

Department of Civil Engineering						
4th Sem (2nd Year) Summer 2021						
Theory No: 2			Subject: HYDRAULICS & IRRIGATION ENGINEERING			
Sl No	Week No	Period		Numbers of Classes to be Scheduled	Topics to be covered	Remarks
		From	To			
1	W 1	15-04-2021	20-04-2021	5	1.HYDROSTATICS:1.1 Properties of fluid: density, specific gravity, surface tension, capillarity, viscosity and their uses	18-04-2021 is public holiday
2	W 2	22-04-2021	28-04-2021	5	1.2 Pressure and its measurements: intensity of pressure, atmospheric pressure, gauge pressure, absolute pressure and vacuum pressure; relationship between atmospheric pressure, absolute pressure and gauge pressure; pressure head: pressure gauges	24-04-2021 and 25-04-2021 are public holiday
3	W 3	29-04-2021	04-05-2021	5	1.3 Pressure exerted on an immersed surface: Total pressure, resultant pressure, expression for total pressure exerted on horizontal & vertical surface. 2. KINEMATICS OF FLUID FLOW:2.1 Basic equation of fluid flow and their application: Rate of discharge, equation of continuity of liquid flow, total energy of a liquid in motion- potential, kinetic & pressure, Bernoulli's theorem and its limitations. Practical applications of Bernoulli's equation.	02-05-2021 is public holiday.
4	W 4	05-05-2021	11-05-2021	5	2.2 Flow over Notches and Weirs: Notches, Weirs, types of notches and weirs, Discharge through different types of notches and weirs-their application (No Derivation)	08-05-2021 and 09-05-2021 are public holiday.

Theory No: 2						
Subject: HYDRAULICS & IRRIGATION ENGINEERING						
SI No	Week No	Period		Numbers of Classes to be Scheduled	Topics to be covered	Remarks
		From	To			
5	W 5	12-05-2021	18-05-2021	5	2.3 Types of flow through the pipes: uniform and non uniform; laminar and turbulent; steady and unsteady; Reynold's number and its application	14-05-2021 and 16-05-2021 are public holiday
6	W 6	19-05-2021	25-05-2021	5	2.4 Losses of head of a liquid flowing through pipes: Different types of major and minor losses. Simple numerical problems on losses due to friction using Darcy's equation, Total energy lines & hydraulic gradient lines (Concept Only). 2.5 Flow through the Open Channels: Types of channel sections-rectangular, trapezoidal and circular, discharge formulae- Chezy's and Manning's equation, Best economical section.	22-05-2021 and 23-05-2021 are public holiday.
7	W 7	26-05-2021	31-05-2021	5	3 PUMPS:3.1 Type of pumps 3.2 Centrifugal pump: basic principles, operation, discharge, horse power & efficiency.3.3 Reciprocating pumps: types, operation, discharge, horse power & efficiency	30-05-2021 is Holiday
8	W 8	01-06-2021	05-06-2021	5	1. Hydrology 1.1 Hydrology Cycle 1.2 Rainfall: types, intensity, hyetograph 1.3 Estimation of rainfall, rain gauges, Its types(concept only), 1.4 Concept of catchment area, types, run-off, estimation of flood discharge by Dicken's and Ryve's formulae 2 Water Requirement of Crops 2.1 Definition of irrigation, necessity, benefits of irrigation, types of irrigation	
9	W 9	07-06-2021	17-06-2021	5	2.2 Crop season 2.3 Duty, Delta and base period their relationship, overlap allowance, kharif and rabi crops 2.4 Gross command area, culturable command area, Intensity of Irrigation, irrigable area, time factor, crop ratio 3 FLOW IRRIGATION 3.1 Canal irrigation, types of canals, loss of water in canals 3.2 Perennial irrigation	10-05-2021, 12-05-2021 14-05-2021, 15-05-2021 is Holiday

