VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
Ibrahimbagh, Hyderabad-31

Approved by A.I.C.T.E., New Delhi and
Affiliated to Osmania University, Hyderabad-07

Sponsored by
VASAVI ACADEMY OF EDUCATION
Hyderabad

SYLLABUS BOOK FOR
B.E (CIVIL) VII and VIII SEMESTER
UNDER CBCS WITH EFFECT FROM 2020–2021
(For the students admitted in 2017-18)

DEPARTMENT OF CIVIL ENGINEERING
+91-40-23146010, 23146011
Fax: +91-40-23146090
Website: www.vce.ac.in

DEPARTMENT MISSION

"To strive for excellence in order to make the students better citizens with technical knowledge and social awareness"

DEPARTMENT VISION

"To impart knowledge in the latest technologies to the students of civil engineering to fulfil the growing needs of the society."

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
SCHEME OF INSTRUCTION AND EXAMINATION (R-17)
B.E. – (CIVIL ENGINEERING) VII-SEMESTER ACADEMIC YEAR 2020 - 2021
(Students Admitted in 2017-2018)

B.E (Civil) VII Semester								
Course Code	Name of the Course	Scheme of Instruction			Duration in Hrs	Scheme of Examination		
		Hours per Week				Maximum Marks		Credits
		L	T	P / D		SEE	CIE	
THEORY								
HS040EH	Economics and Finance for Engineers	2	-	-	3	60	40	2
PC710CE	Concrete Technology	3	-	-	3	60	40	3
PC720CE	Estimation & Specifications	3	-	-	3	60	40	3
PE7XXCE	Professional Elective – I	3	-	-	3	60	40	3
PE7XXCE	Professional Elective – II	3	-	-	3	60	40	3
PE7XXCE	Professional Elective – III	3	-	-	3	60	40	3
PE7XXCE	Professional Elective – IV	3	-	-	3	60	40	3
PRACTICALS								
PC711CE	Computer Applications-II Lab	-	-	2	3	50	30	1
PW719CE	Project Seminar	-	-	2	-	-	30	1
	CC / RC / TC	-	-	-	-	-	-	-
Student should acquire one online course certificate equivalent to two credits during III-VII Semester								
	TOTAL	**20**	**-**	**4**		**470**	**340**	**22**
	GRAND TOTAL	**24**				**810**		
Note: The left over hours are to be allotted to CC / RC / TC based on the requirement.								

PROFESSIONAL ELECTIVES

PROFESSIONAL ELECTIVE – I		
1	PE711CE	Advanced Design of Steel Structures
2	PE712CE	Railway & Airport Engineering
3	PE713CE	Advanced Environmental Engineering
PROFESSIONAL ELECTIVE – II		
1	PE721CE	Health Monitoring & Retrofitting of Structures
2	PE722CE	Foundation Engineering
3	PE723CE	Optimization Techniques
PROFESSIONAL ELECTIVE – III		
1	PE731CE	Finite Element Method
2	PE732CE	Transportation Infrastructure Planning and Management
3	PE733CE	Water Resources Engineering
PROFESSIONAL ELECTIVE – IV		
1	PE741CE	Pre-Stressed Concrete
2	PE742CE	Geoinformatics
3	PE743CE	Disaster Mitigation and Management

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
IBRAHIMBAGH, HYDERABAD – 500 031

DEPARTMENT OF CIVIL ENGINEERING

CONCRETE TECHNOLOGY

SYLLABUS FOR B.E. VII-SEMESTER

L : T : P (Hrs./week):3 : 0 : 0	SEE Marks:60	Course Code: PC710CE
Credits : 3	CIE Marks:40	Duration of SEE: 3 Hrs

COURSE OBJECTIVES	COURSE OUTCOMES
Objectives of this course are to:	Upon the completion of this course the students will be expected to:
1. Learn the properties of concrete in its fresh state and hardened state. 2. Design the concrete mixes using admixtures by different methods. 3. Learn the properties and applications of different types of special concretes.	1. Understand the properties of concrete in its fresh state 2. Understand the properties of concrete in its hardened state 3. Design the concrete mixes by I.S., British and ACI methods. 4. Use chemical and mineral admixtures in making concrete of desired properties. 5. Identify different types of special concretes for specific use

UNIT-I:**Constituents of Concrete:** Types of cements and their composition. Tests on various properties of aggregates.
Properties of fresh concrete: Mixing and batching. Workability, factors effecting workability, various tests procedures. Segregation and bleeding. Vibration of concrete. Types of vibrators and their influence on composition. Analysis of fresh concrete.

UNIT-II : **Properties of Hardened concrete:** Strength of concrete. Water cement ratio. Gel space ratio. Effective water in the mix. Short term and long term properties of concrete. Tests and procedures. Influence of various parameters on strength of concrete. Relationship between various mechanical strengths of concrete. Curing of concrete. Maturity concept. Stress-strain curves of concrete. Durability of concrete.

UNIT-III : Mix design of concrete: Basic considerations, Parameters of mix design. Factors in the choice of mix proportions and their influence. Quality control. Various methods of mix design. I.S.Code method. British and ACI methods.

UNIT-IV : Admixtures used in concrete: Classification of admixtures. Chemical and mineral admixtures. Influence of various admixtures on properties of concrete. Applications. Concept of ready mixed concrete. Fly ash concrete – properties and proportion of fly ash, applications; Recycled aggregate concrete.

UNIT-V :Special Concrete: High strength concrete, High performance concrete, Ferro cement, Light weight concrete, High density concrete. Self- compacting concrete - their specialties and applications.
Fibre Reinforced Concrete: Need for Fibre reinforced concrete (FRC), Mechanism of FRC, types of fibres, fibre shortcrete

Learning Resources:

1. Shetty M.S., and Jain.A.K, Concrete Technology, 8th edition,S.Chand & Company, 2019.
2. Neville A.M., and Brooks.J.J., Concrete techno;ogy, 2nd edition , pearson
3. Mehta P.K., and Paulo J.M.M., Concrete-Microstructure-Properties and Material, 4th edition,McGraw Hill Publishers.
4. Krishnaraju N., Design of Concrete Mixes, 5th edition, CBS Publishers, 2018
5. Gambhir M.L., Concrete Technology, McGraw Hill Education (India) Private Limited, 2013.
6. SanthakumarA.R.,Concrete Technology, 2nd edition, Oxford University Press.
7. IS456-2000, Indian standard code of practice for plain and reinforced concrete, Bureau of Indian standards
8. IS:10262-2009, Indian standard code of practice for design of concrete mixes, Bureau of Indian standards

The break-up of CIE: Internal Tests + Assignments + Quizzes

1	No. of Internal Tests	:	2	Max. Marks for each Internal Test	:	30
2	No. of Assignments	:	3	Max. Marks for each Assignment	:	5
3	No. of Quizzes	:	3	Max. Marks for each Quiz Test	:	5

Duration of Internal Tests : 90 Minutes

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
IBRAHIMBAGH, HYDERABAD – 500 031

DEPARTMENT OF CIVIL ENGINEERING
ESTIMATION AND SPECIFICATIONS

SYLLABUS FOR B.E. VII-SEMESTER

L : T : P (Hrs./week):3 : 0 : 0	SEE Marks:60	Course Code: PC720CE
Credits : 3	CIE Marks:40	Duration of SEE: 3 Hrs

COURSE OBJECTIVES	COURSE OUTCOMES
Objectives of this course are to:	Upon the completion of this course the students will be expected to:
1. Understand the concept of quantity Estimation and prepare estimates and bar bending schedules for various RCC works 2. Learn to prepare rate analysis for various item of works in construction. 3. Acquire knowledge on various types of specifications used in construction 4. Acquire knowledge on various types of contracts, tenders 5. Interpret case studies on Public-Private Partnerships with an emphasis on the construction industry, like BOT, BOOT and DPR.	1. Estimate the quantities of materials used in various construction works. 2. Compute and prepare bar bending schedules. 3. Prepare rate analysis for various quantities 4. List the various types of specifications, contracts used in construction and examine various documents related to construction. 5. Interpret case studies on Public-Private Partnerships with an emphasis on the construction industry.

UNIT – I: Detailed Estimates: Working out the detailed estimate for Flat roof building -load bearing, RCC & Steel framed structure, Bituminous and C.C Road work including earthwork and Irrigation canal work including earthwork.

UNIT – II: Estimation of steel quantities: Estimation of steel quantities for Slabs, Beams and Columns, Footings – Rectangular, Isolated and Stair Case.

UNIT – III: Rate Analysis: Preparation of analysis of rates and theoretical requirements of materials as per the standard data for Major items of works of a building and all items of work for bituminous and concrete road works.

UNIT – IV: Specifications: General and detailed specification of works, Types of estimates and Earnest Money, Security Deposit, Measurement Book and muster roll.

Contracts & Tender: Introduction, types of construction contracts and their advantages and disadvantages, conditions of contracts, Introduction to Indian contract act. Tender form, Tender Notice, E- Tender, Work Order.

UNIT – V: Project Delivery Methods: Project Delivery Methods - Design Build (DB), Design Bid Build (DBB), Detailed Project Report (DPR), Concept of Public Private Partnership (PPP) - Build Operate Transfer (BOT), Build Own Operate Transfer (BOOT), Recent developments - case studies.

Learning Resources:

1. Dutta B.N. Estimating and Costing in Civil Engineering (Theory and Practice), UBS Publishers' Distributors Pvt Ltd., 2016.
2. Chakraborty M. Estimating, Costing, Specification & Valuation In Civil Engineering , (Published by Author), 2006.
3. Upadhyay A.K. Civil Estimating & Costing: Including Quality Surveying, Tendering and Valuation, S K Kataria and Sons, 2013.
4. Patil, B.S. Civil Engineering Contracts and Estimation, Orient Black Swan, 2015.
5. Leonard Holm, John E. Schaufelberger, Dennis Griffin, Thomas Cole Construction Cost Estimating: Process and Practices, Pearson Education, 2017.

