Faculty of Agricultural Sciences (IAS)
Siksha 'O' Anusandhan, Deemed to be University

B.Sc. (Hons.) Agriculture as per 5th Dean's committee (2016-17)

Programme Outcomes:

- The agricultural graduates will be able to guide the farmers in adoption of recommended package of practices in growing crops/ variety on sole and cropping system mode.
- They develop practical knowledge in providing location specific solutions to crops with real time management approach in respect to nutrients, water and disease and pests both in agronomical and horticultural crops.
- They acquire the skill to translate the crop- based scientific recommendation in farmers language and transmit them to the farming community for adoption.
- They acquire the basic knowledge on different course(s) of their choice related to different specialized disciplines of agricultural sciences to pursue higher education in the field of their interest.
- They develop knowledge and experience through learning mode to take up entrepreneurship by establishing Integrated Farming System module in holistic manner involving different commodities from crops, livestock and poultry.
- They acquireknowledge, skill and earn the eligibility to be employed in different sectors of agriculture and allied branches.

1st Year 1st Semester

AG-111 Fundamentals of Agronomy 4(3+1)

Course Outcomes:

- Students can identify and select seasonal crop(s), judging seed good quality, skill to identify different weed flora and their management under different ecosystem
- Develops knowledge to Identify fertilizers, can advise farmers the crop-based dose and commercial requirement and suitable farm implements for crops under different land types.
- Students can work out irrigation requirement and can advise farmers on adoption of irrigation methods under varying water resource and availability conditions.

HT-111 Fundamentals of Horticulture 2(1+1)

Course Outcomes:

- Basic knowledge about scope and importance and botanical classification of different horticultural crops.
- This course is able to make easier for the students to understand preparation of different nursery and it's maintenance in horticultural crop.
- Layout and planning for different horticultural crops
- Getting knowledge on modern intercultural operation practiced in horticultural crops.

SC-111 Fundamentals of Soil Science 3(2+1)

Course Outcomes:

- Students will gain knowledge regarding soil physical, chemical and biological properties and processes in relation to plant growth.
- A brief overview on origin of the earth, rocks and minerals, weathering and soil formation.
- Practical excellence in soil sampling and qualitative analysis of some important soil parameters.

EE 111 Fundamentals of Agricultural Extension Education 3(2+1)

Course Outcomes:

- Principles and methods of extension approach, rural development programs, communication models, programme formulation and evaluation
- New trends in agriculture extension: privatization extension.
- Monitoring and evaluation – concept and definition, monitoring, and evaluation of extension programmes. Transfer of Technology- Concept and models.
- Skill development in handling audio-visual equipments, preparation of presentation
- Can learn about agricultural journalism and process of programme production of radio and TV.

AS-111 Statistical Methods 2(1+1)

Course Outcomes:

- Brain exercise with basic statistical tools will develop the student's skill.
- Practical presentation of data in graphical way.
- Knowledge of design and sampling help for future research programme.

AT-111 Farm Machinery and Power 2(1+1)

Course Outcomes:

- Impart knowledge about different farm machineries used and their operation
- Maintenance and economics in operation
- Repair, maintenance and hiring of tractors through Agro-service centre
- Practical oriented skills to use various farm equipments in field

SS 111 Comprehension and Communication Skills in English 2(1+1)

Course Outcomes:

- To improve soft skills like communication skills, interpersonal skills, presentation skills etc.
- To learn the skills designed to help the candidates to express themselves better in academic and professional careers**.**
- To be trained in professional writing with enriched vocabulary and expertise in conversation, interviews, presentations, group discussions etc.
- Students will be able to prepare their curriculum vitae and job applications which will help them in building their professional career.

AG-112 Agricultural Heritage 1(1+0)

Course Outcomes:

- At the end of session, the students can blend old and sustainable agril. practices with present day agricultural practices.
- Students can suggest the old ways and means of farming under poor soil conditions to mitigate the harmful effect of injudicious use of agrochemicals.
- The background knowledge can help the students in higher studies as part of their research programmed.

EE-112 Human values and ethics 1(1+0) (Non Gradial Course)

Course Outcomes:

- Students will appreciate the essential complimentarily between values and skills to ensure sustained happiness and prosperity which are the core aspirations of all human beings.
- The process of self-exploration and self-awareness will enable the students to evaluate their pre-conditioning and present beliefs.
- Students will develop a holistic perspective towards life, profession and happiness based on a correct understanding of human reality, human body and rest of the existence.

PRM-111 Elementary Mathematics 2(2+0)

Course Outcomes:

- To improve an ability to apply mathematics and its application in agriculture and its applied sectors.
- To learn the skills designed to help and understand the plant and its ecosystem by using mathematics application**.**
- Students will be able to prepare and apply the knowledge gained in designing fields.

PRB-111 Introductory Biology 2(1+1)

Course Outcomes:

- To improve skills in interpreting the plant organs and describe their roles and mechanisim.
- To learn the skills designed to help the candidates to understand better in the subject related concepts of B.Sc. (Hons.) Agriculture**.**
- Students will be able to understand the description of plants and the role of animal in agriculture.

NSS-111 NSS/NCC/Physical Education & Yoga Practices 2(0+2)

Course Outcomes:

- The social leadership capability will be developed among the students
- Students will be awared about the social problems, stigmas and make the students capable to tackle them
- Students will be able to know various programmes related to society and their skills will be enhanced.

1st year 2nd Semester

AG-123 Introductory Agro-meteorology and climate change 2(1+1)

Course Outcomes:

- Students develop the technical know-how on layout of an agricultural meteorological observatory, the instruments required, their installation.
- Equipped with the knowledge of recording data on weather elements, calculation, tabulation, calculation and their relations vis-a-vis interpretation with crop growth and development.

- Students will be acquainted with the weather forecast system, and can help the farmers in adopting necessary measures suggested through agro-advisory service.

