

## FACULTY OF AGRICULTURE

### M.Sc. Agronomy

#### **AGR 611 - MODERN CONCEPTS IN CROP PRODUCTION (2+0)**

##### **COURSE OUTCOME:**

CO 1: To understand advanced concepts of crop growth and productivity in relation to climate change

CO 2: To gain knowledge on bio-technology in agriculture, eco-restoration and nano technology.

CO 3: To acquire knowledge on modern concepts in tillage and farm mechanization.

CO 4: To gain knowledge on principles and components of organic farming, vermi technology, resource conservation technology.

CO 5: To gain knowledge on ideal plant ideotypes and yield maximization.

#### **AGR 612 - PRINCIPLES AND PRACTICES OF WEED MANAGEMENT (2 + 1)**

##### **COURSE OUTCOME:**

CO 1: To understand the knowledge on weed biology and survey of weeds in varied ecosystem.

CO 2: To identify the nature, type and economic uses of weeds in varied habitat.

CO 3: To gain knowledge on herbicide application techniques

CO 4: To evaluate different methods of weed control

CO 5: To formulate integrated weed management practices for different ecosystems

#### **AGR 613 - AGRO METEOROLOGY AND CROP WEATHER FORECASTING (2+1)**

##### **COURSE OUTCOMES**

CO 1: To acquire knowledge on agro meteorology and its different variables on crop production

CO 2: To understand the onset and withdrawal of monsoon and crop seasons

CO 3: To gain knowledge about evapo transpiration and its effect on crop production

CO 4: To understand weather forecasting and weather in relation to pest and disease management

CO 5: To design crop weather calendar for various agro climatic zones

#### **AGR 614 - AGRONOMY OF CEREALS, PULSES, FODDERS AND GREEN MANURE CROPS (1+1)**

##### **COURSE OUTCOME:**

CO 1: To have knowledge about the staple food crops and their cultivation practices with post harvest technologies

CO 2: To assess a nature of the farm site and develop a new cropping system with the available resources

CO 3: To understand recent crop management practices on crop productivity and resource use efficiency.

CO 4: To gain knowledge about the recent trends in cultivation of crops

CO 5: To construct post harvest management practices and value addition.

#### **AGR 621 - PRINCIPLES AND PRACTICES OF WATER MANAGEMENT (2+1)**

##### **COURSE OUTCOME:**

CO 1: To understand the principles involved in estimating water requirement for different crops.

CO 2: To gain knowledge on various methods of irrigation scheduling and approaches.

CO 3: To acquire knowledge on pressurized irrigation system to economize the water.

CO 4: To construct ideologies pertaining to water management in problem soils

CO 5: To analyse the quality of irrigation water.

### **AGR 622 - PRINCIPLES AND PRACTICES OF SOIL FERTILITY AND NUTRIENT MANAGEMENT (2+1)**

#### **COURSE OUTCOME:**

CO 1: To expand breadth of knowledge and expertise in soil fertility and productivity in crop production.

CO 2: To develop scientific capability in independently assessing, interpreting, and summarizing soil problems.

CO 3: To propose, evaluate or execute experimental protocol regarding nutrient budgeting for crop production.

CO 4: To foster commitment to ethical behavior in fertilization of crops with respect to environment perspectives

CO 5: To gain knowledge about soil fertility assessment and methods of fertilizer application

### **AGR 623 - AGRONOMY OF OILSEED, FIBRE, SUGAR, TUBER AND NARCOTIC CROPS (1+1)**

#### **COURSE OUTCOME:**

CO 1: To gain the information and acquire practical knowledge about various commercial crops and its beneficial and economic importance to the farming communities.

CO 2: To gain knowledge about importance of sugar crops and its cultivation practices

CO 3: To formulate different cropping system and production technologies for various fibre crops

CO 4: To construct idea regarding knowledge on growing of tuber crops

CO 5: To create awareness about narcotics crops and its production technologies

### **AGR 624 - FARMING SYSTEMS FOR SUSTAINABLE AGRICULTURE (1 +1)**

#### **COURSE OUTCOME:**

CO 1: To prepare cropping schemes and design and evaluate cropping system and workout input requirements for crops.

