Shri Vaishnav Vidyapeeth Vishwavidyalaya, Indore
Shri Vaishnav Institute of Agriculture
B.Sc. (Hons) Agriculture

GUAGRI 104: Fundamentals of Genetics

Course Code	Course Name	TEACHING & EVALUATION SCHEME							
		THEORY			PRACTICAL		L	P	CREDITS
		END SEM University Exam	Two term exam*	Teachers Assessment*	END SEM University Exam	Teachers Assessment*			
GUAGRI 104	FUNDAMENTALS OF GENETICS	50	30	00	15	05	2	1	3

Legends: **L** - Lecture; **P** – Practical; **C**-Credit;
*__Teacher Assessment__ shall be based on following components: Quiz / Assignment / Project / Participation in Class,

Course Objectives

1. To study the genetics concept in crops

Course Outcomes0

1. Student will able to understand structural and functional aspect of heredity material in crops
2. Student will able to understand cell and cell cycle for the improvement of crop

Unit-1

Pre and Post Mendelian concepts of heredity, Mendelian principles of heredity. Architecture of chromosome; chromonemata, chromosome matrix, chromomeres, centromere, secondary constriction and telomere; special types of chromosomes.

Unit-2

Chromosomal theory of inheritance –cell cycle and cell division –mitosis and meiosis. Probability and Chi-square. Dominance relationship, Epistatic interactions with example.

Unit-3

Multiple alleles, pleiotropism and pseudoalleles, Linkage and it`s estimation, crossing over mechanisms , chromosome mapping. Structural and numerical variations in chromosome and their implications.

Unit-4

Use of haploids, dihaploids and doubled haploids in Genetics. Mutation classification, Methods of inducing mutations & CIB technique, mutagenic agents and induction of mutation. Qualitative and Quantitative traits, Polygenes and continuous variations, multiple factor hypothesis, Cytoplasmic inheritance.

Unit-5

Nature, structure and replication of genetic material. Protein synthesis, transcription and translational mechanism of genetic material. Gene concept :Gene structure, function and regulation, Lac and Trp operons

Practical: GUAGRI 104

Study of microscope, Study of cell structure. Mitosis and Meiosis cell division. Experiments on monohybrid, dihybrid, trihybrid, testcross and back cross, Experiments on epistatic interactions including test cross and back cross, Practice on mitotic and meiotic cell division, Experiments on probability and Chi-square test. Determination of linkage and cross over analysis (through two point test cross and three point test cross data. Study of models on DNA and RNA structures.

Books:

1. B. D. Singh .*Plant Breeding – Principles and methods*. Kalyani Publishers New Delhi.
2. Phunadan Singh. *Essentials of Plant Breeding*. Kalyani publisher new Delhi.
3. Chopra, V.L. .*Plant breeding theory and practice*. Oxford and IBH Publishing Co. PVT. Ltd.
4. Allard, R. .*Principles of plant breeding*. John Wiley and Sons , New Delhi.
5. J. R. Sharma. *Principles and Practices of Plant Breeding*. Tata McGraw-Hill publishing Co., New Delhi

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