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Subject: HYDRAULICS & IRRIGATION ENGINEERING						
Sl No	Week No	Period		Numbers of Classes to be Scheduled	Topics to be covered	Remarks
		From	To			
10	W 10	18-06-2021	23-06-2021	5	3.3 Different components of irrigation canals and their functions 3.4 Sketches of different canal cross-sections 3.5 Classification of canals according to their alignment, Various types of canal lining – Advantages and disadvantages	20-06-2021 is holiday.
11	W 11	24-06-2021	30-06-2021	5	4 WATER LOGGING AND DRAINAGE : 4.1 Causes and effects of water logging, detection, prevention and remedies 5 DIVERSION HEAD WORKS AND REGULATORY STRUCTURES 5.1 Necessity and objectives of diversion head works, weirs and barrages 5.2 General layout, functions of different parts of barrage	26-06-2021 and 27-06-2021 are holidays.
12	W 12	01-07-2021	06-07-2021	5	5.3 Silting and scouring 5.4 Functions of regulatory structures	04-07-2021 is holiday.
13	W 13	07-07-2021	14-07-2021	5	6 CROSS DRAINAGE WORKS :6.1 Functions and necessity of Cross drainage works - aqueduct, siphon, super-passage, level crossing	10-07-2021 to 12-07-2021 are holidays.
14	W 14	15-07-2021	19-07-2021	5	6.2 Concept of each with help of neat sketch 7 DAMS 7.1 Necessity of storage reservoirs, types of dams 7.2 Earthen dams: types, description, causes of failure and protection measures.	18-07-2021 is holiday.
15	W 15	20-07-2021	26-07-2021	5	7.3 Gravity dam- types, description, Causes of failure and protection measures. 7.4 Spillways-Types (With Sketch) and necessity.	21-07-2021 & 24-07-2021 are holidays.
16	W 16	28-07-2021	29-07-2021	2	Revision	
Total	15			77		

Department of Civil Engineering

4th Sem (2nd Year) Summer 2021

Theory No: 4

Subject: HIGHWAY ENGINEERING

Sl No	Week No	Period		Numbers of Classes to	Topics to be covered	Remarks
		From	To			
1	W1	15-04-2021	20-04-2021	5	Introductions- Importance of highway transportation, importance organisations like Indian road congress, Ministry of surface transport, central road research institute. Functions of Indian Roads Congress. IRC classification of roads. Organisation of state highway	18-04-2021 is public holiday
2	W2	22-04-2021	28-04-2021	5	Road Geometric - Glossary of terms used in geometric and their importance, right of way, formation width, road margin, road shoulder, carriage way, side sloped, kerbs, formation level, camber and gradient.	24-04-2021 and 25-04-2021 are public holiday

2	W3	29-04-2021	04-05-2021	5	Road Geometric - Design and average running speed, stopping and passing sight distance.	02-05-2021 is public holiday.
3	W 3	05-05-2021	11-05-2021	5	Road Geometric - Necessity of curves, horizontal and vertical curves including transition curves and super elevation, methods of providing super elevation.	08-05-2021 and 09-05-2021 are public holiday.
4	W 4	12-05-2021	18-05-2021	5	Road Materials - Different types of road materials in use : soil, aggregates, binders. Function of soil as highway subgrade, california bearing ratio: methods of finding CBR valued in the laboratory and at site and their significance.	14-05-2021 and 16-05-2021 are public holiday

5	W 5	19-05-2021	25-05-2021	5	Road Materials - Testing aggregates: Abrasion test, Impact test, crushing strength test, water absorption test & soundness test. Aggregates: Availability of road aggregates in India, Requirements of road aggregates as per IS specifications. Binders: common binders: cement, bitumen and Tar, properties as per IS specifications, penetration and viscosity test of bitumen, procedure and a significance of cut back bitumen and bituminous emulsion and their uses.	22-05-2021 and 23-05-2021 are public holiday.
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6	W 6	26-05-2021	31-05-2021	5	<p>Road Pavements - Road pavements : Flexible and rigid pavement, their merits and demerits, typical cross sections ,functions of various components.Sub - grade preparation: Setting out alignment of road, setting out bench marks, control pages for embankment and cutting, borrow pits, making profile of embankment, construction of embankment,compaction, stabilization,preparation of subgrade, methods of checking camber,gradient and alignment as per reccomendations of IRC,equipment used for subgrade preparation.Flexible pavements : necessity of sub base, stabilized sub bade, purpose of stabilization (no</p>	30-05-2021 is Holiday
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7	W 7	01-06-2021	05-06-2021	5	Road Pavements- preparation Base course: (a) Brick soling,(b) Stone soling, © Metalling : Water bound Macadam and Bituminious Macadam. Types of surfacing: (a) surface dressing,(b) (i) Premix carper,(ii) Semi dence carpet,© Bituminious concrete.(d)Grouting methods of constructions as per ministry of surface transport, specifications and quality control.	
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8	W 8	07-06-2021	17-06-2021	5	Road Pavements- Rigid pavements: Construction of concrete roads as per IRC specifications : From laying,mixing and placing the concrete, compacting and finishing, curing,joints in concrete pavement, equipment used.	10-05-2021, 12-05-2021 14-05-2021, 15-05-2021 is Holiday
		18-06-2021	23-06-2021	5	Hill Roads - Introduntion: Typical cross sections showing all details of a typical hill road in cut,partly in cutting and partly in filling.	20-06-2021 is holiday.

