Resolution No. AC/II(22-23).3.RUS12

S. P. Mandali's

Ramnarain Ruia Autonomous College

(Affiliated to University of Mumbai)

RUIA COLLEGE
Explore • Experience • Excel

Syllabus for

Program: F.Y.B.Sc.

Program Code: (RUSZOO)

(As per the guidelines of National Education Policy 2020-
Academic year 2023-24)

(Choice based Credit System)

GRADUATE ATTRIBUTES

S. P. Mandali's Ramnarain Ruia Autonomous College has adopted the Outcome Based Education model to make its science graduates globally competent and capable of advancing in their careers. The Bachelors Program in Science also encourages students to reflect on the broader purpose of their education.

GA	GA Description **A student completing Bachelor's Degree in Science program will be able to:**
GA 1	**Recall and explain acquired scientific knowledge in a comprehensive manner and apply the skills acquired in their chosen discipline. Interpret scientific ideas and relate its interconnectedness to various fields in science.**
GA 2	**Evaluate scientific ideas critically, analyse problems, explore options for practical demonstrations, illustrate work plans and execute them, organise data and draw inferences.**
GA 3	**Explore and evaluate digital information and use it for knowledge upgradation. Apply relevant information so gathered for analysis and communication using appropriate digital tools.**
GA 4	**Ask relevant questions, understand scientific relevance, hypothesize a scientific problem, construct and execute a project plan and analyse results.**
GA 5	**Take complex challenges, work responsibly and independently, as well as in cohesion with a team for completion of a task. Communicate effectively, convincingly and in an articulate manner.**
GA 6	**Apply scientific information with sensitivity to the values of different cultural groups. Disseminate scientific knowledge effectively for upliftment of the society.**
GA 7	**Follow ethical practices at the workplace and be unbiased and critical in the interpretation of scientific data. Understand the environmental issues and explore sustainable solutions for it.**
GA 8	**Keep abreast with current scientific developments in the specific discipline and adapt to technological advancements for better application of scientific knowledge as a lifelong learner.**

PROGRAM OUTCOMES

PO	Description **A student completing Bachelor's Degree in Science program in the subject of ZOOLOGY will be able to:**
PO 1	Identify the major groups of organisms, discuss the basis of their biodiversity, and draw parallels with their phylogenetic relationship, using well-thought cardinal features of classification on the basis of morphology and molecular information.
PO 2	Understand and analyse the evolutionary link amongst the animals and also understand the basic classification patterns of invertebrates and vertebrates. They will be able to compare and contrast the anatomy and physiology of different invertebrates and vertebrate phylum.
PO 3	Analyse the genes, genomes, cells, cell organelles, tissues and histological studies, understand the linkage of genes, mechanisms of sex determination, various structures of DNA and apply the knowledge of genetics to the process of evolution.
PO 4	Analyse and understand the broad concepts of ecology, food webs, food chains and the interconnectedness of biotic and abiotic factors. Comprehend the concepts of Population dynamics, communities and its dependence on the ecosystems.
PO 5	Objectively understand and evaluate information about animal behaviour and ecology encountered in our daily lives.
PO 6	Students will be able to demonstrate proficiency in the experimental techniques and methods of analysis appropriate for their area of specialization within Zoology.
PO 7	Get a flavor of research by working on project besides improving their writing skills. It will further enable the students to think and interpret individually.

CREDIT STRUCTURE BSc

Semester	Subject 1		Subject 2	GE/ OE course (Across disciplines)	Vocational and Skill Enhancement Course (VSC) & SEC	Ability Enhancement Course/ VEC/IKS	OJT/FP/CEPCC, RP	Total Credits
	DSC	DSE						
1	4		4	4 (2*2)	VSC-2 + SEC -2	AEC- 2 (CSK) + VEC- 2 (Env Sc.) + IKS-2		22
2	4		4	4 (2*2)	VSC-2 + SEC-2	AEC-2 (CSK)+ VEC-2 (Understanding India)	CC-2	22
Total	8		8	8	8	10	2	44
Exit option: award of UG certificate in Major with 44 credits and an additional 4 credit Core NSQF course/ Internship or Continue with Major and Minor								
3	Major 8		Minor 4	2	VSC-2	AEC-2 MIL	FP -2, CC-2	22
4	Major 8		Minor 4	2	SEC-2	AEC-2 MIL	CEP-2, CC-2	22
Total	16		8	4	4	4	8	44
Exit option: award of UG Diploma in Major with 88 credits and an additional 4 credit Core NSQF course/ Internship or Continue with Major and Minor								

5	**DSC 12**	**DSE 4**	**Minor 2**		**VSC-2**		**CEP/FP-2**	**22**
6	**DSC 12**	**DSE 4**	**Minor 2**				**OJT-4**	**22**
Total	**24**	**8**	**4**		**2**		**6**	**44**
	Exit option: award of UG Degree in Major with 132 credits or Continue with Major for Honours/ Research							

