year 2023– 24 onwards)

Course Code	Title of the Course	Credits	Hours/wk		Maximum Marks		
			Theory	Practical	CIA	CEE	Total
FIRST SEMESTER							
11T	Part I-Language I	4	6	-	25	75	100
12E	Part II-English I	4	6	-	25	75	100
13A	Core course I: Animal Diversity-Non Chordata	4	6		25	75	100
	Core Practical I	-	-	4	-		-
1AB	Allied A: paper I Biochemistry	4	5	-	20	55	75
	Allied Practical	-	-	2	-	-	-
1FA	Environmental Studies*	2	2	-	-	50	50
Total		18					425
SECOND SEMESTER							
21T	Part I-Language II	4	6	-	25	75	100
22E	Part II-English II	2	4	-	25	25	50 [@]
	Language Proficiency for Employability http://kb.naanmudhalvan.in/Special:FilePath/Cambridge_Course_Details.pdf	2	2	-	25	25	50 [#]
23A	Core course II: Animal Diversity-Chordata	4	5		25	75	100
23P	Core Practical II	4	-	4	40	60	100
2AB	Allied A: Paper II Biochemistry	4	5	-	20	55	75
23Q	Allied A :Practical	2	-	2	20	30	50
2FB	Value Education – Human Rights*	2	2	-	-	50	50
Total		24					575
THIRD SEMESTER							
31T	Part I-Language III	4	6	-	25	75	100
32E	Part II-English III	4	6	-	25	75	100
33A	Core course I: Sustainable Development and Fundamentals of Natural Resource Management	4	6		25	75	100
	Core Practical II	-	-	2	-		-
3AJ	Allied B: Paper I Botany	4	5	-	20	55	75
	Allied B Practical	-	-	2	-	-	-
3ZA	Skill Based I: Entomology	2	3	-	25	25	50 [@]

3FC	NonMajorElectiveI* Yoga.	2	2	-	-	-	50
Total		20					475
FOURTHSEMESTER							
41T	PartI-Language – IV	4	5	-	25	75	100
42E	PartII-English – IV	4	5	-	25	75	100
43A	CorecourseIV: Ecology, Evolution & Zoogeography	4	5		25	75	100

43P	CorePracticalII	4	-	2	40	60	100
4AJ	AlliedB: Paper II Botany	3	5	-	20	55	75
4PJ	AlliedBPractical	2	-	2	20	30	50
4ZB	SkillBasedI:Ornithology	2	2	-	25	25	50 [@]
	Naan Mudhalvan Digital Skill for Employability	2	3		25	25	50 [#]
	http://kb.naanmudhalvan.in/Special:Filepath/ /Microsoft_Course_Details.xlsx						
4FD	Non-MajorElectiveII* GeneralAwareness.	2	2	-	-	-	50
Total		27					675

FIFTHSEMESTER							
53A	CoreCourseV: Wildlife Management Techniques	4	6	-	25	75	100
53B	CoreCourseVI: ConservationBiology.	4	6	-	25	75	100
53C	CoreCourseVII: Biology of Vertebrates	3	5	-	25	75	100
	CorePracticalIII	-	-	2	-	-	-
	CorePracticalIV	-	-	2	-	-	-
5EA	ElectiveCourseI: Eco –development and Ecotourism	3	3		20	55	75
5EB	ElectiveCourseII:Indian Wildlifelaws&Forensics	2	3	-	20	30	50
	ElectiveCourseV:Practical	-	-	2	-	-	-
57A	Internship/Projectwork#**	1	-	-	25	-	25
5ZC	SkillBasedIII:Biostatistics &Computer Applications	2	3	-	25	25	50 [@]
TOTAL		19					500
SIXTHSEMESTER							

63A	CoreCourseVIII: Forestry & Silviculture	4	5	-	25	75	100
63B	CoreCourseIX: AnimalBehavior	4	5	-	25	75	100
63C	CoreCourseX: Aquatic Biology and wetland Ecosystem	3	5	-	25	75	100
63P	CorePracticalIII	4	-	2	40	60	100
63Q	CorePracticalIV	4	-	2	40	60	100
6EA	Elective Course III: Marine National Parks in India	3	3	-	20	55	75
6EB	ElectiveCourse IV: Field Biology, Remote sensing and Geo- informatics	2	3	-	20	55	75
63R	ElectiveCourseV:Practical	2	-	2	20	30	50
6ZD	SkillBasedIV: Forest Based Industry using Exotic species (Lantana,Lac)	2	2	-	2	25	50 [@]
	Extensionactivities**	2	1	-	50	-	50
	Naan Mudhalvan Employability Readiness –IBM Skills build. (edunet foundation)	2	3	-	25	25	50 [#]
	TOTAL	32					850
	GRANDTOTAL	140					3500
ONLINECOURSES							
	1.	SWAYAM					
	2.	MOOC'S					

5

* No Continuous Internal Assessment (CIA). Only University Examinations.

** No University Examinations. Only Continuous Internal Assessment (CIA).

@ University semester examination will be conducted for 50 marks (As per the existing pattern of examination)and the marks will be converted to 25 marks.

Naan Mudhalvan Course: CEE will be assessed by Industry for 25 marks and CIA will be done by the course teacher

#VALUEADDEDCOURSE(OPTIONAL)

S.No	PAPAERS	TOTAL MARKS
1.	Tiger Monitoring.	100
2.	DataMining.	100
3.	EconomicsofConservation.	100
4.	IntellectualPropertyRights.	100





***First
Semester***

Coursecode	13A	ANIMAL DIVERSITY–NON-CHORDATA	L	T	P	C
Core/Elective/SBS	Core Course I		4	0	0	4
Pre-requisite	Basic knowledge about life forms		Syllabus Version		2023-2024	
Course Objectives:						
<ol style="list-style-type: none"> To understand the taxonomy, relationship and evolution of animals. To identify the phyla of invertebrate animals, and recognize their distinguishing features and characters. To appraise the diversity of animals in a phylogenetic context. To understand how different body designs, solve biological problems related to physiological and environmental challenges. To develop an appreciation for the role of invertebrates in biological communities, ecological interactions, and conservation. 						
Expected Course Outcomes:						
On the successful completion of the course, student will be able to:						
1	The learner will be able to understand the diversity and basic taxonomy of Non-chordates.				K2	
2	The learner will get an idea of adaptation and importance of non-chordates.				K3	
3	The learner will be able to identify the animal at different taxonomic level				K4	
4	The paper will give a strong observation skill and prompt him to think about its conservation, its role in biodiversity and its potentials in technological prospects.				K5	
K1-Remember; K2-Understand; K3-Apply; K4-Analyze; K5-Evaluate; K6–Create						
Unit:1	CLASSIFICATION AND PROTISTA				17hours	
Concept of five kingdom classification of life. Introduction to Protista & Animal kingdom–Systems of classification & nomenclature - levels of organization - Types of symmetry. General characters of Protista & Classification with examples. Type study: Paramecium. General topics: Parasitic Protista, Life Cycle of Plasmodium, Locomotion & Nutrition in Protozoa.						
Unit:2	PORIFERA AND COELENTERATA				17hours	
Characters & classification (up to class) of Porifera & Coelenterata with examples –salient features of <i>Ctenophora</i> . Type study: Leucosolenia, Obelia Colony. General topics: Canal system in sponge, Polymorphism in Coelenterata, Diversity (Types) of corals and structure of coral polyp, Coral reefs.						
Unit:3	PLATYHELMINTHES, ASCHELMINTHES AND ANNELIDS				18hours	
Characters & classification (up to class) of Platyhelminthes, Aschelminthes & Annelids with examples. Type study: <i>Taenia</i> , <i>Ascaris</i> , <i>Megascolex</i> . General topics: Coelom, coelomoducts & metamerism, Parasitic adaptations in Helminths and annelids, Filter feeding in Polychaetes.						

Unit:4	ARTHROPODA	18hours
Characters&classification(uptoclass)ofArthropodawithexamples.Briefdescriptionsof <i>Limulus</i> (living fossil), <i>Sacculina</i> (Parasiticcastration),Copepods,Scorpion,Spider, <i>Peripatus</i> (affinities),Millipedes(roleinecosystem)&Centipedes(GeneralDescription). Typestudy: Cockroach&Prawn, Generaltopics: Crustaceanlarvae,Social Insects		
Unit:5	MOLLUSCA AND ECHINODERMATA ANDHEMICHORDATA.	18hours
Characters&classification(uptoclass)ofMolluscaandEchinodermatawithexamples.Characters of Hemichordata. Brief descriptions of Fresh water Mussel, <i>Chiton</i> , <i>Sepia</i> , Star fish,SeaCucumber & <i>Balanoglossus</i> Typestudy: <i>Pila</i> ,Starfish (External&Watervascularsystemonly). General topics: Larval forms of Mollusca, Torsion & de-torsion in Mollusca, EconomicallyimportantMollusca, Echinoderm larva, Evolutionaryaffinities ofHemichordata.		
Unit:6	ContemporaryIssues	2hours
Expertlectures,onlineseminars –webinars		
TotalLecturehours		90hours
TextBook(s)		
1	NairNC.(2017). <i>InvertebrataandChordata</i> , SarasPublicationNagercoil,Tamilnadu.	
2	NairNC,LeelavathyS,SoundaraPandian NMuruganT andArumugamN.(2010). <i>AText BookofInvertebrates</i> ,SarasPublicationNagercoil,Tamilnadu.	
3	KotpalRL,AgarwalSKandKhetarpalRP.(1990). <i>ModernTextbookofInvertebrates</i> , RastogiPublications,Meerut.	
4	JordanAnd Verma.(1963). <i>InvertebrateZoology</i> , S.Chand &Co,New Delhi	
ReferenceBooks		
3	AndersonTA.(2001). <i>InvertebrateZoology</i> ,Oxford UniversityPress,NewDelhi.	
4	BarringtonEJW.(1967). <i>InvertebrateStructureandFunctions</i> .English LanguageBookSociety.	
5	HymanLH, <i>TheInvertebrates(6 vols)</i> .McGraw-HillCompanies Inc.NY	
8	Ebanasar J and Sheeja BD. <i>Outlines of five kingdoms of life</i> , Shine and Twinkle Publication,Nagercoil.	
RelatedOnlineContents[MOOC,SWAYAM, NPTEL, Websitesetc.]		
1	NationalDigital LibraryofIndia https://ndl.iitkgp.ac.in/	
2	SwayamPrabha https://www.swayamprabha.gov.in/index.php/program/archive/9	
CourseDesignedBy:Dr.B. RAMAKRISHNAN,Assistant Professor, GAC,Ooty		

MappingwithProgrammeOutcomes										
COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	S	S	S	M	M	M	M	M	M	M
CO3	M	M	M	S	M	M	S	S	M	S
CO3	M	S	M	M	M	S	M	M	S	M
CO4	M	M	S	M	M	M	S	M	M	S

*S-Strong;M-Medium;L-Low





***Second
Semester***

Coursecode	23A	ANIMAL DIVERSITY –CHORDATA	L	T	P	C
Core/Elective/SBS	Core CourseII		4	0	0	4
Pre-requisite	Basic knowledge on life forms		Syllabus version		2023- 24	
Course Objectives:						
<ol style="list-style-type: none"> 1. To understand the taxonomy and relationship and evolution of animals. 2. To identify the class of vertebrate animals, and recognize their vertebrate distinguishing features. 3. To appraise the diversity of animals in a phylogenetic context. 4. To understand how different body designs, solve biological problems related to physiological and environmental challenges. 5. To develop an appreciation for the role of vertebrates in biological communities, ecological interactions, and conservation problems. 						
Expected Course Outcomes:						
On the successful completion of the course, student will be able to:						
1	The learner will be able to understand the diversity and basic taxonomy of chordates.					K2
2	The learner will get an idea of adaptation and importance of chordates.					K3
3	The learner will be able to identify any vertebrate animal at different taxonomic level.					K4
4	The paper will give a strong observation skill and prompt him to think about its conservation role in biodiversity and its potential in technological prospects.					K5
K1-Remember;K2-Understand;K3-Apply;K4-Analyze;K5-Evaluate;K6-Create						
Unit:1	FISHES				17hours	
General characters and classification of Chordata (upto class) with examples. Brief descriptions of <i>Amphioxus</i> , <i>Ascidia</i> , Hagfish, Scolidon, Mullet, Anabas, Cat fish, Seahorse. General topics: Affinities of Prochordates, Accessory respiratory organs in teleost, Types of Fins and function Comparison of Teleost and elasmobranchs, Evolutionary significance of Dipnoi, Migration of Fishes.						
Unit:2	AMPHIBIA				17hours	
Classification and characters of Amphibia (upto order with examples). Habitat, classification, examples and brief descriptions of Proteus-Salmander –Newts -Ambystoma -Mud puppy – Congo eels –Sirens –Toads (Indian, African and South American) –Tree frogs –Rana.						
Unit:3	REPTILIA				18hours	
Classification and characters of Reptilia (up to order with examples). Habitat, classification, examples and brief descriptions- Varanus – Uromastix – Chameleon – Phrynosoma – Iguano – Heloderma – Typhlops – Him snakes – Uropeltis – Xenopeltis – Boas & Pythons – Vipers – Cobras – Coral snakes – Rattlesnakes – Crocodiles – Alligator – Gharial – Tortoise & Turtles.						
Unit:4	AVES				18hours	

–SalientfeaturesofAves–classificationuptoFamily.Briefdescriptionswithexamplesof Fowls–Swifts–HummingBirds–Hornbills–Frogmouths–Nightjars–Plover–Turns–Gulls–Hérons– Strokes–Ibis–SpoonBills–Doves–Hoopoe–Kingfisher–Beeeater–		
Vultures–Rollers–Cookoos–Coucals–Fowls–Quails–Pelicans–Cormorants–Flamingo– Woodpeckers–Bee eaters –Flycatchers–Bushchat –Fantails–Wagtails–Parrots&Parakeets Cockatoos – Owls – Trogons – Tits – Larks – Prinia – Shrike – Drongo – Finches – Swallow – Thrushes– Bulbul– Sunbird – Pitta –Warbler &Barblers.		
Unit:5	MAMMALS	18hours
ClassificationandcharactersofMammals(uptoorderwithexamples).Habitat,classification,examplesa ndbriefdescriptionofEchidna–Platypus–Tasmanianwolf–Kangaroo–opossum–Shrew–Hedgehog– Bats–Rodents–Hare–AquaticMammals–Anteaters–Felids–Canids–Herspestids–Mustellids–Bear– Hyena–Oldworldmonkeys–NewworldMonkeys–Artiodactyla–Elephants– Perissiodactyla.		
Unit:6	CONTEMPORARYISSUES	2hours
Expertlectures,onlineseminars –webinars/Field work		
TotalLecturehours		90hours
TextBook(s)		
1	Arumugam N. <i>Animal Diversity - Volume - 2 - Chordata</i> , Saras Publication, Nagercoil, Tamilnadu.	
2	ThangamaniA,PrasannakumarS,Narayanan LM,ArumugamN.(2014). <i>ATextBookofChordates</i> ,Saras Publication, Nagercoil, Tamilnadu.	
ReferenceBooks		
1	EkambaranathaAyyaandAnanthakrishnanTN.(1995). <i>ManualofZoologyVol–II,S.</i> ViswanathanPvt. Ltd.Chennai.	
2	KotpalRL.(2019). <i>Mordern TextBookof Zoology Vertebrates</i> ,4 th edition,Rastogi Publications,Meerut.	
3	YoungJZ.(1950). <i>LifeofVertebrates</i> . ClarendonPress,Oxford,UK.	
4	PoughHarveyF, ChristineM .Janis andJohn B.Heiser.(2002). <i>VertebrateLife</i> ,Pearson Education Inc.NewDelhi.	
5	VermaPS.(2013). <i>ChordateZoology</i> ,SChandPublishers,NewDelhi.	
RelatedOnlineContents[MOOC,SWAYAM, NPTEL, Websitesetc.]		
1	NationalDigital LibraryofIndia https://ndl.iitkgp.ac.in/	
2	SwayamPrabha https://www.swayamprabha.gov.in/index.php/program/archive/9	
CourseDesignedBy:Dr.B.RAMAKRISHNAN,Assistant Professor, GAC,Ooty		

MappingwithProgrammeOutcomes										
COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	S	M	M	M	M	M	M	S	M	M
CO3	M	S	M	M	M	M	S	S	M	S
CO3	M	M	M	M	S	M	S	M	S	M
CO4	M	M	M	M	M	S	S	M	S	S



Coursecode	23P	CHORDATAANDNON-CHORDATA PRACTICAL	L	T	P	C
Core/Elective/SBS	CorePracticalII				4	4
Pre-requisite	KnowledgeontaxonomyofAnimals		Syllabus Version		2023-24	
CourseObjectives:						
Themain objectives ofthis courseareto:						
<ol style="list-style-type: none"> 1. Todevelop skill of Taxonomy 2. Toimprovehandsonpracticeskill 3. Todevelopfieldknowledge 						
ExpectedCourseOutcomes:						
Onthesuccessful completionofthe course, studentwill beable to:						
1	Thelearner will be ableto explaintaxonomyofanimals					K3
2	Thelearner will be Developconceptofecosystemsandinteractions					K3
3	Thelearner will be IdentifyFishes,Insects&Birds					K3
4	ImportanceofBiodiversity					K3
5	Identify Non-Chordata and Chordata with its ecological significance					K4
K1-Remember;K2-Understand;K3-Apply;K4-Analyze;K5-Evaluate;K6-Create						
MAJORPRACTICAL						
<ol style="list-style-type: none"> 1. IdentificationofgivenInsectorderbasedonthedichotomouskeyprovided. 2. IdentificationoffamilyofgivenFish 3. Based on the sketch of bodyparts identifyfamilyofsnake based on theKeyprovided. 4. Micrometrymeasurementof given Protozoan /microarthropod /anysample. 5. DigitalProjectionof aForest/Reef/Benthic/Aquaticecosystemandidentificationsvertebrates&invertebrates in theprojection. 						
MINORPRACTICAL						
<ol style="list-style-type: none"> 1. Cockroach/Mosquito:MountingofAppendages &Mouthparts 2. Earthworm:Mountingofbodysetae 3. Fish:MountingofScales 4. Motilityof Paramecium– Hangingdropmethod. 						
VISIT						
Visit to any nearby area of biodiversity significance (Report should be included in record). Thetrip may be undertaken during the free hours without affecting classhours. The same can be done even during practical hours.						

