With effect from the Academic Year 2020-21 (R-18)

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) V and VI SEMESTER
UNDER CBCS WITH EFFECT FROM 2020–2021
(For the students admitted in 2018-19)

DEPARTMENT OF CIVIL ENGINEERING
+91-40-23146010, 23146011
Fax: +91-40-23146090
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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)
DEPARTMENT OF CIVIL ENGINEERING
SCHEME OF INSTRUCTION AND EXAMINATION (R-18)
B.E. – (CIVIL ENGINEERING) V-SEMESTER ACADEMIC YEAR 2020 - 2021
(Students Admitted in 2018-19)

B.E (Civil) V 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								
U18HS510EH	Skill Development-III: Soft Skills	1	-	-	2	40	30	1
U18HS040EH	Economics & Finance for Engineers	2	-	-	3	60	40	2
U18HS020EH	Human Values and Professional Ethics-II	1	-	-	2	40	30	1
U18PC510CE	Structural Analysis	3	-	-	3	60	40	3
U18PC520CE	Hydraulics and Hydraulic Machinery	2	-	-	3	60	40	2
U18PC530CE	Environmental Engineering	3	-	-	3	60	40	3
U18PC540CE	Concrete Technology	2	-	-	3	60	40	2
U18PE510CE	Skill Development-III: Technical Skills	1	-	-	2	40	30	1
U18OEXXXXX	Open Elective-III	3	-	-	3	60	40	3
PRACTICALS								
U18PC521CE	Hydraulics and Hydraulic Machinery Lab	-	-	2	3	50	30	1
U18PC531CE	Environmental Engineering Lab	-	-	2	3	50	30	1
U18PC541CE	Concrete Lab	-	-	2	3	50	30	1
U18PW519CE	Mini Project : Surveying Camp	-	-	-	-	-	30	1
Student should acquire one online course certificate equivalent to two credits during III-VII Semester								
TOTAL		**18**	**-**	**6**	**-**	**630**	**450**	**22**
GRAND TOTAL		**24**				**1080**		
Note: The left over hours are allotted to ECE-III / CCA-III / CC / RC / TC are arranged based on need.								

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

DEPARTMENT OF CIVIL ENGINEERING
STRUCTURAL ANALYSIS

SYLLABUS FOR B.E. V SEMESTER

L : T : P (Hrs./week):3 : 0 : 0	SEE Marks:60	Course Code: U18PC510CE
Credits : 3	CIE Marks:40	Duration of SEE: 3 Hours

COURSE OBJECTIVES	**COURSE OUTCOMES**
The objectives of the course are to	Upon the completion of the course, students are expected to
1. Explain methods of analysis for indeterminate beams, portal frames, arches and trusses 2. Describe analysis of beams and pin jointed frames using strain energy methods 3. Explain approximate methods of analysis for lateral loads	1. Find degree of indeterminacy of various structures subjected to external forces. 2. Perform analysis of beams and rigid jointed frames subjected to external loads using moment distribution method & slope deflection method and draw bending moment diagrams. 3. Analyse indeterminate structures subjected to external loads using Kani's method and draw bending moment diagrams 4. Analyse three hinged, two hinged parabolic arches carrying vertical loads and frames subjected to lateral loads and draw bending moment diagrams. 5. Apply strain energy methods in the analysis of beams and pin jointed frames subjected to external forces.

UNIT-I: **Static and Kinematic indeterminacy**: Determination of static and kinematic indeterminacy of beams, pin jointed and rigid jointed frames. Introduction to analysis by force method and displacement method.

Moment distribution method: Slope deflection equations, Analysis of continuous beams with and without sinking of supports, single bay single storey portal frames with and without side sway - loading on beam/portal

frame shall be point load(s) and uniformly distributed load- shear force and bending moment diagrams.

UNIT-II: Slope deflection method: Analysis of continuous beams with and without sinking of supports, single bay single storey portal frames with and without side sway - loading on beam/portal frame shall be point load(s) and uniformly distributed load- shear force and bending moment diagrams.

UNIT-III: Kani's method: Analysis of continuous beams with and without sinking of supports, single bay single storey portal frames with and without side sway - loading on beam/portal frame shall be point load(s) and uniformly distributed load- shear force and bending moment diagrams.

UNIT-IV: Approximate methods: Portal method and cantilever method.
Analysis of arches: Three hinged and two hinged parabolic arches, determination of horizontal thrust, bending moment, normal thrust and radial shear for static loading.

UNIT-V: Strain energy methods: Determination of displacements using unit load method for statically determinate structures such as beams, pin-jointed trusses.
Redundant pin jointed trusses: Analysis of plane trusses with one degree of redundancy (internal / external), lack of fit and temperature effects.

Learning Resources:

1. Vazirani V.N., Ratwani M.M, Duggal S.K., "Analysis of Structures - Vol. II Theory, Design and Details of Structures", Khanna Publishers, 16th Edition, 2015.
2. Thandavamoorthy T.S., "Structural Analysis", Oxford Higher Education, Second Edition, 2012.
3. Ramamrutham S., Narayan R., "Theory of Structures", Dhanpath Rai publications, 2014
4. Devdas Menon, "Structural Analysis", 1st Edition, Narosa Book Distributors Pvt Ltd,2014.
5. Reddy C.S., "Basic Structural Analysis", 3rd Edition, Mc Graw Hill, 2010.
6. Junarkar S.B., Shah, "Mechanics of Structures", Volume II, Charotar Pub. House,

2010.
7. Chu-Kia Wang, “Intermediate Structural Analysis (English) 1st Edition”, McGraw Hill Education, 2010.
8. Hibbeler R.C., “Structural Analysis”, 8/E, Prentice Hall, Higher Education, 2012.
9. Louis F. Geschwindner, Harry H. West, "Fundamentals of Structural Analysis", 2nd Edition, Wiley India Pvt. Ltd., 2011.
10. Stephen P. Timoshenko and Donovan H. Young “ Theory of Structures” McGraw Hill International Edition, 1968
11. http://nptel.ac.in/downloads/105101085/

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

1	No. of Internal Tests	:	2	Max. Marks for each Internal Tests	:	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
HYDRAULICS AND HYRAULIC MACHINERY

SYLLABUS FOR B.E. V SEMESTER

L : T : P (Hrs./week):2: 0 : 0	SEE Marks:60	Course Code: U18PC520CE
Credits : 2	CIE Marks:40	Duration of SEE: 3 Hrs

COURSE OBJECTIVES	COURSE OUTCOMES
The objectives of the course are to	Upon the completion of the course, students are expected to
1. Study various aspects of open channel flow. 2. Learn the concepts of boundary layer theory 3. Discuss the performance and design of hydraulic turbines and centrifugal pump.	1. Compute velocity, specific energy and critical depth in steady uniform flow through open channels 2. Determine water surface profiles, hydraulic jumps and surges in non uniform flow through open channels 3. Explain growth and separation of boundary layer and evaluate drag & lift forces for various shapes of bodies in a medium 4. Evaluate the performance characteristics and perform design of turbines for various conditions of head, discharges and power 5. Evaluate the performance characteristics and perform design of centrifugal pump for various conditions of head, discharges and power

UNIT-I: Steady uniform flow through open channels: Descriptions and definitions, difference between pipe flow and channel flow, velocity and pressure distribution in channel cross section, energy and momentum correction coefficients, friction to flow in open channel, uniform flow, Manning's and Chezy's formulae, most efficient channel cross-section,

specific energy, concept and applications of critical depth.

UNIT-II: Gradually varied flow: Significance of Froude Number, dynamic equation of gradually varied flow, classification of gradually varied flow profiles, computation of flow profiles and characteristics of flow profiles. Hydraulic Jump- Momentum equation for a jump in horizontal rectangular channel, energy dissipation in hydraulic jumps and surges in open channels, elementary surge analysis.

UNIT-III: Boundary layer: Boundary layer growth and separation, methods to control separation, drag and lift forces, drag on airfoil and sphere, Principle of stream lining. Displacement, energy & momentum thickness stream lined body and bluff body, magnus effect.

UNIT-IV: Hydraulic Turbines: Classification, specific speed, unit quantities velocity triangles and principles of design of Pelton wheel turbine, Francis turbine and Kaplan turbine, characteristics curves cavitation in turbines .

UNIT-V: Centrifugal Pump: Component, work done, heads and efficiencies, minimum starting speed, specific speed and characteristics curves of centrifugal pump.

Learning Resources:

1. Modi P.N., Seth S.M., “Fluid Mechanics”, Standard Book House, 2013
2. Bansal R.K., “Fluid Mechanics & Hydraulic Machinery”, Laxmi Publications, 2015
3. Rama Durgaiah D., “Fluid Mechanics and Machinery” New Age International Publishers, 2002
4. Ojha C.S.P., Brendtsson R., Chandramouli P.N., “Fluid Mechanics and Machinery”, Oxford University Press, 2010.
5. Ven Te Chow ”Open - Channel Hydraulics” International Student Edition, McGraw-Hill, 2009.
6. K Srinivasa Raju and D Nagesh kumar, “ Fluid Mevhanics problem solving using MATLAB” Prentice Hall of India, 2020
7. http://nptel.ac.in/courses/105107059/, Fluid Mechanics

8. http://nptel.ac.in/courses/105103096/3, Hydraulics

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

1	No. of Internal Tests	:	2	Max. Marks for each Internal Tests	:	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
ENVIRONMENTAL ENGINEERING

SYLLABUS FOR B.E. V SEMESTER

L : T : P (Hrs./week):3 : 0 : 0	SEE Marks:60	Course Code: U18PC530CE
Credits : 3	CIE Marks:40	Duration of SEE:3 Hrs

COURSE OBJECTIVES	COURSE OUTCOMES
The objectives of the course are to	Upon the completion of the course, students are expected to
1. Analyze water and waste water system and understand the concepts of demand, supply and distribution system and Identify various public health elements 2. State the stages involved in water and sewage design treatment, mechanism and disposal 3. Describe the concept of sludge and solid waste management.	1. Assess the demand, quality of water and concept of storm water. 2. Formulate preliminary design of waste water treatment plant. 3. Understand the characteristics of domestic sewage and methods of disposal. 4. Design of primary, secondary and tertiary treatment units of waste water and a simple sewerage system. 5. Understand the sludge and solid waste management.

UNIT-I: Water Demand and Forecasting Methods: Water demand and per capita consumption, population forecasting approaches. Water distribution systems and solution of a simple network using hardy cross method. Storm water sewers – storm water estimation by rational method.
Water Quality: Standards of potable water, Physical and Chemical Properties.

UNIT-II: Treatment of Water: Design of rectangular and circular sedimentation tanks, coagulation and flocculation, design of a flocculator. Filtration – types of filters and filter media. Design principles of slow and rapid sand filters, Disinfections – necessity and methods, chlorination of

water supplied, Removal of hardness, tastes & odour control.

UNIT-III: Wastewater Characteristics and Disposal: Biochemical Oxygen Demand (BOD), Chemical Oxygen Demand (COD), Population equivalent, Relative Stability, Natural Methods of wastewater disposal-Self-purification of streams, Oxygen sag Analysis, Dilution into sea, disposal by land treatment

UNIT-IV: Waste Water Treatment: Preliminary treatment, Screens, Grit chambers. Trickling filter, Activated sludge process, Oxidation ponds, Oxidation ditches.

Sewage Conveyance – Sewer types and appurtenances. Velocity in sewers, Design of a simple sewerage system.

UNIT-V: Sludge: Sludge digestion and disposal methods – septic tanks – design parameters and working principles. Low cost waste treatment

Solid Waste: Types, source and composition of solid waste. Methods of collection, transportation and disposal

Learning Resources:

1. Punmia B.C., "Environmental Engineering Vol. I & II", Laxmi Publications Pvt Ltd., New Delhi, 2015
2. Birdi G.S, "Water Supply and Sanitary Engineering", Dhanpat Rai & Sons, 2014
3. Peavy H.S., Rowe D.R., Tchobanoglous G., "Environmental Engineering", Tata McGraw Hills, New Delhi, 2017
4. Metcalf & Eddy M.C., "Waste Water Engineering – Treatment & Reuse", Tata McGraw Hill Publications, New Delhi, 2003
5. http://nptel.ac.in/courses/105106119/

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

1	No. of Internal Tests	:	2	Max. Marks for each Internal Tests	:	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
CONCRETE TECHNOLOGY

SYLLABUS FOR B.E. V-SEMESTER

L : T : P (Hrs./week):2 : 0 : 0	SEE Marks:60	Course Code: U18PC540CE
Credits : 2	CIE Marks:40	Duration of SEE: 3 Hrs

Course objectives	Course Outcomes
Objectives of this course are to	Upon 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 shoterete.

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 H
ill 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

Finishing School-III: Technical Skills

SYLLABUS FOR B.E. V SEMESTER

L : T : P (Hrs./week):1:0 :0	SEE Marks:40	Course Code: U18PE510CE
Credits : 1	CIE Marks:30	Duration of SEE:2Hrs

BIM concepts / Industry standard coding practices through C or other programming languages / Applications of spread sheets in engineering

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

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

Duration of Internal Tests : 90 Minutes

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

DEPARTMENT OF CIVIL ENGINEERING

SPATIAL INFORMATION TECHNOLOGY

(Open Elective-III)

SYLLABUS FOR B.E. V SEMESTER

L : T : P (Hrs./week):3:0: 0	SEE Marks:60	Course Code: U18OE510CE
Credits : 3	CIE Marks:40	Duration of SEE:3 Hrs

COURSE OBJECTIVES	COURSE OUTCOMES
Objectives of this course are to	Upon the completion of the course, students are expected to
1. To provide fundamental knowledge on geo spatial technology such as Remote sensing GPS and GIS.	1. Select the type of remote sensing technique/data, identify and analyze the earth surface features from the satellite images. 2. Identify GPS components, interpret the navigational message and signals received by the GPS satellites, Identify the error sources and apply corrections for accurate positioning. 3. Analyse the basic components of GIS, process spatial and attribute data, identify and rectify mapping inaccuracies and prepare thematic maps

Unit I:

Introduction and Basic Concepts of Remote Sensing

Introduction, Basic concepts of remote sensing, Airborne and space born sensors, Passive and active remote sensing, EMR Spectrum, Energy sources and radiation principles, Energy interactions in the atmosphere, Energy interactions with earth surface features, Atmospheric windows, Spectral reflectance curves

Unit II:

Remote Sensing Systems

Satellites and orbits, Polar orbiting satellites, Image characteristics and

different resolutions in Remote Sensing, Multispectral, thermal and hyperspectral remote sensing. Some remote sensing satellites and their features, Map and Image, color composites, introduction to digital data, elements of visual interpretation techniques. Applications of Remote sensing in various fields.