9	W 9	24-06-2021	30-06-2021	5	Hill Roads- Breast walss,Rataining walss,different types of bends.	26-06-2021 and 27-06-2021 are holidays.
10	W 10	01-07-2021	06-07-2021	5	Road Drainage - Necessity of road drainage work,cross drainage works, surface and sub surface drains and strom water drains,location,spacing and typical details of side drains.	04-07-2021 is holiday.

11	W 11	07-07-2021	14-07-2021	5	Road Drainage - Side ditches for surface drainage, intercepting drain, pipe drains in hill roads, details of drainings in cutting embankment, typical cross sections.	10-07-2021 to 12-07-2021 are holidays.
		15-07-2021	19-07-2021	5	Road Maintenance - Common types of road failures - their causes and remedies.	18-07-2021 is holiday.

12	W 12	20-07-2021	26-07-2021	5	Road Maintenance - Maintenance of bituminous road such as patch work and resurfacing.Maintenance of concrete roads - filling cracks,repairing joints,maintenanace of shoulders,(berm),maintenance of traffic control devices.	21-07-2021 & 24-07-2021 are holidays.
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13	W 13	28-07-2021	29-07-2021	2	Construction Equipments - Output and use of the following plants and equipments: Hot mixing plant, Tipper, tractors,(wheel and crawler) scraper, bulldozer, dumpers, shovels,grades, roller dragline.Asphalt mixer and tar boilers.Road pavers,Modern construction equipments for roads.	
Total	15			77		



Department of Civil Engineering						
4th Sem (2nd Year) Summer 2021						
Theory No:		3				
Subject:		SURVEY – I				
Sl No	Week No	Period		Numbers of Classes to be Scheduled	Topics to be covered	Remarks
		From	To			
1	W 1	15-04-2021	20-04-2021	5	1. INTRODUCTION TO SURVEYING, LINEAR MEASUREMENTS: 1.1 Surveying: Definition, Aims and objectives 1.2 Principles of survey-Plane surveying- Geodetic Surveying- Instrumental surveying. 1.3 Precision and accuracy of measurements, instruments used for measurement of distance, Types of tapes and chains. 1.4 Errors and mistakes in linear measurement – classification, Sources of errors and remedies.	18-04-2021 is public holiday
2	W 2	22-04-2021	28-04-2021	5	1.5 Corrections to measured lengths due to-incorrect length, temperature variation, pull, sag, numerical problem applying corrections. 2 CHAINING AND CHAIN SURVEYING :2.1 Equipment and accessories for chaining 2.2 Ranging – Purpose, signaling, direct and indirect ranging, Line ranger – features and use, error due to incorrect ranging.	24-04-2021 and 25-04-2021 are public holiday
3	W 3	29-04-2021	04-05-2021	5	1.3 Pressure exerted on an immersed surface: Total pressure, resultant pressure, expression for total pressure exerted on horizontal & vertical surface. 2. KINEMATICS OF FLUID FLOW:2.1 Basic equation of fluid flow and their application: Rate of discharge, equation of continuity of liquid flow, total energy of a liquid in motion- potential, kinetic & pressure, Bernoulli's theorem and its limitations. Practical applications of Bernoulli's equation.	02-05-2021 is public holiday.
4	W 4	05-05-2021	11-05-2021	5	2.2 Flow over Notches and Weirs: Notches, Weirs, types of notches and weirs, Discharge through different types of notches and weirs-their application (No Derivation)	08-05-2021 and 09-05-2021 are public holiday.