SUBMISSION OF REPORT

1. Submission of Field Report on Bird Watching: Report of minimum 5 days bird watching in a locality should be submitted during examination. The trip may be undertaken during holy days or other free hours or anytime without affecting class hours individually.
2. Submission of Photo Album of invertebrates & Vertebrates with identification and classification (Evaluation of reports should be based on field effort, diversity of photos, classification and identification. Costly presentation of photo albums should compulsorily be discouraged, as the objective of this is to make students familiar with fauna. The collection may be undertaken during holy days or other free hours or anytime without affecting class hours, individually).

SPOTTERS

1. **Classify giving reasons:** *Paramecium, Obelia, Liver fluke, Ascaris, Pila, Starfish, Balanoglossus, Any fish, Tree frog, Snake, King Fisher and Bat.*
2. **Draw labeled sketches:** *Amphioxus, Trochophore, Any Echinoderm larva.*
3. **Biological significance:** *Paramecium – Conjugation, Malarial Parasite, Gemmules, Limulus, Hippocampus, Nautilus. Axolotl larva,*
4. **Relate structure and function:** *Spicules of sponges, Scolex of tapeworm, Nereis parapodium, Carapace and plastron of Turtle, Electric organ – Narcine.*
5. **Descriptive Notes:** *Hydra, Physalia, Rotifer, Sea cucumber, Chiton, Placoid scales, Chameleon, Quill feather.*

Total Practical Hours

60 (Each Semester) x 2 = 120 Hours Per Year

Text Book(s)

- | | |
|---|---|
| 1 | Verma, P.S. (2000). <i>A Manual of Practical Zoology - Chordates</i> , S Chand Publications, New Delhi. |
| 2 | Verma, P.S. (2010). <i>A Manual of Practical Zoology - Invertebrates</i> , S Chand Publications, New Delhi. |

Course Designed By: Dr. B. RAMAKRISHNAN, Assistant Professor, GAC, Ooty

Mapping with Programme Outcomes

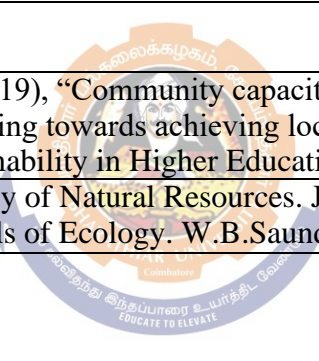
COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	M	M	M	S	S	M	S	M	M	S
CO3	S	M	S	M	M	S	M	M	S	M
CO3	M	S	M	M	S	S	M	S	M	M
CO4	M	M	M	M	M	M	S	M	M	M

*S-Strong; M-Medium; L-Low



***Third
Semester***

Course code	33A	SUSTAINABLE DEVELOPMENT AND FUNDAMENTALS OF NATURAL RESOURCE MANAGEMENT	L	T	P	C
Core/Elective/SBS		Core Course III	4	0	0	4
Pre-requisite		Basicknowledgeon natural resource	Syllabus version		2023- 24	
CourseObjectives:						
<ol style="list-style-type: none"> To understand development is concern with developing an economic growth, Environmental Protection, Social Inclusion. Tounderstanding the nature of environmental biology To offer resources for upcoming generation. To improve the quality of living of all organisms and maintain the ecological balance for sustainable development. 						
ExpectedCourseOutcomes:						
Onthesuccessful completionofthecourse,student willbe ableto:						
1	Understand the Basic concept of Sustainable Development (SD),the environment, social and economic dimensions.					K2
2	Students will understand how soil fertility is determined and how plant nutrient deficiencies are identified and means of improving soil fertility and adding nutrient for plant growth.					K3
3	Apply theoretical frameworks to real world sustainability issues.					K3
4	Apply skills of inquiry, including college – level research, in the analysis of sustainability issues.					K3
5	Apply skills of inquiry, including college – level research, in the analysis of sustainability issues.					K5
6	Students will be able to critically evaluate current events and public information related to natural resources as being scientifically – based or opinion based and contribute to the knowledge base of information.					K5
	Explain and evaluate current challenges to sustainability, including modern world social, environmental and economic structure and crises.					K5
K1-Remember;K2-Understand;K3-Apply;K4-Analyze;K5-Evaluate;K6–Create						
Unit:1	INTRODUCTION TO NATURAL RESOURCES				14hours	
Concept of resource, classification of natural resources. Factors influencing resources availability, distribution and uses. Interrelationships among different type of natural resources. Social and economic dimension of resource management.						
Unit:2	FOREST RESOURCES AND LAND RESOURCES				14hours	
Forest vegetation, status and distribution, major forest types and their characteristics. Use and over – exploitation, case studies. Timber extraction, mining, dams and their effect on forest and tribal people, forest management. Land as a resource.dry land, land use classification, land degradation, man induced landslides, soil erosion and desertification.						
Unit:3	FOOD RESOURCES AND APPROACHES IN RESOURCE MANAGEMENT				15hours	

World food problems, changes caused by agriculture and over- grazing, effects of modern agriculture, fertilizer-pesticide problems, water logging. Salinity, case studies. Ecological approach, ethnological approach, implication of the approaches, integrated resources management strategies.		
Unit:4	SUSTAINABILITY	15hours
Introduction to sustainability & its factors, requirement for sustainability: food security and agriculture, renewable resources –water and energy, non – renewable resources, factors and trade – offs, sustainability conflicts, a conceptual framework for linking sustainability and sustainable development. Sustainable Forest, Management, Agenda -21 and UNEP programs towards sustainable development		
Unit:5	DIMENSION OF SUSTAINABLE DEVELOPMENT	15hours
Society,environment, culture and economy: current challenges – natural, political, socio – economic imbalance; sustainable development initiative and policies of various countries: global, regional, national, local; needs of present and future generation – political, economic, environmental.		
Unit:6	CONTEMPORARYISSUES	2hours
Expertlectures,onlineseminars –webinars		
	TotalLecturehours	75hours
TextBook(s)		
1	Franco, I.B. and Tracey, J. (2019), “Community capacity – building for sustainable development: Effectively striving towards achieving local community sustainability targets”, <i>International journal of Sustainability in Higher Education</i> , Vol.20 No.4,pp. 691-725.	
2	Francois Remade 1984.Ecology of Natural Resources. John Wiley &Sons Ltd. Odum, E.P.1971. Fundamentals of Ecology. W.B.Saunders Co.USA,574p.	
		
ReferenceBooks		
1	Elliott, Jennifer, 2012.An Introduction to Sustainability Development.4 th Ed.Routledge, London.	
2	Rogers,peter P., Kazi F .Jalal, and John A.Boyd “ An Introduction to sustainable development”.(2012)	
3	Soubbotina , Tatyana p.2004.Beyond Economic Growth : An Introduction to sustainable Development.WBI learning resources series.Washington DC ;World Bank.	
4	Kerr,Julie,Introduction to energy and climate: Developing a sustainaleenvironment.CRC Press,2017.	
5	Bell, Simon, and Stephen Morse. Sustainability indicators: measuring the immeasurable?.Routledge , 2012.	
6	Sorensen, Bent. Energy, Resources and Welfare: Exploration of Social Frameworks for Sustainable Development. Academic Press, 2016.	
7	Global Change and Natural Resources Management, Vitousek, P.M.1994. Beyond global warming, <i>Ecology and global change, Ecology</i> 75,1861-1876.	
8	Agarwal, K.C., 2001. Envirinmentl Biology, Nidhi Publication Ltd .Bikaner. Cunningham, W.P.Cooper, T.H.Gorhani,E&Hepworth,M.T.2001,Environmental Encyclopedia, Jaico Publishing House.	

9	Miller T.G.Jr.Environmental science, Wadsworth publishing Co.(TB)
RelatedOnlineContents[MOOC,SWAYAM, NPTEL,Websitesetc.]	
1	NationalDigital LibraryofIndiahttps://ndl.iitkgp.ac.in/
2	SwayamPrabhahttps://www.swayamprabha.gov.in/index.php/program/archive/9
CourseDesignedBy: Mrs. SHEELA PRIYADARSHINEE,Associate Professor, GAC,coimbatore	

MappingwithProgrammeOutcomes										
COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	M	M	M	M	M	M	M	M	M	M
CO3	M	M	M	S	M	M	M	M	S	M
CO3	M	M	M	M	S	M	S	M	S	M
CO4	S	M	M	M	M	M	M	S	M	M

*S-Strong;M-Medium;L-Low



Coursecode	3ZA	ENTOMOLOGY	L	T	P	C
Core/Elective/SBS		SkillBased CourseI	2	0	0	2
Pre-requisite	Knowledge on Arthropods		Syllabus version		2023-24	
CourseObjectives:						
<ol style="list-style-type: none"> 1. To give an introduction to diversity of world Insects. 2. To make aware of the various protocols in entomology. 3. To prompt the student to undertake entomology as profession or passion. 						
Expected Course Outcomes:						
On the successful completion of the course, student will be able to:						
1	Understand the basic concepts in entomology					K1
2	Identify various insects and butterflies					K2
3	Identify insect damages					K2
4	Understand Apiculture and Sericulture as social relevance					K3
K1-Remember; K2-Understand; K3-Apply; K4-Analyze; K5-Evaluate; K6-Create						
Unit:1	MORPHOLOGY				8hours	
General Body plan – Structure of head, wings, thorax, abdomen, appendages and genitalia. Types of mouthparts. Classification & habits of insects up to orders with examples.						
Unit:2	BUTTERFLIES AND MOTHS				9hours	
Butterflies & Moths – Body parts of Butterfly - Identification of types of Swallowtails: Clubtails – Roses - Bird wings – Mime – Mormon – Raven - Helen - peacock – Jay – Blue bottles – Swordtails – Zebra. Whites, sulfurs and orange-tips.						
Unit:3	BEHAVIORAL ENTOMOLOGY				9hours	
Reproductive behavior in insects (mate finding, courtship, territoriality, parental care, parental investment and sexual selection) - Role of different signals in host searching (plant and insects) and host acceptance, ovipositional behavior, pollination behavior, coevolution of plants and insect pollinators						
Unit:4	DAMAGE AND CONTROL				8hours	
Insect Damage and Sign Categories - Bark beetles and wood borers - Gall makers & defoliating insects - Fluid-feeding insects - Terminal and root insects - Seed and cone pests Insect sampling in a forest ecosystem - Forecasting and assessing risk of insect outbreaks Insects and silviculture – Insect Control methods (Synthetic & Biological – Brief outline).						
Unit:5	COMMERCIAL ENTOMOLOGY				9hours	
Principles and practice of Apiculture & Sericulture. Applications of entomology in Wildlife Forensics.						
Unit:6	CONTEMPORARY ISSUES				2hours	
Expert lectures, online seminars – webinars						

	TotalLecturehours	45hours
TextBook(s)		
1	ImmsAD. (1972). <i>Text bookof EntomologyVol. I&II</i> .Ed. ByRichardand Owen.ELBS	
2	NairK.K.AnandhkrishnanTN&DavidBV. <i>GeneralandappliedEntomology</i> .Tata Mc.GrawHillPubl.Delhi.	
ReferenceBooks		
1	KehimkarID. (2008). <i>BookofIndianbutterflies</i> . OxfordUniversityPress.	
2	MetcalfRL,LuckmannWH,editors.(1994). <i>Introductiontoinsectpestmanagement</i> . John Wiley&Sons.	
3	JayashreeKV,TharadeviCS&ArumugamN. (2014). <i>Apiculture</i> ,Sara Publication Nagercoil,Tamilnadu.	
4	PedigoLP.(1989). <i>Entomologyandpestmanagement</i> . MacmillanPublishingCompany.	
5	EikichiHiratsuka.(2000). <i>Silkwormbreeding</i> , OxfordandIBHpublications,NewDelhi	
RelatedOnlineContents[MOOC,SWAYAM, NPTEL, Websitesetc.]		
1	AppliedEntomology https://swayam.gov.in/nd2_cec20_bt02/preview	
2	SwayamPrabha https://www.swayamprabha.gov.in/index.php/program/archive/9	
CourseDesignedBy:Dr.B.RAMAKRISHNAN,Assistant Professor, GAC,Ooty Dr. N.B. RAJESWARI ,Guest Faculty , GAC,Ooty.		

MappingwithProgrammeOutcomes										
COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	S	M	M	M	S	M	M	M	S	S
CO2	M	S	M	M	S	M	S	S	M	M
CO3	S	M	M	M	M	S	S	M	M	S
CO4	S	M	M	M	M	S	S	M	M	S

*S-Strong;M-Medium;L-Low



***Fourth
Semester***

Coursecode	43A	ECOLOGY, EVOLUTION AND ZOOGEOGRAPHY	L	T	P	C
Core/Elective/SBS	Core Course IV		4	0	0	4
Pre-requisite	Knowledge on Animal diversity & Taxonomy		Syllabus version		2023-24	
Course Objectives:						
<ol style="list-style-type: none"> To develop awareness about the environment and the interaction of various components. To develop an idea of the adaptations and its significance in relation to evolution. To make the students aware of how organic evolution occurred and how the various life forms come into existence. To make the students aware of the historical periods during the evolution of earth and status of fauna during the particular age. To understand the distribution of the various faunal components. 						
Expected Course Outcomes:						
On the successful completion of the course, student will be able to:						
1	The students will be able to present an overview of diversity of life forms in an ecosystem, will be able to differ between Qualitative & Quantitative study.				K2	
2	The learner can correlate choice of habitat for organisms to abiotic factors, aspect of energy transfer and will be able to explain the necessity for and adaptations, providing examples.				K3	
3	Students will be able to describe the history and development of evolutionary				K4	
4	Students will be able to describe the history of life on earth.				K5	
K1-Remember; K2-Understand; K3-Apply; K4-Analyze; K5-Evaluate; K6-Create						
Unit:1	ECOLOGICAL CONCEPTS				15 hours	
Ecosystem structure & function. Limiting factors. Biogeochemical cycles: Carbon, Nitrogen, water and Phosphorous. Concept of Species, Population dynamics and Growth curves. Food web Pyramids & Trophic levels. Animal relationships: - Mutualism, commensalism, parasitism, Competition, Predation, Prey and Predator relationship.						
Unit:2	ECOSYSTEMS				15 hours	
Habitat ecology: Freshwater, Estuarine and Terrestrial ecosystems (Detailed study). Ecotone & Edge effect. Air, Water, Noise & Thermal Pollution. E-Waste - definition and management. Fundamentals of Machine Learning.						
Unit:3	THEORIES OF EVOLUTION				14 hours	
Theories of Organic evolution. Fossils - types and formation. Evidence of evolution Convergent & Divergent evolution. Natural selection - Isolation & Speciation.						

