

Course File

Water Resources Engineering (5CE4-05)

Semester: V Year: III (2023-24)

Name of faculty: Dr. Kuldeep Swarnkar

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Total Number of Lectures: 28

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VISSION & MISSION OF INSTITUTE

Vision

Empowering student with recent and emerging technologies to create innovative technical leaders capable of contributing to industrial and societal needs for betterment of mankind across the globe.

Mission

M1: To provide dynamic learning environment to students by providing constant exposure to latest technologies by linking closely with the industries.

M2: To establish effective interface with industry to obtain live problems to enhance critical thinking and problem solving skills among students and consultancy projects for faculty.

M3: To provide avenues and opportunities to faculty for domain specific trainings and qualification upgradation.

M4: To develop ethical leaders with strong communication skills.

VISION & MISSION OF DEPARTMENT

Department Vision

To increase students learning of fundamentals for designing and planning of buildings and latest technologies through industry-aligned project-based learning which will help in transforming students to be good civil engineering professionals leading to innovation and incubation of new ideas.

Department Mission

M1: To create experimental learning through solving problems of Government, Society, Smart Cities, Industry and other entities.

M2: To teach the latest technologies to the students as beyond the syllabus activity so that they are updated and industry ready.

M3: To enable engineering students understand industry-aligned technologies and learn to find solutions from their early engineering days and this is the only way to produce globally relevant engineers solving real-life problems applying current technologies.

M4: To enable students to generate projects through problem faced by and requirement of Smart cities, industry, Government and other entities whereby those outlined problem statements are to be studied deeply by a group of faculty members to convert them into real-time project format.

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

PEOs 1: To provide an in-depth understanding of the fundamentals of Civil Engineering and create a foundation for lifelong learning to facilitate a progressive career in the construction Industry, as an entrepreneur and in pursuit of higher studies.

PEOs 2: To equip the students with technical and analytical skills to develop innovative solutions to complex real-life problems using existing and novel technologies. To equip the students with good communication and interpersonal skills, inter-disciplinary teamwork and leadership skills to enable them to fulfill professional responsibilities.

PEOs 3: To expose them to various contemporary issues which will enable them to become ethical and responsible towards themselves, co-workers, Society and the Nation.

PEOs 4: To make the student's industry ready by imparting education related to the latest technologies so that they can grab future industry jobs.

PROGRAM SPECIFIC OUTCOMES (PSO's)

- PSO1: To be aware of and initiate some-work on future technologies and new developments which may impact the future Industry 4.0.
- PSO2: Hands on training on upcoming technologies and project-based learning.
- PSO3: Get exposure to BIM (Building Information Modeling).

PROGRAMME OUTCOMES (POs)

A student will develop:

- PO01. ENGINEERING KNOWLEDGE: An ability to apply knowledge of Mathematics, Science and Engineering Fundamentals in Electronics and Communication Engineering.
- PO02. PROBLEM ANALYSIS: Ability to analyze and interpret data by designing and conducting experiments. Develop the knowledge of developing algorithms, designing, implementation and testing applications in electronics and communication related areas.
- PO03. DESIGN/ DEVELOPMENT OF SOLUTION: An ability to Design a system Component or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability.
- PO04. CONDUCTION OF INVESTIGATION OF COMPLEX PROBLEMS: Ability to Identify, formulate and solve engineering problems.
- PO05. MODERN TOOL USAGE: An ability to use the techniques, skills and modern engineering tools necessary for engineering practice.
- PO06. THE ENGINEERING AND SOCIETY: Broad education necessary to understand the impact of engineering solutions in a global, economic, environmental and societal context.
- PO07. ENVIRONMENT & SUSTAINABILITY: Understand the impact of professional engineering solution in societal and environmental contexts, and demonstrate the knowledge of, and need of sustainable development.
- PO08. ETHICS: An ability to understand the professional, social and ethical responsibility.

PO09. INDIVIDUAL AND TEAM WORK: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO10. COMMUNICATION: An ability to Communicate effectively in order to succeed in their profession such as, being able to write effective reports and design documentation, make effective presentations.