The break-up of CIE: Internal Tests + Assignments + Quizzes

1	No. of Internal Tests	:	2	Max. Marks for each Internal Test	:	30
2	No. of Assignments	:	3	Max. Marks for each Assignment	:	5
3	No. of Quizzes	:	3	Max. Marks for each Quiz Test	:	5
	Duration of Internal Tests	:	90 Minutes			

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
IBRAHIMBAGH, HYDERABAD – 500 031

DEPARTMENT OF CIVIL ENGINEERING

ADVANCED DESIGN OF STEEL STRUCTURES

SYLLABUS FOR B.E. VII-SEMESTER

L : T : P (Hrs./week):3 : 0 : 0	SEE Marks:60	Course Code: PE711CE
Credits : 3	CIE Marks:40	Duration of SEE: 3 Hrs

COURSE OBJECTIVES	COURSE OUTCOMES
Objectives of this course are to:	Upon the completion of this course the students will be expected to:
1. Learn the design of plate girder for heavy loads and long spans. 2. Design gantry girder for industrial workshops 3. Design beam columns for industrial buildings 4. Understand the use of Indian standard railway loadings and types of steel bridges for railways 5. Learn the design of deck type plate girder railway bridges for broad gauge railway loadings and end bearings	1. Design a welded plate girder by limit state method. 2. Design a gantry girder by limit state method. 3. Design a beam - column by limit state method. 4. Use the Indian standard railway loadings and different types of steel bridges for railways. 5. Design deck type riveted plate girder and bearings for steel Railway Bridges

UNIT-I: Design of Plate girders: (Limit state design**)** Design of welded plate girder for static loads as per IS:800-2007 – Economical Depth, Design of Cross Section, Flange curtailment, intermediate and bearing stiffeners, Design of connections. Sketch showing the details of longitudinal section and cross section.

UNIT-II: Design of Gantry girders: **(**Limit state design**)** Basic principles, Loads, Codal provisions, Design of Cross section and design of welded connection as per IS: 800-2007. Sketch showing general layout and cross section of gantry girder.

Design of Beam – Column: Introduction – general behavior of beam - columns – codal provision for local capacity check and overall buckling check – Design of beam -column.

UNIT-III: Design of Steel Railway Plate Girder Bridge: Types of steel bridges, Economical span. Indian standard railway broad gauge train loading – permissible stresses.

Design of Deck type riveted plate girder railway bridges for broad gauge main line loading – Design of cross section, riveted connections, Intermediate and bearing stiffeners – Design of cross frame, Sketch showing the longitudinal section & cross section. Types of bearings for steel railway bridges. Design of rocker and roller bearings for steel railway bridges.

Learning Resources:

1. Duggal S.K "Limit State Design of Steel Structures" 3rd Edition McGraw Hill Education (India), 2019
2. Purnima B.C Ashok Kumar Join and Arun Kumar Join, "Design of Steel Structures" Laxmi publication Pvt. Ltd, 2015.
3. Ramchandra and Virendra Gehlot "Design of Steel Structures - II",Scientific Publishers (India) 2008.
4. Bhavikatti S.S. "Limit State Design of Steel Structures", 5th Edition Dream Tech. Press 2019.
5. Arya A.S, Awadhesh Kumar and Ajmani J.L. " Design of Steel Structures" Nem Chand & Bros, 2014.
6. Subramanian N "Design of Steel Structures, Limit State Method", Oxford University Press, 2018
7. Gambhir M.L. "Fundamentals of structural Steel Design" Tata Mc.Graw Hill Education Pvt.Ltd., 2013
8. Shah V.L. And Veena Gore " Limit State Design of Steel Structures" Structures Publications, 2009
9. Chaterjee, S "The design of Modern Steel Bridges" BSP Professional Books, 1991
10. IS: 800 – 2007: Code of Practice for General Construction in Steel, Bureau of Indian Standards, New Delhi.
11. IS: 875-1987: Code of Practice for Design loads for buildings and structures, Bureau of Indian Standards, New Delhi.
12. Bridge Rules – 1982, specifications for Indian Railway Loadings
13. ISI Handbook No. 1 Bureau of Indian Standards, New Delhi
14. IS: 1915 – 1961 – The Indian Standard Code of Practice for design of steel bridges Bureau of Indian Standards, New Delhi
15. Bhavikatti S.S. & Prasad K.V. "Steel Tables with Plastic Modules of I.S.Section" I.K International Publishing House Pvt. Ltd, 2016

16. http://nptel.ac.in/courses/105103094/
17. www.steel-insdag.org

The break-up of CIE: Internal Tests + Assignments + Quizzes

1	No. of Internal Tests	:	2	Max. Marks for each Internal Test	:	30
2	No. of Assignments	:	3	Max. Marks for each Assignment	:	5
3	No. of Quizzes	:	3	Max. Marks for each Quiz Test	:	5
	Duration of Internal Tests	:	90 Minutes			

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
IBRAHIMBAGH, HYDERABAD – 500 031

DEPARTMENT OF CIVIL ENGINEERING
RAILWAY AND AIRPORT ENGINEERING

SYLLABUS FOR B.E. VII-SEMESTER

L : T : P (Hrs./week):3 : 0 : 0	SEE Marks:60	Course Code: PE712CE
Credits : 3	CIE Marks:40	Duration of SEE: 3 Hrs

COURSE OBJECTIVES	COURSE OUTCOMES
Objectives of this course are to:	Upon the completion of this course the students will be expected to:
1. Impart knowledge on the basics of railway with respect to alignment, components, geometric design, construction and maintenance of track. 2. Introduce principles of airport engineering with respect to planning and geometric design	1. Describe the requirements of alignment and its surveys and explain the permanent way components with its functions 2. Design the elements of railway track 3. Present the techniques for construction and maintenance of railway track 4. Elucidate the requirements of airport layout and explain aircraft characteristics 5. Draw wind rose diagrams and determine the corrected runway length

Unit I: Introduction to Railway Engineering: Significance of Road, Rail, Air and Water transports - Coordination of all modes to achieve sustainability , Classification of railway lines in India, Different gauges on Indian Railways, Railway alignment – Requirements of an Ideal alignment , surveys for railway alignment - Traffic, Reconnaissance, Preliminary and Final location surveys.
Permanent way: Permanent way component parts and its functions. Rails – various types, functions, creep in rails, creep measurement, coning of wheels, Track fittings and fastenings, Sleepers- various types, merits and demerits, ballast- various types .

Unit II: Geometric Design: Details of geometric design, Gradients, grade compensation, Circular curves, Super elevation, safe speed on curves, Transition curves, widening of gauge on curves, Vertical curves, Check rails

Points, Crossing, Level Crossing: Important terms, switches, Tongue rails, Crossing, Turnouts, Layout of turnout, Classification of level crossings.

UNIT-III: Track construction – Stages in construction of railway track – earthwork, plate laying and laying of ballast
Maintenance of track: Necessity of maintenance, Maintenance of railway track – Maintenance of surface rails, Maintenance of track alignment, Maintenance of gauge, Maintenance of proper drainage and Maintenance of track components

Unit IV: Airport Planning: Introduction to air transportation, air craft types and its characteristics. Components of an airport, Terminal area and airport lay-out- building functions and planning considerations, vehicular circulation and parking area, apron and hangar, typical airport layouts.

Unit V: **Runway design:** Site selection of an airport as per ICAO, orientation of runway by wind rose diagrams, basic runway length determination including corrections, geometric design, runway configurations, Taxiway design.

Learning Resources:

1. Satish Chandra and Agarwal M. M., "Railway Engineering", Oxford Publishers, 2013.
2. Khanna. S.K., Arora, M.G. and Jain. S.S., "Airport Planning and Design" Nem Chand & Bros, Roorkee, India, 2012.
3. Saxena S. C. and Arora S. P., "A Text Book of Railway Engineering", Dhanpat Rai and Sons, 2010.
4. Mundrey J. S., "Railway Track Engineering", Tata McGraw Hill, 2009.
5. Rangwala, "Railway Engineering" Charotar Publishers, 2015.

The break-up of CIE: Internal Tests + Assignments + Quizzes

1	No. of Internal Tests	:	2	Max. Marks for each Internal Test	:	30
2	No. of Assignments	:	3	Max. Marks for each Assignment	:	5
3	No. of Quizzes	:	3	Max. Marks for each Quiz Test	:	5
	Duration of Internal Tests	:	90 Minutes			

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
IBRAHIMBAGH, HYDERABAD – 500 031

DEPARTMENT OF CIVIL ENGINEERING
ADVANCED ENVIRONMENTAL ENGINEERING

SYLLABUS FOR B.E. VII-SEMESTER

L : T : P (Hrs./week):3 : 0 : 0	SEE Marks:60	Course Code: PE713CE
Credits : 3	CIE Marks:40	Duration of SEE: 3 Hrs

COURSE OBJECTIVES	COURSE OUTCOMES
Objectives of this course are to:	Upon the completion of this course the students will be expected to:
1. Understand the characteristics and effects of industrial wastes on land and human health. 2. Describe the waste water characteristics and treatment from various industries 3. Explain various effects of air pollution and perform quantitative analysis on various samples for air pollution. 4. Interpret the working and control of equipments pertaining to air pollution 5. State the objectives of EIA, legal provisions and preparation of EIA documents	1. Classify various types of industrial wastes 2. Assess the treatment procedure for waste water from different industries. 3. Analyse air quality parameters, effects of air pollution. 4. Design the control equipments of air pollution. 5. Understand the need for EIA and preparation of EIA reports

UNIT-I: Industrial Waste Management: Types of industries, characteristics of industrial wastes, effects of industrial effluents on streams, land and human health. Environmental legislation related to industrial effluents and hazardous wastes. Streeter phelps equation.

UNIT-II: Industrial Waste Water Treatment: Manufacturing process, waste water characteristics and effluent of the following industries – Leather tanning, dairy, pulp and paper, pharmaceutical, textiles, steel plants, thermal power plants, fertilizer, cement, sugar and distilleries.

