



## Koneru Lakshmaiah Education Foundation

(Category -1, Deemed to be University estd. u/s. 3 of the UGC Act, 1956)

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### KL COLLEGE OF AGRICULTURE

Program: B.Sc.(Hons.)Agriculture

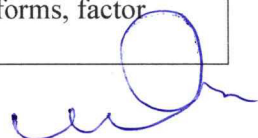
Academic Year :2020-2021

Course Code	Course Title	Co No	Description of the course outcome
20AGRO1 01	AGRICULTURAL HERITAGE	CO1	Understand ancient agricultural practices and it's relevance to modern agriculture practices and appreciate the agriculture practiced throughout the world and to know the richness of agricultural heritage in India
		CO2	Understand judicious traditional agricultural practices and relate with modern methods and Our journey (Developments) in agriculture and vision for the Future
		CO3	Illustrate how we can make use of agricultural resources
		CO4	Understand agricultural concepts
20AGRO1 02	FUNDAMENTALS OF AGRONOMY	CO1	Understand the principles of agronomy often involves a summoning of resources from related disciplines such as Botany, Soil Science, Irrigation, plant protection, Plant Genetics and Breeding, Agrometeorology etc
		CO2	Understand the various nutrients and their effects on plant health and Plan irrigation measures for plant growth and development
		CO3	Illustrate the weeds in a field. Plan for sustainable agricultural production, and apply scientific methods and tools in field preparation and for designing cropping
		CO4	Illustrate the impact of the professional agricultural solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development

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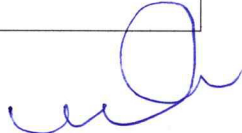
		CO5	Demonstrate and Identification and proper crop management practices with practical knowledge to produce food for humans. Learning aspects to do calculations on fertilizers dose and water requirement for crops and also usage of different tillage implements
20BICM1 01	FUNDAMENTAL OF BIOCHEMISTRY AND BIOTECHNOLOGY	CO1	Understand the knowledge on Carbohydrates, Lipids and Proteins
		CO2	Understand the enzymes and nucleic acids functions
		CO3	Apply the metabolic pathways to plants.
		CO4	Apply the biotechnology in crop improvement
		CO5	Apply the qualitative test for Carbohydrates, amino acids, and Nucleic acids
20ENGL1 01	COMPREHENSIO& COMMUNICATION SKILLS IN ENGLISH	CO1	Understand the various types of passages to know the theme, tone, and main idea of the passage and improve listening skills.
		CO2	Understand and apply the concepts of writing skill for drafting professional transactions.
		CO3	Practice telephone etiquette at different official/informal contexts
		CO4	Recognize and reproduce English sounds
		CO5	Practicing Communication skills.
20SSAC1 21	FUNDAMENTALS OF SOIL SCIENCE	CO1	Understand the basic concepts of Rocks and Minerals and their association with the protolith and Soil Profile
		CO2	Understand the physical soil properties and water movement in soil
		CO3	Understand chemical properties of soil and colloids
		CO4	Understand soil biology, and soil group of India
		CO5	To Understand/Determination phase and chemical properties of soil through experiments
20AECO1 41	FUNDAMENTALS OF ECONOMICS	CO1	understand the nature, scope and subject matter of economics
		CO2	understand the consumer and producer's behaviour
		CO3	understand the different market forms, factor pricing and public finance



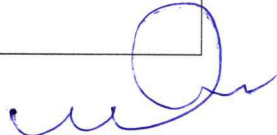
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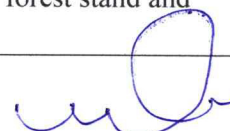
		CO4	understand the concepts associated with national income, population, banking and economic system.
20HORT1 81	FUNDAMENTALS OF HORTICULTURE	CO1	Understand the scope and importance of horticulture, divisions of horticulture, classification of horticultural crops, climate and soil requirements
		CO2	Application of propagation methods and orchard establishment.
		CO3	Apply knowledge of aspects of orchard management viz training, pruning, management of juvenility, flower bud differentiation and unfruitfulness problems in addition to vegetable and ornamental gardens.
		CO4	Apply knowledge of fertiliser and irrigation management schedules in addition to lawn making and use of growth regulators.
		CO5	Implement basic plant propagation and irrigation methods.
20AEXT1 90	HUMAN VALUES & ETHICS (NON GRADIAL)	CO1	Understand the significance of value inputs in a classroom and start applying them in their life and profession
		CO2	Understand the Distinguish between values and skills, happiness and accumulation of physical facilities, the Self and the Body, Intention and Competence of an individual, Ethics-Professional, environmental, ICT.
		CO3	Understand the Positive attitude and scientific temper, Teamwork and volunteering, Rights and responsibilities, Road safety, Human relations and family harmony, modern challenges and value conflict
		CO4	Understand the role of a human being in ensuring harmony in society and nature and Sensitization against drug abuse and other social evils, by developing personal code of conduct (SWOT/SWOC/SNAC Analysis).
20AEXT1 91	SOCIOLOGY & EDUCATIONAL PSYCHOLOGY	CO1	Evaluate the knowledge of rural sociology its importance and characteristics of Indian rural society, social groups, social stratification, in agricultural extension

  
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		CO2	Explain the concept of educational psychology, intelligence, perceptions, in agricultural extension
		CO3	Apply the knowledge of culture, social values, social institutions, and social change, social control and attitudes, leadership and training in Agricultural Extension
		CO4	Apply educational psychological methods to assess farmer's personality and understand different types of emotions, frustrationdeterminants, and motivate them by different teaching learning methods, to bring in a behavioural change
		CO5	Apply and understand the Rural sociology and educational psychology for practical purpose.
20COCA100	NSS/NCC/PHYSICAL EDUCATION AND YOGA PRACTICES	CO5	NSS programmes and activities, Youth development programmes and Vocational skill development
20UC1102J	DESIGN THINKING & INNOVATION - I	CO1	Understand the basics of design thinking and enable them to solve the real-world problems.
		CO2	Understand the requirements of the problem & plan appropriately to solve the same
		CO3	Apply the Design Thinking and Innovation to develop the solutions and present them effectively to the users.
		CO4	Apply the Design Thinking and Innovation to refine the solution based on users' feedback
20AMBE101	AGRICULTURAL MICROBIOLOGY	CO1	Explain the contributions of eminent scientists in microbial world, Role of microbes in fermentation, Protection against infection, applied aspects of Microbiology, morphological types of Bacteria
		CO2	Explain the Microbial Nutrition, Metabolic pathways, Cell Division, Bacterial genetics
		CO3	Explain the role of microbes in fertility of soils and plant growth, Nitrogen cycle, Nitrogen, PGPR Organisms in human welfare