PO11. PROJECT MANAGEMENT & FINANCE: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in team, to manage projects and in multidisciplinary environment.

PO12. LIFE-LONG LEARNING: Recognize the need and an ability to engage in life-long learning.

Course Overview:

Water resources engineering is the quantitative study of the hydrologic cycle -- the distribution and circulation of water linking the earth's atmosphere, land and oceans. Surface runoff is measured as the difference between precipitation and abstractions, such as infiltration (which replenishes groundwater flow), surface storage and evaporation. Applications include the management of the urban water supply, the design of urban storm-sewer systems, and flood forecasting. Hydraulic engineering consists of the application of fluid mechanics to water flowing in an isolated environment (pipe, pump) or in an open channel (river, lake, and ocean). Civil engineers are primarily concerned with open channel flow, which is governed by the interdependent interaction between the water and the channel.

After studying Water Engineering, graduates can work as a Water Resource Engineer, Environmental Engineer, Hydrologist/ Hydrological Engineer, Sustainability Engineer/ Sustainable Energy Technologist, Environmental Protection Specialist, etc and can earn around INR 4 LPA to INR 6 LPA. Their salary will increase gradually as per the experience they gather throughout the duration of B.Tech Water Resource Engineering course.

Course Outcome:

CO. NO.	Cognitive Level	Course Outcome
1	Comprehension	Students will be able to Understand the basics of Hydrograph, rainfall analysis and its distribution.
2	Analysis	Student will learn to analyse the rainfall patterns and can evaluate the same with probabilistic methods.
3	Synthesis	Students be able to design the channels on the basis of Kennedy's theory and Lacey's theory.
4	Synthesis	Students will be able to generate designs and layout of canal according to the use.
5	Synthesis	Students be able to differentiate between types of canals and canal headworks.

Mapping COs, POs and PSOs:

Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PS O1	PS O2	PS O3
CO25405.1	2	3	3	3	0	1	0	0	0	0	1	0	2	1	1
CO25405.2	3	2	2	3	0	1	0	0	0	0	1	0	2	1	1
CO25405.3	1	2	2	2	0	1	0	0	0	0	1	0	2	2	1
CO25405.4	2	2	2	3	0	1	0	0	0	0	1	0	2	1	1
CO25405.5	2	2	2	2	0	1	0	0	0	0	1	0	2	1	1

UNIVERSITY ACADEMIC CALENDAR

Academic Calendar for Odd Semester for Session

RAJASTHAN TECHNICAL UNIVERSITY KOTA				
Course: Bachelor of Technology (B.TECH.) for Odd Semester				
Semester	I	III	V	VII
Induction Program	17.08.2023			
Commencement of Classes	11.09.2023	24.08.2023	04.09.2023	04.09.2023
Commencement of First Mid Term	02.11.2023	03.10.2023	05.10.2023	05.10.2023
Commencement of Second Mid Term	07.12.2023	16.11.2023	20.11.2023	20.11.2023
Last Working Day	23.12.2023	02.12.2023	02.12.2023	30.11.2023
Commencement of Practical Exams	02.01.2024	04.12.2023	23.12.2023	14.12.2023
Commencement of Theory Exams	18.01.2024	14.12.2023	08.12.2023	07.12.2023
Winter Break				

ACADEMIC CALENDAR OF INSTITUTE

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Academic Calendar

Academic Calendar for Odd Semester for Session 2023-24 (Odd Semester)

Course: Bachelor of Technology (B.TECH.)				
Semester	I	III	V	VII
Induction Program	10-08-2023			
Commencement of Classes	20-08-2023	11-09-2023	30-08-2023	22-08-2023
Commencement of First Mid Term	04-11.2023	02-11.2023	02-11.2023	27-09-2023
Commencement of Second Mid Term	15-01-2024	27-12-2023	27-12-2023	05-12-2023
Last Working Day	20-01-2024	12-01-2024	12-01-2024	20-12-2023
Commencement of Practical Exams	29-01-2024	15-01-2024	15-01-2024	31-12-2023
Commencement of Theory Exams	15-02-2024	30-01-2024	29-01-2024	27-12-2023