UNIT-III: Air Pollution: Sources, classification and effects of air pollutants, Meteorology of air pollution, wind rose diagrams, lapse rates, atmospheric stability and dispersion of air pollutants, stack height calculation, ambient air quality monitoring, stack sampling, analysis of air pollutants.

UNIT-IV: Air Pollution Control: Air quality standards, methods of air pollution control-zoning, source correction, control of suspended parciulate matter by equipment (gravitation, centrifugation, filtration, scrubbing, electrostatic precipitation), selection of proper equipment, gaseous pollutant control by absorption, condensation, combustion.

UNIT-V: Environmental Impact Assessment: Need for environmental impact assessment (EIA), objectives of EIA. EIA capabilities and limitations. Legal provisions of EIA. Methods of EIA, base line data collection required for EIA, evaluation of impacts, prediction of impacts. Preparation of Environmental Management Plan, preparation of EIAs of road project, Industry, and dam. Issues related to rehabilitation of affected people, Preparation of Environmental impact statement and Environment management plan.

Learning Resources:

1. Rao M.N. and Dutt, Waste Water Treatment, Oxford and IBM Publications Ltd, 2008.
2. Eckenfelder, Industrial Water Pollution Control, McGraw Hill Book Co, 1999.
3. Rao C.S., Environmental Pollution Control Engineering, WileyEastern Ltd., 2006.
4. Rao M.N., Rao H.V.N., Air Pollution Control, Tata McGraw Hill, 2001.
5. Peavy and Rowe, Environmental Engineering, McGraw Hill Publications, 2013.
6. Keiley, Environmental Engineering, McGraw Hill Publishers, 2003.

The break-up of CIE: Internal Tests + Assignments + Quizzes

1	No. of Internal Tests	:	2	Max. Marks for each Internal Test	:	30
2	No. of Assignments	:	3	Max. Marks for each Assignment	:	5
3	No. of Quizzes	:	3	Max. Marks for each Quiz Test	:	5
	Duration of Internal Tests	:	90 Minutes			

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
IBRAHIMBAGH, HYDERABAD – 500 031

DEPARTMENT OF CIVIL ENGINEERING

HEALTH MONITORING & RETROFITTING OF STRCTURES

SYLLABUS FOR B.E. VII-SEMESTER

L : T : P (Hrs./week):3 : 0 : 0	SEE Marks:60	Course Code: PE721CE
Credits : 3	CIE Marks:40	Duration of SEE: 3 Hrs

COURSE OBJECTIVES	**COURSE OUTCOMES**
Objectives of this course are to:	Upon the completion of this course the students will be expected to:
1. Identify the importance of structural health monitoring, which gives the knowledge about the safety & stability of structures 2. Assess the present condition and strength of an existing structure by adopting Non destructive testing methods. 3. Conduct condition survey concrete structures by Non destructive evaluation.	1. Explain the importance of structures health monitoring (SHM) and the basic components of SHM. 2. Describe the application of SHM in civil engineering with respect to various types of structures. 3. Describe the various methods of Non – destructive testing of concrete structures to know their health condition. 4. Examine the various Non – destructive testing methods which are suitable for determining the condition of the existing concrete structures. 5. Examine the condition of the existing structures by conducting condition survey to know various defects and to make use NDT methods for evaluation to suggest the methods of rehabilitation.

UNIT–I: Introduction to Structural Health Monitoring (SHM) : Definition & motivation for SHM, SHM – a way for smart materials and structures, SHM and bio mimetic - analogy between the nervous system of a man and a structure with SHM, SHM as a part of system management,

Passive and Active SHM, NDE, SHM and NDECS, Basic components of SHM, materials for Sensor design

UNIT–II: Application of SHM in Civil Engineering: Introduction to capacitive methods, capacitive probe for cover concrete, SHM of a bridge, applications for external post tensioned cables, monitoring historical buildings

UNIT–III: Non Destructive Testing of Concrete Structures: Introduction to NDT - Situations and contexts, where NDT is needed, classification of NDT procedures, Visual Inspection, Half- Cell Electrical Potential Methods, Schmidt Rebound Hammer Test, Resistivity Measurement, Electro Magnetic Methods, Radiographic Testing, Ultrasonic Testing, Infra Red Thermography, Ground penetrating Radar, Radio Isotope gauges, Other methods.

UNIT-IV: Condition Survey & NDE of Concrete Structure: Definition and objective of Condition Survey, Stages of Condition Survey (Preliminary, Planning, Inspection and Testing stages), possible defects in concrete structures, Quality control of concrete structures- Definition and need, Quality control applications in concrete structures, NDT as an option for Non-Destructive Evaluation (NDE) of Concrete structures, Case studies of a few NDT procedures on concrete structures

UNIT–V: Rehabilitation and Retrofitting of Concrete Structures: Repair, rehabilitation & retrofitting of structures, damage assessment of concrete structures, materials and methods for repairs and rehabilitation, modelling of repaired composite structure, structural analysis and design – importance of re-analysis, execution of rehabilitation strategy, case studies

Learning Resources:

1. Daniel Balageas, Claus-Peter FritzenamI Alfredo Guemes, “Structural Health Monitoring” published by ISTE Ltd, U.K. 2006.
2. “Guide book on Non-destructive Testing of Concrete Structures, Training Course series no. 17”, International Atomic Energy Agency, Vienna, 2002

3. Hand book on "Repair and Rehabilitation of RCC Buildings", published by Director General, CPWD, Govt. of India, 2002.
4. Handbook on Seismic Retrofitting of Buildings, published by CPWD & Indian Building Congress in Association with IIT, Madras, Narosa Publishing House, 2008.

The break-up of CIE: Internal Tests + Assignments + Quizzes

1	No. of Internal Tests	:	2	Max. Marks for each Internal Test	:	30
2	No. of Assignments	:	3	Max. Marks for each Assignment	:	5
3	No. of Quizzes	:	3	Max. Marks for each Quiz Test	:	5
	Duration of Internal Tests	:	90 Minutes			

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
IBRAHIMBAGH, HYDERABAD – 500 031

DEPARTMENT OF CIVIL ENGINEERING
FOUNDATION ENGINEERING

SYLLABUS FOR B.E. VII-SEMESTER

L : T : P (Hrs./week):3 : 0 : 0	SEE Marks:60	Course Code: **PE722CE**
Credits : 3	CIE Marks:40	Duration of SEE: 3 Hrs

COURSE OBJECTIVES	**COURSE OUTCOMES**
The objectives of the course are to introduce	Upon the completion of the course, students are expected to
1. Calculate bearing capacity of soils for shallow foundation and pile capacity foundations and design various types of engineering structures. 2. Examine soil exploration and select an appropriate drilling, sampling and field property measurement tools for different soil profiles. 3. Design reinforced earth wall.	1. Design sheet piles under cantilevered and anchored actions using analytical approach. 2. Design Reinforced Earth Wall subjected to lateral pressure using different Geosynthetics as tension bearing elements. 3. Evaluate bearing capacity, settlements and adapt appropriate parameters for the design of foundations for given situation of foundation and soil type using analytical approach. 4. Evaluate the capacity of pile foundation and pile groups using analytical methods under static and dynamic normal loadings including negative skin friction. 5. Appraise site investigation methods adopted in determining index and engineering properties of soil under given field situation.

UNIT-I: Sheet Piles: Sheet pile structures, cantilever sheet pile in cohesive and cohesionless soils, types of anchors, Anchored sheet pile-Depth of embedment in cohesive and cohesionless soils -free earth support.

Braced excavation: Fundamental pressure distribution diagrams.

UNIT-II: Design of Reinforced earth wall: Classification of geosynthetics and their applications, introduction to design of RE walls with geotextile as tension bearing elements.

UNIT-III: Bearing Capacity of soils: Terzaghi's equation for bearing capacity in soils – it's modification for continuous, square, rectangular and circular footings, general and local shear failure conditions-Allowable bearing pressure-IS code method of calculating bearing capacity.
Introduction to combined and mat footings.

UNIT-IV: Pile Foundations: Types of piles – timber, steel, concrete, cast-in-situ, precast piles, bearing piles, friction piles, compaction piles, large diameter piles. Pile capacity – static formulae, dynamic formulae, pile load test, determination of point resistance and skin friction as per IS code. Bearing capacity of pile groups, negative skin friction.

UNIT-V: Site investigation: Need for investigation. Designing an investigation. Methodologies of investigations- advance in Drilling technologies, samplers and sampling techniques. In-situ testing-Penetration tests- Ground water observations, PMT, introduction to Geophysical exploration. Presenting results of site investigation. Introduction to resilient modulus.

