

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. VI Semester

Paper-DSE - II

Genetics

Session 2024-25

Course Outcomes

CO. No.	Course Outcomes	Cognitive Level
CO 1	Gain knowledge of basic principles of inheritance and variations, DNA, RNA and their function.	U
CO 2	Deeper understanding of linkage, Sex determination, Chromosomes, Mutations and mutagens.	U
CO 3	Gain knowledge of human karyotype, Genome project, Inheritance of blood group and genetic diseases in human	U
CO 4	Demonstrate gene therapy, PCR, DNA fingerprinting techniques and their application	Apply
CO 5	Find Job Opportunities in Hospitals, Pharmaceutical Companies and other health services, Forensic Science Research Associates, Genetic Counselor, Clinical Research Associate, Animal Breeder, Genetic Laboratory Technicia	C

Credit and Marking Scheme

	Credits	Marks		Total Marks
		Internal	External	
Theory	3	40	60	100
Practical	1	40	60	100
Total	4			200







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Evaluation Scheme

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

Content of the Course

Theory

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

Total No. of Lectures: 60 Hrs.

Maximum Marks: 60

Units	Topics	No. of Lectures
I	Overview of Genetics- Introduction and Historical background of genetics, Definition, Scope and Importance of Genetics, Chromosomes: Transmitters of Heredity, Structure and Organization of Chromosomes, Types of Chromosomes, Chemical composition of chromosomes, Nucleocytoplasmic Interaction Mendel's laws of Heredity, Variations: Types and genetic basis of Variations on	10
II	Gene and Genetic Material--Chemistry of Gene - Nucleic acids and their structure, Concept of DNA replication, Nucleosome (Solenoid Model), Types of genes: Split genes, Overlapping genes and Pseudogenes,. Genetic code	10
III	Genelinkage and recombination-Sex-determination, Sex-linked Inheritance, Structural changes in chromosomes: Deficiency, Duplication, Translocation and Inversion, Numerical changes in chromosomes: Aneuploidy, Polyploidy, Mutation: Types of mutations and mutagens	10
IV	Human Genetics & Genetic Engineering-Human chromosomes: Human Karyotype and Human Genome Project, Common genetic disorders, Multiple factors and blood groups, Twins: Fraternal, Maternal and Siamese twins, Transgenic and knockout animals and their applications, Gene Therapy:- Germline, and Somatic cell gene therapy. Recombinant DNA technology, Gene cloning, Gene library, PCR and Hybridization techniques, DNA finger printing	15

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