Evaluation Scheme

FACULTY DETAILS:

Name of the Faculty : Dr. Kuldeep Swarnkar

Designation : Assistant Professor

Department : Civil Engineering

1. TARGET

a) Percentage Pass : 100 %

b) Percentage I class: 70 %

2. METHOD OF EVALUATION

2.1. Continuous Assessment Examinations (Mid-Term 1 & 2)

2.2. Assignments / Seminars

2.3. Mini Projects

2.4. Quiz

2.5. Semester Examination

Others _____

3. List out any new topic(s) or any innovation you would like to introduce in teaching the subject in this Semester.

1. Take the help of creative tools to stimulate creativity. Include slide presentations, demonstration or forms of visual exercises that will excite the young minds and capture their interest.

Signature of Faculty:

Signature of HOD

UNIVERSITY SYLLABUS



RAJASTHAN TECHNICAL UNIVERSITY, KOTA

Syllabus

3rd Year - V Semester: B.Tech. (Civil Engineering)

5CE4-05: WATER RESOURCE ENGINEERING

Credit: 2
2L+0T+0P

Max. Marks: 100(IA:30, ETE:70)
End Term Exam: 3 Hours

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

TEXT/REFERENCE BOOKS

1. Irrigation Water Power and Water Resource Engineering by KR Arora, Standard Publishers and Distributors, Delhi.
2. Water Resource Engineering by Modi, Standard Publishers.
3. Irrigation and Water Power Engineering by BC Punmia & B B Lal, Laxmi Publication (P) Ltd.
4. Irrigation Engineering by G.L. Asawa, New Age International Publishers, New Delhi.

WEEKLY TIME TABLE OF THE TEACHER

First Time Table: with effect from (Date): Effective from 17 August 2023

Day	1	2	3	4	5	6	7
Monday						WRE	WRE
Tuesday						WRE	
Wednesday							WRE
Thursday			WRE				
Friday	WRE						
Saturday							

COURSE-PLAN

Lect. No.	Unit	Topics	Teaching methods/ teaching aids
1.	1	Introduction: objective, scope and outcome of the course	White board, ppt,
2.	2	Introduction: definitions, functions and advantages of irrigation, present Status of irrigation in india	White board, ppt, demonstration
3.	2	Classification for agriculture, soil moisture and crop water relations	White board
4.	2	Irrigation water quality. Consumptive use of water	White board
5.	2	Principal indian crop seasons and water requirements	White board
6.	3	Canal irrigation: types of canals, design of channels	White board, ppt
7.	3	Regime and semi theoretical approaches (kennedy's theory, lacey's theory)	White board
8.	3	Diversion head works: design for surface and subsurface flows	White board
9.	3	Bligh's and khosla's methods	White board, ppt
10.	4	Embankment dams: suitable sites	White board
11.	4	Causes of failures, stability and seepage analysis	White board
12.	4	Flow net, principles of design of earth dams	White board, ppt,
13.	4	Gravity dams: force acting on a gravity dam, stability requirements	White board
14.	5	Well irrigation: open wells and tube wells	White board, ppt, demonstration
15.	5	Types of tube wells, duty of tube well water	White board
16.	5	Cross-drainage structure: necessity of cross drainage structures, their types and	White board
17.	5	Comparative merits and demerits	White board
18.	6	Hydrology: definition, hydrologic cycle	White board
19.	6	Measurement of rainfall, flood hydrograph	White board, ppt
20.	6	Flood hydrograph	White board
21.	6	Rainfall analysis, infiltration	White board, ppt
22.	6	Run off	White board

23.	6	Unit hydrograph and its determination	White board, ppt,
24.	6	Unit hydrograph and its determination	White board
25.		Revision to coursework	White board, demonstration
26.		Revision to coursework	White board
27.		Revision to coursework	White board
28.		Revision to coursework	White board

Signature of Faculty:

Signature of HOD

Assignment Sheet

ASSIGNMENT NO. 1

1. How will you test the consistency of rainfall record?
2. Explain the difference between evaporation, interception and transpiration?
3. Write the applications of Unit Hydrograph.
4. What do you understand by routing of a flood?
5. Define the terms aquiclude and aquitard.
6. Define the Instantaneous unit hydrograph and write its uses.

