

UNIVERSITY OF JAMMU, JAMMU

COURSE SCHEME

B.E 5th Semester Civil Engineering

For Examination to be held in the Year December 2020,2021,2022,2023

Contact hours/week = 27

Course Code	Course Type	Course Title	Load Allocation			Marks Distribution		Total Marks	Credits	% Change
			L	T	P	Internal	External			
PCE-501	Professional Core Course	Structural Analysis –II	3	1	0	50	100	150	4	100%
PCE-502	Professional Core Course	Geotechnical Engineering	3	1	0	50	100	150	4	100%
PCE -503	Professional Core Course	Transportation Engineering	2	1	0	50	100	150	3	100%
PCE-504	Professional Core Course	Construction Planning & Management	2	1	0	50	100	150	3	100%
PCE-505	Professional Core Course	Environment Engineering	3	1	0	50	100	150	4	100%
MOC-501	*Massive Open Online Course	SWAYAM/NPTEL	3	0	0	100	0	100	3	100%
PIT-511	Professional Core Course	Summer Survey Camp (IT-1)	0	0	0	100	0	100	1	100%
PCE-512	Professional Core Course	Structural Analysis –II Lab	0	0	2	50	0	50	1	100%
PCE-513	Professional Core Course	Geotechnical Engineering Lab	0	0	2	50	0	50	1	100%
PCE-514	Professional Core Course	Environment Engineering Lab	0	0	2	50	0	50	1	100%
Total			16	5	6	600	500	1100	25	

NOTE: *The department shall offer the Swayam/NPTEL course out of the list of courses offered by Swayam around the time of commencement of the semester. However, the selected NPTEL course should not be similar to the regular courses offered as a part of the department curriculum.

Examination to be held in the Year December 2020,2021,2022,2023.

CLASS: B.E 5th SEMESTER

BRANCH: CIVIL ENGINEERING

COURSE TITLE:STRUCTURAL ANALYSIS –II

COURSE NO.:PCE- 501

DURATION OF EXAM:3 HOURS

CREDITS: 4

L	T	P	Marks	
3	1	0	Theory 100	Sessional 50

COURSE OUTCOMES : On completion of the course the students will be able to:

CO1	State general theorems and analyse beams plane frames using energy and consistent deformation method.
CO2	Draw shear force and bending moment diagrams for fixed as well as continuous beams and find deflections in beams using different methods
CO3	Analyse indeterminate structures using various classical methods and draw shear force and bending moment diagrams.
CO4	Analyse the structures subjected to moving loads.

Module I

Principle of Virtual work, Maxwell's reciprocal theorem, First theorem of Castigliano, Deflection of Truss Joints (Determinate Trusses) by Maxwell's Method.

Statically indeterminate Structures, Second Theorem of Castigliano and its applications for beams and portal frames.

Degree of redundancy of structures, Forces in members of redundant trusses (Single Degree).

(10hrs)

Module II

Fixed & Continuous Beams: Fixed beams, bending moment diagrams, Fixed beams with supports at different levels, Advantages & disadvantages.

Continuous beams: Clapyron's three moment theorem.

Deflection of Determinate structures: cantilevers, simply supported beams using (a) Moment area method (b)Conjugate beam method

(10hrs)

Module III

Analysis of continuous beams and frames (having indeterminacy up to 03 degrees) including sinking and rotation yielding of supports using

(a) Slope deflection method

(b) Moment distribution method

(10hrs)

Module IV

Influence lines: Basic concepts of influence lines, application of Muller Breslau's principle.

Rolling loads: Use of influence lines for determination of shear force and bending moment in simply supported beams, overhanging beams, compound beams.

Influence lines for truss reactions and members forces for plane determinate trusses.

(10hrs)

RECOMMENDED BOOKS:

- | | | |
|----|-----------------------------------|-----------------|
| 1. | BASIC STRUCTURAL ANALYSIS | REDDY,C.S |
| 2. | THEORY OF STRUCTURES | RAMAMURTHAM, S. |
| 3. | INDETERMINATE STRUCTURAL ANALYSIS | WANG, C.K. |
| 4. | THEORY AND ANALYSIS OF STRUCTURES | JAIN & ARYA |

NOTE: There shall be total eight questions of 20 marks each, two from each module. Five questions have to be attempted selecting at least one from each module. Use of Calculator is allowed.

Examination to be held in the Year December 2020,2021,2022,2023

CLASS : B.E 5th SEMESTER

BRANCH: CIVIL ENGINEERING

CREDITS: 4

COURSE TITLE: GEOTECHNICAL ENGINEERING

COURSE NO.: PCE- 502

DURATION OF EXAM: 3 HOURS

L	T	P	Marks	
3	1	0	Theory 100	Sessional 50

COURSE OUTCOMES : On completion of the course the students will be able to:	
CO1	Identify the formation of soil and classification of the soils
CO2	Measure permeability and determine the flow characteristics
CO3	Determine the mechanism of compaction and consolidation and evaluating them through various tests.
CO4	Estimate the shear strength and also evaluate stresses within the soil mass

MODULE – I

Introduction, Origin & Formation of soil, Major soil deposits of India and General Types of soils. Three-Phase soil system and phase relationships.

Clay minerals & its structural unit, Clay-water relationship, Soil structures.

Index Properties: Specific Gravity, Specific Surface, Relative Density, Particle size Analysis, Stokes' law & Sedimentation analysis, Grain Size Distribution curve, Consistency of soils. **(10 hrs)**

MODULE – 2

Various soil-classification systems & Field Identification.

Principle of effective stress, Capillary phenomena, Seepage force and Quicksand condition. Permeability(1-D Flow), Darcy's law, Discharge and Seepage velocity, Lab Methods for determination of Co-efficient of Permeability, Factors affecting Permeability. Seepage through Soil (2-D flow), Laplace's equation, Flow net, Uplift Pressures, Seepage through Earth Dam. **(10 hrs)**

MODULE– 3

Compaction: Introduction, Field and Laboratory methods, Factors affecting compaction.

Consolidation: Principle of Consolidation, One-dimensional Consolidation, Consolidation Tests, Determination of coefficient of consolidation, Pre-consolidation Pressure, Secondary Compression, Computation of Ultimate/final Settlement. **(10 hrs)**

MODULE – 4

Shear Strength of soil, Mohr's Circle and its characteristics, Mohr's Coulomb's Equation, Different lab tests and drainage conditions, Stress-Strain curves. **(10 hrs)**

RECOMMENDED BOOKS:

- | | |
|--|------------------------|
| 1. Basic and Applied Soil Mechanics | Gopal Ranjan & ASR Rao |
| 2. SOIL MECHANICS & FOUNDATION ENGG. | ARORA K.R |
| 3. SOIL MECHANICS AND FOUNDATION ENGG. | PUNMIA B.C |
| 4. FOUNDATION ENGINEERING | P.C.Varghese |
| 5. GEOTECHNICAL ENGINEERING PRINCIPLE AND PRACTICE | DONALD P.CODUTO |
| 6. SOIL MECHANICS AND FOUNDATION ENGINEERING | P. PURSHOTHAMA RAJ |

NOTE: There shall be total eight questions of 20 marks each, two from each module. Five questions have to be attempted selecting at least one from each module. Use of Calculator is allowed.