Learning Resources:

1. Gopal Ranjan, Rao A.S., "Basic and Applied Soil Mechanics", Wiley Eastern Limited, third edition, 2016.
2. Principles of Foundation Engineering by Braja M. Das -2017 edition
3. J. E. Bowels, "Foundation Analysis and Design", McGraw-Hill
4. Design of Foundation Systems: Principles and Practices by Nainan P. Kurian
5. Murthy V.N.S., "A Textbook of Soil Mechanics & Foundation Engineering", CBS Publishers, 2015.
6. Venkatramaiah C., "Geo-technical Engineering", New Age Publishers, fourth edition, 2012.
7. Foudation Enginnering- P. C. Varghese– PHI Learning Pvt. Ltd.
8. Soil Mechanics in Engineering Practice By Karl Terzaghi, Ralph B. Peck, Gholamreza Mesri
9. Soil Mechanics SI version by T. William Lambe and Robert V. Whitman-Wiley India edition
10. Craig's Soil Mechanics By Jonathan Knappett, R.F. Craig-CRC publisher 9th edition

11. Shenbaga Kaniraj, "Design Aids In Soil Mechanics and Foundation Engineering", McGraw Hill Education (India) Private Limited, 2001.
12. https://nptel.ac.in/courses/105/105/105105176/

The break-up of CIE: Internal Tests + Assignments + Quizzes

1	No. of Internal Tests	:	2	Max. Marks for each Internal Test	:	20
2	No. of Assignments	:	3	Max. Marks for each Assignment	:	5
3	No. of Quizzes	:	3	Max. Marks for each Quiz Test	:	5
Duration of Internal Tests		:	60 Minutes			

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
IBRAHIMBAGH, HYDERABAD – 500 031

DEPARTMENT OF CIVIL ENGINEERING

OPTIMIZATION TECHNIQUES

SYLLABUS FOR B.E. VII-SEMESTER

L : T : P (Hrs./week):3 : 0 : 0	SEE Marks:60	Course Code: PE723CE
Credits : 3	CIE Marks:40	Duration of SEE: 3 Hrs

Course objectives	Course Outcomes
The objectives of the course are to introduce	*Upon the completion of the course, students are expected to*
1. Understand the importance optimization to various practice problems and solve them simple mathematical techniques.	1. Applying the concept of simple mathematic for practice problem for optimization. 2. Analyze the one Dimensional problem and application to civil engineering procedure. 3. Understand constrained and unconstrained optimization. 4. Apply the dynamic programming techniques to solve problem in civil engineering problems. 5. Appraise the Integer programming techniques

UNIT-I: Introduction: Engineering applications, Statement of optimization, classification of optimization**, Classical optimization:** Single variable, multi variable with and with optimization. Mutli variable with inequality constraints Khun -Tucker conditions**.**

UNIT-II: One Dimensional Minimization: Uni-modal Function, Unrestricted search, Exhaustive search, Dichtomous search, Interval Halving method, Fibonici and golden bisection Method , Newton and Quasi Newton method.

UNIT-III: Non Linear –Unconstrained optimization-I: classification, scaling of design variables, Random search methods, Univeriate search, pattern Directions, Hook Jeeves, Powel method, Rosenbrock method.

UNIT-IV: Non Linear –Unconstrained optimization-II: characteristics,

Random search methods, complex method, sequential linear programming, Zoutendijk's method, Penality method,

UNIT-V: Dynamic programming: Multi stage decision processes, concept of sub optimization, few example problems

Integer programming: Gomory's cutting plane method, Branch and bound method.

Learning Resources:

1. SS. Rao: Engineering Optimization theory and practice, New age international 3rd edition 2013.
2. K.Deb: Engineering Optimization, New age international 3rd edition New Delhi
3. Jasbir .S.Arora: introduction to Optimum Design: Mc Graw hill International edition, 4th edition Singapore.
4. J.K Sharma : Operations Research, S Chand ,9th edition , New Delhi

The break-up of CIE: Internal Tests + Assignments + Quizzes

1	No. of Internal Tests	:	2	Max. Marks for each Internal Test	: 30
2	No. of Assignments	:	3	Max. Marks for each Assignment	: 5
3	No. of Quizzes	:	3	Max. Marks for each Quiz Test	: 5
	Duration of Internal Tests		:	90 Minutes	

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
IBRAHIMBAGH, HYDERABAD – 500 031

DEPARTMENT OF CIVIL ENGINEERING

FINITE ELEMENT METHOD
SYLLABUS FOR B.E. VII-SEMESTER

L : T : P (Hrs./week):3 : 0 : 0	SEE Marks:60	Course Code: PE731CE
Credits : 3	CIE Marks:40	Duration of SEE: 3 Hrs

COURSE OBJECTIVES	COURSE OUTCOMES
Objectives of this course are to:	Upon the completion of this course the students will be expected to:
1. Understand variational approach and compute stiffness matrices for bars, trusses and beam 2. Formulate stiffness matrix of beam, strain-displacement, stress strain relationships for elastic continuum and understand plane stress and plane strain problems 3. Understand the formulation of finite element method and determine stiffness matrices for CST and 4 noded rectangular elements for plane stress and plane strain problems 4. Understand the concept of isoparametric finite elements and formulate shape functions for Lagrangian and serendipity elements 5. Understand formulation of stiffness matrices for axisymmetric elements	1. Apply variational principles to simple problems and solve problems of bars, trusses and beams 2. Compute stiffness matrix of beam elements and write strain displacement, stress-strain relationship for elastic continuum and write stiffness matrices for plane stress and plane strain problems 3. Compute stiffness matrices for CST and 4 noded rectangular elements for plane stress and plane strain problems. 4. Formulate stiffness matrix for four noded quadrilateral elements and eight noded parabolic elements and write shape functions for Lagrangian and serendipity elements 5. Compute stiffness matrices for three noded ring element and four noded tetrahedral elements

UNIT-I: Introduction to the finite element method: Variational approach, Rayleigh – Ritz, and Galerkin's methods. Stiffness matrix for two noded bar, truss and beam elements, problems with 3 degrees of freedom.

UNIT –II: Stiffness matrix for two noded beam element with 3 degrees for freedom per node. Transformation, generation of stiffness matrix for frames. Strain displacement and stress-strain relationship in an elastic continuum (linear problems). Equations of equilibrium, and boundry conditions. Plane stress and plane strain problems.

UNIT- III: Formulation of finite element method using principle of virtual displacement. Determination of stiffness matrix for three noded triangular element (constant strain triangle) and 4 noded rectangular element for plane stress and plane strain problems. Convergence criteria for selection of displacement models. Discrimination of continuum. Assembly of global stiffness and load matrices. Displacement boundary conditions.

UNIT- IV: Isoparametric finite elements: Direct construction of shape functions for higher order elements using natural co-ordinate system. Shape functions for eight noded parabolic curved isoparametric element. Determination of element stiffness matrix for four noded quadrantal element. Use of Jacobian and Gauss quadrature techniques. Load matrix for eight noded rectangular isoparametric element (for body forces and surface traction)

UNIT – V: Axisymmetric Problems: Strain displacement and stress-strain for axisymmetric problems. Stiffness matrix for three noded ring element. Volume co-ordinates and stiffness matrix for four noded tetrahedron element.

Learning Resources:

1. Zienkiewicz O.C., Taylor R.L. and Zhu J.Z., The Finite Element Method, (Its Basics and fundamentals) Vol. I, McGraw Hill, 2013.
2. Krishna Moorthy C.S., Finite Element Analysis, McGraw Hill, 2017.
3. Desai C.S. and Abel J.F., Introduction to the Finite Method, Van Nostrand, 2002

4. Chandrupatla T.R., Finite Element Analysis for Engineering and Technology, Universities Press, 2004

The break-up of CIE: Internal Tests + Assignments + Quizzes

1	No. of Internal Tests	:	2	Max. Marks for each Internal Test	:	30
2	No. of Assignments	:	3	Max. Marks for each Assignment	:	5
3	No. of Quizzes	:	3	Max. Marks for each Quiz Test	:	5
Duration of Internal Tests		:	90 Minutes			

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
IBRAHIMBAGH, HYDERABAD – 500 031

DEPARTMENT OF CIVIL ENGINEERING

TRANSPORTATION INFRASTRUCTURE PLANNING AND MANAGEMENT

SYLLABUS FOR B.E. VII-SEMESTER

L : T : P (Hrs./week):3 : 0 : 0	SEE Marks:60	Course Code: PE732CE
Credits : 3	CIE Marks:40	Duration of SEE: 3 Hrs

COURSE OBJECTIVES	COURSE OUTCOMES
Objectives of this course are to	*Upon the completion of this course the students will be expected to*
1. Introduce students to the fundamentals of transportation planning and the types of skills and knowledge that transportation planners need 2. Familiarize students with contemporary transportation planning issues and methods of analysis	1. Identify urban transportation problems. 2. Estimate urban travel demand. 3. Plan urban transport networks. 4. Identify urban transport corridors. 5. Prepare urban transportation plans

Unit – I: Introduction: Role of transportation in the economic development of nations, overview of transport modes, growth trends, National Transport Policy of India – Case studies, transportation planning in the developing world; and comparative international transportation policies; Fundamentals of transportation , Principles of planning, evaluation, selection, adoption, financing, and implementation of alternative urban transportation systems; formulation of community goals and Objectives, inventory of existing conditions; transportation modeling trip generation, distribution, modal choice, assignment

Unit – II: Data Collection And Inventories: Collection of data – Organization of surveys and Analysis, Study Area, Zoning, Types and Sources of Data, Road Side Interviews, Home Interview Surveys, Commercial Vehicle Surveys, Sampling Techniques, Expansion Factors, Accuracy Checks, Use of Secondary Sources, Economic data – Income – Population – Employment – Vehicle Owner Ship.

Unit – III: Travel Demand issues: Trends, Overall Planning process, Long term Vs Short term planning, Demand Function, Independent Variables, Travel

Attributes, Assumptions in Demand Estimation, Detailed approach on 4 step travel demand estimation; Sequential, and Simultaneous Approaches, Aggregate and Disaggregate Techniques.

Unit – IV: Demand and supply planning: Planning for sustainable urban mobility, positive and negative externalities in urban transport, congestion pricing, parking policy, demand management , Urban travel and transportation system characteristics – a systems perspective, Data management and use in decision making , Demand analysis , Urban activity analysis, Supply analysis; Plan Preparation And Evaluation: Travel Forecasts to Evaluate Alternative Improvements, Impacts of New Development on Transportation Facilities. Master plans, Selection of Corridor, Corridor Identification, Corridor deficiency Analysis.

