Integral University, Lucknow
Integral Institute of Agricultural Science and Technology
Evaluation Scheme of Undergraduate program
B. Sc. (Hons.) Agriculture
w.e.f. Session 2019-20

Elective Courses

Course Code	Subject	Periods Per h/week/sem			Evaluation Scheme Theory Mid sem			Evaluation Scheme Practical Examination					End sem Theory Exam	Subject total	Credit	Total Credit Points
								Sessional			End sem exam	Sub Total (sessional + exam)				
		L	T	P	CT	TA	Total	CT	TA	Total	Total					
AG235	**Agribusiness Management**	2	0	2	10	10	**20**	5	5	**10**	**20**	**50**	**50**	**100**	2:0:1	**3**
AG236	**Agrochemicals**	2	0	2	10	10	**20**	5	5	**10**	**20**	**50**	**50**	**100**	2:0:1	**3**
AG237	**Commercial Plant Breeding**	1	0	4	10	10	**20**	5	5	**10**	**20**	**50**	**50**	**100**	1:0:2	**3**

Students can opt any one paper from the elective courses

B.Sc. (Hons.) Agriculture
Syllabus: Agribusiness Management
Paper Code: AG235
w.e.f. Session 2019-20

Theory **3(2+1)**

Unit 1.

Transformation of agriculture into agribusiness, various stakeholders and components of agribusiness systems. Importance of agribusiness in the Indian economy and New Agricultural Policy. Distinctive features of Agribusiness Management: Importance and needs of agro-based industries, Classification of industries and types of agro based industries.

Unit 2.

Institutional arrangement, procedures to set up agro based industries. Constraints in establishing agro-based industries. Agri-value chain: Understanding primary and support activities and their linkages. Business environment: PEST & SWOT analysis. Management functions: Roles & activities, Organization culture. Planning, meaning, definition, types of plans. Purpose or mission, goals or objectives, Strategies, polices procedures, rules, programs and budget. Components of a business plan, Steps in planning and implementation.

Unit 3.

Organization staffing, directing and motivation. Ordering, leading, supervision, communications, control. Capital Management and Financial management of Agribusiness. Financial statements and their importance. Marketing Management: Segmentation, targeting & positioning. Marketing mix and marketing strategies. Consumer behaviour analysis, Product Life Cycle (PLC). Sales & Distribution Management.

Unit 4.

Pricing policy, various pricing methods. Project Management definition, project cycle, identification, formulation, appraisal, implementation, monitoring and evaluation. Project Appraisal and evaluation techniques.

Practical

Study of agri-input markets: Seed, fertilizers, pesticides. Study of output markets: grains, fruits, vegetables, flowers. Study of product markets, retails trade commodity trading, and value added products. Study of financing institutions- Cooperative, Commercial banks, RRBs, Agribusiness Finance Limited, NABARD. Preparations of projects and Feasibility reports for agribusiness entrepreneur. Appraisal/evaluation techniques of identifying viable project- Non-discounting techniques. Case study of agro-based industries. Trend and growth rate of prices of agricultural commodities. Net present worth technique for selection of viable project. Internal rate of return.

Suggested Readings:

- Information and Communication Technologies Management in Turbulent Business Environments by SC Lenny Koh and Stuart Maguire
- Knowledge Management Systems: Information and Communication Technologies for Knowledge Management by Ronald Maier
- Handbook on Foreign Trade Policy and Guide to Export & Import by The Institute of Chartered Accountants of India, New Delhi
- Agricultural and Food Marketing Management by I.M. Crawford

B.Sc. (Hons.) Agriculture
Syllabus: Agrochemicals
Paper Code: AG236
w.e.f. Session 2019-20

Theory **3(2+1)**

Unit 1.

An introduction to agrochemicals, their type and role in agriculture, effect on environment, soil, human and animal health, merits and demerits of their uses in agriculture, management of agrochemicals for sustainable agriculture.

Unit 2.

Herbicides-Major classes, properties and important herbicides. Fate of herbicides. Fungicides - Classification – Inorganic fungicides - characteristics, preparation and use of sulfur and copper, Mode of action-Bordeaux mixture and copper oxychloride. Organic fungicides- Mode of action- Dithiocarbamates-characteristics, preparation and use of Zineb and maneb. Systemic fungicides- Benomyl, carboxin, oxycarboxin, Metalaxyl, Carbendazim, characteristics and use.

Unit 3.

