

**Program:** B.Sc. (Hons.) Agriculture

**Semester:** Fifth

**Course:** Principles of Integrated Pest and Disease Management

**Course Code:** 13A.311

L	T	P	C
2	0	2	3

---

### Course Objective:

- To get familiarized with various categories of pest
- To understand how IPM decisions are made and factors that influence the decision-making process
- To understand the strategies and tactics of IPM, including biological, cultural, regulatory, mechanical and chemical/bio-pesticidal, pest monitoring, and decision making based on the symptoms from various pests and recommend the management practices.
- To apply knowledge gained to solve actual pest management problems

### Unit I:

Categories of insect pests and diseases, IPM: Introduction, history, importance, concepts, principles and tools of IPM. Economic importance of insect pests, diseases and pest risk analysis.

### Unit II:

Methods of detection and diagnosis of insect pest and diseases. Calculation and dynamics of economic injury level and importance of Economic threshold level.

### Unit III:

Methods of control: Host plant resistance, cultural, mechanical, physical, legislative, biological and chemical control. Ecological management of crop environment. Introduction to conventional pesticides for the insect pests and disease management.

### Unit IV:

Survey surveillance and forecasting of Insect pest and diseases. Development and validation of IPM module. Implementation and impact of IPM (IPM module for Insect pest and disease. Safety issues in pesticide uses. Political, social and legal implication of IPM. Case histories of important IPM programmes. Case histories of important IPM programmes.

### Practical:

1. Methods of diagnosis and detection of various insect pests, and plant diseases
2. Methods of insect pests and plant disease measurement,
3. Assessment of crop yield losses
4. Calculations based on economics of IPM
5. Identification of biocontrol agents, different predators and natural enemies.
6. Mass multiplication of Trichoderma
7. Mass multiplication of Pseudomonas,
8. Mass multiplication of Trichogramma
9. Mass multiplication of NPV etc.

10. Identification and nature of damage of important insect pests and diseases and their management
11. Crop (agro-ecosystem) dynamics of a selected insect pest and diseases.
12. Plan & assess preventive strategies (IPM module) and decision making.
13. Crop monitoring attacked by insect, pest and diseases.
14. Awareness campaign at farmers' fields.

**Suggested Reading:**

1. K.P. Srivastava, G.S. Dhaliwal. *A Textbook of Applied Entomology Vol-I*
2. K.P. Srivastava, G.S. Dhaliwal . *A Textbook of Applied Entomology Vol-II*
3. M.Prakash. *Insect Ecology*
4. G.S. Dhaliwal. *Interated Pest Management*
5. H.Lewin Devasahayam. *Practical manual of Entomology Insect & Non-Insect Pests.*
6. Dhaliwal, G. S. and Ramesh Arora 2001. *Integrated pest management: Concepts and approaches, Kalyani Publishers Ludhiana.*
7. Metcalf, R. L .and Luckman, W. H. 1982. *Introduction to insect pest management. Wiley inter science publishing, New York.*
8. Larry P Pedigo 1991. *Entomology and pest management, Prentice Hall of India Private Ltd., New Delhi.*
9. Venugopala Rao, N., Umamaheswari, T., Rajendraprasad, P., Naidu, V.G and Savithri, P. 2004. *Integrated Insect Pest Management. Agrobios (India) Limited, Jodhpur.*
10. Chaube, H.S. and Ramji Singh. 2001. *Introductory Plant Pathology. International Book Distribution Co., Lucknow. 136.*
11. Mehrotra, R.S. 1980. *Plant Pathology. Tata McGraw-Hill Publishing Co. Ltd., New Delhi.*
12. Singh, R.S. 2002. *Introduction to Principles of Plant Pathology. Oxford & IBH Publ. Co.P. Ltd., New Delhi.*
13. Vidyasekharan, P. 1993. *Principles of Plant Pathology. CBS Publishers and Distributors, New Delhi.*

**Program:** B.Sc. (Hons.) Agriculture

**Semester:** Fifth

**Course:** Manures, Fertilizers and Soil Fertility Management

**Course Code:** 13A.312

L	T	P	C
2	0	2	3

---

### Course Objective:

- To impart knowledge about the importance of organic manures and preparation methods of bulky and concentrated manures.
- To get familiarized with concept of integrated nutrient management and the improvement of soil fertility status
- To get acknowledge with essential plant nutrient and their deficiency symptoms, concept of nutrient cycle
- To acquaint with laboratory skills to analyze soil/plants for various macro and micro nutrients.

