Practical -6: Study of morphology, classification, anatomy and reproduction in Cycas. Practical -7: Study of morphology, classification & anatomy, reproduction in Pinus. Practical -8: Study of morphology, classification anatomy, reproduction in Gnetum.

Practical -9: Study of important blue green algae causing water blooms in the lakes.

Practical -10: Preparation of natural media and cultivation of Azolla in artificial ponds.

Practical -11: Study different algal products and fossils impressions and slides.

Practical-12: Visit to algal cultivation units/lakes with algal blooms/Fern house/ Nurseries/Geology museum/lab to study plant fossils.

(Note: Botanical study tour to a floristic rich area for 1-2 days and submission of study report is compulsory)

Evaluation Scheme for Lab Examination

A Critoria	Marks
Assessment Criteria Classification and	10
description T.S. of given material	. 05
Identification	05
Viva Voice /Tour report	05
Total	25

OPEN-ELECTIVE SYLLABUS:



				Credits	03
Year	I	Course Code: 21BSC	1BO12	S.4 ************************************	
Sem.	II	Course Title: Bio-fue	ls	Hours	40
Course	Pre-r	equisites, if any ssessment Marks: 40	NA Summative Assessment Marks: 60	Duration of ESA:.02	hrs.
Course	e	1. To make the commercial 2. To make the industries at	se the student should be able to: e students familiar with Bio-fuel plant sexploitation. e students known about the Bio-fuel used solvingfuel problems in feature. interest amongst the students to know todaylife and economic wellbeing.	sed in automobile	2

V SEM BOTANY, P-I	
Unit III	14hrs
Taxonomic Hierarchy: Concept of taxa (family, genus, species); Categories and taxonomic	
hierarchy; Species concepts (biological, morphological, evolutionary). Modes of speciation.	
De la Santa of toya Type	
Botanical Nomenclature: Principles and rules (ICN); Brief account of Ranks of taxa, Type	
concept (Typification), Rule of priority, Author citation., valid publication, rejection of	-
names, principle of priority and its limitations; Names of hybrids/cultivated species.	
Unit IV	14hrs
Biometrics, Numerical Taxonomy; Phenetics and Cladistics: Characters; Variations;	II.
OTUs, character weighting and coding; Cluster analysis; Phenograms, cladograms	
(definitions and differences).	
Phylogenetic Systematics: Terms and concepts (primitive and advanced, homology and	
analogy, parallelism and convergence, morophyly, Paraphyly, polyphyly, clades,	
synapomorphy, symplesiomorphy, apomorphy, lineage sorting, serial homology etc).	
Origin and evolution of angiosperms; Co-evolution of angiosperms and animals; Methods	
of illustrating evolutionary relationship (phylogenetic tree, cladogram).	
Molecular taxonomy: DNA sequences of chloroplast genes (atpB, rbcl.,) and one nuclear	
gene (nuclear ribosomal 18s DNA).	

V Semester

Plant Morphology and Taxonomy (Practical

Program Name	B.Sc. in BOTANY	Semester	V	
Course Title	Plant Morphology and Taxonomy (Practical)	Practical Credits	02
Course Code	DSC - 21BSC5BOT 5P1		Contact Hours	4 Hours per week
Formative Asse	ssment 25 Marks	Summ	native Assessment	25 Marks

Practical Content

- 1. Study of root, stem and leaf structure and modifications. Study of inflorescence types. Study of flower and its parts, Study of fruits. Floral diagram and floral formula.

 04 hrs
- 2. Study of families mentioned in theory with at least two examples for each family and make suitable diagrams, describe them in technical terms (Description, V.S. flower, section of ovary, floral diagrams, floral formulae and systematic position according to Bentham & Hooker's system of classification) and identify up to species using the flora.

 26 hrs
 - 3. Construction of plant phylogenetic trees using various loci (atpB & rbcL,) with various phylogenetic methods (Neibour Joining, Maximum Likelihood etc). (Demonstration). 06 hrs.
 - 4. Identify plants / plant products of economic importance belonging to the families mentioned in the syllabus; with binomial, family and morphology of useful parts. Cotton, Mango, Red gram, Green gram, Horse gram, Black gram, Bengal gram, Indigo, Brinjal, Tomato, Chilly, Tamarind, Bitter gourd, Luffa, Asfoetida, Cumin, Coriander, Coffee, Rubber, Tapioca, Ricinus, Ginger, Turmeric, Coir, Arecanut, Rice, Wheat, Ragi, Sugarcane Annonamuricata, Catharanthus roses, Rauvolfia serpentaina, Justicia Adhatoda, Vitex nigundo and Leucas aspera.
 - 5. Field visit: Local or outside area / Botanical garden/ tribal settlements minimum 3 to 5 days.