CO 2: To understand interaction between different farm enterprises.

CO 3: To prepare integrated farming system models for different eco systems.

CO 4: To gain knowledge about drought mitigation strategies

CO 5: To evaluate different resource management techniques in conservation agriculture.

### **OPCAGR 711 - ORGANIC FARMING AND PRECISION AGRICULTURE (2+1)**

#### **COURSE OUTCOME:**

CO 1: To acquire knowledge on concepts of organic agriculture.

CO 2: To gain the information about the impact of organic farming and indigenous practices on environment.

CO 3: To understand the procedure followed for organic certification as per NPOP guidelines namely production standards, labelling and accreditation.

CO 4: To equip students with geostatistical techniques and variables of crop yield mapping.

CO 5: To understand GIS based nutrient delivery system and DSSAT for variable crop yield mapping.

### **OPCAGR 712 - DRYFARMING AND WATERSHED MANAGEMENT (2+1)**

#### **COURSE OUTCOME:**

CO 1: To construct mapping of arid and semi arid regions

CO 2: To acquire skill on integrated dry farming technologies

CO 3: To gain knowledge on soil and moisture conservation approaches and contingent crop plan to evade risk in dry farming.

CO 4: To formulate IFS model for dry farming region

CO 5: To acquire practical knowledge on rain water harvesting techniques and watershed management principles.

#### **OPCENT 711 PRODUCTIVE INSECTS AND WEED KILLERS (2+1)**

##### **COURSE OUTCOMES :**

CO1: Capable of identifying the honey bee species, Learn about beekeeping tool And equipment and Apiary management techniques

CO2: Describe bee keeping methods, Migratory bee keeping and Economics of Bee keeping

CO3: Practice mulberry plant cultivation and produce good quality of leaf for cocoon production

CO4 : Demonstrate rearing method of mulberry and non mulberry Silkworm and uses minor productive insects .

CO5 : Capable of identifying the Identification of important weed killers, Mass production techniques of potential weed killer insects and Conservation and augmentation techniques for weed killers.

#### **OPCENT 712 PEST MANAGEMENT IN ORGANIC FARMING (2+1)**

##### **COURSE OUTCOME:**

CO1: Understands the scope and importance of organic farming and pest management related challenges in organic farming

CO2: cultural and traditional pest management activities and their impact

CO3: Demonstrate ecological engineering tactics in conservation, augmentation Of natural enemies and deterrence of pests

CO4: Explain bio rational pest management options for organic pest Management

CO5: Discuss the legislation, certification and agencies involved in organic certification process.

#### **OPC PAT 711 BIOLOGICAL CONTROL OF CROP DISEASES (2+1)**

##### **COURSE OUTCOME:**

CO 1. Having updated knowledge of new bio regulators

CO 2. Having knowledge about the mechanism of Bio control agents.

CO 3. Having knowledge, the Hypo virulence, suppressive soil and compatibility of Bio control agents.

CO 4. Trained in mass production and quality control methods of Bio control agents.

CO 5. Expertise in cross protection techniques and botanical approaches for plant disease management.

#### **OPC PAT 712 MUSHROOM TECHNOLOGY (2+1)**

##### **COURSE OUTCOME :**

CO1. Updated knowledge about new edible and medicinal mushrooms

CO2. Trained in isolation and identification of mushroom

CO3. Awareness about the mushroom production constraints

CO 4. Having knowledge about the uses of Mushroom

CO5. Expertise in cost analysis in mushroom production and project preparation.

#### **OPCAGM 711- MICROBIAL INOCULANT PRODUCTION TECHNOLOGY (2+1)**

##### **COURSE OUTCOME:**

CO 1 - To make the students to understand the concepts of microbial inoculants and their role on soil fertility and plant growth.

CO 2 - To learn about the isolation and characterization of efficient bioinoculant strains.

