

Lesson Plan/ Course Break – up
CVE-402-L BRIDGE ENGINEERING

Name of the Faculty : Mr. Manik Goyal
Discipline : B.Tech in Civil Engineering
Semester : VIII (4th Year)
Subject : CVE-402-L Bridge Engineering
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)
1 st	1	Definition, components of bridge, classification of bridges.
	2	Selection of site, economical span.
	3	Aesthetics consideration, necessary investigations. Essential design data.
2 nd	4	Standard Specifications for Roads and Railways Bridges: General, Indian Road Congress Bridge Code, width of carriage way, clearance,
	5	Various loads to be considered for the design of roads bridges, detailed explanation of IRC standard live loads.
	6	Various loads to be considered for the design of railway bridges, detailed explanation of IRC standard live loads.
3 rd	7	Design Consideration for R. C. C. Bridges: Various types of R.C.C. bridges(brief description of each type)
	8	Design of R.C.C. culvert bridges.
	9	Design of R.C.C. culvert bridges.
4 th	10	Design of R.C.C. culvert bridges.
	11	Design of R.C.C. T-beam bridges.
	12	Design of R.C.C. T-beam bridges.
5 th	13	Design Consideration for Steel Bridges: Various types of steel bridges (brief description of each)
	14	Various types of steel bridges (brief description of each)
	15	Design of truss bridges.
6 th	16	Design of truss bridges.
	17	Design of truss bridges.
	18	Design of truss bridges.
7 th	1st Minor Test	
8 th	19	Design of plate girder bridges.
	20	Design of plate girder bridges.
	21	Design of plate girder bridges.
9 th	22	Design of plate girder bridges.
	23	Design of plate girder bridges.
	24	Design of plate girder bridges.
10 th	25	Design of plate girder bridges.
	26	Design of plate girder bridges.
	27	Hydraulic & Structural Design: Piers
11 th	28	Hydraulic & Structural Design: Piers
	29	Hydraulic & Structural Design: Piers
	30	Hydraulic & Structural Design: Abutments

12 th	31	Hydraulic & Structural Design: Abutments	
	32	Hydraulic & Structural Design: Abutments	
	33	Hydraulic & Structural Design: wing-wall and approaches	
13 th	34	Hydraulic & Structural Design: wing-wall and approaches	
	35	Hydraulic & Structural Design: wing-wall and approaches	
	36	Brief Description: Bearings, joints, articulation and other details.	
14th	2nd Minor test		
15 th	37	Bridge Foundation: Various types, Necessary investigations	
	38	Design criteria of well foundation	
	39	Design criteria of well foundation	

CVE – 404-L Railway and Airport Engineering

Name of the Faculty : Mr. Pankaj Dahiya
Discipline : B.Tech in Civil Engineering
Semester : VIII (4thYear)
Subject : CVE – 404-L Railway and Airport Engineering
Lesson Plan Duration : 15 Weeks
Work Load (Lecture / Tutorial) per week (in hrs.) : Lectures – 02, Tutorial-01