Introduction and classification of insecticides: inorganic and organic insecticides Organochlorine, Organophosphates, Carbamates, Synthetic pyrethroids Neonicotinoids, Biorationals, Insecticide Act and rules, Insecticides banned, withdrawn and restricted use, Fate of insecticides in soil & plant. IGRs Biopesticides, Reduced risk insecticides, Botanicals, plant and animal systemic insecticides their characteristics and uses.

Unit 4.

Fertilizers and their importance. Nitrogenous fertilizers: Feedstocks and Manufacturing of ammonium sulphate, ammonium nitrate, ammonium chloride, urea. Slow release N-fertilizers. Phosphatic fertilizers: feedstock and manufacturing of single superphosphate. Preparation of bone meal and basic slag. Potassic fertilizers: Natural sources of potash, manufacturing of potassium chloride, potassium sulphate and potassium nitrate. Mixed and complex fertilizers: Sources and compatibility–preparation of major, secondary and micronutrient mixtures. Complex fertilizers: Manufacturing of ammonium phosphates, nitrophosphates and NPK complexes. Fertilizer control order. Fertilizer logistics and marketing. Plant bio-pesticides for ecological agriculture, Bio-insect repellent.

Practical

Sampling of fertilizers and pesticides. Pesticides application technology to study about various pesticides appliances. Quick tests for identification of common fertilizers. Identification of anion and cation in fertilizer. Calculation of doses of insecticides to be used. To study and identify various formulations of insecticide available kin market. Estimation of nitrogen in Urea. Estimation of water soluble P_2O_5 and citrate soluble P_2O_5 in single super phosphate. Estimation of potassium in Muraite of Potash/Sulphate of Potash by flame photometer. Determination of copper content in copper oxychloride. Determination of sulphur content in sulphur fungicide. Determination of thiram. Determination of ziram content.

Suggested readings:

- Chemistry and Technology of Agrochemical Formulations by Knowles, Alan (Ed.), Springer
- Pesticides in Agriculture and Environment by Wilis B. Wheeler
- Pesticides: Health, Safety and the Environment by Allen Poulter
- Agricultural Pests and their Control by V. B. Awasthi

B.Sc. (Hons.) Agriculture
Syllabus: Commercial Plant Breeding
Paper Code: AG237
w.e.f. Session 2019-20

Theory **3(1+2)**

Unit 1.

Types of crops and modes of plant reproduction. Line development and maintenance breeding in self and cross pollinated crops (A/B/R and two line system) for development of hybrids and seed production.

Unit 2.

Genetic purity test of commercial hybrids. Advances in hybrid seed production of maize, rice, sorghum, pearl millet, castor, sunflower, cotton pigeon pea, Brassica etc. Quality seed production of vegetable crops under open and protected environment.

Unit 3.

Alternative strategies for the development of the line and cultivars: haploid inducer, tissue culture techniques and biotechnological tools. IPR issues in commercial plant breeding: DUS testing and registration of varieties under PPV & FR Act. Variety testing, release and notification systems in India. Principles and techniques of seed production, types of seeds, quality testing in self and cross pollinated crops.

Practical

Floral biology in self and cross pollinated species, selfing and crossing techniques. Techniques of seed production in self and cross pollinated crops using A/B/R and two line system. Learning techniques in hybrid seed production using male-sterility in field crops. Understanding the difficulties in hybrid seed production, Tools and techniques for optimizing hybrid seed production. Concept of rouging in seed production plot. Concept of line its multiplication and purification in hybrid seed production. Role of pollinators in hybrid seed production. Hybrid seed production techniques in sorghum, pearl millet, maize, rice, rapeseed-mustard, sunflower, castor, pigeon pea, cotton and vegetable crops. Sampling and analytical procedures for purity testing and detection of spurious seed. Seed drying and storage structure in quality seed management. Screening techniques during seed processing viz., grading and packaging. Visit to public private seed production and processing plants.

Suggested Readings:

- Singh, B.D., 1997. *Plant Breeding*: *Principles and Methods*. Kalyani Publishers, New Delhi. P. 702.
- Pundan Singh, 1992. *Genetic.* Kalyani Publishers, New Delhi, P. 509.
- Nagat T, Lorz H & Widholm JM. 2008. *Biotechnology in Agriculture and Forestry*. Springer.
- Trivedi PC. 2000. *Plant Biotechnology: Recent Advances*. Panima Publishers
- Spangenberg G. 2001. *Molecular Breeding of Forage Crops*. Kluwer Academic Publishers.
- Chahal GS & Gosal SS. 2002. *Principles and Procedures of Plant Breeding: Biotechnological and Conventional Approaches.* Narosa Publishers.