AG-124 Course Name: Introduction to Agroforestry 2(1+1)

Course Outcomes:

- Students will be able to know different agroforestry systems for varying agroecological situations and their suitability with conventional agriculture.
- At the end of session, students will be able to suggest different agroforestry-based models in companion with field and horticultural crops and their management.
- Students can become a part of the team engaged in adoption agroforestry-based solution to restore soil health through carbon sequestration and mitigating climate change impact

PB-121 Fundamentals of Genetics 3(2+1)

Course Outcomes:

- Knowledge on the basic principles of heredity and variation.
- Understanding on cytogenetics, polyploidy, mutation and gene expression.
- Development of analytical, quantitative and problem-solving skills from classical to molecular genetics.
- Help the students in understanding the upcoming courses related to plant breeding and genetics.

HT-122: Production Technology for Fruit and Plantation Crops 3(2+1)

Course Outcomes:

- To get practical knowledge about the scientific production technology of fruit and plantation crops.
- To know about the processing methods in plantation crops.
- To understanding the production constraints through various field visits.

SC-122 Agricultural Microbiology 2(1+1)

Course Outcomes:

• Knowledge on the principles of microbiology and details of important microorganisms

• Appraisal on the role of microorganism in improving soil fertility

• Practical experience in extracting the microbes from soil culturing the microbes in the laboratory.

EN 121: Fundamentals of Entomology 4(3+1)

Course Outcomes:

- Students will gain the basic knowledge about external morphology of the insect's body i.e., head, thorax and abdomen, their appendages and functions, basic aspects of anatomy of different systems, elementary physiology, nutritional physiology and their application in entomology.
- Students will know about classification of insects up to the level of families with hands-on experience in identifying the families of insects.
- Concepts of ecology, basic principles of distribution and abundance of organisms and their causes will be known by all the students. Study life tables, organization of communities, diversity indicies. Train students in sampling methodology, calculation of diversity indicies, constructing life tables, relating insect population fluctuations to biotic and/or abiotic causes,
- All will be familiarized with principles of insect pest management, including concept and philosophy of IPM. Train students in computation of ETL, implementing IPM programmes.

PP-121 Fundamentals of Plant Pathology 3(2+1)

Course Outcomes:

- Acquaintance with various laboratory equipment and basic knowledge on laboratory techniques.
- Knowledge on disease symptoms and identification of various micro-organisms.
- Basic idea on pesticides, calculations and the method of applications.

CP-121 Fundamentals of Crop Physiology—1 2(1+1)

Course Outcomes:

- Physiology of crops is the fundamental importance as it provides basic knowledge of plant internal functions and various life processes.
- Provide knowledge regarding different growth parameters and mineral nutrition of plants role in crop growth.

- Then one can better understand on physiological performances of crops in the field under agro climatic situations to predict yield and productivity.

AE-121 Fundamentals of Agricultural Economics 2(2+0)

Course Outcomes:

- Students will learn the basic economic terminology related to major branches.
- Knowledge about basic working of the Indian economy at micro and macro level.
- Learn to apply these economic concepts in agricultural sector.

EE-123 Rural Sociology & Educational Psychology 2(2+0)

Course Outcomes:

- Understand concept of rural sociology, its importance in agricultural extension, characteristics of Indian rural society
- Understand social groups, social stratification, culture, social values, social control and attitudes
- Understand concept of educational psychology, intelligence, personality, perceptions and motivation

NSS-111 NSS/NCC/Physical Education & Yoga Practices 2(0+2)

Course Outcomes:

- The social leadership capability will be developed among the students
- Students will be awared about the social problems, stigmas and make the students capable to tackle them
- Students will be able to know various programmes related to society and their skills will be enhanced.

2nd Year 3rd Semester

AG-215 Crop Production Technology-I (*Kharif* Crops) 2(1+1)

Course Outcomes:

- Students will develop knowledge of raising different field crops specific to *kharif* season.
- Application skills in raising and managing *kharif* crops scientifically.
- Scope for agro-entrepreneurship.

PB-212 Fundamentals of Plant Breeding 3(2+1)

Course Outcomes:

- Understanding various modes of reproduction in crop plants and their genetic consequences.
- Idea on various breeding methods followed for development of superior cultivars.
- Practical knowledge on emasculation and hybridization techniques in both self & cross pollinated crops for development of hybrids.

HT-213: Production Technology for Vegetable and Spices 3(2+1)

Course Outcomes:

- Practical knowledge about raising of vegetable seedlings and production technology in field condition
- To get idea for solving field related problems
- Better knowledge on field preparation and intercultural operation along with different harvesting method and its maturity stage is the outcome of this course.

SC-213 Environmental Studies and Disaster Management 3(2+1)

Course Outcomes:

- This course will make the students aware of different environmental concerns like pollution, conservation, etc and will create a pro-environmental attitude.
- Learning about the ways to mitigate important disasters in the World and India in particular.
- Ability to conduct various qualitative and quantitative tests for waste samples collected from the locality

PP-212 Introductory Nematology 2 (1+1)

Course Outcomes:

- Students acquire the basic knowledge on handling nematological laboratory appliances and develop skill on collection, extraction and identification of nematode.

- Adequate identification of the symptoms of diseases inflicted by nematodes and take appropriate steps towards developing management strategies.
- Students will know the damage potential and biology of nematode taxa that are parasitic to plants.

ST-211 Principles of Seed Technology: 2(1+1)

Course Outcomes:

- Details knowledge about the growth, development and production strategy of different quality seeds.
- Different Technology used for processing of the seed and long-term storage methods for better seed quality.
- Forecasting demand of quality seed and market linkage for better availability of seed to the farmer.

AE-212 Agricultural Finance and Co-Operation 3(2+1)

Course Outcomes:

- Students will learn skills on financial economics tools used in agricultural finance.
- Gain knowledge about working of the financial sector of India.
- Able to analyse and apply the financial management tools in agriculture sector.

AT – 212 Soil and Water Conservation Engineering2(1+1)

Course Outcomes:

- Management of land and water to eradicate the draught condition
- Increasing the production and productivity of land for economic upliftment of the people of the area
- Control of Soil from water and wind erosion
- Knowledge on installation of water harvesting structures

AH-211 Livestock & Poultry Management 4(3+1)

Course Outcomes:

- Employment as a manager of livestock and poultry farms.
- Establishment of independent dairy and poultry farms.
- Manufacturing of cattle and poultry feed

NSS-111 NSS/NCC/Physical Education & Yoga Practices 2(0+2)

Course Outcomes:

- The social leadership capability will be developed among the students
- Students will be awared about the social problems, stigmas and make the students capable to tackle them
- Students will be able to know various programmes related to society and their skills will be enhanced.