Unit III:

Global positioning Systems (GPS)

Overview of GNSS and Introduction to GPS, GLONASS, GALILEO, COMPASS, IRNSS systems , Applications of GPS.

GPS: Basic concepts, Functional system of GPS – Space segment, control segment and user segment, Working principle of GPS, Signal structure and code modulation, Pseudo-range measurements and navigation message

Unit IV

Errors and Positioning methods of GPS

Errors and biases in GPS measurements, Accuracy of navigation position: UERE and DOP, Intentional degradation of GPS signals: Selective availability (SA) and Anti-spoofing (AS) Differential GPS: Space based augmentation systems (e.g., SBAS, GAGAN) and Ground based augmentation systems (e.g., WASS, EGNOS)

GPS Carrier Phase measurements: Single Differencing, Double Differencing and Triple Differencing in GPS measurements.

Unit V

Basic Concepts: Introduction to GIS, History of GIS, Early development in GIS, Areas of GIS application, Components of GIS, Overview of GIS Software packages, Current issues and Trends in GIS.

Variables-Point, line, polygon, Geographic coordinate system, Map projections, Map Analysis.

GIS Data: Data types – spatial, non-spatial (attribute data) – data structure, data format – point line vector – Raster – Polygon

Data Input : Keyboard entry, Manual Digitizing, Scanner, Remotely sensed data, Existing Digital data Cartographic database, Digital elevation data

Data Editing: Detection and correction of errors, data reduction, edge matching

Learning Resources:

1. James B. Campbell & Randolph H. Wynne., Introduction to Remote Sensing, The Guilford Press, 2011
2. Lillesand, Kiefer, Chipman., Remote Sensing and Image Interpretation, Seventh Edition, 2015
3. Leick, A., GPS Satellite Survey, John Wiley: NJ, 2015
4. Hofmann, B., Lichtenegger H. and Collins J., Global Positioning System: Theory and Practice, Springer: Berlin, 2011.
5. Basudeb Bhatta, Remote Sensing and GIS, Oxford University Press, 2011.
6. Hofmann-Wellenh of, Bernhard, Lichtenegger, Herbert, Wasle, Elmar, GNSS – GPS, GLONASS, Galileo and more, 2013
7. Thanappan Subash., Geographical Information System, Lambert Academic Publishing, 2011.
8. Paul Longley., Geographic Information systems and Science, John Wiley & Sons, 2005
9. John E. Harmon & Steven J. Anderson., The design and implementation of Geographic Information Systems, John Wiley & Sons, 2003
10. ArcGIS 10.1 Manuals, 2013.
11. Kang Tsung Chang., Introduction to Geographic Information Systems, Tata Mc Graw Hill Publishing Company Ltd, New Delhi, 2008.
12. Burrough, P.A., Principles of GIS for Land Resource Assessment, Oxford Publications, 2005.
13. C.P.Lo & Albert K. W.Yeung, Concepts and Techniques of Geographic Information Systems, Prentice Hall India Pvt.Ltd, 2002.

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

1	No. of Internal Tests	:	2	Max. Marks for each Internal Tests	:	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

Hydraulics & Hydraulics Machinery Lab

SYLLABUS FOR B.E. V SEMESTER

L : T : P (Hrs./week):0:0:2	SEE Marks:50	Course Code: U18PC521CE
Credits : 1	CIE Marks:30	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. Manning's rugosity coefficient and super elevation in open channels. 2. Impact coefficient on different types of vanes and drag & lift forces in wind tunnel. 3. Pre and post jump depths and calculate loss of energy in hydraulic jump. 4. Familiarize with the procedures of calculating overall efficiency of different types of pumps and turbines.	1. Determine Manning's rugosity coefficient and measure super elevation in an open channel and estimate loss of energy in hydraulic jump. 2. Evaluate impact coefficient for different types of vanes. 3. Evaluate the overall efficiency of various pumps and turbines and draw performance characteristic curves. 4. Practice working as a team member and lead a team 5. Demonstrate professional behaviour in conducting the experiments and presenting the results effectively

LIST OF EXPERIMENTS

1	Open Channel Flow	Determination of Manning's rugosity coefficient
2	Open Channel Bend	Determination of super elevation
3	Impact of Jets	Determination of vane coefficient on different types of vanes
4	Centrifugal pump	Determination of efficiency and performance characteristics.

5	Centrifugal pump test rig	Determination of efficiency and performance Characteristics under varying loads
6	Pelton Wheel Turbine	Determination of efficiency and Performance characteristics
7	Francis Turbine	Determination of efficiency and Performance characteristics
8	Kaplan Turbine	Determination of efficiency and Performance characteristics
9	Self priming pump	Determination of efficiency and performance characteristics
10	Wind tunnel	a) To study Drag & Lift characteristic of different angles of attack and find coefficient of drag and lift b) Study pressure distribution over an aerofoil
11	Hydraulic Jump	Determination of pre and post jump depth in channel flow

Learning Resources:

http://eerc03-iiith.virtual-labs.ac.in/ index.php? section=List% 20of%20experiments

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
Environmental Engineering Lab

SYLLABUS FOR B.E. V SEMESTER

L : T : P (Hrs./week):0:0: 2	SEE Marks:50	Course Code: U18PC531CE
Credits : 1	CIE Marks:30	Duration of SEE: 3 Hrs

COURSE OBJECTIVES	COURSE OUTCOMES
The objectives of the course are to	Upon the completion of the course, students are expected to
1. Familiarize with the procedures of water quality analysis. 2. Estimate the Biochemical Oxygen Demand (BOD) and Chemical Oxygen Demand (COD) for sewage samples. 3. Calculate the coagulant reduction of turbidity and disinfection dosage. 4. Practice working of flame photometer.	1. Analyse the water samples for the determination of alkalinity, hardness, chlorides, calcium, pH, contents of sodium and potassium in water using flame photometer, total dissolved solids and turbidity. 2. Estimate the Biochemical Oxygen Demand (BOD) and Chemical Oxygen Demand (COD) in sewage samples. 3. Calculate the coagulant dosage for reducing the turbidity and disinfection dosage. 4. Practice working as a team member and lead a team 5. Demonstrate professional behaviour in conducting the experiments and presenting the results effectively

LIST OF EXPERIMENTS

1. Determination of Alkalinity.
2. Determination of Hardness.
3. Determination of Chlorides.
4. Determination of Acidity.
5. Determination of Variation of pH.

6. Determination of Dissolved Oxygen
7. Determination of Biochemical Oxygen Demand (B.O.D.)
8. Determination of total dissolved solids
9. Determination of residual chlorine.
10. Determination of turbidity
11. Determination of coagulant dose – Jar test.
12. Determination of Chemical Oxygen Demand (C.O.D.)
13. Determination of Sodium & Potassium present in water using flame photometer (Demonstration).

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
Concrete Lab

SYLLABUS FOR B.E. V SEMESTER

L : T : P (Hrs./week):0:0 : 2	SEE Marks:50	Course Code: U18PC541CE
Credits :1	CIE Marks:30	Duration of SEE:3 Hrs

COURSE OBJECTIVES	COURSE OUTCOMES
The objectives of the course are to	Upon the completion of the course, students are expected to
1. Determine the physical properties of cement, fine aggregate and coarse aggregate 2. Determine workability of concrete 3. Determine the strength of concrete using destructive and non-destructive methods	1. Determine the physical properties of cement, fine aggregate and coarse aggregate 2. Determine the workability of concrete 3. Determine the compressive strength using destructive and non-destructive methods and flexural strength by destructive method. 4. Practice working as a team member and lead a team 5. Demonstrate professional behaviour in conducting the experiments and presenting the results effectively

LIST OF EXPERIMENTS

I TESTS ON CEMENT

1 (a) Specific gravity of cement.
(b) Unit weight or bulk density of cement.
2 Normal consistency of cement.
3 (a) Initial setting time of cement
(b) Final setting time of cement
(c) Fineness of cement by sieving
4 Compressive strength of cement

II TESTS ON AGGREGATE:

5 (a) Specific gravity of fine aggregate.
(b) Bulk density of fine aggregate.
6 (a) Specific gravity of coarse aggregate.
(b) Bulk density of coarse aggregate.
7 Bulking of sand by laboratory method.
8 Bulking of sand by field method.
9 Fineness modulus of fine aggregate.
10 Fineness modulus of coarse aggregate.

III TESTS ON CONCRETE

11 Workability of concrete by slump test
12 Workability of concrete by compacting factor test
13 Compressive strength of concrete
14 Flexural strength of concrete

IV EXPERIMENTS FOR DEMONSTRATION ONLY

15 Non-Destructive Testing of Concrete Structures.
16 Workability of concrete by Flow test
17 Workability of concrete by Vee-Bee test.

Learning Resources:

1. IS: 269-1989, Indian Standard Code of Practice for Ordinary Portland Cement, 33 Grade – Specifications (Fourth Revision), Bureau of Indian Standards, New Delhi
2. IS: 8112-1989, Indian Standard Code of Practice for 43 Grade Ordinary Portland Cement – Specifications (First Revision), Bureau of Indian Standards, New Delhi
3. IS: 12269-1987, Indian Standard Code of Practice for Ordinary Portland Cement, 53 Grade – pecifications, Bureau of Indian Standards, New Delhi
4. IS: 650-1991, Indian Standard Code of Practice for Standard Sand for Testing Cement – Specifications (Second Revision), Bureau of Indian Standards, New Delhi
5. IS: 2386 (Part-III) -1963, Indian Standard Methods of Test for Aggregates for Concrete, Bureau of Indian Standards, New Delhi
6. IS: 1199-1959, Indian Standard Methods of Sampling and Analysis of Concrete, Bureau of Indian Standards, New Delhi
7. IS: 516-1959, Indian Standard Methods of Tests for Strength of Concrete, Bureau of Indian Standards, New Delhi
8. IS: 13311 (Part-1)-1992, Indian Standard Non-Destructive Testing of Concrete – Methods of Test, Part-1 Ultrasonic Pulse Velocity, Bureau of Indian Standards, New Delhi
9. IS: 13311 (Part-2)-1992, Indian Standard Non-Destructive Testing of Concrete – Methods of Test, Part-2 Rebound Hammer, Bureau of Indian

Standards, New Delhi
10. IS: 4031(Part-2)-1999, Indian Standard Methods of Physical Tests for Hydraulic Cement, Determination of Fineness by Blaine Air Permeability Method, Bureau of Indian Standards, New Delhi

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

MINI PROJECT: SURVEYING CAMP

SYLLABUS FOR B.E. V SEMESTER

L : T : P (Hrs./week):0:0:0	SEE Marks:30	Course Code: U18PW519CE
Credits : 1	CIE Marks: - - -	Duration of SEE: 3 Hrs

COURSE	**COURSE**
The objectives of the course are to introduce	Upon the completion of the course, students are expected to
1. Field exercises with modern surveying equipment including GPS and Total Station. 2. All aspects of executing and plotting of field surveys 3. Capturing topographical features	1. Measure the topographical features using advanced surveying instruments such as total station and GPS 2. Plot the data obtained in the field through mapping software like QGIS / ArcGIS

Course Content:

A one week (6 days, 36 hours) surveying camp shall be organized in the intervening period between the completion of the IV semester and the commencement of V semester.

The work has to be graded for 30 Sessional marks by a committee consisting of the Head of the Department and 2 - 3 senior faculty members. The surveying camp shall expose the students to all the aspects of planning, organizing and conducting a field survey, and plotting of the same.

OPEN ELECTIVES OFFERED BY VARIOUS DEPARTMENTS IN B.E. V SEMESTER (2020-21)

Dept	Title	Code	credits
CSE	Fundamentals Of Object Oriented Programming	U18OE510CS	3
CSE	Web Design	U18OE520CS	3
ECE	Sensors For Engineering Applications	U18OE510EC	3
EEE			3
IT	Introduction To Database Management Systems	U18OE510IT	3
IT	Introduction To Statistical Programming	U18OE520IT	3
Mech.	Introduction To Robotics	U18OE510ME	3
Mech.	Introduction To Automobile Engineering	U18OE520ME	3
Mech.	Advanced Course Entrepreneurship	U18OE530EH	3
Maths.	Discrete Mathematics for Engineers	U18OE520MA	3
H&SS	Technical Writing and Professional Presentations	U18OE010EH	3

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
9-5-81, Ibrahimbagh, Hyderbad-500031, Telangana State

Department of Computer Science & Engineering
Fundamentals Of Object Oriented Programming (Open Elective-III)

SYLLABUS FOR B.E.V-SEMESTER

L:T: P (Hrs/Week):3:0:0	SEE Marks: 60	Course Code: **U18OE510CS**
Credits: 3	CIE Marks: 40	Duration of SEE : 3 Hours

COURSE OBJECTIVES	**COURSE OUTCOMES** On completion of the course, students will be able to
1. Apply object oriented principles for developing an application using Java constructs. 2. Design GUI using existing Java classes and interfaces.	1. Adopt the fundamentals of Object oriented system development for developing a application. 2. Apply basic features of OOP to design an application. 3. Employ runtime error handling, concurrent programming practices to develop a parallel processing application. 4. Perform string handling, read and write operations using console and files IO streams. 5. Design GUI for a java application using AWT classes.

