Detailed Course Scheme

Bachelor of Science (Hons.)

Agriculture

Semester-IV

(2024- 28)

DOC202410100009

RNB GLOBAL UNIVERSITY
RNB Global City, Ganganagar Road,
Bikaner, Rajasthan 334601

OVERVIEW

RNB Global University follows Semester System along with Choice Based Credit System as per latest guidelines of University Grants Commission (UGC). Accordingly, each academic year is divided into two semesters, **Odd (July-December) and Even (January-June)**Also, the university follows a system of continuous evaluation along with regular updating in course curricula and teaching pedagogy.

The Curriculum for B. Sc Agriculture program for (January-June) EvenSemester 2026 along with examination pattern is as follows:

Course Scheme

Semester –IV

S. No.	Course Code	Course Category	Course Name	L	T	P	Credits
1.	SECA77006	SEC-VI	Horticulture nursery management	0	0	4	2
2.	AECA55010	AEC-12	Agricultural Informatics and Artificial Intelligence (AI)	2	0	0	2
3.	AECA55011	AEC-13	Agricultural Informatics and Artificial Intelligence (AI) Lab	0	0	2	1
4.	BSAC48200	DSCHO-3a	Production Technology of Vegetables and Spices	1	0	0	1
5.	BSAC48201	DSCHO-3b	Production Technology of Vegetables and Spices Lab	0	0	2	1
6.	BSAC45252	DSCEC-1	Principles of Agricultural Economics and Farm Management	2	0	0	2
7.	BSAC41250	DSCAG-5a	Crop Production Technology-II (Rabi Crops)	1	0	0	1
8.	BSAC41251	DSCAG-5b	Crop Production Technology-II (Rabi Crops) Lab	0	0	4	2
9.	BSAC46200	DSCAE-1a	Farm Machinery and Power	1	0	0	1
10.	BSAC46201	DSCAE-1b	Farm Machinery and Power Lab	0	0	2	1
11.	BSAC41255	DSCAG-6a	Water Management	1	0	0	1
12.	BSAC41256	DSCAG-6b	Water Management Lab	0	0	2	1
13.	BSAC43250	DSCSO-3a	Problematic Soils and their management	1	0	0	1
14.	BSAC43251	DSCSO-3b	Problematic Soils and their management Lab	0	0	2	1
15.	BSAC42200	DSCPB-2a	Basics of Plant Breeding	2	0	0	2
20.	BSAC42201	DSCPB-2b	Basics of Plant Breeding Lab	0	0	2	1
21.	WHNN99000		Workshop & Seminars / Human Value & Social Service / NSS	-	-	-	1
			Total	**11**		**20**	**22**

The students who wish to exit with UG- Diploma after 2nd year, has to undergo 10 weeks of internship programme (10 credits) after 2nd Year.

EVALUATION SCHEME - THEORY

The evaluation of the theory paper of B.Sc. Agriculture program would be based on Internal and External Assessments. Internal Assessment would consist of 50% of the marks (50 marks) and external assessment (in form of End Term Exam) would consist of remaining 50% marks (50 marks). Detailed scheme of Internal and External Assessments as follows:

Internal Assessment

The distribution of Internal Assessment Marks is as follows:

Type	Details	Marks
Mid Term	Two Mid-term Sessional of 15 marks each (15+15)	30
Marks obtained in various Tests, Assignments, Presentations, Quiz, Tutorials, etc.	Average of marks obtained	15
Academic and course involvement		5
TOTAL	**50**	

External Assessment

Type	Marks
Theory	50

EVALUATION SCHEME - PRACTICAL

The evaluation of the practical paper of B.Sc. Agriculture program would be based on Internal and External Assessments. Internal Assessment would consist of 50% of the marks (50 marks) and external assessment (in form of End Term Exam) would consist of remaining 50% marks (50 marks). Detailed scheme of Internal and External Assessment is as follows:

Internal Assessment

Type	Details	Marks
Marks obtained in various manuals, practical file, participation, any model prepared, output of practical	Average of marks obtained	45
Academic and course involvement		5
TOTAL	**50**	

External Assessment

Type	Marks
Practical	50

1. Vision

Vision of School of Agriculture is to be established as advanced studies and research and skill-based centre for students and scholars.

2. Mission

Mission of School of Agriculture is to cultivate a scholarly mindset and analytical abilities in students, as well as train them in agricultural sphere, to reach the profession's daunting needs by providing dynamic knowledge in the field of agriculture.

3. Program Educational Objectives (PEOs)

After successful completion of the program, the graduates will be

AGPEO 1: Able to apply concepts of basic and applied sciences to Agriculture

AGPEO 2: Able to design and develop interdisciplinary and innovative systems.

AGPEO 3: Able to inculcate effective communication skills, team work, ethics, leadership in preparation for a successful career in agriculture and R&D organizations.

4. Program Outcomes (POs)

Students graduating with the B.Sc. (Hons.) Agriculture degree should be able to:

PO1. Agriculture knowledge: Apply the knowledge of basic and applied sciences to agriculture, agriculture fundamentals and agriculture specialization to the solution of complex agriculture problems. Apply the knowledge of regenerative agriculture with a conservation and rehabilitation approach to food and farming systems.

PO2. Problem analysis: Identify, formulate, review research literature, and analyze complex agriculture problems reaching substantiated conclusions using first principles of basic and applied sciences. Understand rapid appraisal of agricultural innovation systems, a diagnostic tool that can guide the analysis of complex agricultural problems and innovation capacity of the agricultural system towards futuristic agriculture.

PO3. Design/development of solutions: Design solutions for complex agriculture problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, social, and environmental considerations.

PO4. Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5. Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern agriculture and IT tools including prediction and modelling to complex agriculture activities with an understanding of the limitations. Learning use of GIS, IoT, Automation, Intelligent Systems in Farming & Agriculture development & trading.

PO6. The agriculture graduate and society: Apply reasoning informed by the contextual knowledge to assess social, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional agriculture practices. Recognize, analyze, and evaluate the critical human and social factors impacting agriculture. Understand the social dimensions of agriculture and its connections with food and environmental systems.

PO7. Environment and sustainability: Understand the impact of the professional agriculture solutions in societal and environmental contexts, and demonstrate the knowledge and need for sustainable development.

PO8. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the agriculture practice.

PO9. Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO10. Communication: Communicate effectively on complex agriculture activities with the agriculture community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO11. Project management and finance: Demonstrate knowledge and understanding of the agriculture and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments. Able to design, launch and run a new business, to create job and not to seek for job. Also capable with an effective mix of knowledge, skills, and personal attitudes to be employed initially and function successfully in the required roles.

PO12. Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

5. Program Specific Outcomes (PSOs)

At the end of the program, the student will be able to:

PSO 1. Clearly understand the concepts and applications in the field of agriculture. Apply the knowledge of crop cultivation, crop improvement, soil and crop management for sustainable organic agricultural production and development.

PSO 2. Associate the learning from the courses related to agriculture to arrive at solutions to real world problems. Analyze and identifying complex agricultural problems and formulating ethical solutions using the principles of agricultural science, and business.

PSO 3. Have the capability to comprehend the technological advancements in the usage of modern design tools to analyze and design subsystems/processes for a variety of applications. Develop innovative processes, products, and technologies to meet the challenges in agriculture and farming practices

PSO 4. Possess the skills to communicate in both oral and written forms, the work already done and the future plans with necessary road maps, demonstrating the practice of professional ethics and the concerns for social and environmental wellbeing.

6. Course Outcomes (COs):

Course	Course outcomes: - After completion of these courses students should be able to
SECA77006-Horticulture Nursery Management Lab	**CO1:** Identify and classify different types of horticultural nurseries (temporary, permanent) and associated structures. **CO2:** Explain the processes involved in planning, designing, and preparing nursery beds and the propagation methods for horticultural plants, including seed propagation, vegetative propagation, and micro-propagation. **CO3:** Demonstrate the techniques of propagation (cutting, layering, grafting, budding) and seedling transplanting with an understanding of their advantages and disadvantages. **CO4:** Analyze the importance of nursery management practices, including watering, fertilization, pest and disease control, and hardening of seedlings, for sustainable nursery production. **CO5:** Evaluate the economic aspects of nursery production and the importance of maintaining records and inventory in nursery operations to enhance efficiency.
AECA55010-Agricultural Informatics and Artificial Intelligence	**CO1:** Understand the fundamentals of computer systems **CO2:** Summarize the benefits and limitations of using DBMS in agricultural data management and analysis **CO3:** Apply information and communication technologies (ICT) in agriculture **CO4:** Contrast and dissect the effectiveness of different agricultural models **CO5:** Classify various artificial intelligence (AI) control strategies and search techniques and evaluate their applications in agriculture.
AECA55011-Agricultural Informatics and Artificial Intelligence Lab	**CO1:** Relate the functions of different computer components to their use in the operating system. **CO2:** Proficiency in Microsoft Office for Scientific Documentation. **CO3:** Apply database management techniques to create and manage agricultural databases. **CO4:** Analyze various programming languages (Visual Basic, Java, FORTRAN, C, and C++) for their suitability in agricultural applications. **CO5:** Application of Advanced IT Tools in Agriculture.