2nd Year 4th Semester

AG-226 Crop Production Technology-II (rabi crops) 2(1+1)

Course Outcomes:

- Students will develop knowledge of raising different field crops specific to Rabi crops.
- Application skills in raising and managing rabi crops scientifically.
- Scope for agro-entrepreneurship.

AG-227 Farming System and Sustainable Agriculture 1(1+0)

Course Outcomes:

- Students are acquainted with the concept of farming system and IFS modules for different category of farmers with varying resources to generate year round income.
- Self-employment capability through agro-entrepreneurship development by utilizing the by products from different enterprise.
- Students can enhance their knowledge as well as develop eco-friendly farming system models in a sustainable manner through resource recycling

AG-228 Course Name: Principles of Organic Farming 2(1+1)

Course Outcomes:

- At the end of the session, students will understand organic packages for different crops, organic certification procedure
- Students will develop their skill to prepare organic products and their application.
- Develop skills through practical orientation to organic production technologies.

PB-223 Intellectual Property Rights 1(1+0)

Course Outcomes:

- Exposure to various types intellectual property rights.
- Idea on various acts and organization related to IPR.

- Knowledge on protection of plant varieties under UPOV and PPV&FR Act of India, Plant breeders rights, and farmers rights.

HT-224: Production Technology for Ornamental, Medicinal & Aromatic Plants 2(1+1)

Course Outcomes:

- To get practical idea about identification of different ornamental, medicinal and aromatic plants.
- To know about the standardized methods for raising nursery of different flowers and medicinal and aromatic plants.
- Better knowledge on field preparation and intercultural operation along with different harvesting method and its isolation and extraction process of chemical constituents from medicinal & aromatic plants

SC-224 Problematic Soils and their Management 2(2+0)

Course Outcomes:

• Knowledge about soil quality, health, distribution of waste land and problem soils in India.

• Categorization and management of wastelands to be utilised effectively.

• Understanding the quality and standards of irrigation water, bio remediation and land capability and land suitability classification.

PP-223 Principles of Integrated Pest and Disease Management 3(2+1)

Course Outcomes:

- Acquire knowledge of pest surveillance and develop models for disease forecasting.
- Student will know about proper detection and diagnosis of pest and diseases.
- Assessment of disease intensity, determination of various injury levels and crop yield loss.
- Development of different IPM modules for management of different pests and their application.
- Acquire knowledge about mass multiplication of various important biocontrol agents.

ST-222Seed production and Seed Testing: 1(0+1)

Course Outcomes:

- Details knowledge about the foundation and certified seed production techniques of OPVs and hybrids.

- Different seed testing methods used for quality seed production.
- 3.Chemical, biochemical, molecular methods used for genetic purity testing.
- 4.Knowledge regarding different health testing methods for identification of seed borne diseases.

CP-222 Fundamentals of Crop Physiology—ll: 1(1+0)

Course Outcomes:

- Details knowledge about the physiology of seed development, maturation and changes during seed development.
- Knowledge regarding maturity indices, dormancy, seed quality parameters and factors affecting quality of seed and crop.
- One can better understand the concepts of physiological and biochemical changes during a seed life to a mature and during post-harvest changes.

AE-223 Agricultural Marketing, Trade and Prices 3(2+1)

Course Outcomes:

- Students will learn the use of price analysis tools for agricultural market prices.
- Knowledge about practical application of marketing and price analysis tools in policy making.
- Develop an understanding on the working of markets from local to global level.

AS-222 Agri-Informatics 2(1+1)

Course Outcomes:

- Establishment of consultancy farm
- Helping farmers in smart way

AT-223 Renewable Energy and Green Technology 2(1+1)

Course Outcomes:

- Knowledge on different energy sources.
- Select appropriate energy technologies to meet the energy demand of the state in agriculture except the use of hydro power energy.
- It will enable students to understand the concepts in the production process of biodiesel, bio-fuels and briquettes.

AE-224 Agri-business Management 3(2+1)

Course Outcomes:

- Students will learn the management aspect of agricultural businesses.
- Gain knowledge directly from business economics to evaluate projects and new

ventures in agricultural sector.

- Able to set up projects on agricultural business management.

SC-225 Agrochemicals 3(2+1)

Course Outcomes:

• This course will give both theoretical and practical experience to students about agrochemicals, their type and role in agriculture, management of agrochemicals for sustainable agriculture.

• They will be aware of pesticides with reference to their classification, structure, mode of action, synthesis and formulations and quality

• Knowledge on Fertilizers, their manufacturing process, quality and their importance.

AG-229 Weed Management 3(2+1)

Course Outcomes:

- Students are enriched with recent developments in herbicide, their selectivity and mode of action, resistance development etc.
- Students will develop knowledge to select crop specific herbicides, their use, dose calculation and safe handling.
- Students can know the critical crop weed competition period, possible phyto-toxicity and residual effects of herbicides in different crops under different crop agro-ecological systems.

3rd Year 5th Semester

AG-311 Course Name: Practical Crop Production (*Kharif* Crops) 2(0+2)

Course Outcomes:

- Students will gain the knowledge of selecting good quality seeds, manures, fertilizers, plant protection chemicals, farm machineries and irrigation management for different field crops in rainfed and irrigated farming.
- Students will get the benefit of imparting training to the farmers and farm women in their practical life after entering to the service at the state government and central government.
- Students can recommend scientific based crop management practices for different crops under varying farming situations both for resource poor and resource rich farmers.

PB-314 Crop Improvement – I (*Kharif*) 2(1+1)

Course Outcomes:

- Getting idea on centers of origin, distribution of species, wild relatives of various *kharif* crops.
- Exposure to various conventional and modern plant breeding methods for the improvement of important *kharif* crops.
- Visit to seed production plots, AICRP plots of different field crops and getting a practical knowledge on hybrid development.