Week	Theory	
	Lecture day	Topic (Including Assignment Test)
1 st	1	Introduction, Permanent Way and Rails, Rail transportation and its importance in India.
	2	Permanent way: requirements and components, Gauges in India and abroad. Selection of gauge. Coning of wheels. Adzing of sleepers
2 nd	3	Rails: functions, composition of rail steel, types of rail sections, requirements of an ideal rail section, length of rails.
	4	Defects in rails. Creep of rails. Long welded rails and continuously welded rails. Sleepers: functions, requirements of an ideal sleeper. Types of sleepers: wooden, cast iron, steel and concrete sleepers, advantages, disadvantages and suitability of each type.
3 rd	5	Sleeper density. Fastenings for various types of sleepers: fish plates, spikes, bolts, bearing plates, keys, chairs, jaws, tie bars.
	6	Elastic fastenings. Ballast: functions, requirements, types of ballast and their suitability
4 th	7	Points and Crossings: Necessity. Turnout: various components, working principle.
	8	Switch: components, types. Crossing: components and types. Design elements of a turnout, design of a simple turnout.
5 th	9	Layout plan of track junctions: crossovers, diamond crossing, single-double slips, throw switch, turn table, triangle.
	10	Signaling, Interlocking and Train Control: Signals: objects, types and classification. Semaphore signal: components, working principle. Requirements / principles of a good interlocking system.
6 th	11	Brief introduction to devices used in interlocking. Methods of control of train movements: absolute block system, automatic block system,
	12	Centralized train control and automatic train control systems. Geometric Design of the Track: Gradients, grade compensation. Super elevation, cant deficiency, negative super elevation.
7 th	13	MINOR TEST I
	14	
8 th	15	Maximum permissible speed on curves. Tractive resistances, types. Hauling capacity of a locomotive.
	16	Stations, Yards and Track Maintenance: Stations: functions and classification. Junction, non-junction and terminal stations.
9 th	17	Yards: functions, types. Marshalling yard: functions, types.
	18	Maintenance of railway track: necessity, types of maintenance. Brief introduction to mechanized maintenance, M.S.P and D.T.M.
10 th	19	Introduction and Airport Planning: Air transportation, its importance and characteristics, status in India

	20	Layout plan of an airport and its basic elements: terminal area, apron, taxiway, runway, hanger, Aircraft characteristics, their effect on elements of an airport.
11 th	21	Site selection of an airport
	22	Classification of airports, Runway Layout and Pavement Design: Runway orientation
12 th	23	Wind Rose diagram
	24	Basic runway length. Corrections to basic runway length, Numerical Problem
13 th	25	Runway patterns
	26	Difference between highway and runway pavement, Types of runway pavements
14 th	27	MINOR TEST II
	28	
15 th	29	Design factors for runway pavement.
	30	Brief introduction to design of thickness of a runway pavement, Illustrative example for runway pavement thickness

CVE 406-L INDUSTRIAL WASTE WATER TREATMENT

Name of the Faculty : Ms. Menka Yadav
Discipline : B.Tech in Civil Engineering
Semester : VIII (4th Year)
Subject : CVE 406-L, IWWT
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)
1 st	1	Industrial Waste Water - introduction
	2	Current Issues in Water and Wastewater Treatment Operations
	3	Wastewater Regulations, Parameters, and Characteristics, Wastewater Sources and Types
2 nd	4	Wastewater Treatment: Basic Overview
	5	Collection Systems
	6	Preliminary Treatment, Primary Sedimentation
3 rd	7	Biological Treatment
	8	Secondary Sedimentation
	9	Advanced Treatment, Wastewater Disinfection
4 th	10	Discharge Effluent
	11	Methods for IWWT - Introduction
	12	Effects of industrial wastes on stream, Sewerage systems - Introduction
5 th	13	Types of Sewerage systems, Design of economical diameter of sewerage pipe
	14	Wastewater treatment plant - introduction
	15	Minimizing the effects of industrial effluents on waste water treatment plants and receiving streams-conservation of water
6 th	16	Pretreatment of Industrial Wastes - Introduction
	17	Pretreatment of Industrial Wastes – Unit Operations, Unit Processes
	18	Reuse of waste water, volume reduction
7 th	19	MINOR TEST I
	20	
	21	
8 th	22	Strength reduction, neutralization, equalization and proportioning, Population equivalent
	23	Industrial effluent standards for disposal into inland surface water sources and on land for irrigation