UNIT-I: Object Oriented System Development: Understanding Object Oriented Development, Understanding Object Concepts, Benefits of Object Oriented Development.
Java Programming Fundamentals: Introduction, Overview of Java, Data types, Variables and Arrays, Operators, Control Statements.

UNIT-II: Building blocks of OOP: Classes and Methods, Constructor, Parameterized constructor, Garbage Collection, this, static, final keywords, Inheritance, types of inheritance, Method Overriding, Abstract class, Nested class, Interface, Package.

UNIT-III: Exception Handling: try, catch, throw, throws, finally, creating user defined exceptions
Multithreaded Programming: Types of Thread creation, multiple threads, isalive, join, thread priority, Thread Synchronization, Inter process communication.

UNIT-IV:String Handling: String constructors, operations, character extraction, comparison, search, modification. StringBuffer, methods, StringBuilder, StringTokenizer
Util: Date, Calendar, Random, Timer, Observable
IO: Files and Directories, I/O Classes and Interfaces, Byte Streams classes and Character Stream classes

UNIT-V: Applet: Applet Class, Applet architecture
Event Handling: The Delegation Event Model, Event Classes, Source of Events, Events Listener Interfaces
GUI Development: AWT: Classes, Working with Graphics, Frames, Menu, Layout Managers**.**

Learning Resources:

1. Herbert Schildt, The Complete Reference Java, 7th Edition, Tata McGraw Hill 2005.
2. P. Radha Krishna, Object Oriented Programming through Java, Universities Press, 2007.
3. Sachin Malhotra, Saurabh Choudhary, Programming in Java, 2nd Edition, Oxford Press, 2014.
4. https://docs.oracle.com/javase/tutorial/java

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 Test: 90 minutes

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
9-5-81, Ibrahimbagh, Hyderbad-500031, Telangana State

Department of Computer Science & Engineering
WEB DESIGN (OPEN ELECTIVE-III)

SYLLABUS FOR B.E.V-SEMESTER
(COMMON FOR CIVIL, ECE, EEE & MECH)

L:T: P (Hrs/Week):3:0:0	SEE Marks: 60	Course Code: **U18OE520CS**
Credits: 3	CIE Marks: 40	Duration of SEE : 3 Hours

COURSE OBJECTIVES	**COURSE OUTCOMES** On completion of the course, students will be able to
To Develop web application using HTML, CSS, JavaScript and PHP.	1. Design static web pages. 2. Apply styles to the web pages. 3.Create dynamic web pages using JavaScript. 4. Design DTD and schema for a given XML file. 5.Develop server side components using PHP.

UNIT-I: Web Basics and overview: Introduction to Internet, World Wide Web, Web Browsers, Web Servers, URL, MIME, HTTP, Web Programmers Tool Box, Introduction to HTML Purpose of HTML and XHTML, Text Formatting, Hypertext Links, Images, Lists, Tables, Forms and Frames.

UNIT-II: Cascading Style Sheets- Levels of Stylesheet, Style Specification Formats, Selector Formats, Property Value Forms, Font Properties, List Properties, Alignment of Text, Box Model, Background Images, Borders, div and span tags, Conflict Resolution.

UNIT-III: JavaScript - Object Orientation and JavaScript, Primitives, Operations, Expressions, Control Statements, Object Creation, Arrays, Functions- Introduction, Program Modules in JavaScript, Programmer-Defined Functions, Function Definitions, Random-Number Generation, Scope Rules, JavaScript Global Functions, Recursion, Constructors, Regular Expressions, DOM Model, Events, Event Handling in JavaScript, JavaScript objects.

UNIT-IV: Introduction to XML, Syntax of XML, XML Document Structure, Document type Definition, Namespaces and Schemas.

Client-Server Architecture, Multi-tier Architecture, Web server.

UNIT-V: PHP- Overview of PHP, General Syntactic Characteristics, Primitives, Operations, and Expressions, Output, Control Statements, Arrays, Functions, Pattern Matching, Form Handling, Cookies and Session Tracking.

Learning Resources:

1. Robert W. Sebesta, "Programming the World Wide Web", Pearson Education.(3rd)
2. Uttam K.Roy, "Web Technologies", Oxford publishers.
3. http://www.w3schools.com
4. https://www.php.net/manual/en/tutorial.php

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 Test: 90 minutes

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
9-5-81, Ibrahimbagh, Hyderbad-500031, Telangana State

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING
SENSORS FOR ENGINEERING APPLICATIONS (OPEN ELECTIVE)

SYLLABUS FOR B.E.V-SEMESTER (for other branches)

L:T: P (Hrs/Week):3:0:0	SEE Marks: 60	Course Code: **U18OE510EC**
Credits: 3	CIE Marks: 40	Duration of SEE : 3 Hours

COURSE OBJECTIVES	**COURSE OUTCOMES** On completion of the course, students will be able to
1. The student will come to know the various stimuli that are to be measured in real life instrumentation. 2. He will be able to select the right process or phenomena on which the sensor should depend on 3. He will be aware of the various sensors available for measurement and control applications.	1. Appreciate the operation of various measuring and control instruments which they encounter in their respective fields. 2. Visualize the sensors and the measuring systems when they have to work in areas of interdisciplinary nature and also think of sensors and sensors systems when for a new situation they encounter in their career 3. Identify and select the right process or phenomena on which the sensor should depend on. 4. Know various stimuli that are to be measured in real life instrumentation.

UNIT – I

Introduction: What is a sensor and what is a transducer? Electrical sensor – need for sensors in the modern world. Different fields of sensors based on the stimuli - various schematics for active and passive sensors.

General characteristics and specifications of sensors - Implications of specifications uses of sensors - measurement of stimuli - block diagram of sensor system. Brief description of each block.

UNIT – II

Sensors for mechanical systems or mechanical sensors - Displacement -

acceleration and force - flow of fluids - level indicators - pressure in fluids - stress in solids. Typical sensors - wire and film strain gauges, animometers, piezo electric and magnetostrictive accelerometers, potentiometric sensors, LVDT.

UNIT – III

Thermal sensors – temperature – temperature difference – heat quantity. Thermometers for different situation – thermocouples thermistors – color pyrometry.

Optical sensors: light intensity – wavelength and color – light dependent resistors, photodiode, photo transistor, CCD, CMOS sensors.

Radiation detectors: radiation intensity, particle counter – Gieger Muller courter (gas based), Hallide radiation detectors.

UNIT – IV

Magnetic sensors: magnetic field, magnetic flux density – magneto resistors, Hall sensors, super conduction squids.

Acoustic or sonic sensors: Intensity of sound, frequency of sound in various media, various forms of microphones, piezo electric sensors.

UNIT – V

Electrical sensors: conventional volt and ammeters, high current sensors, (current transformers), high voltage sensors, High power sensors.

High frequency sensors like microwave frequency sensors, wavelength measuring sensors.

MEMs and MEM based sensors.

Learning Resources :

1. Doebelin, “Measurement Systems: Application and Design”, McGraw Hill Kogakusha Ltd.
2. Julian W. Gardner, Vijay K. Varadan, Osama O. Awadelkarim “Microsensors, MEMS and Smart Devices”, New York: Wiley, 2001.
3. Henry Bolte, “Sensors – A Comprehensive Sensors”, John Wiley.

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 Test: 90 minutes

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
9-5-81, Ibrahimbagh, Hyderbad-500031, Telangana State

DEPARTMENT OF INFORMATION TECHNOLOGY
INTRODUCTION TO DATABASE MANAGEMENT SYSTEMS (Open Elective-III)

SYLLABUS FOR B.E.V-SEMESTER
(Common for CIVIL, ECE, EEE & MECH)

L:T: P (Hrs/Week):3:0:0	SEE Marks: 60	Course Code: **U18OE510IT**
Credits: 3	CIE Marks: 40	Duration of SEE : 3 Hours

COURSE OBJECTIVES	**COURSE OUTCOMES** On completion of the course, students will be able to
Apply the concepts of database management systems and design relational databases.	1. Understand functional components of the DBMS and develop ER model for a given problem and map ER it to Relational model 2. Understand Relational model and basic relational algebra operations. 3. Devise queries using SQL. 4. Design a normalized database schema using different normal forms. 5. Understand transaction processing and concurrency control techniques.

UNIT – I

Introduction: Database System Applications, Purpose of Database Systems, View of Data, Database Languages, Relational Databases, Database Architecture, Database Users and Administrators.

Database Design and the E-R Model: Overview of the Design Process, The E-R Model, Constraints, E-R Diagrams

UNIT – II

Relational Model: Structure of Relational Databases, Database Schema,

Keys, Schema Diagrams, Relational Query Languages, Fundamental Relational-Algebra Operations.

UNIT – III

Structured Query Language: Introduction, Data Definition, Basic Structure of SQL Queries, Modification of the Database, Additional Basic Operations, Set Operations, Null Values, Aggregate Functions, Nested Subqueries, Join Expressions, Views.

UNIT – IV

Relational Database Design: Features of Good Relational Design, Normalization-Decomposition Using Functional Dependencies, Functional-Dependency Theory.

UNIT – V

Transactions: Transaction Concepts, Transaction State, Concurrent Executions, Serializability

Concurrency Control: Lock-Based Protocols, Timestamp-Based Protocols.

Learning Resources :

1. Abraham Silberschatz, Henry F Korth, S. Sudarshan, Database System Concepts, 6th Edition, McGraw-Hill International Edition, 2011.
2. Raghu Ramakrishnan, Johannes Gehrke, Database Management Systems, Third Edition, McGraw-Hill International Edition, 2003.
3. Elmasri, Navathe, Somayajulu and Gupta, Fundamentals of Database System, 6th Edition, Pearson Education, 2011.
4. Patric O'Neil, Elizabeth O'Neil, Database-principles, programming, and performance,Morgan Kaufmann Publishers, 2001.
5. Peter Rob, Carlos coronel, Database Systems, (2007), Thomoson.
6. https://nptel.ac.in/courses/106105175/

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 Test: 90 minutes

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
9-5-81, Ibrahimbagh, Hyderbad-500031, Telangana State

DEPARTMENT OF INFORMATION TECHNOLOGY
INTRODUCTION TO STATISTICAL PROGRAMMING (Open Elective-III)

SYLLABUS FOR B.E.V-SEMESTER
(Common for CIVIL, ECE, EEE & MECH)

L:T: P (Hrs/Week):3:0:0	SEE Marks: 60	Course Code: **U18OE520IT**
Credits: 3	CIE Marks: 40	Duration of SEE : 3 Hours

COURSE OBJECTIVES The objectives of this course are to:	**COURSE OUTCOMES** On completion of the course, students will be able to
The course will enable the students to apply the statistical programming concepts and techniques using Python libraries in the analysis of Statistical data.	1. Understands the basics of statistical concepts and various data types in Numpy, Pandas. 2. Cleans and Analyzes the data with descriptive statistics and EDA. 3. Visualizes the data with matplotlib, seaborn graphic libraries. 4. Analyzes data with various statistical inference techniques using Hypothesis testing. 5. Understands and applies various data distributions, sampling and simulation of random variables. 6. Applies various statistical models like linear regression, ANOVA to the data.

Unit I: Introduction to Statistical computing and Python libraries

Intro to statistics: Samples and Population, Descriptive statistics; intro to Computational statistics, Data analysis, knowledge discovery in Data, Various data types.

Intro to statistical computing software: Python libraries & R.

Unit II: Data Collection, Cleaning and Exploratory Data Analysis using Pandas.

Data types in Numpy, Pandas: list, vector, matrix, array, tensor, DataFrame. Operations on Data Types.
Data import using Pandas, Data cleaning, imputation, EDA case studies using Pandas.

Unit III: Data Visualization with matplotlib and Seaborn.
Intro to matplotlib and Seaborn graphic libraries, basic visualizations using matplotlib, Advanced visualizations with Seaborn, Data correlation chart. Case studies on visualizations.

Unit IV: Data distributions, Statistical Inference using Hypothesis testing.
Understanding various data distributions: Bernoulli, Binomial, Exponential, Poisson & Gaussian.
Intro to Hypothesis testing: p-value, critical value, interpretation of test results.
Types of Hypothesis testing using Scipy.stats: Normality tests, Correlation tests, Comparing samples.

Unit V: Simulations and Statistical models
Random variables, sampling and simulation of data distributions.
Statistical models: Linear algebra, Optimizations, Linear regression, Intro to Statistical or Machine learning.

Learning Resources:

1. https://machinelearningmastery.com/statistics_for_machine_learning/
2. https://scipy-lectures.org/packages/statistics/index.html
3. Udemy: Python for Statistical Analysis
4. courseera: Statistics with Python specialization
5. https://numpy.org/
6. https://pandas.pydata.org/
7. https://matplotlib.org/
8. https://seaborn.pydata.org/
9. https://www.statsmodels.org/stable/index.html
10. https://scikit-learn.org/stable/
11. A first Course in Statistical Programming with R, W. John Braun, Duncan J. Murdoch, Cambridge University Press, 2007.