Unit III	14hrs
Plant Breeding: Introduction and objectives. Breeding systems: modes of reproduction in crop plants. Important achievements and undesirable consequences of plant breeding. Methods of crop improvement. Introduction: Centers of origin and domestication of crop plants, plant genetic resources, Acclimatization. Selection methods: Self-pollinating and cross-pollinating plants and types of vegetative propagation in plants.	
Unit IV	14hrs
Hybridization: self, cross and vegetative propagation in plants – Procedure, advantages and limitations. Quantitative inheritance: Concept, mechanism, examples of inheritance of Kernel colour in wheat, Monogenic vs Polygenic inheritance.	

Inbreeding depression and heterosis: History, genetic basis of inbreeding depression and heterosis; Applications.

Role of mutations in crop improvement; Polyploidy; Distant hybridization and role of

PAPER-2.

V Semester Genetics and Plant Breeding (Practical)

Program Name	B.Sc. in BOTANY	Semester	V
Course Title	Genetics and Plant Breeding (Practical)	Practical Credits	02
Course Code	DSC - 21BSC5BOT 5P2	Contact Hours	4 Hours per week
Formative Assessment	25 Marks	Summative Assessment	25 Marks

Practical Content

Practical: Plant breeding:

biotechnology in crop improvement.

- 1. Reproductive biology, self and cross pollinated plants; vegetative propagation
- 2. Hybridization: Emasculation, bagging, pollination and production of hybrids and pollen fertility
- 3. Origin, distribution and centres of diversity of crop plants: Wheat, Sorghum, Rice, Chilly Sugarcane, Cotton, Potato, coffee, Sunflower and groundnut
- 4. Visit to nursery / horticulture.

Practical: Genetics

- 1. Mendel's laws through seed ratios. Laboratory exercises in probability and chi-square
- 2. Chromosome mapping using point test cross data.
 - 3. Pedigree analysis for dominant and recessive autosomal and sex-linked traits.
- 4. Incomplete dominance and gene interaction through seed ratios (9:7, 9:6:1, 13:3, 15:1, 12:3:1, 9:3:4).
- 5. Study of aneuploidy: Down's, Klinefelter's and Turner's syndromes.
- 6. Photographs/Permanent Slides showing Translocation Ring, Laggards and Inversion Bridge.

Fifth Semester B.Sc. (Zoology)

Paper Code: ZOODSEP 6.2A Sixth

Teaching Hours: 3 H / Week

Total hours:45

Paper Title: Practicals-6A

Marks: Th-40+IA-10

Credits:1

 Study of threatened animals of India (Tiger, Lion, Single horned Rhinoceros, Musk deer, Gaur, Golden Langur, Lion tailed monkey)

- 2. Estimation of CO₂ from different water samples
- 3. Estimation of dissolved oxygen from different water samples
- 4. Estimation of total hardness
- 5. Study of Ecological Adaptations and Morphological peculiarities: Examples" Hermit crab, Draco, Stick insect, Puffer fish, Exocetus, Phrynosoma, Chameleon and Bat.
- 6. Marking of existing Project tiger areas and Biosphere reserves in Indian map
- Spotting of the endangered animals conserved in protected areas of Karnataka state (using Karnataka map)
- 8. Marking of National parks in Karnataka map
- 9. Marking of Wildlife sanctuaries in Karnataka map

10. Visit to nearby locality or forest to study the ecosystem

PRINCIPAL

SAMS College & TP Science Institute

SANKESHWAR



Sixth Semester B.Sc. (Zoology)

Paper Code: ZOODSET 6.2A

Paper Title: Ecology, Zoogeography

and Wildlife Conservation

Marks: Th-80+IA-20

Credits:3

Teaching Hours: 4 H / Week

Total hours:60

15Hours

UNIT-I

Ecology: (Part – A)