### Unit I:

Introduction and importance of organic manures, properties and methods of preparation of bulky and concentrated manures. Green/leaf manuring. Fertilizer recommendation approaches. Integrated nutrient management.

### Unit II:

Chemical fertilizers: classification, composition and properties of major nitrogenous, phosphatic, potassic fertilizers, secondary & micronutrient fertilizers, Complex fertilizers, nano fertilizers Soil amendments, Fertilizer Storage, Fertilizer Control Order.

### Unit III:

History of soil fertility and plant nutrition. criteria of essentiality. role, deficiency and toxicity symptoms of essential plant nutrients, Mechanisms of nutrient transport to plants, factors affecting nutrient availability to plants. Chemistry of soil nitrogen, phosphorus, potassium, calcium, magnesium, sulphur and micronutrients.

### Unit IV:

Soil fertility evaluation, Soil testing. Critical levels of different nutrients in soil. Forms of nutrients in soil, plant analysis, rapid plant tissue tests. Indicator plants. Methods of fertilizer recommendations to crops. Factor influencing nutrient use efficiency (NUE), methods of application under rainfed and irrigated conditions.

### Practical:

1. Introduction of analytical instruments and their principles, calibration and applications, Colorimetry and flame photometry.
2. Estimation of soil organic carbon
3. Estimation of alkaline hydrolysable N in soils.
4. Estimation of soil extractable P in soils.
5. Estimation of exchangeable K; Ca and Mg in soils.
6. Estimation of soil extractable S in soils.

7. Estimation of DTPA extractable Zn in soils.
8. Estimation of N in plants.
9. Estimation of P in plants.
10. Estimation of K in plants.
11. Estimation of S in plants.

***Suggested Reading:***

1. S. Kannaiyan & Others. *Biofertilizer Technology*
2. John L. Havlin. *Soil Fertility & Fertilizers*
3. S. Kannaiyan & Others. *Biofertilizer Technology*
4. *Indian Society of Soil Science. 2012. Fundamentals of Soil Science. IARI, New Delhi.*
5. Yawalkar K.S, Agarwal, T.P and Bokde, S 1995. *Manures and Fertilisers. Agril. Publishing House, Nagpur*
6. Samuel Tisdale, Nelson Werner L, Beaton James D and Havlin John L. 2005. *Soil Fertility and Fertilizers: An Introduction to Nutrient Management, Macmillian Publishing Co., New York.*
7. D. K .Das 2014. *Introductory Soil Science. Kalyani Publishers, New Delhi*

**Program:** B.Sc.(Hons.) Agriculture

**Semester:** Fifth

**Course:** Pest of Crops and Stored Grain and their Management

**Course Code:** 13A.313

L	T	P	C
2	0	2	3

---

**Course Objective:**

- To identify the insect and mite pests, their symptoms, biology, host range, etc. under field and storage conditions.
- To suggest a suitable/viable management strategies

**Unit I:**

General account on nature and type of damage by different arthropods pests. Scientific name, order, family, host range, distribution, biology and bionomics, nature of damage, and management of major pests and scientific name, order, family, host range, distribution, nature of damage and control practice other important arthropod pests of various:

**Unit II:**

Field crop, vegetable crop, fruit crop.

**Unit III:**

Plantation crops, ornamental crops, spices and condiments.

**Unit IV:**

Factors affecting losses of stored grain and role of physical, biological, mechanical and chemical factors in deterioration of grain. Insect pests, mites, rodents, birds and microorganisms associated with stored grain and their management. Storage structure and methods of grain storage and fundamental principles of grain store management.

