SR Engineering College

Innovation . Creativity . Entrepreneurship

III -B.TECH-CIVIL-II SEMESTER

LESSON PLANS

2018 - 19

DEPARTMENT OF CIVIL ENGINEERING

SR ENGINEERING COLLEGE *(Autonomous)*
(RA15) COURSE STRUCTURE:: B. TECH. CIVIL ENGINEERING
(Applicable from the batch admitted during 2015-16 academic year and onwards)

L: Theory, T: Tutorial, P/D: Practical / Drawing, C: Credits,
CIE: Continuous Internal Evaluation, SEE: Semester End Examination

III Year II Semester

S.No.	Course Code	Course	Hours / Week			
			L	T	P/D	C
1	OE OE109 OE111	***Open Elective – 2*** Smart Cities Intellectual Property Rights	3	-	-	3
2	HS104	Economics and Finance for Engineers	3	-	-	3
3	CE114	Structural Analysis – II	4	1	-	4
4	CE115	Concrete Technology	3	-	-	3
5	CE116	Highway Engineering	4	-	-	4
6	CE119 CE120	**Professional Elective -1** 1.Watershed Management 2. Prestressed Concrete	3	-	-	3
7	CE123	Concrete Technology Lab	-	-	3	2
8	CE124	Highway Engineering Lab	-	-	3	2
Total						**24**

(OE109) SMART CITIES

Year	Semester	Hours / Week			C	Marks		
		L	T	P/D		CIE	SEE	Total
III or IV	I or II	3	-	-	3	30	70	100

COURSE OBJECTIVES:

Students will be able to

1. Recognize the vision behind smart cities and its goals.
2. Assess the technology behind smart transportation system.
3. Summarize the importance of natural resource and waste management.
4. Judge the importance of power, need of power storage and find solutions.
5. Prioritize for user friendly environment and cost effective steps and governance.

COURSE OUTCOMES:

At the end of the course, the student will develop ability to

1. Judge the needs and cause behind the vision to transform into smart cities.
2. Identify the issues and challenges for urban development, at par with the international scenario.
3. Select and demonstrate new technologies for urban development.
4. Interpret the importance of technology and implementation to have smart transportation.
5. Examine the importance of natural resource (water) and use intelligent concepts for preserving it.
6. Study the various disasters and services rendered towards process wastage.
7. Identify the importance of electricity, their importance and apply various measures for preserving it.
8. Appraise and educate the public for user friendly environment and governance to make the county smarter.

UNIT – I

Introduction: Vision and goals of smart city, concept of smart city and its features, issues and challenges of urbanization in India, international scenario, issues and probable solutions, need for smarter approaches process of selection of smart cities, developing and demonstrating new technologies, smart city strategies, digital and information technologies, urban planning best practices.

UNIT – II

Smart Transportation: Importance and significance of mobility, data collections, smart sensors, role of geographic information system, integration of GIS and ITS, related air quality; accidents and safety analysis; advanced traffic management systems, commercial vehicle operations, advanced transportation systems, advanced vehicle control systems, case studies, public transportation management; electronic payment, connected vehicle technology and application, mobile applications.

UNIT – III

Water and Waste Management: Reminded of water's importance, challenges for water use and intelligent water system concept, trends and issues for water use management, specific technologies for smart water use, strategic prioritization and allocation, water quality,

flooding, drought and aging infrastructure, leakage and pressure management, municipal services, smart solutions and emerging in the solid waste management, technologies to process waste, garbage collection.

UNIT – IV

Power Grids: Smart grid concepts, development of innovative next-generation technologies and tools in the areas of transmission, distribution, energy storage, power electronics, measures of certain parameters of the electric grid, innovative digital technologies for electricity delivery, intensive application of demand-side technologies, Electric Reliability Technology Solutions (CERTS).

UNIT – V

Smart Payments and E-Governance: People participation, accountability and transparency, user-friendly process, removal of hierarchal process barriers and red tape, service delivery Payments and finance concepts, city governments and citizen benefits, economic growth, global GDP, population growth, inadequate infrastructure, operational costs and concepts of e-administration, e-services, e-governance and e-democracy.

TEXT BOOKS:

1. Bob Williams, "Intelligent Transport Systems Standards", Artech House Publishers, 2008
2. Ronald A. Beaulieu, "National Smart Water Grid, Integrated Solutions for Sustainable Fresh Water Supply Flexi Bound", 2010.

REFERENCE BOOKS:

1. Austroads, "The Implication of Intelligent Transport Systems for Road Safety", Austroads Incorporated, 1999.
2. Chowdhury, M. A. and Sadek, A, "Fundamentals of Intelligent Transportation Systems Planning", Artech House, 2003.
3. Pernille Ingildsen and Gustaf Olsson, "Smart Water Utilities: Complexity Made Simple", 1st Edition, IWA Publishing.
4. Keyhani, Ali, Marwali and Muhammad, "Smart Power Grids", Springer, 2011.

(OE111) INTELLECTUAL PROPERTY RIGHTS

Year	Semester	Hours / Week			C	Marks		
		L	T	P/D		CIE	SEE	Total
III or IV	I or II	3	-	-	3	30	70	100

COURSE OBJECTIVES:

Students will be able to

1. Discuss the importance of intellectual property rights.
2. Explain the importance of trade mark and registration processes.
3. State the laws of copy right and patents.
4. Recognize the status of trade secrets.
5. Summarize the new developments of intellectual property.

COURSE OUTCOMES:

At the end of the course, the student will develop ability to

1. Illustrate various types of intellectual property.
2. Describe the importance of intellectual property rights.
3. Outline the procedure for selection and evaluation of trade mark.
4. Identify the rights to perform the work publicly.
5. Memorize the law of patents and also patent searching process.
6. Explain the concept of trade secrete law.
7. Recall the misappropriation right of publicity.
8. Describe the international overview on intellectual property.

UNIT – I

Introduction to Intellectual Property: Introduction, types of intellectual property, international organizations, agencies and treaties, importance of intellectual property rights.

UNIT – II

Trade Marks: Purpose and function of trademarks, acquisition of trade mark rights, protectable matter, selecting and evaluating trade mark, trade mark registration processes.

UNIT – III

Law of Copy Rights: Fundamental of copy right law, originality of material, rights of reproduction, rights to perform the work publicly, copy right ownership issues, copy right registration, notice of copy right, international copy right law.

Law of Patents: Foundation of patent law, patent searching process, ownership rights and transfer.

UNIT – IV

Trade Secrets: Trade secrete law, determination of trade secrete status, liability for misappropriations of trade secrets, protection for submission, trade secrete litigation.

Unfair Competition: Misappropriation right of publicity, false advertising.

UNIT – V

New Development of Intellectual Property: new developments in trade mark law; copy right law, patent law, intellectual property audits.

International overview on intellectual property, international - trade mark law, copy right law, international patent law, international development in trade secrets law.

TEXT BOOKS:

1. Deborah, E. Bouchoux, "Intellectual Property Right", Cengage Learning.
2. M Murray and M.J. Mehlman, "Encyclopedia of Ethical, Legal and Policy Issues in Biotechnology", John Wiley and Sons, 2000.

REFERENCE BOOKS:

1. Prabuddha ganguli, "Intellectual Property Right - Unleashing the Knowledge Economy", Tata McGraw Hill Publishing Company Ltd.
2. P.Narayanan; "Law of Copyright and Industrial Designs", Eastern Law House, Delhi, 2010.
3. P.N. Cheremisinoff, R.P. Ouellette and R.M.Bartholomew, "Biotechnology Applications and Research", Technomic Publishing Co. Inc., USA, 1985.
4. D. Balasubramaniam, C.F.A.Bryce, K. Dharmalingam, J. Green and K. Jayaraman, "Concepts in Biotechnology", University Press (Orient Longman Ltd.), 2002.

(HS104) ECONOMICS AND FINANCE FOR ENGINEERS

(Common to all branches)

Year	Semester	Hours / Week			C	Marks		
		L	T	P/D		CIE	SEE	Total
III	II	3	-	-	3	30	70	100

COURSE OBJECTIVES:

Students will be able to

1. Explain importance of economics and its application into business practice.
2. Develop least cost combination of inputs in production
3. Formulate suitable pricing policy pricing method
4. Apply the concepts of accounting in calculating the profits of business
5. Identify relevant capital budgeting techniques and appraise the projects

COURSE OUTCOMES:

At the end of the course, the student will develop ability to

1. Forecast the demand for product / service for a profitable business administration.
2. Apply the demand forecasting techniques to estimate the demand
3. Minimize the cost incurred in production and estimate the profit zone.
4. Recognize the time value in cash flows
5. Evaluate various investment opportunities and select best project
6. Select least cost combination of inputs in production
7. Analyze capital budgeting techniques.
8. Build financial reports and evaluate financial status of the organization.

Note: Present value tables need to be permitted into the examination hall.

UNIT–I

Introduction to Economics: Definition, Nature and Scope – Demand Determinants, Law of Demand and its exceptions - Elasticity of Demand: Definition, Types, Measurement and Significance, Demand forecasting: factors and methods

UNIT–II

Theory of Production and Cost Analysis: Production Function - Least Cost Combination of Inputs. Break-Even Analysis (BEA) - Cost Concepts - Determination of Break-Even Point (Simple problems)

UNIT–III

Introduction to Markets and Pricing: Types of Market - Price-Output Determination in case of Perfect Competition, Monopoly and monopolistic – Pricing objectives and Methods

UNIT–IV

Financial Accounting and analysis: Double-Entry Book Keeping, Journal, Ledger, and Trial Balance – Final Accounts (Trading, Profit and Loss Account and Balance Sheet) with simple adjustments). Financial Analysis: Liquidity, Activity, Capital structure and Profitability ratios.

UNIT–V

Capital Budgeting: Time Value of Money – Simple and Compound techniques. Nature and scope of Capital Budgeting, Payback Method, Accounting Rate of Return (ARR), Net Present Value and IRR Methods (simple problems).

TEXT BOOKS:

1. EWilliam G. Sullivan , "Engineering Economy", Pearson.
2. V.S. Bagad, "Managerial Economics and Financial Analysis", Technical Publications, Pune.

REFERENCE BOOKS:

1. Sasmita Mishra , "Engineering Economics and Costing" , PHI.
2. M.Kasi Reddy and S.Saraswathi, "Managerial Economics and Financial Accounting", PHI.