ASSIGNMENT NO. 2

1. Explain the types of rain gauges with their relative advantages and disadvantages.
2. A catchment has six rain gauge stations. The annual rainfall values in a year recorded by these gauges are 130, 140, 118, 108, 145 and 102 cm respectively. For a 5% error in the estimation of mean rainfall, calculate the optimum number of rain gauge stations in the catchment. Also determine the percentage of error in recording rainfall if an extra five rain gauge stations are installed in the catchment.
3. Explain briefly the evaporation process. Explain the factors that influence the process of evaporation?
4. The average rainfall over 45 ha of watershed for a particular storm is given below. The volume of runoff from this storm was determined as 2.25 ha-m. Determine w-index and ϕ -index.

Time (hr)	0	1	2	3	4	5	6	7
Rainfall (cm)	0	0.5	1.0	3.25	2.5	1.5	0.5	0

5.a) What are the various factors affecting the runoff? Explain.

b) The ordinates of a 12-hr unit hydrograph are given below. Compute 6-hr unit hydrograph ordinates using S-curve technique.

Time (hr)	0	6	12	18	24	30	36	42	48	54	60
12-hr UH	0	1	4	8	16	19	15	12	8	5	3

SAMPLE QUIZ QUESTIONS

1. Bernard's distribution graph is a plot of time on X-axis and
 - (A) Run off on the y-axis
 - (B) Total run off on the y-axis
 - (C) Percentage of total surface run off on y-axis
 - (D) Percentage of total surface run off during uniform time intervals on y-axis
2. The rate of evaporation from reservoirs may be determined by
 - (A) Pan-measurement method
 - (B) Empirical formulae
 - (C) Storage equation method
 - (D) All the above
3. Pick up the correct statement from the following:
 - (A) Rain which is intercepted by buildings, vegetation's and other objects, is generally known as rainfall interception
 - (B) The difference between the total rainfall and intercepted rainfall, is generally called ground rainfall
 - (C) When rainfall exceeds the interception rainfall, water reaches the ground and infiltration starts
 - (D) All the above
4. The standard height of a standard rain gauge, is
 - (A) 10 cm
 - (B) 20 cm
 - (C) 30 cm
 - (D) 50 cm
5. The runoff is affected by
 - (A) Type of precipitation
 - (B) Rain intensity and duration of rainfall
 - (C) Rain distribution and soil moisture deficiency
 - (D) All the above

6. With the usual meanings of letters, the equation $V = 400 I (D102/4)$ is used for determining the velocity of ground water flow in metres per day. It is known as

- (A) Meinzer's formula
- (B) Slichter's formula
- (C) Darcy's formula
- (D) Hazen's formula

7. Hydrology is the science which deals with

- (A) Rain water
- (B) River water
- (C) Sea water
- (D) Surface and underground water

8. Symon's rain gauge is

- (A) Tipping-bucket gauge
- (B) Weighing type gauge
- (C) Float recording gauge
- (D) Non-recording gauge

9. If P and A are the perimeter and area of a drainage basin, its compactness coefficient, is

- (A) $P^2/2\pi A$
- (B) $P/2\pi A$
- (C) $P/2\sqrt{\pi A}$
- (D) $P^3/\pi^3 A$

TECHNO INDIA NJR INSTITUTE OF TECHNOLOGY, UDAIPUR

B. TECH. 3rd YEAR (V SEM.) – MT-I

Water Resource Engineering (5CE4-05)

Time: 2 Hours

Max. Marks: 70

Note:

- 1) The paper is divided into 2 parts: Part-A and Part-B.
- 2) Part-A contains 10 questions and carries 2 marks each.
- 3) Part-B contains 5 questions. Each question has two options and carries 10 marks each.

