Lesson Plan

CVE-302-LDesign of Steel Structures - II

Name of the Faculty	**:**	Mr. Kuldeep Singh
Discipline	**:**	B.Tech in Civil Engineering
Semester	**:**	VI (3rd Year)
Subject	**:**	**CVE-302-L**, **Design of Steel Structures - II**
Lesson Plan Duration	**:**	15 Weeks
Work Load (Lecture / Drawing) per week (in hrs.)	**:**	Lectures – 03, Drawing-02

Week	**Theory**	
	Lecture day	**Topic (Including Assignment Test)**
1st	1	Elementary Plastic Analysis and Design • Introduction, Scope of plastic analysis
	2	• Ultimate load carrying capacity of tension members
	3	• Ultimate load carrying capacity of compression members
2nd	4	• Flexural members, shape factor, mechanisms
	5	• Plastic collapse and analysis
	6	• Plastic analysis applied to steel beams and simple portal frames and design
3rd	7	Design of Water Tanks: • Introduction, permissible stresses
	8	• Design of circular steel tanks
	9	• Design of Rectangular steel tanks.
4th	10	• Prestressed steel tanks including staging
	11	Design of Steel Stacks: • Introduction, permissible stresses, various loads to be considered for the design of steel stacks
	12	• IS specifications for steel stacks
5th	13	• Foundation specification for steel stacks
	14	• Design of steel stacks including foundation
	15	• Design of steel stacks including foundation
6th	16	• Design of steel stacks including foundation
	17	• Guyed stacks - Introduction
	18	• Design of guyed stacks

7th	19	**MINOR TEST I**
	20	
	21	
8th	22	• Design of guyed stacks
	23	• Towers: introduction, types
	24	• Introduction - Transmission line towers microwave towers
9th	25	• Design loads, classification of towers
	26	• Specifications of transmission line
	27	• Design procedure of transmission line tower
10th	28	• Design procedure of transmission line tower
	29	• Design procedure of transmission line tower
	30	Cold Formed Sections: • Introduction and brief description of various types of cold formed sections
11th	31	• Applications of various types of cold formed sections, local buckling
	32	• concepts of effective width and effective sections, Elements with stiffeners
	33	• Design of compression
12th	34	• Design of bending elements
	35	Industrial Buildings: • Loads, general arrangement and stability
	36	• design considerations for industrial buildings
13th	37	• Purlins – introduction and specifications
	38	• Design of purlins
	39	• Design of purlins
14th	40	**MINOR TEST II**
	41	
	42	
15th	43	• Design of roof trusses
	44	• Industrial building frames
	45	• Bracings and Stepped columns

CVE-304-L IRRIGATION ENGINEERING-I

Name of the Faculty : Ms. Manju Godara

Discipline : B.Tech in Civil Engineering

Semester : VI (3rd Year)

Subject : **CVE-304-L IRRIGATION ENGINEERING-I**

Lesson Plan Duration : 15 Weeks

Work Load (Lecture / Tutorial) per week (in hrs.) : Lectures – 03, Tutorial-01

Week	Theory		
	Lecture Day	Topic (Including assignment / Test)	
Unit-I			
1st	1	**Introduction:**Irrigation-necessity, advantages, disadvantages	
	2	Impact of irrigation on human environment	
	3	Need and development of irrigation in India, Crops and crop seasons, ideal cropping pattern and high yielding varieties of crops	
2nd	4	**Soil-water relationship and irrigation methods:** Soil-water relationship	
	5	Root zone soil water, infiltration,	
	6	Consumptive use, field capacity,Wilting point, available moisture in soil, GCA, CCA,	
3rd	7	Intensity of irrigation, delta, base period, Kor depth, core period	
	8	Frequency of irrigation, duty of water, relation between delta, duty and base period, irrigation requirement,Flooding methods, border strip method, check basin and furrow method,	
	9	Assessment of irrigation water, sprinkler irrigation, favorable conditions,Sprinkler systems, hydraulics of sprinkler irrigation, planning, design and maintenance of sprinkler systems, drip irrigation-components parts, advantages and limitations, suitability of drip irrigation.	
Unit-II			
4th	10	**Canal irrigation,**	
	11	Component of canal distribution system,	
	12	Alignment of channels, Losses in irrigation channels	