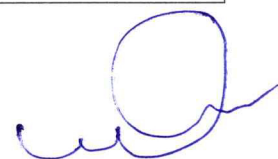
  
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		CO4	Explain the Types of fermentations, Bio-fertilizers Bio-pesticides, Bio-fuel Production- Biodegradation - Biogas, Bio-manures and Composting Technologies for the welfare of agricultural society
		CO5	Use basic laboratory equipment, apparatus and procedures for the study of microorganisms and to isolate and recognize major groups of microorganisms
20AGRO 103	INTRODUCTORY AGROMETEOROLOG Y AND CLIMATE CHANGE	CO1	Understand agrometeorology (definitions, aims, scope and importance) and to learn about the characteristics, behaviour of the atmosphere and agroclimatic zones.
		CO2	Understand roles of agrometeorology in agriculture and the changes of individual weather elements and their relation to crop production. Gain the information of weather and climate which are considered as basic input in agricultural planning
		CO3	Summarize the importance of monsoon in agriculture and the management of weather hazards for improving crop productivity
		CO4	Illustrate the Weather forecasting and impact of climate change on agriculture
		CO5	Illustrate with the meteorological instruments and recording the observation from the agro meteorological observatory and also about the measurement and computation of different weather parameters.
20AGRO1 04	INTRODUCTION TO FORESTRY	CO1	Understand various imparted basic information about various harvesting, transportation and processing systems used in the management of forest resources and production of forest products
		CO2	Discuss acquainted with the management plans with multiple objectives and constraints
		CO3	Understand how to develop and apply silviculture prescriptions appropriate to the management objectives
		CO4	Illustrate and analyze the forest inventory information and project future forest stand and tree conditions



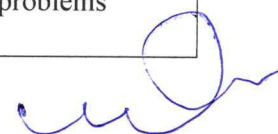
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		CO5	Apply laboratory equipment, and procedures for the study about the tree species description and aware of the growing stock and the management practices of forest
20GPBR1 11	FUNDAMENTALS OF GENETICS	CO1	Understand the basic knowledge about the pre-mendelian and mendelian genetics, chromosome structure and function, cell division and its significance in the life processes, mendelian principle of heredity and different laws, cell structure, gene interaction studies, prediction of monohybrid and dihybrid crosses based on probability and chi-square test. Analysis of dominance and co-dominance phenomenon on the field level and farm management.
		CO2	Understand the major characteristic features of the genetic interactions and epistatic effect, self-incompatibility, pleiotropic effect, linkage, crossing over and its significance in the plant breeding. To impart knowledge to students about the chromosome mapping and the genetic and cytological maps.
		CO3	Develop and understand about sex determination and sex linkage traits, qualitative and quantitative traits, chloroplast and mitochondrial inheritance and their characteristic features. Study of biotechnological tools like DNA and RNA structure and its replication, protein synthesis at transcriptional and translational level.
		CO4	Analyse and gain knowledge about characteristic features of protein synthesis steps, eukaryote and prokaryote gene regulation, mutations: types and role in plant breeding, methods of inducing mutations, molecular basis and significance in the plant breeding, chromosomal aberrations: deletion, duplications and their role in plant breeding, inversion types, translocation: types and role in breeding.

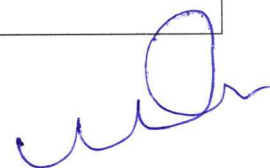


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		CO5	Practical study of microscope, cell structure, mitotic and meiotic cell division. Calculation based practical on probability, chi-square, monohybrid and dihybrid crosses, epistasis interactions including test and back cross, linkage determination and crossing over analysis through two point and three-point test cross data
20ENTO1 31	FUNDAMENTALS OF ENTOMOLOGY I	CO1	Understand various morphological structures like insect body segmentation, different parts of head, thorax and abdomen along with modifications
		CO2	Understand various morphological structures like insect legs, wings, sensory organs, metamorphosis, digestive, circulatory and excretory systems.
		CO3	Understand the nervous, reproductive, endocrine systems in insects and classification of Orders viz., Orthoptera, Dictyoptera and Isoptera
		CO4	Understand systematic arrangement of Hemiptera, Lepidopteta, Coleoptera and Diptera
		CO5	Apply the methods of collection and preservation of insects, observe external features of insects, study the mouthparts, digestive system and reproductive system of insects by dissection and observation and identification of different insects of some important families
20AENG 151	SOIL AND WATER CONSERVATION ENGINEERING	CO1	Understand the concepts of soil, water, and wind erosion along with their various conservation practices
		Co2	Comprehend about terraces, contours, and grasses waterways in order to prevent erosion at different grades of slopy land
		CO3	Characterize the concepts of irrigation water measurement and various irrigation methods - micro-irrigation, underground pipeline system.
		CO4	Understand the water conservation structure, and the systems associated with wells to drive water out of them to irrigate the agricultural land
		CO5	Apply the solutions to the real-life problems through laboratories' work.



20CPHY1 62	FUNDAMENTALS OF CROP PHYSIOLOGY	CO1	Apply the basic knowledge and history of crop physiology it's important in agriculture, cell overview, seed germination and metabolic changes during seed development and plant Growth and its Development. Impart an insight into the various plant water relations.
		CO2	Apply higher levels of learning about the Rate of transpiration and Water use efficiency in C3, C4 and CAM plants. Assimilation of mineral nutrients in crop plant and also about photosynthesis and its reaction centre in crop plant
		CO3	Illustrate the mechanism of various metabolic processes in crop. The factor affecting photosynthesis, Respiration, Biosynthesis of fatty acids in plastids, Physiology of flowering, vernalizationin, Occurrence of auxin, transport of auxin, biosynthesis of auxin and its mode of action.
		CO4	Acquire basic knowledge about growth and development in plants like Auxin, Gibberellins, Cytokinins, Absciscic acid and Ethylene. They learn aboutsenescence, abscission and post-harvest physiology
		CO5	Apply Practical study of Seed vigour and viability tests, seed germination, leaf area measurement, Growth analysis, measurement of water status in plants, leaf anatomy of C3 and C4 plants and the students has developed their skills and techniques related to crop physiology. So that they can design their own experiments.
20PATH1 71	FUNDAMENTALS OF PLANT PATHOLOGY I	CO1	Understand the basic knowledge on the introduction of plant pathology, objective of plant pathology, history of plant diseases, plant pathogens, plant diseases, symptoms and disorders. Important plant diseases caused by fungi, bacteria, virus, spiroplasm etc. general characteristic features of plant parasitic organisms its physiological and morphological traits, its taxonomical classification.

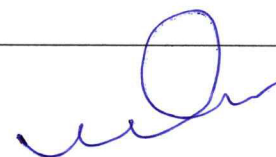


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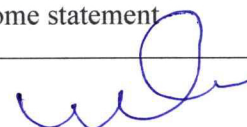
		CO2	Understand the major characteristic features of the Kingdom Fungi, Phylum Chytridiomycota, Phylum Zygomycota, Phylum Ascomycota, Phylum Basidiomycota, Kingdom Chromista, Protozoa.
		CO3	Develop and understand the Phylum Basidiomycota, Sub phylum, Kingdom Chromista, their classification and different characteristic features.
		CO4	Gain knowledge about characteristic features of Kingdom Protozoa, Characteristics features of (prokaryotes) plant pathogenic bacteria, classifications, and identification. Phylum Firmicutes, Virus and viroid, its important characteristic plant virus and viroid, classification, and taxonomy. To know about the Nematodes, importance in agriculture, general characteristics and diseases caused by plant parasitic nematodes.
		CO5	Practical study on Microscopy, morphological identification of different fungi, disease symptoms caused by pathogen. Phytopathogenic bacteria isolation and its characteristics, transmission of plant virus and plant parasitic nematodes.
20HORT1 82	PRODUCTION TECHNOLOGY OF FRUITS AND PLANTATION CROPS	CO1	Understand the basics of fruit and plantation crop industry
		Co2	Apply principles of crop production of major fruit crops
		CO3	Apply principles of crop production of minor fruit crops and plantation crops
		CO4	Apply principles of crop production of cashew, tea, coffee and rubber
		CO5	Hands on approach on identification of suitable crop varieties, pests and diseases in fruit crops
20UC1102	DESIGN THINKING & INNOVATION - I	CO1	Understand the basics of design thinking and its implications in product or service development
		Co2	Understand and Analyse the requirements of a typical problem