Theory No: 3						
Subject: SURVEY – I						
SI No	Week No	Period		Numbers of Classes to be Scheduled	Topics to be covered	Remarks
		From	To			
5	W 5	12-05-2021	18-05-2021	5	2.3 Types of flow through the pipes: uniform and non uniform; laminar and turbulent; steady and unsteady; Reynold's number and its application	14-05-2021 and 16-05-2021 are public holiday
6	W 6	19-05-2021	25-05-2021	5	2.4 Losses of head of a liquid flowing through pipes: Different types of major and minor losses. Simple numerical problems on losses due to friction using Darcy's equation, Total energy lines & hydraulic gradient lines (Concept Only). 2.5 Flow through the Open Channels: Types of channel sections-rectangular, trapezoidal and circular, discharge formulae- Chezy's and Manning's equation, Best economical section.	22-05-2021 and 23-05-2021 are public holiday.
7	W 7	26-05-2021	31-05-2021	5	3 PUMPS:3.1 Type of pumps 3.2 Centrifugal pump: basic principles, operation, discharge, horse power & efficiency.3.3 Reciprocating pumps: types, operation, discharge, horse power & efficiency	30-05-2021 is Holiday
8	W 8	01-06-2021	05-06-2021	5	1. Hydrology 1.1 Hydrology Cycle 1.2 Rainfall: types, intensity, hyetograph 1.3 Estimation of rainfall, rain gauges, Its types(concept only), 1.4 Concept of catchment area, types, run-off, estimation of flood discharge by Dicken's and Ryve's formulae 2 Water Requirement of Crops 2.1 Definition of irrigation, necessity, benefits of irrigation, types of irrigation	
9	W 9	07-06-2021	17-06-2021	5	2.2 Crop season 2.3 Duty, Delta and base period their relationship, overlap allowance, kharif and rabi crops 2.4 Gross command area, culturable command area, Intensity of Irrigation, irrigable area, time factor, crop ratio 3 FLOW IRRIGATION 3.1 Canal irrigation, types of canals, loss of water in canals 3.2 Perennial irrigation	10-05-2021, 12-05-2021 14-05-2021, 15-05-2021 is Holiday

Theory No: 3						
Subject: SURVEY – I						
Sl No	Week No	Period		Numbers of Classes to be Scheduled	Topics to be covered	Remarks
		From	To			
10	W 10	18-06-2021	23-06-2021	5	3.3 Different components of irrigation canals and their functions 3.4 Sketches of different canal cross-sections 3.5 Classification of canals according to their alignment, Various types of canal lining – Advantages and disadvantages	20-06-2021 is holiday.
11	W 11	24-06-2021	30-06-2021	5	4 WATER LOGGING AND DRAINAGE : 4.1 Causes and effects of water logging, detection, prevention and remedies 5 DIVERSION HEAD WORKS AND REGULATORY STRUCTURES 5.1 Necessity and objectives of diversion head works, weirs and barrages 5.2 General layout, functions of different parts of barrage	26-06-2021 and 27-06-2021 are holidays.
12	W 12	01-07-2021	06-07-2021	5	5.3 Silting and scouring 5.4 Functions of regulatory structures	04-07-2021 is holiday.
13	W 13	07-07-2021	14-07-2021	5	6 CROSS DRAINAGE WORKS :6.1 Functions and necessity of Cross drainage works - aqueduct, siphon, super-passage, level crossing	10-07-2021 to 12-07-2021 are holidays.
14	W 14	15-07-2021	19-07-2021	5	6.2 Concept of each with help of neat sketch 7 DAMS 7.1 Necessity of storage reservoirs, types of dams 7.2 Earthen dams: types, description, causes of failure and protection measures.	18-07-2021 is holiday.
15	W 15	20-07-2021	26-07-2021	5	7.3 Gravity dam- types, description, Causes of failure and protection measures. 7.4 Spillways-Types (With Sketch) and necessity.	21-07-2021 & 24-07-2021 are holidays.
16	W 16	28-07-2021	29-07-2021	2	Revision	
Total	15			77		

Department of Civil Engineering						
4th Sem (2nd Year) Summer 2021						
Theory No:		1				
Subject:		STRUCTURAL DESIGN – I				
Sl No	Week No	Period		Numbers of Classes to be Scheduled	Topics to be covered	Remarks
		From	To			
1	W 1	15-04-2021	20-04-2021	5	1.Working stress method (WSM) 1.1 Objectives of design and detailing. State the different methods of design of concrete structures.1.2 Introduction to reinforced concrete, R.C. sections their behavior, grades of concrete and steel. Permissible stresses, assumption in W.S.M.1.3 Flexural design and analysis of single reinforced sections from first principles.1.4 Concept of under reinforced, over reinforced and balanced sections. 1.5 Advantages and disadvantages of WSM, reasons for its obsolescence.	18-04-2021 is public holiday
2	W 2	22-04-2021	28-04-2021	5	2.Philosophy Of Limit State Method (LSM)2.1 Definition, Advantages of LSM over WSM, IS code suggestions regarding design philosophy.2.2 Types of limit states, partial safety factors for materials strength, characteristic strength, characteristic load, design load, loading on structure as per I.S. 8752.3 Study of I.S specification regarding spacing of reinforcement in slab, cover to reinforcement in slab, beam column & footing, minimum reinforcement in slab, beam & column, lapping, anchorage, effective span for beam & slab. 3. Analysis and Design of Single and Double Reinforced Sections (LSM)3.1 Limit state of collapse (flexure), Assumptions, Stress-Strain relationship for concrete and steel, neutral axis, stress block diagram and strain diagram for singly reinforced section.	24-04-2021 and 25-04-2021 are public holiday