(CE114) STRUCTURAL ANALYSIS - II

Year	Semester	Hours / Week			C	Marks		
		L	T	P/D		CIE	SEE	Total
III	II	4	1	-	4	30	70	100

COURSE OBJECTIVES:

Students will be able to

1. Mention and recall the importance of analysis in civil engineering.
2. Discuss different methods of analysis.
3. Exemplify an illustrate behavioural orientation and mechanism of structures for different conditions and criteria.
4. Idealize and analysis statically determinate an indeterminate structures.
5. Explain about plastic theory of beans and frames.

COURSE OUTCOMES:

At the end of the course, the students will develop ability to

1. Relive the historic developments in structures.
2. Annotate different types of structures and their potential.
3. Perceive ability to analysis different types of structures.
4. Apply various methods to analyze different types of structures.
5. Analyze statically determinate and indeterminate structures.
6. Interpret difference between determine and indeterminate structures.
7. Evaluate plastic movement and collapse load for different boarding collapse.
8. Comment on the behavior of structures with respect to different conditions.

UNIT – I

Slope Deflection Method: portal frames with and without side sway.
Moment Distribution Method: portal frames with and without side sway.

UNIT – II

Kani's Methods: Application to continuous beams – yielding of supports – portal frames with and without side sway.

UNIT – III

Matrix Force (Flexibility) Method: Basic principles - choice of redundant – released structure - application of fixed beams, continuous beams and portal frame up to two degree static indeterminacy.

UNIT– IV

Matrix Displacement (Stiffness) Method: Concept of stiffness method - restrained structure - applications to continuous beams and portal frames up to two degree of kinematic indeterminacy.

UNIT– V

Introduction to Plastic analysis: The ductility of steel, plastic bending of beams, stages of bending of rectangular sections, evaluation of fully plastic moment, evaluation of shape

factor, plastic hinge, conditions and basic theorems of plastic analysis - lower and upper bound theorems.
Determination of collapsible load for some standard cases of beams by static and kinematic methods.

TEXT BOOKS:

1. Vazrani and Ratawani, "Theory of Structures: Analysis of Structures", Khanna Publications, 2009.
2. S Ramamuratam, "Theory of Structures", Dhanpat Rai Publications.

REFERENCE BOOKS:

1. T S Thandavamoorthy, "Analysis of Structures", Oxford University Press, New Delhi.
2. G S Pandit and S P Gupta, "Analysis of Structures", McGraw Hill Inc.
3. S S Bhavikatti, "Structural Analysis", Vikas Publishing House.
4. B C Punmia, "Theory of Structures," Laxmi Publications.

(CE115) CONCRETE TECHNOLOGY

Year	Semester	Hours / Week			C	Marks		
		L	T	P/D		CIE	SEE	Total
III	II	3	-	-	3	30	70	100

COURSE OBJECTIVES:

Students will be able to

1. Know the types of cement, mineral and chemical admixtures, aggregates.
2. Understand the properties of concrete.
3. Evaluate the methodology of mix designing.
4. Know about the procedure in concreting.
5. Understand special concrete and their use.

COURSE OUTCOMES:

At the end of the course, the students will develop ability to

1. Identify the suitability of materials for the construction works.
2. Detailed knowledge of concrete constituents: cement, aggregates, water and admixtures.
3. Determine the properties of fresh and hardened concrete design: mixing, handling, casting, curing etc.
4. Test all the concrete materials as per IS code design the concrete mix using ACI and IS code methods.
5. Understand the durability requirements of concrete.
6. Evaluate the applications of special concretes in order to ensure quality control while testing/sampling and acceptance criteria.
7. Evaluate the importance plastics, metals, timber as construction materials.
8. Review of special topics and new developments related to the materials used in the construction industry.

UNIT- I

Cement: Portland cement – chemical composition – Hydration, Setting of cement – Structure of hydrate cement – Test on physical properties – Different grades of cement. Admixtures: Types of admixtures – mineral and chemical admixtures.

UNIT – II

Aggregates: Classification of aggregate – Particle shape and texture – Bond, strength and other mechanical properties of aggregate – Specific gravity, Bulk density, porosity, adsorption and moisture content of aggregate – Bulking of sand – Deleterious substance in aggregate – Soundness of aggregate – Alkali aggregate reaction – Thermal properties – Sieve analysis – Fineness modulus – Grading curves – Grading of fine and coarse Aggregates – Gap graded aggregate – Maximum aggregate size.

UNIT – III

Fresh Concrete: Workability – Factors affecting workability – Measurement of workability by different tests – Setting times of concrete – Effect of time and temperature on workability – Segregation and bleeding – Mixing and vibration of concrete – Steps in manufacture of concrete – Quality of mixing water.

UNIT – IV

Hardened Concrete: Water / Cement ratio – Abram's Law – Gelspaoe ratio – Nature of strength of concrete – Maturity concept – Strength in tension and compression – Factors affecting strength – Relation between compression and tensile strength – Curing - Testing of hardened concrete- Compression tests – Tension tests – Factors affecting strength – Flexure tests – Splitting tests – Pull-out test, Non-destructive testing methods – codal provisions for NDT- Elasticity, creep and shrinkage – Modulus of elasticity – Dynamic modulus of elasticity – Posisson's ratio – Creep of concrete – Factors influencing creep – Relation between creep and time – Nature of creep – Effects of creep – Shrinkage – types of shrinkage.

UNIT – V

Mix Design: Factors in the choice of mix proportions – Durability of concrete – Quality Control of concrete – Statistical methods – Acceptance criteria – Proportioning of concrete mixes by various methods – BIS method of mix design - Special concretes - Introduction to Light weight concrete – Cellular concrete – No-fines concrete – High density concrete – Fibre reinforced concrete – Polymer concrete – High performance concrete – Self compacting concrete- Introduction to Prestressed Concrete Technology – Pretensioning and Posttensioning.

TEXT BOOKS:

1. M S Shetty. "Concrete Technology", S. Chand and Co., 2006.
2. M L Gambhir, "Concrete Technology", Tata McGraw Hill Publishers, New Delhi, 2013.

REFERENCE BOOKS:

1. S S Bhavikatti, "Concrete Technology", I.K. International Publications, 2015.
2. Nayak NV and A K Jain, "Hand Book on Advanced Concrete Technology", Narosa Publications, 2012.
3. A M Neville, "Properties of Concrete", (Article published in 1963).
4. A R Santha Kumar, "Concrete Technology", Oxford University Press, New Delhi, 2006.

(CE116) HIGHWAY ENGINEERING

Year	Semester	Hours / Week			C	Marks		
		L	T	P/D		CIE	SEE	Total
III	II	4	-	-	4	30	70	100

COURSE OBJECTIVES:

Students will be able to

1. Discuss various road construction materials.
2. Explain geometric design of highways and expressways.
3. Analyze and design of flexible and rigid pavements.
4. Discuss fundamentals of traffic studies.
5. Understand basic requirements and mechanisms for highway maintenance, drainage, economic, and environment.

COURSE OUTCOMES:

At the end of the course, the students will develop ability to

1. Explain surveys involved in planning and highway alignment.
2. Design cross section elements, sight distance, horizontal and vertical alignment.
3. Predict traffic studies.
4. Implement traffic regulations and control.
5. Sketch intersection design.
6. Analyze the characteristics of pavement materials.
7. Sketch flexible pavements as per IRC.
8. Design rigid pavements as per IRC.

UNIT – I

Highway Planning and Geometric Design: History of Road Construction, Highway Development in India , Highway Cross Sectional Elements, Design of Horizontal Alignment – Horizontal Curves Super elevation, Widening of Pavements on Horizontal Curves and Transition Curves Design of Vertical Alignments – Rolling, Limiting, Exceptional and Minimum Gradients, Summit and Valley Curves-Sight Distances – Factors affecting Sight Distances, PIEV theory, Stopping Sight Distance (SSD), Overtaking Sight Distance (OSD), Sight Distance at Intersections, Intermediate Sight Distance and Illumination Sight Distance [Derivations and Problems in SSD and OSD].

UNIT- II

Highway Materials and Construction: Desirable Properties and Testing of Highway Materials: California Bearing Ratio Test, Field Density Test - Aggregate - Crushing, Abrasion, Impact Tests, Water absorption, Flakiness and Elongation indices and Stone polishing value test - Bitumen - Penetration, Ductility, Viscosity, Binder content and Softening point Tests. - Construction Practice - Water Bound Macadam Road, Bituminous Road and Cement Concrete Road [as per IRC and MORTH specifications].

UNIT- III

Flexible and Rigid Pavements: Rigid and Flexible Pavements- Components and their functions -Design Principles of Flexible and Rigid Pavements, Factors affecting the Design of Pavements - ESWL, Climate, Sub-grade Soil and Traffic - Design practice for Flexible

Pavements [IRC Method and Recommendations- Problems] - Design practice for Rigid Pavements – IRC Recommendations - concepts only.

UNIT- IV

Traffic Engineering: Basic parameters of traffic-Volume, Speed ,Density-Traffic Volume studies-Data collection and presentation-Speed studies, Parking studies and parking characteristics, Road accidents-Causes and preventive measures, Road traffic Signs-Types and specifications-Road marking-Need and types of road marking, design of Traffic Signals-Webster method-Numerical examples of signal design by Webster Method.

UNIT- V

Highway Maintenance: Types of defects in Flexible pavements – Surface defects, Cracks, deformation, disintegration – symptoms, causes and treatments. - Types of Pavement, failures in Rigid Pavements – Scaling, Shrinkage, Warping, Structural Cracks Spalling of Joints and mud pumping – and special repairs. - Pavement Evaluation – Pavement Surface Conditions and Structural Evaluation, Evaluation of pavement Failure and strengthening - Overlay design by Benkelman Beam Method [Procedure only].

TEXT BOOKS:

1. Khanna K and Justo C E G, “Highway Engineering”, Khanna Publishers, Roorkee, 2001.
2. Huang yang H, “Pavement Analysis and Design”, 2nd Edition.

REFERENCE BOOKS:

1. Kadivali L.R, “Traffic Engineering and Transportation Planning”, Khanna Publishers, Delhi.
2. Yoder, E J and Witlzak M, “Principles of Pavement Design”, Wiley, 2nd Edition.
3. C Handola S.P, “Text Book of Transportation Planning”, S Chand and Company; 1st Edition, 2001.
4. Kadiyali L. R, “Principles and Practice of Highway Engineering”, Khanna Publishers, Delhi.

(CE119) WATERSHED MANAGEMENT
(Professional Elective-1)

Year	Semester	Hours / Week			C	Marks		
		L	T	P/D		CIE	SEE	Total
III	II	3	-	-	3	30	70	100

COURSE OBJECTIVES:
Students will be able to
1. Identifying all the available natural resources of a watershed for optimum production and with minimum hazards to the available Natural Resources of a watershed.
2. Discuss the measures to control damaging runoff, arrest soil erosion and moderating the floods in the downstream areas.
3. Developing the watershed harvesting structures for recharging the groundwater to improve the groundwater potential of that area.
4. Prioritizing watershed or sub-watershed areas for appropriate use of land resources and thus developing forest and fodder resources as well as protection of the environment.
5. Applying all the scientific methods for protection, conservation and enhancing the available natural resources of a watershed.