5th	13	Design discharge,	
	14	Silt theories and design of alluvial channels	
	15	Comparison of Kennedy's and Lacey's theories,	
6th	16	Canal section and design procedure,	
	17	Canal section and design procedure,	
	18	Garrets and Lacey's diagrams	
7th	**1stMinor Test**		
Unit-III			
8th	19	**Water logging and land reclamation**	
	20	Water logging-effects	
	21	Causes and measures of prevention,Lining of irrigation channels,	
9th	22	Types of lining,	
	23	Design of lined channel land drainage,	
	24	Open drains, design considerations, Advantages of tile drains	
10th	25	Depth of tile drains, Layout of closed drains	
	26	Discharge and spacing of closed drains, diameter of tile drain	
	27	Outlets for tile drains, maintenance of tile drains, purpose of land reclamation and methods of land reclamation.	
Unit-IV			
11th	28	**River Training**	
	29	Classification of rivers	
	30	River training and its objectives, Classification of river training works	
12th	31	Methods of river training	
	32	Marginal embankments	
	33	Guidebanks, spurs	
13th	34	Cutoffs	
	35	Bank pitching and launching apron	
	36	**Canal outlets,**Classification	

14th	**2nd Minor test**		
15th	37	Requirements of a good outlet,	
	38	Design of pipe, APM and open flume outlet,	
	39	Flexibility proportionality, setting and sensitivity of outlet.	

Lesson Plan

CVE-308-L GEOTECHNOLOGY-II

Name of the Faculty : Ms. Menka Yadav

Discipline : B.Tech in Civil Engineering

Semester : VI (3rd Year)

Subject : **CVE-308-L GEOTECHNOLOGY-II**

Lesson Plan Duration : 15 Weeks

Work Load (Lecture / Tutorial) per week (in hrs.) : Lectures – 03, Tutorial-01

Week	Theory		
	Lecture Day	Topic (Including assignment / Test)	
Unit-I			
1st	1	**Earth Dams:**Introduction, types of sectionsEarth dam foundations, causes of failure and criteria for safe design,	
	2	Control of seepage through the embankment, control of seepage through the foundation	
	3	Drainage of foundations, criterion for filter design, Introduction to rock fill dams	
2nd	4	**Stability of slopes:**Causes of failure, factors of safety	
	5	Stability analysis of slopes-total stress analysis	
	6	Effective stress analysis, Stability of infinite slopes types of failures of finite slopes	
3rd	7	Analysis of finite slopes-mass procedure, method of slices, effect of pore pressure	
	8	Fellinius method to locate center of most critical slip circle	
	9	Friction circle method, Taylor's stability number, Slope stability of earth dam during steady seepage, during sudden draw down and during and at the end of construction	
Unit-II			
4th	10	**Braced Cuts:**Depth of unsupported vertical cut,	
	11	Sheeting and bracing for deep excavation,Movements associated with sheeting and bracing,	

	12	Modes of failure of braced cuts, pressure distribution behind sheeting.	
5th	13	**Cofferdams:**Introduction, Types of cofferdams,	
	14	Design and lateral stability of braced cofferdams	
	15	Design data for Cellular cofferdams,	
6th	16	Design data for Cellular cofferdams,	
	17	Stability analysis of cellular cofferdams on soil and rock	
	18	Inter-lock stresses.	
7th	**1stMinor Test**		
Unit-III			
8th	19	**Cantilever Sheet Piles:**Purpose of sheet piles	
	20	Cantilever sheet piles	
	21	Depth of embedment in granular soils-rigorous method,	
9th	22	Simplified procedure, cantilever sheet pile	
	23	Penetrating clay and limiting height of wall	
	24	**Anchored Bulkheads:**Methods of design, Free earth support method in onless and cohesive soils, fixed	
10th	25	Free earth support method in cohesionless and cohesive soils, fixed	
	26	Earth support method in cohesionless soils-Blum's equivalent beam method	
	27	Earth support method in cohesionless soils-Blum's equivalent beam method	
Unit-IV			
11th	28	**Soil Stabilization:**Soil improvement	
	29	Shallow compaction	
	30	Mechanical treatment, Use of admixtures	
12th	31	Lime stabilization, cement stabilization,	
	32	Lime fly ash stabilization, dynamic compaction and consolidation,	
	33	Bituminous stabilization, chemical stabilization, Pre-compression, lime pile and column, stone column, grouting, reinforced earth.	
13th	34	**Basics of Machine Foundations:**Terminology	
	35	Characteristics elements of a vibratory systems	

	36	Analysis of vibratory motions of a single degree freedom system-undamped free vibrations, Undamped forced vibrations	
14th	**2nd Minor test**		
15th	37	Criteria for satisfactory action of a machine foundation	
	38	Degrees of a freedom of a block foundation	
	39	Barken's soil spring constant, Barken's method of a determining natural frequency of a block foundation subjected to vertical oscillations	

