



ST. ALOYSIUS COLLEGE(AUTONOMOUS), JABALPUR

Reaccredited 'A+' Grade by NAAC(CGPA:3.68/4.00)

College with Potential for Excellence by UGC

DST-FIST Supported & STAR College Scheme by DBT

Faculty of Science

Bachelor of Science (B.Sc.)

SUBJECT: ZOOLOGY

B.Sc. II Semester

Paper-ELECTIVE

CELL BIOLOGY, REPRODUCTIVE BIOLOGY AND DEVELOPMENTAL BIOLOGY

Course Outcome

Hours-60

M.M-60

S. No.	Course Outcomes	
	On completion of this course students will able to:-	
01	Develop deeper understanding of what life is and how it functions at cellular level	U,An
02	Understand the nature and basic concepts of Cell biology, Reproductive and Developmental biology.	U
03	Understand structure and functions of cell membrane and cellular organelles	U
04	Understand the importance of latest reproductive trends, reproductive techniques to be applied for human welfare.	U,Apply
05	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	U,Create
06	Understand about the evolutionary development of various animals.	U

Credit and Marking Scheme

	Credits	Marks		Total Marks
		Internal	External	
Theory	4	40	60	100
Practical	2	40	60	100
Total	6	200		

Evaluation Scheme

	Marks	
	Internal	External
Theory	3 Internal Exams each of 20 Marks (During the Semester) (Best 2 will be taken)	1 External Exams (At the End of Semester)
Practical	3 Internal Exams (During the Semester) (Best 2 will be taken)	1 External Exams (At the End of Semester)

Theory

Signature

Signature

Signature



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No. of Lectures (in hours per week): 2 Hrs. per week

Units	Topics	No. of Lectures
I	Cell Biology 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	Reproductive Biology 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	12
III	Recent Assisted Reproductive Techniques (ART) 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	10



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IV	Developmental Biology 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 1.6 Extra embryonic membranes of Chick: Formation and functions. Keywords/Tags: Fertilization, Frog embryology. Tadpole metamorphosis, Parthenogenesis	15
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References

Text Books, Reference Books and Other Resources:-

Suggested readings:

1. Armugam, "A Text Book of Embryology", Saras Publication, 2005.
2. Balinsky, BI, "An Introduction to Embryology", Cengage Learning, 2012.
3. De Robertis, EDP, De Robertis, EMF, "Cell and Molecular Biology", Eighth edition, Lippincott, Williams & Wilkins, Philadelphia, 2006.
4. Gupta, PK, "Cell Biology, Genetics and Evolution", Rastogi
5. Haffner, L, "Human reproduction at a glance", BWL Publication, "Human Embryology", Publications, 2013.
- Churchill Livingstone, 2001.
7. Powar, CB, "Cell Biology", Himalaya Publishing House, 2010.
6. Larsen, 8. Rastogi, VB, "Introduction to Cytology", KNRN Publication, 1988.
9. Rastogi, VB, "Animal Distribution and Developmental Biology", KNE2001. Publication, 2020.
10. Sastry, KV, Publications, 2018. "Endocrinology and Reproductive Biology",
11. Verma and Agarwal, "A Text Book of Cytology", S. Chand & Co., 1999.
12. Verma, PS, Agarwal, V, K. "Chordate Embryology", S. Chand & Co., 2000
13. Pardesi, K and Dubey, A., 'Cell and Developmental Biology', Akhandpubli house, New Delhi, India edition, 2020.

A. Saxena

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Amarsingh



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List of Practical

Part B- Content of the Course		
Total No. of Lectures – Tutorials – Practical (2 hour per week): L-T-P: 30		
Unit	Topic	No. of Lectures
I	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 and Polytene Chromosome under Phase Contrast Microscope.	15
II	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	
III	Squash preparation of onion root tip to understand the stages of Mitosis	
IV	Squash preparation of Grasshopper testis to understand the stages of Meiosis	
Keywords/Tags: Stages of cell division, Stages of Embryonic development, Squash Preparation		

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