Unit – V: Metropolitan cities: Design issues in urban mobility, integrating land use and transport planning; , Overview of urbanization process, city structure and urban activity and infrastructure systems, Economic and social significance of urban infrastructure systems; Transport's Role in tackling Social Inclusion, Economic Impacts of Transport Policy

Learning Resources:

1. Bruton M.J, Introduction to Transportation Planning , Hutchinson of London Ltd,1988.
2. Hutchinson B.G, Introduction to Urban System Planning, McGraw Hill,1974.
3. Kadiyali L.R., Traffic Engineering and Transport Planning –Khanna Publishers,2011
4. John W. Dickey, Metropolitan transportation planning , Tata McGraw Hill, New Delhi, 1980

The break-up of CIE: Internal Tests + Assignments + Quizzes

1	No. of Internal Tests	:	2	Max. Marks for each Internal Test	:	30
2	No. of Assignments	:	3	Max. Marks for each Assignment	:	5
3	No. of Quizzes	:	3	Max. Marks for each Quiz Test	:	5
	Duration of Internal Tests	:	90 Minutes			

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
IBRAHIMBAGH, HYDERABAD – 500 031

DEPARTMENT OF CIVIL ENGINEERING
WATER RESOURCES ENGINEERING

SYLLABUS FOR B.E. VII-SEMESTER

L : T : P (Hrs./week):3 : 0 : 0	SEE Marks:60	Course Code: PE733CE
Credits : 3	CIE Marks:40	Duration of SEE: 3 Hrs

Course Objectives	**Course Outcomes**
Objectives of this course are to:	*At the end of the course, students will be able to:*
1. To explain the different methods of irrigation and related terms. 2. Learn canal regulation works and other irrigation structures. 3. To describe the various aspects of reservoirs, types and functions of spillway and energy dissipators. 4. Study construction and design aspects of earth dams.	1. Explain types and methods of irrigation and related terms. 2. Explain Bligh's theory and Khosla's theory for diversion head work. 3. Express canal regulation works, canal falls, cross drainage works and outlets. 4. Describe the types and functions of spill way and energy dissipators. 5. Understand the criteria for design and construction of earth dams.

UNIT-I: Irrigation: Duty, delta and base period of crops, methods of irrigation, irrigation efficiencies depth of irrigation, wilting point, consumptive use, types of canals, balancing depth of cutting, Kennedy's and lacey's theories, design of lined and unlined canals.

UNIT-II: Diversion head works: Components, causes of failures, difference between weir and barrage, Bligh's creep theory, Khosla's theory and method of independent variables, design principles of vertical drop weir.

UNIT-III: Regulation works: Canal falls, types, design principles of trapezoidal notch fall, types of regulators, functions of cross regulator and head regulator , Cross drainage works, types, selection and design principles, types of outlets, flexibility, sensitivity and proportionality of outlets.

UNIT-IV: Spill Ways & Energy Dissipation: Types of spill ways, ogee spill way, design of ogee profile, description of syphon spill way & chute spill way. Energy dissipators, hydraulic jump & bucket type dissipators, tail water rating curve & jump height curve.

UNIT-V: Earth dams: Types, Methods of construction, Seepage analysis for homogenous and Zoned embankment dams, Drainage in embankment dams, various types of filters, Failure of Earth dams & Design criteria. Design to suit available materials and foundation conditions, seepage control measures.

Learning Resources:

1. Modi, Irrigation & Water Resources and Water Power, Standard Publishers, New Delhi.
2. S.K. Garg, Irrigation Engg. & Hydralic Structures, Khanna Publishers
3. B.C. Punmiya & B.B. Lal, Irrigation & Water Power Engineering, Laxmi Publishers.
4. Ralph W.Warbs and W.P.James, Water Resources Engineering, Prentice Hall, New Delhi.

The break-up of CIE: Internal Tests + Assignments + Quizzes

1	No. of Internal Tests	:	2	Max. Marks for each Internal Test	:	30
2	No. of Assignments	:	3	Max. Marks for each Assignment	:	5
3	No. of Quizzes	:	3	Max. Marks for each Quiz Test	:	5
	Duration of Internal Tests	:	90 Minutes			

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
IBRAHIMBAGH, HYDERABAD – 500 031

DEPARTMENT OF CIVIL ENGINEERING

PRE-STRESSED CONCRETE

SYLLABUS FOR B.E. VII-SEMESTER

L : T : P (Hrs./week):3 : 0 : 0	SEE Marks:60	Course Code: PE741CE
Credits : 3	CIE Marks:40	Duration of SEE: 3 Hrs

COURSE OBJECTIVES	**COURSE OUTCOMES**
Objectives of this course are to:	*Upon the completion of this course the students will be expected to:*
1. Appreciate the importance & use of pre stressed concrete. Which possesses additional advantages compared to conventional RCC. 2. Acquire the knowledge on prestress operations and materials of Prestress 3. Acquire the knowledge on the design of prestressed concrete components.	1. Understand the process of production of Prestressed concrete and the principle involved. 2. Examine the advantage of prestressing in reducing tension in concrete and making the beam more safer 3. Describe how the deflections in beams are reduced in Prestressed compared to RCC 4. Examine the shear distribution in Prestressed concrete sections & the design procedure. 5. Explain how the end blocks of Prestressed concrete beams are strengthened against bursting tension.

Unit-I: Introduction: Basic Concepts, materials, permissible stresses – systems of prestressing. Losses of prestress in pre-tensioned and post-tensioned members.

Unit-II: Design: Analysis of PSC beams for flexure using elastic analysis of simple and composite sections with various cable profiles.

Unit-III: Design of sections for flexure: Design of PSC sections by elastic and limit state methods for flexure.

Design for Shear: Shear and principle stresses, Design of R.C. section for shear, cracked and uncracked sections.

Unit-IV: Deflections: Importance of deflections, factors influencing deflections, codal provisions, short terms and long-term deflections – computation. Cable profiles

Unit-V: End Blocks: Nature of stresses, stress distribution – Magnel and Guyon's Methods – IS code provisions – Design by Guyon's method.

Continuous Beams: Advantages of continuous members – codal provisions – analysis of two span continuous beams – concordant cable profiles.

Learning Resources:

1. Krishna Raju N., Prestressed Concrete, Tata McGraw Hill, 2001.
2. Pandit G.S. and Gupta S.P., Prestressed Concrete, CBS Publications, 2008.
3. Dayaratnam, Prestressed Concrete, Oxford & IBH Publications, 2017
4. Lin TY. And Bushy, Design of Pre stressed concrete Structures, Wiley India, Pvt, Ltd, 2010
5. IS 1343-2012, Code of Practice for Prestressed concrete, B.I.S Publications.

The break-up of CIE: Internal Tests + Assignments + Quizzes

1	No. of Internal Tests	:	2	Max. Marks for each Internal Test	:	30
2	No. of Assignments	:	3	Max. Marks for each Assignment	:	5
3	No. of Quizzes	:	3	Max. Marks for each Quiz Test	:	5
Duration of Internal Tests		:	90 Minutes			

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
IBRAHIMBAGH, HYDERABAD – 500 031

DEPARTMENT OF CIVIL ENGINEERING
GEOINFORMATICS

SYLLABUS FOR B.E. VII-SEMESTER

L : T : P (Hrs./week):3 : 0 : 0	SEE Marks:60	Course Code: PE742CE
Credits : 3	CIE Marks:40	Duration of SEE: 3 Hrs

COURSE OBJECTIVES	**COURSE OUTCOMES**
Objectives of this course are	*Upon the completion of this course the students will be expected to:*
1. To provide fundamental knowledge on geo spatial technologies such as GIS, remote sensing, photogrammetry, and GPS	1. Define common coordinate systems and projections in a map and types of data in GIS 2. Explain the theoretical and practical considerations required for preparing a GIS-database 3. prepare, manipulate, display and analyse spatial data, synthesise and present high quality GIS-based outputs in a report format 4. Apply the principles and techniques of remote sensing and photogrammetry in preparation of map 5. Describe the fundamental theory and concepts of the Global Positioning System

UNIT-I: Introduction and scope of Geoinformatics, Branches of Geoinformatics, Geoinformatics technologies and Applications
Cartography: Map, definitions, representations-Point, line, polygon, Geographic coordinate system, Map projections, Map Analysis.
Geographic Information System (GIS) Data: Data types – spatial, non-spatial (attribute data)

UNIT-II: GIS: Data structure, data format – point, line, Polygon, vector – Raster, Advantages and Disadvantages
Data Input: Keyboard entry, Manual Digitizing, Scanner, Remotely sensed data, Existing Digital data Cartographic database, Digital elevation data

Data Base Management Systems: Functions & components, storage of GIS data
Data Editing: Detection and correction of errors, data reduction, edge matching

UNIT-III: Data Analysis and Modelling: Spatial analysis, Vector data analysis, Raster data analysis – Modelling in GIS – Digital elevation model Modelling networks

Presentation of Geo-data and Analysis: Types of output data – Types of errors elimination and accuracies – sampling– Components of data quality
Applications of Geographic Information System (GIS): Soil and water resources, Agriculture, Land use planning, geology and Municipal applications.

UNIT-IV: Remote Sensing: Overview, sensors and Platforms, interpretation elements; Geometric and radiometric distortions, Geo-referencing, re-sampling methods; Atmospheric errors and removal;

Photogrammetry: metric and non-metric cameras; Geometry of near vertical and tilted photographs, heights and tilt distortions; Rectification and ortho-photographs; Stereoscopy; Orientation interior, exterior, relative, and absolute.

UNIT V: Global Positioning System (GPS): Overview-signal structure and code modulation Pseudo-range measurements; Accuracy of navigation position: UERE and DOP. Intentional degradation of GPS signals: Selective availability (SA) and Anti-spoofing (AS), Point positioning, Differential Positioning and Relative positioning; Space based augmentation systems and Ground based augmentation systems

Learning Resources:

1. Kang-Tsung Chang, Introduction to GIS, Tata McGraw Hill Edition, 2017.
2. Anji Reddy M., Remote Sensing and Geographic Information System, 2012
3. John R Jensen, Ryan R Jensen, Introduction to Geographic Information System, 2013
4. John A. Richards, Remote sensing Digital Image Analysis, 2013
5. T. Schenk, Introduction to photogrammetry, 2005
6. Leick, A., GPS Satellite Survey, John Wiley: NJ, 2015
7. Hofmann, B., Lichtenegger H. and Collins J., Global Positioning System: Theory and Practice, Springer: Berlin, 2012.