CO 3 - To educate about the various formulations of microbial inoculants with improved shelf life and their quality standards.

CO 4 - To know the techniques of mass multiplication, storage and methods of application of bioinoculants.

CO 5 - To make students to analyse the performance of microbial inoculants in field level, their constraints in production technology, marketing and economics.

#### **OPCAGM 712- INDUSTRIAL MICROBIOLOGY (2+1)**

##### **COURSE OUTCOME:**

CO 1 - To learn about the important industrial microbes and their products.

CO 2 - To learn about the strategies to improve the strain efficiency and preservation techniques for future purposes.

CO 3 - To make the students to understand the concepts and types of fermentation process, types of fermentor, their design and purposes.

CO 4 - To gain knowledge on the techniques of industrial production of organic acids, antibiotics, enzymes and fermented foods.

CO 5 - To train the students to develop skills on the techniques of mass production of biofertilizers and bio pesticides.

#### **OPCSAC 711 SOIL, WATER AND AIR POLLUTION (2+1)**

##### **COURSE OUTCOME:**

CO 1. Scholars gain knowledge on environmental pollution and conservation.

CO 2. Students understand the methods of abatement of various types of pollution towards a safe environment.

CO 3. Scholars will be able to communicate the ill- effects of environmental pollution to farmers.

#### **OPCSAC 712 SOIL HEALTH MANAGEMENT (2+1)**

##### **COURSE OUTCOME:**

CO 1. Scholars achieve practical knowledge on soil related constraints and management.

CO 2. Scholars gain knowledge on irrigation water quality and their management .

CO 3. Scholars become professionals in handling tools on soil health maintenance.

#### **OPCGPB 621 CONCEPTS OF CROP PHYSIOLOGY (2+1)**

##### **COURSE OUTCOME:**

CO 1. Will be able to identify the crop mineral nutrient deficiencies and their symptoms .

CO2. In addition, hands on exposure to preparation of solutions, analysis of pigment composition, estimation of growth analytical parameters.

CO 3. Will be able to diagnose and correct nutrient deficiencies, 4. Will be competent in enzyme assays and application of plant growth regulators.

#### **OPCABT 711 BIO-INSTRUMENTATION (2+1)**

##### **COURSES OUTCOMES:**

CO 1. Ability to understand diagnosis and repair of related equipments.

CO 2. Understanding the problem and ability to identify the necessity of an equipment to a specific problem.

CO 3. Ability to take measurements involved in some agricultural equipments.

#### **OPC-ABT 712 PLANT TISSUE CULTURE (2+1)**

**COURSE OUTCOME :**

- CO1. Standardize protocols for the in vitro propagation from ex vitro explants
- CO2. To optimize the culture conditions for rapid propagation and regeneration of agriculturally important plants.
- CO3. Biochemical monitoring of explants proliferation and regeneration .
- CO4. Optimization of medium and culture conditions for the enhancement of active principle production
- CO5. Biochemical characterization of regeneration and genetic transformation using Agrobacterium.

**OPCGPB 711 GERMLASM COLLECTION, EXCHANGE AND QUARANTINE (2+1)****COURSE OUTCOME**

- CO1. Students will have knowledge on the conservation of biodiversity
- CO 2. They will be able to identify the various insitu and exsitu conservation techniques
- CO3. They will acquire knowledge on various organizations involved in conservation and their policies
- CO 4. The students will have knowledge on plant quarantine regulations.

**OPC-GPB 712 FUNDAMENDALS OF GENETICS (2+1)****COURSE OUTCOME :**

- CO1. Students will acquire comprehensive understanding of the chemical basis of heredity.
- CO2. The knowledge required to design, execute, and analyze the results of genetic experimentation in Plant Breeding systems.
- CO 3. Critical understanding on quantification of heritable traits that provides insight into cellular and molecular mechanisms.
- CO 4. The ability to evaluate conclusions that are based on genetic data.