Unit:4	GEOLOGICALTIMESCALE	14 hours
Hardy Weinberg Equilibrium & Genetic drift. Colouration - Mimicry types & Significance. Geological timescale (Pre-cambrian Eon; Upto periods for Paleozoic & Mesozoic era; upto epoch for Cenozoic era)		
Unit:5	ZOOGEOGRAPHY	15 hours
Zoogeographical regions – Palaearctic, Nearctic, Neotropical, Oriental, Australian and Ethiopian regions - their Climatic and faunal peculiarities. Wallace line, Discontinuous distribution - Continental Drift. Brief outlines of Human evolution.		
Unit:6	CONTEMPORARYISSUES	2 hours
Expert lectures, Online Seminars – Webinars/Field Study		
Total Lecture hours		75 hours
Text Book(s)		
1	Arumugam N. (2014). <i>Concepts of Ecology</i> , Saras Publication, Nagercoil, Tamilnadu.	
2	Verma PS and VK. (2004). <i>Cell Biology, Genetics, Evolution and Ecology</i> , S Chand Publishers, New Delhi.	
Reference Books		
1	Gupta PK. <i>Cytology, Genetics and Evolution</i> , Rastogi Publications, Meerut.	
2	Verma PS and Agarwal VK. (2001). <i>Environmental Biology: Principles of Ecology</i> , S Chand Publishers, New Delhi	
3	Sharma PD. (2018-19). <i>Elements of Ecology</i> , Rastogi Publications, Meerut.	
4	Odum EP. (1971). <i>Fundamentals of Ecology</i> , W. B. Saunders College Publishing, Philadelphia.	
5	Benton AH and Werner WE. (1976). <i>Field Biology and Ecology</i> , Tata McGraw Hill, New Delhi.	
6	Ridley M. (2003). <i>Evolution</i> , Blackwell Publishing.	
7	Barton NH, Briggs DEG, Eisen JA, Goldstein DB and Patel NH. (2007). <i>Evolution</i> . Cold Spring Harbour Laboratory Press. US.	
8	Hall BK and Hallgrimsson B. (2008). <i>Evolution</i> , Jones and Bartlett Publishers.	
Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]		
1	National Digital Library of India https://ndl.iitkgp.ac.in/	
2	Wildlife Ecology https://swayam.gov.in/nd1_noc20_bt38/preview	
4	Evolutionary Biology https://swayam.gov.in/nd2_cec20_bt06/preview	
Course Designed By: Dr. B. RAMAKRISHNAN, Assistant Professor, GAC, Ooty		

MappingwithProgrammeOutcomes										
COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	M	M	M	S	M	S	M	S	M	S
CO2	M	S	M	S	M	S	M	M	S	M
CO3	M	M	S	M	S	S	M	M	M	S
CO4	S	S	S	S	S	M	S	S	S	M

*S-Strong;M-Medium;L-Low



Coursecode	4ZB	ORNITHOLOGY	L	T	P	C
Core/Elective/SBS	SkillBased CourseII		2	0	0	2
Pre-requisite	Knowledge on Birds diversity		Syllabus version		2023- 24	
CourseObjectives:						
<ol style="list-style-type: none"> 1. To give an introduction to bird science. 2. To make aware of the various protocols in ornithology. 3. To prompt the students to undertake ornithology as a profession or passion. 						
Expected Course Outcomes:						
On the successful completion of the course, student will be able to:						
1	Appreciate the diversity of birds of the world and understand how birds are classified.					K2
2	Learn how birds evolved and are still evolving.					K3
3	Recognize some of the ways that birds communicate, find food, and attract mates.					K4
4	Understand the role of birds in the world and how they interact with ecosystems.					K3
K1-Remember;K2-Understand;K3-Apply;K4-Analyze;K5-Evaluate;K6–Create						
Unit:1	BIRD DESCRIPTION				8 hours	
Classification of birds up to order level. Terms used in description of Birds Plumage & parts – Types of Bills – Types of feet – Identification of birds in the field based on tail, bill, crest, leg & colour.						
Unit:2	BIRD WATCHING AND MIGRATION				8 hours	
Keys for bird identification - Bird watching equipment – Field guides – Photography – identification of calls – Feet and beak modification in Birds, Bird migration - Methods to study migration - Common migrants of south India.						
Unit:3	FORAGING, MATING AND SONG				9 hours	
Diversity of foods and foraging behaviors - Social foraging - mating preferences - Pair-bonds, courtship, and divorce - Production and control of song - Song variation in space and time - Functions of bird song.						
Unit:4	BREEDING				9 hours	
Timing of breeding - Breeding territories - Nests and nest building - Eggs & Clutch size - Clutch and egg replacement- Incubation & Hatching - Altricial and precocial young - Parent/offspring recognition - Parental care in birds.						
Unit:5	DEMOGRAPHY				-9 hours	
Avian populations change – over time and space – Methods of estimation - Classifying bird species assemblages - Recent avian extinctions - Causes of avian population decline - Major threats to bird populations - Conservation solutions - Value of wild birds - Bird data access. Influences of climatic changes in avian communities.						

Unit:6	CONTEMPORARYISSUES	2hours
Expertlectures,onlineseminars –webinars/ Fieldobservations		
TotalLecturehours		45hours
TextBook(s)		
1	SalimAliand S.DillonRipley. (1973). <i>Handbookof theBirds ofIndia andPakistan</i> , Volume 9.Oxford UniversityPress.	
2	PodulkaS,Rohrbaugh RW and BonneyR.(2004). <i>Handbookof birdbiology</i> .CornellLabof Ornithology.	
ReferenceBooks		
1	AliSand RipleySD.(1983). <i>Handbookof thebirds of India andPakistan</i> .Compact edition. OxfordUniversityPressand BNHS,Mumbai.	
2	CaughleyG,SinclairAR. <i>Wildlifeecologyandmanagement</i> .BlackwellScience.	
3	ChinnaSathanandBal Pandey, <i>TheNesting behaviourofIndian Birds</i> , SugeethPublications.	
RelatedOnlineContents[MOOC,SWAYAM, NPTEL, Websitesetc.]		
1	NationalDigital LibraryofIndia https://ndl.iitkgp.ac.in/	
2	CornellLab AllaboutBirds https://www.allaboutbirds.org/guide/	
CourseDesignedBy:Dr.B.RAMAKRISHNAN,Assistant Professor, GAC,Ooty		

MappingwithProgrammeOutcomes										
Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	S	M	M	M	M	M	M	M	M	M
CO2	M	M	M	M	M	M	M	M	M	M
CO3	M	S	S	M	S	S	S	S	M	M
CO4	M	M	M	M	S	M	M	M	S	M

*S-Strong;M-Medium;L-Low

Coursecode	43P	ECOLOGYSANDEVOLUTION		L	T	P	C	
Core/Elective/SBS		CorePracticalIII		0	0	2	2	
Pre-requisite		Knowledgeofanimal anatomy,ecologyand Evolution		Syllabus Version		2023-24		
CourseObjectives:								
<ol style="list-style-type: none"> 1. Todevelophandsonskillindoingecologicalexperiments 2. Tounderstandadaptationsandevolutionarymechanism 								
ExpectedCourseOutcomes:								
Onthesuccessful completionofthecourse, student willbe ableto:								
1	Abletoanalyzevariousecologicalparameters						K3	
2	Ableto identifytheanimals basedon call sounds						K3	
3	Ableto evolutionary principles in her or his own research						K3	
K1-Remember;K2-Understand;K3-Apply;K4-Analyze;K5-Evaluate;K6-Create								
MAJORPRACTICAL								
<ol style="list-style-type: none"> 1. Water quality analyzes – calcium and magnesium 2. Prepare a square (1m²) quadrat and construct a rectangular (0.5m²) and circular (1m radius)quadrat inside the square quadrat estimate the density and project it for 1square km andcomparetheresults. 3. Estimate the Net primary productivity of water sample (Assuming the experiment takingplaceatan aquaticecosystem) usingdark and light bottleexperiment. 4. EstimatethepH,Carbonate&Bicarbonatesingivenwatersamplesandstatetherelationship. 5. Estimatethesalinityatthreedifferenttemperature andPlotthetemperaturealinitygraph. 								
MINORPRACTICAL								
<ol style="list-style-type: none"> 1. Identificationofcallofatleastfivebirdsfromthegiven20 callsounds.(Forexaminationthecall sound can beprojected using audiodevise). 2. Identification of call of at least five birds from the given 20 call sounds. (Forexaminationthecall sound can beprojected using audiodevise). 3. EstimationofTemperatureofGiven WaterSamples 4. IdentificationofZoogeographicalrealmsfromtheworldMap&Describethespecificfauna 5. Demonstrationofusage ofM-StripesappandDistancesoftwareinwildlifecensus. 								
VISITANDSUBMISSION								
Report of Visit to Zoological park (minimum two days or two zoos) and report should besubmittedwithdescriptionofscientificnameandhabitatofanimaldisplayedshouldbesubmittedon the practical exam.								
Reportof participationinawildlifecensusor5dayparticipationinanaturecampor5dayinternshipina sanctuary/reserve /inaninstituteorresearchlab(internalofexternal)ofwildlife Significancewithdescriptionofdailyactivities, proceduresfollowedandobservationsshouldbesubmittedindividually.								

SPOTTERS	
A. Identification: Freshwater and marine planktons B. Biological significance: Rocky, Sandy and Muddy shore fauna C. Comment of Animal Relation Ship: <i>Sacculina</i> on Crab/Hermit Crab & Sea Anemone. D. Ecological Adaptation: <i>Chameleon</i> , <i>Balanus</i> , <i>Chaetopterus</i> , <i>Anabas</i> E. Comment on the Evolutionary Significance; Fossil, <i>Limulus</i> , Analogous organs, Homologous organs.	
Total Practical hours	
60 hours	
Text Book(s)	
1	Slingsby, D and Cook C. <i>Practical Ecology</i> , Palgrave Macmillan publications
2	Practical Zoology Volume 1, 2, 3, Saras Publications, Nagercoil
Course Designed By: Dr. B. RAMAKRISHNAN, Assistant Professor, GAC, Ooty	

Mapping with Programme Outcomes										
COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	S	S	S	M	S	S	M	S	M	S
CO2	M	M	M	S	M	S	S	M	S	M
CO3	S	S	M	M	S	M	M	S	M	S

*S-Strong; M-Medium; L-Low





***Fifth
Semester***

Coursecode	53A	WILDLIFE MANAGEMENT TECHNIQUES	L	T	P	C
Core/Elective/SBS	CoreCourseV		4	0	0	4
Pre-requisite	KnowledgeonBasic conceptsofWildlife		Syllabus Version		2023-24	
CourseObjectives:						
Themain objectives ofthis courseareto:						
<ol style="list-style-type: none"> 1. Totrainthestudentsin theusageofvarious techniquesusedinwildlife sciences. 2. Totrain thestudentsto develop skillin usingvarious instruments. 3. Totrainthestudentsreadingthepopulationestimation techniques. 						
ExpectedCourseOutcomes:						
Onthesuccessful completionofthecourse, student willbe ableto:						
1	Trainedtoassessvariouspopulationestimationtechniques.				K3	
2	Thesudents willbe trained intheusageofvarious wildlifeinstruments.				K3	
3	Abletoidentifyalltheindirectsignsrelatedtowild animals.				K5	
4	Intotalthestudent willdevelopskill inwildlife managementtechniques				K6	
K1-Remember;K2-Understand;K3-Apply;K4-Analyze;K5-Evaluate;K6-Create						
UNIT 1	WILDLIFE MANAGEMENT				14 hours	
Wildlife Management: Basic concepts and principles - Wildlife management before and after implementation of Wild Life (Protection) Act, 1972 – IUCN – CITES – NBA – IBA – Project Tiger – Project Elephant – Project Crocodile. Captive breeding & Reintroduction of wild animals.						
UNIT II	SIGNSURVEYANDOCCUPANCY				14 hours	
Identification of Pug marks & hoof marks ofvarious animals. Identification of scats, dung,pellet based on structure. Other indirect signs of animal presence. Herbivore sign survey andestimationof density– Occupancyanalysisbasedon indirect signsurvey.						
UNIT III	POPULATIONESTIMATION				15 hours	
Quadrat sampling – different types and estimation of density & abundance. Transect lines andsampling- estimation of abundance. Planning of ideal census methods – sample counts – Blockcounts–Roadsidecounts–Dungcount– Pugmark&waterholecounts(Calculationforpopulationnumber estimation in thesemethods), Drones – monitoringterrain &wildlife.						
UNIT IV	CHEMICAL RESTRAINTS				15 hours	
Chemicalrestraints:Advantage&Disadvantage– Syringes&darts–planning operation.Wildlifehealthmonitoring–Bodyconditionevaluation–Monitoringinfection- Infectiousdiseases.Postmortem–Externalexamination–internalexamination– examinationofabnormalities–Preservation&diagnosisofspecimen.						
UNIT V	ZOOS,SANCTUARIES AND NATIONAL PARKS				15 hours	

Zoos, Zoological Parks, Wildlife Sanctuaries, National Parks & Tiger Reserves:
Definition – in-situ and ex-situ conservation, formation, management and administration.
Case studies (VOC park zoo, Arignar Anna Zoological Park, Srivilliputtur Wildlife Sanctuary, Vedanthangal bird sanctuary, Mukkuruthi and Guindy National Parks, Mudumalai and Periyar Tiger Reserves - Nilgiri Biosphere Reserve.

Unit:6	CONTEMPORARYISSUES	2hours
Expertlectures,onlineseminars –webinars		
TotalLecturehours		75hours
TextBook(s)		
1	DasmanRF. <i>Wildlife Biology</i> , JohnWiley&Sons, NewYork.	
2	GilasRHJr.(ed.), <i>WildlifeManagementTechniques,3rded.</i> TheWildlifeSociety, Washington D.C.,NatarajPublishers, DehraDun.	
ReferenceBooks		
1	RobinsonW LandEricGBolen.(2002). <i>WildlifeEcologyand Management</i> ,Maxmillan PublishingCompany,NewYork.	
2	Rodgers WA. (1991). <i>Techniques for Wildlife Census in India - A Field Manual: 5.TechnicalManual-T M-2. WII.</i>	
3	SahariaVB.(1982). <i>WildlifeofIndia</i> ,NatarajPublishers,DehraDun.	
4	TeagueRD(ed.),(1987). <i>AManualof WildlifeConservation</i> (TheWildlifeSociety,8.WsashingtonD.C.). Nataraj Publishers, DehraDun.	
5	WII.AGuidetoChemicalRestraintofAnimals.	
6	Saharia, V.B. 1982 Wildlife in India, Nataraj Publishers, Dehra Dun	
7	Seshadri, B.1986 India's Wildlife reserves, Sterling Pub'rs Pvt. Ltd., New Delhi	
8	Giles, R.H. Jr. (Ed) 1984. Wildlife Management Techniques 3rd edition. The wildlife Society, Washington. D.C. Nataraj Publishers,Dehradun. India	
9	Dasman, Rf. 1964, Wildlife Biology. John and Wiley and sons Newyork. Pp231.	
10	Rodgers, W.A 1991. Techniques for Wildlife census in India – A Field manual technical Manual – Wildlife Institute of India, Dehra Dun	
RelatedOnlineContents[MOOC,SWAYAM, NPTEL, Websitesetc.]		
1	Ecology&Wildlife MOOC https://www.mooc-list.com/course/ecology-and-wildlife-conservation-futurelearn	
2	SwayamPrabha https://swayamprabha.gov.in/index.php/program/current/9/272109	
CourseDesignedBy: Dr.B.RAMAKRISHNAN,Assistant Professor, GAC,Ooty		

MappingwithProgrammeOutcomes										
COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	S	S	M	S	M	S	S	M	S	M
CO2	M	M	M	M	M	M	M	S	M	S
CO3	M	M	S	M	S	S	M	M	M	S
CO4	S	M	S	M	S	M	S	M	M	S