**Practical:**

1. Identification of different types of damage. Identification and study of life cycle and seasonal history of various insect pests attacking crops and their produce: (a) Field Crops; (b) Vegetable Crops; (c) Fruit Crops; (d) Plantation, gardens, Narcotics, spices & condiments.
2. Identification of insect pests and Mites associated with stored grain.
3. Determination of insect infestation by different methods.
4. Assessment of losses due to insects.
5. Calculations on the doses of insecticides application technique.
6. Fumigation of grain store / godown.
7. Identification of rodents and rodent control operations in godowns.
8. Identification of birds and bird control operations in godowns.
9. Determination of moisture content of grain.
10. Methods of grain sampling under storage condition.
11. Visit to Indian Storage Management and Research Institute, Hapur and Quality Laboratory, Department of Food., Delhi.
12. Visit to nearest FCI godowns.

**Suggested Reading:**

1. *Vasantharaj David, B. and Rama Murthy V.V. 2016. Elements of Economic Entomology, Popular Book Depot, Coimbatore. 80*
2. *Vasantharaj David, B and Aanathakrishnan, T.N. 2006. General and Applied Entomology. Tata McGraw-Hill Publishing House, New Delhi.*
3. *Nair MRGK. 1986. Insects and Mites of crops in India. Indian Council of Agricultural Research New Delhi.*
4. *Ramakrishna Ayyar, T.V. 1963. Handbook of Economic Entomology for South India. Government Press, Madras.*
5. *Dennis S Hill 1987 Agricultural Insect Pests of tropics and their control, Cambridge University Press, New York*
6. *Upadhyaya K.P. and Kusum Dwivedi. 1996. A Text Book of Plant Nematology. Aman Publishing House, Meerut.*
7. *Khare, S.P. 1993. Stored Grain Pests and their Management. Kalyani Publishers, Ludhiana.*
8. *Atwal, A.S. 1976. Agricultural Pests of India and South East Asia. Kalyani Publishers, Ludhiana.*

**Program:** B.Sc. (Hons.) Agriculture

**Semester:** Fifth

**Course:** Diseases of Field and Horticultural Crops and their Management- I

**Course Code:** 13A.314

L	T	P	C
2	0	2	3

### Course Objective:

- To understand the Symptoms, etiology, disease cycle and management of various field and horticultural crops
- To make student identify the disease and frame a viable management plan.

### Unit I:

Symptoms, etiology, disease cycle and management of major diseases of following crops:

Field Crops: Rice: blast, brown spot, bacterial blight, sheath blight, false smut, khaira and tungro; Maize: stalk rots, downy mildew, leaf spots; Sorghum: smuts, grain mold and anthracnose, Bajra :downy mildew and ergot;

### Unit II:

Groundnut: early and late leaf spots, wilt Soybean: Rhizoctonia blight, bacterial spot, seed and seedling rot and mosaic; Pigeonpea: Phytophthora blight, wilt and sterility mosaic; Finger millet: Blast and leaf spot; black & green gram: Cercospora leaf spot and anthracnose, web blight and yellow mosaic; Castor: Phytophthora blight; Tobacco: black shank, black root rot and mosaic.

### Unit III:

Horticultural Crops: Guava: wilt and anthracnose; Banana: Panama wilt, bacterial wilt, Sigatoka and bunchy top; Papaya: foot rot, leaf curl and mosaic, Pomegranate: bacterial blight;

### Unit IV:

Cruciferous vegetables: Alternaria leaf spot and black rot; Brinjal: Phomopsis blight and fruit rot and Sclerotinia blight; Tomato: damping off, wilt, early and late blight, buck eye rot and leaf curl and mosaic; Okra: Yellow Vein Mosaic; Beans: anthracnose and bacterial blight; Ginger: soft rot; Colocasia: Phytophthora blight; Coconut: wilt and bud rot; Tea: blister blight; Coffee: rust

### Practical:

- Identification and histopathological studies of selected diseases of field and horticultural crops covered in theory.
  - Field visit for the diagnosis of field problems.
  - Collection and preservation of plant diseased specimens for Herbarium;
- Note: Students should submit 50 pressed and well mounted specimens.

