

D. B. G. GOVT. COLLEGE, PANIPAT

Session 2026-2027 (ODD SEMESTER)

NAME OF PROFESSOR: ARVIND KUMAR

DESIGNATION: Assistant Professor in Botany

SUBJECT/PAPER: VOC (B23-BOT-109) Organic Farming

CLASS- B.A. III, 5TH Sem

SR. NO.	MONTH	TOPICS TO BE COVERED	REMARKS IF ANY
1.	August	Basics of organic farming – Concept and components of organic farming, aims and objectives; Need of organic farming Historical development of organic farming in India; Status of organic farming in India; Advantages and disadvantages of organic farming. Organic farming process- Concept of farming system, Developing organic farms, Important steps & methods; Pure organic farming and integrated farming system (combination of organic and inorganic).	Practical
2.	September	Plant nutrients: Essential plant nutrients, their role in plant growth and development, Nutrient uptake and utilization by plant. Nutrient management in organic farming: Balanced nutrients supply for organic farming system using nutrients from organic sources. Preparation, nutrient content and methods of use of following- FYM/Rural compost, mulching, city compost, oil cakes, animal wastes, vermicomposts, vermiwash, jeevamrit, beejamrit, green manures, biofertilizers.	Practical, Assignment +Test
3.	October	Bio fertilizers and their method of use – Nitrogenous, Phosphatic, Potassic, availability of nutrients from above sources. Recycling of organic matter in organic agriculture-Transformation of organic substances in soil. Disease and pest management in organic farming-Integrated pest & disease managements; Organic pesticides, bio-pesticides; Inorganic pesticides, disadvantages of their use;Seed, seedling and soil treatment measures; Feasibility of complete dependence on organic sources.Weed management inorganic farming	Practical, Assignment +Test
4.	November	Use of Neem and other plant products in organic farming; Organic agri horticulture in urban & semi urban areas. Certification, Standardization, Marketing	Practical

		- Quality control and certification procedures of organic products. Organic standards In India. Govt. schemes related to organic farming in India. Potential demand and Marketing of organic products. Organic farming and food security in India.	
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TWO ASSIGNMENTS AND ONE UNIT TEST WILL BE TAKEN AS PER SCHEDULE.

Signature of Assistant Professor

D. B. G. GOVT. COLLEGE, PANIPAT

Session 2026-2027 (ODD SEMESTER)

NAME OF PROFESSOR: ARVIND KUMAR

DESIGNATION: Assistant Professor in Botany

SUBJECT/PAPER: B23-BOT-501- Economic Botany and Plant Biotechnology

CLASS- B.Sc. III, 5TH Sem

SR. NO.	MONTH	TOPICS TO BE COVERED	REMARKS IF ANY
1.	August	Food Plants: Introduction to Cereals and Millets; Origin, distribution, botanical description, brief idea of cultivation and uses of Rice, Wheat and Maize. Protein Crops (Pulses); Origin, distribution, botanical description, brief idea of cultivation and uses of Gram, Arhar, Peas. Introduction to Vegetables; Origin, distribution, botanical description, brief idea of cultivation and uses of Potato, Tomato, Onion. Fibers: Introduction to natural fibers; Origin, distribution, botanical description, brief idea of cultivation, processing and uses of Cotton, Jute and Flax. Oil Yielding Crops: Origin, distribution, botanical description, brief idea of cultivation and uses of Groundnut, Mustard and Coconut.	Practical
2.	September	Spices and Condiments: Introduction to spices and condiments; Morphology of plant part used, brief idea of cultivation and uses of Coriander, Black Pepper, Ginger, Turmeric and Cloves. Medicinal Plants: Brief idea of Cultivation, botanical features and medicinal importance of Cinchona, Rauwolfia, Atropa, Opium, Cannabis, Indian Gooseberry and Withania. Beverages: Botanical description and processing of Tea and Coffee. Rubber: Botanical description and processing of Hevea Sugar: Botanical description, cultivation and harvesting of Sugarcane; processing of Sugar. Timber: Note on important timber yielding plants.	Practical, Assignment +Test
3.	October	Genetic Engineering in plants: Introduction and applications Direct DNA transfer/Physical methods of gene transfer in plants - micro projectile bombardment, electroporation, liposome mediated,	Practical, Assignment +Test

		Calcium phosphate mediated etc. Restriction Endonucleases: Types and role; brief idea about cloning vectors- Ti plasmid, BAC, Lambda phage, cosmid, shuttle vector, eukaryotic vectors (YAC) Plant transformation by Agrobacterium tumefaciens and A. rhizogenes. Strategies for gene transfer to plant cells. Binary and co-integrate vectors.	
4.	November	Plant Tissue Culture: Concept, History, Scope and Applications; Totipotency Organogenesis Cryopreservation Types of culture: Seed, Embryo, callus, suspension, organs, Cell and protoplast culture Micropropagation/clonal propagation (different routes of multiplication axillary bud proliferation, somatic embryogenesis, organogenesis), Synthetic seeds (a brief account) In vitro haploid production Androgenic methods: Anther culture, Microspore culture Androgenesis Significance and use of haploids Gynogenic haploids, factors effecting gynogenesis Somatic hybridisation, Cybrids, Somaclonal variations	Practical

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Signature of Assistant Professor

D. B. G. GOVT. COLLEGE, PANIPAT

Session 2026-2027 (ODD SEMESTER)

NAME OF PROFESSOR: ARVIND KUMAR

DESIGNATION: Assistant Professor in Botany

SUBJECT/PAPER: B23- SEC (Bio-Fertilizer)

CLASS- B.A. II, 3rd Sem,

SR. NO.	MONTH	TOPICS TO BE COVERED	REMARKS IF ANY
1.	July		Practical
2.	August	General account of microbes used as biofertilizers; Rhizobium: Morphology, identification, isolation, cultivation and mass multiplication.	Practical
3.	September	Azospirillum: Isolation and mass multiplication. Azotobacter: Classification, characteristics, crop response to Azotobacter inoculum, maintenance and mass multiplication.	Practical, Assignment +Test
4.	October	Cyanobacteria (Blue green algae), Anabaena- Azolla; nitrogen fixation, factors affecting growth, Anabaena- Azolla association in rice cultivation.	Practical, Assignment +Test

5	November	Mycorrhizal association – types of mycorrhizal association, occurrence and distribution of phosphorous nutrition, growth and yield. Colonization of VAM.	Practical
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Signature of Assistant Professor