		CO3	Plan the necessary activities towards solving the problem through ideation and prototyping
		CO4	evaluate the solution and refine them based on the customer feedback
20AGRO 201	CROP PRODUCTION TECHNOLOGY I	CO1	Illustrate about origin, geographical distribution, and economic importance of Kharif crops.
	(CEREALES, MILLETS AND PULSES)	CO2	Illustrate about Soil and climatic requirements, varieties, cultural practices and yield of Kharif crops.
		CO3	Apply the constraints in production of oilseeds and pulses maybe identified through course content.
		CO4	Apply the production technology of Kharif cereals and millets fulfil the need of human consumption and milch cattle. Analysis pf comparative benefits of the different kharif crops
		CO5	Demonstrate on seed to seed of field management practices and also identification of growth stages critical stages, pest and disease management etc. Which can be solved at field level. Also, complete awareness on crop cultivation practices of Kharif crops
20GPBR2 11	FUNDAMENTALS OF PLANT BREEDING	CO1	Understand the basic knowledge about the plant breeding, modes of reproductions, self and cross pollination, self-incompatibility and male sterility in crops. Study about the plant introduction agencies in India and their role.
		CO2	Gain knowledge and expertise in different breeding methods for self-pollinated and cross-pollinated crops and concept of population genetics and manage the crops on field level and statistical analysis.
		CO3	Become expert in the genetic basis of heterosis, inbreeding depression to solve the agricultural problems and development of inbred lines, hybrids, composite and synthetic varieties. To be well versed with different methodologies for asexually propagated crops and wide hybridization area.



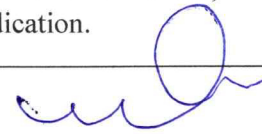
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		CO4	Analyse and gain knowledge about the polyploidy and mutation breeding concepts. To be able to help in Agricultural Research Systems in the areas of crop improvement through breeding for important biotic and abiotic stresses involving both conventional and biotechnological approaches.
		CO5	Practical study of germplasm in various crops, emasculation and hybridization techniques in self and cross- pollinated crops. Study of male sterility systems, Analysing statistical parameters, design, heterosis, heritability estimation and prediction of hybrid performance on field level and work out the extent of natural out crossing in crops.
20ENTO2 31	FUNDAMENTALS OF ENTOMOLOGY II (INSECT ECOLOGY AND CONCEPTS OF IPM)	CO1	Understand various abiotic and biotic factors of insect ecology
		CO2	Acquainted with the concepts, components and tools of Integrated Pest Management
		CO3	Acquainted with the mechanical, physical, biological and microbial control of insects
		CO4	Awareness of recent formulations and application methods of chemical control of insects
		CO5	Apply of sampling techniques, calculations of insecticides doses, mass multiplication of biological agents and identification of non-insect pests
20AECO2 41	AGRICULTURAL FINANCE AND CO-OPERATION	CO1	understand the importance of credit in agriculture and the criteria to avail credit
		CO2	recognize the source of credit, crop loan system, and financial inclusion.
		CO3	identify the different schemes for financing weaker sections, also Understand higher financing agencies present in India and world along with crop insurance schemes
		CO4	understand the agricultural project and its cycle, cooperation, and its history along with cooperative institutions in India
		CO5	Analysing the progress of priority sector lending, working out different repayment plans and prepare balance sheet along with income statement



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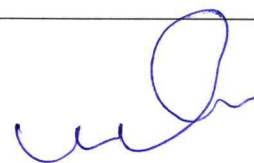
20AENG2 51	FARM MACHINERY AND POWER	CO1	Understand the working principles of IC engines with its different components and terminologies
		CO2	Characterize the primary and secondary tillage implements with its functions, constructions and maintenance.
		CO3	Comprehend the details of harrows, sowing equipment, and harvesting equipment.
			Understand the systems of tractor mounted equipments for land development and soil conservation.
		CO5	Apply the field equipments knowledge into the agricultural field.
20CPHY2 61	ECO-PHYSIOLOGY	CO1	Basic principles of Ecosystem, structure, components, types of ecosystem, types of food chains, pathways of energy in the biosphere and Agro-climatic zones of India – Crop distribution in India and Andhra Pradesh.
		CO2	Basic processes in physiology and their environments Edaphic factors and their Classification, Physiographic factors of Land, and Biotic and abiotic Factor affecting in Plants
		CO3	Physiological approaches for climate resilient in agriculture. Knowledge of Allopathy and Phyto-remediation in agriculture
		CO4	The impact of different Pollution, Global warming, Controlled environment and Effects on crop yields and limitations.
		CO5	To study Hydrophytes, Mesophytes, Xerophytes and the effects of light and shade on crop growth, competition in crop plants and soil pollution on crop growth,
20PATH2 71	FUNDAMENTALS OF PLANT PATHOLOGY- II (PLANT PATHOLOGY PRINCIPLES)	CO1	<b>Understand</b> the history of plant pathology, terms and concept of plant pathology, survival of plant pathogens, dispersal of plant pathogens.
		CO2	<b>Understand</b> the phenomenon of infection, pathogenesis, toxins, defense mechanisms in plant.
		CO3	<b>Develop and understand</b> biochemical defense mechanism, general principles of plant disease management, eradication-cultural methods, physical methods of eradication.



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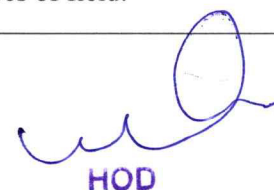
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		CO4	<b>Gain knowledge</b> about important fungal and bacterial biocontrol agents, contact and systemic fungicides, mode of action and formulations of fungicides, introduction to botanicals and other non-chemical preparations etc.
		CO5	<b>Practical study</b> on various laboratory equipments, preparation of media, isolation and Koch's postulates. Study of fungicides and their formulations. Methods of pesticide application. Calculation of fungicide sprays concentrations. Bioassay of fungicides, Bio-control of plant pathogens, Preparation of non-chemicals and botanicals against disease management.
20HORT2 81	PRODUCTION TECHNOLOGY FOR VEGETABLES AND SPICES	CO1	Apply the production practices of Tomato, Brinjal & Chilli, Okra & Leafy vegetables
		CO2	Apply the production practices and their management of melons
		CO3	Apply the constraints in productions aspects of root and bulb crops.
		CO4	Apply the scope, importance and future perspective of spices.
		CO5	Demonstrating the seed extraction, nursery raising, direct seed sowing and transplanting, Harvesting & preparation for market, of vegetables and spices cultivation.
20AEXT2 91	FUNDAMENTALS OF AGRICULTURAL EXTENSION	CO1	Understand the term Education; Extension Programme planning Meaning, Process, Principles and Steps in Programme Development Agricultural developmental programs launched by different organisations in India
		CO2	Analyse the Agricultural developmental programs and new trends in Agricultural Extension, and community development and Rural development in India
		CO3	Analyse the Panchayat Raj system, poverty alleviation programs, women development programs, PRA, rural leadership and training and administration of extension in rural areas