BSAC48200-Production Technology of Vegetables and Spices	**CO1:** Understanding the importance of vegetables and spices in human nutrition, highlighting their roles in health and dietary diversity, as well as their contributions to the national economy through production, trade, and employment. **CO2:** Understanding of the cultivation practices for key vegetable and spice crops, including the optimal time for sowing and transplanting, planting distances, and specific fertilizer requirements tailored to the nutrient needs of different species. **CO3:** Develop effective irrigation strategies and weed management practices that enhance crop yield and quality for a range of vegetables and spices, considering factors such as climate and soil conditions. **CO4:** Identify and manage physiological disorders affecting major vegetables and spices, understanding the causes and implementing practical solutions to mitigate issues for improved crop health and productivity. **CO5:** Apply their knowledge of sustainable agriculture by designing and implementing kitchen gardening practices that promote the cultivation of various vegetables and spices, focusing on resource optimization, local biodiversity, and community health benefits.
BSAC48201-Production Technology of Vegetables and Spices Lab	**CO1:** Able to accurately identify various vegetables and spice crops, detailing their characteristics and classifications, along with a comprehensive description of different varieties, including their unique features and uses. **CO2:** Demonstrate knowledge of various propagation methods, including seed collection, extraction techniques, and rapid multiplication strategies, as well as the importance of nursery raising for successful crop establishment. **CO3:** Acquire practical skills in direct seed sowing and transplanting, understanding the appropriate methods and timing for each technique to optimize plant growth and yield. **CO4:** Learn to evaluate and apply appropriate fertilizer regimes for different vegetable and spice crops, emphasizing soil health and plant nutrition to enhance productivity and sustainability in cultivation. **CO5:** Analyze the economics of vegetable and spice cultivation, including cost-benefit assessments, and develop an understanding of harvesting techniques and post-harvest practices that ensure quality preservation and market readiness of produce.

BSAC45252- Principles of Agricultural Economics and Farm Management	**CO1:** Understand and define fundamental economic concepts, including the meaning, scope, and subject matter of economics, distinguishing between micro- and macroeconomics, and positive and normative analyses. **CO2:** Explain the nature of economic theory, including the rationality assumption, the concept of equilibrium, and economic laws as generalizations of human behaviour. **CO3:** Analyze basic economic concepts such as goods, services, demand, utility, cost, price, wealth, income, and welfare to evaluate their roles in economic activities. **CO4:** Examine the importance of agricultural economics, its characteristics, role in economic development, and the impact of agricultural planning in national development. **CO5:** Apply demand theory, including the law of demand, determinants of demand, utility theory, and elasticity concepts, to consumer behavior and market analysis.
BSAC41250 – Crop Production Technology –II (*Rabi* Crops)	**CO1:** Explain the origin, distribution, and economic importance of Rabi crops. **CO2:** Classify Rabi crops and identify suitable varieties for different agro-climatic regions. **CO3:** Design sustainable cultivation plans for Rabi crops with economic and environmental considerations. **CO4:** Evaluate soil and climatic factors to recommend productivity-enhancing strategies. **CO5:** Apply cultural and management practices for optimal crop yield.
BSAC41251- Crop Production Technology –II (*Rabi* Crops) Lab	**CO1:** Demonstrate appropriate sowing methods for wheat and sugarcane. **CO2:** Identify and manage major weeds in rabi crops effectively. **CO3:** Analyze morphological and yield-contributing traits of rabi crops. **CO4:** Perform quality analysis of sugarcane juice and medicinal crop oils. **CO5:** Evaluate advanced agronomic practices through research station visits.

BSAC46200-Farm Machinery and Power	**CO1:** Identify sources of farm power, components of I.C. engines, and tractor systems **CO2:** Explain the working principles of I.C. engines and functions of tractor systems. **CO3:** Calculate tractor operational costs and calibrate sowing equipment. **CO4:** Analyze the selection criteria for tractors and implements for various agricultural operations. **CO5:** Evaluate the performance and suitability of farm machinery for harvesting, threshing, and plant protection.
BSAC46201-Farm Machinery and Power Lab	**CO1:** Identify components of I.C. engines, tillage implements, and farm machinery **CO2:** Explain the working principles of tractor systems like air cleaning, cooling, and lubrication. **CO3:** Calibrate seed drills and calculate power requirements for implements. **CO4:** Analyze the suitability of machinery for hill agriculture and various operations. **CO5:** Evaluate the performance of sprayers, dusters, and harvesting equipment.
BSAC41255-Water Management	**CO1:** Understand the principles of irrigation, including the objectives, water requirements, and its critical role in plant growth and soil health. Demonstrate knowledge of water resources and irrigation development in India for diverse crop types. **CO2:** Analyze soil-plant-water relationships, including soil moisture distribution, water budgeting, rooting characteristics, and moisture stress effects on crop growth. Apply knowledge of soil moisture estimation techniques and water budgeting for efficient crop management. **CO3:** Identify and assess various irrigation methods, such as surface, subsurface, sprinkler, and drip irrigation. Evaluate the suitability, advantages, limitations, and economic considerations of each method for different crops and soil types. **CO4:** Evaluate water management practices for major crops like rice, wheat, maize, groundnut, sugarcane, mango, banana, and tomato. Develop strategies for irrigation scheduling, effective rainfall utilization, and use of fertigation to optimize water usage. **CO5:** Implement advanced irrigation systems, including underground pipeline layouts, irrigation automation, and Artificial Intelligence-based climate-responsive irrigation practices. Assess irrigation water quality, conjunctive water use, and management practices to improve irrigation efficiency and sustainability.

BSAC41256-Water Management Lab	**CO1:** Acquire hands-on skills in determining soil properties such as bulk density, moisture content, field capacity, and permanent wilting point using methods like gravimetric, tensiometer, electrical resistance **CO2:** Demonstrate proficiency in measuring irrigation water using devices such as flumes, weirs, notches, and orifices. **CO3:** Perform field assessments of infiltration rates and demonstrate irrigation methods, including furrow, check basin **CO4:** Develop the ability to install, operate, and maintain advanced irrigation systems like drip and sprinkler irrigation. **CO5:** Gain practical exposure to irrigation planning by visiting farmers' fields, calculating the cost of drip irrigation, and assessing the layout and efficiency of different irrigation methods.
BSAC43250-Problematic Soils and their Management	**CO1:** To acquaint the students about various problem soils like degraded soils, acid soils, saline soils, alkali soils, eroded soils, submerged soils, polluted soils. **CO2:** To impart knowledge about remote sensing, GIS, Multipurpose tree and Land capability classification. **CO3:** To give hands on training about estimation of various soil and water quality parameters associated with problem soils. **CO4:** To Study Irrigation water – quality and standards. **CO5:** Bio remediation through MPTs of soils.
BSAC43251-Problematic Soils and their Management Lab	**CO1:** Acquaint the students about Determination of pHs and EC of saturation extract of problematic soil **CO2:** Determination of redox potential in soil, Estimation of water soluble and exchangeable cations in soil **CO3:** Determination of Quality of irrigation water (pH, EC, Ca, Mg, Na, CO3, HCO3, Cl, SAR and RSC **CO4:** Understand Irrigation water – quality and standards. **CO5:** Determination of dissolved oxygen and free carbon in water samples

BSAC42200- Basics of Plant Breeding	**CO1:** Understand the historical development, concepts, and roles of plant breeding, including genetic variation, heritability, and genetic advance, to explain their significance in crop improvement. **CO2:** Apply knowledge of genetic principles such as self-incompatibility, male sterility, Hardy-Weinberg Law, and population genetics to implement breeding methods for self- and cross-pollinated crops. **CO3:** Analyze advanced plant breeding techniques, including mutation breeding, wide hybridization, and polyploidy, to evaluate their applications in addressing biotic and abiotic stresses. **CO4:** Evaluate participatory plant breeding approaches, heterosis exploitation, and breeding methods for asexually propagated crops to recommend strategies for developing improved cultivars. **CO5:** Create breeding programs incorporating variety release protocols, intellectual property rights, and plant breeders' and farmers' rights to promote sustainable crop development and genetic resource conservation.
BSAC42201- Basics of Plant Breeding Lab	**CO1:** Understand the tools and techniques in plant breeding, including the plant breeder's kit, floral structures, and emasculation and hybridization methods, to describe their roles in crop improvement. **CO2:** Apply knowledge of population genetics, including inbreeding effects, male sterility systems, and handling of segregating populations, to conduct breeding experiments and manage genetic diversity. **CO3:** Analyze data from plant breeding experiments using statistical methods such as mean, range, variance, heritability, and randomized block design (RBD), to evaluate breeding strategies. **CO4:** Evaluate pollination mechanisms, natural out-crossing, and the performance prediction of double-cross hybrids to assess the potential of breeding techniques in crop production. **CO5:** Design and implement screening protocols for biotic and abiotic stress tolerance, while maintaining accurate breeding records and data collection for improving crop resilience and productivity.
WHNN99000- Workshop & Seminars / Human Value & Social Service / NSS	**CO1:** Relate to the concept of cognitive development and Big Five personality characteristics. Explain the basic fundamentals of Emotional Intelligence. **CO2:** Develop ability to practice new problem-solving skills in a group and use these skills in personal life. Build coping strategies and adapt balanced self- determined behaviour. **CO3:** Find about the working and mechanism of human nature. Classify and explain group behavior at organizational level and individual level. **CO4:** Organize and plan organizational change and stress management practices. Discover various human values and their importance in real world. **CO5:** Create leadership skills to be effective leader and evaluate the hierarchy of human values.