*S-Strong;M-Medium;L-Low



Coursecode	53B	CONSERVATIONBIOLOGY		L	T	P	C
Core/Elective/SBS	CoreCourseVI	4	0	0	4		
Pre-requisite	KnowledgeofAnimal diversity&Ecology	Syllabus version		2023-24			
CourseObjectives:							
1. To give the student a state-of-the-art insight of scientific developments in ConservationBiology.							
2. Tolearntouse this informationinanintegrativeway.							
3. Tostudythevarious conservationmeasures adoptedinIndia.							
ExpectedCourseOutcomes:							
Onthesuccessful completionofthecourse,student willbe ableto:							
1	Analyseandinterpretthe problemsinconservationBiology.						K5
2	Thelearnerwill beabletounderstand thedistribution anddiversityof fauna.						K2
3	Explainthevariousstrategiesadoptedinconservationofvariouspecies.						K6
K1-Remember;K2-Understand;K3-Apply;K4-Analyze;K5-Evaluate;K6-Create							
Unit:1	BIODIVERSITYANDCONSERVATION		14hours				
Biodiversity– Classificationwith examples– <i>insitu</i> & <i>exsitu</i> conservationmethods – Sanctuary –NationalParks–Tigerreserves(examples)–Zoo’s–botanicalgardens–germplasmconservation–DNAlibraries–Tissueculture&cloning.Conservationreserves–SacredGrooves-People participation inConservation.							
Unit:2	WETLANDECOSYSTEM		14hours				
Distribution of Teleosts, Anura&Squamata in India. Conservation of wetlands - EstuarinehabitatsinIndia–Backwaters –Mangroves&significance– impactsofdams.DetailedstudyofPitchavaramMangroves,KuttanadEcosystem,Sundarbans.- MigrationofFishes,Hillstreamadaptationsinfishes.							
Unit:3	AMPHIBIANSANDREPTILES		15hours				
Parental care in amphibians, Origin of Amphibians- Aquatic amphibians andreptiles in India, Conservation &threats to tortoise & turtles - Evolution & Adaptive radiation of Reptiles, Dinosaurs the extinctreptiles,Identificationof Poisonousandnon-poisonoussnakes,Poisonapparatusandtypesof poison.							
Unit:4	DIVERSITYOFMAMMALS		15hours				
DiversityofMarsupials– Aquaticmammalsandadaptation -Adaptive radiation inMammals, Endemic & endangered mammals of south India - Dentition in mammals - Diversity of SmallcatsinIndia,DiversityofCivets&MongooseinIndia-NTCA and Tigermonitoring.							
Unit:5	CONSERVATIONOFMAMMALS		15hours				
Distribution and conservation of Old World Monkeys, Distribution and conservation ofIndianungulates,Corridors - Securing Conservationof Indian Rhino - Breeding biology & feeding ecology of Elephants – Human Corridors (case studies) in India and abroad.conflicts&Mitigation inIndian landscape – UnderstandingNational Biodiversityportal.							

Unit:6	Contemporary Issues	2hours
Expert lectures, online seminars – webinars/ Field studies		
Total Lecture hours		75hours
Text Book(s)		
1	Arumugam N. (2014). <i>Animal Diversity - Volume - 2 - Chordata</i> , Saras Publication, Nagercoil, Tamilnadu.	
2	Ekambaranatha Ayyar and Ananthakrishnan TN. (1993). <i>Manual of Zoology Vol – II</i> , S. Viswanathan Pvt. Ltd. Chennai.	
3	Menon V, S.K Tiwari, K. Ramkuar, Sunil Kyarong, U Ganguly, R. Sukumar. (2017). <i>Right Of Passage: Elephant Corridors of India</i>	
Reference Books		
1	Indraneil Das. (2008). <i>Snakes and other reptiles of India</i> Natraj Publication S, Delhi.	
2	Kartikshanker and Choudhury BC. (2007). <i>Marine turtles of the Indian subcontinent</i> , Natraj Publications, Delhi.	
3	Kotpal RL. (2015). <i>Modern Text Book of Zoology Vertebrates</i> , Rastogi Publications, Meerut.	
4	Prater SH. (1971). <i>The book of Indian animals</i> Natraj Publications, Delhi.	
5	Romulus Whitaker and Ashok captain. (2004). <i>Snakes of India: the field guide</i> , Natraj Publications, Delhi.	
6	Thangamani A, Prasannakumar S, Narayanan LM, Arumugam N. (2018). <i>A Text Book of Chordates</i> , Saras Publication, Nagercoil, Tamilnadu.	
7	Verma PS. (2010). <i>Chordate Zoology</i> , S Chand Publishers, New Delhi.	
8	Anderson J and Slater DL. (1981). <i>Catalogue of Mammals, Vols. I and II</i> , Cosmo Publications, New Delhi.	
Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]		
1	Wildlife Conservation https://swayam.gov.in/nd1_noc20_bt39/preview	
2	National Digital Library of India https://ndl.iitkgp.ac.in/	
Course Designed By: Dr. B. RAMAKRISHNAN, Assistant Professor, GAC, Ooty		

Mapping with Programme Outcomes										
COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	S	M	M	S	M	S	S	S	M	M
CO2	M	S	S	S	M	S	M	M	S	M
CO3	M	S	M	S	S	M	S	S	M	S

*S-Strong; M-Medium; L-Low

Coursecode	53C	BIOLOGY OF VERTEBRATE	L	T	P	C
Core/Elective/SBS	CoreCourseVII		4	0	0	4
Pre-requisite	Knowledgeinanimaldiversity,vertebrate		Syllabus Version		2023-24	
CourseObjectives:						
<ol style="list-style-type: none"> 1. To enable the students, understand the basic principles, classification, diversity and adaptations of vertebrates. 2. To understand what the vertebrates are. 3. To understand different categories of vertebrates. 4. To understand the general characters of each class of vertebrates. 5. To understands the level of organization in vertebrate classes. 6. To understand the origin and evolutionary relationship in different classes of vertebrates 						
ExpectedCourseOutcomes:						
Onthesuccessful completionofthecourse,student willbe ableto:						
1	Student should be able to describe unique characters of amphibians, reptiles, aves and mammals.					K1
2	Student should be able to recognize life functions of amphibians, reptiles, aves and mammals.					K2
3	To understand the ecological role of different classes of vertebrates.					K2
4	To understand the diversity of vertebrates					K2
K1-Remember;K2-Understand;K3-Apply;K4-Analyze;K5-Evaluate;K6–Create						
Unit:1	ICHTHOLOGY				14hours	
Ichthyology: Diversity of fishes, Characteristics of Fishes with suitable examples, Food and feeding habits – breeding habits of fresh water fishes – Detailed study on goldenmahaseer fish						
Unit:2	HERPETOLOGY				14hours	
Herpetology: AMPHIBIA: Diversity, Characteristics of amphibia with suitable examples. Distribution and salient features of South Indian amphibians. Food and feeding habits – breeding habits – detailed study on Rhacophorus malabaricus						
Unit:3	REPTILIA				15hours	
Unit III: REPTILIA: Diversity, Characteristics of Reptilia with suitable examples. Distribution and salient features of South Indian reptiles. Food and feeding habits – breeding habits of Indian Lizards, snakes, turtles, tortoises and crocodiles. Key characters of venomous and non-venomous Snakes						
Unit:4	ORNITHOLOGY				15hours	
Ornithology: Classification of Birds up to orders with suitable examples. Food and feeding habits – breeding habits and Adaptation of Indian birds: Coastal birds – Inland water birds – Birds of terrestrial, high altitudes and deserts. Biology of Bird migration.						

Unit:5	MAMMOLOGY	15hours
Unit V: Mammology: Distribution of mammals - marine, aquatic, arboreal, aerial, fossorial and terrestrial. Food and feeding habits – Herbivores, carnivores and omnivores. Breeding biology of scaly ant-eater, whales, elephant and tiger.		
Unit:6	CONTEMPORARYISSUES	2hours
Expertlectures,online seminars –webinars/visitto institutions.		
TotalLecturehours		75hours
TextBook(s)		
1	1. Khanna,S and H.R Singh.2006.A Text book of fish biology and Fisheries	
2	2. Ranjit Daniels. 2005.Amphibians of peninsular India. Indian Academy of Sciences, Uni. Press, India.	
3	3. Welty, J. 1982. The Life of Birds. Saunders College Publishing, New York.	
4	4. J.C. Daniel. Amphibians and Reptiles of India	
5	5. Prater, Mammals of India	
6	6. Vivek Menon, 2014. Field guide of Mammals of India	
7	7. Ali, S., and S.D. Ripley. 1969. The Handbook of Birds of India and Pakistan. Oxford University Press – Delhi.	
8	8. Farner D.S. and J.K. King. 1971-75. Avian Biology. 1-5 vols. Academy Press, Delhi.	
9	9. Kannan. P. 2014. Snakes and other reptiles of Nilgiris. HADP	
10	10. Whitaker. R. 2002. Snakes of India. A Field Guide.	
ReferenceBooks		
1	Das. I. 1985. Indian Turtles, A field guide. WWF India. B.Sc. Zoology (Wildlife Biology) 2013-14 onwards Annexure No. 24B Page 3 of 13 SCAA Date: 24.04.2015	
2	Day F. 1958. The Fishes of India Vols. I and II. William Dawson and Sons Ltd., London	
3	Deoras, P.J. 1965. Snakes of India. National Book Trust, New Delhi.	
4	Goin. G.J. and O.R. Goin. 1971. Introduction to Herpetology. W.H. Freeman and Company, San Francisco	
5	Lagler, K.F. J.F. Rardoh and R.R. Miller. 1962. Ichthyology. The Study of Fishes. John Wiley and Sons, New York.	
6	Love, M.S. and G.M. Galliet, 1979. Readings in Ichthyology. Prentice - Hall of India, New Delhi.	
7	Murthy, T.S.N. 1987. The snakes of India. International Book Distributors, Dehra Dun	
8	Osellariors, Augue A. and J. Attridge. 1975. Reptiles. Hutchinson University Library, London.	
9	Robinson, D. 1976. Tortoises, Turtles and Terrapins, John Bartholomew & Sons Ltd., Edinburgh	
10	Sedgwick. A. 1962. A student's Text Book of Zoology Vol. II Vertebrata. Central Book Depot. Allahabad.	
11	Young, J.Z. 1950. The life of vertebrates. Clarendon press, Oxford.	
RelatedOnlineContents[MOOC,SWAYAM, NPTEL, Websitesetc.]		
1	NationalDigital LibraryofIndiahttps://ndl.iitkgp.ac.in/	
2	SwayamPrabhahttps://www.swayamprabha.gov.in/index.php/program/archive/9	
CourseDesignedBy:Dr.B.RAMAKRISHNAN,Assistant Professor, GAC,Ooty Dr. N.B.RAJESWARI , Guest Faculty , GAC,Ooty.		

Mapping with Programme Outcomes										
COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	S	M	M	M	M	M	M	S	M	S
CO2	M	S	M	M	M	M	M	M	S	M
CO3	M	S	M	S	S	M	S	M	M	S
CO4	S	S	S	S	M	S	M	S	M	M
CO5	M	M	S	M	S	M	M	M	S	M

*S-Strong;M-Medium;L-Low



Course code	5EA	ECO DEVELOPMENT AND ECOTURISM	L	T	P	C
Core/Elective/SBS	Elective Course I		3	0	0	3
Pre-requisite	Knowledge about the ecology and Ecotourism		Syllabus version		2023-24	
Course Objectives:						
To make the students equipped with principles and applications of Eco-development Programmers						
Expected Course Outcomes:						
On the successful completion of the course, student will be able to:						
1	Explain the diverse nature of tourism, including culture and place, global/local perspectives, and experience design and provision.					K2
2	Develop and evaluate eco-tourism policy and planning initiatives.					K2
3	Apply principles of sustainability to the practice of tourism in the local and global context.					K3
4	Evaluate and apply various research methods commonly used in the context of tourism.					K5
K1-Remember; K2-Understand; K3-Apply; K4-Analyze; K5-Evaluate; K6-Create						
Unit:1	DEFINITION AND PRINCIPLES				8hours	
Definition and Principles of eco-development and eco tourism – Description for identification of areas – Criteria for area identification - identification of resource organizations – Baseline survey						
Unit:2	PARTICIPATORY RURAL APPRAISAL (PRA)				8hours	
Participatory Rural Appraisal (PRA) exercise – History of the area - Collection of socioeconomic details - Preparation of social map- Resource map- problem analysis and prioritization addressing the problems-SWOT analysis						
Unit:3	COMMITTEES				9 Hours	
Formation of Eco-development Committees - Micro plan preparation and its implementation – Finding funding agencies- Fund utilization – Formation of revolving fund – Community development fund – Welfare fund						
Unit:4	ECO CLUBS				9 Hours	
Formation of self help groups, Nature clubs and Eco clubs for students, Wildlife protection team – creation of alternative income generation activities – value addition and utilization of NTFP- Involvement in forest protection and gathering intelligence and information – awards and rewards						
Unit:5	ECO DEVELOPMENT AREA				9Hours	
Study on successful eco development areas – Case studies – Periyar Tiger Reserve and Kalakkad-Mundanturai Tiger Reserves - Monitoring and evaluation of eco-development programmes, data collection, analysis and interpretation, report writing and preparation of eco development Plan						
Unit:6	CONTEMPORARY ISSUES				2hours	

Expertlectures,onlineseminars –webinars	
	TotalLecturehours
	45hours
References Book(s)	
1	Eco Development- Towards a philosophy of environmental Education -Balasubramanian and Arun, Regional Institute of Higher Education, Singapore, 1984
2	Joint Forest Management- The Haryana Experience- Sarin Madhu, Centre for Environmental Education, Ahmedabad, 1996
3	Microplanning Manual for Joint Forest Management areas- Bahshih Singh, Varalekshmi, Tata Energy Research Institute, New Delhi, 1998
4	People and Protected Areas- Towards participatory conservation in India- Ashish Kothari, Neena Singh, Saloni Suri, Sage Publications, New Delhi, 1996
5	Participatory Rural Appraisal- Methods and Applications in Rural Planning- Amitava Mukherjee, Vikas Publishing House, New Delhi, 1995
6	Learning to share- Experiences and Reflexions on PRA and community participation- Neela Mukherjee & others, Concept Publishing Company, New Delhi, 1997
7	Participatory Rural Appraisal- Methodology and Application- Neela Mukherjee, Concept Publishing Company, New Delhi, 1993
8	Ecotourism- A guide for planners and Managers- Lidberg, Kregetc, Natraj Publishers, New Delhi, 1999
9	Tourism and Development in India- Sunitha Chopra, Ashish Publishing House, New Delhi, 1991
RelatedOnlineContents[MOOC,SWAYAM, NPTEL, Websitesetc.]	
1	ForestBiometry https://swayam.gov.in/nd1_noc20_bt04/preview
2	ForestsandtheirManagement https://swayam.gov.in/nd1_noc20_bt01/preview
3	NationalDigital LibraryofIndia https://ndl.iitkgp.ac.in/
CourseDesigned ByDr.B.RAMAKRISHNAN,Assistant Professor, GAC,Ooty Dr. R.S.SUNDARRAJ ,Guest Faculty , GAC,Ooty.	