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		CO4	Explain the transfer of technology, training of farmers, Extension teaching methods, functions of communication methods, Agriculture journalism, Diffusion and adoption of innovation and its characteristics.
		CO5	Use different types of extension teaching methods evaluation and visits relevant to the course under practical work.
20COCA200	EDUCATION TOUR	CO5	Visit to the research station to impart research to the students
20AGRO202	CROP PRODUCTION TECHNOLOGY-II (OIL SEEDS, FIBRE, SUGAR, TOBACCO AND FODDER CROPS)	CO1	Illustrate with the knowledge of profitable crop Production technology.
		CO2	Complete knowledge on Origin, geographical distribution, economic importance, soil and climatic Requirements, important varieties, pest, and diseases resistance varieties, cultural practices, and yield of Rabi crops
		CO3	Apply on Identification on different weeds in rabi season crops like Pulses, oilseeds, sugar crops and forage crops with details study on improving their package and practices and storage technologies
		CO4	Illustrate with proper knowledge about irrigation scheduling in Rabi season crops, the additional area can Increase of low water required crops.
		CO5	Demonstrate on seed to seed of field management practices and also identification of growth stages critical stages, pest and disease management etc. Which can be solved at field level. Also, complete awareness on crop cultivation practices of Rabi crops
20AGRO203	FARMING SYSTEMS AND SUSTAINABL	CO1	Apply major aspects of agricultural practices and traditions through time and throughout the world.
		CO2	Illustrate with gaining knowledge about general relationships among culture, economics, politics, science, and agricultural development.
		CO3	Apply various enterprises including farming system. Students studied types of farming, crop rotation and other practices of field.

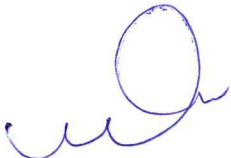


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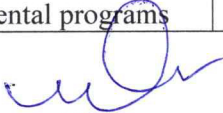
		CO4	Apply to show how agricultural scientists are attempting to minimize agricultural pollution and sustain food production adequate for the world's population
20AGRO2 04	IRRIGATION WATER MANAGEMENT	CO 1	Illustrate the knowledge of irrigation water management to maximising crop yield and quality by developing irrigation and water management techniques can help growers demonstrate best practice to retailers and consumers.
		CO2	Apply the ways for growers to improve crop performance by evaluating the different types of irrigation and water managements systems available.
		CO3	Apply the knowledge of various irrigation methods which are more efficient to minimize the water loss and improve the water use efficiency of crop and water requirements of the crops,
		CO4	Apply the knowledge on Water requirements of crops, soil-plant- relationship, Irrigation requirements, duty and delta, Irrigation efficiencies, methods of irrigation, Quality of irrigation water.
		CO5	Demonstrate on increasing need for efficient and effective irrigation and water management to maximize crop yield and quality whilst making best use of the water available.
20SMCA2 01	STATISTICAL METHODS	CO1	Understand various definitions of Statistics - Singular and plural reference of Statistics - A comprehensive definition of Statistics - Importance of Statistics in agriculture - limitations of statistics
		CO2	Understand the Probability – Addition - Multiplication theorems - Binomial and Poisson distributions
			Understand the Chi-Square test for 2x 2 and m x n contingency Table - Yate's correction for Continuity, Correlation, regression, ANOVA and block designs.
		CO4	Understand ANOVA with Two way Classification (RBD) - Layout and analysis, Advantages and disadvantages, Sampling methods.
		CO5	Analyze the data using various descriptive and inferential statistics using R/Excel
20LSPM2 01	LIVE-STOCK AND POULTRY	CO1	Understand the role and importance of live-stock

	MANAGEMENT	CO2	Apply principles of livestock rearing	
		CO3	Apply principles of Management of different types of cattle	
		CO4	Apply principles of Formulation of rations and feeding	
		CO5	Identification methods of farm animals and poultry and identification methods of farm animals and poultry	
20SSAC2 21	MANURES, FERTILIZERS A	CO1	Introduction - Scientists responsible for the essentiality of nutrients- Essential nutrients – Deficiency symptoms of nutrients -Nitrogen - Leaching losses of nitrate nitrogen – Phosphorus - Potassium	
		CO2	Calcium - Sulphur - Micronutrient - Zn and Mn - Fe and Cu -Boron and Molybdenum - Chlorine - Soil fertility Evaluation	
		CO3	Plant analysis – Soil test based fertilizers recommendation -Nutrient use efficiency - Methods of application of nutrients underrainfed and irrigated conditions - Introduction and importance oforganic manures - Bulky organic manures – Compost andcomposting – Methods of preparation of rural and urban compost.	
		CO4	Green manures –Definitions of penning, sewage, sewerage, sullage, pouderette, Activated compost process - Chemical fertilizers –Phosphatic fertilizers – Secondary and micronutrient fertilizers –Amendments - Mixed fertilizers – Fertilizer Control Order (FCO)	
		CO5	Acquaint with the analytical instruments and recording theobservations from the soil samples and plant samples and also about the estimation and identification of different nutrients.	
20AECO2 42	AGRICULTURAL MARKETING, TRADE AND PRICES	CO1	Understand the concept of market and its types, demand-supply of farm products, exchange functions, facilitating functions and market functionaries	
		CO2	Understanding the marketing channels, supply chain, marketing mix, product life cycle, pricing, market promotion, segmentation, and integration	

  
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		CO3	Explain the marketing costs, margins, and price spread, regulated markets, APMC, cooperative marketing, types of risk in marketing, future trading and commodity exchanges
		CO4	Describe the agricultural product price, CACP, MSP, international trade, WTO and its agreements, TRIPS and IPR in Indian agriculture
		CO5	Analyse elasticities and plot demand supply curve for agricultural commodities, study market arrival, prices, and comparative advantage, compute marketable and marketed surplus, construct index numbers, estimate costs, margins and price spread
20AENG2 52	RENEWABLE ENERGY AND GREEN TECHNOLOGY	CO1	<b>Understand</b> the classification of biogas plant with to produce the energy from biogas.
		CO2	<b>Characterize</b> the gasifiers, solar energy and solar appliances.
		CO3	<b>Comprehend</b> the solar heating and cooling, photovoltaic system, and wind energy.
		CO4	<b>Understand</b> the details of wind mills, biofuels, biodiesel production and ethanol from agriculture produce.
		CO5	<b>Apply</b> the lab experiments knowledge by performing various experiments in renewable energy.
20HORT2 82	PRODUCTION TECHNOLOGY FOR ORNAMENTAL CROPS, MEDICINAL AND AROMATIC PLANTS AND LANDSCAPING	CO1	Understand the importance and scope of ornamental crops and landscaping
		CO2	Apply the production practices of commercial flowers in protected cultivation.
		CO3	Apply the scope, importance and future prospectus in cultivation of medicinal and aromatic plants.
		CO4	Apply the techniques of processing and value addition in ornamental crops and MAPs produce
		CO5	Apply nursery techniques viz. bed preparation, seed sowing, training and pruning, harvesting and post- harvest handling of cut and loose flowers.
20AEXT2 92	ENTREPRENEURSHIP DEVELOPMENT AND BUSINESS	CO1	Analyze the business environment in order to identify business opportunities, and learn the basic terms entrepreneurship developmental programs