12. https://cran.r-project.org/manuals.htm

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 Test: 90 minutes

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
9-5-81, Ibrahimbagh, Hyderbad-500031, Telangana State

DEPARTMENT OF MECHANICAL ENGINEERING
INTRODUCTION TO ROBOTICS (Open Elective-III)

SYLLABUS FOR B.E.V-SEMESTER

L:T: P (Hrs/Week):3:0:0	SEE Marks: 60	Course Code: **U18OE510ME**
Credits: 3	CIE Marks: 40	Duration of SEE : 3 Hours

COURSE OBJECTIVES The objectives of this course are to:	**COURSE OUTCOMES** On completion of the course, students will be able to
The objectives of this course are to: Identify robots and its peripherals for satisfactory operation and control of robots for industrial and non-industrial applications.	1. understand the anatomy of the robot and various robot configurations for it's selection depending on the task. 2. classify the end effectors , understand different types of joints,various types of mechanical actuation and robot drive systems for carrying out the assigned job effectively. 3. analyze a planar manipulator through forward kinematics and understand the control of robot manipulator for better reliability and efficiency. 4. Classify the various sensors used in robots for proper selection to an application. 5. summarize various industrial and

UNIT-I
ROBOT BASICS
Robot-Basic concepts, Need, Law, History, Anatomy, specifications.
Robot configurations-cartesian, cylindrical, polar ,articulated and SCARA.
Robot wrist mechanism, Precision and accuracy of robot.

UNIT-II
ROBOT ELEMENTS
End effectors-Classification, Types of Mechanical actuation, Gripper design, Robot drive system types: Electrical, pneumatic and hydraulic. Position and velocity feedback devices, Robot joints and links-Types, Motion interpolation.

UNIT-III

ROBOT KINEMATICS AND CONTROL

Robot kinematics – Basics of direct and inverse kinematics, Robot trajectories, 2D and 3D Transformation- Scaling, Rotation and Translation, Homogeneous transformation. D-H matrix. Forward kinematics for a 2-link RR planar manipulator.

Control of robot manipulators – Point to point and Continuous Path Control. Robot programming.

UNIT-IV

ROBOT SENSORS

Sensors in robots – Touch sensors-Tactile sensors – Proximity and range sensors. Force sensors, Light sensors, Pressure sensors.

Introduction to Machine Vision and Artificial Intelligence.

UNIT-V

ROBOT APPLICATIONS

Applications of robots in Industries, Medical, Household, Entertainment, Space, Underwater, Defense, and Disaster management.

Applications of Micro and Nanorobots, Future Applications of robots.

Learning Resources:

1. MikellP. Groover, Mitchell Weiss, Roger N Nagel and Nicholas G Odrey, "Industrial Robotics Technology, Programming and Applications", TataMcGraw-Hill Publishing Company Limited *,* 2008.
2. Deb.S.R and Sankha Deb, "Robotics Technology and Flexible Automation", Tata McGraw HillPublishing Company Limited, 2010.
3. KlafterR.D, Chmielewski T.A, and Negin. M, "Robotic Engineering: An Integrated Approach", Prentice Hall of India Pvt. Ltd.,1994.
4. K.S. Fu,R.C. Gonzalez and C.S.G.Lee , "Robotics control, sensing, vision and intelligence",TataMcGraw-Hill Publishing Company Limited, 2008
5. R.K. Mittal and I.J.Nagrath"Robotics and Control", Tata McGraw-Hill Publishing Company Limited,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 Test: 90 minutes

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
9-5-81, Ibrahimbagh, Hyderbad-500031, Telangana State

DEPARTMENT OF MECHANICAL ENGINEERING
INTRODUCTION TO AUTOMOBILE ENGINEERING (OE-III)

SYLLABUS FOR B.E.V-SEMESTER

L:T: P (Hrs/Week):3:0:0	SEE Marks: 60	Course Code: **U18OE520ME**
Credits: 3	CIE Marks: 40	Duration of SEE : 3 Hours

COURSE OBJECTIVES The objectives of this course are to:	**COURSE OUTCOMES** On completion of the course, students will be able to
1. familiarize the student with the different types of automobiles and engine components. 2. impart adequate knowledge in fuel supply, cooling, lubrication systems of IC engines. 3. understand the steering geometry, steering mechanism and types of suspension systems. 4. gain the knowledge about working of clutch, gear mechanism, brakes 5. make the student conversant with types of wheels, tyres and pollution control techniques.	1. identify types of Automobiles and engine components. 2. describe the engine fuel system in petrol and Diesel engines, cooling, lubrication systems. 3. describe the steering mechanism, suspension systems 4. analyse the working principle and operation of clutch, gear mechanism and brakes. 5. know the pollutants from automobile and pollution control techniques and identify the types of wheels, tyres.

UNIT-I

Introduction: Types of automobiles: Hybrid Vehicles, Electrical, gas and Fuel cell vehicles. Chassis and body, Lay out of transmission system, Engine components: cylinder block, cylinder head, crankcase, crank shaft and cam shaft. Types of IC Engines: SI and CI engines, two stroke and four stroke engines.

UNIT-II

Fuel system: Fuel supply system for SI engines and CI engines. Simple carburettor, Introduction to Multipoint fuel injection system (**MPFI**) of petrol engines and Introduction to **CRDI** system for diesel engines.

Cooling system: air cooling, water cooling: Thermo syphon, pump circulation system.

Lubrication system: Petroil System, splash system, pressure lubrication: Wet sump and Dry Sump.

Ignition system: Battery Ignition System, Magneto Ignition System and Electronic Ignition System.

UNIT-III

Suspension system: Rigid axle, Independent suspension system:Double wish bone type, Macpherson strut system, Air suspension system.

Steering system: front axle, wheel alignment, steering geometry: camber, caster, toe-in, toe-out, steering linkage for vehicle with rigid axle front suspension, steering linkage for vehicle with independent front suspension, Ackermann steering mechanism.

UNIT –IV

Power Train: Single plate clutch, Multi plate clutch. Manual Gear Box: sliding mesh gear box, constant mesh gear box, synchromesh gear box and Automatic Gear Box. Working principle of Differential.

Brakes: Types: Drum and Disc brakes, Mechanical and Hydraulic Brakes, **ABS** system.

UNIT –V

Wheels and Tyres: Types of Wheels: wire wheels, disc wheels, alloy wheels. Types of tyres: Tube type, tubeless type. **SRS** Airbag system.

Automobile Emissions and control: Automobile pollutants and sources of pollution. Pollution Control Techniques: Catalytic Converters, EGR and PCV. Bharath emission Norms.

Learning Resources:

1. Crouse & Anglin, “Automobile Engineering”, 10th Edition, Tata McGraw Hill Publishing Co. Ltd., New Delhi,. 2007.
2. Kirpal Singh, “Automobile Engineering”, Vol.I& II, 13th Edition, Standard Publishers, New Delhi 2013.
3. R.B Gupta, “Automobile Engineering” 7th Edition, Satya Prakashan, New Delhi, 2015.
4. Joseph Heitner, “Automotive Mechanics”, 2nd Edition, Affiliated East West Pvt. Ltd., 2013.
5. C.P. Nakra, “Basic Automobile Engineering”, 7th Edition, Dhanpat Rai Publishing C (P) Ltd., 2016.

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 Test: 90 minutes

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
9-5-81, Ibrahimbagh, Hyderbad-500031, Telangana State

DEPARTMENT OF MECHANICAL ENGINEERING
ADVANCED COURSE INENTREPRENEURSHIP (OE-IV)

SYLLABUS FOR B.E.V-SEMESTER

L:T: P (Hrs/Week):3:0:0	SEE Marks: 60	Course Code: **U18OE530EH**
Credits: 3	CIE Marks: 40	Duration of SEE : 3 Hours

COURSE OBJECTIVES The objectives of this course are to:	**COURSE OUTCOMES** On completion of the course, students will be able to
1. Acquire additional knowledge and skills for developing early customer traction into a repeatable business. 2. They will learn the tools and methods for achieving sustainable growth, such as refining the product or service and business models, building brand strategy, making a sales and financial plan etc.	1. Develop an A-team 2. Refine business models and expand customer segments, brand strategy and create digital presence, channel strategy for customer outreach 3. Develop strategies to grow revenues and markets, understand Advance Concepts of business finance, do Financial Planning, find Funding for growth 4. Leverage technologies and platforms for growth stage companies 5. Develop key metrics to track progress, understand Basics of registering a company.

Unit I: Pivoting and New Business Model
Introduction to Advance Course and Recapping the key concepts; Revisit of idea/ solution, business model and team members, Need for a mentor; Pivoting and its need; Types of Business models; Refining business model; Analyzing the Business Model of Competitors; Adding new customer segments to existing business model.

Unit II: Business Planning
Product Management: Need for a product management with examples;

Making a sales plan; Building sales organization: Entrepreneur interview, Hiring sales team; Making a people plan for the venture; Introduction and understanding financial planning and forecasting template; Discussing financial planning and revisiting business model; Creating a procurement plan; Negotiation.

Unit III: Customer Life cycle and Building the A-team

Customer life cycle; identifying secondary revenue streams; Funding Landscape: Funding options for an entrepreneur; Investor hunt: Creating funding plan and designing the pitch deck; Attracting right talent – I: Intro to building the A-team; Examples; Setting the team for success.

Unit IV: Branding and Channel Strategy, Leveraging Technologies

Creating brand Strategy: Drawing venture's golden circle; Defining the positioning statement: values; Creating a Public Image and Presence of the Venture; Identifying the right channel; Platforms for Marketing and Promotion; Platforms for Communication and Collaboration; Making the Tech Plan.

Unit V: Measuring Progress, Legal Matters and Role of Mentors & Advisors

Metrics for Customer Acquisition and Retention; Financial Metrics: Finding new revenue streams based on key financial metrics; Re-forecasting financial plan to increase margin; Professional Help and Legal & Compliance Requirements; Selecting IP for organization; Identifying mentors and advisors; Scouting board of directors; Capstone Project.

Learning Resources:

1. http://www.learnwise.org
2. Clancy, Ann L. & Binkert, Jacqueline, "Pivoting- A coach's guide to igniting substantial change" Palgrave Macmillan US 2017
3. Porter, Michael, E., "Competitive Advantage: Creating and Sustaining Superior Performance", Free press, 1st edi.
4. Schwetje, Gerald & Vaseghi Sam,"The Business Plan", Springer-Verlag Berlin Heidelberg.
5. LeMay, Matt, "Product Management in Practice", O'Reilly Media Inc.
6. Smart, Geoff & Randy, Street., "Who: The A method of hiring", Ballantine books, 2008.
7. Blokdyk, Gerardus., "Customer Lifecycle Management - A complete guide", 5starcooks, 2018

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 Test: 90 minutes

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
9-5-81, Ibrahimbagh, Hyderbad-500031, Telangana State

DEPARTMENT OF MATHEMATICS
Discrete Mathematics for Engineers (Open Elective)

SYLLABUS FOR B.E.V-SEMESTER

L:T: P (Hrs/Week):3:0:0	SEE Marks: 60	Course Code: **U18OE520MA**
Credits: 3	CIE Marks: 40	Duration of SEE : 3 Hours

COURSE OBJECTIVES	**COURSE OUTCOMES**
The course will enable the students to:	On completion of the course, students will be able to
1. Understand Propositions and their equivalences, predicates and quantifiers and learn various proof strategies. **2. Study** the concepts of number theory such Modular Arithmetic, Congruences and basic cryptography etc., **3. Understand** the basics of counting, combinatory, and various methods of solving Recurrence relations. **4. Understand** Relations, Equivalence relations, Posets and Hasse diagrams. **5. Analyze** the concepts of Graphs.	**1. Use logical notation** to define and reason about **fundamental mathematical concepts and synthesize induction hypothesis and simple Induction proofs**. **2. Prove elementary properties of modulararithmetic** and basic cryptography and apply in Computer Science. **3. Calculate number of possible outcomes** of elementary combinatorial processes such as permutations and combinations **Model and analyze computational processes** using analytic and Combinatorial methods. **4. Prove** whether a given relation is an equivalence relation/poset and will be able to draw a Hasse diagram. **5. Apply** graph theory models of data structures and to solve problems of connectivity**.**

UNIT – I (10 Hours)

Logic: Logic- Logical connectives- Propositional equivalences– Predicates and quantifiers – Nested quantifiers.

Mathematical Reasoning, Induction: Proof Strategy- Methods of Proofs- Mathematical Induction- Second Principle of Mathematical Induction.

UNIT – II (8 Hours)

Number Theory: The Integers and Division- Division Algorithm- Fundamental Theorem of Arithmetic –Modular Arithmetic-Integers and Algorithms- Euclidean Algorithm -Linear Congruences- Fermat's Little Theorem.

UNIT – III (8 Hours)

Counting: Basics of counting- Pigeonholeprinciple- Permutations and combinations – Pascal's Identity- Vandermonde's Identity- Generalized Permutations and combinations.

Advanced Counting Techniques: Recurrence relations: Solving Recurrence Relations- Linear Homogeneous and Non-Homogeneous Recurrence relations.

UNIT – IV (8 Hours)

Relations: Relations – Properties -Representing relations - Equivalence Relations - Partial Orderings- Poset.

UNIT –V (8 Hours)

Graph Theory: Introduction- Types of graphs- Graph terminology- Basic theorems- Representing Graphs and Graph Isomorphism - Connectivity- Euler and Hamiltonian paths -

Text Books:

1. Kenneth H.Rosen – Discrete Mathematics and its application – 5th edition, McGraw – Hill, 2003.
2. Joel. Mott. Abraham Kandel, T.P.Baker, Discrete Mathematics for Computer Scientist & Mathematicians, Prentice Hall N.J., 2nd edn, 1986.

Reference Books:

1. Discrete and Combinatorial Mathematics by Ralph P. Grimaldi , Pearson International
2. J.P.Trembly, R.Manohar, Discrete Mathematical Structure with Application to Computer Science, McGraw- Hill – 1997.
3. R.K. Bisht, H.S.Dhami - Discrete Mathematics, Oxford University Press, 2015.