Earth as living planet, sub divisions of ecology, scope of ecology, biosphere

Abiotic factors: Lightand Temperature (effect on animals and plants)

Biotic Factor: Mutualism, commensalism, amensialism, parasitism, predation, competition

and parasitism

Biogeochemical cycles: Principles and concepts of water, nitrogen, carbon,

oxygen cycles

Community ecology: Community structure, ecological niches, edge effect,

stratification, ecotone

UNIT-II 15 Hours

Ecology: (Part - B)

Habitats: Freshwater habitat Lotic and Lentic systems. Zonation of Sea, Marine Biota, Esturine ecology, Mangrooves. Terrestrial habitat: A brief account of Biomes. Ecological Adaptations of Freshwater, Marine and Terrestrial fauna. Ecological Adaptations of Freshwater, Marine and Terrestrial animals

Population ecology: Density, natality, mortality, age distribution, population growth, types and curves

UNIT-III 15 hours

Zoogeography: Zoogeographical realms of world, a brief account of Wallace's line, means of dispersal, factors affecting the dispersal of animals, continental drift theory, types of distribution of animals, island life, insular fauna, new world marsupials

UNIT-IV 15 hours

Wildlife and its Conservation: Wildlife conservation methods, Wildlife in India, Causes for the depletion of wildlife, Wildlife conservation techniques, methods and measures. Brief account of: IUCN, WWF, Bombay Natural History Society, Indian Board for Wild Life, Red Data Book. Wild Life Act 1972 and its amendments in India, CITES. Project Tiger and Biosphere Reserve. Management of protect areas, Conservation of wetlands, Wildlife

ecotourism

PRINCIPAL

SANKESHWAR



Course Title: SOCIETY AND TR	IBES
Total Contact Hours: 60	Course Credits: 4
Formative Assessment Marks: 40	Duration of ESA/Exam: 3 hours
Model Syllabus Authors:	Summative Assessment Marks: 60

Course Objectives

- To provide basic knowledge about social organisation among tribal people, with specific focus on Karnataka
- · To critically understand the implications of transformation of tribal community
- To undertake micro research work on tribal community for effective showcase of practicality

Course Outcomes (COs) for DSC 10:

At the end of the course the student should be able to:

- Understand and appreciate the social organisation among the tribal community
- Assess the impact of social changes on tribal social life
- Communicate their micro research work effectively to the society

Articulation Matrix for Course 10: Mapping of Course Outcomes (COs) with Program Outcomes (POs 1-12)

Course Outcomes (COs)/ Program Outcomes (POs)	1	2	3	4	5	6	7	8	9
Understand and appreciate the social organisation among the tribals	х			х				Х	
Assess the impact of social changes on tribal social life		х	х	х	х	х	х		х
Handle micro research work and communicate effectively	х		х	х	х	х		Х	



DSC SOC C10 - Content of Course: SOCIETY AND TRIBES	60 Hours
UNIT - I CONCEPTS AND CATEGORIES	15
Chapter 1:	
Tribes and Indigenous People; Genealogies, Scheduled Tribes, Primitive Tribes, De-	
Notified or ex-criminal Tribes in India; Geographical Distribution of Tribes in India	
Chapter 2:	
Hadis (Yarava, Jenukuruba, Kadukurubas): Meaning, Rules of Marriage, Clan,	
Lineage, Consanguinity and Affinity; Male-Female relations	
Chapter 3:	
Social System, Legal System, Political System, Economic System, Religion and Magic	
UNIT - II CHANGES AND DEVELOPMENT ISSUES	15
Chapter 4:	
Social Mobility: Types, Tribes and Caste, Tribe-Caste-Peasant Continuum,	
Sanskritisation	
Chapter 5:	
Tribalisation, Detribalisation, Retribalisation	
Chapter 6:	
Tribal Development and Welfare: Approaches- Assimilationist and Isolationist;	
Problems of Exploitation, Land Alienation, Unemployment, Cultural Transformation,	
Scheduled Areas, Tribal Justice and Modern Law	
UNIT - III STUDYING TRIBES	15
Chapter 7:	
Tradition of Fieldwork: History and Significance; Ethics of Fieldwork	
Chapter 8:	
Indian Tribes- Participatory Method, Case Studies, Sample Surveys	
Chapter 9:	
Studying Tribes: Primary and Secondary Data; Etic & Emic Perspectives	
UNIT - IV FIELD WORK	15
Students have to take up field work in any nearby tribal settlement and present their	13
findings in a Seminar and written report	



