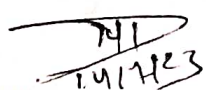
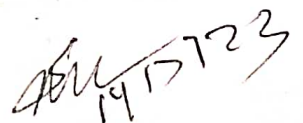
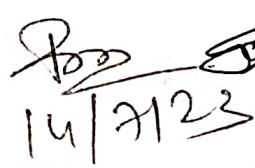
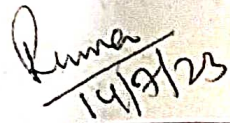
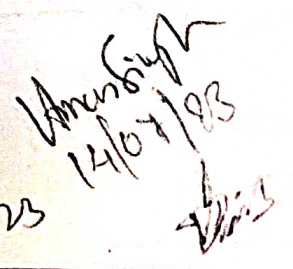


**St. Aloysius College (Autonomous), Jabalpur**  
**Department of Higher Education, Govt. of M.P.**  
**Under Graduate Syllabus for B.Sc. (Bio)**  
**As recommended by Central board of Studies in Zoology**  
**Class - B.Sc. II Semester**  
**(Session 2023-24)**

Theory Syllabus			
Part A Introduction			
Programme-Certificate Course	Class: B.Sc	Sem -II Semester	Session: 2023-2024
Subject: Zoology			
1.	Course Code	SI-ZOOL2T	
	Course Title	<b>Cell Biology, Reproductive Biology and Developmental Biology</b>	
	Course Type (Core Course/Elective/Generic Elective/Vocational..)	Core Course – Major (Zoology)	
	Pre-requisite (if any)	To study this course a student must have had the subject Biology in 12 <sup>th</sup> Class	
	Course Learning outcomes (CLO)	<p>Upon completion of the course students should be able to</p> <ol style="list-style-type: none"> <li>1. Develop deeper understanding of what life is and how it functions at cellular level</li> <li>2. Understand the nature and basic concepts of Cell biology, Reproductive and Developmental biology.</li> <li>3. Understand structure and functions of cell membrane and cellular organelles</li> <li>4. Understand the importance of latest reproductive trends, reproductive techniques to be applied for human welfare.</li> <li>5. Understand the general patterns and sequential developmental stages during embryogenesis; and understand how the developmental processes lead to establishment of body plan of multi-cellular organisms.</li> <li>6. Understand about the evolutionary development of various animals.</li> </ol>	
6	Credit Value	4	
7	Total Marks	MM 60+40	Min Passing Marks 35

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**Part B Content of the course**

**Total No. of Lectures – Tutorials- Practical (in hours per week): 2hours per week**  
**L-T-P:**

Unit	Topics	No. of Lectu
I	<b>Cell Biology</b>  1.1 Concept of Prokaryotic and Eukaryotic Cells, difference between Prokaryotic and Eukaryotic Cells 1.2 Structure and functions of Plasma membrane 1.3 Structure and functions of Golgi body, Mitochondria, Endoplasmic reticulum, Ribosome and Lysosome 1.4 Structure and functions of Nucleus 1.5 Structure and functions of Chromosome and special type of chromosomes-Lamp brush and Polytene chromosome 1.6 Cell cycle, Mitotic and Meiotic cell division and their significance  Keywords/Tags: Prokaryote, Eukaryote, Cell organelles, Chromosomes, Cell Cycle	13
II	<b>Reproductive Biology</b>  1.1 Structure of Male reproductive system of Lepus 1.2 Structure of Female reproductive system of Lepus 1.3 Histology of Testis, and Ovary of Lepus 1.4 Gametogenesis - Spermatogenesis and oogenesis, difference between spermatogenesis and oogenesis 1.5 Types of Eggs-based on amount and distribution of yolk with examples  Keywords/Tags: Reproductive system, Gametogenesis, Sperms, Eggs	13
III	<b>Recent Assisted Reproductive Techniques (ART)</b>  1.1 Stem Cell-Types and their uses 1.2 Gene bank, Sperm bank, Superovulation, Cryopreservation 1.3 In Vitro Fertilization (IVF) and Embryo Transfer (ET)), Zygote Intra Fallopian Transfer (ZIFT), Intracytoplasmic Sperm Injection (ICSI), MOET (Multiple ovulation embryo transfer) 1.4 Placentation -Types, examples and functions 1.5 Placenta Banking-Placenta preservation benefits  Keywords/Tags: Gene bank, Sperm bank, Superovulation, IVF, ET, ZIFT, ICSI, Placenta banking	12