8. Hofmann-Wellenhof, Bernhard, Lichtenegger, Herbert, Wasle, Elmar, GNSS – GPS, GLONASS, Galileo and more, 2013.

The break-up of CIE: Internal Tests + Assignments + Quizzes

1	No. of Internal Tests	:	2	Max. Marks for each Internal Test	:	30
2	No. of Assignments	:	3	Max. Marks for each Assignment	:	5
3	No. of Quizzes	:	3	Max. Marks for each Quiz Test	:	5
	Duration of Internal Tests		:	90 Minutes		

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
IBRAHIMBAGH, HYDERABAD – 500 031

DEPARTMENT OF CIVIL ENGINEERING
DISASTER MITIGATION AND MANAGEMENT

SYLLABUS FOR B.E. VII-SEMESTER

L : T : P (Hrs./week):3 : 0 : 0	SEE Marks:60	Course Code: PE743CE
Credits :	CIE Marks:40	Duration of SEE: 3 Hrs

COURSE OBJECTIVES	COURSE OUTCOMES
Objectives of this course are to:	Upon the completion of this course the students will be expected to:
1. Know about the state of art of disaster management in world and explore the history of the disasters and comprehend how past events have helped shape the future. 2. Study the various natural and manmade disasters and apply the mitigation measures 3. Expose students to various technologies used for disaster mitigation and management.	1. Attain knowledge on various types, stages, phases in disaster with international & national policies & programmes with reference to the disaster reduction. 2. Understand various types of natural disaster, their occurrence, Effects, Mitigation and Management Systems in India 3. Understand different types of manmade disasters, their occurrence, Effects, Mitigation and Management Systems in India. 4. Explain the utility of geographic information systems (GIS), Remote sensing technology in all phases of disaster mitigation and management. 5. Develop understanding on the concepts of risk, vulnerability, warning and forecasting methods in disaster management.

UNIT-I: Introduction: Hazard, vulnerability and risk, Types of disasters , Disaster management cycle, role of civil engineers in disaster management, Progress of disaster management in world, vulnerability profile of India, Disaster management act, Disaster management in India

UNIT-II: Natural Disasters: Hydro - meteorological based disasters – Tropical cyclones, floods, drought and desertification zones, Geographical based disasters – Earthquake, Tsunamis, Landslides and avalanches – Causes, Types, effects and Mitigation measures, coastal zone management

UNIT-III: Human induced hazards: chemical industrial hazards, major power breakdowns, traffic accidents, etc. Case studies

UNIT-IV: Remote sensing and GIS for Disaster Management: Introduction to remote sensing and GIS, its applications in disaster mitigation and management, case studies

UNIT-V: Disaster Management: Risk assessment and hazard mapping – mitigation and management options – warning and forecasting.

Learning Resources:

1. Rajib, S and Krishna Murthy, R.R. "Disaster Management Global Challenges and Local Solutions", Universities Press,2012.
2. Navele, P & Raja, C.K. Earth and Atmospheric Disasters Management, Natural and Manmade, B.S. Publications, 2009.
3. Fearn-Banks, K Crises Computations Approach: A case book approach, Route ledge Publishers, 2011.
4. Battacharya, T. Disaster Science and Management, Tata McGraw Hill Company, 2012.

The break-up of CIE: Internal Tests + Assignments + Quizzes

1	No. of Internal Tests	:	2	Max. Marks for each Internal Test	:	30
2	No. of Assignments	:	3	Max. Marks for each Assignment	:	5
3	No. of Quizzes	:	3	Max. Marks for each Quiz Test	:	5
	Duration of Internal Tests		:	90 Minutes		

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
IBRAHIMBAGH, HYDERABAD – 500 031

DEPARTMENT OF CIVIL ENGINEERING

COMPUTER APPLICATIONS-II LAB

SYLLABUS FOR B.E. VII-SEMESTER

L : T : P (Hrs./week):0 : 0 : 2	SEE Marks:50	Course Code: PC711CE
Credits : 1	CIE Marks:30	Duration of SEE: 3 Hrs

COURSE OBJECTIVES	COURSE OUTCOMES
Objectives of this course are to:	*Upon the completion of this course the students will be expected to:*
1. To introduce the platforms of GIS related softwares inorder to apply the knowledge in GIS based projects	1. Generate a GIS base map with data obtained from surveys, scanned map, satellite images, CAD 2. Create thematic maps for various applications in civil engineering 3. Perform spatial analysis with GIS tools

List of experiments:

1. Introduction to ARCGIS – ARCMAP Data view, Table of contents, toolbars, Adding data, Creation of feature classes, importing data from CAD
2. Rectification of satellite images/scanned map
3. Database creation and digitization of spatial datasets and projections.
4. Attribute data integration to the vector data – Creation of tables, fields.
5. Map layout generation with legend, scale, north arrow and grids.
6. Use of spatial analysis tools, querying, joining data.
7. Use of editing tools, buffer and overlay analysis
8. Creation of thematic maps
9. Introduction to QGIS
10. Practice exercises through case studies.

No. of Internal Tests: 01 Max. Marks for Internal Test: 12

Marks for day-to-day laboratory class work 18

Duration of Internal Test: 2 Hours

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
IBRAHIMBAGH, HYDERABAD – 500 031

DEPARTMENT OF CIVIL ENGINEERING
PROJECT SEMINAR

SYLLABUS FOR B.E. VII-SEMESTER

L : T : P (Hrs./week):0:0:2	SEE Marks: - - -	Course Code: PW719CE
Credits : 1	CIE Marks:30	Duration of SEE: --

Course outcomes:

1. Analyse civil engineering problems in a multi disciplinary domain.
2. Acquire the ability to make effective presentation.
3. Explore the use of research based knowledge.
4. Apply engineering knowledge in the context of society
5. Present the details obtained after mutual discussions with the team members

Instructions to students:

Objective of the project seminar is to actively involve the students in preparation of the final year project with regard to following components:

1. Problem definition and specification.
2. Literature survey, familiarity with research journals.
3. Broad knowledge of available techniques to solve a particular problem.
4. Planning of the work, preparation of bar (activity) charts.
5. Presentation – oral and written.

The department can initiate the project allotment procedure at the end of VI semester and finalise it in the first two weeks of VII semester.

First 4 weeks of VII semester will be spent on special lectures by faculty members, research scholars, post graduate students of the department and invited lectures by engineers from industries and R & D institutions. The objective of these preliminary talks will be to expose the students to real life

practical problems and methodology to solve the technical problems.

Seminar schedule will be prepared by the co-ordinator for all the students from 5^{th} week to the last week of the semester which should be strictly adhered to.

Each student will be required to:

1. Submit a one-page synopsis before the seminar for display on notice board.
2. Give a 20 minutes presentation followed by 10 minutes discussion.
3. Submit a technical write-up on the talk.

At least two teachers will be associated with the Project Seminar to evaluate students for the award of sessional marks which will be on the basis of performance in all the 3 items stated above

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
SCHEME OF INSTRUCTION AND EXAMINATION (R-17)
B.E. – (CIVIL ENGINEERING) VIII-SEMESTER ACADEMIC YEAR 2020 - 2021
(Students Admitted in 2017-2018)

B.E (Civil) VIII Semester								
Course Code	Name of the Course	Scheme of Instruction			Scheme of Examination			
		Hours per Week			Duration in Hrs	Maximum Marks		Credits
		L	T	P / D		SEE	CIE	
THEORY								
PE8XXCE	Professional Elective – V	3	-	-	3	60	40	3
PE8XXCE	Professional Elective – VI	3	-	-	3	60	40	3
PRACTICALS								
PW819CE	Project /Internship	-	-	18	Viva-Voce	50	50	9
	TOTAL	**6**	**-**	**18**		**170**	**130**	**15**
	GRAND TOTAL	**24**				**300**		

Note: 1. Student are awarded with two credits for completion of online course certificate
2. The left over hours are to be allotted to CC / RC / TC based on the requirement.

PROFESSIONAL ELECTIVE

PROFESSIONAL ELECTIVE – V		
1	PE851CE	Advanced Reinforced Concrete Design
2	PE852CE	Ground Improvement Techniques
3	PE853CE	Ground Water Hydrology
PROFESSIONAL ELECTIVE – VI		
1	PE861CE	Elements of Earthquake Engineering
2	PE862CE	Advanced Transportation Engineering
3	PE863CE	Construction Management & Administration

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
IBRAHIMBAGH, HYDERABAD – 500 031

DEPARTMENT OF CIVIL ENGINEERING

ADVANCED REINFORCED CONCRETE DESIGN

SYLLABUS FOR B.E. VIII-SEMESTER

L : T : P (Hrs./week):3 : 0 : 0	SEE Marks:60	Course Code: PE851CE
Credits : 3	CIE Marks:40	Duration of SEE: 3 Hrs

COURSE OBJECTIVES	COURSE OUTCOMES
Objectives of this course are to:	*Upon the completion of this course the students will be expected to:*
1. Design the ring girder of a circular overhead water tank. 2. Understand the design of deep beams for multi storied structures 3. Design portal frames and multi-story frames by substitute frame method for vertical loads 4. Understand the design of Flat slabs 5. Gain knowledge on the advanced type of foundation design like pile foundation and raft foundation	1. Design the beams curved in plan. 2. Design the deep beams. 3. Design the portal frame and building frames by substitute frame method 4. Design Flat slabs to get more head room 5. Design the piles foundations for weak soils and raft or mat foundations to control the uneven settlements.

UNIT-I: Beams curved in plan: Introduction - design principles - structural design of beams curved in plan of circular and semicircular types.

Deep beams: Introduction – flexural and shear stresses in deep beams. I.S. Code provisions – Design of deep beams.

UNIT-II: Building frames: Design of rectangular portal frames for vertical loading including hinges at the base – Detailing of Reinforcement.

Multi storied Frames: Analysis by substitute frame methods for different loading cases.

