

# Water Resource Engineering



Prepared by:-  
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## VISION

To become a role model in the field of Civil Engineering for the sustainable development of the society.

## MISSION

- 1) To provide outcome base education.
- 2) To create a learning environment conducive for achieving academic excellence.
- 3) To prepare civil engineers for the society with high ethical values.

# CIVIL ENGINEERING DEPARTMENT

## Program Educational Objectives

- 1 To strengthen students with fundamental knowledge, effective computing, problem solving and communication skills enable them to have successful career in civil engineering.
2. To enable students in acquiring civil engineering's latest tools, technologies and management principles to give them an ability to solve multidisciplinary engineering problems.
3. To impart students with ethical values and commitment towards sustainable development in collaborative mode.
4. To reinforce students with research aptitude and innovative approaches which help them to identify, analyze, formulate and solve real life problems and motivates them for lifelong learning.
5. To empower students with leadership quality and team building skills that prepare them for employment, entrepreneurship and to become competent professionals to serve societies and global needs

# Course Outcomes of WRE

After completing this course the student must demonstrate the knowledge and ability to:

CO-1: Student can able to understand different terminology related to Irrigation structures and design of regulatory works.

CO-2: Student can able to understand the various types head works and design of diversion head works.

CO-3: Student can understand various methods of analysis of the stability of dams and estimation of floods.

CO-4: Student can apply mathematics, science and technology in the field of water resources engineering.

# CO-PO MAPPING

Enter correlation levels 1, 2 or 3 as: [1: Slight (Low)], [2: Moderate (Medium)] and [3: Substantial (High)] moreover if there is no correlation, put “-”.

CO/PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12
CO 1	3	3	2	2	-	3	3	-	2	2	1	3
CO 2	3	2	3	3	-	3	3	-	2	2	3	3
CO 3	3	3	3	3	3	-	3	3	-	3	3	2
CO 4	3	3	3	3	-	3	3	-	3	3	3	3



# Lecture Plan

Unit No./ Total lec. Req.	Topics	Lect. Req.
Unit-1	1. Definitions, functions and advantages of irrigation, present status of irrigation in India	1
	2. classification for agriculture, soil moisture and crop water relations	1
	3. Irrigation water quality. Consumptive use of water	1
	4. principal Indian crop seasons and water requirements	1
Unit- 2	1. Types of canals, parts of canal irrigation system	1
	2. channel alignment, assessment of water requirements, estimation of channel losses	1
	3. design of channels, regime and semi theoretical approaches	1
	4. Kennedy's Theory, Lacey's Theory	1
	5. cross section of channels, silt control in canals	1
Unit- 3	1. System of regulation and control, outlets, assessment of canal revenue	1
	2. Critical tractive force, regimes of flow	1
	3. resistance relationship for natural streams, bed load	1
	4. meandering, aggradations and degradation, different stages of rivers	1
	5. Design for surface and subsurface flows, Bligh's and Khosla's methods.	1
	6. river training & bank protection works	1
Unit -4	1. Necessity of Cross drainage structures, their types and selection, comparative merits and demerits	1
	2. Cross-Drainage Structures SKETCHES	1
	3. Open wells and tube wells,types of tube wells,duty of tube well water	1
	4. types of channels lining	1
Unit-5	1. Definition, Hydrologic cycle, Application to Engineering problems	1
	2. measurement of rainfall	1
	3. rain gauge, peak flow, flood frequency method	1
	4. catchment area formulae	1
	5. Flood hydrograph	1
	6. Rainfall analysis, Infiltration, Run off	1
	7. Unit hydrograph and its determination	1
	8. Estimation of run off	1
	TOTAL	28

# 5CE4-05: WATER RESOURCE ENGINEERING SYLLABUS

**Credit: 2**  
**2L+0T+0P**

**Max. Marks: 100(IA:20, ETE:80)**  
**End Term Exam: 2 Hours**

<b>SN</b>	<b>Contents</b>	<b>Hours</b>
<b>1</b>	Introduction: Objective, scope and outcome of the course.	<b>1</b>
<b>2</b>	<b>Introduction:</b> Definitions, functions and advantages of irrigation, present status of irrigation in India, classification for agriculture, soil moisture and crop water relations, Irrigation water quality. Consumptive use of water, principal Indian crop seasons and water requirements.	<b>5</b>
<b>3</b>	<b>Canal Irrigation:</b> Types of canals, design of channels, regime and semi theoretical approaches (Kennedy's Theory, Lacey's Theory) <b>Diversion Head works:</b> Design for surface and subsurface flows, Bligh's and Khosla's methods.	<b>6</b>
<b>4</b>	<b>Embankment Dams:</b> Suitable sites, causes of failures, stability and seepage analysis, flow net, principles of design of earth dams. <b>Gravity Dams:</b> Force acting on a gravity dam, stability requirements.	<b>5</b>
<b>5</b>	<b>Well Irrigation:</b> Open wells and tube wells, types of tube wells, duty of tube well water. <b>Cross-Drainage Structure:</b> Necessity of Cross- drainage structures, their types and selection, comparative merits and demerits.	<b>5</b>
<b>6</b>	<b>Hydrology:</b> Definition, Hydrologic cycle, measurement of rainfall, Flood hydrograph, Rainfall analysis, Infiltration, Run off, Unit hydrograph and its determination.	<b>6</b>
		<b>28</b>