7. CO PO Mapping

SECA77006	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	3	2	3		2	3	3	2		2	
CO2	2	2	3	2		2		2	3	3	3	3
CO3	3	2		2	3	2	3	2			2	3
CO4	3	3	2	2	2		2		3	2	3	2
CO5	2	3				3	3	3	3	2	3	2

AECA55010	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	2		3	2			2	2	2	3
CO2	2		2		3	3	2		2	2	2	3
CO3	3	3	3	3	3		3	2	2	3	3	2
CO4	2	3	3	3		2	2	3	3	2		2
CO5		3	3	3	3	2	2	2	2	2	2	2

AECA55011	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	2	3	2	2	2	3	3	2	2		3
CO2	3	3		2	3			2	2	2		2
CO3	3	3	2	2		3		2		2	3	
CO4	3	2			2		2	2			3	2
CO5	2	2	3	2	2	2	3	3	2	2		3

BSAC48200	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	2	3		2		2	2	2	2	2
CO2	3	2	3	2	2			3	3		3	
CO3	2	3	2	3			2	3	3	2		2
CO4	3	2			3	2	3			2	2	3
CO5	2		3	3	3	2		3	3	2	3	3

BSAC48201	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	2	3		2			2	3	2	2
CO2	2			2	2		3	3	3		3	
CO3	3	3	2				2	2	3	2		2
CO4	3	2	2	3		2			2	3	2	2
CO5	2		3	3	3	3		3	3	3	3	3

BSAC45252	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	2	3	3	3		2	2	2		3	2
CO2		2		3		3	2	2	2	3	2	2
CO3	3	3	3		3	3	3			3	3	
CO4	2		2	2	2	3	3	2		3	3	2
CO5	3	3	3	3		3		2	3		3	

BSAC41250	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	2	3		3	3		2	3	3	3
CO2	3		3		2	2	3	2	2	2		2
CO3	2	3	3	3		3	3	3			3	3
CO4	2	2	2	3	3	2	3		2		3	3
CO5	2	2		3	3	2	3		2		3	3

BSAC41251	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	3	3			2	2		3	2
CO2	3		3		2	2	3	2		2	3	2
CO3	3	3	3	3		3	3	3			3	3
CO4	2	2		3	3	2	3		2		3	3
CO5	3	3		3		3	3		2	3		3

BSAC46200	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	2	3	2	3	3	2	2	2	3
CO2	3	3	2	3	3		3	2	3	2		3
CO3	3	3	2	2	3	2	3	3	3		2	3
CO4	2	2	2	3		3	2		3	2	2	3
CO5	3	2	3	3		3		2	2	3	3	2

BSAC46201	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	3		3	3	3	2	3	2		2
CO2	2	3		3	2	3		3	2	3	3	2
CO3	3	3	3	2	3	2	3	2	3		2	3
CO4	3	3	2	3			2	3	2	3	3	3
CO5	2	2	3	2	3	2	3	2	3	2		3

BSAC41255	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	2	2		3	2		2	2	3	3	
CO2	2	3	3	2		3	2		2	2	2	2
CO3	3	2		2	2	2	3		2		3	3
CO4	3	2	2	2	3		2	3	3		2	3
CO5	3	3	3	3		2	3	3	3	3		2

BSAC41256	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1		3	2	2	2	3	2	2	3		2	3
CO2	3				3		3	3	2		3	2
CO3	2	2	2	2	3	2		2		3	2	
CO4	3	2		3		2	2	2	2	3		2
CO5	2	2	3	2	2		2		3		2	3

BSAC43250	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	3	2	3	2	2	2	3		2
CO2	3	3	3			3	3	2	2	3	3	2
CO3		3	3	3	2	3	3	3	2	2		3
CO4	3	3	3	3	3	2		2	3	2	2	3
CO5	3	3	3	3	2		3	2		3	3	3

BSAC43251	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	3	2		2	2	2	3	3		3	2
CO2	2	2	3	3		2	3	2	3	2	3	2
CO3	3	3	2	2	3		3	3	3	3	2	3
CO4	2		3	2	3	3	2		3	2	2	3
CO5	3	3	3	3	2	3	3	2		3	3	3

BSAC42200	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	3		2	3		2	3	2		3
CO2	3	2	2	2	2	2		2	2	2	2	2
CO3	3		3	3	2	2	2			3	2	
CO4	3	3	2	2	2			2	2		2	2
CO5		2	2	3	2	3	2	3	2	2	3	3

BSAC42201	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3		2	3	3	2	2	3			3	2
CO2	3	3		3	2			2	3	3		2
CO3	2		2			3	2	3		3	2	
CO4	3	3	2	3	2	3	3	3		3		3
CO5	2	3			2	3	3		3		2	3

WHNN99000	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2		3	3	3	2	2	3			3	2
CO2	3	3		3	2			2	3	3		2
CO3	3		2			3	2	3		3	2	
CO4	3	3	2	3	2	3	3	3		3		3
CO5	2	3			2	3	3		3		2	3

8. Curriculum

Course Name: Horticulture Nursery Management Lab

Course Code: SECA77006

Course Outline

Importance and scope of horticulture nurseries, Tools and equipment used in nurseries; Nursery and Types of nurseries: temporary, permanent, Planning and designing of a nursery, Preparation of nursery bed; Nursery structures: Shade nets, polyhouses, mist chambers, greenhouses.; Propagation of horticultural plants by seeds advantages and disadvantages of seed propagation; Hardening of seedlings; Seedling transplanting; Vegetative propagation, advantages and disadvantages of vegetative propagation; Propagation by cutting; Propagation by layering; Propagation by grafting; Propagation by budding; Micro-propagation; Watering, fertilization, and nutrient management in nursery plants Identification and control of nursery pests and diseases; Economics of nursery production; Maintenance of nursery records and inventory; Visit to the near nursery unit.

Course Name: Agricultural Informatics and Artificial Intelligence (AI)

Course Code: AECA55010

Course Outline

Unit-I Introduction to Computers, Anatomy of Computers, Memory Concepts, Units of Memory, Operating System: Definition and types, Applications of MS-Office for creating, Editing and Formatting a document, Data presentation, Tabulation and graph creation, Statistical analysis, Mathematical expressions, Database, concepts and types, creating data base, Uses of DBMS in Agriculture. Internet and World Wide Web (WWW): Concepts and components.

Unit-II Computer programming: General concepts, Introduction general programming concepts. Concepts and standard input/output operations. e-Agriculture, Concepts, design and development, Application of innovative ways to use information and communication technologies (IT) in Agriculture. Computer Models in Agriculture: Statistical, weather analysis and crop simulation models, concepts, inputs-outputs files, limitation, advantages and application of models for understanding plant processes, sensitivity, verification, calibration and validation, IT applications for computation of water and nutrient requirement of crops, Computer-controlled devices (automated systems) for Agri-input management. Smartphone mobile apps in agriculture for farm advice: Market price, post-harvest management etc. Geospatial technology: Concepts, techniques, components and uses for generating valuable agri-information. Decision support systems: Concepts, components and applications in Agriculture. Agriculture Expert System, Soil Information Systems etc., for supporting farm decisions. Preparation of contingent crop- planning and crop calendars using IT tools. Digital India and schemes to promote digitalization of agriculture in India.

Unit-III: Introduction to artificial intelligence, background and applications, Turing test. Control strategies, Breadth-first search, Depth-first search, Heuristics search techniques: Best-first search, A* algorithm, IoT and Big Data; Use of AI in agriculture for autonomous crop management, and health, monitoring livestock health, intelligent pesticide application, yield mapping and predictive analysis, automatic weeding and harvesting, sorting of produce, and other food processing applications; Concepts of smart agriculture, use of AI in food and nutrition science etc.

Suggested Readings

1. Concepts and Techniques of Programming in C by Dhabal Prasad Sethi and Manoranjan, Wiley India.
2. Fundamentals of Computer by V. Rajaroman.
3. Introduction to Information Technology by Pearson.
4. Introduction to Database Management System by C. J. Date.
5. Introductory Agri-Informatics by Mahapatra, Subrat K et al, Jain Brothers Publication.

Course Name: Agricultural Informatics and Artificial Intelligence (AI) Lab

Course Code: AECA55011

Course Outline

Study of computer components, accessories, practice of important DoS Commands, Introduction of different operating systems such as Windows, Unix/Linux, creating files and folders, File Management .Use of MS-Word and MS Power-point for creating, editing and presenting a scientific documents, MS-EXCEL-Creating a spreadsheet, Use of statistical tools, Writing expressions, Creating graphs, Analysis of scientific data, MS-ACCESS: Creating Database, preparing queries and reports, Demonstration of Agri- information system, Introduction to World Wide Web (WWW) and its components, Introduction of programming languages such as Visual Basic, Java, Fortran, C, C++, Hands on practice on Crop Simulation Models (CSM), DSSAT/Crop-Info/Crop Syst/ Wofost, Preparation of inputs file for CSM and study of model outputs, computation of water and nutrient requirements of crop using CSM and IT tools, Use of smart phones and other devices in agro-advisory and dissemination of market information, Introduction of Geospatial technology, AR/ VR demonstration, Preparation of contingent crop planning, India Digital Ecosystem of Agriculture (IDEA).