Part- A (20 Marks)

A.	Enlist functions of irrigation water.	CO1
B.	What do you mean by “consumptive use of water”?	CO1
C.	Explain field capacity (F_c).	CO1
D.	Classify principal Indian crops based on crop seasons.	CO1
E.	Define duty and delta along with their relation.	CO1
F.	Enlist different forms of precipitation.	CO2
G.	What is the hydrologic cycle?	CO2
H.	What is a rain gauge and what are its types?	CO2
I.	Define a hyetograph with its drawing.	CO2
J.	What is a unit hydrograph?	CO2

Part- B (50 Marks)

1. What are the benefits and ill effects of irrigation?	CO1
OR	
1. What are the factors affecting duty and how it can be improved?	CO1

2. A watercourse has a culturable commanded area of 1200 hectares. The intensity of irrigation for crop A is 40% and for B is 35%, both the crops being Rabi crops. Crop A has a kor period of 20 days and crop B has a kor period of 15 days. Calculate the discharge of the watercourse if the kor depth for crop A is 10 cm and for B it is 16 cm.	CO1
OR	
2. An irrigation canal has a gross commanded area of 80,000 hectares out of which 85% is culturable irrigable. The irrigation intensity for the Kharif season is 30% and the Rabi season 60%. Find the discharge required at the head of the canal if the duty at its head is 800 hectares/cumecs for the Kharif season and 1700 hectares/cumec for the rabi season.	CO1

3. The table below provides the necessary data about the crop, their duty, and the area under each crop, commanded by a canal taking off from a storage tank. Taking a time factor for the canal to be $13/20$, calculate the discharge required at the head of the canal. If the capacity factor is 0.8, determine the design discharge.

CO1

Crop	Base period (days)	Area (hectare)	Duty at the head of canal (hectare/cumec)
Sugarcane	320	850	580
Overlap for sugarcane during hot weather	90	120	580
Wheat (Rabi)	120	600	1600
Bajri (Monsoon)	120	500	2000
Vegetable (Hot weather)	120	360	600

OR

3. What are the methods for computing runoff from a catchment area? Write down various formulae.

CO2

4. Explain Symon's rain gauge with a figure.

CO2

OR

4. What are the advantages and sources of errors in recording type rain gauges?

CO2

5. Explain methods for computation of average rainfall over a basin.

CO2

OR

5. Explain losses from precipitation in detail.

CO2

Marks and Gap Analysis of Mid-Term 1

S.No	University Roll No.	Name of Student	Mid-Term 1 MM-70	Remark (Remedial Class need or not – Y/N)
1.	21ETCCE001	Dev vaishnav	54	N
2.	21ETCCE002	Hitesh Sutradhar	44	N
3.	21ETCCE004	Naved khan	47	N
4.	21ETCCE006	Pushpendra gehlot	58	N
5.	21ETCCE007	Shalin Dak	44	N
6.	21ETCCE009	Tamanna kumawat	68	N
7.	21ETCCE300	Muniraj Sharma	68	N
8.	22ETCCE200	Moiz Udaipurwala	56	N
9.	22ETCCE201	Vikas Suthar	65	N

*(Y, if obtained marks are <50%)

Signature of Faculty:

Signature of HOD

Remedial Action Taken to Remove the Gaps (After Mid- Term 1)

S.no.	University Roll no.	Name of Student	Topics to be discussed in Remedial Class	Schedule Date of Remedial Class	Outcome Achieved
1.	NIL				
2.					

Signature of Faculty:

Signature of HOD

TECHNO INDIA NJR INSTITUTE OF TECHNOLOGY, UDAIPUR

B. TECH 3rd – YEAR (V SEM.)

Water Resource Engineering (SCE4-05)

Time: 3 Hours

Max. Marks: 70

Note:

- 1) The paper is divided into 3 parts: Part-A, Part-B and Part-C.
- 2) Part-A contains 10 questions and carries 2 mark each.
- 3) Part-B contains 7 questions carries 4 marks each. Attempt any 5 Questions.
- 4) Part-C contains 5 questions carries 10 marks each. Attempt any 3 Questions.