PB-315 Fundamentals of Plant Biotechnology 2(1+1)

Course Outcomes:

- Getting acquainted with various micro-propagation methods and their application in crop improvement.
- Idea on recombinant DNA technology and various methods of gene transfer.
- Exposure to the field of transgenic and their application in crop improvement.
- Knowledge on various types of marker systems and their application in crop improvement.

HT-315: Post-harvest Management and Value Addition of Fruits and Vegetables 2(1+1)

Course Outcomes:

- To get some idea about different post-harvest practices likes sorting, grading and packaging.
- To get idea about different storage house and its method of storage in Fruits and Vegetables.
- Preparation of different value-added product like jam, jelly, sauce, ketch up, chips, RTS, pickle etc.

SC-316 Geoinformatics, Nano-technology and Precision Farming 2(1+1)

Course Outcomes:

• Basic knowledge on fundamentals of geoinformatics, its application in precision farming and fertiliser recommendation approaches.

• Adequate information on nanotechnology, its concept, different commercial nano-formulations and their practical utility in seed, water, fertilizer and plant protection.

• Hand-on skill on use of various GIS database and softwares to generate thematic maps.

• Woking experience on handling of GPS hardware for real-time access of time and positional information.

SC-317 Fundamentals of Plant Biochemistry2(1+1)

Course Outcomes:

• Theoretical experience on the elementary knowledge on structure and functions of biomolecules.

• They will get a brief overview of the metabolism of the biomolecules.

• Practical excellence in determining the important biomolecules through different analytical methods.

EN 312: Pests of Crops and Stored Grains and their Management 3(2+1)

Course Outcomes:

- The students will be familiarized about nature of damage and seasonal incidence of insect pests that cause loss to major crops.
- Students will know effective management of harmful pests by different methods and also know the economic aspect of IPM techniques which will be further useful.

PP-314 Diseases of Field & Horticultural Crops & their Management-I 3(2+1)

Course Outcomes:

- Development of knowledge on diagnosing different diseases of field and horticultural crops based on the symptoms expressed in the field.
- Acquire the skill of collection and preservation of diseased specimens
- Development management strategies to tackle the diseases in *Kharif* Season.

EE-314 Communication Skills and Personality Development 2 (1+1)

Course Outcomes:

- Develop effective communication skills (spoken and written)
- Develop effective presentation skills
- Become self confident individuals by mastering inter-personnel skills, team management skills which will help them in their job life in future.
- Development of all round personalities with mature outlook to function effectively in different circumstances
- Write papers, proposals, reports etc. which will also help them in achieving their academic degree.
- They will be able to appreciate any piece of writing and comprehend it.

EN 313 (E): Biopesticides &biofertilizers 3(2+1)

Course Outcomes:

- This course will impart knowledge to the students on the fundamental knowledge on classification, production, application and quality control of biopesticides
- Knowledge on classification, preparation method and quality control of biofertilizer.
- Practical exposure isolation, purification and quality control of biopesticides and mass multiplication of biofertilizers.

AT-314 Protected Cultivation (Elective) 2(1+1)

Course Outcomes:

- Knowledge on design of green house for raising high value crops
- Enhancement of economic condition of the green house entrepreneurs on production of quality products
- Knowledge on Growing off-season, medicinal, aromatic and ornamental crops to boost the development demand of the society
- Self employment for educated youth in farm sector can be increased

PB-316 Commercial Plant Breeding 3(1+2)

Course Outcomes:

- Exposure to the principles and techniques of quality seed production in various crops; their maintenance, release and notification system.
- Learning techniques in hybrid seed production using male-sterility in field crops.
- Knowledge on DUS testing and registration of varieties under PPV & FR Act

EE- 315 Agricultural Journalism 3(2+1) (Elective Course)

Course Outcomes:

- Knowledge and skill writing news/magazine articles
- Students will be able to analyze various aspects of agricultural journalism. conceptual knowledge about gathering various sources of agricultural information, organizing the materials and treatment of the stories.
- Students would also gain knowledge about the editorial mechanics of copy reading, proof reading, lay outing etc.

3rd Year 6th Semester

AG-321 Course Name: Rainfed Agriculture and Watershed Management 2(1+1)

Course Outcomes:

- Students will develop working knowledge in managing soil and crops under rainfed condition.
- Students will be able to use technical skills develop their own skill for better management of crops and soil in different watersheds based on rainfall characteristics.
- Students will learn to coordinate with line departments in managing the crops under aberrant weather conditions and develop alternate crop plan.

AG-322 Course Name: Practical Crop Production (*Rabi* Crops) 2(0+2)

Course Outcomes:

- Students will gain the knowledge of selecting good quality seeds, manures, fertilizers, plant protection chemicals, farm machineries and irrigation management for different field crops in rainfed and irrigated farming.
- Students will get the benefit of imparting training to the farmers and farm women in their practical life after entering to the service at the state government and central government.

- Students can recommend scientific based crop management practices for different crops under varying farming situations both for resource poor and resource rich farmers.

PB-327 Crop Improvement – II (*Rabi*) 2(1+1)

Course Outcomes:

- Getting idea on centres of origin, distribution of species, wild relatives of various *rabi* crops.
- Exposure to various conventional and modern plant breeding methods for the improvemet of important *rabi* crops.
- Visit to seed production plots, AICRP plots of different field crops and getting a practical knowledge on hybrid development.

SC-328 Manures, Fertilizers and Soil Fertility Management 3(2+1)

Course Outcomes:

• Students will understand the role of fertilizers and manures in supplying nutrients to plants so as to achieve high fertilizer use efficiency.

• They will have an overall idea on preparation of organic manures and composts which is needed for sustainable agriculture

• Evaluation soil fertility by using suitable methods.

• Analysis and recommendation some of the essential nutrients in soil and plants.

EN 324: Management of Beneficial Insects 2(1+1)

Course Outcomes:

- Students will able to know the basic knowledge regarding the biology and basic concepts of apiculture, sericulture and lac culture
- Students will know the techniques and tools of apiculture, sericulture and lac culture and the commercial aspects which will helpful to create employability.