CVE – 310-L Transportation Engineering - I

Name of the Faculty : Mr. Harish Kumar

Discipline : B.Tech in Civil Engineering

Semester : VI (3rd Year)

Subject : CVE-310-L, Transportation Engineering-I

Lesson Plan Duration : 15 Weeks

Work Load (Lecture / Tutorial) per week (in hrs.) : Lectures – 03, Tutorial-01

Week	Theory	
	Lecture day	**Topic (Including Assignment Test)**
1st	1	Transportation and its importance. Different modes of transportation
	2	Brief review of history of road development in India and abroad: Roman, Tresagne, Telford and Macadam constructions.
	3	Road patterns, Classification of roads, Objectives of highway planning
2nd	4	Planning surveys. Saturation system of planning
	5	**Highway Plans, Highway Alignment and Surveys:** Main features of 20 years road development plans in India
	6	Requirements of an ideal highway alignment.
3rd	7	Factors affecting alignment. Surveys for highway alignment
	8	Cross section elements: friction, carriageway, formation width, land width, camber, IRC recommended values.
	9	Types of terrain Design speed. Sight distance, stopping sight distance
4th	10	overtaking sight distance, overtaking zones, intermediate sight distance
	11	sight distance at intersections, head light sight distance
	12	Set back distance. Critical locations for sight distance
5th	13	**Design of Horizontal and Vertical Alignment:** Effects of centrifugal force
	14	Design of super elevation. Providing super elevation in the field
	15	Radius of circular curves. Extra-widening
6th	16	Type and length of transition curves. Gradient, types and values
	17	Summit curves and valley curves, their design criterion
	18	Grade compensation on curves

7th	19	**MINOR TEST 1**
	20	
	21	
8th	22	Traffic Characteristics And Traffic Surveys Road user and vehicular characteristics
	23	Traffic studies such as volume, speed and O & D study
	24	Parking and accident studies, Fundamental diagram of traffic flow
9th	25	Level of service and PCU, Capacity for non-urban roads
	26	Causes and preventive measures for road accidents
	27	**Traffic Control Devices:** Traffic control devices: signs, signals, markings and islands
10th	28	Types of signs. Types of signals.
	29	Design of an isolated fixed time signal by IRC method
	30	Intersections at grade and grade separated intersections
11th	31	Design of a rotary. Types of grade separated intersections
	32	**Highway Materials: Soil and Aggregates:** Subgrade soil evaluation: CBR test
	33	Plate bearing test. Desirable properties of aggregates
12th	34	Various tests, testing procedures
	35	IRC/IS specification for suitability of aggregates
	36	Proportioning of aggregates for road construction by trial and error and Routhfuch method
13th	37	Bituminous Materials and Bituminous Mixes: Types of bituminous materials: bitumen, tar, cutback and emulsions
	38	Various tests, testing procedures
	39	IRC/IS specifications for suitability of bituminous materials in road construction
14th	40	**MINOR TEST II**
	41	
	42	
15th	43	Bituminous mix, desirable properties
	44	Marshall's method of mix design
	45	Basic concept of use of polymers and rubber modified bitumen in bituminous mixes.

CVE-312-L WATER SUPPLY & TREATMENT

Name of the Faculty : Mr. Kamaldeep Singh

Discipline : B.Tech in Civil Engineering

Semester : VI (3rd Year)

Subject : **CVE-312-L Water Supply & Treatment**

Lesson Plan Duration : 15 Weeks

Work Load (Lecture / Tutorial) per week (in hrs.) : Lectures – 03, Tutorial-01

Week	Theory		
	Lecture Day	Topic (Including assignment / Test)	
Unit-I			
1st	1	**Water Quantity: Introduction**	
	2	Importance and necessity of water supply scheme	
	3	Water demands and its variations, Estimation of total quantity of water requirement	
2nd	4	Population forecasting	
	5	Quality and quantity of surface and ground water sources	
	6	Quality and quantity of surface and ground water sources	
3rd	7	Selection of a source of water supply	
	8	Selection of a source of water supply	
	9	Types of intakes	
Unit-II			
4th	10	**Water Quality: Introduction**	
	11	Impurities in water and their sanitary significance	
	12	Impurities in water and their sanitary significance	
5th	13	Impurities in water and their sanitary significance	
	14	Physical analysis of water	
	15	Physical analysis of water, Chemical analysis of water	

