

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	IVA06WMT		Course Name		Water Management				
Teaching Scheme					Examination Scheme (Marks)				
(Per week)	Lecture (DT)		Practical (Lab.)		Total		CE	SEE	Total
	L	TU	P	TW					
Credit	1	0	1	0	2	Theory	40	40	80
Hours	1	0	2	0	3	Practical	20	00	20
Pre-requisites									
Not Applicable									
Course Outcomes									
On successful completion of the course, the students will be able to:									
CO1	To define and explain irrigation and its objectives, describe soil–plant–water relationships, water resources in India, and the role of water in plant growth.								
CO2	To analyse soil moisture availability, moisture distribution, rooting characteristics, water budgeting, evapotranspiration, crop water requirement and evaluate the effects of moisture stress on crop growth.								
CO3	To apply and analyse different methods of soil moisture estimation, irrigation scheduling, surface, sub-surface and pressurized irrigation systems (sprinkler and drip), including fertigation and economic use of irrigation water.								
CO4	To evaluate and implement efficient irrigation layouts, water use efficiency, conjunctive use of water, irrigation water quality management, and assess modern approaches such as automation, artificial intelligence and climate-based irrigation for different crops.								
Theory Syllabus									
Unit	Content								Hrs.
1	Irrigation: definition and objectives; Importance: Function of water for plant growth, water resources and irrigation development for different crops in India; Soil plant water relationships; Available and unavailable soil moisture, distribution of soil moisture, water budgeting, rooting characteristics, moisture extraction pattern, effect of moisture stress on crop growth.								3
2	Methods of soil moisture estimation, evapotranspiration and crop water requirement; effective rainfall, different approaches of scheduling of irrigation; Methods of irrigation: surface and sub-surface, pressurized methods, viz., sprinkler and drip irrigation, their suitability, merits and limitations, fertigation, economic use of irrigation water								4
3	Layout of different irrigation systems, Irrigation efficiency and water use efficiency, conjunctive use of water, irrigation water quality and its management. Water management of different crops (rice, wheat, maize, groundnut, sugarcane, mango, banana and tomato)								4
4	Quality of irrigation water, irrigation management practices for different soils and crops, drip, sprinkler. Layout of underground pipeline system, Irrigation automation, Artificial Intelligence and climate-based irrigation practices and its management.								4
Practical Content									
<ol style="list-style-type: none"> Determination of bulk density by field method Determination of soil moisture content by gravimetric method, tensiometer, electrical resistance block and neutron moisture meter Determination of field capacity by field method Determination of permanent wilting point; Measurement of irrigation water by using water measuring devices viz., flumes, weirs, notches, orifices Calculation of irrigation water requirement (Problems) Determination of infiltration rate; Demonstration of furrow method of irrigation Demonstration of check basin and basin method of irrigation Visit to farmers' field and cost estimation of drip irrigation system Demonstration of filter cleaning, fertigation, injection and flushing of laterals Layout for different methods of irrigation, Erection and operation of sprinkler irrigation system Measurement of emitter discharge rate, wetted diameter and calculation of emitter discharge variability 									

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

12. Visit the irrigation research centre/ station and visit the command area	
Text Books	
1	Dilipkumar Mujmdar. Irrigation water management: Principles and Practices. Prentice Hall of India Pvt. Ltd.,
Reference Books	
1	S.V. Patil & Rajakumar, G. R., Water Management in Agriculture and Horticultural Crops. Satish serial publishing House, Delhi.
2	Michael, A.M. Irrigation Theory and practice. Vikas publishing house Pvt, Ltd.

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

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