Examination to be held in the Year December 2020,2021,2022,2023

CLASS : B.E 5th SEMESTER

BRANCH : CIVIL ENGINEERING

COURSE TITLE: TRANSPORTATION ENGINEERING

COURSE NO.: PCE- 503

DURATION OF EXAM: 3 HOURS

CREDITS: 3

L	T	P	Marks	
2	1	0	Theory	Sessional
			100	50

COURSE OUTCOMES : On completion of the course the students will be able to:

CO1	Prepare the plan for roads (highways) as per IRC standards
CO2	Implement guidelines of traffic engineering and suggest modern materials for highway construction
CO3	Design flexible and rigid pavement using IRC Methods
CO4	Estimate the run off, scour depth and IRC loadings on a bridge.

Module -I

Highway Engineering Introduction, History and Classification of Roads, I.R.C, Motor Vehicle act, National Highway Act, Alignment Design, Highway Location, Route Surveys.

Highway Geometric Design: Elements, Signs, Distance, I.R.C recommendations for carriage way width, Design of horizontal and vertical alignments. **(08hrs)**

Module- II

Traffic Engineering: Introduction, Scope and Characteristics of Traffic, Traffic Studies, parking studies, off street parking, I.R.C recommendations for minimum parking space for truck and cars, Classification of Accident, accident studies Highway lighting.

Highway Materials: Subgrade Soil and its preparation, properties and tests for subgrade soil, road stone aggregates and bituminous materials. **(10hrs)**

Module- III

Highway Pavement Design: Types of Pavement Structure, Objects and requirements of Pavements, Functions of Pavement Components, Design factors for Pavement, ESWL, Various methods of design of Flexible Pavements considering I.R.C considerations e.g., group index method, CBR method and Burmister's method, Tri axial Method. General design consideration of Rigid Pavements, difference between Rigid and Flexible Pavements, Westergaard's Method for design of Rigid Pavements and concept for stresses due to load and temperature in rigid pavements. **(10hrs)**

Module- IV

Bridges : Introduction, importance of bridges, brief history of development of bridges, selection of bridge site, recommended practice for site exploration and soil investigation.

Basic components of a bridge, determination of flood discharge, scour depth, afflux, economic span, requirements of an ideal bridge, classification of Bridges, selection of type of Bridge.

Introduction to foundation of bridges and I.R.C classification of live loads for road bridges: I.R.C Class AA Loading, I.R.C Class A Loading, I.R.C Class B Loading, I.R.C Class 70R loading. **(10hrs)**

RECOMMENDED BOOKS:

- | | |
|---|-----------------------|
| 1. Traffic Engineering and Transportation Planning | Kadiyali, L.R. |
| 2.Highway Engineering | Khanna& Justo |
| 3. Highway Material Testing | Khanna& Justo |
| 4. Bridge Engineering | Bindra S.P |
| 5. Roads, Railways, Bridges, Tunnels and Harbour Dock engineering | B.L Gupta, Amit Gupta |

NOTE: There shall be total eight questions of 20 marks each, two from each module. Five questions have to be attempted selecting at least one from each module. Use of Calculator is allowed.

Examination to be held in the Year December 2020,2021,2022,2023.

CLASS: B.E 5th SEMESTER

BRANCH: CIVIL ENGINEERING

CREDITS: 3

COURSE TITLE: CONSTRUCTION PLANING & MANAGEMENT

COURSE NO.: PCE- 504

DURATION OF EXAM:3 HOURS

L	T	P	Marks	
2	1	0	Theory 100	Sessional 50

COURSE OUTCOMES : On completion of the course the students will be able to:

CO1	Plan and schedule the Project by various network techniques of construction planning.
CO2	Correlate the man power requirement, optimum duration and optimum cost of the project.
CO3	Explain the various concepts of Tenders and maintaining of different accounts.
CO4	Identify the quality control standards and the management of various resources used in construction.

Module I

Introduction to Bar Charts and Mile stone charts, Elements of network, Development of network, Network rules, Network techniques CPM and PERT, Network analysis, Time estimates, Time computations, Determination of Slack and float, Critical Path. **(09hrs)**

Module II

Determination of total cost of project, crashing of networks, Methods of resource allocation Resource Levelling and Resource Smoothing, CPM updating, Feasibility report of project, Cost - Benefit ratio. **(08hrs)**

Module III

Tenders, Earnest Money, Security Deposit, Comparative Statements, Contracts, Types and Conditions, Cash Book, Debit and Credit Notes, Imp rest accounts. Types of measurement book, Classification of works, Stages in construction of a project, Indent, Invoice, Depreciation and methods, Safety in construction at site works. **(10hrs)**

Module IV

Functions of construction management, Objectives of construction management, Stages of planning by different agencies, Construction agencies, Material Management, Inventory Control, Economic order quantity (EOQ), Organization, Types of organization and its principles. Quality control and Quality assurance techniques, Standardization. **(10hrs)**

RECOMMENDED BOOKS:

- | | |
|---|------------------|
| 1. CONSTRUCTION PLANNING EQUIPMENT& METHODS | PURIFOY, R.L. |
| 2. CONSTRUCTION MANAGEMENT | HARPAL SINGH |
| 3. PERT & CPM - Principles & Applications | SRINATH, DR.L.S. |
| 4. MANAGEMENT IN CONSTRUCTION INDUSTRY | DHARWADKAR, P.P. |
| 5. STANDARDISATION - A New Discipline | VERMAN, L.C. |

NOTE: There shall be total Eight questions of 20 marks each, two from each Module. Five questions have to be attempted selecting at least one question from each Module. Use of calculator is allowed.

Examination to be held in the Year December 2020,2021,2022,2023.

CLASS: B.E 5th SEMESTER

BRANCH: CIVIL ENGINEERING

COURSE TITLE: ENVIRONMENT ENGINEERING

COURSE NO.:PCE- 505

DURATION OF EXAM:3 HOURS

CREDITS: 4

L	T	P	Marks	
3	1	0	Theory 100	Sessional 50

COURSE OUTCOMES : On completion of the course the students will be able to:	
CO1	Assess the characteristics of water as well as waste water and their impacts
CO2	Estimate the quantities of water as well as waste water and plan their conveyance components.
CO3	Design the components of a water treatment plant.
CO4	Design the various primary, aerobic and anaerobic secondary waste water treatment units with their effectiveness.