6th	16	Bacteriological analysis of water	
	17	Bacteriological analysis of water	
	18	Water quality standards	
7th	**1stMinor Test**		
Unit-III			
8th	19	**Water Treatment: Introduction**	
	20	Objectives, Treatment processes and their sequence in conventional treatment plant	
	21	Sedimentation – plain and aided with coagulation	
9th	22	Types, features and design aspects	
	23	Mixing basins and Flocculation units	
	24	Filtration – mechanism involved, Types of filters	
10th	25	Slow and rapid sand filtration units (features and design aspects)	
	26	Slow and rapid sand filtration units (features and design aspects)	
	27	Disinfection principles and aeration	
Unit-IV			
11th	28	**Water Distribution: Introduction**	
	29	Distribution system	
	30	Gravity system, Pumping System	
12th	31	Dual system,	
	32	Layout of Distribution System	
	33	Dead End System, Grid Iron System	
13th	34	Ring System	
	35	Radial System, their merits and demerits	
	36	Radial System, their merits and demerits	
14th	**2nd Minor test**		
15th	37	Distribution Reservoir-functions & determination of storage capacity	
	38	Distribution Reservoir-functions & determination of storage capacity	
	39	Distribution Reservoir-functions & determination of storage capacity	

CVE-310-P TRANSPORTATION ENGINEERING-I (P)

Name of the Faculty : Mr. Manik/Mr. Harish

Discipline : B.Tech in Civil Engineering

Semester : VI (3rd Year)

Subject : CVE-310-P Transportation Engineering-I (P)

Lesson Plan Duration : 15 Weeks

Work Load (Lecture / Practical) per week (in hrs.) : Practical – 02

Week	Practical	
	Lecture day	**Topic (Including Assignment Test)**
1st	1	Tests on Road Aggregates – Introduction of – MORTH, IS: 2386 Part IV, IS: 383 – 1970 (Group 1,3)
	2	Tests on Road Aggregates – Introduction of – MORTH, IS: 2386 Part IV, IS: 383 – 1970 (Group 2,4)
2nd	3	Exp. 1 - Aggregate Impact Test (Group 1,3)
	4	Exp. 1 - Aggregate Impact Test (Group 2,4)
3rd	5	Exp. 2 - Los-Angeles Abrasion Test on Aggregates (Group 1,3)
	6	Exp. 2 - Los-Angeles Abrasion Test on Aggregates (Group 2,4)
4th	7	Exp. 3 - Dorry's Abrasion Test on Aggregates (Group 1,3)
	8	Exp. 3 - Dorry's Abrasion Test on Aggregates (Group 2,4)
5th	9	Exp. 4 - Deval Attrition Test on Aggregates (Group 1,3)
	10	Exp. 4 - Deval Attrition Test on Aggregates (Group 2,4)
6th	11	Tests on Bituminous Material – Introduction of – IS:73 – 2006, IS: 1202 – 1978, IS:1203 – 1978, IS: 1205 – 1978, IS: 1208 – 1978,IS: 1209 – 1978 (Group 1)
	12	Tests on Bituminous Material – Introduction of – IS:73 – 2006, IS,3: 1202 – 1978, IS:1203 – 1978, IS: 1205 – 1978, IS: 1208 – 1978, IS: 1209 – 1978 (Group 2,4)
7th	13	**MINOR TEST I**
	14	
8th	15	**VIVA – VOCE Group – 1,3**
	16	**VIVA – VOCE Group – 2,4**
9th	17	Exp. 5 - Penetration Test on Bitumen (Group 1,3)
	18	Exp. 5 - Penetration Test on Bitumen.(Group 2,4)
10th	19	Exp. 6 - Ductility Test on Bitumen (Group 1,3)
	20	Exp. 6 - Ductility Test on Bitumen(Group 2,4)
11th	21	Exp. 7 - Viscosity Test on Bituminous Material (Group 1,3)
	22	Exp. 7 - Viscosity Test on Bituminous Material(Group 2,4)

12th	23	Exp. 8 - Softening Point Test on Bitumen (Group 1,3)
	24	Exp. 8 - Softening Point Test on Bitumen (Group 2,4)
13th	25	Exp. 9 - Flash and Fire Point Test on Bitumen (Group 1,3)
	26	Exp. 9 - Flash and Fire Point Test on Bitumen (Group 2,4)
14th	27	**MINOR TEST II**
	28	
15th	29	**VIVA – VOCE Group – 1,3**
	30	**VIVA – VOCE Group – 2,4**