MappingwithProgrammeOutcomes										
COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	S	M	M	S	M	M	M	M	M	M
CO2	M	S	M	M	M	M	M	M	S	M
CO3	S	M	M	L	M	L	M	M	L	M
CO4	M	M	M	M	L	M	M		S	S

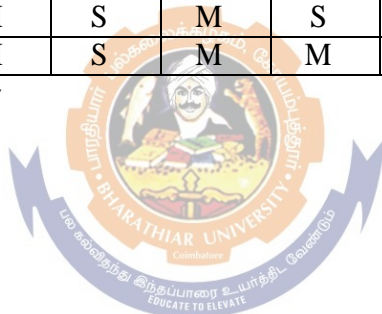
*S-Strong;M-Medium;L-Low

Coursecode	5EB	INDIANWILDLIFELAWS&FORENSICS.	L	T	P	C
Core/Elective/SBS	Electivecourse II		3	0	0	2
Pre-requisite	Basicknowledgeonwildlifeconservation		Syllabus version		2023-24	
CourseObjectives:						
1. Tomakethestudentgetawarewithvariouslegislationsrelatedtowildlifeandconservation.						
2. Tomakethestudent getfamiliarwithwildlifeconservation.						
ExpectedCourseOutcomes:						
Onthesuccessful completionofthecourse,student willbe ableto:						
1	Abletofollowandinterpretvariousrules andregulationsrelatedtowildlife.					K2
2	Identifyvarious crimesand give necessaryinformation to publicregardingthe Wildlifeconservation.					K3
3	Thelearner will beableto identifythe necessityof forensicsrelated to wildlife Crimes.					K3
K1-Remember;K2 -Understand;K3-Apply;K4- Analyze;K5-Evaluate; K6-Create						
Unit:1	BIODIVERSITYACT				8hours	
HistoryofWildlifelawsinIndia –HighlightsofBiologicalDiversityAct,2002&Biological DiversityRules, 2004.						
Unit:2	WPAANDCONSERVATION				9hours	
Introduction to Wildlife Protection Act (over view of Chapters) - Declarations & regulationsrelatedtoSanctuaries ,Nationalparks&Closedareas– CentralZooAuthority&recognitionof Zoos.						
Unit:3	WPA-TRADE				8hours	
Prohibitionoftraderelated towildlife– Prevention&detectionofoffences.Introductionto animalinvolvedin Schedule Ito V.Plantsin ScheduleVI.Overview ofAmendments.						
Unit:4	WILDLIFETRADE				9hours	
Wildlifetrade–importantspeciesandparts traded-specialreferencetoturtles,reptiles,birds andmammals.Collectionofphysicalandbiologicalevidencesfromcrimescene.Radioisotopesinforensics						
Unit:5	WILDLIFEFORENSICS				9hours	
Forensic entomologyinwildlifecrimes-wildlife toxicology-cyber forensics inwildlife- forensic veterinary pathology - forensic photography - role of diatoms in wildlife forensics – Introductiontomolecularforensics –species,sexandgeo-referencingsamples–FINS.						
Unit:6	CONTEMPORARYISSUES				2hours	
Expertlectures,onlineseminars–webinars,Fieldvisit						
TotalLecturehours					45hours	

TextBook(s)	
1	Lawmann.(2017). <i>WildlifeProtectionAct1972</i> ,KamalPublishers,NewDelhi.
2	MajumdarAB(Author),NandyD,MukherjeeS.(2013). <i>EnvironmentandWildlife Laws in India</i> , LexisNexisPublishers.
ReferenceBooks	
1	HuffmanJEandWallace JR.(2018). <i>WildlifeForensicsMethodsandApplications</i> , Willey BlackwellPublishers,UK.
RelatedOnlineContents[MOOC,SWAYAM, NPTEL, Websitesetc.]	
1	TheIndianWildlife(Protection)Act1972 http://envfor.nic.in/legis/wildlife/wildlife1.html
2	https://Indiacode.nic.in/bitstream/123456789/1726/1/197253.pdf
CourseDesignedBy:Dr.B.RAMAKRISHNAN,Assistant Professor, GAC,Ooty Dr. N.B.RAJESWARI ,Guest Faculty , GAC,Ooty.	

MappingwithProgrammeOutcomes										
COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	S	M	S	M	S	S	M	M	S	M
CO2	M	S	M	S	M	S	M	S	M	S
CO3	M	S	M	S	M	M	M	M	S	S

*S-Strong;M-Medium;L-Low



Coursecode	5ZC	BIostatistics and Computer Applications	L	T	P	C
Core/Elective/SBS	Skill Based Course III		2	0	0	2
Pre-requisite	Aptitude in basic Mathematics & Biology		Syllabus version		2023-24	
Course Objectives:						
1. To develop awareness about the application of statistics in Wildlife Biology 2. To train how the biological data are processed and interpretations are made. 3. To give an introduction to computer and databases.						
Expected Course Outcomes:						
On the successful completion of the course, student will be able to:						
1	The course will give an idea how data should be managed & processed.					K2
	The course will develop the research aptitude of the students.					
2	The course will help use of different statistical tools to interpret at the research aptitude of the students.					K2
K1-Remember; K2-Understand; K3-Apply; K4-Analyze; K5-Evaluate; K6-Create						
Unit:1	SAMPLING AND GRAPH				8 hours	
Types of Sampling – Concept of Sampling in Biology. Frequency distribution – Individual, discrete & Continuous series. <i>Drawing practice:</i> Histogram, Ogive, Bar, Pie chart.						
Unit:2	MEASURES OF CENTRAL TENDENCY				9 hours	
Concept & equations of Mean & deviation (individual, discrete & continuous series) <i>Problem Solving:</i> (individual series alone) Mean, median, mode and Standard Deviation.						
Unit:3	CORRELATION AND REGRESSION				9 hours	
Concept & types of Co-relation & regression. <i>Problem Solving:</i> Co-efficient of Correlation, Regression for X on Y & Y on X.						
Unit:4	TESTS OF SIGNIFICANCE				8 hours	
Concept of Student's "t", Chi square. <i>Problem Solving:</i> "t" test – independent & dependent, Chi square.						
Unit:5	COMPUTER-APPLICATION				9 hours	
Central Processing Unit – Output & Input devices – Storage devices – Software & hardware – Basic operation of MS Word, Excel & Power Point – Browsers & Search engines – Introduction to Biological databases – significance of NCBI – Taxonomic browser.						
Unit:6	CONTEMPORARY ISSUES				2 hours	
Expert lectures, online seminars – webinars						
Total Lecture hours					45 hours	
Text Book(s)						
1	Ramakrishnan P. (2015). <i>Biostatistics</i> , Saras Publication Nagercoil, Tamilnadu.					

2	ArumugamN.(2015). <i>BasicConceptsofBiostatistics</i> ,SarasPublicationNagercoil, Tamilnadu,
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ReferenceBooks	
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1	BanerjeePK. (2014). <i>IntroductiontoBiostatistics</i> ,5 th edition,S.ChandPublication,New Delhi.
2	PandeyM.(2015). <i>BiostatisticsBasicandAdvanced</i> , PublishersVivaBooks,NewDelhi.

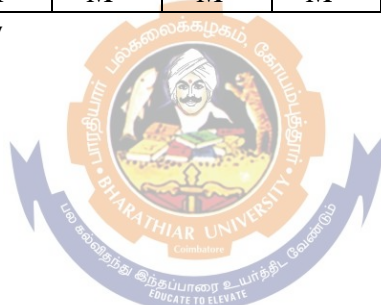
RelatedOnlineContents[MOOC,SWAYAM,NPTEL,Websitesetc.]	
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1	IntroductiontoBiostatistics https://swayam.gov.in/nd1_noc19_bt19/preview
2	BiostatisticsandDesignexperiments https://swayam.gov.in/nd1_noc20_bt11/preview
3	NationalDigital LibraryofIndia https://ndl.iitkgp.ac.in/

CourseDesignedBy:Dr.B.RAMAKRISHNANAssistant Professor, GAC,Ooty
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MappingwithProgrammeOutcomes										
COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	M	M	M	M	M	S	M	S	M	M
CO2	M	S	M	M	M	M	S	M	S	S

*S-Strong;M-Medium;L-Low





***Sixth
Semester***

Coursecode	63A	FORESTRY & SILVICULTURE	L	T	P	C
Core/Elective/SBS	Core Course VIII		4	0	0	4
Pre-requisite	Basicknowledgeaboutforestmanagement		Syllabus version		2023-24	
CourseObjectives:						
<ol style="list-style-type: none"> TheForestrycourseisdesigned to teach technicalknowledge. Todevelopskillsforalearneron forest management. 						
ExpectedCourseOutcomes:						
Onthesuccessful completionofthecourse,student willbe ableto:						
1	Gainknowledge anddevelopa goodideaaboutsilviculture.					K2
2	Familiarizeandaware withsocialforestryandagroforestry&itsmanagement.					K2
3	Understandandabletocarryout forestsurvey.					K3
4	Thelearnercan involvein forestmanagementandpreparationinventories.					K3
K1-Remember;K2-Understand;K3-Apply;K4-Analyze;K5-Evaluate;K6-Create						
Unit:1	SILVICULTURE				14hours	
Factors influencing vegetation – Regeneration of forests – Methods of propagation – grafting - Nursery & Planting techniques - Clear felling, Coppice and Conversion systems – SilviculturemanagementinIndia.						
Unit:2	MENSURATION&SURVEY				15hours	
Methods of measuring - diameter, girth, height and volume of trees - form-factor - volumeestimation of stand - annual increment. Sampling methods and sample plots. Methods of forestsurvey–map reading.						
Unit:3	FORESTMANAGEMENT				14hours	
Types of forests in India – identification and dominant flora – Impact of fire on forests – Biotic threats on forest – Proliferation of IAS in forest - Preparation of inventories – Management of forestplantations– commercialforests–forest cover monitoring.						
Unit:4	SOCIALFORESTRY&MANAGEMENT				15hours	
Agroforestry – Scope & necessity. Social/Urban Forestry – Joint Forest Management – Tribalparticipationinforest management.Soil conservation –causes oferosion –roleof forests.Watershedmanagement & Environmentalfunction offorests.						

Unit:5	FORESTRESOURCEUTILIZATION	15hours
Harvesting practices – logging and extraction - Non timber forest products – Wood seasoningandpreservation–Compositewoods-Anatomicalstructureofwood-defectsandabnormalities.Timberidentification.		
Unit:6	CONTEMPORARYISSUES	2hours
Expertlectures,onlineseminars –webinars		
TotalLecturehours		75hours
TextBook(s)		
1	ArumugamNandKumaresanV.(2014). <i>EnvironmentalStudies</i> ,SarasPublicationNagercoil,Tamilnadu.	
2	AgarwalaVP.(1980). <i>ForestsIndia</i> .OxfordandIBHPublishingCo.,NewDelhi.	
3	K.Manikandan and S.Prabhu .(2015) <i>Indian Forestry : A Break through Approach to Forest service.</i> ,Fourth revised edition, Jain brothers ,New Delhi	
ReferenceBooks		
1	PuriGS,MeherVM,GuptaRKandPuriS.(1981). <i>ForestEcology</i> .OxfordandIBHPublishingCo., NewYork.	
2	StebbinEP.(1977). <i>AManualofElementaryForestZoologyForIndia</i> .InternationalBookDistributors,DehraDun.	
3	SukachevVandDlisN.(1964). <i>FundamentalsofForestBiogeocoenology</i> ,OliverandBoyd,Edinburgh.	
4	Tiwari KM and Singh RV. (1980). <i>Social Forestry Plantations</i> . Oxford and IBH PublishingCo.,New Delhi.	
5	WarningRHandSchlesingerWH.(1985). <i>ForestEcosystems:ConceptsandManagement</i> . AcademicPress,New York.	
RelatedOnlineContents[MOOC,SWAYAM,NPTEL,Websitesetc.]		
1	ForestBiometry https://swayam.gov.in/nd1_noc20_bt04/preview	
2	ForestsandtheirManagement https://swayam.gov.in/nd1_noc20_bt01/preview	
3	NationalDigital LibraryofIndia https://ndl.iitkgp.ac.in/	
CourseDesignedBy:Dr.B.RAMAKRISHNAN,Assistant Professor, GAC,Ooty		

MappingwithProgrammeOutcomes										
COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	S	M	M	M	M	M	S	M	M	S
CO2	M	S	S	S	M	M	M	M	S	M
CO3	S	M	M	S	S	S	S	S	M	M
CO4	M	M	S	M	M	S	S	M	M	S

*S-Strong;M-Medium;L-Low

Coursecode	63B	ANIMALBEHAVIOUR	L	T	P	C
Core/Elective/SBS	CoreCourse IX		4	0	0	4
Pre-requisite	KnowledgeofAnimalecologyandevolution		Syllabus version		2023-24	
CourseObjectives:						
Themain objectives ofthis courseareto:						
<ol style="list-style-type: none"> 1. Thecoursewillgive abasicideaofdifferents types ofanimalbehavioranditssignificance. 2. Thecoursealsogivesaninsighttothestudentsaboutthereasonforvarious typesofbehavior. 3. Thecoursealsoexplainshowdifferent animalsadaptdifferentbehaviorinorderto overdifferentstrategies and how it is used inadaptation. 						
ExpectedCourseOutcomes:						
Onthesuccessful completionofthecourse,student willbe ableto:						
1	Thestudentwill beable toexplain thebasic conceptsof animalbehavior.					K2
2	Observeandunderstand thereasonsof variousstrangebehaviour inanimals.					K2
3	Analysethevariousanimalrelationsinaninterdisciplinaryapproach.					K4
K1-Remember;K2-Understand;K3-Apply;K4-Analyze;K5-Evaluate;K6-Create						
Unit:1	INTRODUCTION TO BEHAVIOUR				15hours	
Historicaloutlines –patterns,objectives&mechanismofbehavior.Reflex action-types-Reflex arch - complex behaviour. Kinesis: orthokinesis&klinokinesis. Taxis: kinds of taxis -Sun-compassorientation, dorsal-lightreaction –Biological rhythms.						
Unit:2	LEARNING AND MOTIVATION				14hours	
Learning &Instinct: conditioning, habituation, sensitization, reasoning -classical and modernconceptswithexamples.Motivation–types,models&examples –Motivationalconflict – decisionmaking&displacement. Hormones&Pheromones in behavior.						
Unit:3	ALTRUISM AND SEXUAL SELECTION					
Altruism and evolution-reciprocal altruism - group selection - kin selection - inclusive fitness,cooperation.Parentalcare&Costbenefitanalysis.Courtship-Malerivalry–Female choice–Infanticide–Mate guarding–Crypticmatechoice-Polygamoussexualconflicts.						
Unit:4	SOCIAL ORGANISATION AND COMMUNICATION				15hours	
SocialOrganizationinhoneybees–foraging–Beedance.Echolocationinbats–Herdcompositioninelephants–Migratorypathandconceptofcorridor.SocialbehaviorinFelids–Predation. Pack formation and splitting in Wild dogs. Social Spacing– Communal defense-Aggression-territorydefending.						
Unit:5	COMMUNICATION				15hours	
SongofBirds& behavior– rolein mating–territorydefending&others.Vocal communication inmammals –interspeciesandintraspecificsignificance.AlarmCallsinanimals-Signals&cues. Crypsis&Mimicry — Evolution of sex– Methodsto studybehavior.						

Unit:6	CONTEMPORARYISSUES	2hours
Expertlectures,onlineseminars –webinars		
TotalLecturehours		75hours
TextBook(s)		
1	Arumugam NA and Natarajan P. <i>Animal Behaviour – Ethology</i> , Saras PublicationNagercoil,Tamilnadu.	
2	RidleyM.(1986). <i>AnimalBehaviour -AconciseIntroduction</i> ,BlackwellScientific Publications,Oxford.	
ReferenceBooks		
1	LeshnerAI,(1978). <i>An IntroductiontoBehaviouralEndocrinology</i> ,OxfordUniversityPress, NewYork.	
2	SlaterPJB.0(1985). <i>AnIntroductiontoEthology</i> ,Cambridge UniversityPress,Cambridge.	
3	WallaceRA.(1979). <i>TheEcology andEvolutionofAnimalBehaviour</i> ,Goodyear Publishing CompanyInc.,SantaMonica,California.	
4	WilsonEO.(1978). <i>Sociobiology</i> ,TheBelknapPress,HarvardUniversityPress,Cambridge, MA.	
5	ManningAandDawkins MS.(2012). <i>An Introduction toAnimal Behaviour</i> ,6 th edition, Cambridge UniversityPress, UK.	
6	MarlerPand HamiltonJ.(1966). <i>Mechanismof AnimalBehaviour</i> ,JohnWiley&Sons, USA.	
7	DavidMcFarland. (1985). <i>AnimalBehaviour</i> ,PitmanPublishingLimited,London,UK.	
RelatedOnlineContents[MOOC,SWAYAM, NPTEL, Websitesetc.]		
1	NationalDigital LibraryofIndia https://ndl.iitkgp.ac.in/	
2	SwayamPrabha https://www.swayamprabha.gov.in/index.php/program/archive/9	
3	AnimalBehaviourMOOCcourse https://www.mooc-list.com/tags/animal-behaviour	
4		
CourseDesignedBy: Dr.B.RAMAKRISHNAN,Assistant Professor, GAC,Ooty Dr. N.B.RAJESWARI , Guest Faculty , GAC, Ooty.		