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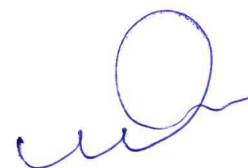
	COMMUNICATION	CO2	Explain the Generation, incubation and commercialization of business ideas and SWOT analysis and government policies for the rural economic development. And identify the elements of success of entrepreneurial ventures,
		CO3	Consider the legal and financial conditions for starting a business venture, and stems in establishment of MSME management
		CO4	Evaluate the effectiveness of different entrepreneurial strategies, program planning, marketing skills and assessment of entrepreneurial skills.
		CO5	Specify the basic performance indicators of entrepreneurial activity, Field visits to study any one Agri - based industries/ business – Strengths,
			Weaknesses, Opportunities and Threats (SWOT) analysis. And go to the visit to different industries to understand the business skills under practical work
20AGRO3 01	GEOINFORMATICS AND NANOTECHNOLOGY	CO1	Understand precision agriculture concepts and techniques, principles and practices, geoinformatics concepts, use and crop discrimination monitoring techniques
		CO2	Understand geodesy principles, management of spatial data, global positioning system and application of nanotechnology in rainfed agriculture.
		CO3	Describe about cartography, application of remote sensing techniques in rainfed agriculture, fertilizer recommendation using geospatial technologies in precision farming
		CO4	Apply geo referencing, Nanotechnology concepts and techniques, nano sensors, Nano-fertilizers and nano pesticides
		CO5	Apply knowledge on use of GPS for watershed management, crop yield, GIS software, image processing software, remote sensing and nano technology



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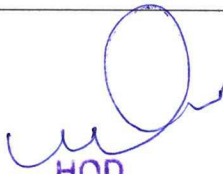
20AGRO3 02	PRACTICAL CROP PRODUCTION	CO5	To know cultivation technology of different crops in respect to different situations and understand crop cycle, environmental requirements, agronomic management and economics of crop production.
20BICM3 00	PRINCIPLES OF FOOD SCIENCE AND NUTRITION	CO1	Evaluate the information on food science and nutrition issues appearing in the popular press.
		CO2	Discuss the important pathogen and spoilage microorganism in foods, and preservation techniques
		CO3	Discuss basic principles and practices of cleaning and sanitation in food preparation operation
		CO4	Explain the malnutrition, energy metabolism, balanced diet, menu planning and new trends in food science and nutrition in maintaining health.
20GPBR3 11	CROP IMPROVEMENT-I (CEREALS, MILLETS, PULSES AND OIL SEEDS)	CO1	Understand the basic knowledge about the plant breeding. Study about the conventional and modern innovative approaches for the development of hybrids/varieties in cereals like wheat, barley and rice.
		CO2	Explain the different breeding methods for the development of hybrids and varieties in major and minor millets.
		CO3	Understand the knowledge regarding the conventional and modern innovative approaches for the development of hybrids or varieties in pulses like, chickpea, pigeonpea, urd bean, mung bean, soybean, cowpea and horsegram and field management.
		CO4	Assign the breeding procedures in oilseeds. To be able to help in Agricultural Research Systems in the areas of crop improvement through conventional and modern innovative approaches for the development of hybrids and varieties in oilseed crops like groundnut, castor, sesame, sunflower, safflower, rapeseed, mustard, linseed, niger, coconut and oil palm.



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		<b>CO5</b>	Employ the knowledge about the floral biology, emasculation and pollination techniques in cereals, millets, pulses and oilseeds. Visit to Agriculture research stations/AICRP projects and policies of crops. To gain knowledge about the parentage of released varieties and about the specialized characters in various crops.
20GPBR3 13	INTELLECTUAL PROPERTY RIGHTS	<b>CO1</b>	Understand the basic knowledge about the IPR, different organizations working under IPR. Study about the treaties for IPR protection and types of IPR and legislations covering IPR in India.
		<b>CO2</b>	Explain the patent systems in India and management strategies related to patent allied activities. To be well versed with different methodologies for UPOV for protection of plant varieties and plant breeders' rights and utilization of agriculture technologies to modernize it.
		<b>CO3</b>	Assign the registry of plant varieties under PPV&FR Act, 2001, breeders' rights, researcher rights, farmers rights and rights of TK holders and their management in the agriculture research system.
		<b>CO4</b>	Adapt the knowledge about the convention of biological diversity. To be able to help in Agricultural Research Systems through the gain of knowledge regarding the international treaties on plant genetic resources for food and agriculture. To impart knowledge to make the environment safe i.e., Indian biological diversity act, 2002 and its salient features, access and benefit sharing.
20SSAC3 21	PROBLEMATIC SOILS AND THEIR MANAGEMENT	<b>CO1</b>	To understand the concepts of problematic soils, definition, distribution in India and Andhra Pradesh. Saline and sodic soils visual symptoms, characteristic features, Effect of salinity and sodicity on plant growth and development, reclamation measures and management practices

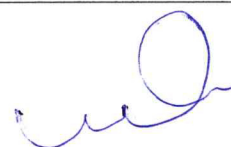
  
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		<b>CO2</b>	To apply the concepts of acid, acid sulphate soils area, distribution in India and andrapradesh. Land degradation problems and sources of polluted soils	
		<b>CO3</b>	To analyze the soil pollution management practices, Bio remediation problems and Land capability and land suitability classification	
		<b>CO4</b>	To apply the concepts of Remote sensing and GIS techniques, Soil healthy and Quality, Irrigation water quality standards, Guidelines for judging the water quality.	
		<b>CO5</b>	To analyze the problematic soils identification, determination of infiltration rate, pH, EC, ESP,GR,LR, CaCO <sub>3</sub> , Ca and Mg, CO <sub>3</sub> and HCO <sub>3</sub> , Na and K, RSC and SAR	
20ENTO3 31	PESTS OF FIELD CROPS AND STORED GRAIN AND THEIR MANAGEMENT	<b>CO1</b>	Study of Economic Entomology, Rice and Sorghum pests	
		<b>CO2</b>	Acquainted with the pests of Sugarcane, cotton and other fiber crops	
		<b>CO3</b>	Acquainted with the pests of oil seeds and pulses	
		<b>CO4</b>	Awareness of stored grain pests and their management	
		<b>CO5</b>	Evaluation of crop pests and stored grain pests damage	
20AENG3 51	PROTECTED CULTIVATION AND POST-HARVEST TECHNOLOGIES	<b>CO1</b>	Understand the greenhouse gases with it's type, shape and response to the environment.	
		<b>CO2</b>	Comprehend the planning and construction of greenhouse gas chamber.	
		<b>CO3</b>	Understand the details of post-harvest equipment used in grains processing after harvest from the field.	
		<b>CO4</b>	Characterize the drying, moisture measurement and handling and grains during post-harvest operation.	
		<b>CO5</b>	Apply the greenhouse gas chamber and food processing operations from the lab to land condition.	