Course Name: Production Technology of Vegetables and Spices

Course Code: BSAC48200

Course Outline

Importance of vegetables and spices in human nutrition and national economy, kitchen gardening, brief about origin, area, climate, soil, improved varieties and cultivation practices such as time of sowing, transplanting techniques, planting distance, fertilizer requirements, irrigation, weed management, harvesting and yield, physiological disorders of important vegetable and spices (tomato, okra, brinjal, chili, capsicum, cucumber, bitter gourd , bottle gourd, sweet potato, cassava and moringa, pumpkin, French bean, peas; cole crops such as cabbage, cauliflower, knol-khol; bulb crops such as onion, garlic; root crops such as carrot, radish, beetroot; tuber crops such as potato; leafy vegetables such as amaranth, palak, perennial vegetables, spice crops like turmeric, zinger, garlic, coriander, cumin, black pepper, cardamom, fenugreek, fennel, clove, nutmeg, cinnamon, curry leaf, tamarind and herbal spices).

Suggested readings

1. Olericulture, Fundamentals of Vegetable Production (Vol.1) by K.P. Singh, Anant Bahadur
2. Vegetable crops by J. Kabir, T.K. Bose, M.G. Som
3. Vegetable crops (Production technology, Vol II) by M.S. Fagaria, B.R. Choudhury, R.S. Dhaka

Course Name: Production Technology of Vegetables and Spices Lab

Course Code: BSAC48201

Course Outline

Identification of vegetables and spice crops and their seeds. Description of varieties. Propagation methods - rapid multiplication techniques - seed collection and extraction. Nursery raising. Direct seed sowing and transplanting. Study of morphological characters of different vegetables and spices. Fertilizers applications. Harvesting and post-harvest practices, Economics of vegetables and spices cultivation, visit to spice gardens.

Course Name: Principles of Agricultural Economics and Farm Management

Course Code: BSAC45252

Course Outline

Unit-I Economics: Meaning, scope and subject matter, definitions, activities, approaches to economic analysis; micro- and macro-economics, positive and normative analysis. Nature of economic theory; rationality assumption, concept of equilibrium, economic laws as generalization of human behavior. Basic concepts: Goods and services, desire, want, demand, utility, cost and price, wealth, capital, income and welfare. Agricultural economics: meaning, definition, characteristics of agriculture, importance and its role in economic development. Agricultural planning and development in the country. Demand: meaning, law of demand, demand schedule and demand curve, determinants, utility theory; law of diminishing marginal utility, equi-marginal utility principle.

Unit-II Consumer's equilibrium and derivation of demand curve, concept of consumer surplus. Elasticity of demand: concept and measurement of price elasticity, income elasticity and cross elasticity. Production: process, creation of utility, factors of production, input output relationship. Laws of returns: Law of variable proportions and law of returns to scale. Cost: Cost concepts, short run and long run cost curves. Supply: Stock v/s supply, law of supply, supply schedule, supply curve, determinants of supply, elasticity of supply. Distribution theory: meaning, factor market and pricing of factors of production. Concepts of rent, wage, interest and profit. National income: Meaning and importance,circular flow, concepts of national income accounting and approaches to measurement, difficulties in measurement.

Unit-III Population: Importance, Malthusian and Optimum population theories, natural and socio-economic determinants, current policies and programs on population control. Money: Barter system of exchange and its problems, evolution, meaning and functions of money, classification of money, money supply, general price index, inflation and deflation. Economic systems: Concepts of economy and its functions, important features of capitalistic, socialistic and mixed economies, elements of economic planning. Forms of business organizations, international trade and balance of payments. GST and its implication on Indian economy.

Suggested Readings

1. Johl, S.S. and T.R Kapur. 2009. Fundamentals of Farm Business Management. Kalyani Publishers
2. S. Subha Reddy, P. Raghu Ram, T.V. Neelakanta and I. Bhvani Devi .2004. Agricultural Economics. Oxford & IBH publishing Co. Pvt. Ltd

Course Name: Crop Production Technology-II (Rabi Crops)

Course Code: BSAC41250

Course Outline

Origin, geographical distribution, economic importance, soil and climatic requirements, varieties, cultural practices and yield of Rabi crops. Cereals- wheat and barley. Pulses- chickpea, lentil, peas. Rabi redgram and, rajmash. Oilseed- rapeseed, mustard, sunflower, safflower; and linseed. Sugar crops-sugarcane and sugar beet. Medicinal and aromatic crops- mentha, lemon grass and citronella. Forage crops – barseem, lucerne and oat; potato, quinoa, tobacco.

Suggested Readings

1. B. Gurarajan, R. Balasubramanian and V. Swaminathan. Recent Strategies on Crop Production. Kalyani Publishers, New Delhi.
2. Chidda Singh.1997. Modern techniques of raising field crops. Oxford and IBH Publishing Co. Pvt. Ltd., New Delhi.
3. Rajendra Prasad. Textbook of Field Crops Production - Commercial Crops. Volume II ICAR Publication.
4. Rajendra Prasad. Textbook of Field Crops Production - Foodgrain Crops. Volume I ICAR Publication.
5. S.R. Reddy. 2009. Agronomy of Field Crops. Kalyani Publishers, New Delhi.
6. S.S. Singh. 2005. Crop Management. Kalyani Publishers, New Delhi.
7. Rajendra Prasad. 2002. Text Book of Field Crops Production, ICAR, New Delhi.
8. Reddy, S.R. 2004. Agronomy of Field crops, Kalyani Publishers, Ludhiana.
9. Subhash Chandra Bose, M. and Balakrishnan, V. 2001. Forage Production South Asian Publishers, New Delhi.
10. UAS, Bangalore. 2011. Package of Practice. UAS, Bengaluru.

Course Name: Crop Production Technology-II (Rabi Crops) Lab

Course Code: BSAC41251

Course Outline

Sowing methods of wheat and sugarcane; identification of weeds in rabi season crops; study of morphological characteristics of rabi crops; study of yield contributing characters of rabi season crops; yield and juice quality analysis of sugarcane; study of important agronomic experiments of rabi crops at experimental farms; study of rabi forage experiments; oil extraction of medicinal crops; visit to research stations of related crops.

Course Name: Farm Machinery and Power

Course Code: BSAC46200

Course Outline

Status of Farm Power in India; Sources of Farm Power, I.C. engines, working principles of I C engines; comparison of two stroke and four stroke cycle engines, Study of different components ofI.C. engine, I.C. engine terminology and solved problems; Familiarization with different systems of I.C. engines: Air cleaning, cooling, lubrication, fuel supply and hydraulic control system of a tractor; Familiarization with Power transmission system : clutch; gear box, differential and final drive of a tractor; Tractor types; Cost analysis of tractor power and attached implement; Criteria for selection of tractor and machine implements. Familiarization with Primary and Secondary Tillage implement; Implement for hill agriculture; implement for intercultural operations; Familiarization with sowing and planting equipment; calibration of a seed drill and solved examples; Familiarization with Plant Protection equipment; Familiarization with harvesting and threshing equipment.

Suggested readings

1. Jagdiswar Sahay – Elements of Agricultural Engineering
2. Jain, S.C. and C.R. Rai-Farm Tractor and maintenance and repair. Standard Publishers, 1705-B, Naisarak. Delhi- 110006.
3. Ojha, T.P. and A.M. Michael, A.M. Principles of Agricultural Engineering. Vol.I. Jain brothers, 16/893, East Park Road, Karol Bagh, New Delhi -110005
4. Surendra Singh- Farm machinery –Principles and applications, ICAR, New Delhi

Course Name: Farm Machinery and Power Lab

Course Code: BSAC46201

Course Outline

Study of different components of I.C. engine. To study air cleaning and cooling system of engine; Familiarization with clutch, transmission, differential and final drive of a tractor; Familiarization with lubrication and fuel supply system of engine; Familiarization with brake, steering, hydraulic control system of engine; Learning of tractor driving; Familiarization with operation of power tiller; Implements for hill agriculture; Familiarization with different types of primary and secondary tillage implements: mould plough, disc plough and disc harrow; Familiarization with seed-cum-fertilizer drills their seed metering mechanism and calibration, planters and trans planter; Familiarization with different types of sprayers and dusters; Familiarization with different inter-cultivation equipment; Familiarization with harvesting and threshing machinery; Calculation of power requirement for different implements.

Course Name: Water Management

Course Code: BSAC41255

Course Outline

Unit-I Irrigation: definition and objectives; Importance: Function of water for plant growth, water resources and irrigation development for different crops in India; Soil plant water relationships; Available and unavailable soil moisture, distribution of soil moisture, water budgeting, rooting characteristics, moisture extraction pattern, effect of moisture stress on crop growth. Methods of soil moisture estimation, evapotranspiration and crop water requirement; effective rainfall, different approaches of scheduling of irrigation; Methods of irrigation: surface and sub-surface, pressurized methods, viz., sprinkler and drip irrigation, their suitability, merits and limitations, fertigation, economic use of irrigation water;

Unit-II Layout of different irrigation systems, Irrigation efficiency and water use efficiency, conjunctive use of water, irrigation water quality and its management. Water management of different crops (rice, wheat, maize, groundnut, sugarcane, mango, banana and tomato); quality of irrigation water, irrigation management practices for different soils and crops, drip, sprinkler. Layout of underground pipeline system, Irrigation automation, Artificial Intelligence and climate-based irrigation practices and its management.