Online Resources:

1. http://mathworld.wolfram.com/topics
2. http://www.nptel.ac.in/course.php

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 Test: 90 minutes

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
9-5-81, Ibrahimbagh, Hyderbad-500031, Telangana State

DEPARTMENT OF HUMANITIES AND SOCIAL SCIENCES
Technical Writing and Professional Presentations (OE)

SYLLABUS FOR B.E.V-SEMESTER

L:T: P (Hrs/Week):3:0:0	SEE Marks: 60	Course Code: **U18OE010EH**
Credits: 3	CIE Marks: 40	Duration of SEE : 3 Hours

COURSE OBJECTIVES	**COURSE OUTCOMES** On completion of the course, students will be able to
This course introduces the principles and mechanics of technical writing for students of engineering. Students will learn: 1. Specific communications skills associated with reporting technical information and will write a series of papers ranging from process description and feasibility reports to research projects, project proposals, and statement of purpose, which are pre-requisites for start-up companies and getting into foreign universities as well. 2. How to make effective presentations as part of today's workplace demands.	**At the end of the course the student will be able to** 1. write effective reports 2. research and write project proposals and SoPs 3. make persuasive presentations

UNIT I

A. TECHNICAL REPORTS- INFORMAL

Informal report formats, project and research reports

B. TECHNICAL REPORTS-FORMAL

Formal report components, feasibility reports, evaluation reports, Analytical and informational reports, executive summaries.

UNIT II

TECHNICAL WRITING IN BUSINESS CORRESPONDENCE

Components of a letter, types of electronic communication, effective emails, instant and text messaging guidelines.

UNIT III

Technical Resume, Curriculum Vitae, Biodata, Cover letter, resume format.

UNIT IV

A. PROFESSIONAL PRESENTATIONS

Paper presentations, Poster presentations, PowerPoint presentations, video demos and tutorials

B. VIDEO DEMOS AND TUTORIALS

Storyboard writing, e-learning methods; video demos, training videos, webinars, conducting surveys, questionnaire, assessments, quiz, introduction to e-learning tools; Adobe Captivate, TechSmith Camtasia.

UNIT-V

HOW TO WRITE PROPOSALS AND STATEMENT OF PURPOSE

Types of proposals, persuasive elements, requests for proposals, stating your objective

METHODOLOGY: -

Case Studies
Demonstration
Presentations
Expert lectures

Writing and Audio-visual lessons

ASSESSMENT: -

Online assignments
Individual and Group

Learning Resources: -

1. Effective Technical Communication, M Ashraf Rizvi, Tata McGraw-Hill Education, 2005
2. Raman, Meenakshi & Sangeeta Sharma. Technical Communication: Principles and
Practice. Second Edition. New Delhi: Oxford University. Press, 2011.
3. Hacking Your Statement of Purpose: A Concise Guide to Writing Your SOP, Milena
Young, 2014.
4. How to prepare a feasibility study: a step-by-step guide including 3 model studies. Front Cover. Robert E. Stevens, Philip K. Sherwood. Prentice-Hall, 1982.
5. Successful Presentations (with DVD): John Hughes & Andrew Mallett. Oxford university Press.

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 Test: 90 minutes

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
DEPARTMENT OF CIVIL ENGINEERING
SCHEME OF INSTRUCTION AND EXAMINATION (R-18)
B.E. – (CIVIL ENGINEERING) VI-SEMESTER ACADEMIC YEAR 2020 - 2021
(Students Admitted in 2018-19)

B.E (Civil) VI 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								
U18HS610EH	Skill Development-IV: Soft Skills	1	-	-	2	40	30	1
U18PC610CE	Design of Steel Structures	3	-	-	3	60	40	3
U18PC620CE	Soil Mechanics	3	-	-	3	60	40	3
U18PC630CE	Advanced Structural Analysis	3	-	-	3	60	40	3
U18PC640CE	Transportation Engineering	3	-	-	3	60	40	3
U18PC650CE	Reinforced Concrete Design	3	-	-	3	60	40	3
U18PE610CE	Skill Development-IV: Technical Skills	1	-	-	2	40	30	1
U18OEXXXXX	Open Elective-IV	3	-	-	3	60	40	3
PRACTICALS								
U18PC621CE	Soil Mechanics Lab	-	-	2	3	50	30	1
U18PC631CE	Computer Applications Lab	-	-	2	3	50	30	1
U18PC641CE	Transportation Engineering Lab	-	-	2	3	50	30	1
U18PW619CE	Theme based Project	-	-	2	-	-	30	1
Student should acquire one online course certificate equivalent to two credits during III-VII Semester								
TOTAL		**20**	**-**	**8**		**590**	**420**	**24**
GRAND TOTAL		**28**				**1010**		
Note: The left over hours are to be allotted to CCA-IV / CC / RC / TC based on the requirement.								

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

DEPARTMENT OF CIVIL ENGINEERING

DESIGN OF STEEL STRUCTURES

SYLLABUS FOR B.E. VI SEMESTER

L : T : P (Hrs./week):3 : 0 : 0	SEE Marks:60	Course Code: U18PC610CE
Credits : 3	CIE Marks:40	Duration of SEE: 3 Hrs

COURSE OBJECTIVES	COURSE OUTCOMES
The objectives of the course are to	Upon the completion of the course, students are expected to
1. understand the design philosophies of steel structures. 2. design the bolted connections and welded connections including detailing . 3. design tension members, compression members and beams by limit state design as per IS: 800-2007. 4. estimate the loads on roof trusses and design the members of roof truss.	1. Compare the different design philosophies and employ limit state design in the design of structural elements using rolled steel sections according to IS: 800-2007 Design bolted connection using black bolts and welded connections using fillet welds, groove welds subjected to concentric loads by limit state method according to IS:800-2007 2. Design tension members using limit state design according to IS:800-2007 3. Design compression members and column bases using limit state design according to IS:800-2007 4. Design laterally supported beams using limit state design according to IS:800-2007 5. Estimate loads on roof trusses subjected to different load combinations and design purlins, members of truss using angle sections by limit state according to IS: 800-2007

UNIT-I: Materials and Specifications (Limit State Design): types of Structural Steel – classification of Rolled Steel Sections.
Design Philosophies: Elastic or working stress design, plastic or limit design and limit state design
Introduction to Limit State Design: Loads & load combinations, characteristic loads, design loads, design strength, partial safety factors for materials and loads.
Bolted Connections: Types of bolts, types of bolted joints, load transfer mechanism, modes of failure of bolted joints, design of bolted joints using ordinary black bolts for concentric loads. High strength friction grip bolts.
Welded Connections: Types of welds, types of welded joints, design of welded joints for concentric loads using fillet welds and groove welds.

UNIT-II: Design of Tension Members (Limit State Design): Introduction to tension members - applications of tension members, modes of failure, design of tension members – design of lug angles.

UNIT-III: Design of Compression Members (Limit State Design): Introduction, sections used for compression members. Effective length of compression members, slenderness ratio, types of buckling, design of compression members for axial loads with single section and built-up sections (symmetric in both directions), lacing and battening.
Design of Column Bases: Design of slab base and gusseted base for axial load

UNIT-IV: Design of Beams (Limit State Design): Introduction to plastic analysis - plastic hinge, plastic moment, shape factor. Classification of cross sections, phenomenon of lateral torsional buckling; design of laterally restrained beams. Check for web crippling, web buckling & deflection.

UNIT-V: Design of Roof trusses (Limit State Design): Types of trusses, estimation of loads - dead load, live load and wind load, design of purlins, analysis of roof trusses and design of its members with angle sections. Bracings of roof trusses.

Learning Resources:

1. Duggal S.K., "Design of Steel Structures", 2nd Edition, Tata McGraw Hill Publishing, 2019
2. Gambhir M.L., "Fundamentals of Structural Steel Design", McGraw Hill Education (India) Pvt. Ltd., New Delhi, 2013
3. Bhavikatti S.S., "Limits state Design of steel Structures", 5th Edition, dream technology Press 2019.
4. Subramanian N, "Design of Steel Structures (Limit State methods)", 2nd Edition Oxford University Press, 2018.
5. IS: 800-2007: Code of Practice for General Construction in Steel, Bureau of Indian Standards, New Delhi
6. IS: 875-1987: Code of Practice for Design loads for buildings and structures,

Bureau of Indian Standards, New Delhi
7. ISI Handbook No. 1 or Steel Tables by Bhavikatti S.S.
8. http://nptel.ac.in/courses/105103094/
9. www.steel-insdag.org

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

1	No. of Internal Tests	:	2	Max. Marks for each Internal Tests	:	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
SOIL MECHANICS

SYLLABUS FOR B.E. VI SEMESTER

L : T : P (Hrs./week):3 : 0 : 0	SEE Marks:60	Course Code: U18PC620CE
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. Study Origin, classification of soils and estimate index and engineering properties by different procedures 2. Learn Concepts of compaction and consolidation of soils 3. Estimate shear strength parameters, earth pressure and analyze stability of different slopes	1. Interpret composition and structure of soils and classify them according to IS Soil classification. 2. Evaluate effective stress under Hydrostatic Conditions, Steady State One-Dimensional Flow and Transient Hydrodynamic Conditions using analytical approach. 3. Compute stress distribution and analyze mechanisms of compaction and consolidation of soils under given field conditions. 4. Determine and judge shear strength in soils under given field conditions. 5. Evaluate lateral earth pressure using Rankine's and Columb's wedge theories and assess stability slopes in soils under given field conditions.

UNIT-I: Introduction and clay chemistry: – Brief history of discipline, Soil formation, structure of soils, composition and structure of clay minerals, clay-water interaction

Soil phase relationships pseudo-elastic three phase particulate medium,

Mass-volume & weight-volume relationships and determination of specific gravity and water content.

Index properties: Shape and size characterization- Grain size distribution analysis including wet analysis-hydrometer analysis, Atterberg limits and consistency indices, Soil classification systems.

UNIT-II: Effective stress: Effective stress principle, Fundamentals of Effective stress under hydrostatic condition, distribution of stress with depth influence of shifting water table, shift in ground surface and capillarity. Functional relation between effective stress and engineering properties.

Permeability of Soils: Validity of Darcy's Law - Factors affecting permeability – Field and laboratory tests to determine permeability- Equivalent permeability of stratified soils.

Effective stress under one dimensional flow – seepage force, downward flow, upward flow, Quick Sand phenomena- Remedial measures. Laplace equation, qualitative representation of flownets under defined boundary conditions- Locating phreatic line in a homogeneous earthen dam using Kozeny's parabola – computation of seepage quantity, total, effective and neutral stress.

UNIT-III: Stress Distribution : Boussinesq's and Westergaard's equations for point load. Application of point load formulae for uniformly distributed load on circular and rectangular areas. Use of Newmark's chart (for Boussinesq's equation). Contact pressure distribution.

Compaction Process: Compaction Mechanism; factors affecting compaction. Determination of compaction characteristics - standard and modified Proctor tests - Light and Heavy compaction tests.CBR test – Field and laboratory based.

Consolidation Process: Spring analogy - Void ratio and effective stress (e Vs log P) relationship – Terazaghi's theory of one dimensional consolidation - assumptions and derivation of one dimensional consolidation equation,

computation of magnitude of settlement and time rate of settlement.

UNIT-IV: Shear Strength: Significance of Shear strength in soils – Mohr-Coulomb equation – shear parameters - Determination of shear strength – Direct shear test, large shear box test Tri-axial compression tests (Unconsolidated Undrained (UU), Consolidated Undrained (CU) and Consolidated Drained (CD)), UCC test, Vane shear test. Stress- strain behavior of soils-Stress path-Skemptons pore water parameters

UNIT-V: Earth Pressure: States of earth pressure-Active, passive, at rest condition; Rankine's theory: computation of active and passive earth pressure in cohesionless and c-φ soils; Coulomb's Wedge theory; Introduction to graphical solution.

Slope stability: Definition and classification of slopes-types and slope failures-Factors of safety with respect to cohesion, angle of shearing resistance, Height – Analysis of stability of slope using Swedish slip circle method and Taylor's stability number.

Learning Resources:

1. Murthy V.N.S., "A Textbook of Soil Mechanics & Foundation Engineering", CBS Publishers, 2015.
2. Gopal Ranjan, Rao A.S., "Basic and Applied Soil Mechanics", Wiley Eastern Limited, third edition, 2016.
3. Venkatramaiah C., "Geo-technical Engineering", New Age Publishers, fourth edition, 2012.
4. Shashi K.Gulhati and Manoj Datta, "Geotechnical Engineering", Tata Mc-Graw Hill, 2005
5. Braja M. Das, Khaled Sobhan, "Principles of Geotechnical Engineering", Cengage Learning, 2014
6. Craig's, R.F., "Soil Mechanics" Springer, 2013
7. Karl Terzaghi, Ralph B. Peck, Gholamreza Mesri., "Soil Mechanics in Engineering Practice" John Wiley & Sons, 07-Feb-1996
8. William Lambe T., Robert V. Whitman., "Soil Mechanics" John Wiley & Sons, 2012
9. Arora K.R., "Soil Mechanics and Foundation Engineering", Standard Publishers Distributors revised and enlarged sixth edition, 2007.
10. Scott, R.F., "Principles of Soil Mechanics", Addison Wesley, Massachusetts,

11. IS Code: IS-2720, Methods of tests for Soils.
12. http://nptel.ac.in/courses/105101084/

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

1	No. of Internal Tests	:	2	Max. Marks for each Internal Tests	:	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 STRUCTURAL ANALYSIS

SYLLABUS FOR B.E. VI SEMESTER

L : T : P (Hrs./week):3:0 : 0	SEE Marks:60	Course Code: U18PC630CE
Credits : 3	CIE Marks:40	Duration of SEE: 3 Hrs

COURSE OBJECTIVES	COURSE OUTCOMES
The objectives of the course are to	Upon the completion of the course, students are expected to
1. Explain the use of influence line diagrams in the analysis of simply supported beams and trusses subjected to moving loads. 2. Analyze beams and frames using flexibility method and stiffness method, and to develop element stiffness matrices and assembly of global stiffness matrices.	1. Perform analysis of simply supported beam subjected to moving loads using influence line diagrams 2. Compute forces in the members of the trusses subjected dead load & live load using influence line diagrams 3. Apply flexibility method for analysis of beams and frames with degree of indeterminacy not exceeding three 4. Explain the principles of analysis of structures subjected to external forces using stiffness method. 5. Analyse the structures subjected to external loads by developing element stiffness matrices, assembly of global stiffness matrices and load matrices.