**OPCSST 711 SEED PRODUCTION TECHNIQUES IN CROPS (2+1)****COURSE OUTCOME:**

- CO 1. To really understand the basic principles of seed production in varieties and hybrids .
- CO2. To know the concept of and methods of hybrid seed production.
- CO 3. To understand the importance of field standards and seed standards in quality seed production.

**OPCSST 712 SEED QUALITY TESTING AND CERTIFICATION (2+1)****COURSE OUTCOME :**

- CO 1. To have a faith in seed certification procedure and importance of IMSCS .
- CO 2. To sort out the rogues and off types from the seed production area and to understand the importance of seed testing .
- CO 3. Will be in a position to emphasis on Seed Legislation, certification, labelling of different seed classes and truthfully labelled seeds.

**OPCHOR 711 PROPAGATION AND NURSERY MANAGEMENT OF HORTICULTURAL CROPS (2+1)****COURSE OUTCOME :**

- CO1- gain knowledge on physiology, principles, factors influencing, media and methods of propagation of Horticultural crops.
- CO2- gain skill in all propagation methods and technology for commercial scale adoption .
- CO3- becomes capable of managing commercial nursery business.

**OPC - FSC 712 GENETIC RESOURCES AND CONSERVATION OF FRUIT CROPS (2+1)****COURSE OUTCOM:**

CO1: The students will be able to understand the strategies in conservation and utilization of fruit crop biodiversity .

CO2: They will be able to demonstrate different techniques in ex -situ conservation.

CO3: They will be able to identify underutilized minor fruit crops.

**OPC VSC 712 HI - TECH VEGETABLE PRODUCTION (2+1)****COURSE OUTCOME :**

CO1:The students will be able to demonstrate working principles of protected cultivation.

CO2: The students will be able to establish and manage Hi-Tech vegetable production units.

**OPC-FLA 712 ORNAMENTAL HORTICULTURE ( 2+1)****COURSE OUTCOME :**

CO1:The students will be able to demonstrate working principles of protected cultivation.

CO2: The students will be able to establish and manage Hi-Tech vegetable production units.

**OPC-PSM 712 GENETIC RESOURCES AND CONSERVATION OF MEDICINAL AND AROMATIC PLANTS (2+1)****COURSE OUTCOME :**

CO1: The students will be able to identify the genetic resources of underutilized medicinal and aromatic plants.

CO2: They will be able to demonstrate conservation techniques followed for underutilized medicinal and aromatic plants.

CO3; They will be able to identify underutilized minor medicinal crops.

**OPC AEC 621 NATURAL RESOURCE AND ENVIRONMENTAL ECONOMICS (2+1)****COURSE OUTCOME:**

CO 1. Gain knowledge on basic concepts of environmental economics.

CO2. Identify the optimal extraction level of renewable resources using economic models.

CO3. Assess the ways to manage common property resources.

CO4. Understand environmental legislations in India.

CO 5. Analyse economic problems related to natural resource use including climate change problems.

**OPC AEC 711 AGRI BUSINESS ANALYSIS (2+1)****COURSE OUTCOME:**

CO 1. Understand special features of agribusiness and its importance in Indian economy.

CO 2. Understand the principles of agribusiness management.

CO 3. Know the ways to communicate information effectively and economically.

CO4. Analyse the future prospects of agribusiness using different approaches of management.

CO 5. Estimate economic and financial feasibility of agri-business industries.

**OPCAEC 712 AGRICULTURAL INSURANCE AND RISK MANAGEMENT (2+1)****COURSE OUTCOME :**

CO1. Understand the role of financial institutions in agricultural development.

CO2. Understand kinds of risk in agriculture and allied sectors.

CO3. Know the principles of insurance and assess the credit need.

CO4. Analyse different risk management techniques.

CO5. Discuss the role of agencies involved in agricultural insurance and types of insurance products.

#### **OPCAEX 711 FARM JOURNALISM (2+1)**

##### **COURSE OUTCOMES :**

CO 1: Develop skills about the art of script writing for different media.

CO 2: Practice and prepare for online journalism and web writing

CO 3: Develop skills to prepare and shoot the video programme.