Suggested Readings

1. Rao, Y.P. and Bhaskar, S.R. Irrigation technology. Theory and practice. Agrotech publishing Academy, Udaipur.
2. DilipkumarMujmdar. Irrigation water management: Principles and Practices. Prentice Hall of India Pvt. Ltd.,
3. S.V. Patil &Rajakumar, G. R., Water Management in Agriculture and Horticultural Crops. Satish serial publishing House, Delhi.
4. Carr M. K. V. and Elias Fereres. Advances in Irrigation Agronomy. Cambridge University Press.
5. Michael, A.M. Irrigation Theory and practice. Vikas publishing house Pvt, Ltd

Course Name: Water Management Lab

Course Code: BSAC41256

Course Outline

Determination of bulk density by field method; Determination of soil moisture content by gravimetric method, tensiometer, electrical resistance block and neutron moisture meter; Determination of field capacity by field method; Determination of permanent wilting point; Measurement of irrigation water by using water measuring

devices viz., flumes, weirs, notches, orifices; Calculation of irrigation water requirement (Problems); Determination of infiltration rate; Demonstration of furrow method of irrigation; Demonstration of check basin and basin method of irrigation; Visit to farmers' field and cost estimation of drip irrigation system; Demonstration of filter cleaning, fertigation, injection and flushing of laterals; layout for different methods of irrigation, Erection and operation of sprinkler irrigation system; Measurement of emitter discharge rate, wetted diameter and calculation of emitter discharge variability; Visit to irrigation research centre/ station and visit to command area.

Course Name: Problematic Soils and their management

Course Code: BSAC43250

Course Outline

Soil quality and health, Distribution of Waste land and problem soils in India, Categorization of Problem soils based on properties. Reclamation and management of Acid soils, Saline, Sodic soils, Acid Sulphate soils, Eroded and Compacted soils, polluted soils. Contaminated soils (Pesticide contamination, Heavy metal contamination), Mined soils (Coal mined, Oil mined), Management of Riverine soils, Waterlogged soils, Irrigation water – quality and standards, utilization of saline water in agriculture. Use of Remote sensing and GIS in diagnosis and management of problem soils. Irrigation and water quality. Multipurpose tree (MPT) species, bio remediation through MPTs of soils, land capability and classification, land suitability classification.

Suggested readings

1. Agarwal, R.R., Yadav, J.S.P. and Gupta, R.N. (1982). Saline Alkali soils of India, ICAR, AGROBIOS (India).
2. Brady Nyle C and Ray R Well., 2014. Nature and properties of soils. Pearson Education Inc., New D Delhi.
3. Cirsan J. Paul., 1985,. Principles of Remote Sensing. Longman, New York
4. Indian Society of Soil Science., 2002. Fundamentals of Soil Science. IARI, New Delhi.
5. Osman, Khan Towhid., 2018., Management of Soil Problems. Springer publication
6. Srivastava, V. C., 2002. Management of Problem Soils -Principles and Practices New Delhi

Course Name: Problematic Soils and their management Lab

Course Code: BSAC43251

Course Outline

Determination of pHs and EC of saturation extract of problematic soil. Determination of redox potential in soil, Estimation of water soluble and exchangeable cations in soil and computation of SAR and ESP and characterization of problematic soil. Determination of Gypsum requirement of alkali / sodic soil. Determination of lime requirement of acidic soil. Determination of Quality of irrigation water (pH, EC, Ca, Mg, Na, CO3, HCO3, Cl, SAR and RSC), Determination of nitrate (NO3-) from irrigation water, Determination of dissolved oxygen and free carbon dioxide levels in water samples.

Course Name: Basics of Plant Breeding

Course Code: BSAC42200

Course Outline

Unit-I Historical development, concept, nature and role of plant breeding, major achievements and future prospects; Genetics in relation to plant breeding, modes of reproduction and apomixes, self- incompatibility and male-sterility-genetic consequences, cultivar options, Plant genetic resources, its utilization and conservation Domestication, Acclimatization and Introduction. Centres of origin/ diversity, Components of Genetic variation. Heritability and genetic advance. Pre-breeding and Universal Plant Breeder's equation. Genetic basis and breeding methods in self-pollinated crops- mass and pure line selection, hybridization techniques and handling of segregating population.

Unit-II Multiline concept, Concepts of population genetics and Hardy-Weinberg Law, Genetic basis and methods of breeding cross-pollinated crops, modes of selection. Population movement schemes- Ear to Row method, Modified Ear to Row, recurrent selection schemes. Heterosis and inbreeding depression, development of inbred lines and hybrids, composite and synthetic varieties. Breeding methods in asexually propagated crops, clonal selection and hybridization. Wide hybridization and pre-breeding. Polyploidy in relation to plant breeding, mutation breeding- methods and uses. Breeding for important biotic and abiotic stresses. Participatory plant breeding. Variety Release and notification. Intellectual Property Rights, Patenting, Plant Breeders and Farmer's Rights.

Suggested Readings

1. Principles of Plant Breeding (1st & 2nd Edition) by RW Allard.
2. Plant Breeding: Principles & Practices by JR Sharma.
3. Plant Breeding- B.D. Singh.
4. Principles and Procedures of Plant Breeding - Biotechnical and Conventional Approaches by GS Chahal and SS Gosal.
5. Principles of Plant Genetics and Breeding by George Acquaah.

Course Name: Basics of Plant Breeding Lab

Course Code: BSAC42201

Course Outline

Plant Breeder's kit, Study of germplasm of various crops, Study of floral structures of self- pollinated and cross-pollinated crops, Emasculation and hybridization techniques in self and cross pollinated crops, Consequences of inbreeding on genetic structure of resulting populations, Study of male sterility system, Handling of segregating populations, Methods of calculating mean, range, variance, standard deviation, heritability, Designs used in plant breeding experiments, analysis of Randomized Block Design, To work out the mode of pollination in a given crop and extent of natural out-crossing, Prediction of performance of double cross hybrids, Maintenance of breeding records and data collection, Screening tests for biotic and abiotic stresses.

9. Lesson Plan

SECA77006 - Horticulture Nursery Management Lab

Unit	Particulars	Class No.	Pedagogy of Class
Unit-I	Importance and scope of horticulture nurseries	P-1	Practical
Unit-I	Tools and equipment used in nurseries	P-2	Practical
Unit-I	Nursery and Types of nurseries: temporary, permanent	P-3	Practical
Unit-I	Planning and designing of a nursery	P-4	Practical
Unit-I	Preparation of nursery bed	P-5,6	Practical
Unit-I	Nursery structures: Shade nets, playhouses, mist chambers, greenhouses	P-7,8	Practical
Unit-I	Propagation of horticultural plants by seeds advantages and disadvantages of seed propagation	P-9,10	Practical
Unit-I	Hardening of seedlings	P-11	Practical
Unit-I	Seedling transplanting	P-12	Practical
Unit-I	Vegetative propagation, advantages and disadvantages of vegetative propagation	P-13,14	Practical
Unit-I	Propagation by cutting	P-15,16	Practical
Unit-I	Propagation by layering	P-17,18	Practical
Unit-I	Propagation by grafting	P-19,20	Practical
Unit-I	Propagation by budding	P-21,22	Practical
Unit-I	Micro-propagation	P-23,24	Practical
Unit-I	Watering, fertilization, and nutrient management in nursery plants	P-25,26	Practical
Unit-I	Identification and control of nursery pests and diseases	P-27	Practical
Unit-I	Economics of nursery production	P-28	Practical
Unit-I	Maintenance of nursery records and inventory	P-29	Practical
Unit-I	Visit to the near nursery unit	P-30	Practical

AECA55010 - Agricultural Informatics and Artificial Intelligence (AI)

Unit	Particulars	Class No.	Pedagogy of Class
Unit-I	Introduction to Computers, Anatomy of Computers	C-1	Lecture
Unit-I	Memory Concepts, Units of Memory	C-2	Lecture
Unit-I	Operating System: Definition and types, Applications of MS-Office for creating, Editing and Formatting a document, Data presentation, Tabulation and graph creation	C-3,4	Lecture
Unit-I	Statistical analysis, Mathematical expressions, Database, concepts and types, creating data base	C-5	Lecture
Unit-I	Clarification Class	C-6	Clarification Class
Unit-I	Uses of DBMS in Agriculture	C-7	Lecture
Unit-I	Internet and World Wide Web (WWW): Concepts and components	C-8	Lecture
Unit-I	Quiz	C-9	Quiz
Unit-II	Computer programming: General concepts, Introduction general programming concepts	C-10	Lecture
Unit-II	Classroom Assignment -I	C-11	Classroom Assignment
Unit-II	Concepts and standard input/output operations. e-Agriculture, Concepts, design and development	C-12	Lecture
Unit-II	Application of innovative ways to use information and communication technologies (IT) in Agriculture	C-13	Lecture
Unit-II	Computer Models in Agriculture: Statistical, weather analysis and crop simulation models, concepts, inputs-outputs files, limitation, advantages	C-14	Lecture
Unit-II	Home Assignment		Home Assignment
Unit-II	Application of models for understanding plant processes, sensitivity, verification, calibration and validation	C-15	Lecture
Unit-II	IT applications for computation of water and nutrient requirement of crops, Computer-controlled devices (automated systems) for Agri-input management	C-16,17	Lecture
Unit-II	Classroom Assignment-II	C-18	Classroom Assignment
Unit-II	Smartphone mobile apps in agriculture for farm advice: Market price, post-harvest management etc.	C-19	Lecture