Part- A (20 Marks)

A.	What are the functions of irrigation water?	CO1
B.	What is limiting soil moisture condition?	CO1
C.	Define alluvial and Non-alluvial channels.	CO2
D.	What are drawbacks in Kennedy's theory?	CO2
E.	What are downstream drainage systems in earthen dams?	CO3
F.	What is a flow net?	CO3
G.	Define an aquifer.	CO4
H.	Explain Darcy's law.	CO4
I.	What do you mean by intensity of rainfall?	CO5
J.	Differentiate between hydrograph and hyetograph.	CO5

Part- B (20 Marks)

1.	Discuss various types of irrigation.	CO1
2.	Discuss various types of canals.	CO2
3.	What is a zoned embankment type dam?	CO3
4.	Discuss confined and unconfined aquifer.	CO4
5.	What are various types of tube wells?	CO4
6.	Explain tipping bucket type rain gauge.	CO5
7.	What are factors which affect the runoff?	CO5

Part- C (30 Marks)

1.	<p>The base period, intensity of irrigation and duty of various crops under a canal system are given in Table below. Find the reservoir capacity if the canal losses are 20% and reservoir losses are 12%.</p> <table border="1" data-bbox="268 322 1300 629"> <thead> <tr> <th data-bbox="268 322 512 434">Crop</th> <th data-bbox="517 322 699 434">Base period (days)</th> <th data-bbox="703 322 1023 434">Duty at the field (hectare/cumec)</th> <th data-bbox="1027 322 1300 434">Area under the crop (hectares)</th> </tr> </thead> <tbody> <tr> <td data-bbox="268 441 512 472">Wheat</td> <td data-bbox="517 441 699 472">120</td> <td data-bbox="703 441 1023 472">1800</td> <td data-bbox="1027 441 1300 472">4800</td> </tr> <tr> <td data-bbox="268 479 512 510">Sugar-cane</td> <td data-bbox="517 479 699 510">360</td> <td data-bbox="703 479 1023 510">800</td> <td data-bbox="1027 479 1300 510">5600</td> </tr> <tr> <td data-bbox="268 517 512 548">Cotton</td> <td data-bbox="517 517 699 548">200</td> <td data-bbox="703 517 1023 548">1400</td> <td data-bbox="1027 517 1300 548">2400</td> </tr> <tr> <td data-bbox="268 555 512 586">Rice</td> <td data-bbox="517 555 699 586">120</td> <td data-bbox="703 555 1023 586">900</td> <td data-bbox="1027 555 1300 586">3200</td> </tr> <tr> <td data-bbox="268 593 512 624">Vegetables</td> <td data-bbox="517 593 699 624">120</td> <td data-bbox="703 593 1023 624">700</td> <td data-bbox="1027 593 1300 624">1400</td> </tr> </tbody> </table>	Crop	Base period (days)	Duty at the field (hectare/cumec)	Area under the crop (hectares)	Wheat	120	1800	4800	Sugar-cane	360	800	5600	Cotton	200	1400	2400	Rice	120	900	3200	Vegetables	120	700	1400	CO1
Crop	Base period (days)	Duty at the field (hectare/cumec)	Area under the crop (hectares)																							
Wheat	120	1800	4800																							
Sugar-cane	360	800	5600																							
Cotton	200	1400	2400																							
Rice	120	900	3200																							
Vegetables	120	700	1400																							
2.	<p>Using Lacey's theory design a channel section for the following data: Discharge (Q) = 30 cumecs; Silt factor (f) = 1.00; Side slope = 0.5:1. Also find the longitudinal slope of the channel.</p>	CO2																								
3.	<p>What are causes of failures of earth dams?</p>	CO3																								
4.	<p>Classify types of cross-drainage works with sketches.</p>	CO4																								
5.	<p>What is unit hydrograph? List the assumptions involved in unit hydrograph theory.</p>	CO5																								