B.A. Semester V

Course Title: SOCIAL ENTREPREM	NEURSHIP
Total Contact Hours: 60	Course Credits: 04
Formative Assessment Marks: 40	Duration of ESA/Exam: 03 hours
Model Syllabus Authors:	Summative Assessment Marks: 60

Course Objectives:

- To induce the concept of social entrepreneurship
- · To motivate and guide towards start-up and business plans
- · To help in innovation and incubation towards the start-up ecosystem

Course Outcomes (COs) for DSC 9:

At the end of the course the student should be able to:

- Understand the scope and need for social entrepreneurship
- Plan and implement socially innovative ideas
- · Equip themselves to establish social enterprise or non-profit organisation

Articulation Matrix for Course 9:

Mapping of Course Outcomes (COs) with Program Outcomes (POs 1-12)

Course Outcomes (COs)/ Program Outcomes (POs)	1	2	3	4	5	6	7	8	9
Understand the scope and need for social entrepreneurship	х		Х	х				Х	Х
Plan and implement socially innovative ideas			х	х	х	Х			Х
Equipped to start their own social enterprise or non for profit organisation							х	х	х

DSC SOC C9 - Content of Course:	60
SOCIAL ENTREPRENEURSHIP	Hour
JNIT - I FUNDAMENTALS OF SOCIAL ENTREPRENEURSHIP	15
Chapter 1	
Social Entrepreneurship: Meaning, Features and Relevance; Social Business:	
Meaning; Difference between Social Entrepreneurship and Social Business;	
Relationship between Social Entrepreneurship and Social Change	
Chapter 2	
Typology of Ventures: Social Purpose Ventures, Social Consequence	
Entrepreneurship, Profit & Non-Profit Models of Social Entrepreneurship	
Chapter 3	
Identifying social business opportunities	
UNIT – II ESTABLISHMENT OF NON-PROFIT ORGANISATIONS	15
Chapter 4	
Concept (includes Non-Government Organisations), Objectives and establishment	
of Non-Profit Organisations (NPOs)	
Chapter 5	
Legal Procedure for establishment of NPOs: Societies Registration Act, Indian	
Companies Act, Charitable Endowments Act, Foreign Contribution (Regulation)	
Act (FCRA); Available Tax Reliefs	
Chapter 6	
Social Values of NPOs: Mission and Vision; MoA and Bye-Laws	
UNIT - III MANAGEMENT AND FINANCING	15
Chapter 7	
Human Resource Management: Staffing Plan, Social Security of Workers:	
Provisions and Benefits of Gratuity Act; Rules and Regulations of EPF Scheme	
Chapter 8	
Project Management: Definition of Concept: Identification of Project; Proposal	
Development: Basic Factors, Project Proposal Guide; Budget, Rationale for sending	
Project Proposal to the Donor; Proposal Writing; Do's and Don'ts of a Project	
Proposal	
Chapter 9	
Financing: Sources of Finance: Government, Donors, International Agencies;	
Documents Used in Fund Raising; Due Diligence; Campaigns; Internal Income	
or annipulgita, internal income	
Generation	



UNIT - IV

CASE STUDIES

Chapter 10

Pratham, RUDSET, Vivekananda Girijana Kalyana Kendra, B.R. Hills, etc.

Chapters 11 & 12

Students should study the functioning of a local NPO, present their ideas in a seminar and submit a report (For example working in the areas of Sanitation, Rural Development, Women Empowerment, etc.)