Unit-II	Geospatial technology: Concepts, techniques, components and uses for generating valuable agri-information.	C-20	Lecture
Unit-II	Presentation	C-21	Presentation
Unit-II	Decision support systems: Concepts, components and applications in Agriculture. Agriculture Expert System, Soil Information Systems etc., for supporting farm decisions.	C-22	Lecture
Unit-II	Preparation of contingent crop- planning and crop calendars using IT tools. Digital India and schemes to promote digitalization of agriculture in India.	C-23	Lecture
Unit-II	Home Assignment		Home Assignment
Unit-III	Introduction to artificial intelligence, background and applications, Turing test. Control strategies, Breadth-first search, Depth-first search, Heuristics search techniques: Best-first search, A* algorithm, IoT and Big Data.	C-24,25	Lecture
Unit-III	Use of AI in agriculture for autonomous crop management, and health, monitoring livestock health, intelligent pesticide	C-26	Lecture
Unit-III	Application, yield mapping and predictive analysis, automatic weeding and harvesting, sorting of produce, and other food processing applications.	C-27	Lecture
Unit-III	Clarification Class	C-28	Clarification Class
Unit-III	Concepts of smart agriculture, use of AI in food and nutrition science etc.	C-29	Lecture
Unit-III	Quiz	C-30	Quiz

AECA55011 - Agricultural Informatics and Artificial Intelligence (AI) Lab

Unit	Particulars	Class No.	Pedagogy of Class
Unit-I	Study of computer components, accessories, practice of important DoS Commands	P-1	Practical
Unit-I	Introduction of different operating systems such as Windows, Unix/Linux, creating files and folders, File Management	P-2,3	Practical
Unit-I	Use of MS-Word and MS Power-point for creating, editing and presenting a scientific documents	P-4	Practical
Unit-I	MS-EXCEL-Creating a spreadsheet, Use of statistical tools, Writing expressions, Creating graphs, Analysis of scientific data	P-5	Practical
Unit-I	MS-ACCESS: Creating Database, preparing queries and reports	P-6	Practical
Unit-I	Demonstration of Agri- information system, Introduction to World Wide Web (WWW) and its components	P-7	Practical
Unit-I	Introduction of programming languages such as Visual Basic, Java, Fortran, C, C++	P-8	Practical
Unit-I	Hands on practice on Crop Simulation Models (CSM), DSSAT/Crop-Info/Crop Syst/ Wofost	P-9	Practical
Unit-I	Preparation of inputs file for CSM and study of model outputs, computation of water and nutrient requirements of crop using CSM and IT tools	P-10,11	Practical
Unit-I	Use of smartphones and other devices in agro-advisory and dissemination of market information	P-12	Practical
Unit-I	Introduction of Geospatial technology, AR/ VR demonstration	P-13	Practical
Unit-I	Preparation of contingent crop planning	P-14	Practical
Unit-I	India Digital Ecosystem of Agriculture (IDEA)	P-15	Practical

BSAC48200 - Production Technology of Vegetables and Spices

Unit	Particulars	Class No.	Pedagogy of Class
Unit-I	Importance of vegetables and spices in human nutrition and national economy, kitchen gardening.	C-1	Lecture
Unit-I	Brief about origin, area, climate, soil, improved varieties and cultivation practices such as time of sowing, transplanting techniques, planting distance, fertilizer requirements, irrigation, weed management, harvesting and yield, physiological disorders of important vegetable tomato, okra, brinjal, chili and capsicum.	C-2	Lecture
Unit-I	Home Assignment		Home Assignment
Unit-I	Bitter gourd, bottle gourd and pumpkin.	C-3	Lecture
Unit-I	Tuber crops such as potato sweet potato and cassava.	C-4	Lecture
Unit-I	French bean and peas	C-5	Lecture
Unit-I	Cole crops such as cabbage, cauliflower and knol-khol.	C-6	Lecture
Unit-I	Class Assignment	C-7	Class Assignment
Unit-I	Bulb crops such as onion and garlic	C-8	Lecture
Unit-I	Root crops such as carrot, radish and beetroot.	C-9	Lecture
Unit-I	Presentation	C-10	Presentation
Unit-I	Quiz	C-11	Quiz
Unit-I	Leafy vegetables such as amaranth, palak and perennial vegetables.	C-12	Lecture
Unit-I	Home Assignment		Home Assignment
Unit-I	Spice crops like turmeric, zinger, garlic, coriander, cumin, black pepper and cardamom.	C-13	Lecture
Unit-I	Fenugreek, fennel, clove, nutmeg, cinnamon, curry leaf, tamarind and herbal spices.	C-14	Lecture
Unit-I	Clarification Class	C-15	Clarification Class

BSAC48201 - Production Technology of Vegetables and Spices –Lab

Unit	Particulars	Class No.	Pedagogy of Class
Unit-I	Identification of vegetables and spice crops and their seeds.	P-1,2	Practical
Unit-I	Description of varieties.	P-3,4	Practical
Unit-I	Propagation methods - rapid multiplication techniques - seed collection and extraction.	P-5,6	Practical
Unit-I	Nursery raising. Direct seed sowing and transplanting.	P-7,8	Practical
Unit-I	Study of morphological characters of different vegetables and spices.	P-9,10	Practical
Unit-I	Preparation and application of PGR's for propagation.	P-11	Practical
Unit-I	Fertilizers applications.	P-12	Practical
Unit-I	Harvesting and post-harvest practices.	P-13	Practical
Unit-I	Economics of vegetables and spices cultivation.	P-14	Practical
Unit-I	Visit to spice gardens.	P-15	Practical

BSAC45252-Principles of Agricultural Economics and Farm Management

Unit	Particulars	Class No.	Pedagogy of Class
Unit-I	Economics: Meaning, scope and subject matter, definitions, activities, approaches to economic analysis;	C-1	Lecture
Unit-I	Micro- and macro-economics, positive and normative analysis.	C-2	Lecture
Unit-I	Nature of economic theory; rationality assumption, concept of equilibrium, economic laws as generalization of human behavior.	C-3	Lecture
Unit-I	Basic concepts: Goods and services, desire, want, demand, utility, cost and price, wealth, capital, income and welfare.	C-4	Lecture
Unit-I	Home Assignment		Home Assignment
Unit-I	Agricultural economics: meaning, definition, characteristics of agriculture, importance and its role in economic development.	C-5	Lecture
Unit-I	Agricultural planning and development in the country.	C-6	Lecture
Unit-I	Classification Class	C-7	Classification Class
Unit-I	Demand: meaning, law of demand, demand schedule and demand curve, determinants,	C-8	Lecture
Unit-II	Consumer's equilibrium and derivation of demand curve, concept of consumer surplus.	C-9	Lecture
Unit-II	Elasticity of demand: concept and measurement of price elasticity, income elasticity and cross elasticity.	C-10	Lecture
Unit-II	Quiz	C-11	Quiz
Unit-II	Utility theory; law of diminishing marginal utility, equi-marginal utility principle.	C-12	Lecture
Unit-II	Production: process, creation of utility, factors of production, input-output relationship.	C-13	Lecture
Unit-II	Laws of returns: Law of variable proportions and law of returns to scale.	C-14	Lecture
Unit-II	Home Assignment		Home Assignment
Unit-II	Cost: Cost concepts, short run and long run cost curves. Supply: Stock v/s supply,	C-15	Lecture
Unit-II	Law of supply, supply schedule, supply curve, determinants of supply, elasticity of supply.	C-16	Lecture
Unit-II	Distribution theory: meaning, factor market	C-17	Lecture

	and pricing of factors of production.		
Unit-II	Concepts of rent, wage, interest and profit. National income: Meaning and importance,.	C-18	Lecture
Unit-II	Classification Class	C-19	Classification Class
Unit-II	Circular flow, concepts of national income accounting and approaches to measurement, difficulties in measurement	C-20	Lecture
Unit-III	Population: Importance, Malthusian and Optimum population theories, natural and socio-economic determinants, current policies and programs on population control.	C-21	Lecture
Unit-III	Classroom Assignment	C-22	Classroom Assignment
Unit-III	Population: Importance, Malthusian and Optimum population theories, natural and socio-economic determinants, current policies and programs on population control.	C-23	Lecture
Unit-III	Money: Barter system of exchange and its problems, evolution, meaning and functions of money, classification of money, money supply, general price index, inflation and deflation.	C-24	Lecture
Unit-III	Classification Class	C-25	Classification Class
Unit-III	Economic systems: Concepts of economy and its functions, important features of capitalistic, socialistic and mixed economies, elements of economic planning.	C-26	Lecture
Unit-III	Quiz	C-27	Quiz
Unit-III	Forms of business organizations, international trade and balance of payments.	C-28	Lecture
Unit-III	GST and its implication on Indian economy.	C-29	Lecture
Unit-III	Presentation	C-30	Presentation

BSAC41250 - Crop Production Technology-II (Rabi Crops)