	24	Study of the following Industries from waste generation, quality and its treatment including brief overview of manufacturing process: Textile – manufacturing process brief introduction
9 th	25	Textile wastes: Cotton textile wastes
	26	Raw Material, Manufacturing Process, Spinning, weaving and sizing
	27	Desizing, Caustic Kiering, Bleaching, Souring, Synthetic Fiber Wastes, Silk and Jute Manufacturing wastes
10 th	28	Tannery - manufacturing process brief introduction
	29	Tannery - waster generation, Characteristics of waste water and its treatment
	30	Sugar Mill - manufacturing process brief introduction,waster generation and its treatment
11 th	31	Distillery - manufacturing process brief introduction
	32	Distillery - waster generation and its treatment
	33	Dairy, pulp & paper - manufacturing process brief introduction, waster generation and its treatment
12 th	34	Metal plating, oil refinery - manufacturing process brief introduction
	35	Metal plating, oil refinery - waster generation and its treatment
	36	Nitrogenous fertilizers - brief introduction,Ammonia Synthesis, Urea Synthesis
13 th	37	Phosphoric Acid, Ammonium Sulphate, DAP
	38	Methods of treatment
	39	Thermal power plants - manufacturing process brief introduction,waster generation and its treatment
14 th	40	MINOR TEST II
	41	
	42	
15 th	43	Radio-active wastes - brief introduction
	44	Handling Radioactive Material
	45	Waster generation, Case Studies,Treatment and Management

CVE-408-P Estimation and Accounts

Name of the Faculty : Mr. Pankaj Dahiya
Discipline : B.Tech in Civil Engineering
Semester : VIII (4th Year)
Subject : CVE-408-P Estimation and Accounts
Lesson Plan Duration : 15 Weeks
Work Load (Lecture / Practical) per week (in hrs.) : Practical – 02

Week	Practical	
	Lecture day	Topic (Including Assignment Test)
1 st	1	Estimate: Principles of estimation, units, items of work, different kinds of estimates,
	2	different methods of estimation, estimation of materials in single room building,
2 nd	3	Illustrative example
	4	two roomed building with different sections of walls, foundation, floors and roofs,
3 rd	5	Illustrative example
	6	R.B. and R.V.C.C. works, Plastering, White-washing, Distempering and painting, doors and windows, lump sum items,
4 th	7	Estimates of canals, roads etc.
	8	Illustrative example
5 th	9	Specification of Works: Necessity of specifications, types of specifications, general specifications,
	10	Specification for bricks, cement, sand, water, lime, reinforcement;
6 th	11	Detailed specifications for Earthwork, Cement, concrete, brick work, floorings, D.P.C., R.C.C.,
	12	Cement plastering, white and color washing, distempering, painting.
7 th	13	MINOR TEST I
	14	
8 th	15	VIVA – VOCE Group - 1
	16	VIVA – VOCE Group - 2
9 th	17	Rate Analysis: Purpose, importance and requirements of rate analysis, units of measurement,
	18	Preparation of rate analysis, procedure of rate analysis for items:- Earthwork, concrete works,
10 th	19	Procedure of rate analysis for items: -R.C.C. works, reinforced brick work, plastering, painting, finishing (white-washing, distempering).
	20	Public Works Account: Introduction, function of P.W. department, contract,
11 th	21	Guidelines, types of contracts, their advantages and disadvantages,

	22	Tender and acceptance of tender, Earnest money, security money, retention money,
12 th	23	Illustrative example of contract and tender
	24	Measurement book, cash book, preparation, examination and payment of bills,
13 th	25	First and final bills, administrative sanction, technical sanction
	26	Illustrative example of Measurement book and bill preparation
14 th	27	MINOR TEST II
	28	
15 th	29	VIVA – VOCE Group - 1
	30	VIVA – VOCE Group - 2

CVE – 414-L Geosynthetics Engineering

(Department Elective – III)