UNIT-I: Moving loads and influence line diagrams: Influence lines for reaction, bending moment and shear force. Determination of maximum bending moment and shear force for moving load systems on simply supported girders, Curves of maximum bending moment and shear force for simply supported girders traversed, by (i) single point load, (ii) two point

loads, (iii) uniformly distributed load longer than span, and (iv) uniformly distributed load shorter than span, enveloping parabola and EUDLL.

UNIT-II: Moving loads on trusses and arches: Influence lines for forces in members of statically determinate trusses under moving loads (warren truss and Pratt truss). Influence line diagrams for three hinged parabolic arches.

UNIT-III: Flexibility & Stiffness Methods of Analysis: Analysis of continuous beams, pin jointed plane trusses, rigid jointed plane frames with static indeterminacy not exceeding three with flexibility method. Introduction to stiffness method

UNIT-IV: Direct Stiffness Method - I: Development of element stiffness matrices for bar and truss elements Transformation matrices, assembly of global stiffness matrices and load matrices. Finding displacements and member end action matrices. Initial stresses and strains.

UNIT-V: Direct Stiffness Method-II: Development of element stiffness matrices for beam and plane frame elements. Transformation matrices, assembly of global stiffness matrices and load matrices. Finding displacements and member end action matrices.

Learning Resources:

1. Vazirani V.N., Ratwani M.M, Duggal S.K., “Analysis of Structures - Vol. II Theory, Design and Details of Structures”, Khanna Publishers, 16th Edition, 2015.
2. Thandavamoorthy T.S., “Structural Analysis”, Oxford Higher Education, Second Edition, 2012.
3. Weaver and Gere, “Matrix Analysis of Framed Structures”, CBS Publisher, 2004
4. Ramamrutham S., Narayan R., “Theory of Structures”, Dhanpath Rai publications, 2014
5. Devdas Menon, "Structural Analysis", 1st Edition, Narosa Book Distributors Pvt Ltd,2014.
6. Reddy C.S., "Basic Structural Analysis", 3rd Edition, Mc Graw Hill, 2010.
7. Junarkar S.B., Shah, “Mechanics of Structures”, Volume II, Charotar Pub. House,

2010.
8. Chu-Kia Wang, "Intermediate Structural Analysis (English) 1st Edition", McGraw Hill Education, 2010.
9. Hibbeler R.C., "Structural Analysis", 8/E, Prentice Hall, Higher Education, 2012.
10. Louis F. Geschwindner, Harry H. West, "Fundamentals of Structural Analysis", 2nd Edition, Wiley India Pvt. Ltd., 2011.
12. Stephen P. Timoshenko and Donovan H. Young " Theory of Structures" McGraw Hill International Edition, 1968
13. http://nptel.ac.in/courses/105101086/

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

1	No. of Internal Tests	:	2	Max. Marks for each Internal Tests	:	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 ENGINEERING

SYLLABUS FOR B.E. VI SEMESTER

L : T : P (Hrs./week):3:0 : 0	SEE Marks:60	Course Code: U18PC640CE
Credits : 3	CIE Marks:40	Duration of SEE: 3 Hrs

COURSE OBJECTIVES	COURSE OUTCOMES
The objectives of the course are to	Upon the completion of the course, students are expected to
1. To provide basic knowledge in transportation so that students can understand and solve transportation related problems and design for highway mode of transportation with focus on highway users' characteristics, geometric and pavement design, traffic engineering, and pavement construction / maintenance 2. Evaluate the fundamental theories and methods of traffic and transportation engineering, including traffic flow fundamentals, geometric design of highways, and pavement design.	1. Given the basic information on geometrical features, design horizontal and vertical alignment of highways/roads complying with IRC standards. 2. Compute key elements of traffic, present and analyse traffic data for solving mobility issues and develop a survey plan for a transportation problem through traffic studies to solve urban traffic problems. 3. Characterize the highway materials used for road construction based on quality control tests and develop a job mix formula for the given materials in field using Rothfuch method. 4. Design flexible and rigid pavements for National highways as per IRC guidelines 5. Employ various construction techniques adopted in field, identify the causes of various pavement failures and suggest remedies.

UNIT-I : HIGHWAY CLASSIFICATION, ALIGNMENT AND GEOMETRIC DESIGN

Introduction, Highway development in India, Functional classification of roads as per IRC, Road patterns,

Highway alignment – Requirements and factors controlling alignment of roads – Factors governing geometric design ,
Highway cross-sectional elements – Carriageway, Shoulders, Medians, Right of way, Footpaths, Bus bays, Cycle tracks, Service roads, Camber. Sight distances – Stopping and overtaking sight distance.
Design of horizontal alignment – Speed, radius, super elevation, extra widening, transition curves.
Design of vertical alignment – gradient, grade compensation, summit curves and valley curves

UNIT-II : TRAFFIC ENGINEERING
Basic traffic characteristics – Volume, speed, density, headways and relationships amongst them.
Traffic studies - Objectives of traffic studies, Methods of data collection and presentation of various traffic studies such as volume studies, speed studies, speed and delay studies, origin destination studies, parking studies, accident studies. Highway capacity and Level of service concepts as per HCM.
Traffic regulation and control – Traffic signs, signals, markings and channelization. Principles of design of at-grade intersections – Simple layouts. Design of isolated signal by Webster and IRC method. Introduction to grade separated interchanges.

UNIT-III : PAVEMENT MATERIAL CHARACTERISATION
Types of pavements and materials for pavements.
Aggregates – characterizing the physical, mechanical and shape related properties of aggregate particles, Blending of aggregates and job mix formula by Rothfuch method.
Binders – Types of paving binders – bitumen, cutbacks and emulsions, modified binders, characterization of bituminous binders : flash and fire point test, penetration test, softening point test, ductility test, Fraass breaking point test, viscosity test , Specific gravity test , elastic recovery test, separation test, simulation of short term aging using RTFOT, simulation of long term aging using PAV. Gradation of bitumen - penetration grading, Viscosity grading and performance grading. Bituminous mixture design by Marshall / Modified Marshall stability test.

UNIT-IV : PAVEMENT DESIGN
Factors affecting pavement design –Traffic, soils and materials
Flexible pavement design using IRC 37:2018.

Rigid pavement design using IRC 58: 2015, Introduction to expansion , contraction, construction and longitudinal joints for jointed plain cement concrete pavements

UNIT-V: PAVEMENT CONSTRUCTION AND MAINTENANCE

Pavement construction - Construction of Water bound Macadam, Wet Mix Macadam and Granular sub base layers. Construction of Dense Bituminous macadam, Bituminous Macadam, Bituminous Concrete, Open Graded Premix Carpet, Mix Seal Surfacing, prime coat, tack coat, seal coat as per MORTH specifications, Introduction to recycled pavements.

Pavement failures and maintenance - Pavement failures – types, causes and remedies, Maintenance of bituminous pavements.

Learning Resources:

1. Khanna S.K., Justo C.E.G., Veeraraghavan A., "Highway Engineering", 10th Edition, Nem Chand & Bros, 2017
2. Kadiyali L.R., Traffic Engineering and Transportation Planning, Khanna Publishers, 2016.
3. Nicholas J. Garber Lester A. Hoel, Traffic and Highway Engineering- III edition, Cengage publication Indian edition 2014.
4. Yoder E.J., Witczak M.W., Principles of Pavement Design, John Wiley & Sons – Indian edition. 2008
5. Srinivasa Kumar R., Pavement design, Orient Blackswan Pvt. Ltd., New Delhi, 2013
6. IRC:37 : 2018 : Guidelines for the design of flexible pavements
7. IRC 58 :2015: Guidelines for the design of plain jointed rigid pavements
8. IRC MORT&H- Specifications for road and bridge works, 2013 (Fifth Revision)
9. IRC 35 -2015 (Road markings), IRC 38 -1988 (Horizontal curves), IRC 53 -2012 (Accident forms), IRC 67 -2012 (Road signs), IRC:82-2015 (Maintenance of BT roads), IRC:86-1983 (geometric design standards), IRC:93-1985 (traffic signals), IRC:106-1990 (capacity), IRC:SP:23-1983 (vertical curves), IRC:SP:41-1994 (at-grade intersection)
10. www.pavementinteractive.org
11. http://nptel.ac.in/courses/105105107/

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

1	No. of Internal Tests	:	2	Max. Marks for each Internal Tests	:	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

REINFORCED CONCRETE DESIGN

SYLLABUS FOR B.E. VI SEMESTER

L : T : P (Hrs./week):3 : 0 : 0	SEE Marks:60	Course Code: U18PC650CE
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. Design philosophies of working stress method and limit state method. 2. Indian standard codes of practice for Reinforced Concrete 3. Design of concrete structural elements using limit state method as per Indian code of practice.	1. Understand design philosophies of concrete and design beams for flexure with working stress method according to IS: 456 -2000. 2. Design beams for flexure with limit state method according to IS: 456-2000. 3. Design beams for shear, torsion and compute deflections with limit state design philosophy according to IS: 456-2000. 4. Perform yield line analysis of slabs and design slabs with limit state method according to IS: 456-2000. 5. Design columns and footings with limit state method according to IS: 456-2000.

UNIT-I: Introduction to Reinforced Cement Concrete: Need for Reinforcement in Concrete – Basic requirements of an RCC Structure- stability, strength, serviceability and durability.

Design Philosophies: Design philosophies- Working stress method (WSM) and limit state method (LSM) relative merits and demerits.

Working stress method: Theory of flexure in RCC beams, Balanced, under-reinforced and over reinforced sections; Analysis and design of singly and doubly reinforced rectangular sections.

UNIT-II: Basic concepts and terminology of LSM: Basic concepts and terminology of LSM - limit state, characteristic loads and strengths, Partial safety factors. Stress strain relationship for concrete and reinforcing steel; stress blocks.

Limit State of collapse in flexure: Assumptions, Analysis for flexure, failure in tension and compression, singly reinforced, doubly reinforced rectangular and flanged beams. Anchorage and development length, Curtailment of reinforcement in beams.

UNIT-III: Limit State of collapse in shear and torsion: Analysis and design for shear and torsion.

Limit State of Serviceability: Check for deflection and cracking.

UNIT-IV: Analysis and design of slabs: Types of slabs-one way, two way simply supported and continuous rectangular slabs subjected to uniformly distributed loads. Design of solid rectangular slabs.

Introduction to Yield line Theory for Slabs: Assumptions – Patterns of Yield lines – Analysis and design of a simply supported rectangular two- way slab using yield line approach.

UNIT-V: Analysis and design of columns: Assumptions, axially loaded circular, square and rectangular columns, Uniaxial and biaxial bending- interaction diagrams.

Design of Footings: Design of isolated square and rectangular footings as per IS code.

Learning Resources:

1. Unnikrishna Pillai S and Devdas Menon, “Reinforced Concrete Design”, McGraw Hill Education India Pvt Ltd.,2009.
2. Varghese P.C, “Limit State Design of Reinforced Concrete”, Prentice Hall of India, 2008.
3. Subramanian N., “Design of Reinforced Concrete Structures”, Oxford University Press, 2013.
4. Robert Park and Thomas Paulay, “Reinforced Concrete structure”, Wiley India Pvt. Ltd, 2013.
5. Shah H.J., “Reinforced Concrete”, Vol.1, Charotar Publishing House, 2012.
6. Punmia B.C., Ashok K. Jain, Arun K. Jain, “Limit State Design of Reinforced Concrete”, Laxmi Publications (P) Ltd. ,2012.
7. Ramamrutham, “Design of Reinforced Concrete Structures”, Dhanpat Rai Publishing Co., 2015.
8. Nptel.ac.in/courses/105105105, Design of Reinforced Concrete Structures.
9. IS:456-2000, Code of Practice for Plain and Reinforced concrete, Bureau of

Indian Standards, New Delhi, India.

10. SP 16: Design Aids for Reinforced Concrete to IS 456:1978, Bureau of Indian Standards, New Delhi, India
11. SP 24: Explanatory Handbook on Indian Standard Code of Practice for Plain and Reinforced Concrete to IS 456:1978, Bureau of Indian Standards, New Delhi, India
12. SP 34: Handbook on Concrete Reinforcement and Detailing (With Amendment 1), Bureau of Indian Standards, New Delhi, India
13. IS: 875-1987 Code of Practice For Design Loads (Other Than Earthquake) For Buildings And Structures Parts (1, 2, 3, 4 & 5), Bureau of Indian Standards, New Delhi, India

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

1	No. of Internal Tests	: 2	Max. Marks for each Internal Tests	:	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
FINISHING SCHOOL-IV: TECHNICAL SKILLS

SYLLABUS FOR B.E. VI SEMESTER

L : T : P (Hrs./week):1: 0 : 0	SEE Marks:40	Course Code: U18PE610CE
Credits : 1	CIE Marks:30	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. Software package on construction management technology 2. Element wise assembling the parts of a building.	1. Plan, execute and monitor large scale projects execution using Project Management software. 2. Execute Exterior designing plans and graphs of building by using Building Information Modelling Software.