PP-325 Diseases of Field & Horticultural Crops & their Management-II 3 (2+1)

Course Outcomes:

- Development of knowledge on diagnosing different diseases of field and horticultural crops based on the symptoms expressed in the field.

- Acquire the skill of collection and preservation of diseased specimens
- Development management strategies to tackle the diseases in *rabi* Season.

AE-325 Farm Management, Production and Resource Economics 2(1+1)

Course Outcomes:

- Students will have a detailed understanding about inputs and outputs in agriculture, agricultural and natural resource management.
- Knowledge about combination of inputs/outputs in production process, how can they be adjusted for optimized resource use and better profits.
- Able to understand and formulate farm plans through various farm management and optimization skills.

EE-326 Entrepreneurship Development and Business Communication 2 (1+1)

Course Outcomes:

- Understand theories of entrepreneurship and business development
- Be able to state, understand and evaluate the key factors needed to develop a successful business
- Describe the concepts of entrepreneurship, agri-preneurship, characteristics of entrepreneur, motivation and entrepreneurship and project management
- Gain knowledge and skills in project formulation, project report preparation and evaluation of projects
- Explain entrepreneurship development programme, government policies, schemes and incentives for promotion of entrepreneurship and social responsibility of business
- Develop the skills of an effective manager through simulated exercises on communication skills
- Get opportunities for agri-entrepreneurship and rural enterprise

AT-325 Protected Cultivation and Secondary Agriculture 2(1+1)

Course Outcomes:

- To impart knowledge on design and construction of green house under controlled system and their maintenance
- It will enable students to understand the concepts on different engineering properties of food materials in application of Post harvest equipment
- A brief knowledge on equipments used for drying of agricultural produces

- Knowledge on Material handling equipments, their principle, working and selection

HT-326 Hi-tech. Horticulture 3(2+1)

Course Outcomes:

- Modern nursery management and mechanisation on micro and protected cultivation techniques.
- Regarding GIS, DGPS, VRA and precision farming.
- Regarding microprapagation, EC and pH based fertilizer scheduling.
- To study about canopy management and high density planting for higher yield and economy.

HT-327: Landscaping 3(2+1)

Course Outcomes:

- Students are able to identify different flowering and foliage trees, shrubs, annuals, pot pants used for different landscaping purposes like avenue plantation, hedge, edge, shrubbery, borders, beds etc.
- Different tools and implements used in landscape design are being identified by the students.
- As the students are physically visited different gardens and parks within the city they are able to distinguish different styles of garden

AG-323 Course Name: Water Management 3(2+1)

Course Outcomes:

- Students will be acquainted with managing irrigation water in different crops for higher irrigation and field efficiency
- Students will be able to recommend suitable water saving technologies and irrigation methods with an aim to produce more crop per drop.
- Students can adopt scientific based irrigation scheduling in crops and cropping systems as part of their entrepreneurship with an approach on high-tech agriculture.

PB-328 Micro propagation Technologies 3(1+2)

Course Outcomes:

- Knowledge and practical skills on different plant tissue culture techniques for crop improvement.
- Acquaintance to modern germplasm conservation approach.

- Entrepreneurship development through in-vitro production of secondary metabolites, like perfumery, pharmaceutical, botanical pesticide etc.

4th Year 7th Semester

RAWE-411 Rural Agricultural Work Experience 20(0+20)

Course Outcomes:

- Team work and build competency in understanding real life situations
- They can learn about management of different components, problem solving attitude.
- Develop art of creative thinking, time management, art of listening, positive use of feedback, observation power, managing conflicts, working of local institutions, working with other organizations etc.
- Students will acquaint with on-going extension and rural development programmes

4th Year 8th Semester

EL-421 PRODUCTION TECHNOLOGY FOR BIOAGENTS AND BIOFERTILIZER (0+10)

Course Outcomes:

• Ability to understand laboratory equipments and conditions required for producing bioagents and biofertilizers on commercial scale.

• Acquaintance with the isolation and characterization of important microorganisms involved to control plant pests.

• Students will be able to isolate, purify and maintain the laboratory cultures of different biofertilizers and understand their role in soil fertility and crop production

EL – 422 Seed Production and Technology: 10(0+10)

Course Outcomes:

- Adequate practical knowledge on seed production of both OPVs and Hybrid
- Provide knowledge regarding seed quality control and seed quality enhancement techniques.

- Visit to different seed processing units and seed production plots will enable students to involve themselves in both public and private sector seed enterprises.

EL-423 Mushroom Cultivation Technology 10(0+10)

Course Outcomes:

- Basic knowledge on commercially grown mushroom
- Knowledge on Preparation of mother culture, spawn, substrate etc to develop entrepreneurship.
- Knowledge on economics and constraints of mushroom cultivation.

EL- 424 Soil, Plant, Water and Seed Testing 10(0+10)

Course Outcomes:

• It may possible to predict nutritional disorders before the appearance of visual symptoms in the plant tissue and helpful to determine the effects of nutrient addition on the nutrient supply to the plant.

• Study the relationship between nutrient status of the plant and crop performance.

• By the end of these practical exercises, the students will be able to analyse various soil, plant, water and seed testing parameters which are important for agriculture.

EL-425: Commercial Horticulture (0+10)

Course Outcomes:

- Outcome of this subject is use and its formulation and preparation of plant growth regulators
- Identification of nutrient deficiencies; Identification of physiological disorders;
- Harvest indices and maturity standards; Post-harvest handling and storage, marketing; Seed extraction
- Cost of cultivation for tropical and sub-tropical vegetable crops
- Project preparation for commercial cultivation of horticultural crops

EL-426: Floriculture and Landscaping (0+10)

Course Outcomes:

- Students will be able to identify the commercial flower crop both for cut and loose flower purpose

- Students will be able to draw a sketch and apply the same practically in the field for layout and planning of a Garden.
- They can gain knowledge regarding different modern cultivation practices for growing flower and foliage crop.