Name of the Faculty	:	Ms. Manju Godara
Discipline	:	B.Tech in Civil Engineering
Semester	:	VIII (4 th Year)
Subject	:	CVE-414-L, Geosynthetics Engineering
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)
1 st	1	<ul style="list-style-type: none">• Introduction to Geosynthetics• Background of reinforced earth• Basic description, mechanism and concept• Historical Development of Geosynthetics
	2	<ul style="list-style-type: none">• Nomenclature related to geosynthetics• Function of geosynthetics
	3	<ul style="list-style-type: none">• Use around the World• Applications of geosynthetics• Development in India
2 nd	4	<ul style="list-style-type: none">• Geosynthetics classification, functions
	5	<ul style="list-style-type: none">• Raw material used, different types of geosynthetics
	6	<ul style="list-style-type: none">• Raw Materials: Polyester, Polypropylene,• Polyethylene, HDPE, CPE, CSPE, PA, Nylon, PVC etc.
3 rd	7	<ul style="list-style-type: none">• Their Durability and Ageing
	8	<ul style="list-style-type: none">• Different types of geosynthetics: Geotextiles,
	9	<ul style="list-style-type: none">• Geogrids, Geonets and Geo membranes• Physical properties of geosynthetics
4 th	10	<ul style="list-style-type: none">• Mechanical properties
	11	<ul style="list-style-type: none">• Hydraulic – Permeability properties
	12	<ul style="list-style-type: none">• Endurance Properties and Nano Material
5 th	13	<ul style="list-style-type: none">• Degrading Agencies, Biological Resistance
	14	<ul style="list-style-type: none">• Chemical Resistance and Weathering Resistance

	15	<ul style="list-style-type: none"> • Abrasion resistance, • Durability properties
6 th	16	<ul style="list-style-type: none"> • Melt flow index and asphalt retention
	17	Manufacturing Methods of: <ul style="list-style-type: none"> • Fibers, Yarn, Nonwoven Geotextiles,
	18	<ul style="list-style-type: none"> • D.S.F. Fabrics • Geogrids – Introduction, Applications
7 th	19	MINOR TEST 1
	20	
	21	
8 th	22	<ul style="list-style-type: none"> • Tests on Geogrids: Aperture opening & Percent open area
	23	<ul style="list-style-type: none"> • Thickness of rib and junctions, Number of ribs per meter length test
	24	<ul style="list-style-type: none"> • Mass per unit area test, Tensile strength test
9 th	25	<ul style="list-style-type: none"> • Interface frictional strength: Shear and pullout
	26	<ul style="list-style-type: none"> • Connection strength between facing blocks and Geogrids
	27	<ul style="list-style-type: none"> • Sampling, Factors influencing Testing
10 th	28	<ul style="list-style-type: none"> • Physical Properties
	29	<ul style="list-style-type: none"> • Physical Properties
	30	<ul style="list-style-type: none"> • Mechanical Properties under Uniaxial loading • Creep Testing
11 th	31	<ul style="list-style-type: none"> • Test on Geonets - I
	32	<ul style="list-style-type: none"> • Test on Geo membranes: thickness, density
	33	<ul style="list-style-type: none"> • Tensile strength / Elongation test, • Permeability test
12 th	34	<ul style="list-style-type: none"> • Erosion Control with Geogrids: Wind Erosion, Rain Water Erosion
	35	<ul style="list-style-type: none"> • Erosion Control Measures, Placement of Geogrids
	36	Bearing Capacity Improvement with Geogrids: <ul style="list-style-type: none"> • Reinforced soil system, • Geocells
13 th	37	<ul style="list-style-type: none"> • Geofoam systems
	38	<ul style="list-style-type: none"> • Advantages, Mechanism, Modes of Failure

	39	<ul style="list-style-type: none"> • Friction Coefficient, • Experimental Studies
14 th	40	MINOR TEST – II
	41	
	42	
15 th	43	Application of Geosynthetics in Water Resource Projects: Case Study <ul style="list-style-type: none"> • Dharoidam,Hiran II Dam
	44	<ul style="list-style-type: none"> • Dharoidam,Hiran II Dam
	45	<ul style="list-style-type: none"> • Meda Creek Irrigation Scheme • Lining of Kakarpar Canal

CVE-430-L PROJECT PLANNING & MANAGEMENT

Name of the Faculty	:	Mr.Harish Kumar
Discipline	:	B.Tech in Civil Engineering
Semester	:	VIII (4 th Year)
Subject	:	CVE – 430-L, Project Planning & Management
Lesson Plan Duration	:	15 Weeks (from Aug, 2018 to Dec, 2018)
Work Load (Lecture / Practical) per week (in hrs.)	:	Lectures – 03