Marks and Gap Analysis of Mid-Term II

Sr. No.	University Roll No.	Name of Student	Mid-Term 2 MM-70	Remark (Remedial Class need or not – Y/N)
1.	21ETCCE001	Dev vaishnav	51	N
2.	21ETCCE002	Hitesh Sutradhar	40	N
3.	21ETCCE004	Naved khan	45	N
4.	21ETCCE006	Pushpendra gehlot	56	N
5.	21ETCCE007	Shalin Dak	41	N
6.	21ETCCE009	Tamanna kumawat	64	N
7.	21ETCCE300	Muniraj Sharma	63	N
8.	22ETCCE200	Moiz Udaipurwala	52	N
9.	22ETCCE201	Vikas Suthar	60	N

*(Y, if obtained marks are <50%)

Signature of Faculty:

Signature of HOD

Remedial Action Taken to Remove the Gaps (After Mid- Term II)

Sr. No.	University Roll no.	Name of Student	Topics to be discussed in Remedial Class	Schedule Date of Remedial Class	Course Outcome
1.	NIL				

Signature of Faculty:

Signature of HOD

University Question Paper

5E1345	Roll No.	Total No of Pages: 2
	5E1345 B. Tech. V - Sem. (Main / Back) Exam., Feb.-March - 2021 PCC/PEC Civil Engineering 5CE4 - 05 Water Resource Engineering	

Time: 2 Hours

[To be converted as per scheme]

Max. Marks: 65

Min. Marks: 23

Instructions to Candidates:

Attempt all five questions from Part A, four questions out of six questions from Part B and one questions out of three from Part C.

Schematic diagrams must be shown wherever necessary. Any data you feel missing may suitably be assumed and stated clearly. Units of quantities used /calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No. 205)

1. NIL

2. NIL

PART - A

(Answer should be given up to 25 words only)

[5×2=10]

All questions are compulsory

- Q.1 Define Hydrological cycle. [2]
- Q.2 Define consumptive use of water. [2]
- Q.3 Enumerate various factors affecting duty. [2]
- Q.4 Write the necessity of cross drainage structures. [2]
- Q.5 Describe the Phreatic line. [2]

PART - B

(Analytical/Problem solving questions)

[4×10=40]

Attempt any four questions

- Q.1 Write the drawbacks in Kennedy's theory. [10]
- Q.2 Draw a neat diagram for a diversion Headwork. [10]
- Q.3 Describe Khosla's theory. [10]
- Q.4 Discuss various modes of failure of a gravity dam. [10]
- Q.5 Discuss various types of tube wells. [10]
- Q.6 Write the various uses of Unit Hydrograph. [10]

PART - C

(Descriptive/Analytical/Problem Solving/Design Questions)

[1×15=15]

Attempt any one questions

- Q.1 What are Lacey's basic regime equations? Starting from the equations derive following equations - [15]
- (a) Wetted Perimeter
 - (b) Hydraulic Radius
 - (c) Bed Slope
- Q.2 A canal has a culturable commanded area of 1,00,000 ha. The intensities of irrigation for Kharif (Rice), Rabi (Wheat) and Sugarcane are respectively 20%, 30% and 10%. The consumptive use of water for the three crops is as under - [15]
- (a) Rice: July = 21cm, August = 24 cm, September = 12 cm, October = 12 cm.
 - (b) Wheat: December = 9cm, January = 9cm, February = 9cm, March = 9cm.
 - (c) Sugarcane: November = 6cm, December to April = 9cm every month, May = 12cm.
- Q.3 Design an irrigation channel by Kennedy's theory to carry a discharge of 5 cumecs. Take $m = 1.0$, $N = 0.0225$ and B/D ratio = 4.40. [15]
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STUDENT PERFORMANCE REPORT

Roll No.	Name of Student	I Mid-Term	II Mid-Term	Average
21ETCCE001	Dev vaishnav	54	51	52.5
21ETCCE002	Hitesh Sutradhar	44	40	42
21ETCCE004	Naved khan	47	45	46
21ETCCE006	Pushpendra gehlot	58	56	57
21ETCCE007	Shalin Dak	44	41	42.5
21ETCCE009	Tamanna kumawat	68	64	66
21ETCCE300	Muniraj Sharma	68	63	65.5
22ETCCE200	Moiz Udaipurwala	56	52	54
22ETCCE201	Vikas Suthar	65	60	62.5