EL-427 Agricultural Waste Management 10(0+10)

Course Outcomes:

- Proper utilisation/management of agricultural wastes/byproducts/animal wastes
- Students can be self employed in making bio-composts, building materials, feed materials for animals etc.
- The students can be engaged as consultants/service providers for composting and water treatment plants
- Waste management helps to maintain a healthy environment of the region

EL 428 Organic Production Technology 10(0+10)

Course Outcomes:

- Students can adopt the practices related to organic farming can demonstrate the preparation of organic formulations in crop, cropping systems and farming systems along with the procedure used for organic certification.
- Students will develop their skill to prepare organic products and their application.
- Develop skills through practical orientation to organic production technologies.

ABM 6: Project Formulation, Evaluation and Monitoring 3(1+2)

Course Outcomes:

- Learn about tools and techniques for preparing and evaluating agribusiness projects.
- On other hand they can learn monitoring and evaluation as effective tools for enriching quality of interventions through their role in decision making and learning.
- They will also learn about various computer applications, IT and data base management techniques.

Mapping of POs vrs. COs

Name of the Course	Course Code	Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6
Fundamentals of Agronomy	AG 111	CO1	✓	✓		✓		
		CO2		✓				
		CO3	✓	✓		✓		
Fundamentals of Horticulture	HT 111	CO1	✓					
		CO2	✓			✓		
		CO3	✓					
		CO4		✓				
Fundamentals of Soil Science	SC 111	CO1	✓					
		CO2				✓		
		CO3	✓					
Fundamentals of Agricultural Extension Education	EE 111	CO1			✓			
		CO2				✓		
		CO3			✓			
		CO4				✓		
		CO5						✓
Statistical Methods	AS 111	CO1				✓		
		CO2				✓		
		CO3				✓		
Farm Machinery and Power	AT 111	CO1			✓	✓		
		CO2			✓			
		CO3					✓	
		CO4			✓	✓		
Comprehension and Communication Skills in English	SS 111	CO1				✓		✓
		CO2				✓		✓
		CO3				✓		✓
		CO4				✓		✓
Agriculture Heritage	AG 112	CO1	✓					
		CO2	✓	✓				
		CO3				✓		
Human Values & Ethics	EE 112	CO1				✓		
		CO2				✓		
		CO3				✓		✓
Elementary Mathematics	PRM 111	CO1				✓		
		CO2				✓		
		CO3				✓		
Introductory Biology	PRB 111	CO1				✓		
		CO2				✓		

		CO3				✓		
NSS/NCC/Physical education and Yoga practice	NSS-111/NCC-111/PE-111	CO1						✓
		CO2						✓
		CO3						✓
Introductory Agro-meteorology & climate change	AG-123	CO1				✓		
		CO2				✓		
		CO3			✓	✓	✓	
Introduction to Agroforestry	AG-124	CO1	✓					
		CO2	✓		✓	✓		
		CO3			✓	✓		
Fundamentals of Genetics	PB-121	CO1				✓		
		CO2				✓		
		CO3				✓	✓	
		CO4				✓		
Production Technology for Fruits and Plantation crops	HT-122	CO1		✓	✓	✓		✓
		CO2	✓	✓		✓		✓
		CO3	✓	✓	✓			
Agricultural Microbiology	SC-122	CO1		✓				
		CO2		✓				
		CO3		✓		✓		
Fundamentals of Entomology	EN-121	CO1				✓		
		CO2				✓		
		CO3		✓		✓		
		CO4		✓		✓		
Fundamentals of Plant Pathology	PP-121	CO1				✓		
		CO2		✓		✓		
		CO3		✓		✓		
Fundamentals of Crop Physiology-I	CP-121	CO1	✓			✓		
		CO2	✓	✓		✓		
		CO3	✓		✓	✓		
Fundamentals of Agril.Economics	AE-121	CO1				✓		
		CO2				✓		
		CO3				✓		
Rural Sociology and Educational Psychology	EE-123	CO1			✓	✓		
		CO2				✓		

		CO3				✓		
NSS/NCC/Physical education and Yoga practice	NSS-111/NCC-111/PE-111	CO1						✓
		CO2						✓
		CO3						✓
Crop Production Technology-I (Kharif Crops)	AG-215	CO1	✓		✓	✓		
		CO2	✓		✓	✓		
		CO3				✓	✓	
Fundamentals of Plant Breeding	PB-212	CO1	✓			✓		
		CO2	✓			✓		
		CO3			✓	✓		
Production Technology for Vegetables & Spices	HT-213	CO1	✓	✓	✓	✓		✓
		CO2	✓	✓	✓			
		CO3	✓		✓			
Environmental studies and disaster management	SC-213	CO1				✓		
		CO2				✓		
		CO3				✓		
Introductory Nematology	PP-212	CO1		✓		✓		
		CO2		✓	✓	✓		
		CO3		✓		✓		
Principles of Seed Technology	ST-211	CO1	✓			✓	✓	
		CO2	✓			✓		
		CO3			✓	✓		✓
Agricultural Finance & Co-operation	AE-212	CO1				✓	✓	
		CO2				✓		✓
		CO3			✓	✓	✓	
Soil and Water conservation Engineering	AT-212	CO1	✓			✓		
		CO2	✓		✓	✓		
		CO3		✓		✓		
		CO4			✓	✓		
Livestock & Poultry Management	AH-211	CO1				✓		✓
		CO2				✓	✓	
		CO3				✓	✓	
NSS/NCC/Physical education and Yoga practice	NSS-111/NCC-111/PE-111	CO1						✓