Lesson Plan			
Week	Lecture Day	Theory	
		Topic(Including Assignment Test)	Date
1 st	1	Construction Management: Significance, objectives and functions of construction management	
	2	Types of constructions, resources for construction industry, stages for construction	
	3	Construction team, engineering drawings.	
2 nd	4	Construction Contracts & Specifications: Introduction, types of contracts, contract document	
	5	Specifications, important conditions of contract, arbitration	
	6	Construction Planning: Introduction, work breakdown structure, stages in planning-pre-tender stages	
3 rd	7	contract stage, scheduling, scheduling by bar charts,	
	8	contract stage, scheduling, scheduling by bar charts,	
	9	preparation of material, equipment, labour and finance schedule, Limitation of bar charts, milestone charts	
4 th	10	Construction Organization: Principles of Organization, communication,	
	11	Leadership and human relations, types of Organizations,	
	12	Organization for construction firm, site organization, Temporary services, job layout.	
5 th	13	Network Techniques in Construction Management-I: CPM Introduction, network techniques, work break down,	
	14	classification of activities, rules for developing networks,	
	15	network development-logic of network, allocation of time to various activities, Numerical Problems	
6 th	16	Numerical Problems	
	17	Numerical Problems	
	18	Fulkerson's rule for numbering events, network analysis ,	
7 th	19	MINOR TEST I	
	20		
	21		
8 th	22	determination of project schedules, critical path,	
	23	ladder construction, float in activities,	
	24	shared float, updating, resources allocation, Resources smoothing and resources leveling.	

9 th	25	Numerical Problems	
	26	Numerical Problems	
	27	Network Techniques in Construction Management-II-PERT: Probability concept in network, optimistic time, pessimistic time, most likely time,	
10 th	28	Numerical Problems	
	29	Numerical Problems	
	30	lapsed time, deviation, variance, standard deviation, Numerical Problems	
11 th	31	slack critical path, probability of achieving completion time,	
	32	central limit theorem, Numerical Problems	
	33	Numerical Problems	
12 th	34	Numerical Problems	
	35	Cost-Time Analysis: Cost versus time, direct cost, indirect cost, total project cost and optimum duration,	
	36	Cost versus time, direct cost, indirect cost, total project cost and optimum duration,	
13 th	37	Contracting the network for cost optimization,	
	38	steps in time cost optimization, illustrative examples.	
	39	illustrative examples	
14 th	40	MINOR TEST II	
	41		
	42		
15 th	43	Inspection & Quality Control: Introduction, principles of inspection, reinforcement of specifications,	
	44	Stages in inspection and quality control,	
	45	Testing of structures, statistical analysis.	

CVE – 426-P TRANSPORTATION ENGINEERING – II (P)

Name of the Faculty : Mr. Manik Goyal
Discipline : B.Tech in Civil Engineering
Semester : VIII(4thYear)
Subject : CVE – 426-P Transportation Engineering – II (P)
Lesson Plan Duration : 15 Weeks (from January, 2019 to April, 2019)
Work Load (Lecture / Practical) per week (in hrs.) : Practical – 02

Week	Practical	
	Lecture day	Topic (Including Assignment Test)
1 st	1	Experiment 1 –Flakiness and Elongation Index of aggregates (Group 1)
	2	Experiment 1 –Flakiness and Elongation Index of aggregates (Group 2)
2 nd	3	Experiment 2 –Specific gravity and water absorption test on aggregates (Group 1)
	4	Experiment 2 - Specific gravity and water absorption test on aggregates (Group 2)
3 rd	5	Experiment 3 - Specific gravity of bitumen(Group 1)
	6	Experiment 3 - Specific gravity of bitumen (Group 2)
4 th	7	Experiment 4 - Proportioning of aggregates (Group 1)
	8	Experiment 4 - Proportioning of aggregates (Group 2)
5 th	9	Experiment 5 - Marshall’s stability test (Group 1)
	10	Experiment 5 - Marshall’s stability test (Group 2)
6 th	11	Experiment 6 - Stripping test on aggregates (Group 1)
	12	Experiment 6 - Stripping test on aggregates (Group 2)
7 th	13	MINOR TEST I
	14	
8 th	15	VIVA – VOCE Group - 1
	16	VIVA – VOCE Group - 2
9 th	17	Experiment 7– Determination of bitumen content (Group 1)
	18	Experiment 7 - Determination of bitumen content (Group 2)
10 th	19	Experiment 8 -CBR lab test on soil (Group 1)
	20	Experiment 8 - CBR lab test on soil (Group 2)
11 th	21	IRC 37 – 2012 specification, CBR calculations and error corrections (Group 1)
	22	IRC 37 – 2012 specification, CBR calculations and error corrections (Group 2)