Unit	Particulars	Class No.	Pedagogy of Class
Unit-I	Introduction to Rabi Crops	C-1	Lecture
Unit-I	Cereals: Wheat	C-2	Lecture
Unit-I	Cereals: Barley and Pulses: Chickpea	C-3	Lecture
Unit-I	Classroom Assignment	C-4	Classroom Assignment
Unit-I	Pulses: Lentil and Peas	C-5	Lecture
Unit-I	Pulses: Rabi Redgram and Rajmash	C-6	Lecture
Unit-I	Home Assignment		Home Assignment
Unit-I	Oilseeds: Rapeseed and Mustard	C-7	Lecture
Unit-I	Quiz	C-8	Quiz
Unit-I	Oilseeds: Sunflower, Safflower, and Linseed	C-9	Lecture
Unit-I	Sugar Crops: Sugarcane and Sugar Crops: Sugar Beet	C-10	Lecture
Unit-I	Home Assignment		Home Assignment
Unit-I	Medicinal and Aromatic Crops	C-11	Lecture
Unit-I	Forage Crops: Barseem, Lucerne, and Oat, Tuber Crops: Potato	C-12	Lecture
Unit-I	Presentation	C-13	Presentation
Unit-I	Non-conventional Crops: Quinoa and Tobacco	C-14	Lecture
Unit-I	Clarification Class	C-15	Clarification Class

BSAC41251 - Crop Production Technology-II (Rabi Crops) Lab

Unit	Particulars	Class No.	Pedagogy of Class
Unit-I	Introduction to Rabi Crops	P-1	Practical
Unit-I	Sowing methods, identification of weeds, study of morphological characteristics, study of yield contributing characters, yield etc. of Cereals: Wheat and Barley	P-2	Practical
Unit-I	Sowing methods, identification of weeds, study of morphological characteristics, study of yield contributing characters, yield etc. of Cereals: Wheat and Barley	P-3	Practical
Unit-I	Sowing methods, identification of weeds, study of morphological characteristics, study of yield contributing characters, yield etc. of Pulses- chickpea	P-4	Practical
Unit-I	Sowing methods, identification of weeds, study of morphological characteristics, study of yield contributing characters, yield etc. of Pulses- lentil,	P-5	Practical
Unit-I	Sowing methods, identification of weeds, study of morphological characteristics, study of yield contributing characters, yield etc. of Pulses- peas. Rabi redgram and, rajmash.	P-6	Practical
Unit-I	Sowing methods, identification of weeds, study of morphological characteristics, study of yield contributing characters, yield etc. of Pulses- Rabi redgram	P-7	Practical
Unit-I	Sowing methods, identification of weeds, study of morphological characteristics, study of yield contributing characters, yield etc. of Pulses- Rabi, rajmash.	P-8	Practical
Unit-I	Sowing methods, identification of weeds, study of morphological characteristics, study of yield contributing characters, yield etc. of Oilseed- rapeseed and mustard	P-9	Practical
Unit-I	Sowing methods, identification of weeds, study of morphological characteristics, study of yield contributing characters, yield etc. of Oilseed- sunflower	P-10	Practical
Unit-I	Sowing methods, identification of weeds,	P-11	Practical

	study of morphological characteristics, study of yield contributing characters, yield etc. of Oilseed- safflower.		
Unit-I	Sowing methods, identification of weeds, study of morphological characteristics, study of yield contributing characters, yield etc. of Oilseed- linseed	P-12	Practical
Unit-I	Sowing methods, identification of weeds, study of morphological characteristics, study of yield contributing characters, yield, juice quality analysis etc. of Sugar crops-sugarcane.	P-13	Practical
Unit-I	Sowing methods, identification of weeds, study of morphological characteristics, study of yield contributing characters, yield, juice quality analysis etc. of Sugar crops- sugar beet.	P-14	Practical
Unit-I	Sowing methods, identification of weeds, study of morphological characteristics, study of yield contributing characters, yield etc. of Medicinal and aromatic crops- mentha	P-15	Practical
Unit-I	Sowing methods, identification of weeds, study of morphological characteristics, study of yield contributing characters, yield etc. of Medicinal and aromatic crops- lemon grass	P-16	Practical
Unit-I	Sowing methods, identification of weeds, study of morphological characteristics, study of yield contributing characters, yield etc. of Medicinal and aromatic crops- citronella	P-17	Practical
Unit-I	Oil extraction of medicinal crops	P-18,19,20	Practical
Unit-I	Sowing methods, identification of weeds, study of morphological characteristics, study of yield contributing characters, yield etc. of Forage crops –barseem	P-21	Practical
Unit-I	Sowing methods, identification of weeds, study of morphological characteristics, study of yield contributing characters, yield etc. of Forage crops – lucerne	P-22	Practical
Unit-I	Sowing methods, identification of weeds, study of morphological characteristics, study of yield contributing characters, yield etc. of Forage crops –oat	P-23	Practical
Unit-I	Sowing methods, identification of weeds,	P-24,25	Practical

	study of morphological characteristics, study of yield contributing characters, yield etc. of potato.		
Unit-I	Sowing methods, identification of weeds, study of morphological characteristics, study of yield contributing characters, yield etc. of quinoa.	P-26,27	Practical
Unit-I	Sowing methods, identification of weeds, study of morphological characteristics, study of yield contributing characters, yield etc. of tobacco.	P-28,29	Practical
Unit-I	Visit to research stations of related crops.	P-30	Practical

BSAC46200 - Farm Machinery and Power

Unit	Particulars	Class No.	Pedagogy of Class
Unit-I	Status of Farm Power in India; Sources of Farm Power	C-1	Lecture
Unit-I	I.C. engines, working principles of I C engines	C-2	Lecture
Unit-I	Comparison of two stroke and four stroke cycle engines, Study of different components of I.C. engine,	C-3	Lecture
Unit-I	I.C. engine terminology and solved problems; Familiarization with different systems of I.C. engines	C-4	Lecture
Unit-I	Class Room Assignment	C-5	Class Room Assignment
Unit-I	Air cleaning, cooling, lubrication, fuel supply and hydraulic control system of a tractor	C-6	Lecture
Unit-I	Familiarization with Power transmission system : clutch; gear box, differential and final drive of a tractor	C-7	Lecture
Unit-I	Home Assignment		Home Assignment
Unit-I	Tractor types; Cost analysis of tractor power and attached implement;	C-8	Lecture
Unit-I	Quiz	C-9	Quiz
Unit-II	Criteria for selection of tractor and machine implements	C-10	Lecture
Unit-II	Familiarization with Primary and Secondary Tillage implement	C-11	Lecture
Unit-II	Home Assignment		Home Assignment
Unit-II	Implement for hill agriculture; implement for intercultural operations; Familiarization with sowing and planting equipment	C-12	Lecture
Unit-II	Presentation	C-13	Presentation
Unit-II	Calibration of a seed drill and solved examples and Familiarization with Plant Protection equipment	C-14	Lecture
Unit-II	Clarification Class	C-15	Clarification Class

BSAC46201 - Farm Machinery and Power-Lab

Unit	Particulars	Class No.	Pedagogy of Class
Unit-I	Study of different components of I.C. engine	P-1	Practical
Unit-I	To study air cleaning and cooling system of engine	P-2	Practical
Unit-I	Familiarization with clutch, transmission, differential and final drive of a tractor	P-3	Practical
Unit-I	Familiarization with lubrication and fuel supply system of engine	P-4	Practical
Unit-I	Familiarization with brake, steering, hydraulic control system of engine	P-5	Practical
Unit-I	Learning of tractor driving; familiarization with operation of power tiller	P-6	Practical
Unit-I	Implements for hill agriculture	P-7	Practical
Unit-I	Familiarization with different types of primary and secondary tillage implements: mould plough, disc plough and disc harrow	P-8	Practical
Unit-I	Familiarization with seed-cum-fertilizer drills their seed metering mechanism	P-9	Practical
Unit-I	calibration, planters and trans planter	P-10	Practical
Unit-I	Familiarization with different types of sprayers and dusters	P-11	Practical
Unit-I	Familiarization with different inter-cultivation equipment	P-12	Practical
Unit-I	Familiarization with harvesting and threshing machinery	P-13	Practical
Unit-I	Calculation of power requirement for different implements	P-14	Practical
Unit-I	Calculation of power requirement for different implements	P-15	Practical

BSAC41255-Water management

Unit	Particulars	Class No.	Pedagogy of Class
Unit-I	Irrigation: definition and objectives; Importance: Function of water for plant growth, water resources and irrigation development for different crops in India	C-1	Lecture
Unit-I	Soil plant water relationships; Available and unavailable soil moisture, distribution of soil moisture	C-2	Lecture
Unit-I	Water budgeting, rooting characteristics, moisture extraction pattern, effect of moisture stress on crop growth	C-3	Lecture
Unit-I	Class Assignment	C-4	Class Assignment
Unit-I	Methods of soil moisture estimation, evapo transpiration and crop water requirement; effective rainfall, different approaches of scheduling of irrigation	C-5	Lecture
Unit-I	Methods of soil moisture estimation, evapo transpiration and crop water requirement; effective rainfall, different approaches of scheduling of irrigation	C-6	Lecture
Unit-I	Quiz	C-7	Quiz
Unit-I	Methods of irrigation: surface and sub-surface, pressurized methods, viz., sprinkler and drip irrigation, their suitability, merits and limitations, fertigation, economic use of irrigation water;	C-8	Lecture
Unit-I	Home Assignment		Home Assignment
Unit-II	Layout of different irrigation systems, Irrigation efficiency and water use efficiency,	C-9	Lecture
Unit-II	Conjunctive use of water, irrigation water quality and its management. Water management of different crops (rice, wheat, maize, groundnut, sugarcane, mango, banana and tomato)	C-10	Lecture
Unit-II	Home Assignment		Home Assignment
Unit-II	Quality of irrigation water, irrigation management practices for different soils and crops, drip, sprinkler	C-11	Lecture
Unit-II	Quality of irrigation water, irrigation management practices for different soils and crops, drip, sprinkler	C-12	Lecture
Unit-II	Presentation	C-13	Presentation
Unit-II	Layout of underground pipeline system,	C-14	Lecture