Module I

Water Engineering : Quality and Quantity

Water supply systems: need for planned water supply schemes, components of water supply system and determination of their design capacities;

Source of Water: Surface and Subsurface Sources of water, Water distribution network, types of intake structure.

Quantity of water: Population forecast, rate of water consumption for various purposes, water demand, factors affecting consumption, fire allowances, fluctuations in demand and its effects on design of Water Supply units.

Quality of water: wholesomeness and palatability, physical, chemical, microbial standards, Introduction to drinking water standard (BIS standard) **(10hrs)**

Module II

Water Treatment: Layout and general outline of water treatment units, sedimentation – principles – design factors, coagulation-flocculation clarifier design – coagulants - feeding arrangements.

Filtration - classification, slow and rapid sand filters, dual media filters, sand, gravel and under-drainage system, mode of action, cleaning, limitations, operational difficulties, performance, basic design consideration, pressure filters: construction and operation.

Disinfection: chlorination, chemistry of chlorination, kinetics of disinfection, chlorine demand, free and combined chlorine, break point chlorination, superchlorination, dechlorination, chlorine residual, use of iodine, ozone, ultraviolet rays and chlorine dioxide as disinfectants. **(12hrs)**

Module III

Characteristics of sewage: Quality Parameters: BOD, COD, TOC, Solids, DO, Nitrogen, Phosphorus, effluent standards. Waste water collection, Estimation of waste water and storm water, System of Sewerage, components of sewerage systems, systems of layout, quantity of sanitary sewage, Hydraulic design of sewers: diameter, self cleansing velocity and slopes, Construction and testing of sewer lines. **(10hrs)**

Module IV

Classification of treatment method, Primary treatment: Screens: Types of screens, screen chamber, disposal of screenings. Grit Chamber: Sources of grit, Velocity control in grit chamber, Disposal of grit, Sources of oil and grease, Importance of removal, Methods of oil and grease removal,

Secondary treatment: activated sludge process, trickling filter, Sludge digestion and drying beds. Stabilization pond, Septic tank, Soakage systems, Imhoff tank, Sludge disposal methods, advantages and disadvantages. **(10hrs)**

RECOMMENDED BOOKS:

- | | |
|--|---------------------|
| 1. WATER SUPPLY AND SEWAGE | STEEL, E.W.& MCGHEE |
| 2. ELEMENTS OF PUBLIC HEALTH ENGINEERING | DUGGAL, K.N. |
| 3. WATER SUPPLY ENGINEERING VOL.1 | GARG, S.K. |
| 4. ENVIRONMENTAL ENGINEERING | PEAVY |
| 5. WATER SUPPLY AND SEWAGE | McGhee |

NOTE: There shall be total Eight questions of 20 marks each, two from each Module. Five questions have to be attempted selecting at least two question from each Module. Use of calculator is allowed.

Examination to be held in the Year December 2020,2021,2022,2023

CLASS: B.E 5th SEMESTER

BRANCH: CIVIL ENGINEERING

COURSE TITLE: SWAYAM/NPTEL

COURSE NO.: MOC- 501

CREDITS: 3

L	T	P	Marks	
3	0	0	Theory 00	Sessional 100

The department shall offer the SWAYAM / NPTEL course (12 weeks) out of the list of courses offered by SWAYAM around the time of commencement of the semester. However, the selected NPTEL course should not be similar to the regular courses offered as a part of the department curriculum.

The overall monitoring of the NPTEL course will be under the supervision of the teacher in-charge of the department.

The NPTEL/SWAYAM certification course comprises of Assignments (25%) and Proctor Examination (Online examination MCQ's based = 75%) conducted at the end of the semester by IIT Madras as per the schedule.

The marks obtained by the student in the NPTEL/SWAYAM certification course will be tabulated by the concerned department.

Note :- In case the student does not pass the certification exam or remains absent in the proctor examination, no certificate will be given to the candidate by the NPTEL and the student will be deemed to have failed in the course. The examination of the said NPTEL course will be taken by the department concerned in the next semester under the supervision of Examination Cell of GCET Jammu. The paper will be of 75 marks and assignment marks will be carried forward from the previous semester.

Examination to be held in the Year December 2020,2021,2022,2023

CLASS: B.E 5th SEMESTER

BRANCH: CIVIL ENGINEERING

CREDIT: 1

COURSE TITLE: SUMMER SURVEY CAMP

COURSE NO.: PIT- 511

L T P
0 0 0

Marks
100

COURSE OUTCOMES : On completion of the course the students will be able to:	
CO1	Apply knowledge, techniques, skills ad applicable tools of the discipline to Engineering and surveying activities.
CO2	Translate the knowledge gained for the implementation of Civil infrastructure facilities.
CO3	Interpret survey data, compute areas, volumes and can draw contour maps and plans as per data obtained from the field notes.
CO4	Apply knowledge, techniques, skills ad applicable tools of the discipline to Engineering and surveying activities.

Normally the camp shall be conducted after 4th Semester examination during summer vacations.

During the survey camp the students will use all important Surveying Instruments. At the end of the camp, each student should independently complete the office work for the survey works done in the field, which includes the preparation of:

1. Site Plan of the Area.
2. Location of roads and important Installations.
3. Leveling of the area to determine the difference of altitudes, at specified locations.
4. Preparation of Contour Map of the prescribed area.
5. Total station surveying to plot a boundary.

Guidelines for Evaluation of marks: The final examination of the survey camp shall be done by a team of minimum three internal examiners and shall include the followings:

Attendance marks: 20%

Maintaining of Daily Note book: 20%

Presentation: 20%

Viva voice: 40%

Examination to be held in the Year December 2020,2021,2022,2023

CLASS: B.E 5th SEMESTER

BRANCH: CIVIL ENGINEERING

CREDIT: 1

COURSE TITLE: STRUCTURAL ANALYSIS –II LAB

COURSE NO.: PCE- 512

L T P
0 0 2

Marks
50

COURSE OUTCOMES : On completion of the course the students will be able to:	
CO1	Determine the horizontal thrust & gauge factor.
CO2	Determine the deflection and flexure rigidity in a beam.
CO3	Verify the Maxwell's and moment area theorem.