### Suggested Reading:

- H.S Chaube, V.S. Pundhir. Crop Diseases and Their management*
- Rangaswami, Gand K.Mahadevan. 2001. Diseases of crop plants in India. Prentice Hall of India Pvt.Ltd, New Delhi.*

3. Singh, R.S. 2005. *Plant Diseases*. Oxford & IBH Publications, New Delhi



**Program:** B.Sc. (Hons.) Agriculture

**Semester:** Fifth

**Course:** Crop Improvement-I (Kharif Crops)

**Course Code:** 13A.315

L	T	P	C
1	0	2	2

---

### **Course Objective:**

- To understand the origin, distribution and different breeding methods to be adopted for the development of varieties / hybrids in various kharif crops
- To study about the plant genetic resources, centers of diversity and breeding for resistance to biotic /abiotic stresses
- To learn about the influence of Genotype x Environment interaction on yield / performance
- To understand floral biology, emasculation and hybridization techniques, maintenance breeding of different kharif crops
- To handle germplasm and segregating populations by different breeding methods
- To make layout of field experiments and apply field techniques for seed production and hybrid seeds production in Kharif crops
- To estimate heterosis, inbreeding depression and heritability

### **Unit I:**

Centers of origin, distribution of species, wild relatives in different cereals; pulses; oilseeds; fibres; fodders and cash crops; vegetable and horticultural crops;

### **Unit II:**

Plant genetic resources, its utilization and conservation, study of genetics of qualitative and quantitative characters; Important concepts of breeding self pollinated, cross pollinated and vegetatively propagated crops;

### **Unit III:**

Major breeding objectives and procedures including conventional and modern innovative approaches for development of hybrids and varieties for yield, adaptability, stability, abiotic and biotic stress tolerance and quality (physical, chemical, nutritional);

### **Unit IV:**

Hybrid seed production technology in Maize, Rice, Sorghum, Pearl millet and Pigeonpea, etc. Ideotype concept and climate resilient crop varieties for future.

### **Practical:**

1. Floral biology, emasculation and hybridization techniques in different crop species; viz., Rice, Jute, Maize, Sorghum, Pearl millet, Ragi, Pigeonpea, Urdbean, Mungbean, Soybean, Groundnut, Sesame, Caster, Cotton, Cowpea, Tobacco, Brinjal, Okra and Cucurbitaceous crops.
2. Maintenance breeding of different kharif crops.
3. Handling of germplasm and segregating populations by different methods like pedigree, bulk and single seed decent methods
4. Study of field techniques for seed production and hybrid seeds production in Kharif crops
5. Estimation of heterosis, inbreeding depression and heritability

6. Layout of field experiments
7. Study of quality characters, donor parents for different characters
8. Visit to seed production plots
9. Visit to AICRP plots of different field crops.

**Suggested Reading:**

1. Allard, R.W. 1960. *Principles of Plant Breeding*. John Wiley & Sons, New York.
2. Phundan Singh. 2006. *Essential of Plant Breeding*. Kalyani Publishers, Ludhiana.
3. Poehlman, J.M. and Borthakur, D. 1995. *Breeding of Asian Field Crops*. Oxford & IBH Publishing Co. Pvt. Ltd. New Delhi.
4. Sharma, J.R. 1994. *Principles and Practices of Plant Breeding*. Tata McGraw-Hill Publishing Co. Ltd., New Delhi.
5. Kalloo, G. 1994. *Vegetable Breeding*. Panima Educational Book Agency, New Delhi.
6. Kumar, N. 2006. *Breeding of Horticultural Crops-Principles and Practices*. New India Publishing Agency, New Delhi
7. George Acquaah. 2012. *Principles of Plant Genetics and Breeding*. Blackwell Publishing Ltd., USA
8. *Mono graphs available on specific crops.*

