Name of Programme: M.Sc. (Ag.)Agronomy

Academic eligibility for admission: - B.Sc. (Ag.)

Curriculum and Syllabus

Semester	Course Code & No.	Course Title	CRD	Mid Exam.	Final Exam		Total
					Theory	Practical	
I st Sem.	AGR-6381	Field Crops-I	3 (2+1)	20	40	40	100
	AGR-6382	Soil fertility & Nutrient management	3 (2+1)	20	40	40	100
	AGR-6383	Principles & Practices of Weed management	3 (2+1)	20	40	40	100
	AST-6384	Statistical Methods	3 (2+1)	20	40	40	100
		Total	**12**				
II nd Sem	AGR-6385	Field Crops-II	3 (2+1)	20	40	40	100
	AGR-6386	Principles & Practices of Water management	3(2+1)	20	40	40	100
	AGR-6387	Soil conservation & Watershed management	3 (2+1)	20	40	40	100
	AST-6388	Design of Experiment	3(2+1)	20	40	40	100
		Total	**12**				
III rd Sem	AGR-7381	Modern Concepts in Crop Production	3(2+1)	20	40	40	100
	AGR-7382	Seed & Crop Physiology	3(2+1)	20	40	40	100
	AGR-7383	Medicinal and Aromatic Plants	3(2+1)	20	40	40	100
	AGR-7484	Dryland Farming	3(2+1)	20	40	40	100
		Total	**12**				
IV th Sem	AGR-7385	Agroforestry & Agrostology	3(2+1)	20	40	40	100
	AGR-7356	Management of Problem Soils	3(2+1)	20	40	40	100
	AGR-599	Seminar	1	Satisfactory/Unsatisfactory			
	Optional (any one from two)						
	AGR-7387	Weed control & Arostology	12 (9+3)	20	40	40	100
	or						
	AGR-598	Thesis Research	12	40 % Internal +60% External)			100
		Total	**19**				
		Grand Total	**55**				**1500**

Semester -I

1 FIELD CROPS –I (AGR-6381)

Credit Hours: 2+1=3) (Marks: MID 20+ THE 40 + PRA. 40=100)

Origin, history, distribution, adaptation, classification, morphology, physiology, varietals improvement and production technology of rice, wheat, maize, sorghum millets, important grain legumes (chickpea. pigeonpea, mungbean, urdbean, lentil, cowpea, and peas quality components and industrial uses of the main and by products and their post-harvest handling for marketing.

2.SOIL FERTILITY AND NUTRIENT MANAGEMENT (AGR-6382)

Credit Hours: 2+1=3) (Marks: MID 20+ THE 40 + PRA. 40=100)

Soil fertility and productivity ; soil composition in relation to crop production, organic and inorganic constituents: essential plant nutrients; deficiency and toxicity symptoms of major and micronutrients and remedial measures ; transformation and dynamics of major plant nutrients; kinds of fertilizers, straight, complex and bulk blended ; methods of fertilizer application; crop response to nutrients ; fertilizer use efficiency, agronomic, chemical and physiological; methods of increasing fertilizer use efficiency : nutrient interactions; fertilizer application in cropping systems direct, residual and cumulative effects; integrated plant nutrient supply systems, organic manures, compost, green, manures, vermi-compost, bio- fertilizers, crop residue and inorganic fertilizers; sustainable agriculture and soil fertility, fertilizers and environment ; fertilizer use in problem soils ; soil moisture-nutrients interactions.

3. PRINCIPLES AND PRACTICES OF WEED MANAGEMENT (AGR-6383)

Credit Hours: 2+1=3) (Marks: MID 20+ THE 40 + PRA. 40=100)

Classification and characteristics of weeds; special weed problems including aquatic and parasitic weeds. Ecology and physiology of major weeds; ecophysiology of crop weed competition including allelopathy; weed indices; principles and methods of weed control, concept of integrated weed management; weed control through bioherbicides, mycoherbicides and allelochemicals ; herbcides history, development and their classification; mode and mechanism of action of herbicides; herbicide selectivity, herbicide mixtures, adjutants and safeners ; degradation of herbicides in soil and plants; effect of herbicides in relation to environment; herbicide resistance in weeds and crops ; weed management in major crops and cropping systems ; weed shifts in cropping systems; control of weeds in non cropped situations .

