AGX6377 Precision Agriculture

6					
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3					
Optional					
None					
Theory		**Activities**	**Independent Learning**	**Assessments**	**Total hours**
17 SSS*2 =34 h	3 DS*2 h = 6h	8 LAB*3h =24h	17 SSS*3h =51h 3 ONLS*1.5h = 4.5h 8 LAB*1.5h =12h	2 CAT*1.25h =2.5h 2 TMA*3h=6h 4 LAB-RT *1h = 4h 4 LAB-EV*1h = 4h	148
To provide knowledge on technologies such as satellite imagery, information technology, and geospatial tools in agricultural production					
PLO3 : Design systems, components or processes that meet specified needs PLO5 : Create, select and apply appropriate techniques, resources, and modern engineering and IT tools to complex engineering activities PLO6: Assess societal, health, safety, legal, cultural and environmental issues related to professional engineering solutions. PL07: Demonstrate broad knowledge of sustainable development concepts and practices required for dealing with contemporary issues related to professional engineering practice. PLO9: Demonstrate ability to function effectively as an individual and in multidisciplinary and multi-cultural teams, with the capacity to be a leader or manager as well as an effective team member PLO12: Engage in independent and lifelong learning in the broad context of technological change					
At the completion of this course student will be able to: CLO1: identify the agricultural and agronomic practices in Sri Lanka and their impacts of current practices on efficiency of production, [PLO12] CLO2: Describe precision agriculture concepts that can be used for efficacious field management and crop production, [PLO3] [PLO12] CLO3: Explain the importance of spatial variability in soil and yield in decision making on field management and crop production[PLO5] [PLO12] CLO4: Apply the principles of remote sensing, Global Positioning Systems, and Geographic Information Systems and using the technological tools in collecting spatial data [PLO5] [PLO12] CLO5: Analyze different plant and soil spatial data with reference to economic and ecological benefits of precision agriculture and] [PLO5] [PLO6] [PLO7] [PLO12] CLO6: Explain the future advancements in precision agriculture and potential for adopting precision agriculture by the farming community in Sri Lanka[PLO9] [PLO12]					

Outline syllabus:

Unit 01 - Introduction to Precision Agriculture

- Session 01: Agriculture and General Agronomic Practices in Sri Lanka
- Session 02: A Brief Overview of Precision Agriculture
- Session 03: Spatial Variability of soil properties and other properties
- Session 04: Generation Spatial Data on Soil and plants
- Session 05: Quantification of spatial variability: Deterministic and Probabilistic tools

Unit 02 - Technology and Tools Used in Precision Agriculture

- Session 06: Global positioning systems: Principles and applications in Precision Agriculture (Includes one practical exercise-3 hours)
- Session 07: Geographical Information Systems
- Session 08: GIS: GIS functions (Includes practical sessions on GIS- 16 hours)
- Session 09: Application of Remote Sensing, Proximal soil sensing (includes one practical session on analysis of proximal sensed data-3 hours)
- Session 10: Crop Yield monitoring and Mapping
- Session 11: Information Implementation
- Session 12: Field practice of Precision Agriculture: Variable Rate Technology and Management Zones based approach (Delineation of management zones practical 2 hours)

Unit 03 Precision Agriculture in Practice

- Session 13: Yield Impacts of Precision Agriculture
- Session 14: Economic and Ecological Impacts of Precision Agriculture
- Session 15: Adoption of Precision Agriculture throughout the World
- Session 16: Adoption of Precision Agriculture in Sri Lanka
- Session 17: Future Developments in Precision Agriculture

Laboratory work:

1. Practical exercise on Global Positioning Systems (GPS)
2. Geographic Information Systems (GIS)
3. Proximal Sensed Data
4. Management Zone Delineation