UNIT-III: Flat slabs: Introduction, Components – I.S. Code provisions – Design methods, Design for flexure and shear.

Foundations: Structural design of piles and pile caps. Raft foundations – Different types – analysis and design

Learning Resources:

1. Krishna Raju N., Advanced Reinforced Concrete Design, 3rd edition, CBS Publishers,2016
2. Shah H.J., Reinforced Concrete, Volume II, 7th edition, Charotar Publishers, 2014
3. Varghese P.C., Advanced Reinforced Concrete Design, 2nd edition,PHI, 2011.
4. Gambhir M.L, Design of Reinforced concrete structures, PHI, 2010
5. Punmia B.C., Ashok Kumar Jain and Arun Kumar Jain, R.C.C. Designs Reinforced Concrete Designs), Laxmi Publications, 2015.
6. IS:456-2000, Indian standard code of practice for plain and reinforced concrete, Bureau of Indian standards
7. SP.16 -1980 Design Aids for reinforced concrete, Bureau of Indian standards
8. SP.34 -1987 Hand book on concrete reinforcement and detailing , Bureau of Indianstandards

The break-up of CIE: Internal Tests + Assignments + Quizzes

1	No. of Internal Tests	:	2	Max. Marks for each Internal Test	:	30
2	No. of Assignments	:	3	Max. Marks for each Assignment	:	5
3	No. of Quizzes	:	3	Max. Marks for each Quiz Test	:	5
Duration of Internal Tests		:	90 Minutes			

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
IBRAHIMBAGH, HYDERABAD – 500 031

DEPARTMENT OF CIVIL ENGINEERING

GROUND IMPROVEMENT TECHNIQUES

SYLLABUS FOR B.E. VIII-SEMESTER

L : T : P (Hrs./week):3:0: 0	SEE Marks:60	Course Code: PE852CE
Credits : 3	CIE Marks:40	Duration of SEE: 3 Hrs

COURSE OBJECTIVES	**COURSE OUTCOMES**
Objectives of the course are to introduce	*Upon the completion of this course students will be expected to*
1. Need for ground improvement and different mechanical, chemical, static and dynamic techniques of ground improvement 2. Various stabilization techniques for cohesionless and cohesive soils 3. Miscellaneous techniques of ground improvement including geotextiles and reinforced earth.	1. Appreciate the need for ground improvement and different mechanical, chemical, static and dynamic techniques 2. Recognize various chemical stabilization and grouting techniques 3. Analyse different methods of Mechanical stabilization 4. Analyse different methods of Hydraulic stabilization 5. Analyse different methods of Modification by admixtures and other grouting techniques.

UNIT-I : **Introduction:** Need for ground improvement, different types of problematic soils, and emerging trends in ground improvement. Different mechanical, chemical, static and dynamic techniques.

UNIT-II: **Mechanical stabilization:** Shallow and deep compaction requirements, principles and methods of soil compaction, shallow compaction and methods, properties of compacted soil and compaction control, deep compaction techniques.

UNIT-III: Hydraulic modification: Ground Improvement by drainage, Dewatering methods. Introduction to dewatering systems, Preloading, Vertical drains, vacuum consolidation, Electro-kinetic dewatering.

UNIT-IV: Modification by admixtures : Cement stabilization and cement columns, Lime stabilization and lime columns. Stabilization using bitumen and emulsions.

UNIT-V : Grouting and Insitu soil treatment methods: Permeation grouting, compaction grouting, jet grouting, different varieties of grout materials, grouting under difficult conditions. Introduction to Soil nailing, rock anchoring, micro-piles.

Learning Resources:

1. Hausmann R., "Engineering principles of Ground Modification", McGraw Hill Publishing Co, 1990.
2. Purushothama Raj P. , Ground Improvement Techniques, Laxmi Publications, 2016
3. Moseley, M.P., "Ground Improvement", Blackie, Academic & professional, 2004
4. Fang-Hsai – Yang, "Foundation Engineering Hand Book", CBS Publication, New Delhi, 1990.
5. M C. R. Davies, F.Schlosser Ground improvement geosystems.
6. Koerner, R. M., Designing with geosynthetics, Prentice Hall Inc. 2012.

The break-up of CIE: Internal Tests + Assignments + Quizzes

1	No. of Internal Tests	:	2	Max. Marks for each Internal Test	:	30
2	No. of Assignments	:	3	Max. Marks for each Assignment	:	5
3	No. of Quizzes	:	3	Max. Marks for each Quiz Test	:	5
	Duration of Internal Tests		:	90 Minutes		

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
IBRAHIMBAGH, HYDERABAD – 500 031

DEPARTMENT OF CIVIL ENGINEERING

GROUND WATER HYDROLOGY

SYLLABUS FOR B.E. VIII-SEMESTER

L : T : P (Hrs./week):3 : 0 : 0	SEE Marks:60	Course Code: PE853CE
Credits : 3	CIE Marks:40	Duration of SEE: 3 Hrs

COURSE OBJECTIVES	COURSE OUTCOMES
Objectives of this course are to:	*Upon the completion of this course the students will be expected to:*
1. Grasp the properties of Ground water and solve for problems on steady flows. 2. Explain the various methods used to calculate parameters of unsteady flow. 3. Describe various geophysical exploration methods and selection of sites 4. Interpret the various artificial methods of ground water recharge, sea water intrusion and its control. 5. Explain conjunctive use of ground water, different ground water analog models.	1. Assess the ground water parameters and flow characteristics, equations 2. Interpret various equations for unsteady radial flow to a well. 3. Understand different methods of geophysical explorations 4. Evaluate the methods of artificial recharge of ground water. 5. Analyse various ground water analog models and hydrologic balance equations

UNIT-I: Introduction: Ground water in the hydrologic cycle, vertical distribution of ground water. Types of aquifers – unconfined, confined and leaky aquifers, porosity, void ratio, storage coefficient, permeability, transmissivity, specific yield, safe yield. General equation of ground water flow, steady undirectional flow, steady radial flow to a well in unconfined and confined aquifers. Steady flow with uniform recharge.

UNIT-II: Unsteady Radial Flow to a well: Non equilibrium equation for pumping tests, Theis method of solution, Cooper Jacob method, Chow's methods of solution, law of times, well flow near acquifer boundaries. Image wells, multiple well systems, partially penetrating wells, steady radial flow in leaky artersion aquifer. Well completion and well development.

UNIT-III: Geophysical Exploration: Surface investigations of ground water – Electrical Resistivity method, seismic refraction method, gravity and magnetic methods, geologic methods, Dowsing. Subsurface Investigations – Test Drilling, resistivity logging, potential logging, Interpretation of logs and selection of site as a well.

UNIT-IV: Artificial Recharge of Ground Water: Methods of recharge, water spreading, sewage discharge, Recharge through pits and shafts, Recharge through well, Induced recharge. Sea water intrusion in coastal aquifers; occurrence, Ghyben-Herzberg relation, space of fresh – salt water interface, length of the intruded sea water wedge, prevention and control of sea water intrusion.

UNIT-V: Ground Water Basin Management: Conjuctive use of surface and ground waters, Hydrologic balance equation. Ground water analog models-sand models, electric analog models, viscuous flow models.

Learning Resources:

1. Todd D.K., Ground Water Hydrology, John Wiley & Sons, Inc., 2011.
2. Ragunath H.M., Ground Water, Wiley Eastern Limited, 2006.
3. Karnath K.P., Ground Water Ananment, Development and Management, Tata McGraw Hill Publishing Company, 2017.
4. Bouwer, Ground Water Hydrology, McGraw Hill, 1979.

The break-up of CIE: Internal Tests + Assignments + Quizzes

1	No. of Internal Tests	:	2	Max. Marks for each Internal Test	:	30
2	No. of Assignments	:	3	Max. Marks for each Assignment	:	5
3	No. of Quizzes	:	3	Max. Marks for each Quiz Test	:	5
	Duration of Internal Tests	:	90 Minutes			

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
IBRAHIMBAGH, HYDERABAD – 500 031

DEPARTMENT OF CIVIL ENGINEERING

ELEMENTS OF EARTHQUAKE ENGINEERING

SYLLABUS FOR B.E. VIII-SEMESTER

L : T : P (Hrs./week)3 : 0 : 0	SEE Marks:60	Course Code: PE861CE
Credits : 3	CIE Marks:40	Duration of SEE: 3 Hrs

COURSE OBJECTIVES	COURSE OUTCOMES
Objectives of this course are to	*Upon the completion of this course the students will be expected to*
1. Obtain the concepts of engineering seismology, related terms. 2. Study of different, dynamic system like single degree & multiple degrees of freedom. 3. Evaluate the Earthquake forces necessary for seismic resistant design. 4. Describe the various case studies of major earthquakes, damage patterns, principles of earthquake resistant design; Retrofitting strategies.	1. Understand the basics of Engineering seismology 2. Gain the knowledge on the concepts of theory of vibrations and response spectrum analysis 3. Follow the seismic design philosophy for the Earthquake forces on various buildings. 4. Estimate the seismic performance of building with respect to damage patterns 5. Understand the concepts of earthquake resistant design as per codal provisions and retrofitting strategies.

UNIT-I: Engineering Seismology: Causes of earthquakes – Seismic waves – Magnitudes, intensity and energy release – characteristics of strong earthquakes, ground motions, soils effects and liquefaction.

UNIT-II: Theory of Vibrations: Introduction, long and short period structure; single, two and multi-degree of freedom systems, damped and undamped variations, concepts of damped and undamped vibrations, response spectrum – Response spectrum analysis.

UNIT-III: Seismic Design Philosophy: Concept of Seismic resistant design, reduction factors – Over strength, Ductility and Redundancy – Determination of earthquake forces on structures. Seismic Design and detailing of Masonry, Reinforced Concrete, and Steel Buildings.

UNIT-IV: Seismic Performance of Buildings: Case Studies of few serious earthquakes in the country in the past, damages to buildings – Damage Patterns – Performance of Non-Engineered Buildings, Rural houses during the Earthquakes.