Signature of Faculty:

Signature of HOD

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RESULT ANALYSIS

S.NO.	RTU ROLL NUMBER	NAME OF STUDENT	END TERM MARKS	SESSIONAL MARKS	TOTAL
		MAX MARKS	70	30	100
1.	21ETCCE001	Dev vaishnav	32	23	55
2.	21ETCCE002	Hitesh Sutradhar	34	19	53
3.	21ETCCE004	Naved khan	26	20	46
4.	21ETCCE006	Pushpendra gehlot	33	25	58
5.	21ETCCE007	Shalin Dak	29	19	48
6.	21ETCCE009	Tamanna kumawat	47	29	76
7.	21ETCCE300	Muniraj Sharma	49	29	78
8.	22ETCCE200	Moiz Udaipurwala	25	24	49
9.	22ETCCE201	Vikas Suthar	53	28	81

TOTAL	PASS	FAIL	ABSENT	PASS %
9	9	0	0	100 %

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Indirect Assessment:

Overall Teacher Self-Assessment (at the completion of course) in terms of course objective and outcomes

Course Objectives:

Water resources engineering is the quantitative study of the hydrologic cycle -- the distribution and circulation of water linking the earth's atmosphere, land and oceans. Surface runoff is measured as the difference between precipitation and abstractions, such as infiltration (which replenishes groundwater flow), surface storage and evaporation. Applications include the management of the urban water supply, the design of urban storm-sewer systems, and flood forecasting. Hydraulic engineering consists of the application of fluid mechanics to water flowing in an isolated environment (pipe, pump) or in an open channel (river, lake, and ocean). Civil engineers are primarily concerned with open channel flow, which is governed by the interdependent interaction between the water and the channel.

After studying Water Engineering, graduates can work as a Water Resource Engineer, Environmental Engineer, Hydrologist/ Hydrological Engineer, Sustainability Engineer/ Sustainable Energy Technologist, Environmental Protection Specialist, etc and can earn around INR 4 LPA to INR 6 LPA. Their salary will increase gradually as per the experience they gather throughout the duration of B.Tech Water Resource Engineering course.

Course Outcomes:

At the end of this course students will be able to:

1. Students will be able to Understand the basics of Hydrograph, rainfall analysis and its distribution.
2. Student will learn to analyse the rainfall patterns and can evaluate the same with probabilistic methods.
3. Students be able to design the channels on the basis of Kennedy's theory and Lacey's theory.
4. Students will be able to generate designs and layout of canal according to the use.
5. Students be able to differentiate between types of canals and canal headworks.

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Methodology to identify bright student

Considered a range of criteria, including academic performance, creativity, critical thinking, problem-solving skills, and enthusiasm for learning. Bright students often excel in multiple areas. Observed how students perform in the classroom. In terms of active participation, engagement in discussions, leadership, and the ability to grasp complex concepts.

Efforts to keep students engaged

1. Active Learning:
 - Incorporate active learning strategies, such as group discussions, problem-solving activities, and hands-on projects. Active participation keeps students engaged and encourages critical thinking.
2. Varied Teaching Methods:
 - Use a variety of teaching methods, including lectures, group work, multimedia presentations, and interactive activities to cater to different learning preferences.
3. Technology Integration:
 - Leverage technology, such as online platforms, educational apps, and interactive software, to make lessons more engaging and interactive.

Methodology to identify weak student

Considered a range of criteria, including classroom observation, formative assessment, summative assessment, assignment review e.t.c. Weak students are struggling students with sensitivity and a desire to support their learning. Some measures, such as additional tutoring, personalized assignments, or alternative assessment methods, to help students succeed.

Targeted interventions for weak student

1. Additional Resources

Offer supplementary learning materials, such as textbooks, online resources, or multimedia content, to provide alternative explanations and reinforce key concepts.

2. Remedial classes

Establish a tutoring program where students can receive extra help from teachers.

3. Flipped classroom

Students are assigned pre-class learning materials, often in the form of videos, readings, or online modules, to cover the foundational concepts before coming to class.