LIST OF EXPERIMENTS:

1. To find horizontal thrust and draw the influence line for horizontal thrust for a two hinged arch.
2. Calibration of electrical strain gauge and determination of gauge factor.
3. To find deflection in fixed continuous beams.
4. To find value of flexural rigidity (EI) for a given beam and compare it with theoretical value.
5. To verify moment area theorem.
6. To verify the Maxwell's reciprocal theorem for beam.
7. To Study the behavior of a portal frames under different end conditions.
8. To measure strain in cantilever beam with the help of strain gauge.
9. Sway in portal frames-demonstration.
10. To study the behavior of different types of struts and to calculate Euler's buckling load.

Examination to be held in the Year December 2020,2021,2022,2023

CLASS : B.E 5th SEMESTER

BRANCH : CIVIL ENGINEERING

CREDIT: 1

COURSE TITLE: GEOTECHNICAL ENGG. LAB

COURSE NO.: PCE- 513

L T P
0 0 2

Marks
50

COURSE OUTCOMES : On completion of the course the students will be able to:	
CO1	Determine index properties of soil.
CO2	Determine the insitu density and compaction characteristics of soil.
CO3	Determine engineering properties of soil.

LIST OF EXPERIMENTS :

1. To determine the moisture content of soil.
2. To determine the Specific gravity of Soil.
3. To determine the Atterberg's limit of soil specimen.
4. To determine the particle size distribution.
5. To find in-situ dry density by Sand replacement method.
6. To determine the compaction characteristics of soil by proctor's test.
7. To determine Permeability by constant head or falling head method.
8. To determine the shear strength of sandy soil by direct shear test.
9. To study Unconfined compression Test.
10. Determination of shear strength parameters of soil under tri axial loadings (Tri axial Compression Test)

Examination to be held in the Year December 2020,2021,2022,2023

CLASS: B.E 5th SEMESTER

BRANCH: CIVIL ENGINEERING

CREDIT: 1

COURSE TITLE: ENVIRONMENTAL ENGINEERING LAB

COURSE NO.: PCE- 514

L T P
0 0 2

Marks
50

COURSE OUTCOMES : On completion of the course the students will be able to:	
CO1	Conduct various quality tests on water and waste water
CO2	Assess the suitability of water for drinking purposes
CO3	Assess the suitability of water for construction and irrigation purposes

LIST OF EXPERIMENTS:

1. To determine the pH value and conductivity of a given sample
2. To find out total dissolved solid, settleable solids and suspended solids of the given sample.
3. To determine the carbonate, bicarbonate, and hydroxide alkalinity of a sample.
4. To find out the concentration of chlorides in the given sample
5. To determine Residual Chlorine in the given sample
6. To estimate the hardness of the given sample of water by standard EDTA method
7. To determine COD of the given waste water sample.
8. To estimate the biological Oxygen demand of the given waste water sample.
9. To determine DO of the given sample.
10. To determine the sulphates in the sample.
11. To determine Nitrates in the given sample of water
12. To determine Fluorides in the given sample of water
13. To determine Iron content in the given sample
14. To determine Lead content in the given sample
15. To determine Total Coliform in the given sample

UNIVERSITY OF JAMMU, JAMMU

COURSE SCHEME

B.E 6th Semester Civil Engineering

For Examination to be held in the Year May 2021,2022,2023,2024

Contact hours/week = 25

Course Code	Course Type	Course Title	Load Allocation			Marks Distribution		Total Marks	Credits	% Change
			L	T	P	Internal	External			
PCE-601	Professional Core Course	Design of RCC Structures	3	1	0	50	100	150	4	100%
PCE -602	Professional Core Course	Hydrology & Irrigation Engineering	2	1	0	50	100	150	3	100%
CEE -603	# Professional Elective Course –I*	Advanced Surveying	3	0	0	50	100	150	3	100%
CEE -604		Foundation Engineering								
CEE -605		Elements of Earth Quake Engineering								
CEE -606	# Professional Elective Course –II	Air Pollution Control & Management	3	0	0	50	100	150	3	100%
CEE -607		Advanced Fluid Mechanics								
CEE -608		Construction Equipment								
HMC-603	Humanities & Social Science Course	Industrial Management	3	0	0	50	100	150	3	100%
MOC-601	*Massive Open Online Course	SWAYAM/NPTEL	3	0	0	100	0	100	3	100%
PCE-611	Professional Core Course	Design of RCC Structure Lab	0	0	2	50	0	50	1	100%
PCE-612	Professional Core Course	Transportation Engineering Lab	0	0	2	50	0	50	1	100%
PCE-613	Professional Core Course	Hydrology & Irrigation Engineering Lab	0	0	2	50	0	50	1	100%
Total			17	2	6	500	500	1000	22	

NOTE: # Open choice to students to select One Elective course in consultation with faculty.

*The department shall offer the Swayam/NPTEL course out of the list of courses offered by Swayam around the time of commencement of the semester. However, the selected NPTEL course should not be similar to the regular courses offered as a part of the department curriculum.

Examination to be held in the Year May 2021,2022,2023,2024

CLASS : B.E 6th SEMESTER

BRANCH: CIVIL ENGINEERING

CREDITS: 4

COURSE TITLE:DESIGN OF R.C.C STRUCTURE

COURSE NO.:PCE- 601

DURATION OF EXAM:3 HOURS

L	T	P	Marks	
3	1	0	Theory	Sessional
			100	50

COURSE OUTCOMES : On completion of the course the students will be able to:

CO1	Interpret the design philosophies and analyze RC sections using Limit State method.
CO2	Design and detail RC beams and slabs using IS code provisions.
CO3	Design and detail RC columns and column footings using IS code provisions.
CO4	Design and detail RC retaining walls using IS code provisions.

Module I

Design philosophies, knowledge of working stress method. Ultimate Load Method. Limit State Method in detail and its statistical back ground. Various Limit States. Analysis and design of singly, doubly reinforced beams, T-beams, cantilever beams using Limit State Method. **(12hrs)**

Module II

Shear, bond, anchorage provisions for rectangular beams using Limit State method. Serviceability conditions. Reinforcement detailing and drawings. Design of beams for Torsion. **(10hrs)**

Module III

Analysis and design of columns by Limit State method. Short and long columns, biaxial bending. Use of design charts, Analysis and design of isolated footing, eccentric footing, combined footing, Introduction to Raft foundation. **(10hrs)**

Module IV

Design of one-way slab, Design of two-way slab with simply supported and restrained edges. Retaining Walls, types, forces, stability requirements. Design of cantilever and counterfort retaining walls, surcharge. **(10hrs)**

RECOMMENDED BOOKS:

1. Reinforced Concrete Structures and Limit State Design Jain, A.K.
2. Limit State Design of Reinforced Concrete Varghese, P
3. Limit State Design of R.C.C. Hughes
4. Plain and Reinforced Concrete Jain & Jaikrishen
5. Limit State Theory and Design of Reinforced Concrete Shah. V.L, & Karve S.R
6. Relevant I.S.Codes

NOTE: There shall be total Eight questions of 20 marks each, two from each Module. Five questions have to be attempted selecting at least one question from each Module. Use of calculator is allowed.