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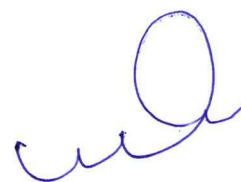
20CPHY3 61	ENVIRONMENTAL STUDIES	CO1	Understand the basic knowledge about the Environmental studies - Natural resources – Renewable and non-renewable resources, Water resources – Sources, uses and over utilization of surface and groundwater - Dams – Benefits and problems, Food resources – Food sources, world food problems and food security
		CO2	Gain knowledge and expertise in different Energy resources – Renewable and non-renewable energy sources, Land resources – Land degradation, desertification and land use planning, Biodiversity – Definition – Types of biodiversity – Bio-geographical classification in India, Threats to biodiversity – Habitat loss – Poaching of wildlife – Man-wild life conflicts.
		CO3	Develop and understand the knowledge regarding the Environmental, Causes, effects and control measures of soil pollution, Causes, effects and control measures of thermal, marine and noise pollution, Solid waste management – Need of waste management – Types of solid waste – Management processing technologies.
		CO4	Analyse and gain knowledge about the Disaster management - Natural Disasters, Man-made disasters – Nuclear disasters, chemical disasters, biological disasters, International strategy for disaster reduction - Concept of disaster management - National disaster management framework - Financial arrangements - Role of NGOs, community based organizations and media, Central, state, district and local administration, Social issues and the environment – Unsustainable to sustainable development – The Environment Protection Act, Human immunodeficiency virus (HIV)/ Acquired Immunodeficiency Syndrome (AIDS) – Role of information technology on environment and human health.



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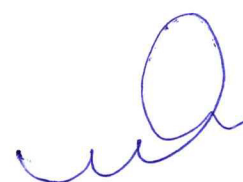
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		CO5	Practical study of Collection, processing and storage of effluent samples and Determination of chemical oxygen demand in waste water sample also how to Estimation of dissolved oxygen in waste water sample and Assessment of chlorophyll content in plants and gain knowledge about the parentage of released varieties and about the specialized characters in various crops.
20PATH3 71	DISEASES OF FIELD AND HORTICULTURAL CROPS AND THEIR MANAGEMENT – I (FIELD CROPS)	CO1	<b>Understand</b> the symptom, etiology, disease cycle and management of major diseases of the crops Rice, Wheat, Sorghum.
		CO2	<b>Understand</b> the symptom, etiology, disease cycle and management of major diseases of the crops Sorghum, Maize, Bajra, Ragi, Cotton, Sugarcane.
		CO3	<b>Develop and understand</b> the symptom, etiology, disease cycle and management of major diseases of the crops Sugarcane, Tobacco, Groundnut, Sesamum, Castor, Sunflower.
		CO4	<b>Gain knowledge</b> about the symptom, etiology, disease cycle and management of major diseases of the crops Safflower, Mustard, Red gram, Bengal gram, Black gram and Green gram, Soybean, Cowpea.
		CO5	Practical study on identification and histopathological studies of selected diseases of field crops covered in theory. Field visit for the diagnosis of field problems. Collection and preservation of plant diseased specimens for Herbarium.
20PATH3 73	PRINCIPLES OF INTEGRATED PEST AND	CO1	By the end of the course students will know the insect pests and diseases, IPM (Introduction, history, importance, concepts, principles, and tools of IPM). Economic importance of insect pests, diseases, and pest risk analysis, Methods of detection and diagnosis of insect pest and diseases. Calculation and dynamics of economic injury level and importance of economic threshold level.



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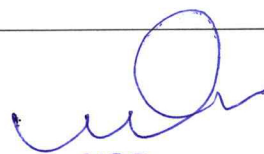
		<b>CO2</b>	Students will understand the impact of plant Diseases, Disease severity, and Area under the Disease Progress Curve. They will be able to recognize many ways of managing. Host plant resistance, mechanical, physical, legislative, biological, and chemical measures.
		<b>CO3</b>	Students will be able to apply the calculations and dynamics, detection and diagnostic of insect pests, ecological principles, and crop management by implementing the different methods of IPM. And also develop and understand the ecological management of crop environment. Introduction to conventional pesticides for insect pests and disease management.
		<b>CO4</b>	Students will be able to solve and give awareness about the safety issues in pesticides, legislative measures, IPM, issues on Environmental impact, Farmer participation, Government and other organizations. Gain knowledge on survey, surveillance and forecasting of Insect pests and diseases. Development and validation of IPM module. Implementation and impact of IPM (IPM module for Insect pest and disease. Safety issues in pesticide use. The political soci and legal implication of IPM. Case history
		<b>CO5</b>	Practical study on various laboratory Methods of diagnosis and detection of various insect pests, and plant diseases, Methods of insect pests and plant disease measurement, Assessment of crop yield losses, calculations based on economics of IPM, Identification of biocontrol agents, different predators and natural enemies. Mass multiplication of Trichoderma, 136 Pseudomonas, Trichogramma, NPV etc. Identification and nature of damage of important insect pests and diseases and their management.



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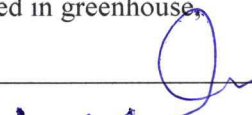
20ELCT3 33	BIOPESTICIDES AND BIOFERTILIZERS	CO1	To apply History and concept, Importance, scope and potential and classification of biopesticides and their advantages and limitations. To apply Entomopathogenic viruses, Entomopathogenic fungi, Entomopathogenic Protozoa, Entomopathogenic Nematodes and Botanical pesticides against pests.
		CO2	To apply Biorationals and to Mass produce Entomopathogenic bacteria, Entomopathogenic virus, Entomopathogenic fungi, Entomopathogenic protozoa and EPN, Formulations, Methods of quality control and techniques of bio pesticide evaluation and Impediments or limitations in mass production and use of biopesticides
		CO3	To apply Introduction, status and scope, Structure and characteristic features of bacterial biofertilizers and to apply Rhizobium, Azotobacter, Azospirillum, Mechanism of phosphate solubilization and Actinorrhizal Symbiotic N <sub>2</sub> fixer-Frankia
		CO4	To apply Cynobacterial biofertilizers, Fungal biofertilizers, Nitrogen fixation, Production technology, FCO specifications and quality control, Application technology, Storage, shelf life, quality control and Factors influencing the efficacy of biofertilizers
		CO5	To analyze mass production technology of bacteria, Entomopathogenic virus, Entomopathogenic fungi, EPN, preparation of important botanical insecticides, Isolation of Rhizobium, Azospirillum and Azotobacter, P and K solubilizers and Mass production technology of BGA, Azolla, Isolation of and purification of VAM and Quality assessment of different biofertilizers
20ELCT3 42	AGRIBUSINESS MANAGEMENT	CO1	Learning and Understanding the basics of various fundamental concepts in Agribusiness management. These basic concepts are needed for further proper understanding of the course and subject.