COURSE OUTCOMES:
At the end of the course, the students will develop ability to
1. Identify all the available natural resources in a sub-watershed or a watershed.
2. Constructing various soil conservation measures.
3. Applying the scientific methods to prevent the erosion of fertile soils.
4. Design and planning for construction of various water harvesting structures.
5. Prioritization for construction of water harvesting and soil conservation measures with consent of the local community and the stakeholders.
6. Analyzing the status of improvement in soil moisture conditions, groundwater recharge and availability of food and fodder for the cattle.
7. Evaluate the changes in land use and land cover before and after implementation of the watershed project activities.
8. Compile the improvements and the changes in terms of natural resources, their availability and socio economic conditions. i.e. pre and post implementation of the watershed program for a sustainable development.

UNIT-I
Introduction: Concept of watershed development- objectives of watershed development-need for watershed development in India- Integrated and multidisciplinary approach for watershed management.- Characteristics of watershed - size- shape- physiography-slope-climate- drainage- land use- vegetation- geology and soils-hydrology and hydrogeology-socio-economic characteristics- basic data on watersheds.

UNIT-II
Principles of Erosion: Types of erosion- factors affecting erosion-effects of erosion on land fertility and land capability- estimation of soil loss due to erosion- Universal soil loss equation. Measures to control Soil erosion - Contour techniques-ploughing- furrowing-trenching- bunding- terracing- gully control- rockfill dams- brushwood dam- Gabion.

UNIT-III

Water Harvesting: Rainwater Harvesting- catchment harvesting- harvesting structures- soil moisture conservation- check dams- artificial recharge- farm ponds- percolation tanks. Land Management- Land use and Land capability classification- management of forest- agricultural- grassland and wild land. Reclamation of saline and alkaline soils.

UNIT-IV

Ecosystem Management: Role of Ecosystem- crop husbandry- soil enrichment- inter- mixed and strip cropping- cropping pattern-sustainable agriculture- bio-mass management- dry land agriculture- Silvi pasture- horticulture- social forestry and afforestation.

UNIT-V

Planning of Watershed Management Activities: People's participation- preparation of action plan- administrative requirements.

TEXT BOOKS:

1. JVS Murthy, "Watershed Management", New Age International Publishers.
2. R.Awurbs and WP James, "Water Resource Engineering", Prentice Hall Publishers, 2001.

REFERENCE BOOKS:

1. VVN Murthy, "Land and Water Management", Kalyani Publications, 2009.
2. D.K.Majumdar, "Irrigation and Water Management", Prentice Hall of India, 2001.

(CE120) PRESTRESSED CONCRETE
(Professional Elective-1)

Year	Semester	Hours / Week			C	Marks		
		L	T	P/D		CIE	SEE	Total
III	II	3	-	-	3	30	70	100

COURSE OBJECTIVES:
Students will be able to
1. Calculate pre stress losses for simple pre stressed concrete members.
2. Design pre stressed concrete girder for flexure using current design procedures
3. Recognize the effects of transfer and develop length on flexural and shear strength.
4. Define and differentiate various material behaviour of pre stressed concrete.
5. List out different pre stressing systems.

COURSE OUTCOMES:
At the end of the course, the students will develop ability to
1. Recognize and state the historical development and importance of pre stress concrete structures.
2. Critique the general mechanical behaviour of pre stressed concrete.
3. Discuss the methods of pre tensioning and post tensioning.
4. Explain about the differential shrinkage.
5. Analysis of end blocks by various methods.
6. Summarize the importance of control of deflections.
7. Examine various losses occurring in pre stressed concrete.
8. Design various structural members with respect to pre stress.

UNIT –I
Introduction: Historic development – General principles of prestressing pretensioning and post tensioning – Advantages and limitations of prestressed concrete – Materials – High strength concrete and high tensile steel their characteristics. I.S.Code provisions- Methods and Systems of Prestressing; Pretensioning and posttensioning methods – Analysis of posttensioning - Different systems of prestressing like Hoyer System- Magnel System Freyssinet system and Gifford – Udall System.

UNIT – II
Losses of Prestress: Loss of prestress in pre-tensioned and post-tensioned members due to various causes like elastic shortage of concrete- shrinkage of concrete- creep of concrete- Relaxation of steel- slip in anchorage bending of member and frictional losses. Analysis of sections for flexure; Elastic analysis of concrete beams prestressed with straight- concentric- eccentric- bent and parabolic tendons.

UNIT – III
Design of Sections for Flexure and Shear: Allowable stress- Design criteria as per I.S.Code – Elastic design of simple rectangular and I-section for flexure- shear- and principal stresses – design for shear in beams – Kern – lines- cable profile.

UNIT – IV

Analysis of End Blocks: By Guyon's method and Mugnel method- Anchorage zone strusses – Approximate method of design – Anchorage zone reinforcement – Transfer of pre stress pre-tensioned members.

UNIT – V

Composite Section: Introduction – Analysis of stress – Differential shrinkage – General designs considerations. Deflections of pre stressed concrete beams: Importance of control of deflections – factors influencing deflections – short term deflections of uncracked members prediction of long term deflections.

TEXT BOOKS:

1. Krishna Raju, "Pre stresed Concrete", Tata McGraw Hill Publications, 2012.
2. N. Rajasekharan, "Pre stressed Concrete", Narosa Publications.

REFERENCE BOOKS:

1. Ramamrutham, "Pre stressed Concrete", Dhanpatrai Publications, 2003.
2. T.Y. Lin, Ned, H. Burns, "Design of Pre stressed Concrete Structures", John Wiley and Sons, 3rd Edition, 2010.
3. Arthur H. Nilson, "Design of Pre stressed Concrete" Narosa Publications, 2nd Edition 2013.

(CE123) CONCRETE TEHCNOLOGY LAB

Year	Semester	Hours / Week			C	Marks		
		L	T	P/D		CIE	SEE	Total
III	II	-	-	3	2	30	70	100

COURSE OBJECTIVES:

Students will be able to

1. Explain different material properties used in the construction of building.
2. Illustrate different material properties used in the construction of roads.
3. Summarize different material properties used in the construction of roads.
4. Define properties and behavior of materials in civil engineering.
5. Paraphrase the different code of practice provisions related to the test.

COURSE OUTCOMES:

At the end of the course, the students will develop ability to

1. Design of different components of various structures and representation in different. Drawings for carrying out construction activity.
2. Explain about different tests on cement.
3. Summarize about different tests on concrete.
4. Draw reinforcement details.
5. Design of different mix proportions.
6. Apply the theoretical concepts learned in the course building materials and concrete technology.
7. Infer the suitability of the material for construction.
8. Examine the physical properties of the construction materials.

LIST OF EXPERIMENTS:

A) Cement and Concretes: Tests on Cements

1. Normal Consistency of fineness of cement.
2. Initial setting time and final setting time of cement.
3. Specific gravity and soundness of cement.
4. Compressive strength of cement.
5. Workability test on concrete by compaction factor, slump and Vee-bee.
6. Young's modulus and compressive strength of concrete.
7. Bulking of sand.
8. Splitting Tensile Strength of concrete
9. Flexural strength of plain concrete
10. Rebound hammer Test.

B) Reinforcement Details

1. Footings – isolated square, rectangular, circular
2. Columns
3. Beams
4. Slabs – one-way, two-way

Note: Any **Ten** experiments may be completed.

(CE124) HIGHWAY ENGINEERING LAB

Year	Semester	Hours / Week			C	Marks		
		L	T	P/D		CIE	SEE	Total
III	II	-	-	3	2	30	70	100

COURSE OBJECTIVES:

Students will be able to

1. Define the properties of the course aggregate.
2. Identify the properties of the bitumen.
3. Compute the suitability of material for construction of roads.
4. Outline the theoretical concepts learned in the course of transportation engineering.
5. Evaluate the strength of aggregates.

COURSE OUTCOMES:

At the end of the course, the students will develop ability to

1. Decide the penetration value.
2. Examine the softening point.
3. Determine ductility value.
4. Evaluate the flash and fire point value.
5. Classify different types of bitumen.
6. Classify different types of aggregate.
7. Discuss the suitability of these materials for construction of road.
8. Analyze the theoretical concepts learned in the course transportation engineering.

LIST OF EXPERIMENTS:

I. Road Aggregates:

1. Aggregate Crushing value test.
2. Aggregate Impact test.
3. Specific Gravity and Water Absorption test.
4. Abrasion test.
5. Flakiness and elongation Indices of coarse aggregates.

II. Bituminous Materials:

1. Penetration test.
2. Ductility test.
3. Softening Point test.
4. Flash and Fire point test.

III. Testing of Soils:

1. C.B.R. Test (IS2720 Part – XVI)

Lesson Plan

Department: Civil Engineering	**Date:**11/10/2018
Academic Year:2018-19	**Year/Semester: III/II**
Name of the Faculty: M. Guru Prasad	
Course Name: Smart Cities	**Course Code: OE 109**

Prerequisite: Knowledge about the smart cities vision and mission, advance technologies in transportation, solid waste management, power grid, advance technologies in power generation.

Course Outcomes:

At the end of the course, the student will develop ability to

1. Judge the needs and cause behind the vision to transform into smart cities.
2. Identify the issues and challenges for urban development, at par with the international scenario.
3. Select and demonstrate new technologies for urban development.
4. Interpret the importance of technology and implementation to have smart transportation.
5. Examine the importance of natural resource (water) and use intelligent concepts for preserving it.
6. Study the various disasters and services rendered towards process wastage.
7. Identify the importance of electricity, their importance and apply various measures for preserving it.

   Appraise and educate the public for user friendly environment and governance to make the county smarter.