UNIT-V: Seismic Resistant Design: Basic Principles of Earthquake resistance. Concepts of earthquake resistant construction in rural areas. Base isolation and energy dissipation devices. Seismic retrofitting – Repair, rehabilitation and retrofitting, retrofitting strategies – Importance of reanalysis. Case studies

Learning Resources:

1. Chopra A.K., Dynamics of Structures, Theory and Applications to Earthquake Engineering, Pearson Education, 2007.
2. Pankaj Agarwal and Manish Shrikhande, Earthquake Resistant Design of Structures, Prentice Hall of India, 2006.
3. Kramer S.L., Geotechnical Earthquake Engineering, Pearson Education, 2004.
4. Mario Paz, International Handbook of Earthquake Engineering: Codes, Programs and Examples, Springer Verlag, 1995.
5. Prakash Rao D.S., Design Principles and Detailing of Concrete Structures, Tata McGraw-Hill Publishing Company, 1998.

The break-up of CIE: Internal Tests + Assignments + Quizzes

1	No. of Internal Tests	:	2	Max. Marks for each Internal Test	:	30
2	No. of Assignments	:	3	Max. Marks for each Assignment	:	5
3	No. of Quizzes	:	3	Max. Marks for each Quiz Test	:	5
	Duration of Internal Tests	:	90 Minutes			

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
IBRAHIMBAGH, HYDERABAD – 500 031

DEPARTMENT OF CIVIL ENGINEERING
ADVANCED TRANSPORTATION ENGINEERING

SYLLABUS FOR B.E. VIII SEMESTER

L : T : P (Hrs./week):3:0: 0	SEE Marks:70	Course Code: PE862CE
Credits : 3	CIE Marks:30	Duration of SEE: 3 Hrs

COURSE OBJECTIVES	COURSE OUTCOMES
Objectives of this course are	*Upon the completion of this course the students will be expected to:*
1. Impart knowledge on advanced transportation concepts in the field of urban transportation planning, ITS, pavement management, economic analysis and transportation system management	1. Estimate urban travel demand 2. Know the concepts of ITS 3. Evaluate the pavement with respect to structure, function and safety 4. Perform economic analysis using highway economic evaluation methods and check the feasibility of highway projects 5. Propose right TSM strategy for solving traffic problems

UNIT-I: Urban Transportation Planning: Introduction to travel demand estimation , Study area delineation, zoning, Planning surveys, OD matrix generation, Four stage travel demand modelling – Trip generation, trip distribution, modal split, trip assignment and their methods.

UNIT-II: Introduction to Intelligent Transportation Systems (ITS): Definition of ITS and Identification of ITS Objectives, Historical Background, Benefits of ITS - ITS Data collection techniques – Detectors, Automatic Vehicle Location (AVL), Automatic Vehicle Identification (AVI), Geographic Information Systems (GIS), video data collection. ITS functional areas – Advanced Traffic Management Systems (ATMS), Advanced Traveler Information Systems (ATIS), Commercial Vehicle Operations (CVO), Advanced Vehicle Control Systems (AVCS), Advanced Public Transportation Systems (APTS), Advanced Rural Transportation Systems (ARTS)

UNIT-III: Pavement Management Systems: Introduction to PMS, Components of PMS, Introduction to project level and network level

management systems, Importance of pavement evaluation in PMS, Functional condition evaluation techniques, Structural condition evaluation techniques – BBD and FWD, Safety evaluation

UNIT-IV: Highway Economic Evaluation: Economic Analysis; Basic Concepts of Economic Analysis, Principles of Economic Analysis; Cash flow diagrams; Time value of Money; Development of cash flow Diagrams; Methods of Economic Evaluation - Equivalent Uniform Annual Cost Method; Present worth of cost method; Equivalent uniform annual net return method; Net present value method; Benefit cost ratio method. Applications of these methods to highway projects.

UNIT-V: Transportation System Management: TSM actions – Objectives and Philosophy; Relevance of TSM actions to Indian Urban Context, TSM actions – Measures to improve vehicular flow, preferential treatment of High occupancy vehicles, Reduced Peak period travel, Promotion of High occupancy and Non vehicular travel modes, Parking management, Transit and para transit service improvements, Transit management efficiency measures.

Learning Resources:

1. Traffic Engineering and Transport Planning - Kadiyali L.R., Khanna Publishers, 2016
2. Hass, R. and Hudson, W. R., Pavement Asset Management, McGraw Hill Company, Inc, 2015
3. ITS Hand Book 2000: Recommendations for World Road Association (PIARC) by Kan Paul Chen, John Miles.
4. Transportation System management Notes: S.R.Chari, REC Warangal.

The break-up of CIE: Internal Tests + Assignments + Quizzes

1	No. of Internal Tests	:	2	Max. Marks for each Internal Test	:	30
2	No. of Assignments	:	3	Max. Marks for each Assignment	:	5
3	No. of Quizzes	:	3	Max. Marks for each Quiz Test	:	5
	Duration of Internal Tests	:	90 Minutes			

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
IBRAHIMBAGH, HYDERABAD – 500 031

DEPARTMENT OF CIVIL ENGINEERING
CONSTRUCTION MANAGEMENT AND ADMINISTRATION

SYLLABUS FOR B.E.VIII SEMESTER

L : T : P (Hrs./week):3:0:0	SEE Marks:60	Course Code: PE863CE
Credits : 3	CIE Marks:40	Duration of SEE: 3 Hrs

COURSE OBJECTIVES	COURSE OUTCOMES
Objectives of this course are to:	*Upon the completion of this course the students will be expected to:*
1. Learn the concept of construction management along with functions and objectives. 2. Understand the various techniques used for construction planning such as bar charts, CPM, PERT and crashing of networks 3. Acquire knowledge on various types of construction contracts, tenders and acts related to construction and construction safety 4. Understand the concept of Linear Programming in Construction along with application of Graphical and Simplex methods.	1. Identify and report the importance and necessity of construction management. 2. Employ bar charts, networks to determine the critical path and alter the construction schedules accordingly. 3. Interpret the terms related to costs and time, and there by solve problems on crashing of networks. 4. Categorize various construction contracts, acts and examine various documents related to construction. 5. Interpret the concept of Linear Programming in Construction, and solve problems on Graphical and Simplex methods.

Unit-I: Significance of Construction Management: Objectives and functions of construction management, construction management team, principles of organization and types of organization.

Unit-II: Construction Planning: Construction planning, bar charts, network techniques in construction management – CPM, Expected likely, pessimistic and optimistic time, normal distribution curve and network problems of PERT.

Unit-III:Time Cost Analysis: Cost time analysis in network planning, updating, simple problems of civil engineering works.

Unit-IV: Contracts: Introduction, types of construction contracts and their advantages and disadvantages, conditions of contracts, Introduction to Indian contract act.

Tender: Tender form, Tender Documents, Tender Notice, Work Order.

Safety in construction: Safety measures, workmen compensation act, construction labour act. Demolition of buildings – safety measures.

Unit – V: Linear programming and optimization in construction: Introduction to optimization – Linear programming, Importance of optimization in construction, Simple problems on formulation of LP, Graphical method, Simplex method.

Learning Resources:

1. Srinath L.S., PERT and CPM: Principles and Application, East-West Press, 2001.
2. Peret, F, Construction Project Management an Integrated approach, Taylor and Francis, Taylor and Francis Group, London & New York, 2009
3. Punmia B.C., and Khandelwal, PERT and CPM, Laxmi Publications, 2016.
4. Gahloj. P.S. and Dhiv. B.M., Construction Planning and Management, Wiley Eastern Ltd., 2018.
5. Kumar Neeraj Jha., Construction Project Management: Theory and Practice, Pearson Education, India, 2011.
6. Seetharaman S., Construction Engineering and Management, Umesh Publications, 2012.

The break-up of CIE: Internal Tests + Assignments + Quizzes

1	No. of Internal Tests	:	2	Max. Marks for each Internal Test	:	30
2	No. of Assignments	:	3	Max. Marks for each Assignment	:	5
3	No. of Quizzes	:	3	Max. Marks for each Quiz Test	:	5
	Duration of Internal Tests	:	90 Minutes			

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
IBRAHIMBAGH, HYDERABAD – 500 031

DEPARTMENT OF CIVIL ENGINEERING

Project / Internship

SYLLABUS FOR B.E. VIII-SEMESTER

L : T : P (Hrs./week):0 : 0 : 18	SEE Marks:50	Course Code: PW819CE
Credits : 9	CIE Marks:50	Duration of SEE: - -

COURSE OBJECTIVES	COURSE OUTCOMES
Objectives of this course are to:	*Upon the completion of this course the students will be expected to:*
1. Solve a real life societal problem through research based approaches	1. Formulate an analytical model for a civil engineering problem and obtain its solution with necessary tools. 2. Design a civil engineering structure with due consideration for public health and safety. 3. Perform and manage as an individual or as a member of a team with ethical values. 4. Examine the concepts of environment and sustainability 5. Write effective reports and communicate effectively on civil engineering problems. 6. Present the conclusions in a way to benefit the society.

Instructions to Students: Solving a real life problem should be the focus of under graduate projects. Faculty members should prepare project briefs (giving scope and references) well in advance which should be made available to the students at the departmental library. The project may be classified as hardware / software / modeling / simulation. It may comprise any elements such as analysis, design, synthesis.

The department will appoint a project coordinator who will coordinate the following.

1. Grouping of students (a maximum of 3 in a group)
2. Allotment of projects and project guides
3. Project monitoring at regular intervals.

All projects allotments are to be completed by the 4th week of VII semester, so that students get sufficient time for completion of the project.

All projects will be monitored at least twice in a semester through students' presentation. Sessional marks should be based on the grades / marks, awarded by a monitoring committee of faculty members and also marks given by the supervisor.

Efforts be made that some of the projects are carried out in industries with the help of industry coordinators. Problems can also be invited from the industries to be worked out through undergraduate projects.