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

Genetics

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 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)

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

References

Text Books:

- **Reference Books:**
- "Computer system Architecture and Organization" by Patterson, McGraw Hill
- "Computer system Architecture & Organization" S.P.S. Saini, S. K. Katheria, Published by Katharia and Sons

Web Links:

List of Practical

PART-I (Computer Fundamentals)

1. Various parts of a computer.
2. Identify various parts inside the CPU like motherboard, SMPS, Ports, Buses, IC chip, Processor, HDD, RAM.
3. Identify various I/O devices

PART-II (Digital Electronics)

1. To study basic gates (AND, OR, NOT) and verify their truth tables.
2. To study and verify NAND as Universal gate using IC 7400.
3. To realize basic gate AND from Universal gate NAND.
4. To realize basic gate OR from Universal gate NAND.
5. To realize basic gate NOT from Universal gate NAND.
6. To study and verify NOR as Universal gate
7. To realize basic gate AND from Universal gate NOR.
8. To realize basic gate OR from Universal gate NOR.
9. To realize basic gate NOT from Universal gate NOR.
10. Verification and Interpretation of truth table for XOR gate.
11. To study Half Adder using basic gates and verify its truth table.
12. To study Full Adder using basic gates and verify its truth table.
13. To design and construct RS flip Flop using gates and verifies the truth table.
14. To design and construct JK Flip Flop using gates and verifies the truth table.
15. To verify De-Morgan's First Law Theorem.
16. To verify De-Morgan's Second Law Theorem.