MappingwithProgrammeOutcomes										
COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	S	M	M	S	M	M	S	M	M	M
CO2	M	M	M	M	M	M	M	M	S	S
CO3	M	S	M	M	M	M	M	S	S	S
CO4	S	M	M	S	M	M	S	M	S	S
CO5	M	M	S	M	M	S	M	M	M	M

*S-Strong;M-Medium;L-Low

Coursecode	63C	AQUATIC BIOLOGY AND WETLAND ECOSYSTEM	L	T	P	C
Core/Elective/SBS	Core CourseX			4	0	0 3
Pre-requisite	Knowledge of Animal ecology and evolution			Syllabus Version	2023-24	
Course Objectives:						
1. Objectives: To make the students equipped with principles and applications of Fresh water and Estuarine Ecosystem.						
Expected Course Outcomes:						
On the successful completion of the course, student will be able to:						
1	Understand the dynamics of aquatic ecosystems and their potential responses to changes					K2
2	Apply conservation and management principles for conservation and sustainable use of aquatic resources					K3
3	Analyse and critically evaluate ideas, data and information and apply relevant scientific principles to solve problems by, for example, creating hypotheses, testing theories and predictions, designing and conducting experiments and statistically analysing data					K4
K1-Remember; K2-Understand; K3-Apply; K4-Analyze; K5-Evaluate; K6-Create						
Unit:1	LIMNOLOGY				14hours	
Limnology: Introduction, History, Present Status of Limnology. Definition of limnology. Freshwater environments: Extent and distribution of fresh waters. Lotic environments. Freshwater communities. Wetlands. Definition and classification of freshwater wetlands- natural and man-made.						
Unit:2	PONDS				15hours	
Ponds: Classification of ponds. Physicochemical properties of pond water. Primary production. Swamps and marshes: Types of swamps. Permanent and seasonal swamps. Physicochemical conditions, Nutrient cycling, Biotic components.						
Unit:3	LAKE AND RESERVOIRS				15hours	
Lakes and reservoirs: Origin. Characteristics. Classification. Eutrophication and pollution of lakes. Ramsar sites in South India. Rivers: Origin and characteristics of river. Functions. Biological productivity. Reservoir, impact of reservoir in wildlife.						
Unit:4	MAJOR THREATS OF FRESHWATER ECOSYSTEM				15hours	
Major threats to freshwater ecosystems, including pollution and sand mining. Impact of large dams and fragmentation on river ecology and fishery. Association of birds and other wildlife with wetland ecosystems.						
Unit:5	THE ESTUARINE ENVIRONMENT				14hours	

The estuarine environment: Dynamics of estuaries. Biodiversity of estuarine systems. Backwaters and estuaries of South India. Mangrove ecosystems: Definition, Origin, Adaptations of mangrove flora and fauna. Major mangrove ecosystems in India		
Unit:6	CONTEMPORARYISSUES	2hours
Expertlectures,onlineseminars –webinars		
TotalLecturehours		75hours
ReferenceBooks		
1	Wetzel, R.G. 1983. Limnology: Second Edition. Michigan State University. C.B.S	
2	2. Welch, P.S. 1952. Limnology. 2nd Edition. McGraw Hill Book Co. NY. P536.	
3	3. Odum. E.P. 1971. Fundamentals of Ecology. Sounders Publ. Philadelphia, p. 574.	
4	4. Veerbala Rastogi and Jayaraj. 1986. Fundamentals of Ecology. Kedharnath publication	
5	5. Sheeja and Ebanasar. 2006. Ecosystem dynamics of ponds and rivers in India. Shine and Twinkle pub.	
6	6. Handbook Of Tropical Estuarine Biology by S.Z, Qasim, 2004	
RelatedOnlineContents[MOOC,SWAYAM, NPTEL, Websitesetc.]		
1	NationalDigital LibraryofIndia https://ndl.iitkgp.ac.in/	
2	SwayamPrabha https://www.swayamprabha.gov.in/index.php/program/archive/9	
CourseDesignedBy:Dr.B.RAMAKRISHNAN,Assistant Professor, GAC,Ooty Dr. C. PRIYA , GuestFaculty,GAC,Ooty.		

MappingwithProgrammeOutcomes										
Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	S	M	M	S	M	M	S	S	M	M
CO3	M	S	M	M	S	S	M	S	M	S
CO3	S	M	M	M	M	M	S	M	S	S

*S-Strong;M-Medium;L-Low

Coursecode	6EA	MARINE NATIONAL PARKS IN INDIA	L	T	P	C
Core/Elective/Supportive	ElectivecourseIII		3	0	0	3
Pre-requisite	Basicknowledgeinmarine animals and national parks		Syllabus Version		2023-2024	
CourseObjectives:						
To understand the significance of Marine National Parks, its habitats and their functioning.						
To understand the threats of marine national parks						
To study the Laws of Regulation.						
ExpectedCourseOutcomes:						
Onthesuccessful completionofthecourse,student willbe ableto:						
1	Basic oceanography to understand influence of unique characteristics of marine environments on marine life.				K2	
2	Mechanistic understand of how process occurring within organisms interact with higher- level organization.				K2	
3	Integrated approaches to studying population ecology, marine habitats, and ecosystem. In depth for select habitats and ecosystem.				K4	
K1-Remember;K2-Understand;K3-Apply;K4-Analyze;K5-Evaluate;K6-Create						
Unit:1	INTRODUCTION TO MARINE NATIONAL PARKS				9hours	
Introduction to Marine National Parks –Characteristics of Marine National Parks-Physical, Chemical and Biological factors; Values and importance of Marine National Parks, their biodiversity wealth. Significance of Marine protected Areas – MPAs Network in India						
Unit:2	MARINE MAMMALS				8hours	
Marine Mammals: Diversity, distribution, distinctive features, adaptations and conservations. Important Marine Wild Animals and their Importance of Marine Mammals: Seals, otters, Walruses, Whales, Dolphins, porpoises and Dugong. Marine Birds, Marine Turtles and Snakes. Aquatic Mammals and their Morphological adaptations.						
Unit:3	THREATS OF MARINE NATIONAL PARKS				8hours	
State and Central Government initiatives to conserve marine national parks in India. Threats to Marine national parks: Climate change, Invasive alien species, faster economic development. Organizations involved in marine National parks – WII, BNHS,DOD, CMFRI, Threats and conservation of Marine national park: Anthropogenic pressure –Pollution and its effect on marine national parks in India. Remedial measures.						
Unit:4	DETAILED STUDY ON MARINE NATIONAL PARKS				9hours	
Rani Jhansi Marine National Park in Andaman and Nicobar Islands, Gahirmatha Marine Park in Odisha, Gulf of Mannar Marine National Park In Tamil Nadu, Malvan Marine Park in Maharashtra, Mahatma Gandhi Marine National Park In Andaman and Nicobar Islands, Marine National Park In Gujarat.						
Unit:5	LAWS AND REGULATIONS				9hours	

Laws and regulations: Biodiversity Act 2002 –Marine National Park related laws and regulation. The Indian Fisheries Act -1857- Water prevention and control of pollution Act 1974 , 1976. Coastal Zone Regulation Act 1991 and its amendments. Exclusive Economic Zone (EEZ). Integrated Coastal Zone Management (ICZM).		
Unit:6	CONTEMPORARYISSUES	2hours
Expertlectures,onlineseminars –webinars		
TotalLecturehours		45hours
TextBook(s)		
1	Prater,S.H. 1971. The Book of Indian Animals.Bombay Natural History Society.Oxford University Press, Chennai.	
2	Thangamani <i>et.al.</i> 2007.A text book of Chordated .SarasPublication,Nagercoil.Kanyakumari.	
3	Marine Parks and Aquaria of the United States: A Reference Guide Hardcover – Import, 1 January 1990 by Anthony L. Pacheco(Author), Susan E. Smith(Author)	

ReferenceBooks	
1	Invitation to Oceanography by Paul R. Pinet 2013, Jones & Bartlett Learning publication house
2	An Introduction to the Biology of Marine Life, James Sumich WCB/McGraw Hill 1999
3	Bal and Rao. 1989. Marine Biology.
4	Venkataraman,K.,Sivaperman C., and C.Raghunathan (Editors) 2013.Ecology and Conservation of Tropical Marine Faunal Communities.Springer Heidelberg New York,London.
RelatedOnlineContents[MOOC,SWAYAM, NPTEL, Websitesetc.]	
1	NationalDigital LibraryofIndia https://ndl.iitkgp.ac.in/
2	SwayamPrabha https://www.swayamprabha.gov.in/index.php/program/archive/9
CourseDesignedBy:Dr.P.KANNANAssistant Professor, Thiru.Vi.Ka.GAC,Thiruvarur.	

MappingwithProgrammeOutcomes										
Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	S	L	M	M	L	M	S	M	S	M
CO2	L	M	S	L	M	L	M	S	M	S

*S-Strong;M-Medium;L-Low

Coursecode	6EB	FIELD BIOLOGY,GEO-INFORMATICS AND	L	T	P	C
Core/Elective/SBS	ElectiveIV		2	0	0	3
Pre-requisite	Knowledge of ecology and statistics		Syllabus Version	2023-2024		
Course Objectives:						
<ol style="list-style-type: none"> 1. To give an introduction to basic geology. 2. To give ideas about the usage of GIS software. 3. To train the students in the creation of maps. 						
Expected Course Outcomes:						
On the successful completion of the course, student will be able to:						
1	Understand the use of geological principles in wildlife sciences.					K3
2	Able to geo-reference the data in cartograms.					K3
3	The students will be able to overlay layers in maps and generate it.					K3
K1-Remember;K2-Understand;K3-Apply;K4-Analyze;K5-Evaluate;K6-Create						
Unit:1	INTRODUCTORY GEOLOGY				10 hours	
Map reading – topo sheets – Google map – satellite imageries – contours, hilly areas, valleys, drainage, reservoirs, buildings, settlements, roads, trek paths, cultivated areas, state boundary, RF boundary. Digital images & pixels – Latitudes & longitudes - Topography maps – Contour lines – Colours & symbols – Scale – types & measuring distance - Mountains & Plateaus in India – Major rivers in India.						
Unit:2	GPS				9 hours	
GPS - applications in identifying locations mapping & Navigation. Introduction to GIS maps – Digitization of Maps and Projection. Brief outlines to ArcView – Mapinfo & QGIS. Satellite images and availability.						
Unit:3	DATA ANALYSIS				8 hours	
Data Entry and Preparation, Spatial Data Generation, Concept of Database and Metadata, Spatial Modelling and Data Visualization.						
Unit:4	MANAGING DATA SOURCE				8 hours	
Opening Data – CRS – OTF – XML files – Shape files – Delimited text files / CSV files - creating layers – Exploring data formats and fields.						
Unit:5	MAP MAKING				8 hours	
Working with Raster and Vector data in GIS software. Usage of general tools in Q- GIS - transferring of GPS data to GIS and remote sensing in wildlife conservation. Mapmaking. Mountains & Plateaus in India – Major rivers in India.						
Unit:6	CONTEMPORARY ISSUES				2 hours	
Expert lectures, online seminars – webinars						
					Total Lecture hours	45 hours
Text Book(s)						

1	Kang-tsung.(2006). <i>ChangIntroductiontoGeographicInformationSystems</i> . McgrawHigher Ed,NY.
2	Chipman LK.(2015). <i>RemoteSensingAndImageInterpretation</i> .7 th edition.Wiley.
ReferenceBooks	
1	ElangovanKGIS: <i>Fundamentals,ApplicationsandImplementations</i> ,New IndiaPublishing Agency
	Giles, R.H. Jr. (Ed) 1984. Wildlife Management Techniques 3rd edition. The wildlife Society, Washington. D.C. Nataraj Publishers, Dehradun. India
	Dasmann, Rf. 1964, Wildlife Biology. John and Wiley and sons Newyork. Pp231.
	Rodgers, W.A 1991. Techniques for Wildlife census in India – A Field manual technical Manual – Wildlife Institute of India, Dehra Dun
RelatedOnlineContents[MOOC,SWAYAM, NPTEL, Websitesetc.]	
1	QGISUserGuideRelease2.8. https://docs.qgis.org/2.8/pdf/en/QGIS-2.8-UserGuide-en.pdf .
2	MapInfoProfessional. https://en.wikipedia.org/wiki/MapInfo_Professional .
3	ArcGIS https://en.wikipedia.org/wiki/ArcGIS .
CourseDesignedBy:Dr.B.RAMAKRISHNAN,Assistant Professor, GAC,Ooty	

MappingwithProgrammeOutcomes										
COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	S	M	M	S	S	M	S	S	S	M
CO2	M	S	S	M	M	S	M	M	M	S
CO3	M	S	M	M	M	S	M	M	M	S

*S-Strong;M-Medium;L-Low

Coursecode	6ZB	FOREST BASED INDUSTRY USING EXOTIC SPECIES (LANTANA,LAC)	L	T	P	C
Core/Elective/SBS		SkillBasedCourseIV	2	0	0	2
Pre-requisite	Knowledgeof exotic species and Lac		Syllabus Version		2023-24	
CourseObjectives:						
<ol style="list-style-type: none"> 1. To develop entrepreneurship in forest resource based industry. 2. To eradicate exotic species in forest area. 3. To develop sustainable use of exotic species. 						
ExpectedCourseOutcomes:						
Onthesuccessful completionsofthecourse,student willbe ableto:						
1	Make the students to understand the impact of exotic species in forest area.					
2	Apply different strategies to value add on the byproduct of exotic species.					
3	The students will be able to analyze pre and post eradication of exotics in forest area.					
4	To create the students as entrepreneurship for the successful utilization of exotic species as their livelihood income.					
K1-Remember;K2-Understand;K3-Apply;K4-Analyze;K5-Evaluate;K6-Create						
Unit:1	LANTANA CAMERA				5hours	
Lantana camera - Introduction, History, Distribution, Habitat, Morphology, Chemical constituents and ecology.Process making lantanafurniture, marketing lantana furniture.						
Unit:2	INDUSTRIAL USES OF LANTANA				6hours	
Lantana camera: Industrial uses – Paper industry – Rubber industry; Medical uses – Folkloric uses ,other economic uses (Green herbicides, insecticides ,biocides, fungicides.)						
Unit:3	POSITIVE AND NEGATIVE IMPACT OF LANTANA CAMERA				6hours	
Positive impact of Lantana camera- Herbal Medicine, Industrial Uses of Lantana, Mulching for Soil Fertility.Invasion by L. camara, Lantana and Fire, Allelopathic Effect, Impact on wild animal and Livestock.						
Unit:4	LAC CULTURE				5hours	
Lac Introduction – Lac insect Taxonomy –Distribution – Life cycle – Host Plants – Strains of Lac insects –Lac cultivation (Local practice, Improved practice,Propagation of lac insect, Innoculation period,harvesting of lac) , composition of Lac						
Unit:5	LAC PROCESSING				6hours	
Stick lac, seed lac, shellac –Hand madeprocess , Heat process, Solvent process; Lac products and their use – Lac dye ,Lac wax ,Shellac, Bleached shellac, Dew axed bleached shellac , Aleuritic acid(Shellac Aleuritic powder).						

Unit:6	CONTEMPORARYISSUES	2hours
Expertlectures,onlineseminars –webinars		
TotalLecturehours		30hours
TextBook(s)		
1	Lac-Culture in Indiaby N. Ghorai	
2	Text Book Of Applied Zoology, Vermiculture, Apiculture, Sericulture, Lac-Culture, Agricultural Pests And Their Controls Paperback – 1 January 2005	
3	Text Book of Applied Zoology: Vermiculture, Apiculture, Sericulture, Lac Culture, Agricultural Pests and their Controls Hardcover – 1 February 2008 ,by Pradip Jabde(Author)	
4	Lac Crop Harvesting and Processing In book: Industrial Entomology (pp.181-196) February 2017	
ReferenceBooks		
1	Lantana camara Linn. (Verbenaceae) Michael D. Day and Myron P. Zalucki	
2	Ecology and Use of Lantana camara in India. The Botanical Review Girish C. S. Negi, Subrat Sharma, Subash C.R. Vishvakarma, Sher S. Samant, Rakesh K. Maikhuri, Ram C. Prasad & Lok M. S. Palni	
RelatedOnlineContents[MOOC,SWAYAM, NPTEL, Websitesetc.]		
1	https://swayam.gov.in/nd2_cec19_bt05/preview 2	
2	https://link.springer.com/content/pdf/10.1007/s12229-019-09209-8.pdf	
CourseDesignedBy:Dr.B.RAMAKRISHNAN,Assistant Professor, GAC,Ooty Dr. N.B.RAJESWARI ,Guest Faculty , GAC,Ooty.		