SUGGESTED INTERNET RESOURCES

Unit 1

- https://www.un.org/development/desa/youth/wpcontent/uploads/sites/21/2020/10/WYR2020-Chapter1.pdf
- https://www.adb.org/sites/default/files/institutional-document/826606/adou2022bn-social-entrepreneurship-definition-philippines.pdf
- https://web.mit.edu/sloan2/dese/readings/week01/Martin Osberg SocialEntrepreneurship.pdf
- https://entreprenorskapsforum.se/wp-content/uploads/2013/03/WP 09.pdf
- https://business.expertjournals.com/ark:/16759/EJBM 710mthembu147-177.pdf
- https://isfcolombia.uniandes.edu.co/images/201519/LRD32.pdf
- https://www.hec.edu/en/faculty-research/centers/society-organizations-institute/think/so-institute-executive-factsheets/what-social-business
- https://socialtrendspot.medium.com/what-is-the-difference-between-social-innovation-social-enterprise-social-entrepreneurship-fe3fce7bf925
- https://www.albany.edu/faculty/miesing/teaching/socent/3 Recognizing Social
 Opportunities.pdf

Unit 2

- http://eprints.lse.ac.uk/29032/1/cswp3.pdf Defining the non-profit sector
- https://prosper-strategies.com/seven-nonprofit-core-values-examples/

Unit 3

- https://www.intechopen.com/chapters/55499
- https://www2.fundsforngos.org/cat/project-planning-and-development/#:~:text=Project
 Planning: Project development is, lot of research and planning.
- https://www.pm4dev.com/resources/manuals-and-guidelines/117-guide-for-ngo-s-project-preparation-and-management-euroaid/file.html
- http://www.pm4ngos.org/wp-content/uploads/2015/05/PMD_Pro_Guide_2e_EN_USLetter.pdf

REFERENCE BOOKS:

- Bornestein, David. (2007). How to change the world: Social entrepreneurs and the power of new ideas, Oxford University Press
- Carlson, Eric J and James Koch (2018). Building a successful social venture: A guide for social entrepreneurs. Berrett-Koehler Publishers Inc, California

Physics.

7		SEMES	TER-	VI						
Category	Course code	Title of the Paper		Mar	ks		eachi urs/w		Credit	Duration of exams
			IA	SEE	Total	L T		P		(Hrs)
DSC9	21BSC6C6PHY1L	Elements of Condensed Matter & Nuclear Physics	40	60	100	4	,	1	4	2
	21BSC6C6PHY1P	Elements of Condensed Matter & Nuclear Physics Practical	25	25	50		ı	4	2	3
	21BSC6C6PHY2L	Electronic Instrumentation & Sensors		60	100	4		1	4	2
DSC10	21BSC6C6PHY2P	Electronic Instrumentation & Sensors Practical	25	25	50		•	4	2	3
	Another Department	Another	40	60	100	4	-	-	4	2
DSC11	Code as a second Major Subject	Department Major Course Title	25	25	50	-	-	4	2	3
	Another Department	Another	40	60	100	4	-	•	4	2
DSC12	Code as a second Major Subject	Department Major Course Title	25	25	50	-	-	4	2	3
INT	21BSC6IN1PHYIN	Internship / Mini Research Project	. <u>.</u>	-	50	3 t	o 4 we	eks	2	Report & Presentation
	P.	То	650		Seme Cre	ster dits	26			





Chemistry

		S	SEM	ESTI	ER-V					
Catego ry	Course code	Title of the Paper	Marl	ζS	7	Teaching hours/ week Credit			Duration of exams (Hrs)	
			IA	SEE	Total	L	T	P		
DSC5	21BSC5C5 CHE5L	Chemistry-5	40	60	100	4	-	-	4	2
	21BSC5C5 CHE5P	Chemistry Lab-5	25	25	50	-	-	4	2	4
	21BSC5C5 CHE6L	Chemistry-6	40	60	100	4	-	2	4	2
DSC6	21BSC5C5 CHE6P	Chemistry Lab-6	25	25	50	×-	-	4	2	4

			SEME	STER	-VI	11					
Catego	Course code	Title of the Paper	1	Marks		1	each urs/	ing week	Credit	Duration of exams (Hrs)	
		Tuper	IA	SEE	Total	L	T	P			
DSC7	21BSC6C6 CHE7L	Chemistry-7	40	60	100	4		-	4	2	
	21BSC6C6 CHE7P	Chemistry Lab-7	25	25	50	-	-	4	2	4	
DSC8	21BSC6C6 CHE8L	Chemistry-8	40	60	100	4 :	1 to	-	4	2	
	21BSC6C6 CHE8P	Chemistry Lab-8	25	25	50	John .	TALA	4	2	4	
INT1	21BSC6 INT1L	Project work/ Industrial Tour and	25	25	50	25,		2	2	2	
		report		i							