Lecture Schedule:

S.No	Topic of the Lecture	Name of the Activity & Instructional Aids	Tentative Date
	UNIT- I		
1	**Introduction:** Vision and goals of smart city, concept of smart city and its features,	Chalk and board	20-11-2018
2	Issues and challenges of urbanization in India, international scenario, issues and probable solutions,	Chalk and board	22-11-2018
3	need for smarter approaches process of selection of smart cities, developing and demonstrating new technologies,	Chalk and board	27-11-2018
4	smart city strategies, digital and information technologies, urban planning best practices.	Chalk and board	29-12-2018
	UNIT- II		
1	**Smart Transportation:** Importance and significance of mobility, data collections	Chalk and board	02-01-2019
2	Smart sensors, role of geographic information system, integration of GIS and ITS	Chalk and board	02-01-2019
3	Accidents and safety analysis; advanced traffic management systems	Chalk and board	04-01-2019
4	Commercial vehicle operations, advanced transportation systems	Chalk and board	04-01-2019
5	Advanced vehicle control systems, case studies	Presentation	08-01-2019
6	Public transportation management; electronic payment	Presentation	08-01-2019
7	Connected vehicle technology and application, mobile applications.	Chalk and board	10-01-2019
	UNIT- III		
1	Water and Waste Management: Reminded of water's importance	Chalk and board	22-01-2019
2	Challenges for water use and intelligent water system concept, trends and issues for water use management	Presentation	22-01-2019
3	Specific technologies for smart water use, strategic prioritization and allocation	Chalk and board	24-01-2019
4	Water quality, flooding, drought and aging infrastructure	Chalk and board	29-01-2019
5	Leakage and pressure management, municipal services	Presentation	31-01-2019
6	Smart solutions and emerging in the	Presentation	05-02-2019

	solid waste management.		
7	Technologies to process waste, garbage collection.	Chalk and board	07-02-2019
	UNIT- IV		
1	Power Grids: Smart grid concepts	Presentation	12-02-2019
2	Development of innovative next-generation technologies and tools in the areas of transmission, distribution.	Presentation	14-02-2019
3	Energy storage, power electronics.	Chalk and board	14-02-2019
4	Measures of certain parameters of the electric grid, innovative digital technologies for electricity delivery.	Chalk and board	26-02-2019
5	Intensive application of demand-side technologies.	Chalk and board	26-02-2019
6	Electric Reliability Technology Solutions (CERTS).	Chalk and board	26-02-2019
	UNIT- V		
1	Smart Payments and E-Governance: People participation, accountability and transparency	Presentation	05-03-2019
2	User-friendly process, removal of hierarchal process barriers and red tape, service delivery.	Chalk and board	05-03-2019
3	Payments and finance concepts, city governments and citizen benefits.	Presentation	07-03-2019
4	Population growth, inadequate infrastructure, operational costs and concepts of e-administration economic growth, global GDP.	Chalk and board	07-04-2019
5	e-services, e-governance and e-democracy.	Chalk and board	12-04-2019

1. Topic Name **:** Need for smarter approaches process of selection of smart cities

Name of the Activity **:** Online search activity

Description of the Activity **:** Students will be able to explain the process of selection of smart cities in which they have to search, find and discuss about their features.

2. Topic Name **:** Accidents and safety analysis; advanced traffic management systems.

Name of the Activity **:** Student discussion on Accidents and safety analysis; advanced traffic management systems, implementation in Warangal district

Description of the Activity **:** Students will be discussing on Accidents and safety analysis; advanced traffic management systems, implementation in Warangal district.

3. Topic Name **:** Development of innovative next-generation technologies and tools in the areas of transmission, distribution.

Name of the Activity	**:** seminar will be given on next-generation technologies and tools in the areas of transmission, distribution.
Description of the Activity	**:** students will give power point presentation on next-generation technologies and tools in the areas of transmission, distribution.

Prepared By: M.Guru Prasad

Note: Dates mentioned are only tentative and will be updated duly

Lesson Plan

Department: Civil Engineering	**Date: 0**9/10/2018
Academic Year: 2018-19	**Year/ Semester :** III/ II
Name of the Faculty: Dr. R. Gobinath	
Course Name: Intellectual Property Rights	**Course Code:** OE 111
Prerequisite: Knowledge about invention, practices related to inventing a product, copyright and its importance, knowledge about copyright and trademark of organisations.	

Course Outcomes:

At the end of the course, the student will develop an ability to

1. Illustrate various types of intellectual property.
2. Describe the importance of intellectual property rights.
3. Outline the procedure for selection and evaluation of trade mark.
4. Identify the rights to perform the work publicly.
5. Memorize the law of patents and patent searching process.
6. Explain the concept of trade secrete law.
7. Recall the misappropriation right of publicity.
8. Describe the international overview on intellectual property.

Lecture Schedule:

S.No	Topic of the Lecture	Name of the Activity & Instructional Aids	Tentative Date
	UNIT- I		
	Introduction to Intellectual property		
1	Introduction to IPR	Presentation	19/11/2018
2	Introduction to IPR - Continued	Class discussion- Quiz	20/11/2018
3	Types of intellectual property.	Presentation	22/11/2018
4	Types of intellectual property – Continued	Presentation	26/11/2018
5	International organizations.	Presentation	28/11/2018
6	International organisations.	Presentation	01/12/2018
7	Agencies and treaties.	Presentation	03/12/2018
8	Importance of intellectual property rights – Revision.	Presentation	05/12/2018
9	Class test- Discussion.	Class activity	07/12/2018
	UNIT- II		
	Trade Marks		
10	Purpose and function of trademarks	Presentation	10/12/2018
11	Purpose and function of trademarks	Presentation	12/12/2018
12	Acquisition of trade mark rights.	Presentation	14/12/2018
13	Protectable matter.	Presentation	17/12/2018
14	Selecting and evaluating Trademarks	Presentation	19/12/2018
15	Selecting and evaluating Trademarks.	Presentation	21/12/2018
16	Trade mark registration processes.	Presentation	24/12/2018
17	Trade mark registration processes.	Presentation	26/12/2018
18	Revision on Trademarks.	Class activity	28/12/2018
	UNIT- III		
	Law of copy rights		
19	Fundamental of copy right law.	Presentation	02/01/2019
20	Originality of material.	Presentation	04/01/2019
21	Rights of reproduction.	Presentation	07/01/2019
22	Rights to perform the work publicly.	Presentation	09/01/2019
23	Copy right ownership issues.	Presentation	11/01/2019
24	Copy right registration.	Presentation	14/01/2019
25	Notice of copy right, international copy right law.	Presentation	16/01/2019
Law of patents			
26	Foundation of patent law.	Presentation	18/01/2019
27	Patent searching process.	Presentation	21/01/2019
28	Patent searching process.	Presentation	23/01/2019
29	Ownership rights and transfer.	Presentation	25/01/2019
30	Revision/ Class work/ Discussion/ quiz during extra hours if any.		
	UNIT- IV		
Trade Secrets			
31	Trade secret law.	Presentation	01/02/2019
32	Determination of trade secrete status.	Presentation	04 /02/2019
33	Liability for misappropriations of	Presentation	06/02/2019

	trade secrets.		
34	Protection for submission and trade secret litigation.	Presentation	08/02/2019
Unfair competition			
35	Misappropriation right of publicity and false advertising.	Presentation/ Videos	11/02/2019
36	Videos and presentation about Competition commission of India and its role.		
37	Revision/ Class work/ Discussion/ quiz during extra classes if any.		
	UNIT- V		
	New development of intellectual property		
39	New developments in trade mark law.	Presentation/ Videos	13/02/2019
39	Copy right law.	Presentation/ Videos	18/02/2019
40	Patent law.	Presentation/ Videos	20/02/2019
41	Intellectual property audits.	Presentation/ Videos	22/02/2019
42	International overview on intellectual property.	Presentation/ Videos	25/02/2019
43	International - trade mark law, copy right laws.	Presentation/ Videos	26/02/2019
44	International patent law.	Presentation/ Videos	27/02/2019
45	International development in trade secrets law.	Presentation/ Videos	28/02/2019
46	Revision/ Class work/ Discussion/ quiz	Class discussion- Quiz	04/03/2019
47	Revision/ Class work/ Discussion/ quiz.	Class discussion- Quiz	06/03/2019
48	Revision/ Class work/ Discussion/ quiz.	Class discussion- Quiz	08/03/2019

1. Topic Name **:** Intellectual property rights and engineering inventions.

Name of the Activity **:** Quiz.

Description of the Activity **:** Students will be given with class quiz to discuss about the importance of intellectual properties and engineering inventions.

2. Topic Name **:** Trademarks and Indian rules

Name of the Activity **:** Student discussion on trademarks in India.

Description of the Activity **:** Students will be formed in group, they will be given with class assignments to check about trademarks in India and how the companies use them in productive way.

3. Topic Name **:** International Copyright and patent laws.

Name of the Activity **:** Group discussion.

Description of the Activity **:** Group activity about International Copyright and patent laws in which group of students will prepare and discuss about International laws related to patents and copyrights from America, Europe and India.

3. Topic Name **:** Filling of IPR form.

Name of the Activity	**:** Class assignment.
Description of the Activity	**:** Filing IPR is not an easy task, the course outcome focus on different aspects but filing IPR is not added, in this task students will be involved in preparing a dummy IPR form as per the norms prescribed and check for relevance and accuracy.
4. Topic Name	**:** Revision and class assignments
Name of the Activity	**:** Class assignment and open book test
Description of the Activity	**:** Students will be formed as groups and will be asked to check internet or books and find data about various patents, international trademarks and other related information. They will be asked to discuss about the same in the class for two hours in total

TEXT BOOKS:

1. Deborah, E. Bouchoux, "Intellectual property right", Cengage learning.
2. M Murray and M.J. Mehlman, Encyclopedia of Ethical, Legal and Policy issues in Biotechnology, John Wiley & Sons 2000.

REFERENCE BOOKS:

1. PrabuddhaGanguli, "Intellectual property right - Unleashing the knowledge economy", Tata Mc Graw Hill Publishing Company Ltd.
2. P. Narayanan; Law of Copyright and Industrial Designs; Eastern law House, Delhi, 2010.
3. P.N. Cheremisinoff, R.P. Ouellette and R.M.Bartholomew, Biotechnology Applications and Research, Technomic Publishing Co., Inc. USA, 1985.
4. D. Balasubramaniam, C.F.A.Bryce, K. Dharmalingam, J. Green and K. Jayaraman, Concepts in Biotechnology, University Press (Orient Longman Ltd.), 2002.

Websites: (Accessed during October 2018)

1) http://www.ipindia.nic.in/
2) https://en.wikipedia.org/wiki/Intellectual_property_in_India
3) http://www.makeinindia.com/policy/intellectual-property-facts
4) http://www.wipo.int/wipolex/en/profile.jsp?code=IN
5) https://www.prv.se/en/prv-for-entrepreneurs/glossary/intellectual-property-rights2/

Course Projects: No course projects planned except assignments related to the content.