**Program:** B.Sc. (Hons.) Agriculture

**Semester:** Fifth

**Course:** Entrepreneurship Development and Business Communication

**Course Code:** 40B.316

L	T	P	C
1	0	2	2

### Course Objective:

- The students enroll for this *courses* that will sharpen their skills and help them manage the *business* better.
- It provides them an opportunity to enter into a process which leads to the realization of an individual's passion for innovation and development.
- It is through this course that inputs that modern technology can be introduced in the small scale sector and thereby a new cost effectiveness and sophistication can be brought about in the product manufactured in the small scale sector.
- To become an entrepreneur, on the basis of one's own self qualities and competencies. To make them job giver rather than job seeker.
- The pride of being a lord of one's own destiny coupled with the satisfaction of being the benefactor of so many
- The course on entrepreneurship provides an excellent opportunity to realize both the goals – the individual status as well as an individual's contribution to the society. Setting up your own enterprise is one way to achieve that double fulfillment.

### Unit I:

Concept of Entrepreneur, Entrepreneurship Development, Characteristics of entrepreneurs; SWOT Analysis & achievement motivation,

### Unit II:

Government policy and programs and institutions for entrepreneurship development, Impact of economic reforms on Agribusiness/Agrienterprises,

### Unit III:

Entrepreneurial Development Process; Business Leadership Skills; Developing organizational skill (controlling, supervising, problem solving, monitoring & evaluation), Developing Managerial skills, Business Leadership Skills (Communication, direction and motivation Skills), Problem solving skill,

### Unit IV:

Supply chain management and Total quality management, Project Planning Formulation and report preparation; Financing of enterprise, Opportunities for agri-entrepreneurship and rural enterprise.

### Practical:

1. Assessing entrepreneurial traits,
2. Problem solving skills, managerial skills and achievement
3. Motivation

4. Exercise in creativity
5. Time audit through planning, monitoring and supervision
6. Identification and selection of business idea
7. Preparation of business plan and proposal writing
8. Visit to entrepreneurship development institute and entrepreneurs.

**Suggested Reading:**

1. *G.L. Ray. Extension Communication & Management*
2. *K.A. Jalihal & Others. Fundamentals of Extension Education & Management in Extension*
3. *Anil Kumar, S., Poornima, S. C., Mini, K., Abraham and Jayashree, K. 2003. Entrepreneurship Development. New Age International Publishers, New Delhi*
4. *Bhaskaran, S. 2014. Entrepreneurship Development & Management. Aman Publishing House, Meerut*
5. *Gupta, C.B. 2001. Management: Theory and Practice. Sultan Chand and Sons, New Delhi*
6. *Indu Grover 2008. Handbook on Empowerment and Entrepreneurship. Agrotech Publishing Academy, Udaipur*
7. *Khanka, S.S. 1999. Entrepreneurship Development. S. Chand and Co., New Delhi*
8. *Mary Coulter 2008. Entrepreneurship in Action. Prentice Hall of India Pvt. Ltd., New Delhi*
9. *Mohanty, S.K. 2009. Fundamentals of Entrepreneurship. Prentice Hall of India Pvt. Ltd., New Delhi*
10. *Prasad, R. 2003. Entrepreneurship - Concepts and Cases. I C F A I Publications, Hyderabad*
11. *Sagar Mondal and Ray, G. L. 2003. Text Book of Entrepreneurship and Rural Development. Kalyani Publishers, Ludhiana*
12. *Singh, D. 1995. Effective Managerial Leadership. Deep and Deep Publications, New Delhi*

**Program:** B.Sc. (Hons.) Agriculture

**Semester:** Fifth

**Course:** Geoinformatics and Nano-technology and Precision Farming

**Course Code:** 13A.316

L	T	P	C
1	0	2	2

---

### Course Objective:

- To acquaint with GIS software, data creation and editing.
- To familiarize with the concepts of precision farming
- To understand use of nano technology in different managerial practices in agriculture

### Unit I:

Precision agriculture: concepts and techniques; their issues and concerns for Indian agriculture; Geoinformatics- definition, concepts, tool and techniques; their use in Precision Agriculture.

