



Shri Vaishnav Vidyapeeth Vishwavidyalaya, Indore

Shri Vaishnav Institute of Agriculture

Choice Based Credit System (CBCS) Scheme in the light of NEP-2020

Under-Graduate, Multi- Inter Disciplinary (Generic Elective Course)

AGGE300: Essentials of Genetics and Plant Breeding (4+0=4)

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*			
AGGE300	Essentials of Genetics and Plant Breeding s	60	20	20	00	00	4	0	0

1. **Legends:** L - Lecture; P Practical; C-Credit.

2. ***Teacher Assessment** shall be based on following components: Quiz / Assignment / Project / participation in class.

Course Objective:

1. To introduce the basic concepts of genetics and plant breeding.
2. To understand the principles of inheritance and genetic variation.
3. To familiarize students with the basic methods of crop improvement.
4. To provide an overview of modern plant breeding techniques and their applications.
5. To highlight the role of genetics and plant breeding in sustainable agriculture.

Course Outcomes: After successful completion of the course, students will be able to:

1. Explain the basic principles of genetics and inheritance.
2. Describe the structure and function of genetic material.
3. Understand the fundamental methods of plant breeding.
4. Explain the role of genetics in crop improvement.
5. Appreciate the importance of plant breeding for food security and sustainable agriculture.

Unit- I:

Introduction, scope and importance of genetics; cell structure; chromosomes; mitosis and meiosis; Mendel's laws of inheritance; monohybrid and dihybrid inheritance; gene, allele, genotype and phenotype; significance of genetics in agriculture.

Unit -II:

Structure and functions of DNA and RNA; DNA replication; protein synthesis (transcription and translation); mutation and its importance; genetic variation; applications of molecular genetics in agriculture.

Unit- III:

History, objectives and importance of plant breeding; centres of origin and diversity; germplasm collection and conservation; plant introduction; selection methods; hybridization; types of pollination and their importance in breeding.



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Unit- IV:

Breeding methods for self-pollinated, cross-pollinated and vegetatively propagated crops; heterosis and hybrid breeding; mutation breeding; breeding for disease and insect resistance; seed production and variety development.

Unit- V:

Introduction to biotechnology in plant breeding; molecular markers and marker-assisted selection (basic concepts); genetically modified crops; genome editing (overview); role of genetics and plant breeding in climate-resilient agriculture, food security and sustainable crop production.

Suggested Readings

1. Singh, B.D. (2021). Fundamentals of Genetics. Kalyani Publishers, New Delhi.
2. Singh, B.D. (2019). Plant Breeding: Principles and Methods. Kalyani Publishers, New Delhi.
3. Gupta, P.K. (2020). Genetics. Rastogi Publications, Meerut.
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Chairperson,
Board of Studies,
Shri Vaishnav
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Vishwavidyalaya, Indore

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Registrar,
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