Prepared By:
Dr.R.Gobinath

Note: Dates mentioned are only tentative and will be updated duly

Lesson Plan

Department: Civil Engineering	**Date:**19-11-2019
Academic Year:2018-2019	**Year /Semester: III/II**
Name of the Faculty: E.Ramesh	
Course Name: Economics and finance for Engineers	**Course Code:** HS104
Prerequisite: Nil	

Course Outcomes:

At the end of the course, the students will develop ability to:

1. Forecast the demand of the product/service for profitable business administration.

2. Apply the demand forecasting techniques to estimate demand.

3. Minimize the cost incurred on production and estimate the profit zone.

4. Recognise the time value in cash inflows.

5. Evaluate various investment opportunities and select the best projects.

6. Develop least cost combination of inputs in production.

7. Analyze capital budgeting techniques.

8. Build/Prepare financial reports and evaluate the financial status of the organisation.

Lecture Schedule:

S.No	Topic of the Lecture	Name of the Activity & Instructional Aids	Tentative Date
	UNIT - I		
1	Introduction to Managerial Economics – Introduction	Class Room Demonstration	19/11/2018
2	Micro and Macro Economics	Class Room Demonstration	21/11/2018
3	Nature and Scope of managerial economics.	Class Room Demonstration	22/11/2018
4	Demand analysis – Demand and its determinants	Class Room Demonstration	26/11/2018
5	Law of demand and its assumptions, operation and Exceptions determinations	Class Room Demonstration	27/11/2018
6	Definition and types of elasticity of demand.	Class Room Demonstration	28/11/2018
7	Demand forecasting – Factors and	Class Room Demonstration	31/11/2018
8	Methods of Demand forecasting	Class Room Demonstration	03/12/2018
	UNIT - II		
9	Theory of Production and Cost Analysis-Introduction	Class Room Demonstration	04/12/2018
10	Production function-with one variable inputs	Class Room Demonstration	05/12/2018
11	Production function-with two and multi variable inputs	Class Room Demonstration	10/12/2018
12	Cobb-douglas production function.	Class Room Demonstration	11/12/2018
13	Isoquants and properties	Class Room Demonstration	12/12/2018
14	Isocost – Properties, MRTS and Least Cost Combination of Inputs	Class Room Demonstration	17/12/2018
15	Break- Even Analysis	Class Room Demonstration	018/12/18

16	Cost-Volume-Profit analysis	Class Room Demonstration and Problem solving	19/12/2018
17	Problems on BEA	Problem solving	24/12/2018
18	**UNIT-III Introduction to Markets and Pricing Policies-Introduction**	Class Room Demonstration	26/12/2018
19	Markets meaning, types, characteristics	Class Room Demonstration	27/12/2018
20	Perfect Competition-characteristics and Price Determination	Class Room Demonstration	31/12/2018
21	Price-Output Determination in Perfect Market	Class Room Demonstration	02/01/2019
22	Monopoly Market and Price-Output Determination	Class Room Demonstration	03/01/2019
23	Monopolistic Market its Features	Class Room Demonstration	07/01/2019
24	Price-Output Determination in Monopolistic Competition	Class Room Demonstration	09/01/2019
25	Pricing objectives and Methods of Pricing	Class Room Demonstration	14/01/2019
26	**UNIT - IV: Introduction to Financial Accounting:**	Class Room Demonstration	15/01/2019
27	Book Keeping-Accounting, Accounting Cycle, Accounting Concepts and Conventions	Class Room Demonstration	16/01/2019
28	Double Entry Rules	Class Room Demonstration	21/01/2019
29	Journal	Problem solving	22/01/2019
30	Ledger	Class Room Demonstration and Problem solving	23/01/2019
31	Trial balance.	Class Room Demonstration	28/01/2019
32	Financial accounts - problems.	Class Room Demonstration	29/01/2019
33	Financial accounts - problems.	Class Room Demonstration	30/1/2019
34	Ratios- Introduction	Class Room Demonstration	04/02/2019
35	Liquidity ratios- problems	Class Room	05/02/2019

		Demonstration	
36	Activity ratios- problems	Class Room Demonstration	06/02/2019
37	Profitability ratios- problems	Class Room Demonstration	11/02/2019
38	**UNIT -V Capital and Capital Budgeting - Introduction**	Class Room Demonstration	12/02/2019
39	Time Value of Money	Class Room Demonstration	13/02/2019
40	Techniques of Time Value of Money	Class Room Demonstration	18/02/2019
41	Capital budgeting : Need, features and Process	Class Room Demonstration	19/02/2019
42	Methods of Capital Budgeting: Pay back method - problems.	Class Room Demonstration and Problem solving	20/02/2019
43	Average Rate of Return Method - Problems	Class Room Demonstration and Problem solving	25/02/2019
44	Net present value method - problems.	Problem Solving	26/02/2019
45	Net Present Value Method - Problems	Problem Solving	27/02/2019
	II MID EXAMINATIONS		

1.Name of the Activity	: Class Room Demonstration
Description of the Activity	**:** In this Activity Topic is discussed through lecture Method and using Power Point Presentations
2.Name of the Activity	: Problem Solving
	Description of the Activity: Under this activity Problems are given to students after discussing the various statistical Methods and students are to be solved the problems.

Prepared By:

E.Ramesh

Lesson Plan

Department: Civil Engineering	**Date:**13/10/2018
Academic Year:2018-2019	**Year/Semester:** III / II
Name of the Faculty: G. Swamy Yadav	
Course Name: Structural Analysis - II	**Course Code:** CE114
Prerequisite:	

Course Outcomes:

At the end of the course, the students will develop ability to

1. Relive the historic developments in structures.
2. Annotate different types of structures and their potential.
3. Perceive ability to analyze different types of structures.
4. Apply various methods to analyze different types of structures.
5. Analyze statically determinate and indeterminate structures.
6. Interpret difference between determine and indeterminate structures.
7. Evaluate plastic movement and collapse load for different loading conditions.
8. Comment on the behavior of structures with respect to different conditions.

Lecture Schedule:

S.No	Topic of the Lecture	Name of the Activity & Instructional Aids	Tentative Date
	UNIT-I		
	Slope Deflection Method Moment Distribution Method		
1	Introduction to portal frames	Chalk and Board	19/11/2018
2	Explanation of symmetrical & asymmetrical portal frames	PPT	19/11/2018
3	Explanation of symmetrical portal frames with vertical loading	Chalk and Board	20/11/2018
4	Explanation of symmetrical portal frames with combined loading	Chalk and Board	20/11/2018
5	Conclusion of symmetrical portal frames with combined loading	Chalk and Board	22/11/2018
6	Problems on portal frames with combined loading	Chalk and Board	26/11/2018
7	Problems on portal frames with combined loading	Chalk and Board	26/11/2018
8	Explanation of unsymmetrical portal frames with vertical loading	Chalk and Board	27/11/2018
9	Explanation of unsymmetrical portal frames with vertical loading	Chalk and Board	27/11/2018
10	Explanation of unsymmetrical portal frames with combined loading	Chalk and Board	29/11/2018
11	Combined loads at different loads and supports	Chalk and Board	03/12/2018
12	Combined loads at different loads and supports	Chalk and Board	03/12/2018
13	Problems	Chalk and Board	04/12/2018
14	Problems	Chalk and Board	04/12/2018
15	Problems	Chalk and Board	06/12/2018
	UNIT-II		
	Kani's Method		
16	Analysis of symmetrical portal frames with vertical loading	Chalk and Board	10/12/2018
17	Analysis of symmetrical portal frames with combined loading	Chalk and Board	10/12/2018
18	Problems on analysis of symmetrical portal frames with vertical loading	Chalk and Board	11/12/2018
19	Problems on analysis of symmetrical portal frames with vertical loading	Chalk and Board	11/12/2018

20	Problems on analysis of symmetrical portal frames with vertical loading	Chalk and Board	13/12/2019
21	Problems on analysis of symmetrical portal frames with vertical loading	Chalk and Board	17/12/2019
22	Problems on analysis of symmetrical portal frames with combined loading	Chalk and Board	17/12/2019
23	Problems on analysis of symmetrical portal frames with combined loading	Chalk and Board	18/12/2019
24	Analysis of unsymmetrical portal frames with vertical loading	Chalk and Board	18/12/2019
25	Analysis of unsymmetrical portal frames with combined loading	Chalk and Board	20/12/2019
26	Problems on analysis of symmetrical portal frames with vertical loading	Chalk and Board	24/12/2019
27	Problems on analysis of symmetrical portal frames with vertical loading	Chalk and Board	24/12/2019
27	Problems on analysis of unsymmetrical portal frames with combined loading	Chalk and Board	27/12/2019
28	Problems on analysis of unsymmetrical portal frames with combined loading	Chalk and Board	31/12/2019
29	Problems on analysis of unsymmetrical portal frames with combined loading	Chalk and Board	31/12/2019
30	Problems	Chalk and Board	03/01/2019
31	Problems	Chalk and Board	07/01/2019
32	Problems	Chalk and Board	07/01/2019
	UNIT-III		
	Matrix Force (Flexibility) Method		
33	Introduction	Chalk and Board	08/01/2019
34	Revision of matrices	Chalk and Board	08/01/2019
35	Different approaches to MM	Chalk and Board	10/01/2019
36	Static and kinematic indeterminacy	Chalk and Board	21/01/2019
37	Flexibility matrix method	Chalk and Board	21/01/2019
38	Derivation of Flexibility matrix	Chalk and Board	22/01/2019
39	Application to beams	Chalk and Board	22/01/2019
40	Simple frames	Chalk and Board	24/01/2019
41	Simple frames	Chalk and Board	28/01/2019
42	Problems on Simple frames	Chalk and Board	28/01/2019
43	Problems on Simple frames	Chalk and Board	29/01/2019

44	Problems	Chalk and Board	29/01/2019
45	Problems	Chalk and Board	31/01/2019
46	Problems	Chalk and Board	04/02/2019
47	Problems	Chalk and Board	04/02/2019
	UNIT– IV		
	Matrix Displacement (Stiffness) Method		
	Introduction of Concept of stiffness method	Chalk and Board	05/02/2019
48	Restrained structure	Chalk and Board	05/02/2019
49	Restrained structure	Chalk and Board	07/02/2019
50	Problems	Chalk and Board	11/02/2019
51	Applications to continuous beams	Chalk and Board	11/02/2019
52	Problems on applications to continuous beams	Chalk and Board	12/02/2019
53	Applications to portal frames up to two degree of kinematic indeterminacy.	Chalk and Board	12/02/2019
54	Continuation of applications to portal frames up to two degree of kinematic indeterminacy.	Chalk and Board	14/02/2019
55	Problems on applications to portal frames up to two degree of kinematic indeterminacy.	Chalk and Board	18/02/2019
56	Problems on applications to portal frames up to two degree of kinematic indeterminacy.	Chalk and Board	18/02/2019
57	Problems	Chalk and Board	19/02/2019
58	Problems	Chalk and Board	19/02/2019
59	Problems	Chalk and Board	21/02/2019
	UNIT– V		
	Introduction to Plastic analysis		
60	Introduction to Plastic analysis	Chalk and Board	25/02/2019
61	The ductility of steel	Chalk and Board	25/02/2019
62	Plastic bending of beams	Chalk and Board	26/02/2019
63	Stages of bending of rectangular sections	Chalk and Board	26/02/2019
64	Evaluation of fully plastic moment	Chalk and Board	28/02/2019
65	Evaluation of shape factor	Chalk and Board	05/03/2019

66	Plastic hinge	Chalk and Board	05/03/2019
67	Conditions and basic theorems of plastic analysis	Chalk and Board	07/03/2019
68	Lower and upper bound theorems.	Chalk and Board	11/03/2019
69	Determination of collapsible load for some standard cases of beams by static and kinematic methods.	Chalk and Board	11/03/2019
70	Problems	Chalk and Board	12/03/2019
71	Problems	Chalk and Board	12/03/2019

1. Topic Name **:** Symmetrical and Un-Symmetrical frames
Name of the Activity **:** Presentation.
Description of the Activity **:** Identifying and explanation of different types of portal frames.