	Irrigation automation, Artificial Intelligence and climate-based irrigation practices and its management.		
Unit-II	Clarification Class	C-15	Clarification Class

BSAC41256-Water management Lab

Unit	Particulars	Class No.	Pedagogy of Class
Unit-I	Determination of bulk density by field method	P-1	Practical
Unit-I	Determination of soil moisture content by gravimetric method, tensiometer, electrical resistance block and neutron moisture meter	P-2	Practical
Unit-I	Determination of soil moisture content by gravimetric method, tensiometer, electrical resistance block and neutron moisture meter	P-3	Practical
Unit-I	Determination of field capacity by field method; Determination of permanent wilting point;	P-4	Practical
Unit-I	Measurement of irrigation water by using water measuring devices viz., flumes, weirs, notches, orifices;	P-5	Practical
Unit-I	Calculation of irrigation water requirement (Problems);	P-6	Practical
Unit-I	Determination of infiltration rate;	P-7	Practical
Unit-I	Demonstration of furrow method of irrigation; Demonstration of check basin and basin method of irrigation	P-8	Practical
Unit-I	Visit to farmers' field and cost estimation of drip irrigation system;	P-9	Practical
Unit-I	Demonstration of filter cleaning, fertigation, injection and flushing of laterals	P-10	Practical
Unit-I	Layout for different methods of irrigation,	P-11	Practical
Unit-I	Erection and operation of sprinkler irrigation system;	P-12	Practical
Unit-I	Measurement of emitter discharge rate, wetted diameter	P-13	Practical
Unit-I	Calculation of emitter discharge variability;	P-14	Practical
Unit-I	Visit to irrigation research centre/ station and visit to command area.	P-15	Practical

BSAC43250 – Problematic Soil sand their Management

Unit	Particulars	Class No.	Pedagogy of Class
Unit-I	Soil quality and health, management	C-1	Lecture
Unit-I	Distribution of Waste land and problem soils in India. Their categorization based on properties.	C-2,3	Lecture
Unit-I	Reclamation and management of Acid soils, Saline, Sodic soils, Acid Sulphate soils	C-4	Lecture
Unit-I	Home Assignment		Home Assignment
Unit-I	Eroded and Compacted soils Flooded soils, Polluted soils, Contaminated soils and Mined soils	C-5	Lecture
Unit-I	Management of Riverine soils, Waterlogged soils	C-6	Lecture
Unit-I	Classroom Assignment	C-7	Classroom Assignment
Unit-I	Irrigation water – quality and standards, utilization of saline water in agriculture.	C-8	Lecture
Unit-I	Home Assignment		Home Assignment
Unit-I	Irrigation and water quality	C-9	Lecture
Unit-I	Use of Remote sensing and GIS in diagnosis and management of problem soils.	C-10	Lecture
Unit-I	Presentation	C-11	Presentation
Unit-I	Multipurpose tree (MPT) species, bio remediation through MPTs of soils	C-12	Lecture
Unit-I	Quiz	C-13	Quiz
Unit-I	Land capability and classification, land suitability classification	C-14	Lecture
Unit-I	Clarification Class	C-15	Clarification Class

BSAC43251 – Problematic Soils and their Management Lab

Unit	Particulars	Class No.	Pedagogy of Class
Unit-I	Determination of pHs and EC of saturation extract of problematic soil	P-1,2	Practical
Unit-I	Determination of redox potential in soil, Estimation of water soluble and exchangeable cations in soil and computation of SAR and ESP and characterization of problematic soil	P-3,4,5	Practical
Unit-I	Determination of Gypsum requirement of alkali / sodic soil	P-6,7	Practical
Unit-I	Determination of lime requirement of acidic soil.	P-8,9	Practical
Unit-I	Determination of Quality of irrigation water (pH, EC, Ca, Mg, Na, CO3, HCO3, Cl, SAR and RSC	P-10,11,13	Practical
Unit-I	Determination of nitrate (NO3-) from irrigation water	P-14	Practical
Unit-I	Determination of dissolved oxygen and free carbon dioxide levels in water samples	P-15	Practical

BSAC42200 - Basics of Plant Breeding

Unit	Particulars	Class No.	Pedagogy of Class
Unit-I	Historical development, concept, nature and role of plant breeding,	C-1	Lecture
Unit-I	Major achievements and future prospects;	C-2	Lecture
Unit-I	Genetics in relation to plant breeding,	C-3	Lecture
Unit-I	Modes of reproduction and apomixes,	C-4	Lecture
Unit-I	Quiz	C-5	Quiz
Unit-I	Self- incompatibility and male-sterility-genetic consequences, cultivar options,	C-6	Lecture
Unit-I	Self- incompatibility and male-sterility-genetic consequences, cultivar options,	C-7	Lecture
Unit-I	Home Assignment		Home Assignment
Unit-I	Plant genetic resources, its utilization and conservation	C-8	Lecture
Unit-I	Domestication, Acclimatization and Introduction.	C-9	Lecture
Unit-I	Clarification class	C-10	Clarification class
Unit-I	Centres of origin/ diversity, Components of Genetic variation.	C-11	Lecture
Unit-I	Classroom assignment	C-12	Classroom assignment
Unit-I	Heritability and genetic advance.	C-13	Lecture
Unit-I	Pre-breeding and Universal Plant Breeder's equation.	C-14	Lecture
Unit-I	Genetic basis and breeding methods in self-pollinated crops- mass and pure line selection, hybridization techniques and handling of segregating population.	C-15	Lecture
Unit-I	Quiz	C-16	Quiz
Unit-I	Genetic basis and breeding methods in self-pollinated crops- mass and pure line selection, hybridization techniques and handling of segregating population.	C-17	Lecture
Unit-II	Class room assignment	C-18	Classroom assignment
Unit-II	Multiline concept, Concepts of population genetics and Hardy-Weinberg Law, Genetic basis and methods of breeding cross-pollinated crops, modes of selection.	C-19	Lecture
Unit-II	Population movement schemes- Ear to Row method, Modified Ear to Row, recurrent selection schemes.	C-20	Lecture
Unit-II	Clarification class	C-21	Clarification class

Unit-II	Heterosis and inbreeding depression, development of inbred lines and hybrids, composite and synthetic varieties.	C-22	Lecture
Unit-II	Breeding methods in asexually propagated crops, clonal selection and hybridization.	C-23	Lecture
Unit-II	Wide hybridization and pre-breeding.	C-24	Lecture
Unit-II	Polyploidy in relation to plant breeding, mutation breeding- methods and uses.	C-25	Lecture
Unit-II	Presentation	C-26	Presentation
Unit-II	Breeding for important biotic and abiotic stresses.	C-27	Lecture
Unit-II	Home Assignment		Home Assignment
Unit-II	Participatory plant breeding.	C-28	Lecture
Unit-II	Variety Release and notification. Intellectual Property Rights, Patenting, Plant Breeders and Farmer's Rights.	C-29	Lecture
Unit-II	Clarification class	C-30	Clarification class

BSAC42201 - Basics of Plant Breeding Lab

Unit	Particulars	Class No.	Pedagogy of Class
Unit-I	Plant Breeder's kit	P-1	Practical
Unit-I	Study of germplasm of various crops	P-2	Practical
Unit-I	Study of floral structures of self- pollinated and cross-pollinated crops	P-3	Practical
Unit-I	Emasculation and hybridization techniques in self and cross pollinated crops	P-4	Practical
Unit-I	Consequences of inbreeding on genetic structure of resulting populations, Study of male sterility system	P-5	Practical
Unit-I	Handling of segregating populations	P-6	Practical
Unit-I	Methods of calculating mean, range, variance, standard deviation, heritability	P-7	Practical
Unit-I	Designs used in plant breeding experiments	P-8	Practical
Unit-I	Analysis of Randomized Block Design	P-9	Practical
Unit-I	To work out the mode of pollination in a given crop and extent of natural out-crossing	P-10	Practical
Unit-I	Prediction of performance of double cross hybrids	P-11	Practical
Unit-I	Maintenance of breeding records and data collection	P-12	Practical
Unit-I	Maintenance of breeding records and data collection	P-13	Practical
Unit-I	Screening tests for biotic and abiotic stresses	P-14	Practical
Unit-I	Screening tests for biotic and abiotic stresses	P-15	Practical

Note:

This is a tentative lesson plan. The same may change from faculty to faculty as per the teaching pedagogy adopted by the faculty.

The students who wish to exit with UG- Diploma after 2nd year, has to undergo 10 weeks of internship programme (10 credits) after 2nd Year.

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