

Resolution No. AC/II(23-24).2.RUS12

**S. P. Mandali's**  
**Ramnarain Ruia Autonomous College**  
*(Affiliated to University of Mumbai)*



**Syllabus for**

**Program: F.Y.B.Sc.**

**Program Code: (RUSZOO)**

(As per the guidelines of National Education Policy 2020-  
Academic year 2024-25)

(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
	<b>A student completing Bachelor's Degree in Science program will be able to:</b>
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
	<b>A student completing Bachelor's Degree in Science program in the subject of ZOOLOGY will be able to:</b>
<b>PO 1</b>	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.
<b>PO 2</b>	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.
<b>PO 3</b>	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.
<b>PO 4</b>	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.
<b>PO 5</b>	Objectively understand and evaluate information about animal behaviour and ecology encountered in our daily lives.
<b>PO 6</b>	Students will be able to demonstrate proficiency in the experimental techniques and methods of analysis appropriate for their area of specialization within Zoology.
<b>PO 7</b>	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	Vocational and Skill Enhancement Course (VSC) & SEC	Ability Enhancement Course/ VEC/IKS	OJT/FP/CEPC, RP	Total Credits
	DS C	DS E						
1	4		4	4	VSC-2 Sub 1+ SEC -2	AEC- 2 (CSK) + VEC- 2 (Understanding India) + IKS-2		22
2	4		4	4	VSC-2 Sub 2+ SEC -2	AEC-2 (CSK)+ VEC- 2 (Env Sc)	CC-2	22
<b>Total</b>	<b>8</b>		<b>8</b>	<b>8</b>	<b>8</b>	<b>10</b>	<b>2</b>	<b>44</b>
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								

Semester	Subject 1 (Major)		Subject 2 (Minor)	GE/ OE course	Vocational and Skill Enhancement Course (VSC) & SEC	Ability Enhancement Course/ VEC/IKS	OJT/FP/CEPCC, RP	Total Credits
	DSC	DSE						
3	Major 8		Minor 4	2	VSC-2-Major	AEC-2 MIL (Marathi/Hindi)	FP -2, CC-2	22
4	Major 8		Minor 4	2	SEC-2	AEC-2 MIL (Marathi/Hindi)	CEP-2, CC-2	22
<b>Total</b>	<b>16</b>		<b>8</b>	<b>4</b>	<b>4</b>	<b>4</b>	<b>8</b>	<b>44</b>
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
<b>Total</b>	<b>24</b>	<b>8</b>	<b>4</b>		<b>2</b>		<b>6</b>	<b>44</b>
Exit option: award of UG Degree in Major with 132 credits or Continue with Major for Honours/ Research								

**Course Code: RUSSECZOO.E111**

**Course Title: INTRODUCTION TO FISHERY**

**Type of Course: Vocational Skill Courses (VSC)**

**Academic year 2024-25**

**COURSE OUTCOMES:**

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

## DETAILED SYLLABUS

### Practical

<b>Course Code: RUSSECZOO.P.E111</b>		
<b>Sr. No.</b>	<b>Practical Title- INTRODUCTION TO FISHERY</b>	<b>Credit - 02</b>
1.	Identification- Freshwater fishes- <i>Labeo rohita</i> , <i>Catla catla</i> , <i>Mrigal</i> , <i>Macrobrachium rosenbergii</i> .	
2.	Identification-Marine water fishes- <i>Harporodon nehereus</i> , <i>Rastrelliger kanagurta</i> , <i>Penaeus vannamei</i> .	
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.	Types of fish migration- <ul style="list-style-type: none"> <li>• Diadromous- Anadromous, Catadromous</li> <li>• Potamodromous</li> <li>• Oceanodrous</li> <li>• Latitudinal</li> <li>• Vertical</li> <li>• Shoreward</li> </ul>	
9.	Measurement of Ova-diameter by using an oculometer. Calculation of fecundity by using <i>Coilea dussumieri</i> .	
10.	Methods of fishery management- <ul style="list-style-type: none"> <li>• Mesh size regulation</li> <li>• Use of GIS</li> </ul>	
11.	Visit to any fish landing center.	
12.	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

**Practical Examination Pattern: Total Marks 50**

**Duration – The duration for the examination shall be 3 hours.**

**Semester End Practical Examination:**

Particulars	Practical
Major Experiment and/or Minor Experiment, Identification and Viva voce	30
Journal	05
Lab Participation	05
Lab work/ Field report/ Presentation	10
<b>Total</b>	<b>50</b>

**PRACTICAL JOURNAL-** The students must present a duly certified journal for appearing at the practical examination, failing which they will not be allowed to appear for the examination. In case of loss of Journal, a Lost Certificate should be obtained from Head/ Co-ordinator / In charge of the department; failing which the student will not be allowed to appear for the practical examination



Ramnarain RUIA Autonomous College