2. Topic Name **:** Collapse load and plastic hinge formation.
Name of the Activity **: P**resentation and Discussion.
Description of the Activity **:** Discussion among the students identifying the position of plastic hinges

3. Topic Name **:** Calculation of static and kinematic determinacy.

Name of the Activity **:** Demonstration.
Description of the Activity **:** Discussion among the students identifying Static and kinematic Indeterminacy of the given structure.

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Prepared By: G. Swamy Yadav

Note: Dates mentioned are only tentative and will be updated duly

Lesson Plan

Department:: Civil Engineering	**Date:**11/10/2018
Academic Year:2018-19	**Year/Semester: III / II**
Name of the Faculty: A. Siva Krishna	
Course Name: Concrete Technology	**Course Code: CE 115**

Preamble:

- Importance of concrete in Civil Engineering.
- Concrete has a Construction Material.
- Biggest structures built using concrete (Hoover dam, Three gorges dam, San Francisco dam)

Course Outcomes:

At the end of the course, the students will develop ability to

1. Identify the suitability of materials for the construction works.
2. Detailed knowledge of concrete constituents: cement, aggregates, water and admixtures.
3. Determine the properties of fresh and hardened concrete design: mixing, handling, casting, curing etc.
4. Test all the concrete materials as per IS code design the concrete mix using ACI and IS code methods.
5. Understand the durability requirements of concrete.
6. Evaluate the applications of special concretes in order to ensure quality control while testing/sampling and acceptance criteria.
7. Evaluate the importance plastics, metals, timber as construction materials.
8. Review of special topics and new developments related to the materials used in the construction industry.

Lecture Schedule

S.No	Topic of the Lecture	Name of the Activity & Instructional Aids	Tentative Date
	UNIT- I		
1	**Introduction:** Cement as an ingredient, Portland cement and its invention, Chemical Composition of cement, Hydration and Setting time of cement.	Chalk and board	23/11/2018
2	Structure of hydrated cement and mineralogical data (SEM,XRD,TEM).	Chalk and board	26/11/2018
3	Physical properties of cement and test as per IS: code and ASIN.	Chalk and board	28/11/2018
4	Different types of cement testing procedures.	Chalk and board	30/11/2018
5	Grades of cement and admixtures.	Chalk and board	03/12/2018
6	Mineral and chemical admixtures.	Presentation	05/12/2018
	UNIT- II		
7	**Aggregate Testing:** Testing of coarse aggregates.	Chalk and board	07/12/2018
8	Testing of fine aggregates.	Chalk and board	10/12/2018
9	Gradation and its importance of aggregates.	Chalk and board	12/12/2018
10	Class test about different IS Codes.	Chalk and board	14/12/2018
11	Lab demonstration on aggregate testing.	Presentation	24/12/2018
	UNIT- III		
12	**Fresh Concrete:** Concrete and RMC.	Chalk and board	28/12/2018
13	Workability and its Measurements.	Presentation	02/01/2019
14	Problems with mixing of concrete.	Chalk and board	04/01/2019
15	Manufacture of concrete and quality of water.	Chalk and board	07/01/2019
16	Lab practice to measure workability and mixing problems.	Presentation	09/01/2019
	UNIT- IV		
17	**Hardened Concrete:** Tests on hardened concrete (NDT and Conventional Concrete).	Presentation	11/01/2019
18	Fundamental of hardened concrete.	Presentation	21/01/2019
19	Elasticity properties of hardened concrete and its measurements.	Chalk and board	23/01/2019
20	Creep, shrinkage and other failures.	Chalk and board	25/01/2019
21	Laboratory practice of testing on concrete	Chalk and board	28/01/2019
22	Electric Reliability Technology Solutions (CERTS).	Chalk and board	30/01/2019

	UNIT- V		
23	**Mix Design:** Factors affecting mix design statically method.	Presentation	01/02/2019
24	Mix design BIS & ACI method.	Chalk and board	04/02/2019
25	Quality control of concrete and durability.	Presentation	06/02/2019
26	Types of concrete.	Chalk and board	08/02/2019
27	Pre stressed concrete.	Chalk and board	11/02/2019
28	Types of concrete.	Presentation	13/02/2019

1.Topic Name **:** Test on physical properties of cement

Name of the Activity **:** Performance in the laboratory by test.

Description of the Activity **:** Students will be able to the physical properties and characteristics of the cement.

2.Topic Name **:** Test on fine aggregates and coarse aggregates.

Name of the Activity **:** Performance in the laboratory by test.

Description of the Activity **:** Students will be able to the know the compressive and flexural strength of aggregates.

3. Topic Name **:** workability of concrete

Name of the Activity **:** Performance in the laboratory by test.

Description of the Activity **:** Students will be able to the know the workability of concrete by different test done by the laboratory.(Compaction factor test, slump flow test, Vee Bee test)

4. Topic Name **:** Hardened concrete

Name of the Activity **:** Performance in the laboratory by test.

Description of the Activity : Students will be able to the know the strength of concrete by using compressive and flexural testing machine

TEXT BOOKS:

1. M S Shetty. "Concrete Technology", S. Chand and Co., 2006.
2. M L Gambhir, "Concrete Technology", Tata McGraw Hill Publishers, New Delhi, 2013.

REFERENCE BOOKS:

1. S S Bhavikatti, "Concrete Technology", I.K. International Publications, 2015.
2. Nayak NV and A K Jain, "Hand Book on Advanced Concrete Technology", Narosa Publications, 2012.
3. A M Neville, "Properties of Concrete", (Article published in 1963).

A R Santha Kumar, "Concrete Technology", Oxford University Press, New Delhi, 2006

Prepared By: A. Siva Krishna

Note: Dates mentioned are only tentative and will be updated duly.

Lesson Plan

Department: Civil Engineering	**Date:**11/10/2018
Academic Year:2018-2019	**Year/Semester:** III/ II
Name of the Faculty: N. Prabhanjan	
Course Name: Highway Engineering	**Course Code:** CE 142
Prerequisite: Transportation Engineering, Pavement Design	

Course Outcomes:

At the end of the course, the students will develop ability to

1. Explain surveys involved in planning and highway alignment.
2. Design cross section elements, sight distance, horizontal and vertical alignment.
3. Predict traffic studies.
4. Implement traffic regulations and control.
5. Sketch intersection design.
6. Analyze the characteristics of pavement materials.
7. Sketch flexible pavements as per IRC.
8. Design rigid pavements as per IRC.

Lecture Schedule:

S.No	Topic of the Lecture	Name of the Activity & Instructional Aids	Tentative Date
	UNIT-I		
	HIGHWAY PLANNING AND GEOMETRIC DESIGN		
1	Introduction to highway engineering, History of Road Construction, Highway	Chalk and board	19/11/2018
2	Road Development in India	Chalk and board	19/11/2018
3	Importance of geometric design , Highway cross section elements	Chalk and board	23/11/2018
4	Highway cross section elements	Chalk and board	23/11/2018
5	Introduction to Design of Horizontal Alignment	Chalk and board	26/11/2018
6	Design of Horizontal Alignment (Super Elevation)	Chalk and board	26/11/2018
7	Design of Horizontal Alignment(Extra Widening)	Chalk and board	30/11/2018
8	Design of Horizontal Alignments(Transition Curves)	Chalk and board	30/11/2018
9	Problems on Design of Horizontal Alignments	Chalk and board	03/12/2018
10	Introduction to Design of Vertical Alignments	Chalk and board	03/12/2018
11	Design of Vertical Alignments(summit curves)	Chalk and board	07/12/2018
12	Design of Vertical Alignments(valley curves)	Chalk and board	07/12/2018
13	Problems on Design of Vertical Alignments	Chalk and board	10/12/2018
14	Different Sight Distances, PIEV Theory	Chalk and board	10/12/2018
15	Derivation of Stopping Sight Distance (SSD)	Chalk and board	14/12/2018
16	Derivation of Overtaking Sight Distance (OSD)	Chalk and board	14/12/2018
17	Problems on SSD and OSD	Chalk and board	17/12/2018
	UNIT-II		
	HIGHWAY MATERIALS AND CONSTRUCTION		
18	Introduction to highway materials, Desirable Properties and Testing on Soil	Chalk and board AND Hands on Sessions	21/12/2018
19	Desirable Properties and Testing on Aggregates	Chalk and board AND Hands on Sessions	21/12/2018
20	Desirable Properties and Testing on Bitumen	Chalk and board AND Hands on Sessions	24/12/2018
21	Construction Procedure of Water Bound Macadam Road	Chalk and board	24/12/2018
22	Construction Procedure of Bituminous Road and [as per IRC and MORTH specifications]	Chalk and board	28/12/2018
23	Construction Procedure of Cement	Chalk and board	28/12/2018