Practical: Identification of important weeds of different crops, preparation of a weed herbarium; weed

4. Statistical Methods (AST-6384)

(Credit Hours: 2+1=3) (Marks: MID 20+ THE 40 + PRA. 40=100)

Frequency distribution, classification and tabulation of data, graphical and diagrammatic representation of data, measures of central tendency, measures of dispersion, coefficient of variance, standard error, skewness & kurtosis.

Consus & sample survey, population and sample, probability, concept of random sampling, simple random sample, statified sample systematic & cluster sampling parameter & sample value. Testing of hypothesis, test of signification based on Z , t and F test X^2-test for goodness of fit and independence of attributes. Scattered diagram. Linear regression & correlation, regression and correlation coefficient.

Practical: related with the course.

Semester-II

5. FIELD CROPS –II (AGR-6385)

(Credit Hours: 2+1=3) (Marks: MID 20+ THE 40 + PRA. 40=100)

Origin history, distribution, adaptation, classification, morphology, physiology, varietal improvement and production technology of oilseed crops (rapeseed and mustard, groundnut, soybean, sunflower, safflower and castor), cotton jute, sugarcane, potato and other important regional crops of the area; quality components and industrial uses of the main and by products and their post-harvest handling for marketing.

6. PRINCIPLES AND PRACTICES OF WATER MANAGEMENT (AGR-6386)

(Credit Hours: 2+1=3) (Marks: MID 20+ THE 40 + PRA. 40=100)

Water and its role in plants: water resources of India ; major irrigation projects and extent of area and crops irrigated in India and different states; soil water movement and water availability, uptake, transport and transpiration in plants ; soil water plant relationship; plant response to water stress; scheduling, depth and methods of irrigation ; micro irrigation system: fertigation ; management of water in controlled environments and polyhouses; water use efficiency: water management of crops and cropping systems; soil, plants and meteorological factors determining water needs of crops; crop plant adaptation to moisture stress condition; quality of irrigation water; effect of saline water and soil salinity on plant- water relation and management of crops, excess soil water and plant growth; water management in problem soils ;drainage requirements of crops and methods of field drainage, their layout and spacing, irrigability of lands.

7. SOIL CONSERVATION AND WATERSHED MANAGEMENT (AGR-6387)

(Credit Hours: 2+1=3) (Marks: MID 20+ THE 40 + PRA. 40=100)

Soil erosion -definition, nature and extent of erosion ; types of erosion, factors affecting erosion; soil conservation- definition, methods of soil conservation - agronomic measures, contour cultivation, strip cropping, cover, crops, vegetative barrier; improved dry farming practices ; mechanical measures - bunding .gully control, bench terracing ; role of grasses and pastures in soil conservations ; wind breaks and shelter belts ; watershed management -definition, objectives, concepts- approach- components steps in implementation of watershed; development of cropping system for watershed areas; alternate land use systems; agroforestry. ley farming: *jhum* management - basic concepts, socio-ethnic aspects, its layout .drainage considerations and agronomic management; rehabilitation of abandoned *jhum* lands and measures to prevent soil erosion.

8. AST 6388-: DESIGN OF EXPERIMENTS

(Credit Hours: 2+1=3) (Marks: MID 20+ THE 40 + PRA. 40=100)

Analysis of variance, Basic principals of experimental design, CRD, RBD, LSD with their analysis mission plot techniques in R.B.D and L.S.D.Factorial experiments its concepts and analysis of 2^2, factorial confounding in symmetrical factorial (in 2^2 experiments), split plot design, strip plot design, uniformity trials. Progeny row trials. Complect family block design, with over trails and simple rotational experiments.Statistical organization, statistics of livestock & filstricks. Source of livestock and agriculture in general. Sources of official statisticion, crop cutting experiments.