MappingwithProgrammeOutcomes										
COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	M	M	M	M	M	M	M	M	M	M
CO3	S	M	S	M	M	S	M	M	M	M
CO3	M	M	M	M	S	M	M	S	M	M
CO4	M	M	M	M	M	M	M	M	M	S

*S-Strong;M-Medium;L-Low

Coursecode	63P	FUNDAMENTALS OF WILDLIFE BIOLOGY – PRACTICAL	L	T	P	C
Core/Elective/SBS	Core Practical III		0	0	2	2
Pre-requisite	Knowledge in basic concepts of wildlife sciences		Syllabus Version		2023-24	
Course Objectives:						
<ol style="list-style-type: none"> 1. Give an insight to basics of life sciences 2. Handling experiments related to life science 3. Gain hands-on experience in experimentation 						
Expected Course Outcomes:						
On the successful completion of the course, student will be able to:						
1	Do basic experiments in life sciences					K3
2	Develop analytical skills in experimentation					K3
3	Making observations during experimentation					K3
4	Interpret the results of experiments					K3
K1–Remember; K2–Understand; K3–Apply; K4–Analyze; K5–Evaluate; K6–Create						
MAJOR PRACTICAL						
Wildlife Management Techniques						
<ol style="list-style-type: none"> 1. Vegetation analysis – Quadrat method 2. Population estimation of herbivores – Block count method 3. Population estimation of carnivores - Pugmark tracing 4. Camera trapping of tiger 						
Biology of vertebrates						
<ol style="list-style-type: none"> 5. Classification and identification of fishes, amphibians, reptiles – any five using photographs 6. Classification and identification of birds and mammals – any five using photograph 						
MINOR PRACTICAL						
Conservation Biology						
<ol style="list-style-type: none"> 7. Prepare housing facilities for captive breeding of Lion-tailed macaque and vulture) 8. Mark and locate biodiversity hotspots in India by using the map 9. Mark and locate biosphere reserves of India by using the map 						
SPOTTERS						
<ol style="list-style-type: none"> 1. Identify the given indirect Sign Pugmark (male & female), Scratch mark, rake mark of tiger, leopards, bear, wild dog and small cats.. 2. Identify the given Reserve plotted in the Map and comment on its importance. MTR, PTR, PKTR, KMTR, Anamali, Sathyamangalam, Bandipur, Nagarhole, Panna, Manas, Rajaji, Corbet, Sunderbans, Sariska, Pench, Melghat & Kanha. 3. Identify the WPASchedule, IUCN Status and comment. Tiger, Wild Dog, Leopard cat, Elephant, Barking Deer, Sambar Deer, Blue Whale, Gangetic Dolphin, Peacock. 4. Call Identification of common birds – any five birds 5. Identification of venomous and non-venomous south Indian snakes (Any five) 						
SUBMISSION 1						

A Photography training have to be undertaken and the candidate needs to submit a photo album of wildlife photography of self-experience (Minimum 15 hours need to be spend in field).

SUBMISSION 2

The candidate need to submit a report of ecotourism of a locality or a report of candidates involvement in conservation effort or the report of candidates involvement in wildlife awareness programme or the report of a similar programme approved by the department. (Minimum 15 hours need to be spend in field).

Total Practical Hours **30 (Each Semester) x 2 = 60 Hours Per Year**

Text Book(s)

PS Verma and Srivastava PC. (2012). *Advanced Practical Zoology*, S. Chand Publications, Chennai.

Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]

<https://www.pdfdrive.com/zoology-books.html>

Course Designed By: Dr. B. RAMAKRISHNAN Assistant Professor, GAC, Ooty

Mapping with Programme Outcomes										
COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	S	S	M	M	M	S	M	M	M	S
CO2	M	M	S	M	M	M	S	M	S	M
CO3	M	S	S	S	S	M	S	M	M	M
CO4	M	M	M	M	M	M	S	M	S	S

*S-Strong; M-Medium; L-Low

Coursecode	63Q	CONSERVATION BIOLOGY AND FORESTRY- PRACTICAL		L	T	P	C
Core/Elective/SBS		Core Practical IV		0	0	2	2
Pre-requisite		Knowledge on conservation biology and forestry		Syllabus Version		2023-24	
Course Objectives:							
<ol style="list-style-type: none"> To create basic knowledge on Conservation To create awareness in forestry To develop hands-on practice in Conservation, 							
Expected Course Outcomes:							
On the successful completion of the course, student will be able to:							
1	Understands sampling techniques in wildlife science						K4
2	Understand population analysis protocol						K4
3	Understand basic methods in forestry.						K4
K1-Remember; K2-Understand; K3-Apply; K4-Analyze; K5-Evaluate; K6-Create							
MAJOR PRACTICAL							
<ol style="list-style-type: none"> Determination of optimum size of a quadrat using species area curve (Innovative lab methods can be used for practical examination). Estimate the abundance and density using multiple square quadrates (Innovative lab methods can be used for practical examination). Lay a line transect in two different habitats and compare the diversity and species richness of the two areas (Innovative lab methods can be used for practical examination). Estimate the density and deviation of population using the belt transect method. Prepare a line transect and estimate the density of given individual herbivores based on the dung sample. (For examination purpose, picture of five repeated survey with five to ten quadrates (10x1m) can be given with presence of dungs and pellets indicated may be given and student should estimate the population density). Estimation of Avian population density using point count method (For examination above given protocol can be followed). 							
MINOR PRACTICAL							
<ol style="list-style-type: none"> Measurement of height of given tree by estimating single pole method Calculate the log volume based on perimeter. Estimate the canopy cover of given tree (both conical and circular). 							
SPOTTERS							
<ol style="list-style-type: none"> Comment on Taxonomy: <i>Casuarina, Cedrus, Dipterocarpus, Emblica, Pinus Pterocarpus, Shorea, Salmalia & Terminalis.</i> Comment on Silviculture importance: <i>Butea, Cassia, Lagerstroemia, Pterocarpus, Albizzia, Anthocephalus</i> Comment on Ecological role: <i>Bamboo, Elaeocarpus, Ficus, Rhododendron, Mahonia, Shizigium, Sholagrass</i> Comment on Commercial use: <i>Sandalum, Dalbergia, Azadirachta, Tectona, Tamarindus</i> Comment on Eradication: <i>Parthenium, Eupatorium, Lantana, Eucalyptus, Acacia</i> 							

SUBMISSION1	
Reportofthein depth studyofaReserve/Protected area regardingits administrativeset up, habitats,conservation activities&disastermanagement.	
SUBMISSION2	
Brief reportof involvementin aresearch orreport ofsmallobservation or report ofbiodiversity surveyof anarea.	
.	
TotalPracticalHours	30(EachSemester)x2 =60HoursPerYear
TextBook(s)	
1	Lindenmayer,DavidandBurgman,Mark.(2005). <i>PracticalConservationBiology</i> . 10.1071/9780643093102.
2	PawarPand Bharadwaj.(2005). <i>SDHandbookofPracticalforestry,Agrobios</i> publications.
RelatedOnlineContents[MOOC,SWAYAM, NPTEL, Websitesetc.]	
1	https://www.mongabay.com/conservation-biology-for-all.html
CourseDesignedBy:Dr.B.RAMAKRISHNAN,Assistant Professor, GAC,Ooty	

MappingwithProgrammeOutcomes										
Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	M	S	L	L	M	S	M	M	M	M
CO2	S	L	M	M	S	M	S	S	S	S
CO3	M	M	S	M	M	M	M	M	S	S

*S-Strong;M-Medium;L-Low

Coursecode	63R	GEO-INFORMATICSANDWILDLIFE FORENSICS–PRACTICAL	L	T	P	C
Core/Elective/SBS	ElectiveCourseV:Practical		0	0	2	2
Pre-requisite	Basicknowledgein geo-informaticsand Forensics		Syllabus Version		2023-24	
CourseObjectives:						
1. TrainthestudentsinGPS andgeo-informatics 2. Totrainthestudentsinbasicforensicconceptsforensicanalysis						
ExpectedCourseOutcomes:						
Onthesuccessful completionofthecourse,student willbe ableto:						
1	Studentswillbe ableto readmaps &GPS					K3
2	Studentswillbe ableto useQGIS					K3
3	Studentswillbe ableto doGeo-referencing					K2
4	Studentswill be ableto identifycarnivorescats					K3
5	Studentswill be able to learntrichology					K3
K1-Remember;K2-Understand;K3-Apply;K4-Analyze;K5-Evaluate;K6–Create						
MAJORPRACTICAL						
1. Given map is RF 1:50,000 or 1:25,000 top sheet, scan the image and convert it intoGISMapor threedimensionalmap. 2. Given is the scanned image of an area, convert the JPEG picture into a vector imagebyassigning the GPS values given and plot a grid inside.Over lay two different sets of GPSpointsas different symbols overthe map. Preparethemap, print andsubmit. 3. Givenis asurveyGPS points, plotit onthegivenvectorimageandoverlaythe giventwo layers estimate the distance between the GPS points in Km and submit a printoutof the mapgenerated.						
MINORPRACTICAL						
1. Runningof PresenceSingle seasonmodel usingoccupancydatapprovided. 2. RunningDistanceSoftwareusingthe datapprovided. 3. Estimatethe population usingcapture-recapturetheory(Concept: Population isclosed,Captureanimals arecolored and reintroduced). 4. Read the six digit grid reference of the given two spots, calculate the altitude andestimatethe distancebetweenpoints based onatopographicsheet. 5. Convertthegivencontourlinemapdrawhillshapes andmarkthe altituderepresentedbyeachline. 6. Inthe givenTopographic sheetmarksteepslopes,gentleslopes,highestpeakandotherdetailsmentioned inquestion.						
SPOTTERS						
1. CommentontheInstrument Pedometer,Fieldcompass,Range finder,Cameratraps,GPS&Drone						
2. Identifyingfeaturesof Scatoftiger, Leopard &Wilddog,DungofGaur,PelletofHare,Sambar Deer,SpottedDeer,BarkingDeer, and Porcupine.						
3. IdentifytheGivenhairsample HairofSambarDeer,Langur, Boar,Gaur,SpottedDeer.						
4. IdentifythetypeofforestinPhotographorProjection Evergreen,Deciduous,ScrubJungle,Shola-grassland,Mangroove						

5. Identify the type of given map Political map, Physical map, Topographic map, Climatic map, Roadmap, Climatic map & Resource map.	
Total Practical Hours 30 (Each Semester) x 2 = 60 Hours Per Year	
Text Book(s)	
1	Kang-tsung. (2006). <i>Chang Introduction to Geographic Information Systems</i> , 9th edition McGraw Higher Ed, NY.
2	Chipman L.K. (2007). <i>Remote Sensing And Image Interpretation</i> . Publisers- Willey, US.
Reference Books	
1	Elangovan K. (2006). <i>GIS: Fundamentals, Applications and Implementations</i> , New India Publishing Agency
Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]	
1	QGIS User Guide Release 2.8. https://docs.qgis.org/2.8/pdf/en/QGIS-2.8-UserGuide-en.pdf .
2	MapInfo Professional. https://en.wikipedia.org/wiki/MapInfo_Professional .
3	ArcGIS https://en.wikipedia.org/wiki/ArcGIS .
Course Designed By: Dr. B. RAMAKRISHNAN, Assistant Professor, GAC, Ooty	

Mapping with Programme Outcomes										
Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	S	M	M	S	M	S	M	L	L	L
CO2	S	M	M	S	S	S	S	L	L	L
CO3	S	M	M	M	M	M	S	M	M	S
CO4	S	S	S	M	M	M	S	M	M	S
CO5	M	M	M	M	M	M	S	M	S	S

*S-Strong; M-Medium; L-Low



***Value
Added
Course***

ValueAdded Course	TIGERMONITORING				L	T	P	C
	ValueAdded Course –I							
Pre-requisite	Basicknowledgein Biology				Syllabus Version		2023-24	
CourseObjectives:								
1.To train students as Biologists in reserves								
Expected Course Outcomes:								
On the successful completion of the course, student will be able to:								
1	Well trained to be Biologists in reserves						K3	
2	Gain knowledge about Monitoring and Assessment of habitats of animals.						K4	
3	Understand and apply techniques in identifying dung pellets, scats and sampling.						K3	
K1-Remember;K2-Understand;K3-Apply;K4-Analyze;K5-Evaluate;K6–Create								
MODULE				10X 2 = 2=Hours				
Module 1.Methods of Sign Survey Module 2. Survey in line transects Module 3.Monitoring the prey population Module 4.Assessment of Habitat Quality Module 5. Monitoring of Tiger and co-predators using camera trapping Module 6. Recognizing the tigers using stripping patterns. Module 7. Occupancy modeling for tiger and co-predators & use of co-variates Module 8. Concepts and estimation of Capture Mark and re capture techniques. Module 9. Estimation of Density. Module 10.Tracing of pug marks.								
PRACTICAL				5X 2 =Hours				
1. Identification of carnivore scats 2. Identification of herbivore Dung pellets 3. Usage of Camera Traps 4. Usage of Field compass 5. Transect laying and quadrates sampling								
REFERENCE BOOKS								
1.Karanth KU and Nichols JDEdited.(2002).Monitoring tigers and their prey:A manual for wildlife researchers, managers and conservationists in tropical Asia, Publishers Central for Wildlife Studies.								
2. Ullas Karanth K and James D Nichols Editor.(2017). Methods For Monitoring Tiger And Prey, Publishers Springer.								
Course Designed By: Dr.B.RAMAKRISHNAN, Assistant Professor, GAC, Ooty								

Mapping with Programme Outcomes										
Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	L	S	S	S	M	S	S	M	S	M
CO2	L	S	S	S	S	M	M	M	S	M
CO3	L	S	S	M	M	S	S	M	S	M

*S-Strong;M-Medium;L-Low

ValueAdded Course	DATAMINING				L	T	P	C
	ValueAdded Course-II							
Pre-requisite	Basicknowledgein Biology				Syllabus Version		2023- 24	
CourseObjectives:								
Themain objectivesof this courseareto:								
1. Totrainstudentsasdataanalyst								
ExpectedCourseOutcomes:								
Onthesuccessful completionofthecourse,student willbe ableto:								
1	Findjobas dataanalysis.						K3	
2	Ableto analysis and applyvarious tool andtechniques.						K3	
K1-Remember;K2-Understand;K3-Apply;K4-Analyze;K5-Evaluate;K6-Create								
MODULE				5X 3 = 15Hours				
<ol style="list-style-type: none"> 1. Introduction-Concepts, Challengesandissues 2. Typesof data, Qualityofdata,pre-processingofdata 3. Decision tree induction - Rule based classifiers - Nearest neighbor classifiers - Bayesianclassifiers-Artificial neural networks -Support vector machine -Ensemble methods - Modevaluation 4. Association analysis: Problem definition, Frequent itemset generation, Rule generation,Challenges,Interestingnessmeasures,Generalization ofassociationpatterns 5. Cluster analysis: Similarity and distance - Density - Center based clustering techniques - Hierarchical clustering -Density based clustering, Other clustering techniques, Scalableclusteringalgorithms, Clusterevaluation. 								
PRACTICAL				5Hours				
Datavisualization-Trainingonvariousvisualization techniques								
REFERENCEBOOKS								
1.CharuC.Aggarwal.(2016).DataMining: TheTextbook,Publisher:Springer.								
2.JiaweiHan,MichelineKamber,JianPei.(2011).DataMining:ConceptsandtechniquesPublisher:ElsevierScience.								
CourseDesignedBy:Dr.B.RAMAKRISHNAN,Assistant Professor, GAC,Ooty								

MappingwithProgrammeOutcomes										
Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	L	L	L	M	L	M	S	S	S	S
CO2	L	L	L	M	L	M	S	S	S	S

