

25MAGT401	SMART FARMING IN AGRICULTURE	Category	L	T	P	R	Credit	Year of Introduction
		VAC	4	0	0	0	4	2025

Preamble

This course provides fundamental knowledge of smart farming technologies and their role in modern agriculture. It introduces the integration of sensors, IoT, automation, and decision support systems to improve farm productivity, resource efficiency, and sustainability.

Prerequisite: Nil

Course Outcomes: After the completion of the course, the student will be able to:

CO	Course Outcomes	Knowledge Level
CO1	Explain the basic concepts and components of smart farming systems.	K2 Understand
CO2	Explain the working principles of sensors and IoT used in agriculture.	K2 Understand
CO3	Explain the role of data analytics and decision support systems in farm management.	K2 Understand
CO4	Explain the applications and future scope of smart farming technologies.	K2 Understand

Mapping of course outcomes with program outcomes and program specific outcomes

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO1	3	1	1	1	-	3	2	-	-	-	-	3	2
CO2	3	2	1	1	3	3	2	-	-	-	-	3	3
CO3	3	2	2	2	3	3	2	-	-	-	-	3	3
CO4	3	2	2	1	-	3	2	-	-	-	2	3	3
Avg	3	1.75	1.5	1.25	3	3	2	-	-	-	2	3	2.75

1: Slight (Low), 2: Moderate (Medium), 3: Substantial (High), -: No Correlation

Mapping of Course Outcomes with Knowledge and Attitude Profile (WK)

CO	WK1	WK2	WK3	WK4	WK5	WK6	WK7	WK8	WK9
CO1	*	*	*	*	*		*	*	*
CO2	*	*	*	*	*	*	*	*	*
CO3	*	*	*	*	*	*	*	*	*
CO4	*	*	*	*	*		*	*	*

Wks Mapped with the Course

WK1	WK2	WK3	WK4	WK5	WK6	WK7	WK8	WK9
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Mark Distribution

Total Marks	CIE Marks	ESE Marks	ESE Duration
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100	40	60	2.5 hrs

Continuous Internal Evaluation Pattern

Attendance	: 5 marks
Continuous Assessment Test	: 20 marks
Continuous Assessment Assignment	: 15 marks

SYLLABUS

Module 1 (12 hrs)

Introduction to Smart Farming: Traditional vs modern agriculture; Concept of precision agriculture; Need for smart farming in India; Components of smart farming systems; Introduction to agricultural sensors (soil moisture, temperature, humidity, pH); Basics of data acquisition in agriculture.

Module 2 (12 hrs)

IoT and Communication Technologies: Basic architecture of IoT; Microcontrollers (Arduino, Raspberry Pi – overview); Wireless communication systems (Wi-Fi, GSM, LoRa – fundamentals); Smart irrigation systems; Greenhouse monitoring; Remote sensing basics in agriculture.

Module 3 (12 hrs)

Data Management and Decision Support: Types of agricultural data; Introduction to cloud computing; Basics of big data in agriculture; Introduction to Artificial Intelligence and Machine Learning (concept level); Decision Support Systems (DSS); Farm management software – overview.

Module 4 (12 hrs)

Applications and Future Trends: Smart irrigation and fertigation; Drone applications in agriculture; GPS and GIS fundamentals; Automation in farm machinery; Smart livestock monitoring; Challenges, sustainability and future scope of smart farming.

Text Books

1. Zhang, Q. (2016). Precision Agriculture Technology for Crop Farming. CRC Press.
2. Balaji, V., & Balamurugan, S. (2019). Internet of Things in Agriculture. CRC Press.
3. Dwivedi, C. (2020). Smart Farming: Technology Applications in Agriculture. Wiley India.

Reference Books

1. Shorey, R., & Srivastava, A. (2018). Internet of Things: Principles and Paradigms. CRC Press.
2. Sekharan, R., & Sinha, G. R. (2020). Agricultural Informatics: Automation Using IoT and Machine Learning. Springer.
3. Ojha, T. P., & Michael, A. M. (2019). Principles of Agricultural Engineering (Vol. I & II). Jain Brothers.

END SEMESTER EXAMINATION - MODEL QUESTION PAPER
(STC 2025 SCHEME)

Course Code	25MAGT401
Course Name	SMART FARMING IN AGRICULTURE
Max. Marks: 60	Duration: 2.5 Hours

Part A				
<i>(Answer all questions. Each question carries 3 marks)</i>				
Qn No.	Question	Marks	CO	BL
1.	Differentiate between traditional and modern agriculture.	3	CO1	L2
2.	Explain the components of a smart farming system.	3	CO1	L2
3.	Explain the working principle of a soil moisture sensor.	3	CO2	L2
4.	Explain the basic architecture of an IoT system.	3	CO2	L2
5.	Explain the role of cloud computing in agricultural data management.	3	CO3	L2
6.	Explain the function of a Decision Support System (DSS) in farming.	3	CO3	L2
7.	Explain the applications of drones in agriculture.	3	CO4	L2
8.	Explain the role of GPS and GIS in smart farming.	3	CO4	L2
Part B				
<i>(Answer any one full question from each Module. Each question carries 9 marks)</i>				
Module I				
Qn No.	Question	Marks	CO	BL
9	Explain the concept of precision agriculture and the need for smart farming in India.	9	CO1	L2
OR				
10	Explain the components of a smart farming system and the basics of data acquisition in agriculture.	9	CO1	L2
Module II				
Qn No.	Question	Marks	CO	BL
11	Explain the basic architecture of IoT and the role of microcontrollers in agricultural applications.	9	CO2	L2
OR				
12	Explain the wireless communication systems (Wi-Fi, GSM, LoRa) used in smart irrigation systems.	9	CO2	L2
Module III				
Qn No.	Question	Marks	CO	BL
13	Explain the types of agricultural data and the role of big data and AI/ML in farm management.	9	CO3	L2
OR				
14	Explain the role of Decision Support Systems and farm management software in agriculture.	9	CO3	L2
Module IV				
Qn No.	Question	Marks	CO	BL

15	Explain the applications of smart irrigation, fertigation and drones in agriculture.	9	CO4	L2
OR				
16	Explain the challenges, sustainability aspects and future scope of smart farming technologies.	9	CO4	L2