		CO2						✓
		CO3						✓
Crop Production Technology-II (Rabi Crops)	AG-226	CO1	✓		✓	✓		
		CO2	✓		✓	✓		
		CO3				✓	✓	
Farming system & Sustainable Agriculture	AG-227	CO1			✓		✓	
		CO2			✓		✓	
		CO3			✓		✓	
Principles of Organic Farming	AG-228	CO1	✓				✓	
		CO2		✓			✓	
		CO3			✓		✓	
Intellectual Property Rights	PB-223	CO1				✓		
		CO2				✓		
		CO3			✓			
Production Technology for ornamental , Medicinal and Aromatic Plants	HT-224	CO1	✓			✓		
		CO2	✓			✓		
		CO3	✓		✓		✓	
Problematic soils and their management	SC-224	CO1				✓		✓
		CO2				✓		
		CO3		✓				
Principles of Integrated Pest and Disease management	PP-223	CO1		✓		✓		
		CO2		✓				
		CO3		✓	✓			
		CO4	✓	✓	✓	✓		
		CO5		✓	✓		✓	✓
Seed Production and Testing	ST-222	CO1	✓				✓	
		CO2	✓			✓		
		CO3	✓			✓		
		CO4		✓				
Fundamentals of Crop Physiology-II	CP-222	CO1	✓					
		CO2	✓			✓		
		CO3			✓	✓		
Agricultural Marketing, Trade & Prices	AE-223	CO1			✓	✓		
		CO2				✓		✓
		CO3				✓		✓

Agri-informatics	AS-222	CO1					✓	
		CO2			✓			
Renewable Energy & Green Technology	AT-223	CO1				✓		
		CO2			✓	✓		
		CO3				✓	✓	
Agri-Business Management	AE-224	CO1			✓		✓	✓
		CO2			✓		✓	
		CO3					✓	
Agro-Chemicals	SC-225	CO1		✓	✓			
		CO2		✓		✓		
		CO3		✓		✓	✓	
Weed management	AG-229	CO1		✓				
		CO2		✓	✓	✓		
		CO3	✓	✓		✓		
Practical Crop Production-I (Kharif Crops)	AG-311	CO1	✓	✓				
		CO2			✓			✓
		CO3	✓		✓			
Crop Improvement-I (Kharif Crops)	PB-314	CO1				✓		
		CO2	✓			✓		
		CO3				✓		
Fundamentals of Plant Biotechnology	PB-315	CO1	✓			✓		
		CO2				✓		
		CO3	✓					
		CO4	✓			✓		
Post-harvest management and Value addition of Fruits & Vegetables.	HT-315	CO1			✓			✓
		CO2			✓	✓		
		CO3					✓	
Geo-informatics, nano technology and precision farming	SC-316	CO1	✓	✓		✓		
		CO2		✓		✓		
		CO3			✓	✓		
		CO4			✓	✓		
Fundamentals of Plant Biochemistry	SC-317	CO1		✓		✓		
		CO2				✓		
		CO3				✓		✓
Pests of crops and stored grain and	EN-312	CO1		✓				

their management								
		CO2		✓	✓			
Diseases of field and horticultural crops and their management-I	PP-314	CO1		✓	✓			
		CO2				✓		
		CO3		✓	✓			
Communication Skills and personality development	EE-314	CO1				✓		✓
		CO2				✓		✓
		CO3				✓		✓
		CO4				✓		✓
		CO5				✓		✓
		CO6				✓		✓
Bio-pesticides and Bio-fertilisers	EN-313	CO1		✓	✓			
		CO2		✓				
		CO3		✓			✓	
Protected Cultivation	AT-314	CO1	✓					
		CO2			✓			
		CO3	✓		✓			
		CO4					✓	
Commercial Plant Breeding	PB-316	CO1	✓					
		CO2	✓			✓		
		CO3				✓		
Agricultural Journalism	EE-315	CO1			✓	✓		✓
		CO2			✓	✓		✓
		CO3			✓	✓		✓
Rainfed Agriculture & Watershed Management	AG-321	CO1	✓					
		CO2	✓		✓			
		CO3	✓					
Practical Crop production-II (Rabi Crops)	AG-322	CO1	✓	✓				
		CO2			✓			✓
		CO3	✓		✓			
Crop Improvement-II (Rabi Crops)	PB-327	CO1				✓		
		CO2	✓			✓		
		CO3				✓		
Manures, Fertilizers and Soil Fertility Management	SC-328	CO1		✓				
		CO2		✓			✓	
		CO3	✓					

		CO4		✓	✓			
Management of beneficial insects	EN-324	CO1			✓	✓	✓	
		CO2			✓		✓	✓
Diseases of field and horticultural crops & their management-II	PP-325	CO1		✓	✓			
		CO2				✓		
		CO3		✓	✓			
Farm Management, Production & Resource Economics	AE-325	CO1		✓				
		CO2		✓				
		CO3					✓	
Entrepreneurship development and Communication	EE-326	CO1					✓	✓
		CO2					✓	✓
		CO3					✓	
		CO4					✓	
		CO5					✓	
		CO6					✓	✓
		CO7					✓	
Protected cultivation and Secondary Agriculture	AT-325	CO1				✓	✓	
		CO2				✓	✓	
		CO3			✓	✓		
		CO4			✓	✓		
Hi-tech Horticulture	HT-326	CO1	✓	✓		✓	✓	
		CO2				✓		
		CO3		✓		✓	✓	
		CO4	✓			✓		
Land Scaping	HT-327	CO1	✓					✓
		CO2	✓			✓		
		CO3				✓		
Water management	AG-323	CO1		✓		✓		
		CO2		✓	✓			
		CO3		✓			✓	
Micropropagation Technology	PB-328	CO1	✓			✓		
		CO2				✓		
		CO3					✓	
Rural Agricultural Work Experience	RAWEP-411	CO1					✓	
		CO2						✓
		CO3						✓

		CO4			✓			
Production Technology for Bio-agents and Bio-fertilizer	EL-421	CO1		✓			✓	
		CO2		✓		✓		
		CO3		✓		✓	✓	
Seed Production and Technology	EL-422	CO1	✓					
		CO2	✓					
		CO3				✓		✓
Mushroom Cultivation Technology	EL-423	CO1			✓		✓	
		CO2			✓		✓	
		CO3				✓		
Soil, Plant, Water and Seed Testing	EL-424	CO1		✓				
		CO2		✓		✓		
		CO3		✓				✓
Commercial Horticulture	EL-425	CO1		✓		✓		
		CO2		✓				
		CO3	✓			✓		
		CO4	✓					
		CO5				✓	✓	
Floriculture and Landscaping	EL-426	CO1	✓					
		CO2				✓		✓
		CO3	✓					
Agriculture Waste Management	EL-427	CO1				✓		
		CO2					✓	
		CO3		✓			✓	
		CO4				✓		
Organic Production Technology	EL-428	CO1	✓			✓		
		CO2					✓	
		CO3	✓				✓	
Project Formulation, Evaluation and Monitoring	ABM 6	CO1					✓	
		CO2				✓		✓
		CO3				✓		✓