Theory No: 1		Subject: STRUCTURAL DESIGN – I				
Sl No	Week No	Period		Numbers of Classes to be Scheduled	Topics to be covered	Remarks
		From	To			
3	W 3	29-04-2021	04-05-2021	5	3.2 Concept of under- reinforced, over-reinforced and limiting section, neutral axis co-efficient, limiting value of moment of resistance and limiting percentage of steel required for limiting singly R.C. section.	02-05-2021 is public holiday.
4	W 4	05-05-2021	11-05-2021	5	3.3 Analysis and design: determination of design constants, moment of resistance and area of steel <u>for rectangular sections</u>	08-05-2021 and 09-05-2021 are public holiday.

Theory No: 1						
Subject: STRUCTURAL DESIGN – I						
SI No	Week No	Period		Numbers of Classes to be Scheduled	Topics to be covered	Remarks
		From	To			
5	W 5	12-05-2021	18-05-2021	5	3.4 Necessity of doubly reinforced section, design of doubly reinforced rectangular section 4 Shear, Bond and Development Length (LSM)4.1 Nominal shear stress in R.C. section, design shear strength of concrete, maximum shear stress, design of shear reinforcement, minimum shear reinforcement, forms of shear reinforcement.4.2 Bond and types of bond, bond stress, check for bond stress, development length in tension and compression, anchorage value for hooks 900 bend and 450 bend standards lapping of bars, check for development length.	14-05-2021 and 16-05-2021 are public holiday
6	W 6	19-05-2021	25-05-2021	5	4.3 Numerical problems on deciding whether shear reinforcement is required or not, check for adequacy of the section in shear. Design of shear reinforcement; Minimum shear reinforcement in beams (Explain through examples only).5 Analysis and Design of T-Beam (LSM)5.1 General features, advantages, effective width of flange as per IS: 456-2000 code provisions.	22-05-2021 and 23-05-2021 are public holiday.
7	W 7	26-05-2021	31-05-2021	5	5.2 Analysis of singly reinforced T-Beam, strain diagram & stress diagram, depth of neutral axis, moment of resistance of T-beam section with neutral axis lying within the flange.	30-05-2021 is Holiday
8	W 8	01-06-2021	05-06-2021	5	5.3 Simple numerical problems on deciding effective flange width. (Problems only on finding moment of resistance of T-beam section when N.A. lies within or up to the bottom of flange shall be asked in written examination)..	
9	W 9	07-06-2021	17-06-2021	5	6. Analysis and Design of Slab and Stair case (LSM)6.1 Design of simply supported one-way slabs for flexure check for deflection control and shear.	10-05-2021, 12-05-2021 14-05-2021, 15-05-2021 is Holiday

Theory No: 1						
Subject: STRUCTURAL DESIGN – I						
Sl No	Week No	Period		Numbers of Classes to be Scheduled	Topics to be covered	Remarks
		From	To			
10	W 10	18-06-2021	23-06-2021	5	6.2 Design of one-way cantilever slabs and cantilevers chajjas for flexure check for deflection control and check for development length and shear.6.3 Design of two-way simply supported slabs for flexure with corner free to lift.	20-06-2021 is holiday.
11	W 11	24-06-2021	30-06-2021	5	6.4 Design of dog-legged staircase 6.5 Detailing of reinforcement in stairs spanning longitudinally.	26-06-2021 and 27-06-2021 are holidays.
12	W 12	01-07-2021	06-07-2021	5	6.5 Detailing of reinforcement in stairs spanning longitudinally. 7 Design of Axially loaded columns and Footings (LSM)7.1 Assumptions in limit state of collapse- compression.	04-07-2021 is holiday.
13	W 13	07-07-2021	14-07-2021	5	7.2 Definition and classification of columns, effective length of column. Specification for minimum reinforcement; cover, maximum reinforcement, number of bars in rectangular, square and circular sections, diameter and spacing of lateral ties	10-07-2021 to 12-07-2021 are holidays.
14	W 14	15-07-2021	19-07-2021	5	7.3 Analysis and design of axially loaded short square, rectangular and circular columns (with lateral ties only).	18-07-2021 is holiday.
15	W 15	20-07-2021	26-07-2021	5	7.4 Types of footing, Design of isolated square column footing of uniform thickness for flexure and shear.	21-07-2021 & 24-07-2021 are holidays.
16	W 16	28-07-2021	29-07-2021	2	Revision	
Total	15			77		