

<b>5<sup>th</sup> Semester</b>	<b>RAG5D002</b>	<b>Precision Farming</b>	<b>L-T-P 3-0-0</b>	<b>3 CREDITS</b>
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**Module I****(7 hours)**

Precision Farming, Precision Farming Precision

n farming development centers (PFDC) in India, Laser Land Levelling (LLL), Seedling and Sapling, Transplanting Soil Culture, Type of Soil Required, Mapping of Soils and Plant Attributes Site Specific Input Application, Irrigation and Fertigation and Nutrient Management, Insect Pests and Disease Management, Yield Mapping of Crops, Precision Spraying Technology, Weed Management, Precision Agriculture Status in India and Application of Plastics in Agriculture; Precision Farming, Precision agriculture(PA), satellite farming or site specific crop management (SSCM), a farming management concept based on observing, measuring and responding to inter and intra-field variability in crops, practice of precision agriculture by the advent of GPS and GNSS.

**Module II****(8 hour)**

Protected Cultivation (Greenhouse Technology) Greenhouse Technology Types of Greenhouses Typical Applications of Greenhouses Choice of Crops for Cultivation Under Greenhouses Plant Response to Greenhouse Environment Growing Medium Planning and Design of Greenhouses Design Criteria of Greenhouse for Cooling and Heating Purposes Greenhouse Equipment, Materials of Construction for Traditional and Low Cost Greenhouses Cost Estimation and Economic Analysis Passive Solar Green House Greenhouse Heating Systems Greenhouse Drying Irrigation Systems used in Greenhouse Drainage Flooding and Leaching Soil Pasteurization in Peat Moss and Mixtures Rock Wool and Other Inert Media Nutrient Film Technique (NFT) Problems / Constraints of Greenhouse Cultivation and Future Strategies Future Thrusts on Greenhouse in India.

### **Module III**

**(9 hours)**

Plant environment interactions – principles of limiting factors, solar radiation and transpiration, greenhouse effect, light, temperature, relative humidity, carbon dioxide enrichment, design and construction of greenhouses – site selection, orientation, design, construction, design for ventilation requirement using exhaust fan system, selection of equipment, Greenhouse cooling system – necessity, methods – ventilation with roof and side ventilators, evaporative cooling, different shading material fogging, combined fogging and fan-pad cooling system, design of cooling system, maintenance of cooling and ventilation systems, pad care etc. Greenhouse heating: necessity, components, methods, design of heating system.

### **Module III**

**(9 hours)**

Root media – types – soil and soil less media, composition, estimation, preparation and disinfection, bed preparation, Planting techniques in green house cultivation. Irrigation in greenhouse and net house – water quality, types of irrigation system, components, design, installation and material requirement. Fogging system for greenhouses and net houses – introduction, benefits, design, installation and material requirement, Maintenance of irrigation and fogging systems; Fertilization – nutrient deficiency symptoms and functions of essential nutrient elements, principles of selection of proper application of fertilizers, fertilizer scheduling, rate of application of fertilizers, methods, automated fertilizer application.

### **Module IV**

**(7 hours)**

Greenhouse climate measurement, control and management; insect and disease management in greenhouse and net houses; selection of crops for greenhouse cultivation, major crops in greenhouse, irrigation requirement, fertilizer management, cultivation, harvesting and post-harvest techniques; economic analysis.

### **Books**

1. PRECISION AGRICULTURE '05 edited by John V. Stafford. Wageningen Academic Publishers, The Netherlands
2. PRECISION AGRICULTURE by Terry A. Brase. Thomson Delmar Learning, New York, US,. Published in 2006
3. HANDBOOK OF PRECISION AGRICULTURE – PRINCIPLES AND APPLICATIONS edited by Ancha Srinivasan. Food Product Press, an imprint of The Haworth Press, Inc. New York. Published, 2006
4. Brahma Singh, Balraj Singh, Naved Sabir and Murtaza Hasan. 2014. Advances in Protected Cultivation. New India Publishing Agency, New Delhi
4. Srivastava, R.K., R.C. Maheswari, T.P. Ojha, and A. Alam. 1988. Plastics in Agriculture. Jain Brothers, Karol Bagh, New Delhi.

### **Digital Learning Resources**

1. <https://doi.org/10.1023/A:1009995404447>
2. <https://doi.org/10.1109/BIOCAS.2017.8325180>