Course Code: RUSZOO.O101

Course Title: INTRODUCTION TO FISHERY

Type of Course: Vocational Skill Courses (VSC)

Academic year 2023-24

COURSE OUTCOMES:

COURSE OUTCOME	DESCRIPTION A student completing this course will be able to:
CO 1	Compare different types of water bodies including water reservoirs.
CO 2	Know common freshwater and marine fishes which are generally available in fish markets and important for aquaculture.
CO 3	Differentiate crafts and gears which are commonly anchored or kept and repaired at sea shores or landing centres.
CO 4	Demonstrate destructive fishing methods which are harmful to the fishery as well as for related ecosystems.
CO 5	Know the steps involved in getting Maximum Sustainable Yield (MSY) in fisheries
CO 6	Understand the fish preservation techniques in fish processing industries as well as in small scale industries
CO 7	Demonstrate how fish byproducts are financially important and can fetch huge profit.

DETAILED SYLLABUS

Course Code	Unit	Course Title INTRODUCTION TO FISHERY	Credits/ Hours 1/15
RUSVSCZOO.O 101	**1**	1.1 Types of water reservoirs and related ecosystem 1.2. Zonation 1.3 Freshwater fishes- *Labeo rohita, Catla catla, Mrigal,* freshwater prawn, *Macrobrachium rosenbergii,* 1.4 Marine water fishes- *Harpodon nehereus, Rastrelliger kanagurta,*marine prawn *Penaeus vannamei* 1.5.Crafts and Gears a) Crafts- Plank built boat, Dugout canoe, Catamaran, Trawler b) Gears-Cast net, Gill net, Hooks and lines, Trawl nets 1.6. Destructive fishing methods - bottom trawling, cyanide fishing, use of explosive, overfishing 1.7.Fishery management- Use of GIS, Regulation of mesh size 1.8.Methods of fish preservation- drying, salting, smoking, canning, pickling, icing, freezing, 1.9.Methods of making fish byproducts- liver oil, body oil, fish meal, isinglass, fish protein concentrate, chitosan	**1/15**

Practical

Course Code: RUSVSCZOOP.O 101		
Sr. No.	**Practical Title- INTRODUCTION TO FISHERY**	**Credit 1**
1.	Identification- Freshwater fishes- *Labeo rohita, Catla catla, Mrigal. Macrobrachium rosenbergii.*	
2.	Identification-Marine water fishes- *Harpodon nehereus, Rastrelliger kanagurta, Penaeus vannamei*.	
3.	**A)** Crafts- Plank built boat, Dugout canoe, Catamaran, Trawler B) Gears - Cast net, Gill net, Hooks and lines, Trawl nets.	
4	Estimation of dissolved oxygen from water samples (Any 2).	
5.	Estimation of carbon dioxide from water samples (Any 2).	
6.	Estimation of salinity of water samples (Any 2).	
7.	Estimation of pH of water samples (Any 3) by pH paper, pH meter, Universal indicator.	
8.	Visit to any fish landing center.	
9.	Visit to a fishery research institute and submission of report	

References:

1. Qasim S.Z., Glimpses of Indian Ocean, Sangum Bodes Ltd. London. Navya Printers, a. Hyderabad.
2. Michael King, Fisheries Biology assessment and management, Fishing News Publishers,1995.
3. Jhingran, Fish and fisheries
4. P. Michal, Ecological methods for field and laboratory investigations.
5. David Ross, Introduction to Oceanography.
6. R.V. Tait, Marine zoology, Oxford press.
7. P. Bensam. Development of marine fishery sciences in India, Daya publishing House.

Modality of Assessment: Vocational Skill Courses (1 Credit Theory Course for BSc)

A) Internal Assessment- 40%- 30 Marks

Sr No	Evaluation type	Marks
2	Class Test/Assignment/Open Book Test	10
	TOTAL	**10**

B) External Examination (Semester End)- 60%- 45 Marks

Semester End Theory Examination:

1. **Duration – The duration for these examinations shall be of 30 Minutes.**
2. **Theory question paper pattern:**

Paper Pattern:

Question	Options	Marks	Questions Based on
1	A) (OR) B) (i and ii)	8 OR 8(4+4)	UNIT 1
2	B)	7	
	TOTAL	**15**	

Practical Examination Pattern: Total Marks 50

A. **Internal Examination: 40%- 20 Marks**

Heading	Practical
Journal	05
Lab Participation	05
Lab work/ Field report/ Presentation	10
Total	**20**

B. **External Examination: 60%- 30 Marks**

Duration – The duration for these examinations shall be of 2 hours.

Semester End Practical Examination:

Particulars	Practical
Major Experiment and/or Minor Experiment, Identification and *Viva voce*	30
Total	**30**