	Concrete Road [as per IRC and MORTH specifications]		
	UNIT-III		
	FLEXIBLE AND RIGID PAVEMENT		
24	Introduction to pavements, variations between Flexible Pavements and Rigid Pavements in components and functioning	Chalk and board	31/12/2018
25	Design Principles of Flexible and Rigid Pavements	Chalk and board	31/12/2018
26	Factors affecting the Design of Pavements	Chalk and board	04/01/2019
27	Design practice for Flexible Pavements based on IRC Recommendations	Chalk and board AND Hands on Sessions	04/01/2019
28	Design practice for Rigid Pavements based on IRC Recommendations	Chalk and board AND Hands on Sessions	07/01/2019
	UNIT-IV		
	TRAFFIC ENGINEERING		
29	Basic parameters of traffic	Chalk and board	11/01/2019
30	Traffic Volume studies	Chalk and board	11/01/2019
31	Speed studies, Parking studies and parking characteristics	Chalk and board	21/01/2019
32	Causes and preventive measures Road accidents	Chalk and board	25/01/2019
33	Types and specifications Road traffic Signs	Chalk and board	28/01/2019
34	Need and types of road marking	Chalk and board	01/02/2018
35	Design of Traffic Signals by Webster's method	Chalk and board	04/02/2019
	UNIT-V		
	HIGHWAY MAINTENANCE		
36	Introduction to Highway Maintenance, Types of defects in Flexible pavements	Chalk and board	08/02/2019 11/02/2019
37	symptoms, causes and treatments of disintegration	Chalk and board	15/02/2019
38	Types of Rigid Pavement failure and special repairs	Chalk and board	18/02/2019 22/02/2019
39	Rivision of 5th unit	Chalk and board	25/02/2019
40	Rivision ALL unitS	Chalk and board	01/03/2019
41	Problems on each unit	Chalk and board	01/03/2019
42	Problems on each unit	Chalk and board	12/03/2019

1.Topic Name	**:** Flexible and Rigid Pavements
Name of Activity	**:** Micro-Project
Description of Activity	Students have to do a micro project on
2.Topic Name	**:** micro-project
Name of Activity	**:** parking design
Description of Activity	: students have to do micro project on parking design for college buses and bikes
3.Topic Name	**:** desirable properties of soil, aggregate, bitumen

Name of Activity	**:** Hands on session
Description of Activity	**:** testing the road construction materials
4.Topic Name	**:** Basic Parameters of traffic engineering
Name of Activity	**:** presentation
Description of Activity	**:** knowing knowledge about basic parameters of traffic of speed, flow, density and signboards, signals, road markings

TEXT BOOKS:

1. S.K.Khanna and C.E.G. Justo, "Highway Engineering", Nemchand and Bros.,7th Edition (2001)
2. Dr. L.R. Kadiyali and Dr. N.B. Lal, "Principles and Practices of Highway Engineering" Khanna Publishers, 2005.

Prepared By: N.Prabhanjan

Note: Dates mentioned are only tentative and will be updated duly

Lesson Plan

Department: Civil Engineering	
Academic Year: 2018-19	Year/Semester: **III / II**
Name of the Faculty: Arun Kumar Beerala	
Name of the Course: Watershed Management	**Course Code:** CE119
Prerequisite:	

Course Outcomes:

At the end of the course, the students will develop ability to

1. Identify all the available natural resources in a sub-watershed or a watershed.
2. Constructing various soil conservation measures.
3. Applying the scientific methods to prevent the erosion of fertile soils.
4. Design and planning for construction of various water harvesting structures.
5. Prioritization for construction of water harvesting and soil conservation measures with consent of the local community and the stakeholders.
6. Analyzing the status of improvement in soil moisture conditions, groundwater recharge and availability of food and fodder for the cattle.
7. Evaluate the changes in land use and land cover before and after implementation of the watershed project activities.
8. Compile the improvements and the changes in terms of natural resources, their availability and socio economic conditions. i.e. pre and post implementation of the watershed program for a sustainable development.

Lecture Schedule:

S. No	Topic of the Lecture	Name of the Activity & Instructional Aids	Tentative Date
	UNIT- I		
	Introduction		
1	Introduction to water shed management	Presentation & Discussion	22/11/2018
2	Concept of watershed development	Presentation & Discussion	28/11/2018
3	Objectives of watershed development	Presentation & Discussion	28/11/2018
4	Need for watershed development in India	Presentation & Discussion	29/11/2018
5	Integrated and multidisciplinary approach for watershed management	Presentation & Discussion	05/12/2018
6	Characteristics of watershed	Presentation & Discussion	05/12/2018
7	Continuation of Characteristics of watershed	Presentation & Discussion	06/12/2018
8	Slope climate- drainage- land use	Presentation & Discussion	12/12/2018
9	Vegetation- geology and soils	Presentation & Discussion	12/12/2018
10	Hydrology and hydrogeology socio-economic characteristics	Presentation & Discussion	13/12/2018
11	Basic data on watersheds.	Presentation & Discussion	19/12/2018
	UNIT- II		
	Principles of Erosion		
12	Principles of Erosion and Types of erosion	Presentation & Discussion	19/12/2018
13	Factors affecting erosion	Presentation & Discussion	20/12/2018
14	Effects of erosion	Presentation & Discussion	27/12/2018
15	Effects of erosion on land fertility and land capability	Presentation & Discussion	28/12/2018
16	Estimation of soil loss due to erosion	Presentation & Discussion	02/01/2019
17	Universal soil loss equation	Presentation & Discussion	02/01/2019
18	Measures to control Soil erosion	Presentation & Discussion	03/01/2019
19	Contour techniques	Presentation & Discussion	09/01/2019
20	Ploughing- furrowing trenching	Presentation & Discussion	09/01/2019
21	Bunding- terracing- gully control	Presentation & Discussion	10/01/2019
22	Rock fill dams- brushwood dam- Gabion.	Presentation & Discussion	23/01/2019

	UNIT-III		
	Water Harvesting		
23	Water harvesting: rainwater harvesting	Presentation & Discussion	23/01/2019
24	Catchment harvesting	Presentation & Discussion	24/01/2019
25	Harvesting structures for practice	Presentation & Discussion	30/01/2019
26	Soil moisture conservation	Presentation & Discussion	30/01/2019
27	Check dams- artificial recharge	Presentation & Discussion	31/01/2019
28	Farm ponds- percolation tanks	Presentation & Discussion	06/02/2019
29	Land Management- Land use	Presentation & Discussion	06/02/2019
30	Land Management- Land use and Land capability classification	Presentation & Discussion	07/02/2019
31	Management of forest agricultural	Presentation & Discussion	13/02/2019
32	Grassland and wild land	Presentation & Discussion	13/02/2019
33	Reclamation of saline and alkaline soils.	Presentation & Discussion	14/02/2019
	UNIT-IV		
	Ecosystem Management		
34	Ecosystem Management: Role of Ecosystem -	Presentation & Discussion	20/02/2019
35	Crop husbandry and its importance	Presentation & Discussion	20/02/2019
36	Continuation of crop husbandry- soil enrichment	Presentation & Discussion	21/02/2019
37	Inter- mixed and strip cropping method	Presentation & Discussion	27/02/2019
38	Continuation of inter- mixed and strip cropping- cropping pattern	Presentation & Discussion	27/02/2019
39	Sustainable agriculture- bio-mass management	Presentation & Discussion	28/02/2019
40	Dry land agriculture- Silvi pasture	Presentation & Discussion	06/03/2019
41	Horticulture and its applications	Presentation & Discussion	06/03/2019
42	Social forestry and afforestation	Presentation & Discussion	07/03/2019
43	Continuation on social forestry and afforestation	Presentation & Discussion	13/03/2019
	UNIT-V		
	Planning of Watershed Management Activities		
44	Planning of Watershed Management Activities: People's participation -	Presentation & Discussion	13/03/2019
45	Preparation of action plan	Presentation & Discussion	Extra
46	Administrative requirements.	Presentation & Discussion	Extra
47	Revision/ Class work/ Discussion/ quiz	Discussion and quiz	Extra
48	Revision/ Class work/ Discussion/ quiz	Discussion and quiz	Extra
49	Revision/ Class work/ Discussion/ quiz	Discussion and quiz	Extra

1. Topic Name	**:** Rainwater harvesting
Name of the Activity	**:** Visiting harvesting structures
Description of the Activity	**:** Students will be able to preserve & use rainwater effectively.

TEXT BOOKS:

1. JVS Murthy, "Watershed Management", New Age International Publishers.
2. R.Awurbs and WP James, "Water Resource Engineering", Prentice Hall Publishers, 2001.

REFERENCE BOOKS:

1. VVN Murthy, "Land and Water Management", Kalyani Publications,2009.
2. D.K.Majumdar, "Irrigation and Water Management", Prentice Hall of India,2001.

Prepared by Arun kumar Beerala

Lesson Plan

Department: Civil Engineering	**Date:**13/11/2018
Academic Year:2018-2019	**Year/Semester:** III /II
Name of the Faculty: G. Swamy yadav	
Course Name: Pre-Stressed Concrete	**Course Code**: CE120
Prerequisite: Concrete Technology, Reinforced Cement Concrete, Strength of Materials	

Course Outcomes:

At the end of the course, the students will develop ability to

1. Recognize and state the historical development and importance of pre stressed concrete structures.
2. Critique the general mechanical behavior of pre stressed concrete.
3. Discuss the methods of pre tensioning and post tensioning.
4. Examine the various losses in pre stressed concrete.
5. Design various pre stressed concrete members.
6. Analysis of end blocks by various methods.
7. Summarize the importance of control of deflections.
8. Explain about the differential shrinkage.

Lecture Schedule:

S.No	Topic of the Lecture	Name of the Activity & Instructional Aids	Tentative Date
	UNIT-I		
	Introduction		
1	Introduction, historic development, principles of pre tensioning and post tensioning.	Chalk and Board	22/11/2018
2	principles of pre tensioning and post tensioning	PPT	28/11/2018
3	Advantages and limitations of pre stressed concrete materials	Chalk and Board	29/11/2018
4	Methods of systems of pre tensioning.	Chalk and Board	05/12/2018
5	Methods of systems of post tensioning.	Chalk and Board	06/12/2018
6	Comparative study of pre and post tensioning.	Chalk and Board	12/12/2018
	UNIT-II		
	Losses of Prestress		
7	Loss of pre stress in pre tensioned members due to various causes.	Chalk and Board	13/12/2018
8	Loss of pre stress in post tensioned members due to various causes.	Chalk and Board	19/12/2018
9	Shrinkage, creep, relaxation, frictional loss and slip in anchorage.	Chalk and Board	19/12/2018
10	Shrinkage, creep, relaxation, frictional loss and slip in anchorage.	Chalk and Board	20/12/2018
11	Analysis of flexural members.	Chalk and Board	27/12/2018
12	Analysis of flexural members.	Chalk and Board	02/01/2018
13	Elastic analysis of beams with straight, eccentric and parabolic tendons.	Chalk and Board	02/01/2019
14	Elastic analysis of beams with straight, eccentric and parabolic tendons.	Chalk and Board	03/01/2019
15	Problems for exercise.	Chalk and Board	09/01/2019
	UNIT-III		
	Design of Sections for Flexure and Shear		
16	Elastic design of simple rectangular Section for flexure, shear.	Chalk and Board	09/01/2019
17	Elastic design of simple rectangular Section for flexure, shear.	Chalk and Board	10/01/2019
18	Elastic design of I-Section for flexure, shear and principal stresses.	Chalk and Board	23/01/2019