### Unit II:

Crop discrimination and Yield monitoring, soil mapping; fertilizer recommendation using geospatial technologies; Spatial data and their management in GIS;

### Unit III:

Remote sensing concepts and application in agriculture; Image processing and interpretation; Global positioning system (GPS), components and its functions; Introduction to crop Simulation Models and their uses for optimization of Agricultural Inputs; STCR approach for precision agriculture;

### Unit IV:

Nanotechnology, definition, concepts and techniques, brief introduction about nanoscale effects, nanoparticles, nano-pesticides, nano-fertilizers, nano-sensors, Use of nanotechnology in seed, water, fertilizer, plant protection for scaling-up farm productivity.

### Practical:

1. Introduction to GIS software, spatial data creation and editing.
2. Introduction to image processing software.
3. Visual and digital interpretation of remote sensing images.
4. Generation of spectral profiles of different objects.
5. Supervised and unsupervised classification and acreage estimation.
6. Multispectral remote sensing for soil mapping.
7. Creation of thematic layers of soil fertility based on GIS.
8. Creation of productivity and management zones.
9. Fertilizers recommendations based of VRT and STCR techniques.
10. Crop stress (biotic/abiotic) monitoring using geospatial technology.
11. Use of GPS for agricultural survey.
12. Formulation, characterization and applications of nanoparticles in agriculture.
13. Projects formulation and execution related to precision farming.

**Suggested Reading:**

1. Pradeep. T. 2007. *NANO: The Essentials: Understanding Nanoscience and Nanotechnology*. Tata McGraw-Hill Publishing Company Limited, New Delhi
2. Lillesand, T.M. and Kiefer, R. W. 1994. *Remote sensing and image interpretation*. (3rd edition), John Wiley and Sons.
3. Anji Reddy, M. 2006. *Text book of Remote sensing and Geographical Information Systems*, (3rd edition), B.S. Publications, Hyderabad.

**Program:** B.Sc. (Hons.) Agriculture  
**Semester:** Fifth  
**Course:** Intellectual Property Rights  
**Course Code:** 13A.317

L	T	P	C
1	0	0	1

---

**Course Objective:**

- To develop understanding of IP and associated rights
- To study about types of IP and legislation covering IPR in India
- To impart significance of IPR in realizing wealth and value creation as knowledge based economy
- To impart knowledge on WTO, Protection of Plant Varieties and Farmers Rights Authorities; Technology Information, Patents, Geographical Indications, National Biodiversity Authority, etc.

**Unit I:**

Introduction and meaning of intellectual property, brief introduction to GATT, WTO, TRIPs and WIPO, Treaties for IPR protection: Madrid protocol, Berne Convention, Budapest treaty, etc.

**Unit II:**

Types of Intellectual Property and legislations covering IPR in India:-Patents, Copyrights, Trademark, Industrial design, Geographical indications, Integrated circuits, Trade secrets. Patents Act 1970 and Patent system in India, patentability, process and product patent, filing of patent, patent specification, patent claims, Patent opposition and revocation, infringement, Compulsory licensing, Patent Cooperation Treaty, Patent search and patent database.

**Unit III:**

Origin and history including a brief introduction to UPOV for protection of plant varieties, Protection of plant varieties under UPOV and PPV&FR Act of India, Plant breeders rights, Registration of plant varieties under PPV&FR Act 2001, breeders, researcher and farmers rights. Traditional knowledge-meaning and rights of TK holders.

**Unit IV:**

Convention on Biological Diversity, International treaty on plant genetic resources for food and agriculture (ITPGRFA). Indian Biological Diversity Act, 2002 and its salient features, access and benefit sharing.