Project Management Software

UNIT-I

- Training on Installation and setup
- Introduction to project management
- Introduction to primavera
- Enterprise project structure (EPS)

UNIT-II

- Organisational breakdown structure
- Project codes and values
- Global and project calendars
- Adding a project (W/O project architect)

Building Information Modelling

- Project Units
- Levels
- Walls
- Basic Wall creation
- Basic creation of Plan

- Wall
- Compound Wall
- Modify Wall
- Stacked Wall
- Wall Opening

- Work breakdown structure (WBS)

UNIT-III

- Budget and establishing spending plan
- Activity codes and values
- Work products and documents
- Activities, relationships and scheduling
- Constraints
- Door
- Window
- Floor
- Ceiling
- Roof
- Components

UNIT-IV

- Grouping and filtering activities
- Bars and layouts
- Resources, roles and costs
- Baseline plan
- 3D modelling
- Stair
- Railing

UNIT-V

- Monitoring the current schedule
- Threshold monitoring and issues
- Project tracking and reports
- Role plays and Use cases discussion
- Views
- Section View
- Elevation View
- Camera View
- Visualization
- Rendering
- Walkthrough
- Print

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

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

Duration of Internal Tests : 90 Minutes

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

DEPARTMENT OF CIVIL ENGINEERING

PROJECT MANAGEMENT (Open Elective-IV)

SYLLABUS FOR B.E. VI SEMESTER

L : T : P (Hrs./week):3: 0 : 0	SEE Marks:60	Course Code: U18OE610CE
Credits : 3	CIE Marks:40	Duration of SEE: 3 Hrs

COURSE OBJECTIVES	COURSE OUTCOMES
The objectives of the course are to	Upon the completion of the course, students are expected to
1. Learn the concept of project management along with functions and objectives. 2. Understand the various techniques used for project planning such as bar charts, CPM, PERT and crashing of networks. 3. Acquire knowledge on various types of contracts, tenders.	1. Understand the objectives, functions and principles of management in projects. 2. Practice the network techniques like CPM and PERT for better planning and scheduling of engineering works. 3. Analyse the importance of cost and time in network analysis and planning the work accordingly. 4. Knowledge on Contracts, Tenders, and Work orders related to the projects. 5. Interpret the concept of Linear Programming and solve problems by Graphical and Simplex methods.

UNIT-I

Significance of Project Management: Objectives and functions of project management, management team, principles of organization and types of organisation.

UNIT-II

Project Planning: Project Planning, bar charts, network techniques in

project 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

UNIT-IV

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

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

UNIT-V

Linear programming and optimization Techniques: Introduction to optimization – Linear programming, Importance of optimization, 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, 2006.
4. http://nptel.ac.in/courses/

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

1	No. of Internal Tests	:	2	Max. Marks for each Internal Tests	:	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
SOIL MECHANICS LAB

SYLLABUS FOR B.E. VI SEMESTER

L : T : P (Hrs./week):0 : 0 : 2	SEE Marks:50	Course Code: U18PC621CE
Credits : 1	CIE Marks:30	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. Index and engineering properties o various soils 2. Field test procedures	1. Determine the index properties of soils and classify soils. 2. Determine Direct shear strength and Triaxial shear strength of a soil sample 3. Calculate Permeability and determine the compaction characteristics of soils 4. Practice working as a team member and lead a team 5. Demonstrate professional behaviour in conducting the experiments and presenting the results effectively.

LIST OF EXPERIMENTS

DETERMINATION OF INDEX PROPERTIES:

2. Determination of Specific Gravity of soil solids using “Density bottle” method.
3. Determination of Specific Gravity & water content using “Pycnometer” method.
4. Determination of Liquid limit using Casgrande’s and Cone Penetration standard LL device.

5. Determination of Shrinkage and Plastic limits
6. Sieve Analysis including Hydrometer Analysis for plotting Particle size distribution curve
7. Determination of Field Density using Core cutter Method
8. Determination of Field Density using Sand Replacement Method

DETERMINATION OF ENGINEERING PROPERTIES

9. Determination of Compaction Characteristics by Standard Proctor test
10. Determination of Laboratory California Bearing Ratio (CBR) value
11. Determination of Co-efficient of Permeability by Constant Head Permeameter test and Variable Head Permeameter tests
12. Swell pressure test on expansive soils
13. Determination of shear strength parameters by Direct Shear Test
14. Determination of Shear Strength of Cohesive soils by "vane shear test"
15. Determination of Shear Strength by conducting "Triaxial Shear Test"
16. Determination of Co-efficient of Consolidation

DEMONSTRATION OF TEST PROCEDURES:

17. Standard Penetration Test

Learning Resources:

1. http://eerc02-iiith.virtual-labs.ac.in/
2. http://home.iitk.ac.in/~madhav/geolab.html

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
COMPUTER APPLICATIONS LAB

SYLLABUS FOR B.E. VI SEMESTER

L : T : P (Hrs./week):0:0: 2	SEE Marks:50	Course Code: U18PC631CE
Credits : 1	CIE Marks:30	Duration of SEE: 3 Hrs

COURSE OBJECTIVES	COURSE OUTCOMES
The objectives of the course are to	Upon the completion of the course, students are expected to
1. Use a structural Design software for analysis and design of RCC and Steel Structures.	1. Perform analysis and design of RCC beams and frames subjected to various loads using a structural design software. 2. Design of G + 2 residential building subjected to dead load and live load combination using software. 3. Design an RCC multi-storeyed building subjected to DL, LL and wind load combination using software. 4. Perform analysis and design of an RCC multi-storeyed building subjected to DL, LL, WL and seismic load combination using software 5. Perform analysis and design of steel trusses and frames subjected to various loads using software.

LIST OF EXPERIMENTS

Introduction of a structural analysis and design software for the design of RCC and Steel structures:

RCC Design:

Perform analysis and design of:

1. Beams

2. Plane frames
3. Space frames
4. G+2 residential building
5. Wind analysis of multistoried structures
6. Seismic analysis of multi-storeyed structures

Steel Design:

Perform analysis and design of:

7. Trusses
8. Frames

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
TRANSPORTATION ENGINEERING LAB

SYLLABUS FOR B.E. VI SEMESTER

L : T : P (Hrs./week):0: 0 : 2	SEE Marks:60	Course Code: U18PC641CE
Credits : 1	CIE Marks:40	Duration of SEE: 3 Hrs

COURSE OBJECTIVES	COURSE OUTCOMES
The objectives of the course are to	Upon the completion of the course, students are expected to
1. Impart basic knowledge to carry out quality control lab tests for roads in highway engineering practice. 2. Conduct quality control in road construction as per standards and introduce the concepts of design mix 3. Conduct traffic studies and present the data for transportation engineering applications	1. Perform experiments on aggregates and bitumen on their suitability for road construction 2. Understand basic traffic studies for transportation planning and design. 3. Conduct tests on job mix formula and Marshall stability 4. Practice working as a team member and lead a team 5. Demonstrate professional behaviour in conducting the experiments and presenting the results effectively

LIST OF EXPERIMENTS

A) Tests on road aggregates

1. Aggregate crushing value test
2. Los Angeles abrasion test
3. Aggregate impact value test
4. Aggregate shape test (flakiness & elongation)
5. Water absorption & Specific gravity of aggregates
6. Job mix formula by Rothfuch Method

B) Tests on bitumen

7. Penetration Test
8. Ductility Test
9. Elastic Recovery Test
10. Softening point Test
11. Specific gravity Test
12. Viscosity Test
13. Flash and fire point Test

C) Traffic Studies

14. Classified Traffic volume study at mid blocks
15. Spot Speed Study
16. Origin & Destination studies

D) Miscellaneous Tests (demonstration only)

18. Bitumen extraction test
19. Design of Bitumen mixture by Marshall stability test

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

THEME BASED PROJECTS

SYLLABUS FOR B.E. VI SEMESTER

OPEN ELECTIVES OFFERED BY VARIOUS DEPARTMENTS IN B.E. VI SEMESTER (2020-21)

Dept	Title	Code	credits

OPEN ELECTIVES OFFERED BY VARIOUS DEPARTMENTS IN B.E. VI SEMESTER (2020-21)

Dept	Title	Code	credits
Civil	Project Management	U18OE610CE	3
CSE	Introduction To Databases	U18OE610CS	3
CSE	Introduction To Operating Systems	U18OE620CS	3
ECE	Internet Of Things And Applications	U18OE610EC	3
ECE	Introduction To Mobile Communications	U18OE620EC	3
IT	Introduction To Web Application Development	U18OE610IT	3
IT	Introduction To Machine Learning	U18OE620IT	3
Mech.	Additive Manufacturing And Its Applications	U18OE610ME	3
Mech.	Industrial Administration And Financial Management	U18OE620ME	3
H&SS	English For Competitive Examinations	U18OE610EH	3

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
9-5-81, Ibrahimbagh, Hyderbad-500031, Telangana State

DEPARTMENT OF CIVIL ENGINEERING
PROJECT MANAGEMENT (Open Elective-IV)

SYLLABUS FOR B.E.VI-SEMESTER

L:T: P (Hrs/Week):3:0:0	SEE Marks: 60	Course Code: **U18OE610CE**
Credits: 3	CIE Marks: 40	Duration of SEE : 3 Hours

COURSE OBJECTIVES The objectives of this course are to:	**COURSE OUTCOMES** On completion of the course, students will be able to
4. Learn the concept of project management along with functions and objectives. 5. Understand the various techniques used for project planning such as bar charts, CPM, PERT and crashing of networks. 6. Acquire knowledge on various types of contracts, tenders.	6. Understand the objectives, functions and principles of management in projects. 7. Practice the network techniques like CPM and PERT for better planning and scheduling of engineering works. 8. Analyse the importance of cost and time in network analysis and planning the work accordingly. 9. Knowledge on Contracts, Tenders, and Work orders related to the projects. 10. Interpret the concept of Linear Programming and solve problems by Graphical and Simplex methods.

UNIT-I

Significance of Project Management: Objectives and functions of project management, management team, principles of organization and types of organisation.

UNIT-II

Project Planning: Project Planning, bar charts, network techniques in project 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

UNIT-IV

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

UNIT-V

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

Learning Resources:

5. Srinath L.S., PERT and CPM: Principles and Application, East-West Press, 2001.
6. Peret, F, Construction Project Management an Integrated approach, Taylor and Francis, Taylor and Francis Group, London & New York, 2009
7. Punmia B.C., and Khandelwal, PERT and CPM, Laxmi Publications, 2006.

8. http://nptel.ac.in/courses/

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 Test: 90 minutes

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
9-5-81, Ibrahimbagh, Hyderbad-500031, Telangana State

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING
INTRODUCTION TO DATABASES (OPEN ELECTIVE-IV)

SYLLABUS FOR B.E. VI-SEMESTER
(COMMON FOR CIVIL, ECE, EEE & MECH)

L:T: P (Hrs/Week):3:0:0	SEE Marks: 60	Course Code: **U18OE610CS**
Credits: 3	CIE Marks: 40	Duration of SEE : 3 Hours

COURSE OBJECTIVES	**COURSE OUTCOMES** On completion of the course, students will be able to
1. Identify different issues involved in the design and implementation of a database system. 2. Understand transaction processing.	1. Identify the functional components of database management system. Create conceptual data model using Entity Relationship Diagram 2. Transform a conceptual data model into a relational model 3.Design database using normalization techniques 4.Apply indexing and hashing techniques for effective data retrieval 5. Explain transaction processing.

UNIT-I

Introduction: Database System Application, Purpose of Database Systems, View of Data, Database Languages, Relational Database, Database Architecture, Database Users and Administrators.

Database Design and E-R Model: Overview of the Design Process, the E-R Model, Constraints, E-R Diagrams.

UNIT-II

Relational Model: Structure of Relation Database, Relational Algebra

Operations, Modification of the Database.
Structured Query Language: Introduction, Basic Structure of SQL Queries, Set Operations, Aggregate Functions, Null Values, Nested Sub queries, Views, Join Expressions.

UNIT-III
Relational Database Design: Features of Good Relational Designs, Atomic Domains and first Normal form, Decomposition Using Functional Dependencies, functional Dependency Theory.

UNIT-IV
Indexing and Hashing: Basic Concepts, Ordered Indices, B+ Tree Index Files, B-Tree Files, Multiple – Key Access, Static Hashing, Dynamic Hashing, Comparison of Ordered Indexing and Hashing.

UNIT-V
Transaction Management: Transaction concept, Storage Structure, Transaction Atomicity and Durability, Transaction Isolation and Atomicity, Serializability, Recoverability.

Learning Resources:

1. Abraham Silberschatz, Henry F Korth, Sudharshan S, Database System Concepts, 6th Edition(2011), McGraw-Hill International Edition.
2. Date CJ, Kannan A, Swamynathan S, An Introduction to Database System , 8th Edition(2006) Pearson Education.
3. Raghu Ramakrishna, and Johannes Gehrke, Database Management Systems, 3rd Edition(2003), McGraw Hill.
4. RamezElmasri, Durvasul VLN Somyazulu, Shamkant B Navathe, Shyam K Gupta, Fundamentals of Database Systems, 4th Edition(2006), Pearson Education.
5. Peter rob, Carlos coronel, Database Systems, (2007), Thomoson.
6. http://nptel.ac.in/courses/106106093/

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 Test: 90 minutes

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
9-5-81, Ibrahimbagh, Hyderbad-500031, Telangana State
DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING
INTRODUCTION TO OPERATING SYSTEMS (OPEN ELECTIVE-IV)

SYLLABUS FOR B.E. VI-SEMESTER
(COMMON FOR CIVIL, ECE, EEE & MECH)

L:T: P (Hrs/Week):3:0:0	SEE Marks: 60	Course Code: **U18OE620CS**
Credits: 3	CIE Marks: 40	Duration of SEE : 3 Hours

COURSE OBJECTIVES	**COURSE OUTCOMES** On completion of the course, students will be able to
1. Understand different Operating system Structures and Services	1. Compare CPU scheduling algorithms and Operating system structures 2. Apply different techniques for Main memory management. 3.Describe file management techniques. 4. Describe deadlock handling methods 5. Analyze Disk scheduling algorithms and I/O operation implementation techniques

UNIT-I:

Introduction to operating systems: Definition, User view and System view of the Operating system, Operating system structure, Operating system services.