Mapping of COs vrs. Employability/ Entrepreneurship/ Skill development

Name of the Course	Course Code	Employability	Entreprene-urship	Skill development
Fundamentals of Agronomy	AG 111	Y		
Fundamentals of Horticulture	HT 111	Y		
Fundamentals of Soil Science	SC 111	Y		
Fundamentals of Agricultural Extension Education	EE 111	Y		
Statistical Methods	AS 111	Y		Y
Farm Machinery and Power	AT 111	Y	Y	Y
Comprehensation and Communication Skills in English	SS 111	Y		Y
Agriculture Heritage	AG 112	Y		
Human Values & Ethics	EE 112	Y		
Elementary Mathematics	PRM 111			Y
Introductory Biology	PRB 111			Y
NSS/	NSS-111/			Y
NCC/	NCC-111			Y
Physical Education and Yoga Practice**	PE-111			Y
Introductory Agro-meteorology & climate change	AG-123	Y		Y
Introduction to Agroforestry	AG-124	Y		Y
Fundamentals of Genetics	PB-121	Y		
Production Technology for Fruits and Plantation crops	HT-122	Y	Y	Y
Agricultural Microbiology	SC-122	Y		Y
Fundamentals of Entomology	EN-121	Y		
Fundamentals of Plant Pathology	PP-121	Y		
Fundamentals of Crop Physiology-I	CP-121	Y		
Fundamentals of Agril.Economics	AE-121	Y		
Rural Sociology and Educational Psychology	EE-123	Y		
NSS/	NSS-121/			Y
NCC/	NCC-121			Y
Physical Education and Yoga Practice**	PE-121			Y

Crop Production Technology-I (Kharif Crops)	AG-215	Y	Y	Y
Fundamentals of Plant Breeding	PB-212	Y		
Production Technology for Vegetables & Spices	HT-213	Y	Y	Y
Environmental studies and disaster management	SC-213	Y		Y
Introductory Nematology	PP-212	Y		
Principles of Seed Technology	ST-211	Y		
Agricultural Finance & Co-operation	AE-212	Y		
Soil and Water conservation Engineering	AT-212	Y		Y
Livestock & Poultry Management	AH-211	Y	Y	Y
NSS/	NSS-211/			Y
NCC/	NCC-211			Y
Physical Education and Yoga Practice**	PE-211			Y
Crop Production Technology-II (Rabi Crops)	AG-226	Y	Y	Y
Farming system & Sustainable Agriculture	AG-227	Y	Y	Y
Principles of Organic Farming	AG-228	Y	Y	Y
Intelectual Property Rights	PB-223	Y		Y
Production Technology for ornamental , Medicinal and Aromatic Plants	HT-224	Y	Y	Y
Problematic soils and their management	SC-224	Y		Y
Principles of Integrated Pest and Disease management	PP-223	Y		Y
Seed Production and Testing	ST-222	Y	Y	Y
Fundamentals of Crop Physiology-II	CP-222	Y		
Agricultural Marketing, Trade & Prices	AE-223	Y		Y
Agri-informatics	AS-222	Y		Y
Renewable Energy & Green Technology	AT-223	Y		Y
Agri-Business Management	AE-224	Y		Y
Agro-Chemicals	SC-225	Y	Y	Y
Weed management	AG-229	Y		Y

Practical Crop Production-I (Kharif Crops)	AG-311	Y	Y	Y
Crop Improvement-I (Kharif Crops)	PB-314	Y		Y
Fundamentals of Plant Biotechnology	PB-315	Y		
Post-harvest management and Value addition of Fruits & Vegetables.	HT-315	Y	Y	Y
Geo-informatics, nano technology and precision farming	SC-316	Y		Y
Fundamentals of Plant Biochemistry	SC-317	Y		
Pests of crops and stored grain and their management	EN-312	Y		Y
Diseases of field and horticultural crops and their management-I	PP-314	Y		Y
Communication Skills and personality development	EE-314	Y		Y
Bio-pesticides and Bio-fertilisers	EN-313	Y	Y	Y
Protected Cultivation	AT-314	Y	Y	Y
Commercial Plant Breeding	PB-316	Y	Y	Y
Agricultural Journalism	EE-315	Y	Y	Y
Rainfed Agriculture & Watershed Management	AG-321	Y		Y
Practical Crop production-II (Rabi Crops)	AG-322	Y	Y	Y
Crop Improvement-II (Rabi Crops)	PB-327	Y		Y
Manures, Fertilizers and Soil Fertility Management	SC-328	Y	Y	Y
Management of beneficial insects	EN-324	Y		Y
Diseases of field and horticultural crops & their management-II	PP-325	Y		Y
Farm Management, Production & Resource Economics	AE-325	Y		Y
Enterprenureship development and Communication	EE-326	Y		Y
Protected cultivation and Secondary Agriculture	AT-325	Y	Y	Y
Hi-tech Horticulture	HT-326	Y	Y	Y
Land Scaping	HT-327	Y	Y	Y
Water management	AG-323	Y		Y
Micropropagation Technology	PB-328	Y	Y	Y
Rural Agricultural Work Experience	RAWEP-411	Y		Y

Production Technology for Bio-agents and Bio-fertilizer	EL-421	Y	Y	Y
Seed Production and Technology	EL-422	Y	Y	Y
Mushroom Cultivation Technology	EL-423	Y	Y	Y
Soil, Plant, Water and Seed Testing	EL-424	Y	Y	Y
Commercial Horticulture	EL-425	Y	Y	Y
Floriculture and Landscaping	EL-426	Y	Y	Y
Agriculture Waste Management	EL-427	Y	Y	Y
Organic Production Technology	EL-428	Y	Y	Y
Project formulation, evaluation and monitoring	ABM-6	Y	Y	Y