**Suggested Reading:**

1. Acharya, N.K. 2014. *Text book of Intellectual Property Rights*. Asia Law House, Hyderabad.
2. Loganathan, E.T. 2012. *Intellectual Property Rights*. New Century Publications, New Delhi.
3. Rosedar, S.R.A. 2016. *Intellectual Property Rights*. Lexis Nexis (2nd Ed.), Nagpur.

**Program:** B.Sc. (Hons.) Agriculture

**Semester:** Fifth

**Course:** Practical Crop Production – I (Kharif crops)

**Course Code:** 13AP.318

L	T	P	C
0	0	4	2

---

**Course Objective:**

- To employ hands on experience in the production of Kharif crops by applying basic principles of agronomy.

**Practical:**

1. Crop planning
2. Raising field crops in multiple cropping systems
3. Field preparation,
4. Seed, treatment,
5. Nursery raising,
6. Sowing,
7. Nutrient, water and weed management
8. Management of insect-pests diseases of crops,
9. Harvesting, threshing, drying winnowing,
10. Storage and marketing of produce.

(The emphasis will be given to seed production, mechanization, resource conservation and integrated nutrient, insect-pest and disease management technologies.)

11. Preparation of balance sheet including cost of cultivation, net returns per student as well as per team of 8-10 students.



## Electives Sem V

**Program:** B.Sc. (Hons.) Agriculture

**Semester:** Fifth

**Course:** Agribusiness Management

**Course Code:** 13A.321

L	T	P	C
2	0	2	3

### Course Objective:

- To impart understanding of business environment in Agriculture
- To learn project management, appraisal and monitoring technique

### Unit I:

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. Institutional arrangement, procedures to set up agro based industries. Constraints in establishing agro-based industries.

### Unit II:

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, policies procedures, rules, programs and budget. Components of a business plan, Steps in planning and implementation. Organization staffing, directing and motivation. Ordering, leading, supervision, communications, control.

### Unit III:

Capital Management and Financial management of Agribusiness. Financial statements and their importance. Marketing Management: Segmentation, targeting & positioning. Marketing mix and marketing strategies.

### Unit IV:

Consumer behaviour analysis, Product Life Cycle (PLC). Sales & Distribution Management. Pricing policy, various pricing methods. Project Management definition, project cycle, identification, formulation, appraisal, implementation, monitoring and evaluation. Project Appraisal and evaluation techniques.

### Practical:

1. Study of agri-input markets: Seed, fertilizers, pesticides.
2. Study of output markets: grains, fruits, vegetables, flowers.
3. Study of product markets, retails trade commodity trading, and value added products.
4. Study of financing institutions- Cooperative, Commercial banks, RRBs, Agribusiness Finance Limited, NABARD.
5. Preparations of projects and Feasibility reports for agribusiness entrepreneur.
6. Appraisal/evaluation techniques of identifying viable project- Non-discounting techniques.

7. Case study of agro-based industries.
8. Trend and growth rate of prices of agricultural commodities.
9. Net present worth technique for selection of viable project.
10. Internal rate of return.

**Program:** B.Sc. (Hons.) Agriculture

**Semester:** Fifth

**Course:** Agricultural Journalism

**Course Code:** 13A.321

L	T	P	C
2	0	2	3

---

### **Course Objective:**

- To impart learning of different kinds of communication media
- To learn gathering agricultural information and writing stories

### **Unit I:**

Agricultural Journalism: The nature and scope of agricultural journalism characteristics and training of the agricultural journalist, how agricultural journalism is similar to and different from other types of journalism.

### **Unit II:**

Newspapers and magazines as communication media: Characteristics; kinds and functions of newspapers and magazines, characteristics of newspaper and magazine readers. Form and content of newspapers and magazines: Style and language of newspapers and magazines, parts of newspapers and magazines.

### **Unit III:**

The agricultural story: Types of agricultural stories, subject matter of the agricultural story, structure of the agricultural story. Gathering agricultural information: Sources of agricultural information, interviews, coverage of events, abstracting from research and scientific materials, wire services, other agricultural news sources.