Curriculum for B.Sc. Mathematics Program of RCUB as per NEP 2020 w.e.f. 2021-22

		SEME	ESTE	R-VI							
Category	Course code	Title of the Paper		and the second	eachi urs/w		Credi	Duratio of exam			
			IA	SEE	Total	L	T	P		(Hrs)	
		Mathematics a	as Ma	jor Disc	cipline						
	21BSC6C6MATMJ1L	Linear Algebra	40	60	100	4		-	4	2	
DSC7	21BSC6C6MATMJ1P	Theory based Practical's on Linear Algebra	25	25	50	-	-	4	2	3	
DSC8	21BSC6C6MATMJ2L	Numerical Analysis	40	60	100	4	-	-	4	2	
	21BSC6C6MATMJ2P	Theory based Practical's on Numerical Analysis	25	25	50	-	-	4	2	3	
	Another	Another	40	60	100	4	-	-	4	2	
DSC6	Department Code as a Minor Subject	Department Course Title	25	25	50	-	-	4	2	3	
	Another	Another	40	60	100	4	-	-	4	2	
DSC6	Department Code as a Minor Subject	Department Course Title	25	25	50	-	-	4	2	3	
INT1	21BSC6 INT1L	Internship/ Project	25	25	50	*	-	-	2	2	
			Total	l Marks	650	20	C	nester redits	26		
		Total Marks for	BSC P	rogram	4100			redits r BSC ogram	146		



BOTANY

V Semester

VI Semester

Total	100	95	100	50	
Exam	09	25	09	25	
IA Exam Total	40	25	40	25	
Credits Instructional Duration	2	3	2	3	
ctional er week		4		4	
Instru	4		4		
Credits Instructional Duration	41	2	4	2	_
Course Title	21BSC6BOT Cell Biology (Theory) 6L1	21BSC6BOT Cell Biology (Practical) 6P1	21BSC6BOT Plant Physiology and Biochemistry (Theory) 6L2	21BSC6BOT Plant Physiology and Biochemistry (Practical) 6P2	
Course	21BSC6BOT 6L1		21BSC6BOT 6L2	21BSC6BOT 6P2	
		DSC			

Total 50

Viva-voce 25

Submission 25

Credits Assigned

Course Title Project

Course Code

RANI CHANNAMMA UNIVERSITY, BELAGAVI

B.Sc. in Zoology Effective from 2023-24

							S										<			Sem.	
	Internship-1	Other subject	Other subject	Other subject	Other subject	DSCC-16	DSCC-15	DSCC-4	DSCC-13		SEC-3	Other subject	Other subject	Other subject	Other subject	DSCC-12	DSCC-11	DSCC-10	DSCC-9	Type of Course	
	Practical					Practical	Theory	Practical	Theory	74	Practical					Practical	Theory	Practical	Theory	<u> = -</u>	
Total						21BSC6C8ZO O8P	21BSC6C8ZO O8L	21BSC6C7ZO O7P	21BSC6C7ZO 07L							21BSC5C6ZO O6P	21BSC5C6ZO O6L	21BSC5C5ZO OSP	21BSC5C5ZOO 5L		
	Internship					Environmental Biology, Wildlife Management and Conservation	Environmental Biology, Wildlife Management and Conservation	Evolutionary and Developmental Biology	Evolutionary and Developmental Biology	Total	The Bee Keeping					Chordates and Comparative Anatomy	Chordates and Comparative Anatomy	Non-Chordates and Economic Zoology	Non-Chordates and Economic Zoology	CourseTitle	
						04 hrs	04hrs	04 hrs	04hrs		04hrs					04 hrs	04hrs	04 hrs	04hrs	Instruc tion hour/ week	
						56	56	56	56		56					56	56	56	56	Total hours /sem	33
						03 hrs	02 hrs	03 hrs	02 hrs		03 hrs					03 hrs	02 hrs	03 hrs	02 hrs	Duratio nof Exam	
	00	60				25	40	25	40		25					25	40	25	40	Format ive	
	c					25	60	25	60		25					25	60	25	60	Marks Sum m ative	100 MCC 100 MCC
	2	5				50	100	50	100		50					50	100	50	100	Total	
26	2	2 2	2	202	94	02	04	02	04	26	02	02	04	02	04	02	04	02	04	Credits	