CVE-312-P ENVIRONMENTAL ENGINEERING-I (P)

Name of the Faculty : Mr. Kamaldeep/Mr. Harish/Mr. Kuldeep

Discipline : B.Tech in Civil Engineering

Semester : VI (3rd Year)

Subject : CVE-312-P Environmental Engineering-I (P)

Lesson Plan Duration : 15 Weeks

Work Load (Lecture / Practical) per week (in hrs.) : Practical – 02

Week	Practical	
	Lecture day	**Topic (Including Assignment Test)**
1st	1	Experiment 1 –Determine the pH value of a given sample of waste water (Group 1,3)
	2	Experiment 1 –Determine the pH value of a given sample of waste water(Group 2,4)
2nd	3	Experiment 2 –To Determine the turbidity in given waste water sample. (Group 1,3)
	4	Experiment 2 - To Determine the turbidity in given waste water sample. (Group 2,4)
3rd	5	Experiment 3 - Determine the acidity of given sample of waste water (Group 1,3)
	6	Experiment 3 - Determine the acidity of given sample of waste water (Group 2,4)
4th	7	Experiment 4 - Determine the alkalinity of given sample of waste water (Group 1,3)
	8	Experiment 4 - Determine the alkalinity of given sample of waste water (Group 2,4)
5th	9	Experiment 5 - Determine temporary hardness in a given water sample(Group 1,3)
	10	Experiment 5 - Determine temporary hardness in a given water sample (Group 2,4)
6th	11	Experiment 5 - Determine permanent hardness in a given water sample (Group 1,3)
	12	Experiment 5 - Determine permanent hardness in a given water sample (Group 2,4)
7th	13	**MINOR TEST I**
	14	
8th	15	**VIVA – VOCE Group – 1,3**
	16	**VIVA – VOCE Group – 2,4**
9th	17	Experiment 6 –Determine total suspended, suspended, in a sewage sample (Group 1,3)
	18	Experiment 6 - Determine total suspended, suspended, in a sewage sample (Group 2,4)
10th	19	Experiment 6 -To determine dissolved settable solids in a sewage sample (Group 1,3)
	20	Experiment 6 - To determine dissolved settable solids in a sewage sample (Group 2,4)
11th	21	Experiment 8 –To Determine chlorine dose required for given water sample (Group 1,3)
	22	Experiment 8 - To Determine chlorine dose required for given water sample (Group 2,4)
12th	23	Experiment 9 - Determine the chloride concentration in a given sample of waste water (G1)

	24	Experiment 9 - Determine the chloride concentration in a given sample of waste water (G2)
13th	25	Experiment 10 - Determine the Sulphate concentration in given water sample (Group 1,3)
	26	Experiment 10 - Determine the Sulphate concentration in given water sample (Group 2,4)
14th	27	**MINOR TEST II**
	28	
15th	29	**VIVA – VOCE Group – 1,3**
	30	**VIVA – VOCE Group – 2,4**

CVE-314-PCOMPUTER APPLICATIONS

Name of the Faculty : Ms. Manju/Mr.Kuldeep

Discipline : B.Tech in Civil Engineering

Semester : VI (3rd Year)

Subject : **CVE-314-P Computer Applications**

Lesson Plan Duration : 15 Weeks

Work Load (Practical) per week (in hrs.) : Practical-02

Week	Practical
	Topic
1st	Computation of roots of a polynomial using. Bisection method, (b) Newton-Raphson method
2nd	Computation of roots of a polynomial using. Bisection method, (b) Newton-Raphson method
3rd	Solution of linear simultaneous equationsusing Gauss Elimination/Gauss Jordan /Triangulation factorization method
4th	Solution of linear simultaneous equationsusing Gauss Elimination / Gauss Jordan / Triangulationfactorization method.
5th	Solution of system of non-linear equation using fixed point / Newton Raphson / modified Newton-Raphson method.
6th	Solution of system of non-linear equation using fixed point / Newton Raphson / modified Newton-Raphson method.
7th	**Viva Voce-1**
8th	Analysis of multi-span Beam and frames using stiffness matrix method.
9th	Analysis of multi-span Beam and frames using stiffness matrix method.
10th	Analysis of Plane frame and space Frame using automated software.
11th	Analysis of Plane frame and space Frame using automated software
12th	Analysis of a three storeyed and ten storeyed building using automated software
13th	Analysis of a three storeyed and ten storeyed building using automated software.
14th	**Viva Voce-II**
15th	Introduction to Auto CAD.