Examination to be held in the Year May 2021,2022,2023,2024

CLASS : B.E6th SEMESTER

BRANCH :CIVIL ENGINEERING

COURSE TITLE:HYDROLOGY & IRRIGATION ENGINEERING

COURSE NO.:PCE- 602

DURATION OF EXAM:3 HOURS

CREDITS: 3

L	T	P	Marks	
2	1	0	Theory 100	Sessional 50

COURSE OUTCOMES : On completion of the course the students will be able to:	
CO1	Analyze hydro-meteorological and estimate precipitation intensity, duration, frequency and losses due to evaporation.
CO2	Develop unit hydrographs for surface runoff
CO3	Estimate the water requirement for irrigation and design irrigation channels.
CO4	Explain and design canal regulation works, cross drainage works.

Module –I

Hydrologic cycle, Precipitation: forms of precipitation, type of precipitation, measurement of precipitation – recording and non recording gauges, gauge network, adjustments of precipitation data, average depth of precipitation over an area - Arithmetic mean, Thiessen polygon and isohyetal method, Hyetograph, Mass curve, Depth area duration curves.

Water Loses: Evaporation, transpiration and infiltration, Factors affecting evaporation, measurement of evaporation, Infiltration, factors affecting infiltration, Determination of infiltration rate. (10hrs)

Module –II

Run off : Factors affecting runoff, Empirical formulae-runoff, Hydrograph: Components of hydrograph, Separation of base flow, Hydrograph for isolated storm and complex storm, unit hydrograph, derivation of unit hydrograph, Unit hydrograph for different duration, S hydrograph. (08hrs)

Module –III

Development of Irrigation in India, Necessity, Benefits and ill effects of Irrigation, Systems of Irrigation (Lift and flow irrigation), Methods of distribution of water, Water requirement of Crops, Canal section, Design procedure for Irrigation Channels, Stable Channel Design, Water Logging and its control, Canal lining. Khosla's theory for determination of pressures and exit gradients, Bligh's creep theory. (10hrs)

Module –IV

River Training Works: Pitched Island, Guide bank, Groynes, Meandering, Artificial cut off, Components of a diversion headwork.

Necessity and location of fall, Classification of falls, Design of Sarda fall. Design of cross regulator and Distributary head regulator, Necessity and types of Cross drainage works, Design of Aqueduct and Syphon Aqueduct. (10hrs)

RECOMMEDED BOOKS:

- | | | |
|----|---|------------------------|
| 1. | Engineering Hydrology | Subramanya, K |
| 2. | Irrigation Engineering & Hydraulic Structures | Garg, S.K. |
| 3. | Irrigation (Practice & Design) | Khushalani, K.B |
| 4. | Theory and Design of Irrigation Structures | Varshney, R.S. & Gupta |
| 5. | Irrigation Engineering & Hydraulic Structures | Sahasrabudhe, S.R. |
| 6. | Irrigation Theory and Practice | Michael, A.M |

NOTE: There shall be total Eight questions of 20 marks each, two from each Module. Five questions have to be attempted selecting at least one question from each Module. Use of calculator is allowed.

Examination to be held in the Year May 2021,2022,2023,2024.

CLASS: B.E 6th SEMESTER

BRANCH: CIVIL ENGINEERING

COURSE TITLE:ADVANCED SURVEYING

COURSE NO.:CEE- 603

DURATION OF EXAM:3 HOURS

CREDITS: 3

CATEGORY: ELECTIVE I

L	T	P	Marks	
3	0	0	Theory 100	Sessional 50

COURSE OUTCOMES : On completion of the course the students will be able to:	
CO1	Apply the knowledge to calculate reduced levels of inaccessible points and distances of missing lines.
CO2	Perform tachometric surveying for distance and height measurements.
CO3	Set out various types of curves in the field.
CO4	Interpret survey data, and relate the knowledge of modern equipment's and methodologies

Module-I

Trigonometric levelling, Different cases of objects, curvature and refraction, Axis-signal correction. Determination of difference in elevation by single and reciprocal observations. Omitted Measurements in traverse survey, Different cases of omitted measurements, Traverse computations and adjustments. **(08hrs)**

Module-II

Tachometric surveying- Purpose of tachometry, Instruments used in tachometry, Systems of tachometric measurements, Basic principle of stadia method, Methods of tachometry and Errors in stadia surveying. Geodetic Surveying, Principle of triangulation, Classification of triangulation, Measurement of angles, Reduction to Centre, Base line measurements and its corrections and Measurement of angles. **(10hrs)**

Module-III

Curves: Classification of curves, Necessity of curves, Elements of simple curve, setting out of simple circular curves, Elements of Compound Curve, Setting out of compound curves, Types of Vertical Curves, Transition Curve, Necessity of transition curve, Super elevation, Length of transition curve **(09hrs)**

Module-IV

Hydrographic surveying, Soundings, Equipment's used in soundings, Methods of locating soundings. Remote Sensing -Necessity of Remote Sensing, Principles of Remote Sensing Elements of remote sensing, Components of Remote Sensing and types of remote sensing
GPS -Fundamentals, working principle and advantage and disadvantages of GPS.
GIS- Basics of GIS, Components of GIS, advantages and disadvantage of GIS **(10hrs)**

RECOMMENDED BOOKS:

1. SURVEYING AND LEVELLING VOL.II BY KANETKAR & KULKARNI
2. SURVEYING VOLS.II & III BY SHANNE
3. SURVEYING BY CLARK
4. REMOTE SENSING & APPLICATIONS By SHIVANGI & MAYA KUMARI
5. SURVEYING VOL.II BY MODI

NOTE: There shall be total Eight questions of 20 marks each, two from each Module. Five questions have to be attempted selecting at least one question from each Module. Use of calculator is allowed.

Examination to be held in the Year May 2021,2022,2023,2024

CLASS : B.E 6th SEMESTER

BRANCH : CIVIL ENGINEERING

COURSE TITLE: FOUNDATION ENGINEERING ELECTIVE-I

COURSE NO.: PCE- 604

DURATION OF EXAM:3 HOURS

CREDITS: 3

L	T	P	Marks	
3	0	0	Theory 100	Sessional 50

COURSE OUTCOMES : On completion of the course the students will be able to:	
CO1	Apply the knowledge to calculate reduced levels of inaccessible points and distances of missing lines.
CO2	Perform tachometric surveying for distance and height measurements.
CO3	Set out various types of curves in the field.
CO4	Interpret survey data, and relate the knowledge of modern equipment's and methodologies

Module I

Lateral Earth Pressure: Earth pressure at rest, Rankine's Theories, Active and passive earth pressure of cohesion & cohesionless soil, Effect of submergence & uniform surcharge, Coulomb's theory.