12 th	23	Experiment 9–Traffic volume study using videography technique(Group 1)
	24	Experiment 9 - Traffic volume study using videography technique(Group 2)
13 th	25	Experiment 10 - Traffic speed study using videography technique(G1)
	26	Experiment 10 - Traffic speed study using videography technique(G2)
14 th	27	MINOR TEST II
	28	
15 th	29	VIVA – VOCE Group - 1
	30	VIVA – VOCE Group - 2

CVE-428-P ENVIRONMENTAL ENGINEERING-II (P)

Name of the Faculty : Ms. Manju Godara
Discipline : B.Tech in Civil Engineering
Semester : VIII (4th Year)
Subject : CVE-428-P Environmental Engineering-II (P)
Lesson Plan Duration : 15 Weeks (from January, 2019 to April, 2019)
Work Load (Lecture / Practical) per week (in hrs.) : Practical – 02

Week	Practical	
	Lecture day	Topic (Including Assignment Test)
1 st	31	Exp. 1 - Determine the acidity and alkalinity of a sewage sample (Group 1)
	32	Exp. 1 - Determine the acidity and alkalinity of a sewage sample (Group 2)
2 nd	33	Exp. 2 - Determine total, suspended, dissolved and settleable solids in a sewage sample (Group 1)
	34	Exp. 2 - Determine total, suspended, dissolved and settleable solids in a sewage sample (Group 2)
3 rd	35	Exp. 3 - Determine volatile and fixed solids in a sewage sample (Group 1)
	36	Exp. 3 - Determine volatile and fixed solids in a sewage sample.(Group 2)
4 th	37	Exp. 4 - To determine oil and grease in a sewage sample.(Group 1)
	38	Exp. 4 - To determine oil and grease in a sewage sample.(Group 2)
5 th	39	Exp. 5 - To determine the chloride concentration in a sewage sample. (Group 1)
	40	Exp. 5 - To determine the chloride concentration in a sewage sample.(Group 2)
6 th	41	Exp. 6 - To determine the Sulphate concentration in a sewage sample.(Group 1)
	42	Exp. 6 - To determine the Sulphate concentration in a sewage sample.(Group 2)
7 th	43	MINOR TEST I
	44	
8 th	45	VIVA – VOCE Group - 1
	46	VIVA – VOCE Group - 2
9 th	47	Exp. 7 - To determine the B.O.D. of a given sewage sample. (Group 1)
	48	Exp. 7 - To determine the B.O.D. of a given sewage sample.(Group 2)
10 th	49	Exp. 8 - To determine the C.O.D. of a given sewage sample.(Group 1)
	50	Exp. 8 - To determine the C.O.D. of a given sewage sample.(Group 2)
11 th	51	Exp. 9 - To determine the T.O.C. of a given sewage sample.(Group 1)

	52	Exp. 9 - To determine the T.O.C. of a given sewage sample.(Group 2)
12 th	53	Exp. 10 - To determine the fecal count of a given sewage sample.(Group 1)
	54	Exp. 10 - To determine the fecal count of a given sewage sample.(Group 2)
13 th	55	Exp. 11 - Microscopic studies of a sewage. (Group 1)
	56	Exp. 11 - Microscopic studies of a sewage. (Group 2)
14 th	57	MINOR TEST II
	58	
15 th	59	VIVA – VOCE Group - 1
	60	VIVA – VOCE Group - 2