CO 4: Prepare short films

CO 5: Practice and develop skill on efficient handling of digital camera.

#### **OPCAEX 712 INTRODUCTION TO VISUAL COMMUNICATION AND ADVERTISING TECHNOLOGIES (2+1)**

##### **COURSE OUTCOMES :**

CO 1 :Understand Principles and concepts of visual communication.

CO 2 :Design various formats of advertising.

CO 3 :Design web advertising.

CO 4 :Design various visual designs and develop story board colours.

CO 5: Develop skill on designing farm advertisements.

#### **STA 611 STATISTICAL METHODS AND DESIGN OF EXPERMENTS (2+1)**

##### **COURSE OUTCOME:**

CO1: The students can understand the statistical concepts applied in agricultural research .

CO2: Can apply statistical tools in design of experiments.

CO3: Can acquire skills in analyzing statistical data efficiently

#### **COM 611 – COMPUTER APPLICATIONS FOR AGRICULTURAL RESEARCH (1 + 1)**

##### **COURSE OUTCOME:**

CO 1: The COURSE OUTCOME will convey knowledge on research integrity, ethics and copyright rules

CO 2: The COURSE OUTCOME will augment the knowledge of the students in designing field experiments to address practical need of the farming community

CO 3: The COURSE OUTCOME will be able to prioritize the research problem in a specific location

CO 4: The COURSE OUTCOME will assist the scholar in publishing quality research paper in indexed journals

CO 5: The COURSE OUTCOME will fortify the students to lead a research team.

#### **PGS 612: TECHNICAL WRITING AND COMMUNICATION SKILLS (0+1)**

##### **COURSE OUTCOMES:**

CO1-Proficiency in the English language to express their views and ideas without any hindrance

CO2-Competency in communication both written and oral

CO3- Fluency in the English language.

CO4- Word power to use the English language effectively.

#### **PGS 623- BASIC CONCEPTS IN LABORATORY TECHNIQUES (0 + 1)**

##### **COURSE OUTCOME:**

CO 1. Have core knowledge leading to laboratory techniques and agriculture research system.

CO 2. To learn the various concept and terminologies for laboratory techniques.

CO3. Graduates will be acquiring knowledge about various laboratory techniques of national and international level.

CO4. Graduates will gain accurate and relevant analytical skills of different analytical skills and will have capacity to interpret information

CO5. Graduates will be able to develop an analytical skill like methods of soil and plant analysis.

**PGS 624: LIBRARY AND INFORMATION SERVICES 0+1**

**COURSE OUTCOME:**

CO 1. To equip the library users with skills to trace information from libraries efficiently,

CO 2. To apprise them of information and knowledge resources,

CO3. To carry out literature survey, to formulate information search strategies

CO 4. To use modern tools (Internet, OPAC, search engines etc.) of information search.

**PGS 715 INTELLECTUAL PROPERTY AND ITS MANAGEMENT IN AGRICULTURE (1+0) (e-course)**

**COURSE OUTCOME:**

CO1: Understand the concepts in international trade.

CO2: Understand the procedure to obtain patent rights.

CO3: Know the way to protect extinct varieties.

CO4: Create awareness about geographical indications of goods and commodities.

CO5: Identify the way to commercialize intellectual properties.

**PGS 716 DISASTER MANAGEMENT (1+ 0) (e-Course)**

**COURSE OUTCOME:**

CO 1: To learn different types of natural disasters

CO 2: To understand climate change, global warming and their mitigation

CO 3: To gain knowledge about disaster management and understand the importance of afforestation

CO 4: To acquire knowledge about disaster warnings

CO 5: To understand the importance of climate smart agriculture

**PGS 717 CONSTITUTIONS OF INDIA(1+0)**

**COURSE OUTCOME:**

CO 1: Understanding the history of making of the Indian Constitution

CO 2: Understanding the philosophy of the Indian Constitution.

CO 3: Understanding the nature of Indian Federalism, about the powers and functions of the President and Prime Minister of India.

CO 4: Make the students abreast of the administrative setup at the centre, state and local level.