### **Unit IV:**

Writing the story: Organizing the material, treatment of the story, writing the news lead and the body, readability measures. Illustrating agricultural stories: Use of photographs, use of artwork (graphs, charts, maps, etc.), writing the captions. Editorial mechanics: Copy reading, headline and title writing, proofreading, lay outing.

### **Practical:**

1. Practice in interviewing.
2. Covering agricultural events.
3. Abstracting stories from research and scientific materials and from wire services.
4. Writing different types of agricultural stories.
5. Selecting pictures and artwork for the agricultural story.
6. Practice in editing, copy reading, headline and title writing, proofreading, layouting.
7. Testing copy with a readability formula.
8. Visit to a publishing office.

**Program:** B.Sc. (Hons.) Agriculture

**Semester:** Fifth

**Course:** Protected Cultivation

**Course Code:** 13A.321

L	T	P	C
2	0	2	3

---

**Course Objective:**

- To get an understanding of greenhouse design and management
- To learn the cultivation of different horticultural and other economically important plants.

**Unit I:**

Protected cultivation- importance and scope, Status of protected cultivation in India and World  
Types of protected structure based on site and climate. Cladding material involved in greenhouse/ poly house. Greenhouse design, environment control, artificial lights, Automation.

**Unit II:**

Soil preparation and management, Substrate management. Types of benches and containers.  
Irrigation and fertigation management. Propagation and production of quality planting material of horticultural crops.

**Unit III:**

Greenhouse cultivation of important horticultural crops – rose, carnation, chrysanthemum, gerbera, orchid, anthurium, liliun, tulip, tomato, bell pepper, cucumber, strawberry, pot plants, etc.

**Unit IV:**

Cultivation of economically important medicinal and aromatic plants. Off-season production of flowers and vegetables. Insect pest and disease management.

**Practical:**

1. Raising of seedlings and saplings under protected conditions,
2. Use of protrays in quality planting material production,
3. Bed preparation and planting of crop for production,
4. Inter cultural operations,
5. Soil EC and pH measurement,
6. Regulation of irrigation and fertilizers through drip, fogging ad misting.

**Program:** B.Sc. (Hons.) Agriculture

**Semester:** Sixth

**Course:** Rainfed Agriculture and Watershed Management

**Course Code:** 13A.359

L	T	P	C
1	0	2	2

---

**Course Objective:**

- To learn about soil and water conservation techniques
- To manage crops in rainfed areas
- To demonstrate soil moisture conservation and water harvesting structures

**Unit I:**

Rainfed agriculture: Introduction, types, History of rainfed agriculture and watershed in India; Problems and prospects of rainfed agriculture in India.

**Unit II:**

Soil and climatic conditions prevalent in rainfed areas; Soil and water conservation techniques, Drought: types, effect of water deficit on physio-morphological characteristics of the plants, Crop adaptation and mitigation to drought;

**Unit III:**

Water harvesting: importance, its techniques, Efficient utilization of water through soil and crop management practices, Management of crops in rainfed areas, Contingent crop planning for aberrant weather conditions

**Unit IV:**

Concept, objective, principles and components of watershed management, factors affecting watershed management.

**Practical:**

1. Studies on climate classification
2. Studies on rainfall pattern in rainfed areas of the country and pattern of onset and withdrawal of monsoons.
3. Studies on cropping pattern of different rainfed areas in the country and demarcation of rainfed area on map of India.
4. Interpretation of meteorological data and scheduling of supplemental irrigation on the basis of evapo-transpiration demand of crops.
5. Critical analysis of rainfall and possible drought period in the country, effective rainfall and its calculation.
6. Studies on cultural practices for mitigating moisture stress.
7. Characterization and delineation of model watershed.
8. Field demonstration on soil & moisture conservation measures.
9. Field demonstration on construction of water harvesting structures.
10. Visit to rainfed research station/watershed.