

GANPAT UNIVERSITY									
FACULTY OF AGRICULTURE, ALLIED SCIENCES AND TECHNOLOGY									
Programme	B.Sc. (Hons.)				Branch/Spec.	Agriculture			
Semester	IV				Version	1.1.1.0			
Effective from Academic Year		2026-27			Effective for the Batch admitted in			July 2025	
Course Code	IVA07AIA		Course Name		Agricultural Informatics and Artificial Intelligence				
Teaching Scheme					Examination Scheme (Marks)				
(Per week)	Lecture (DT)		Practical (Lab.)		Total		CE	SEE	Total
	L	TU	P	TW					
Credit	2	0	1	0	3	Theory	40	40	80
Hours	2	0	2	0	4	Practical	20	00	20
Pre-requisites									
Not Applicable									
Course Outcomes									
On successful completion of the course, the students will be able to:									
CO1	To explain the fundamentals of computers including anatomy, memory concepts, operating systems, internet and WWW, and basic applications of MS-Office for documentation, data presentation and analysis.								
CO2	To apply basic concepts of computer programming languages (Visual Basic, Java, Fortran, C/C++) for standard input-output operations, database creation, and explain the role of DBMS in agricultural applications.								
CO3	To use and analyse IT tools and computer models for agriculture including statistical analysis, weather analysis, crop simulation models, geospatial technologies and decision support systems for farm planning and management.								
CO4	To analyse and evaluate e-Agriculture applications, ICT tools, mobile apps, automated systems, IoT and Big Data for computation of water and nutrient requirements, agri-input management and farm advisory services.								
CO5	To explain and apply concepts of artificial intelligence including search strategies and heuristics, and analyse the use of AI in smart agriculture for crop management, livestock health monitoring, yield prediction, food processing and digital agriculture initiatives in India.								
Theory Syllabus									
Unit	Content								Hrs.
1	Introduction to Computers, Anatomy of Computers, Memory Concepts, Units of Memory, Operating System: Definition and types, Applications of MS-Office for creating, Editing and Formatting a document, Data presentation, Tabulation and graph creation, Statistical analysis, Mathematical expressions, Database, concepts and types, creating database, Uses of DBMS in Agriculture, Internet and World Wide Web (www): Concepts and components.								6
2	Computer programming: General concepts, Introduction to Visual Basic, Java, Fortran, C/ C++, etc. concepts and standard input/output operations. e-Agriculture, Concepts, design and development; Application of innovative ways to use information and communication technologies (IT) in Agriculture; Computer Models in Agriculture: Statistical, weather analysis and crop simulation models, concepts, structure, inputs files, limitation, advantages and application of models for understanding plant processes, sensitivity, verification, calibration and validation								8
3	IT applications for computation of water and nutrient requirement of crops; Computer-controlled devices (automated systems) for Agri-input management; Smartphone mobile apps in agriculture for farm advice: Market price, postharvest management etc.; Geospatial technology: Concepts, techniques, components and uses for generating valuable Agri-information; Decision support systems: Concepts components and applications in agriculture; Agriculture Expert System; Soil Information Systems etc. for supporting farm decisions. Preparation of contingent crop-planning and crop calendars using IT tools								8
4	Digital India and schemes to promote digitalization of agriculture in India. Introduction to artificial intelligence, background and applications, Turing test. Control strategies, Breadth-first search, Depth-first search; Heuristics search techniques: Best-first search, A* algorithm, IoT and Big Data; Use of AI in agriculture for autonomous crop management, and health, monitoring livestock health, intelligent pesticide application, yield mapping and predictive analysis, automatic weeding and harvesting, sorting of produce, and other food processing applications; Concepts of smart agriculture, use of AI in food and nutrition science etc.								8
Practical Content									
1. Study of computer components, accessories,									

Note: Version 1.0.0.0 (First Digit= New syllabus/Revision in Full Syllabus, Second Digit=Revision in Teaching Scheme, Third Digit=Revision in Exam Scheme, Forth Digit= Content Revision)

L=Lecture, TU=Tutorial, P= Practical/Lab., TW= Term work, DT= Direct Teaching, Lab.= Laboratory work
CE= Continuous Evaluation, SEE= Semester End Examination

2. Practice of important DoS Commands,
3. Introduction of different operating systems such as Windows, Unix/ Linux, creating files and folders, File Management.
4. Use of MS-WORD and MS Power-point for creating, editing and presenting a scientific document,
5. MS- EXCEL - Creating a spreadsheet, Use of statistical tools, writing expressions, Creating graphs, Analysis of scientific data, Handling macros.
6. MS-ACCESS: Creating Database, preparing queries and reports,
7. Demonstration of Agri- information system,
8. Introduction to World Wide Web (WWW) and its components,
9. Introduction of programming languages such as Visual Basic, Java, Fortran, C, C++.
10. Hands on practice on Crop Simulation Models (CSM), DSSAT/Crop-Info/Crop Syst/ Wofost,
11. Preparation of inputs file for CSM and study of model outputs, computation of water and nutrient requirements of crop using CSM and IT tools,
12. Use of smart phones and other devices in agro-advisory and dissemination of market information
13. Introduction of Geospatial Technology, Hands on practice on preparation of Decision Support System
14. Preparation of contingent crop planning, India Digital Ecosystem of Agriculture (IDEA)

Text Books

- | | |
|---|---|
| 1 | Sethi, D. P. and Pradhan, M. 2017. Concepts and Techniques of Programming in C. I.K. International Publishing House Pvt. Limited. |
|---|---|

Reference Books

- | | |
|---|---|
| 1 | Kumar, E. 2020. Artificial Intelligence. Wiley. |
| 2 | Vanitha, G. 2023. Agro-Informatics. NIPA, New Delhi. |
| 3 | Date, C. J. 2000. Introduction to Database Management System. Addison-Wesley. |

	PO1	PO2	PO3	PO4	PO5	PO6	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	2	1	1	3	2	3	1	2	1	1	3	3
CO2	1	1	1	2	3	2	1	2	1	2	2	2
CO3	2	1	3	3	3	3	1	2	2	1	2	3
CO4	1	1	1	2	1	2	1	2	2	1	1	2
CO5	2	2	1	2	1	1	2	1	2	1	2	1

Note: Version 1.0.0.0 (First Digit= New syllabus/Revision in Full Syllabus, Second Digit=Revision in Teaching Scheme, Third Digit=Revision in Exam Scheme, Forth Digit= Content Revision)

L=Lecture, TU=Tutorial, P= Practical/Lab., TW= Term work, DT= Direct Teaching, Lab.= Laboratory work
CE= Continuous Evaluation, SEE= Semester End Examination