Semester-III

9. MODERN CONCEPTS IN CROP PRODUCTION (AGR-7381)

(Credit Hours: 2+1=3) (Marks: MID 20+ THE 40 + PRA. 40=100)

Crop growth in relation to environment, agroecological zones of India: concept of potential yield and its realization; modern concepts in tillage: zero or minimum, conservation tillage etc..optimization of plant population and planting geometry in relation to soil fertility, solar radiation and available moisture regimes ; Mitscherlich, Baule and Inverse- yield- nitrogen laws, biotic and abiotic stresses ;concept of ideal plant type ; crop modelling for maximizing crop yield: crop response production functions; cropping and farming systems for sustainable agriculture : organic farming crop residue recycling and management; crop production under protective agriculture: precision agriculture, crop and growth analysis

10. CROP AND SEED PHYSIOLOGY (AGR-7382)

(Credit Hours: 2+1=3) (Marks: MID 20+ THE 40 + PRA. 40=100)

Physiology of seed development ; dormancy - causes and measures to break dormancy, viability and germination of seed; changes in seed during storage; yield concepts and measurements : yield contributing components of crop- plant type, its morphological and physiological parameters, yield, photosynthesis and respiration in relation to dry matter production in crop community; distribution and translocation of photosynthates in relation to yield ; productivity maximization and factors limiting the realization of potential yield, chemical regulators of growth ; stress physiology and resistance to drought and salinity ; crop quality.

11. MEDICINAL AND AROMATIC PLANTS (AGR-7383)

(Credit Hours: 2+1=3) (Marks: MID 20+ THE 40 + PRA. 40=100)

Importance of medicinal and aromatic plants in human health , national economy and related industries, classification of medicinal and aromatic plants according to botanical characteristics and uses ; climate and soil requirements; cultural practices; yield and constituents of important medicinal plants viz *Diascorea spp,* Periwinkle, Cinchona, Datura, Belladona. Gloriosa, Poppy. Rauvolfia, Digitalis, Aloe, Senna, Isabgol, Ginseng, Pyrethrum, Neem. Herbal Medicinal Plants like Harar, Bael, Satavar, Brahmi, Punarnava and aromatic plants viz Citronella, Palmorosa, Lemon grass, *Mentha* Spp., Ocimum, Vetiver, Sandal Wood. Geranium, Jasmine, Roses, Tuberose, Dill, etc.

12. DRYLAND FARMING (AGR-7384)

(Credit Hours: 2+1=3) (Marks: MID 20+ THE 40 + PRA. 40=100)

Definition, concept, characteristics of dryland and rain-fed farming ; significance and dimension of dryland farming in Indian agriculture ; constraints limiting crop production in dryland areas; characterization of environment for water availability ; types of droughts ; adaptation of crop plants to droughts; drought management strategies; preparation of appropriate crop plans for dryland areas; mid- season corrections for aberrant weather conditions; water -harvesting concepts , techniques and practices ; use of mulches, kind, effectiveness and economics ; antitranspirants ; soil and crop management techniques, tillage, seeding, fertilizer use, crop and varietal choice; concept of watershed management and its application in India

Semester –IV

13. AGROFORESTRY& AGROSTOLOGY (AGR-7385)

(Credit Hours: 2+1=3) (Marks: MID 20+ THE 40 + PRA. 40=100)

Definition, concept, scope; historical perspective, agroforestry systems; agri-silvi-culture, silvipasture. agri-silvipasture. agri-horticulture, aqua -silviculture ; alley cropping and energy plantation: agro forestry systems for forage and fuel wood production, resource conservation; improvement of degraded lands: biological diversity and sustainable agriculture and environmental protection; associative influence in relation to above ground and underground interferences: allelopathy in various agro forestry designs/models for different agro climatic conditions : tree crop animal relationship ; food -fodder-fuel systems ; productivity and sustainability: alternate land use systems through agro forestry; social acceptability and economic viability : agro forestry interventions with multipurpose tree species; nutritive value of tree leaf, economics of AF systems. Grass covers of India, Rangeland management.

14. MANAGEMENT OF PROBLEM SOILS (AGR-7386)

(Credit Hours: 2+1=3) (Marks: MID 20+ THE 40 + PRA. 40=100)

Origin, nature, properties and distribution of saline, sodic, calcareous, acid and water logged soils: plant response to soil reaction: nutrient imbalance in problem soils; extent of damage to crops: crop tolerance to salinity, sodicity, acidity and water logging ; reclamation of problem soils: role of soil amendments and soil drainage; agronomic practices in relation to problem soils: cropping pattern for problem soils.

.15. SEMINAR (AGR-599)

16. THESIS RESEARCH (AGR-598)
OR
Special Paper (AGR-7387)