Stability of Slopes: Finite and Infinite Slopes, Stability Number, Analysis for Stability of Slopes, Various Methods. **(10 hrs)**

Module II

Foundation: Introduction and types of foundation, Bearing capacity of shallow foundation by Terzaghi's theory with water table effects and Indian Standard Code method, Bearing capacity of shallow foundation from field methods. Settlement of shallow foundation. **(08 hrs)**

Module III

DEEP Foundation: Types of piles, Load-carrying capacity of piles by dynamic and static formulae, pile load test, negative skin friction. Settlement of pile foundation.

Well Foundations and its components, Methods of construction, Tilt & Shift, Stability of well foundation by Terzaghi's analysis & IRC method. **(10 hrs)**

Module IV

Soil Exploration: Scope, Sampling, Methods of soil exploration, Standard penetration and cone penetration tests.

Stress distribution in soils: Introduction, Vertical stresses due to concentrated load by Boussinesq's and Westergaard's theories, Pressure bulbs, Uniform load on rectangular area based on Boussinesq's Theory. **(10 hrs)**

RECOMMENDED BOOKS:

- | | |
|--|-------------------|
| 1. Soil Mechanics in Theory and Practice | Alam Singh |
| 2. Soil Mechanics & Foundation Engineering | Arora, K.K. |
| 3. Handbook on Design of Foundations | Kaniraj |
| 4. Analysis and Design of Foundations | Prakash, S |
| 5. Soil Mechanics and Foundation Engineering | PurushothamaRaj.P |

NOTE: There shall be total Eight questions, two from each Module. Five questions have to be attempted selecting at least one question from each Module. Use of calculator is allowed.

Examination to be held in the Year May 2021,2022,2023,2024

CLASS: B.E. 6th SEMESTER

BRANCH : CIVIL ENGINEERING

COURSE TITLE : ELEMENTS OF EARTHQUAKE ENGG.

COURSE NO.: PCE- 605

DURATION OF EXAM:3 HOURS

CREDITS: 3

CATEGORY: ELECTIVE-I

L	T	P	Marks	
3	0	0	Theory	Sessional
			100	50

COURSE OUTCOMES : On completion of the course the students will be able to:	
CO1	Learn causes of earthquakes and basic terminologies related to earthquake.
CO2	Know about the types of vibrations, degree of freedom, and equation of motion of S.D.O.F system.
CO3	Analyze the lateral forces and concepts about seismic design, lateral strength and structure configurations.
CO4	Estimation of earthquake lateral forces due to earthquake.

MODULE I

Introduction to Earthquakes, Causes of Earthquakes, Basic Terminology, Magnitude, Intensity, Peak ground motion parameters.

Past Earthquakes and Lessons learnt, Various Types of Damages to Buildings.

Introduction to theory of Vibrations, Sources of Vibrations, Types of Vibrations, Degree of Freedom, Spring action and damping, Equation of motion of S.D.O.F. systems, Undamped, Damped system subjected to transient forces, general solution, green's function.

(18 hours)

MODULE II

Lateral Force analysis, Floor Diaphragm action, moment resisting frames, shear walls.

Concepts of seismic design, Lateral Strength, Stiffness, ductility and structural configuration.

Introduction to provisions of IS 1893-2002 Part-I for buildings. Estimation of lateral forces due to earthquake.

Introduction to provisions of IS 4326.

Introduction to provision of IS 13920.

(18 hours)

RECOMMENDED BOOKS:

1. Earthquake Resistant Design of Structures Agrawal P, Shrikhande M
2. Elements of Earthquake Engg Krishna.J,Chandrasekaran
3. Structural Dynamics –Theory & Computation Paz M
4. Earthquake Resistant Design: Dowrick. D.J
5. Mechanical Vibrations: Rao SS
6. BIS codes: IS 4326,IS 13920,IS 1893

NOTE: There shall be total Eight questions of 20 marks each, Four from each Module. Five questions have to be attempted selecting at least two question from each Module. Use of calculator is allowed.

Examination to be held in the Year May 2021,2022,2023,2024

CLASS: 6th SEMESTER

BRANCH: CIVIL ENGINEERING

CREDITS: 3

COURSE TITLE: AIR POLLUTION CONTROL & MANAGEMENT ELECTIVE-II

COURSE NO.: CEE- 606

DURATION OF EXAM: 3 HOURS

L	T	P	Marks	
3	0	0	Theory 100	Sessional 50

COURSE OUTCOMES : On completion of the course the students will be able to:	
CO1	Identify sampling and analysis techniques for air quality assessment.
CO2.	Attain perfect knowledge about the plume behavior for atmospheric stability conditions.
CO3	Attain ability to design air pollution controlling devices.
CO4	Gain knowledge about air quality management.

Module I

Sources and effects of Air pollution : Classification of air pollutants, Particulates and gaseous pollutants, Sources of air pollution, Source inventory, Effects of air pollution on human beings, materials, vegetation, animals – global warming - ozone layer depletion, Sampling and Analysis – Basic Principles of Sampling – Source and ambient sampling – Analysis of pollutants- Principles. **(10hrs)**

Module II

Dispersion of Pollutants: Elements of atmosphere – Meteorological factors – Wind roses – Lapse rate – Atmospheric stability and turbulence – Plume rise – Dispersion of pollutants – Dispersion models - Applications. **(08hrs)**

Module III

Air Pollution Control : Concepts of control – Principles and design of control measures – Particulates control by gravitational, centrifugal, filtration, scrubbing, electrostatic precipitation – Selection criteria for equipment - gaseous pollutant control by adsorption, absorption, condensation, combustion – Pollution control for specific major industries. **(10hrs)**

Module IV

Air Quality Management: Air quality standards – Air quality monitoring – Preventive measures - Air pollution control efforts – Zoning – Town planning regulation of new industries – Legislation and enforcement – Environmental Impact Assessment and Air quality. Noise Pollution: Sources of noise pollution – Effects – Assessment - Standards – Control methods – Prevention. **(10hrs)**

RECOMMENDED BOOKS:

- | | |
|--|------------------------------|
| 1. ENVIRONMENTAL ENGINEERING, VOL. II | GARG, S.K |
| 2. ENVIRONMENTAL POLLUTION CONTROL ENGINEERING | RAO, C.S |
| 3. AIR POLLUTION CONTROL | RAO, M. N. AND RAO, H. V. N. |
| 4. AIR POLLUTION CONTROL ENGINEERING | NOEL, D. N. |
| 5. INDUSTRIAL AIR POLLUTION CONTROL SYSTEMS | HEUMANN, W. L |

NOTE: There shall be total Eight questions of 20 marks each, two from each Module. Five questions have to be attempted selecting at least one question from each Module. Use of calculator is allowed.