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		<b>CO2</b>	Understanding the concept of how to enter a market or industry. The requirements to build a factory/plant/company for goods production or service production. The marketing techniques that can be used will be understood.
		<b>CO3</b>	Understanding the next steps after planning and setting up of a factory/plant/company. To decide on the product mix, the packaging decisions, selling strategy. Capital management, financial awareness for establishing a business with strong foundation will be understood.
		<b>CO4</b>	Understanding various techniques of appraisal of the business in terms of finance, product, market share etc. Understanding the product and project cycle to know what kind of decisions to be made at what time.
		<b>CO5</b>	Balance sheet analysis, profit & Loss analysis, Break even analysis, Financial ratio analysis for a business, planning of a hypothetical business to understand the real world situations and problems that one has to face during setting up of a business.
20ELCT3 82	LANDSCAPING	<b>CO1</b>	Understand the scope and importance landscaping and its principle, Garden types, Terrace gardening, Vertical gardening
		<b>CO2</b>	Application of Garden components or features in Arches and Pergolas, Garden adornments, Lawn making, Turfing
		<b>CO3</b>	Apply knowledge on Gardens for special purposes- Trees, Shrubs, Herbaceous perennials, Climber and creepers, Ornamental grasses
		<b>CO4</b>	Apply knowledge on Cacti, Bio-aesthetic Planning, Landscaping of urban and rural areas, Landscaping of schools, Bonsai, Computer Aided Designs
		<b>CO5</b>	Implement basic knowledge on landscaping and designing
20ELCT3 83	PROTECTED CULTIVATION	<b>CO1</b>	Understand the scope and importance Protected cultivation, Green houses, Greenhouse design, Cladding material involved in greenhouse, Environment control

  
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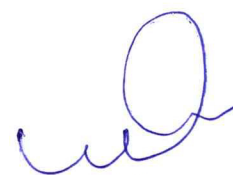
		<b>CO2</b>	Application of Soil preparation and management, Types of benches and containers, Irrigation management, Automation	
		<b>CO3</b>	Apply knowledge on Fertilizer requirement of Carnation, Chrysanthemum, Gerbera, Orchids, Anthurium, Tulip	
		<b>CO4</b>	Apply knowledge on cultivation of Tomato, Bell pepper, Cucumber, Strawberry, Pot plants, Off-season production of flowers and vegetables, Disease management in green houses	
		<b>CO5</b>	Implement basic knowledge on protected cultivation of commercial crops	
20AGRO3 04	PRINCIPLES OF ORGANIC FARMING	<b>CO1</b>	Describe different tillage practices for rainfed crops, losses due to erosion, management of rainfed crops	
		<b>CO2</b>	Discuss different harvesting structures, conservation measures, using of fertilizers in rainfed areas and the different cropping systems in rainfed regions	
		<b>CO3</b>	Apply contingent crop planning, evapotranspiration and land capability classification	
		<b>CO4</b>	Apply Acquaint practical knowledge on cropping pattern of dryland areas, cultural practices in dryland areas, soil moisture conservation measures, watershed and rainfall analysis	
		<b>CO5</b>	Discuss the concept and principles of organic production technology and Role of organic farming in National economy.	
20AENG2 52	AGRICULTURE INFORMATICS	<b>CO1</b>	Understand the computers, Hardware and software aspects.	
		<b>CO2</b>	Understand MS excel, word, power point.	
		<b>CO3</b>	Understand the internet and web.	
		<b>CO4</b>	Understanding the databases and programming in computers.	
		<b>CO5</b>	Apply principles of Agricultural informatics	
20GPBR 312	CROP IMPROVEMENT-I (FIBRES, SUGARS, STARCHES, NARCOTICS, <i>VEGETA BLES, FRUITS</i> AND	<b>CO1</b>	Understand the basic knowledge about the plant breeding. Study about the conventional and modern innovative approaches for the development of hybrids/varieties in fibres crop like cotton and jute and in sugar and starches.	



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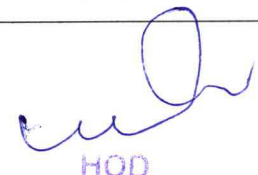
	<b>FLOWERS)</b>	<b>CO2</b>	Gain knowledge and expertise in different breeding methods for the development of hybrids and varieties in narcotics like tobacco and in vegetable crops like tomato, brinjal, chilli, okra, cucumber, cabbage, cauliflower, garlic, onions, gourds and melons.
		<b>CO3</b>	Develop and understand the knowledge regarding the conventional and modern innovative approaches for the development of hybrids or varieties in fruit crops like banana, guava, mango, papaya, lime, lemons, apple, pomegranate and sapota and field management.
		<b>CO4</b>	Analyse and gain knowledge about the breeding procedures in flower crops. To be able to help in Agricultural Research Systems in the areas of crop improvement through conventional and modern innovative approaches for the development of hybrids and varieties in flower crops like rose, jasmine, chrysanthemum and marigold.
		<b>CO5</b>	Practical study of floral biology, emasculation and pollination techniques in fibres, vegetables, fruit crops and in flowers. Visit to Agriculture research stations/AICRP projects and policies of crops. To gain knowledge about the parentage of released varieties and about the specialized characters in various crops.
20GPBR3 14	PRINCIPLES OF SEED TECHNOLOGY	<b>CO1</b>	Understand the basic knowledge about the seed and seed technology, seed quality parameters, Loss of genetic purity and its maintenance. Study about the history and development of seed industry and their functions.
		<b>CO2</b>	Gain knowledge and expertise in seed certification programme in different crops like cereals, millets, oilseeds, pulses and fibres and farming methods along with agricultural practices



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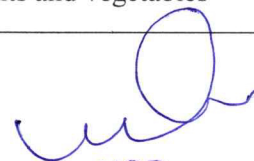
		CO3	Become expert in the organic seed production strategies, identify the problems and management strategies. To be well versed with different methodologies about GoT, GMO detection through molecular and conventional approaches both on lab and field level. Study of seed processing parameters inclusive of seed drying, seed cleaning, coating, packaging, storage and marketing.
		CO4	Analyse and gain knowledge about the seed act, central seed committee, regulation of notified varieties and seed testing parameters for quality assessment. Also, identification of good quality seeds through seed testing.
		CO5	Practical study of seed production in cereals, pulses, oilseeds. Seed purity assessment both on field and lab level. GoT analysis through conventional and molecular approaches for varietal identification. Industrial visit to seed testing laboratories, seed processing plants and seed production field.
20ENTO 332	PESTS OF HORTICULTURAL CROPS AND BENEFICIAL INSECTS	CO1	Apply Study of Vegetable crop pests
		CO2	Understand and Acquainted with the pests of Fruit crops pests
		CO3	Understand and Apply Acquainted with the pests of Plantation crops
		CO4	Apply Awareness of Beneficial insects and their economic importance
		CO5	Apply practical principles of Pests of Horticultural crops and beneficial insects
20AECO 341	FARM MANAGEMENT, PRODUCTION AND RESOURCE ECONOMICS	CO1	Understand about farm management, systems of farming, production function, factor-product relationship
		CO2	Determine the optimum input and output, factor-factor and product-product relationship and study about different enterprises
		CO3	Remember the meaning of cost and its function, cost-output relationship, farm inventory, farm planning and budgeting and linear programming