*S-Strong;M-Medium;L-Low

Value Added Course	ECONOMICSOFCONSERVATION				L	T	P	C
	Value Added Course-III							
Pre-requisite	Basicknowledgeinlifesciences				Syllabus Version	2023- 2024		
CourseObjectives:								
6. Tocreatebasic awarenessaboutconservation								
7. Tocreateawarenesstostudents explorebiodiversityfornew productdevelopment.								
8. TocreateawarenesstounderstandtheeconomicsaspectsofBiodiversity								
ExpectedCourseOutcomes:								
Onthesuccessful completionofthecourse,student willbe ableto:								
1	Explorenaturein searchofnew biodiversityproductsin fieldof medicineand Agriculture.						K3	
2	Abletounderstandthesignificance andneedofconservingresources						K3	
K1-Remember;K2-Understand;K3-Apply;K4-Analyze;K5-Evaluate;K6-Create								
MODULE				15 x2 = 30Hours				
Module1. Concept of Biodiversity Module 2. Ecosystems and Community structureModule 3. Spatial and temporal aspects of biodiversityModule4. Causes of the global loss of biodiversity Module5.Invasivespeciesandtheirimpacton ecosystemsandbiodiversityModule6. Conservationbiology:policyand management Module7.Ecosystemservices andtheirimportanceforhumansocietiesModule8. Biodiversityproducts Module 9. Economics of marine resourcesModule10.BiodiversityproductsfromAnimals.Module11. Biodiversityproducts from plants. Module12.BiotechnologyinBiodiversity Module13.Isolation,identificationandpatentingBiodiversityProductsModule14.Biodiversityas Career Module15.Eco tourismand possibilities.								
ReferenceBooks								
1	AndersonJ andSlaterDL.(1981). <i>Catalogueof Mammals</i> , Vol.IandII.Cosmo Publications,NewDelhi.							
2	HosettiBB,Ramkrishna S.(2016). <i>Biodiversity:ConceptsandConservation</i> ,1 st edition, AavishkarPublishers,Distributors, Jaipur							
3	PraterS H. (1988). <i>TheBookof Indian Animals</i> ,BombayNatural HistorySociety,Bombay							
4	YoungJZ.(1950). <i>TheLifeof Vertebrates</i> ,ClarendonPress, Oxford.							
CourseDesignedBy:Dr.R.SANIL,Associate Professor,GAC,Ooty								

MappingwithProgrammeOutcomes										
Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	S	S	S	M	M	M	M	L	L	L
CO2	S	S	S	S	M	M	M	L	L	L

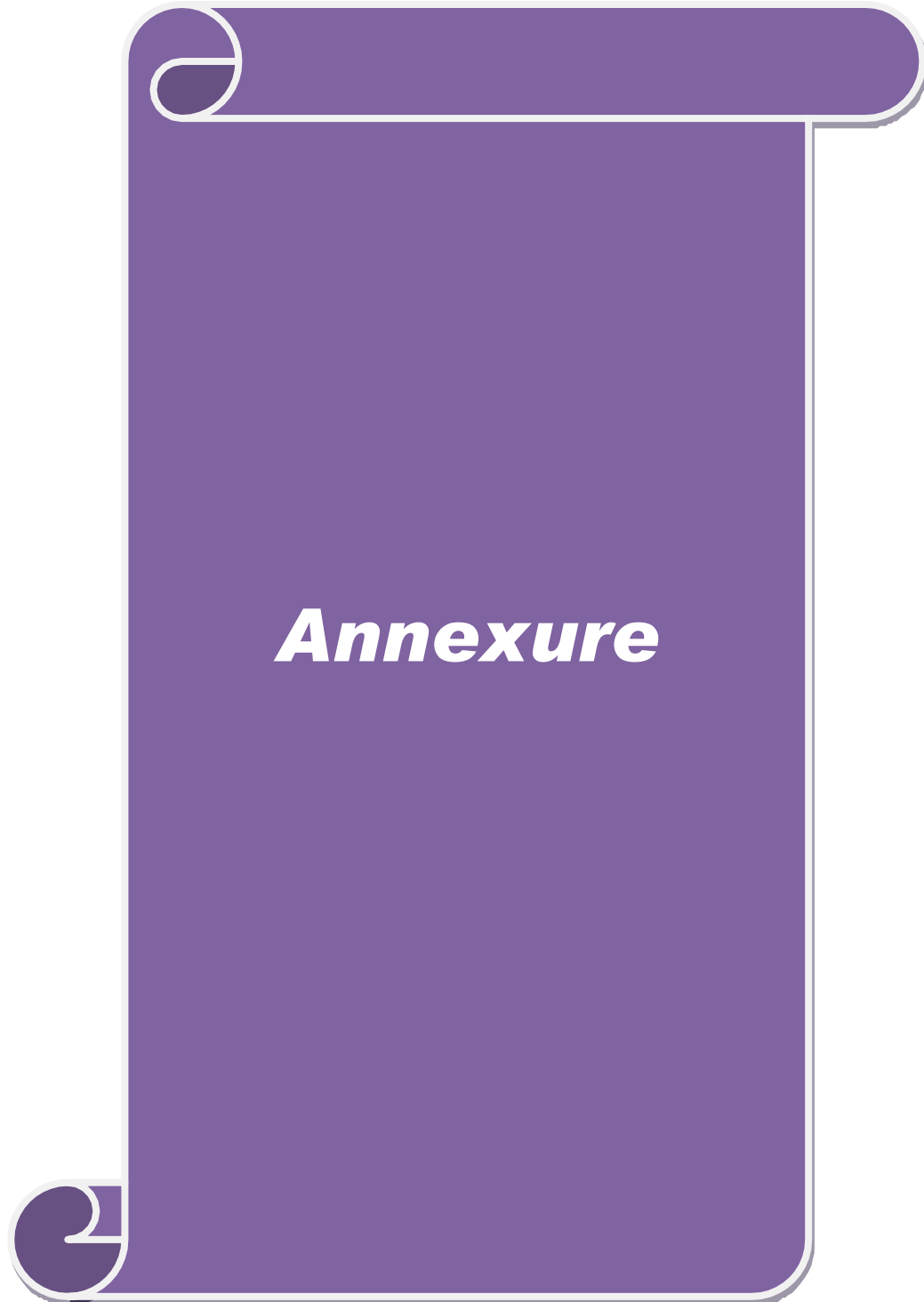
*S-Strong;M-Medium;L-Low

Value Added Course	INTELLECTUAL PROPERTY RIGHT				L	T	P	C
	Value Added Course-IV							
Pre-requisite	Basicknowledge to aware about IPR				Syllabus Version		2023-2024	
Course Objectives:								
<p>1. To introduce fundamental aspects of Intellectual Property Rights to students who are going to play a major role in development and management of innovative projects in industries.</p> <p>2. To disseminate knowledge on patents, patent regime in India and abroad and registration aspects</p> <p>3. To disseminate knowledge on copyrights and its related rights and registration aspects</p> <p>4. To disseminate knowledge on trademarks and registration aspects</p> <p>5. To disseminate knowledge on Design, Geographical Indication (GI), Plant Variety and Layout Design Protection and their registration aspects</p> <p>6. To aware about current trends in IPR and Govt. steps in fostering IPR</p>								
Expected Course Outcomes:								
On the successful completion of the course, student will be able to:								
1	The students once they complete their academic projects, shall get an adequate knowledge on patent and copyright for their innovative research works						K2	
2	During their research career, information in patent documents provide useful insight on novelty of their idea from state-of-the-art search. This provide further way for developing their idea or innovations						K3	
3	Pave the way for the students to catch up Intellectual Property (IP) as a career: a. R&D IP Counsel, Patent Examiner, Patent and Trademark agent, Entrepreneur						K4	
K1-Remember; K2-Understand; K3-Apply; K4-Analyze; K5-Evaluate; K6-Create								
MODULE				15 x 2 = 30 Hours				
<p>Module 1. Introduction and the need for intellectual property right (IPR)</p> <p>Module 2. Kinds of Intellectual Property Rights: Patent, Copyright, Trade Mark, Design, Geographical Indication, Plant Varieties.</p> <p>Module 3. Layout Design and Genetic Resources. Module 4. Traditional Knowledge and Trade Secret. Module 5. IPR in India.</p> <p>Module 6. Patents-Elements of Patentability: Novelty, Non-Obviousness.</p> <p>Module 7. Patent office and Appellate Board, Registration Procedure, Remedies and Penalties. Module 8. Nature of Copyright, Registration Procedure, Ownership and licence of copyright. Module 9. Related Rights - Distinction between related rights and copyrights. Module 10. Concept and Kinds of Trademarks (brand names, logos, signatures, symbols).</p> <p>Module 11. Registration of Trademarks - Rights of holder. Module 12. Design: Meaning and concept of Novel and Original.</p> <p>Module 13. Geographical indication: Meaning, Difference between GI and trademarks. Module 14. Plant variety protection: Meaning Benefit sharing and farmers' rights.</p> <p>Module 15. Layout Design protection: Meaning, Procedure and Effect of registration.</p>								

TextBook(s)	
1	.Nithyananda,KV. (2019). <i>IntellectualPropertyRights:ProtectionandManagement</i> . India,IN:CengageLearningIndia Private Limited.
2	2. Neeraj, P., &Khusdeep, D. (2014). <i>Intellectual Property Rights</i> . India, IN: PHIlarningPrivateLimited.
ReferenceBooks	
1	Ahuja V K. (2017). <i>Law relating to Intellectual Property Rights</i> . India, IN: LexisNexis.
E-resources:	
2	Subramanian, N., &Sundararaman, M. (2018). <i>Intellectual Property Rights – AnOverview</i> .Retrievedfrom http://www.bdu.ac.in/cells/ipr/docs/ipr-eng-ebook.pdf
3	World Intellectual Property Organisation. (2004). <i>WIPO Intellectual propertyHandbook</i> .Retrievedfrom https://www.wipo.int/edocs/pubdocs/en/intproperty/489/wipo_pub_489.pdf
3	JournalofIntellectualPropertyRights(JIPR):NISCAIR
RelatedOnlineContents	
1	CellforIPRPromotionandManagement (http://cipam.gov.in/)
2	World IntellectualPropertyOrganisation(https://www.wipo.int/about-ip/en/)
3	OfficeoftheController General ofPatents,Designs&Trademarks(http://www.ipIndia.nic.in/)
CourseDesignedBy: Dr.B.RAMAKRISHNAN,Assistant Professor, GAC,Ooty	

MappingwithProgrammeOutcomes										
Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	L	L	L	M	M	L	M	S	M	S
CO2	L	L	L	M	M	L	M	S	S	M
CO3	L	L	L	M	L	M	S	S	S	S

*S-Strong;M-Medium;L-Low



B.Sc WILDLIFE BIOLOGY

Syllabus
(With effect from 2023-2024 onwards)

Program Code:



DEPARTMENT OF WILDLIFE BIOLOGY
Bharathiar University
(A State University,
Accredited with
“A” Grade’ by NAAC and
13th Rank among Indian
Universities by MHRD-
NIRF) Coimbatore 641 046,
INDIA

GUIDELINES FOR CONDUCTING VALUE ADDED COURSES

Course Structure

1. The request for approval of syllabus by the concerned authorities is mandatory at least 15 days before the date of commencement of the course. The Syllabus (15/30 hours), Schedule and the Details of Faculty handling the course approved by the Departmental Committee and forwarded by Head of the Department should be enclosed.
 - a. The course offered should not be the same as any course listed in the curriculum of the respective programme/ or any other programme offered in University/Colleges.
 - b. The value added courses may be also conducted during week ends /vacation period.
 - c. The course can be offered any semester in the PG Programmes.
 - d. Industry experts / eminent academicians from other Institutes are also eligible to offer the value added course.
 - e. The course can be offered only if there are at least 10 students opting for it.
 - f. The students may be allowed to take value added courses offered by other departments after obtaining permission from Head of the Department offering the course.

Duration

2. The duration of value added courses is 15 (30) periods of theory or a maximum of theory and Laboratory courses and the course can have a maximum of three hours per day.

For the one (two) credit courses either 15 (30) periods of theory or a combination of theory and Laboratory may be offered. Where, **2 periods** of laboratory = **1 period** of theory

Evaluation

The value added courses shall carry 100 marks and shall be evaluated through

Internal assessment only.

- a. Two Assessments shall be conducted preferably one in the middle and the other at the end of the course by the Department concerned.
- b. The duration of assessment is one hour each.
- c. The total marks obtained in the tests shall be reduced to 100 marks and rounded to the nearest integer.
- d. The Head of the Department may identify a faculty member as coordinator for the course. A committee consisting of the Head of the Department, staff handling the course (if available), coordinator and a senior Faculty member nominated by the Head of the Department shall monitor the evaluation process. The grades shall be assigned to the students by the above committee based on their relative performance.
- e. The coordinator for the course is responsible for maintaining and processing the records with regard to assessment marks and results.

Passing Requirement and Grading Maximum Number of Courses

4. A student can earn a maximum of 3 credits during the entire programme of study by attending value added courses which would be over and above the required maximum number of credits for the award of the degrees.

Financial Commitment

5. The expenditure to be incurred for the conduct of value added courses should be met from nominal fees collected from the students at a rate fixed by the University. However any additional expenditure may be supported by the funds of the Department.



APPLICATION FOR CONDUCTING VALUE ADDED COURSE

1. Name of the Department:
2. UG Programme:
3. **Detail of the Value Added Courses:**
Name of the Value Added Courses
Type of Value Added Courses
(Theory/Lab/Lab integrated Theory/others)
- b. Short Description Enclosure 1 enclosed – YES/NO
- c. Syllabus including Reference Enclosure 2 enclosed - YES/NO
4. **Target audience:** Semester (indicate if more than one) Others
5. **Detail of Faculty handling the course:**
 - a. Name of the Faculty handling the Value Added course
 - b. Details including designation and expertise Enclosure 3 enclosed - YES/NO
 - c. Contact details
Email ID :
Phone No :
6. **Tentative Time Table** including dates of internal assessments : Enclosure 4 enclosed - YES /NO
7. Number of students opting for the course:
8. Department Consultative Committee Minutes : Enclosure 5 enclosed – YES/NO
9. Name and Designation of the Coordinator:
10. Head of the Department (with date & seal)

Note:
*** Fees if any**

DETAILS OF COMPLETION OF VALUE ADDED COURSE

Name of the Department : Name of the Value Added
course offered Name of the Faculty offered the course
: Academic/Industry

Name of the coordinator :
E-mail :
Contact :

Details of students attended the course:

S.No	Name of the Student	Reg.No.	Programme	Semester	Marks	Grade

(Faculty handling the (Senior Faculty nominated by HOD) Course (if available))

(Coordinator)



(with date & seal)

(Head of the Department)

Distribution of Marks for Continuous Internal Assessment (CIA) and Comprehensive External Examination (CEE)

Paper	Maximum Marks	Marks for		Components for CIA		
		CIA	CEE	Test	Assignment	others
Theory (Core/Elective)	100	25	75	15	05	05
Theory (Core/Elective)	75	20	55	10	05	05
Theory (Core/Elective)	50	12	38	09	03	-

Components for 'others' may include the following :

Class Participation, Case studies Presentation, Fieldwork , Field Survey ,Group Discussion ,Term Paper, Workshop / Conference Participation ,Presentation of paper in Conference ,Quiz ,Report / Content Writing, Seminars,etc.

Distribution of Marks for Continuous Internal Assessment (CIA) and Comprehensive External Examination (CEE)

Paper	Maximum Marks	Marks for		Components for CIA		
		CIA	CEE	Test	Assignment	others
Practical (Core/Elective)	100	40	60	30	05	05
Practical (Core/Elective)	75	30	45	20	05	05
Practical (Core/Elective)	50	20	30	10	05	05

Pattern of Question Paper – (for core – theory and elective subjects)

The question paper for each of the core and elective paper shall consists of three section. While section A shall contain 10 objective type question, Section B and section C shall contain question of descriptive nature. Internal choice(either / type) shall be given in Section B and Section C. In section A, there shall be two Question each with four multiple choice from each of the five units. In section B and C ,there shall be one question with internal choice (either / or type) from each of five units. .The composition of the question paper shall be as given below

MAXIMUM 75 MARKS – WHEREVER APPLICABLE			
Section A	Multiple choice questions with four options	$10 * 1 = 10$	10 questions
Section B	Short answer questions of either/or type like 1.a(or)b	$5 * 5 = 25$	5 questions
Section C	Essay-type questions of either/or type like 1.a(or)b	$5 * 8 = 40$	5 questions

MAXIMUM 55 MARKS – WHEREVER APPLICABLE			
Section A	Multiple choice questions with four options	$10 * 1 = 10$	10 questions – 2 from each unit
Section B	Short answer questions of either/or type like 1.a(or)b	$5 * 3 = 15$	5 questions – 1 from each unit
Section C	Essay-type questions of either/or type like 1.a(or)b	$5 * 6 = 30$	5 questions – 1 from each unit

MAXIMUM 25 MARKS – WHEREVER APPLICABLE			
Time: One Hour 30 Minutes			
Section A	Short answer questions of either/or type like 1.a(or)b	5*2=10	One question from each of the five units
Section B	Essay-type questions of either/or type like 1.a(or) b	3*5=15	Six questions with internal choice (either/or type) from all the five units