Examination to be held in the Year May 2021,2022,2023,2024.

CLASS: B.E 6th SEMESTER

BRANCH: CIVIL ENGINEERING

COURSE TITLE: ADVANCE FLUID MECHANICS ELECTIVE-II

COURSE NO.: PCE- 607

DURATION OF EXAM:3 HOURS

CREDITS: 3

L	T	P	Marks	
3	0	0	Theory 100	Sessional 50

COURSE OUTCOMES : On completion of the course the students will be able to:	
CO1	Demonstrate the concepts of Laminar flow through pipes and Boundary layer theory.
CO2	Demonstrate the concepts of Turbulent flow, Unsteady flow and Water hammer phenomenon.
CO3	Design most economical section of an open channel
CO4	Choose appropriate type of turbine for the given condition and suggest type of pump required for specific purpose.

Module I

Laminar Flow: Derivation of Navier Stokes Equations for laminar flow, Hagen-Poiseuille's Equation for Laminar flow in circular pipes, Stokes Law, Darcy's Law.

Boundary Layer Theory : Definition and Characteristics development of boundary layer over a flat plate, Laminar Boundary Layer, Turbulent Boundary Layer, Hydro dynamically Smooth and Rough Surfaces, Applications of Momentum Equation, boundary layer separation and control. **(10hr)**

Module II

Turbulent Flow : Characteristics of turbulent flow, semi empirical equations to estimate shear stress in turbulent flow using Boussinesq' theory, Prandtl's mixing length theory, Velocity distribution in Turbulent Flow, friction factor for commercial Pipes, Moody's diagram.

Unsteady flow :Concept of unsteady flow, Water hammer phenomenon, water hammer action for gradual and sudden closure, conditions for sudden closure of rigid and flexible pipes. **(09hrs)**

Module III

Open Channel Flow :Types and regimes of flow, velocity distribution in open channel, Chezy's and Manning's uniform flow equations, most efficient channel section.

Specific energy, alternate depths, critical flow condition in rectangular, triangular, trapezoidal and circular channels.

Dynamic equation of Gradually varied flow, determination of GVF profiles, Hydraulic jump, flow through transitions (local bed rise and width contraction)

Non-uniform flow equation : Gradually varied flow, Afflux and Back water curve, Channel Slopes and flow profiles, Introduction to surges. **(10hrs)**

Module IV

Pumps : Classification of pumps based on field applications, Reciprocating Pumps, Centrifugal Pumps.

Turbines :classifications of turbine, velocity triangle diagrams for Pelton Wheel, Francis Turbine and Kaplan Turbine, Specific speed, Selection of Turbine. **(09hrs)**

RECOMMENDED BOOKS :

1.ENGINEERING FLUID MECHANICS	GARDE & MIRAJGOANKAR
2.FLUID MECHANICS AND APPLICATIONS	GUPTA & GUPTA
3.OPEN CHANNEL FLOW	RANGA RAJU
4.FLUID MECHANICS & MACHINERY	MODI & SETH
5.HYDRAULIC MACHINES	DR.JAGDISH LAL

NOTE:- There shall be total eight questions of 20 marks each, two from each unit. Five questions have to be attempted selecting atleast one from each unit. Use of Calculator is allowed.

Examination to be held in the Year May 2021,2022,2023,2024.

CLASS : B.E 6th SEMESTER

BRANCH: CIVIL ENGINEERING

CREDITS: 3

COURSE TITLE:CONSTRUCTION EQUIPMENTSELECTIVE-II

COURSE NO.:PCE- 608

L T P

Marks

DURATION OF EXAM:3 HOURS

3 0 0

Theory

Sessional

100

50

COURSE OUTCOMES : On completion of the course the students will be able to:	
CO1	Explain various techniques/machines to be used at appropriate time during construction.
CO2	Demonstrate the principles, operations, applications of different equipment's used in construction
CO3	Analyse the performance of various equipment's
CO4	Select the appropriate equipment required for a specified job

Module -I

Classification of construction equipment, selection, operation cost, investment cost and economic life of equipment

Equipment's for excavation - Working principles, Purpose, factors affecting output and applications of Power shovels, clam shells, Drag lines, and Hoes.

Hauling & Hoisting equipment's- Qualifications for operating and operating requirements of hoisting, Dump trucks, Dumpers and Derrick cranes **(10hrs)**

Module-II

Earth moving equipment's- Working principles, Purpose and applications of Scrapers, Bulldozers, Tractors, and grad ability of tractors.

Earth compaction equipment's- Working principles, Purpose and applications of Smooth wheel rollers , sheep foot rollers and Pneumatic tyred roller. **(09hrs)**

Module III

Drilling and blasting equipment- Operation and applications of Percussion Drill, Abrasion Drill, Fusion Percussion Drill, classification of Explosives and types of crushers

Dewatering and Pumping equipment's- Pump selection, uses and classification of pumps and different methods of dewatering. **(10hrs)**

Module -IV

Pile driving equipment's-Pile driver, Pneumatic hammer. Diesel hammer, Pile cushions and leads

Aggregate and concrete production equipment's-Purpose and applications of Concrete mixers Batching plant and operations involved in concrete construction. **(09hrs)**

RECOMMENDED BOOKS:

- | | |
|--|---------------------|
| 1. Construction Planning Equipment & Methods | PURIFOY, R.L. |
| 2. Construction Equipment and Methods | Leonhard E. Bernold |
| 3. Construction Equipment and Management | S.C Sharma |
| 4. Construction Planning Equipment & Methods | Naseer Khan |
| 5. CONSTRUCTION PROJECT MANAGEMENT | K N JHA |

NOTE: There shall be total Eight questions of 20 marks each, two from each Module. Five questions have to be attempted selecting at least one question from each Module. Use of calculator is allowed

Examination to be held in the Year May 2021,2022,2023,2024.

CLASS: B.E 6th SEMESTER

BRANCH: CIVIL ENGINEERING

COURSE TITLE:SWAYAM/NPTEL

COURSE NO.:MOC- 601

CREDITS: 3

L	T	P	Marks	
3	0	0	Theory 00	Sessional 100

The department shall offer the SWAYAM / NPTEL course (12 weeks) out of the list of courses offered by SWAYAM around the time of commencement of the semester. However, the selected NPTEL course should not be similar to the regular courses offered as a part of the department curriculum.

The overall monitoring of the NPTEL course will be under the supervision of the teacher in-charge of the department.