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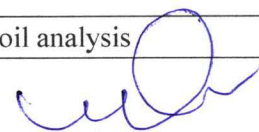
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		CO4	Understand the concepts like risk and uncertainty in agriculture, economy and environmental linkages, environmental costs of economic growth, India's environmental policy
		CO5	Computing depreciation cost, profitable level, least cost combination, opportunity cost, apply cost principles, farm business analysis, budget preparation, collect and analyse data on natural resource in India
20PATH 372	DISEASES OF FIELD AN HORTICULTURAL CROPS	CO1	Understand the etiology, symptoms, host-parasite relationship and specific management practices of the following horticultural crop diseases are citrus diseases, Mango diseases, Guava, Papaya, Ber and sapota diseases
	AND THEIR MANAGEMENT-II (HORTICULTURAL CROPS)	CO2	Understand the etiology, symptoms, host-parasite relationship and specific management practices of the following horticultural crop diseases are Grapevine diseases, Apple and peach diseases, chillies diseases, Brinjal and Okra diseases.
		CO3	Develop and understand the etiology, symptoms, host-parasite relationship and specific management practices of the following horticultural crops diseases are Potato diseases, Tomato diseases, Crucifers and cucurbits diseases.
		CO4	Gain knowledge and understand the etiology, symptoms, host-parasite relationship and specific management practices of the following horticultural crops diseases are Beans, Colocasia and Coriander diseases, Coconut and oil palm diseases, Turmeric, ginger, mulberry diseases, Rose diseases.
		CO5	Practical study on various laboratory identification and histopathological studies of selected diseases of horticultural crops covered in theory. Field visit for the diagnosis of field problems. Collection and preservation of plant diseased specimens for herbarium.
20HORT 381	POST-HARVEST MANAGEMENT AND VALUE ADDITION OF	CO1	To interpret the scope and importance of post-harvest technology of fruits and vegetables

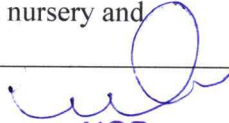


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	FRUITS AND VEGETABLES	CO2	To explain about the important disease, disorders and factors responsible for post-harvest losses in fruits and vegetables.	
		CO3	To understand post-harvest handling, different methods storage, principles and methods of preservation.	
		CO4	To gain knowledge on processing, value addition and packaging of fruits and vegetables	
		CO5	Demonstration of chilling and freezing injury in vegetables and fruits, Extraction and preservation of pulps and juices, Preparation of products, quality control	
20AEXT3 91	COMMUNICATION SKILLS AND PERSONALITY DEVELOPMENT	CO1	Analyze basic communication skills, voice modulation, while giving presentations to the public.	
		CO2	Analyze intercultural communication skills, Reading and comprehension of general and technical articles and precise writing - summarizing, abstracting, individual group presentations, human behaviour.	
		CO3	Analyze interpersonal communication skills and transactional analysis.	
		CO4	Analyze public speaking communication skills, Negotiation skills, stress management and conflict management - Meaning, concept, steps and techniques, emotional intelligence, teamwork, and creativity.	
		CO5	Use the better communication methods for the better understanding of the rural people.	
20RAWE	CROP PRODUCTION	CO5	Hands on experience on crop production	
20RAWE	CROP PROTECTION	CO5	Hands on experience on crop protection	
20RAWE	RURAL ECONOMIC	CO5	Hands on experience on rural economics	
20RAWE	EXTENSION PROGRAMME	CO5	Hands on experience on rural economics	
20RAWE	RESEARCH STATION / KVK / DAATT CENTRE	CO5	Apply the principles of crop production based on Research Station / KVK / DAATT Centre activities and Agro based industries	
20ELP	EXPERIENTIAL LEARNING PROGRAMME (ELP)	CO5	Apply the all-round principles of crop cultivation	
20ELCT 222	SOIL, PLANT, WATER AND SEED TESTING	CO1	Apply the working methods of testing instruments	
		CO2	Apply the principles of soil analysis	

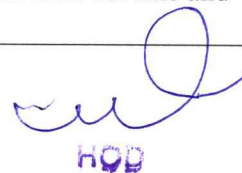
  
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		CO3	Apply the principles of plant testing and analysis	
		CO4	Apply the principles of water testing and analysis	
		CO5	Demonstrate techniques of soil, plant, water and seed testing	
20ELCT 272	FOOD SAFETY ISSUES	CO1	To understand the knowledge on weed biology, their classification, reproduction and characteristics of weeds, crop weed competition, survey of weeds in varied ecosystem and their management	
		CO2	To acquire knowledge on herbicide mode of action, their classification, formulations and their selectivity	
		CO3	To describe herbicides compatibility with nutrients, integrated weed management and management of weeds in different crops	
		CO4	Discuss the weed management in aquatic ecosystems, management of problematic weeds and resistance of herbicides in weeds	
		CO5	To illustrate on Techniques of weed preservation, weed identification Study of herbicide formulations and mixture of herbicide, Herbicide and nutrient compatibility, methods of herbicide application, spraying equipments and Calculations of herbicide doses, weed control efficiency and weed index	
20ELCT 283	HI-TECH HORTICULTURE	CO1	Understand the scope and importance of hi-horticulture, Micro propagation, Nursery management, Mechanization, Protected cultivation	
		CO2	Application of Greenhouse technologies, Micro irrigation systems, Canopy management,	
		CO3	Apply knowledge of High Density orcharding, Precision farming, Remote sensing, Geographical Information System, Differential Global Positioning System.	
		CO4	Apply knowledge of Variable Rate applicator, Precision farming, Mechanized harvesting of produce, Green food production	
		CO5	Implement basic knowledge on nursery and greenhouse management	

  
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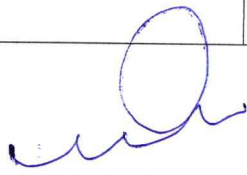


20ELCT 305	AGRICULTURAL WASTE MANAGEMENT	CO1	Understand Various eco-friendly methods for agricultural waste management.
		CO2	Understand Nutritive value and energy production potential of agro wastes.
		CO3	Describe effectively in written essays showing the principals of waste management
		CO4	Apply use of calculations and writing assignments to show effective knowledge of waste management issues as they relate to poultry production.
		CO5	Illustrate on Techniques of Agriculture waste management, and critical thinking skills to show how to solve waste management problems
20ELCT3 06	WEED MANAGEMENT	CO1	Understand the knowledge on weed biology, their classification, reproduction and characteristics of weeds, crop weed competition, survey of weeds in varied ecosystem and their management
		CO2	Classify on herbicide mode of action, their classification, formulations and their selectivity
		CO3	Discuss the herbicides compatibility with nutrients, integrated weed management and management of weeds in different crops
		CO4	Discuss the weed management in aquatic ecosystems, management of problematic weeds and resistance of herbicides in weeds
		CO5	Illustrate on Techniques of weed preservation, Weed identification Study of herbicide formulations and mixture of herbicide, Herbicide and nutrient compatibility, methods of herbicide application, spraying equipments and Calculations of herbicide doses, weed control efficiency and weed index
20ELCT 315	COMMERCIAL PLANT BREEDING	CO1	Understand the basic knowledge of line development and genetic purity testing of hybrids.
		Co2	Understand the hybrid seed production of different crops.
		CO3	Employ the biotechnological tools for line and cultivar development.



		<b>CO4</b>	Observe and understand about the IPR in plant breeding and seed production techniques for self- and cross-pollinated crops.	
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Academic Professor I/C

  
HOD-Agriculture  
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**KLEF (Deemed to be University)**  
**VADDESARAM-522 302.**