19	Elastic design of I-Section for flexure, shear and principal stresses.	Chalk and Board	24/01/2019
20	Kern lines and cable profile.	Chalk and Board	30/01/2019
21	Problems on design of beams.	Chalk and Board	30/01/2019
22	Problems on design of beams.	Chalk and Board	31/01/2019
23	Problems for exercise	Chalk and Board	06/02/2019
	UNIT– IV		
	Analysis of end block		
24	Critical stresses in anchorage zone.	Chalk and Board	06/02/2019
25	Stress analysis using Guyon's method.	Chalk and Board	07/02/2019
26	Stress variation using Magnal method.	Chalk and Board	13/02/2019
27	Stress analysis using IS method.	Chalk and Board	13/02/2019
28	Problems using Guyon's method.	Chalk and Board	14/02/2019
29	Problems using Magnal method.	Chalk and Board	20/02/2019
30	Problems using IS method.	Chalk and Board	20/02/2019
31	Problems using IS method.	Chalk and Board	21/02/2019
	UNIT– V		
	Composite section		
32	Analysis of stresses.	Chalk and Board	27/02/2019
33	Differential shrinkage.	Chalk and Board	27/02/2019
34	Deflections of pre stressed concrete beams.	Chalk and Board	28/03/2019
35	Factors influencing deflections.	Chalk and Board	06/03/2019
36	Short term and long term deflections.	Chalk and Board	06/03/2019
37	Problems on short term deflections.	Chalk and Board	07/03/2019
38	Problems on long term deflections.	Chalk and Board	07/03/2019

1. Topic Name	**:** Pre stressing systems.
Name of the Activity	**:** Presentation.
Description of the Activity	**:** Identifying and explanation of different types of pre stressing systems
2. Topic Name	**:** Stress distribution in end block.
Name of the Activity	**: P**resentation and Discussion.
Description of the Activity	**:** Discussion among the students the variation of stress in anchorage zone.

Prepared By: G. Swamy Yadav

Note: Dates mentioned are only tentative and will be updated duly

(CE123) CONCRETE TEHCNOLOGY LAB

DEMO EXPERIMENTS:

1. Explanation about relevant IS and ASTM code for testing of materials used in concrete.
2. Derive the bulking value of given sand.

OPEN ENDED EXPERIMENT:

1. Calculate the initial setting time using chemical and mineral admixtures.
2. Obtain the workability test on concrete using mineral and chemical admixtures.
3. Reinforcement detailing
   a) Footings
   b) Columns
   c) Beams(250mm*100mm*300mm)
   d) One way slab.
   e) Two way slab

EXERCISE OF EXPERIMENTS:

1. Find out the specific gravity of cement and soundness of the given cement.
2. Obtain the consistency and fineness of cement by using IS code provisions.
3. Obtain the strength characteristics of the concrete (compressive, tensile, flexural strength.
4. Derive the strength characteristics of coarse aggregate as per IS 2386 part 1to 8 and IS 2720 series.
5. Obtain NDT characteristics of the concrete with and without mineral admixtures.

1st Batch

S.No	Name of the Experiment	Date of Experiment				
		28/11/2018	**05/12/2018**	**12/12/2018**	**19/12/2018**	**02/01/2019**
	CYCLE-I					
1	Explanation about relevant IS and ASTM code for testing of materials used in concrete.	BATCH 1	BATCH 2	BATCH 3	BATCH 4	BATCH 5
2	Calculate the initial setting time using .;chemical and mineral admixtures	BATCH 2	BATCH 3	BATCH 4	BATCH 5	BATCH 1
3	Obtain the consistency and fineness of cement by using IS code provisions.	BATCH 3	BATCH 4	BATCH 5	BATCH 1	BATCH 2
4	Find out the specific gravity of cement and soundness of the given cement.	BATCH 4	BATCH 5	BATCH 1	BATCH 2	BATCH 3
5	Derive the strength characteristics of coarse aggregate as per IS 2386 part 1to 8 and IS 2720 series.	BATCH 5	BATCH 1	BATCH 2	BATCH 3	BATCH 1
	CYCLE-II					
S.No	**Name of the Experiment**	**DATE OF EXPERIMENT**				
		09/01/2019	**23/01/2019**	**30/01/2019**	**06/02/2019**	**13/02/2019**
6	Obtain the workability test on concrete using mineral and chemical admixtures.	BATCH 1	BATCH 2	BATCH 3	BATCH 4	BATCH 5
7	Obtain the strength characteristics of the concrete(compressive, tensile, flexural strength)	BATCH 2	BATCH 3	BATCH 4	BATCH 5	BATCH 1
8	Obtain NDT characteristics of the concrete with and without mineral admixtures	BATCH 3	BATCH 4	BATCH 5	BATCH 1	BATCH 2
9	Derive the bulking value of given sand.	BATCH 4	BATCH 5	BATCH 1	BATCH 2	BATCH 3
10	1. Reinforcement detailing. a) Footings. b) Columns. c) Beams(250mm*100 mm*300mm). d) One way slab. **e)** Two way slab.	BATCH 5	BATCH 1	BATCH 2	BATCH 3	BATCH 1

2nd Batch

S.No	Name of the Experiment	Date of Experiment				
		23/11/2018	**30/11/2018**	**07/12/2018**	**14/12/2018**	**21/12/2018**
	CYCLE-I					
1	Explanation about relevant IS and ASTM code for testing of materials used in concrete.	BATCH 1	BATCH 2	BATCH 3	BATCH 4	BATCH 5
2	Calculate the initial setting time using chemical and mineral admixtures.	BATCH 2	BATCH 3	BATCH 4	BATCH 5	BATCH 1
3	Obtain the consistency and fineness of cement by using IS code.	BATCH 3	BATCH 4	BATCH 5	BATCH 1	BATCH 2
4	Finding out the specific gravity of cement and soundness of the given cement.	BATCH 4	BATCH 5	BATCH 1	BATCH 2	BATCH 3
5	Derive the strength characteristics of coarse aggregate as per IS 2386 part 1 to 8 and IS 2720 series.	BATCH 5	BATCH 1	BATCH 2	BATCH 3	BATCH 1
	CYCLE-II					
S.No	**Name of the Experiment**	**DATE OF EXPERIMENT**				
		28/12/2018	**04/01/2019**	**11/01/2019**	**25/01/2019**	**01/02/2019**
6	Obtain the workability test on concrete using mineral and chemical admixtures.	BATCH 1	BATCH 2	BATCH 3	BATCH 4	BATCH 5
7	Obtain the strength characteristics of the concrete(compressive, tensile, flexural strength)	BATCH 2	BATCH 3	BATCH 4	BATCH 5	BATCH 1
8	Obtain NDT characteristics of the concrete with and without mineral admixtures	BATCH 3	BATCH 4	BATCH 5	BATCH 1	BATCH 2
9	Derive the bulking value of given sand.	BATCH 4	BATCH 5	BATCH 1	BATCH 2	BATCH 3
10	Reinforcement detailing. a) Footings. b) Columns. c) Beams(250mm*100 mm*300mm). d) One way slab. **e)** Two way slab.	BATCH 5	BATCH 1	BATCH 2	BATCH 3	BATCH 1

Prepared By: E. Laxmi Prasanna

Note: Dates mentioned are only tentative and will be updated duly

(CE124) HIGHWAY ENGINEERING LAB

DEMO EXPERIMENTS:

1. Evaluate Aggregate Crushing value for given sample of aggregates.
2. Conduct Aggregate Impact test for given sample of aggregates
3. Find Specific Gravity and Water Absorption test for Aggregate for given sample of aggregates.
4. Measure Abrasion test for Aggregate for given sample of aggregates.
5. Solve the Flakiness and elongation Indices for given sample of aggregates

OPEN ENDED EXERCISE EXPERIMENT:

1. Estimate the Penetration value for different bitumen samples.
2. Measure the Ductility value for different bitumen samples.
3. Count the Softening Point value for different bitumen samples.
4. Compute the Flash and Fire point values on different bitumen samples.
5. Determination of C.B.R value for different soil samples

EXERCISE OF EXPERIMENTS:

Description of all Parts of

1. Impact testing machine
2. Crushing testing machine
3. Loss angles abrasion testing machine
4. Length gauge and thickness gauge
5. Ductility testing machine
6. Penetrometer
7. Pensky marten fire and flash test apparatus
8. Ring band ball apparatus test setup
9. C.B.R Test apparatus

S.No	Name of the Experiment	Date of Experiment				
		20/11/2018	**27/11/2018**	**04/12/2018**	**11/12/2018**	**18/12/2018**
	CYCLE-I					
1	Evaluate Aggregate Crushing value for given sample of aggregates.	BATCH 1	BATCH 2	BATCH 3	BATCH 4	BATCH 5
2	Conduct Aggregate Impact test for given sample of aggregates.	BATCH 2	BATCH 3	BATCH 4	BATCH 5	BATCH 1
3	Find Specific Gravity and Water Absorption test for Aggregate for given sample of aggregates.	BATCH 3	BATCH 4	BATCH 5	BATCH 1	BATCH 2
4	Measure Abrasion test for Aggregate for given sample of aggregates.	BATCH 4	BATCH 5	BATCH 1	BATCH 2	BATCH 3
5	Solve the Flakiness and elongation Indices for given sample of aggregates.	BATCH 5	BATCH 1	BATCH 2	BATCH 3	BATCH 1
	CYCLE-II					
S.No	**Name of the Experiment**	**DATE OF EXPERIMENT**				
		08/01/2019	**22/01/2019**	**29/01/2019**	**05/02/2019**	**12/03/2019**
6	Estimate the Penetration value for different bitumen samples	BATCH 1	BATCH 2	BATCH 3	BATCH 4	BATCH 5
7	Measure the Ductility value for different bitumen samples	BATCH 2	BATCH 3	BATCH 4	BATCH 5	BATCH 1
8	Count the Softening Point value for different bitumen samples	BATCH 3	BATCH 4	BATCH 5	BATCH 1	BATCH 2
9	Compute the Flash and Fire point values on different bitumen samples	BATCH 4	BATCH 5	BATCH 1	BATCH 2	BATCH 3
10	Determination of C.B.R value for different soil samples	BATCH 5	BATCH 1	BATCH 2	BATCH 3	BATCH 1

Prepared By: N.Prabhanjan

Note: Dates mentioned are only tentative and will be updated duly