The NPTEL/SWAYAM certification course comprises of Assignments (25%) and Proctor Examination (Online examination MCQ's based = 75%) conducted at the end of the semester by IIT Madras as per the schedule.

The marks obtained by the student in the NPTEL/SWAYAM certification course will be tabulated by the concerned department.

Note :- In case the student does not pass the certification exam or remains absent in the proctor examination, no certificate will be given to the candidate by the NPTEL and the student will be deemed to have failed in the course. The examination of the said NPTEL course will be taken by the department concerned in the next semester under the supervision of Examination Cell of GCET Jammu. The paper will be of 75 marks and assignment marks will be carried forward from the previous semester.

Examination to be held in the Year May 2021,2022,2023,2024.

CLASS: B.E 6th SEMESTER

BRANCH: CIVIL ENGINEERING

CREDITS: 3

COURSE TITLE:INDUSTRIAL MANAGEMENT

COURSE NO.:HMC- 603

L	T	P	Marks	
3	0	0	Theory	Sessional
			100	50

DURATION OF EXAM:3 HOURS

COURSE OUTCOMES : On completion of the course the students will be able to:	
CO1	Understand the concept of management and its evolution
CO2	Shall be able to understand authority relationships & departmentation.
CO3	Analyze about the concept of HRM, wage payment, job evaluation
CO4	Learn the skills of industrial ownership and industrial relations
CO5	Become a good entrepreneur and will be able to opt entrepreneurship as career option.

MODULE-I

Unit 1: Management: Meaning, Characteristics, Objectives and Functions of management. Classical Theory of Management: Henry Fayol's Administrative Management Theory & Taylor's Scientific Management Theory. Elton Mayo's Neo-Classical Theory of Human Relations Prospective and modern management theory. (7hrs)

Unit 2: Departmentation & Delegation of Authority: Meaning, Importance, Basis or pattern of Departmentation, Delegation of Authority: Meaning, Characteristics, Importance, Process, Obstacles/ Barriers to effective delegation of authority, Authority Relationships - Line Organization, Line & Staff Organization, Functional Organization. (6hrs)

Unit 3: Wage Administration and job analysis: Concept of Wages, Characteristics of good wage, Factors affecting wages, Methods of wage payments. Job Evaluation-Objectives, Principles & Methods of job evaluation. (5hrs)

MODULE-II

UNIT-4: Entrepreneurship: Definition and types, Difference Between Intrapreneur & Entrepreneur, Types of Entrepreneur, Qualities of good Entrepreneurs-Role of Entrepreneurs in the economic development of a country. Functions of entrepreneur, Factors affecting entrepreneurship, Entrepreneurship as a career option for technocrats in India, Schemes and policies for entrepreneurship development. (6hrs)

UNIT-5: Legal Forms of Industrial Ownership: Sole Proprietorship, Partnership and Joint Stock Company (Features, merits & demerits) (5hrs)

UNIT-6:

Industrial Relations: Workers participation in management: Meaning, Objectives & Forms, Trade Union: Objectives, Functions, Present Position and Weaknesses. Industrial Conflict: Sources and managing conflict, Arbitration-a conflict resolution mechanism, Collective Bargaining: Meaning, Process, Essential conditions for effective bargaining. (7hrs)

RECOMMENDED BOOKS:

George R Terry & Stephen G. Franklin	Principles of Management.
Harold Koontz & Heinz wehrich	Essentials of Management
S.A. Sherlekar	Principles of Business Management
M. Mahajan	Industrial Engineering & Production Management
Dr. Neeru Vasisth	Principles of Management
Dr. B. P. Singh & Dr. T. N. Chhabra	Business Organisation & Management

NOTE: There will be eight questions of 20 marks each, four from each section. Students are required to attempt five questions selecting at least two questions from each section. Use of Calculator is allowed.

Examination to be held in the Year May 2021,2022,2023,2024

CLASS: B.E 6th SEMESTER

BRANCH: CIVIL ENGINEERING

COURSE TITLE:DESIGN OF RCC STRUCTURE LAB

COURSE NO.: PCE- 611

CREDITS: 1

L	T	P	Marks
0	0	2	50

COURSE OUTCOMES : On completion of the course the students will be able to:	
CO1	Conduct quality control tests on concrete.
CO2	Design concrete mix of any grade.
CO3	Conduct Non- destructive tests on concrete.
CO4	Conduct tests on steel bars.

LIST OF EXPERIMENTS:

1. To find bulk density and bulking factor of aggregates.
- 2.. To carry out Concrete mix design
3. To determine workability of concrete by various method.
- 4..To determine the flexural strength of concrete
5. To determine compressive strength of concrete
- 6.To determine the tensile strength of concrete by split cylinder test
7. Study of nondestructive tests on concrete.
8. Determination of Modulus of elasticity of concrete.
9. To determine tensile strength of steel bars.
10. To determine elongation of steel bars.
11. To study bend and re-bend test of steel bars.

Examination to be held in the Year May 2021,2022,2023,2024

CLASS : B.E 6th SEMESTER

BRANCH: CIVIL ENGINEERING

COURSE TITLE:TRANSPORTATION ENGINEERING LAB

COURSE NO.:PCE- 612

CREDITS: 1

L	T	P	Marks
0	0	2	50

COURSE OUTCOMES : On completion of the course the students will be able to:	
CO1	Characterize the aggregates and bitumen used for road construction
CO2	Design a bituminous mixture.

LIST OF EXPERIMENTS:

1. Aggregate Impact value
2. Los Angeles abrasion test
3. Flakiness and elongation test
4. California Bearing Ratio test
5. Bitumen Penetration test
6. Softening point test
7. Centrifuge extraction test
8. Ductility test
9. Specific gravity of bitumen
10. Flash point & Fire point test
11. Tile Abrasion test
12. Marshall stability test

Examination to be held in the Year May 2021,2022,2023,2024

CLASS: B.E 6th SEMESTER

BRANCH :CIVIL ENGINEERING

COURSE TITLE:HYDROLOGY & IRRIGATION ENGINEERING LAB

COURSE NO.:PCE- 613

CREDITS: 1

L	T	P	Marks
0	0	2	50

COURSE OUTCOMES : On completion of the course the students will be able to:	
CO1	Design a canal.
CO2	Design a diversion head work
CO3	Design the canal regulation works

The practical work consists of:

1. Marking catchment area on a toposheet and determination of average annual rainfall and runoff.
2. To develop a unit hydrograph and to draw a flood hydrograph for given 2 or 3 successive storms
3. Design of canal
4. Design of weir and barrage
5. Design of cross drainage work
6. Design of Sarda canal fall

NOTE: The Department will ensure that students design and prepare the drawing of at least three of the above problems.