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IV	<b>Developmental Biology</b> <p>1.1 Fertilization: Process of fertilization  1.2 Embryonic development of frog up to the formation of three germinal layers  1.3 Fate map construction in frog.  1.4 Metamorphosis of Tadpole Larva  1.5 Parthenogenesis</p> <p>Keywords/Tags: Fertilization, Frog embryology, Tadpole metamorphosis, Parthenogenesis</p>	11
V	<b>Embryonic Development of Chick</b> <p>1.1 Structure of hen's egg.  1.2 Embryonic Development of chick embryo upto the formation of primitive streaks  1.3 Fate map construction in chick  1.4 Extra embryonic membranes of Chick: Formation and functions.</p> <p>Keywords/Tags: Hen's egg, Chick embryology, Fate map, Chick Embryo membranes</p>	11

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# Part B- Content of the Course

Total No. of Lectures - Tutorials-Practical (in hours per week): 02 hours per week  
L-T-P:

Unit	Topics	No. of lectures
1.	Spotting related to the cytology a. Prokaryote and Eukaryote Cell b. Stages of Mitotic cell division c. Stages of Meiotic cell division. d. Lamp brush Chromosome e. Study of Polytene Chromosome under Phase Contrast Microscope.	13
2.	Spotting related to Reproductive Biology and Embryology a. T.S. Testis of Mammal b. T.S. Ovary of Mammal c. Developmental stages of Frog embryology d. Developmental stages of Chick embryology e. Malaria Antibody Test using ELISA Reader f. Calculation of phase percentage of stages of meiotic cell division under Phase Contrast Microscope g. Study of Sperm Morphology under Phase Contrast Microscope	13
3.	Squash preparation of onion root tip to understand the stages of Mitosis	8
4.	Squash preparation of Grasshopper testis to understand the stages of Meiosis	9
5.	Trypan Blue exclusion test of cell viability	8

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6.	Squash preparation of salivary gland chromosome from Chironomus larva / Drosophila	9
Keywords/Tags: Stages of cell division, Stages of Embryonic development, Squash Preparation		
<b>Part C-Learning Resources</b>		
<b>Text Books, Reference Books, Other resources</b>		
<b>Suggested Readings:</b>		
1. Arumumam, N. Nair, NC, Leelavathy, S. Pandian, NS, Murugan, T, Jayasurya, "Practical Zoology - Invertebrata", Volume-I. Saras Publication, 2013.		
2. Lal. SS. "A Text book of Practical Zoology - Invertebrates", Rastogi Publication, 2016		
3. Prakash. M. and Arora. CK. "Laboratory Animals". Anmol Publications, New Delhi, 1998		
4. Verma. PS. "A Manual of Practical Zoology - Invertebrates". S. Chand & Co., 2013.		
5. Virtual Labs ( <a href="https://www.vlab.co.in">https://www.vlab.co.in</a> )		

<b>Part D- Assessment and Evaluation</b>			
<b>Suggested continuous Evaluation Methods:</b>			
Internal Assessment	Marks	External Assessment	Marks
Class Interaction/Quiz	10	Viva Voce on Practical	10
Attendance	10	Practical Record File	10
Assignments (Charts/Model/ Seminar/Rural Service/Technology Dissemination/ Report of Excursion/lab Visits/Survey/Industrial visit	20	<b>Table Work/Experiments</b>	<b>40</b>
		1. Spotting of Cytology	08
		2. Spotting of Reproductive Biology & Embryology	08
		3. Squash Preparation of onion root tip	06
		4. Squash preparation of Grasshopper testis	06
		5. Cell Viability Test	06
		6. Salivary gland chromosome preparation	06

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