Process: Process concept, Process Control block, Context switching.

CPU Scheduling: Scheduling Criteria, Scheduling Algorithms: FCFS, SJF, Round Robin

UNIT-II:

Memory Management: Swapping, Contiguous memory allocation: Fixed Partitioning, Variable Partitioning. Non-Contiguous memory allocation: Paging.

Virtual memory: Demand paging, Page replacement Algorithms: FIFO, Optimal, LRU.

UNIT –III:

File System Interface: File Concept, Access Methods: Sequential, Indexed, and Direct

File System Implementation: File-System Structure, Allocation Methods: Contiguous, Linked and Indexed.

UNIT –IV:

Deadlocks: System model, deadlock characterization: Mutual Exclusion, Hold and Wait,

Non pre-emption, Circular wait. Deadlock Prevention, Deadlock Avoidance: Banker's algorithm.

UNIT-V:

Device Management: Disk Scheduling algorithms: FCFS, SSTF, SCAN.

I/O System: I/O hardware, Application I/O Interface.

Learning Resources:

1. Abraham Silberschatz, Peter B. Galvin, Greg Gagne, *Operating System Concepts*, 9th Edition (2016), Wiley India.
2. Andrew S. Tanenbaum, *Modern Operating Systems*, 2nd Edition (2001), Pearson Education, Asia.
3. Dhananjay, Dhamdhere.M, *Operating System-concept based approach*, 3rd edition (2009), Tata McGraw Hill, Asia
4. Robet Love: *Linux Kernel Development*, (2004)Pearson Education
5. Richard Stevens, Stephen Rago, *Advanced Programming in the UNIX Environment*, 3rd Edition(2013), Pearson Education
6. http://web.stanford.edu/~ouster/cgi-bin/cs140-spring19/index.php

https://nptel.ac.in/courses/106106144/

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 Test: 90 minutes

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
9-5-81, Ibrahimbagh, Hyderbad-500031, Telangana State

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING
Internet of Things and Applications (OPEN ELECTIVE – IV)

SYLLABUS FOR B.E.VI-SEMESTER (for other branches)

L:T: P (Hrs/Week):3:0:0	SEE Marks: 60	Course Code: **U18OE610EC**
Credits: 3	CIE Marks: 40	Duration of SEE : 3 Hours

COURSE OBJECTIVES	**COURSE OUTCOMES** On completion of the course, students will be able to
1. The purpose of this course is to impart knowledge on IoT Architecture, practical constrains. 2. To study various protocols And to study their implementations	1. Understand the Architectural Overview of IoT 2. Enumerate the need and the challenges in Real World Design Constraints 3. Compare various IoT Protocols. 4. Build basic IoT applications using Raspberry Pi. 5. Understand IoT usage in various applications.

UNIT - I : OVERVIEW

Introduction to IoT – Improving Quality of life.

IoT-An Architectural Overview, M2M and IoT Technology Fundamentals-Devices and gateways, Local and wide area networking, Data management, Business processes in IoT.

UNIT - II : Real-World Design Constraints

Real-World Design Constraints- Introduction, Technical Design constraints-hardware is popular again, Data representation and visualization, Interaction and remote control. Power Management in IoT device, Power conditioning using energy harvesting.

UNIT - III : IOT PROTOCOLS

Introduction to MQTT, Quality of services in MQTT, standards and security in MQTT.

Introduction and implementation of AMQP, Implementation of CoAP and MDNS.

UNIT - IV : Device for IoT

Choice of Microcontroller, Introduction to Raspberry Pi ,Features of Pi, Programming platform, Phython programming for Pi. Building basic IoT Applications using Raspberry Pi.

UNIT - V : IoT case studies

Smart Cities and Smart Homes, Connected Vehicles, Agriculture, Healthcare, Activity Monitoring.

Learning Resources:

1. Jan Holler, VlasiosTsiatsis, Catherine Mulligan, Stefan Avesand, StamatisKarnouskos, David Boyle, "From Machine-to-Machine to the Internet of Things: Introduction to a New Age of Intelligence", 1 st Edition, Academic Press, 2014.
2. Peter Waher, "Learning Internet of Things", PACKT publishing, BIRMINGHAM – MUMBAI
3. Bernd Scholz-Reiter, Florian Michahelles, "Architecting the Internet of Things", ISBN 978-3-642-19156-5 e-ISBN 978-3-642-19157-2, Springer
4. Daniel Minoli, "Building the Internet of Things with IPv6 and MIPv6: The Evolving World of M2M Communications", ISBN: 978-1-118- 47347-4, Willy Publications
5. https://nptel.ac.in/courses/106105166/5
6. https://nptel.ac.in/courses/108108098/4

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 Test: 90 minutes

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
9-5-81, Ibrahimbagh, Hyderbad-500031, Telangana State

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING
Introduction to Mobile Communications (OPEN ELECTIVE - IV)

SYLLABUS FOR B.E. VI - SEMESTER (for other branches)

L:T: P (Hrs/Week):3:0:0	SEE Marks: 60	Course Code: **U18OE620EC**
Credits: 3	CIE Marks: 40	Duration of SEE : 3 Hours

COURSE OBJECTIVES	**COURSE OUTCOMES** On completion of the course, students will be able to
1. To understand the technology trends changing from generation to generation. 2. To have an insight into the various propagation models and the effects of fading. 3. To understand the multiple access techniques and Mobile communication system specifications.	1. Analyze various methodologies to improve the cellular capacity. 2. Identify various Propagation effects. 3. Identify the effects of fading and multi path propagation. 4. Categorize various multiple access techniques for Mobile Communications. 5. Analyze the specifications of GSM based Mobile Communication Systems.

UNIT - I:

Introduction to Wireless Communication Systems: Evolution of Mobile Radio Communications, Examples of Wireless Communications Systems, Trends in Cellular Radio and Personal Communication Systems.

The Cellular Concept – System Design Fundamentals: Introduction, Frequency Reuse, Channel Assignment Strategies, Handoff Strategies, Interference and System Capacity, Improving Coverage and Capacity in Cellular Systems.

UNIT - II:

Mobile Radio Propagation - Large Scale Path Loss: Introduction to Radio wave Propagation, Free Space Propagation Model, Reflection, Ground Reflection (Two-Ray) Model, Diffraction, Scattering.

UNIT - III:

Mobile Radio Propagation - Small Scale Fading and Multipath: Small Scale Multipath Propagation, Small – Scale Multipath Measurements, Parameters of Mobile Multipath Channels, Types of Small-Scale Fading, Rayleigh and Ricean Distributions.

UNIT -IV:

Multiple Access Techniques for Wireless Communications: Introduction, Frequency Division Multiple Access (FDMA), Time Division Multiple Access (TDMA), Code Division Multiple Access (CDMA), Space Division Multiple Access (SDMA).

UNIT -V:

Wireless Systems and Standards: Global System for Mobile (GSM) – Services and features, System architecture, GSM Radio subsystem, channel types, Frame structure for GSM.

Learning Resources:

1. Theodore S. Rappaport, Wireless Communications Principles and Practices, 2nd edition, Pearson Education.
2. David Tse, Pramodh Viswanath, Fundamentals of Wireless Communication, 2005, Cambridge University Press.
3. Name of the course: Introduction to Wireless and Cellular Communications
4. Course url: https://swayam.gov.in/nd1_noc19_ee48/preview

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 Test: 90 minutes

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
9-5-81, Ibrahimbagh, Hyderbad-500031, Telangana State

DEPARTMENT OF INFORMATION TECHNOLOGY
INTRODUCTION TO WEB APPLICATION DEVELOPMENT (OPEN ELECTIVE-V)

SYLLABUS FOR B.E.VI-SEMESTER (Common for CIVIL, ECE, EEE & MECH)

L:T: P (Hrs/Week):3:0:0	SEE Marks: 60	Course Code: **U18OE610IT**
Credits: 3	CIE Marks: 40	Duration of SEE : 3 Hours

COURSE OBJECTIVES The objectives of this course are to:	**COURSE OUTCOMES** On completion of the course, students will be able to
Acquire basic skills for designing static and dynamic Web Applications using HTML, CSS , Java script and PHP.	1. Design a static web pages using HTML, CSS. 2. Use JavaScript for creating dynamic web pages and client side validation. 3. Use built-in functions of PHP to perform server side validations and sending emails. 4. Use built-in functions of PHP to connect , query and fetch results from a database. 5. Build a PHP application using an MVC Framework.

UNIT-I: Introduction

Introduction: World Wide Web, Web Browsers, Web Servers, URL, HTTP, TCP Port. HTML: Standard HTML document structure, Basic Tags, Images, Hypertext Links, Lists, Tables, Frames. CSS: In-line style sheets, Internal Style sheets and External Style sheets.

UNIT-II: Basics of JavaScript

JavaScript: Introduction, Basics of JavaScript-variables, data types and operators, Control Structures, Arrays, Functions, HTML Forms, Events and

event handling.

UNIT-III: Basics of PHP

Basics of PHP: Data Types, Variables and Operators, Control Structures: If else, Switch Case. Loop: For, ForEach, While, Do While. Functions in PHP, PHP Forms, Cookies & Sessions, File Processing.

UNIT-IV: Advanced PHP

Advanced PHP: PHP E-Mail, Filters, Database Access, OOPS in PHP. Application using PHP.

UNIT-V: Introduction to MVC

Introduction to Model View Controller Architecture, Building Application using a PHP Framework, Testing and Deploying a PHP application.

Learning Resources:

1. "Web Technologies", 7th Edition, Uttam K.Roy,2012.
2. "Internet & World Wide Web How to Program", 5/e, Paul J. Deitel, Harvey M. Deitel, Abbey Deitel,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 Test: 90 minutes

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
9-5-81, Ibrahimbagh, Hyderbad-500031, Telangana State

DEPARTMENT OF INFORMATION TECHNOLOGY

INTRODUCTION TO MACHINE LEARNING (OPEN ELECTIVE-V)
SYLLABUS FOR B.E VI- SEMESTER (Common for CIVIL, ECE, EEE & MECH)

L:T: P (Hrs/Week):3:0:0	SEE Marks: 60	Course Code: **U18OE620IT**
Credits: 3	CIE Marks: 40	Duration of SEE : 3 Hours

COURSE OBJECTIVES The objectives of this course are to:	**COURSE OUTCOMES** On completion of the course, students will be able to
Introduce the fundamental concepts and approaches in Artificial intelligence and Machine Learning field to effectively apply techniques to the real-world problems.	1. Demonstrate knowledge of the Artificial intelligence and machine learning literature. 2. Apply an appropriate algorithm for a given problem. 3. Apply machine learning techniques in the design of computer systems. 4. Prove basic results in the theory of learning 5. Explain the relative strengths and weaknesses of different machine learning methods and approaches.

UNIT-I:

Introduction to AIML: Foundations of AI, Sub areas of AI, Applications. Introduction to learning, Types of Learning: Supervised Learning, Unsupervised Learning, Reinforcement Learning.

Supervised learning: Linear Regression, Logistic Regression.

UNIT-II:

Supervised Non-parametric learning: Introduction to Decision Trees, K-Nearest Neighbor, Feature Selection.

Supervised Parametric learning: Support Vector Machine, Kernel function and Kernel SVM.

UNIT-III:

Supervised Parametric learning (Neural networks): Perceptron, Multilayer Neural Network, Backpropagation.

UNIT-IV:

Supervised Parametric Bayesian learning: Introduction, Naive Bayes Classification, Bayesian Network.

UNIT-V:

Unsupervised leaning: Clustering, K-means Clustering, DBSCAN

Learning Resources:

1. Tom Mitchell, Machine Learning, First Edition, McGraw-Hill, 1997
2. Christopher Bishop. Pattern Recognition and Machine Learning. Second Edition.
3. EthemAlpaydin , Introduction to Machine Learning, Second Edition
4. T. Hastie, R. Tibshirani, J. Friedman. The Elements of Statistical Learning, 2e, 2008.
5. http://nptel.ac.in/courses/106106139/

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 Test: 90 minutes

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)
9-5-81, Ibrahimbagh, Hyderbad-500031, Telangana State

DEPARTMENT OF MECHANICAL ENGINEERING
Additive Manufacturing and its Applications (Open Elective-IV)

SYLLABUS FOR B.E.VI-SEMESTER

L:T: P (Hrs/Week):3:0:0	SEE Marks: 60	Course Code: **U18OE610ME**
Credits: 3	CIE Marks: 40	Duration of SEE : 3 Hours

COURSE OBJECTIVES The objectives of this course are to:	**COURSE OUTCOMES** On completion of the course, students will be able to
understand the fundamentals of various additive manufacturing technologies and their applications in Engineering Industry.	1. understand the fundamentals of prototyping. 2. study the principle, process, advantages and limitations of liquid based AM systems. 3. study the principle, process, advantages and limitations of solid based AM systems. 4. study the principle, process, advantages and limitations of powder based AM systems. 5. study the applications of AMT in various engineering industries.

UNIT-I

Introduction, Prototyping fundamentals, Historical development, Fundamentals of rapid prototyping, Advantages of Rapid prototyping, Commonly used terms, Rapid prototyping process chain, 3D modelling, Data Conversion, and transmission, Checking and preparing, Building, Post processing, AM data formats, Classification of AM process

UNIT-II

Liquid based AM systems: Stereolithography Apparatus(SLA): Models and specifications, Process, Working principle, photopolymers, Photopolymerisation, Layering technology, laser and laser scanning, Applications, Advantages and disadvantages, Case studies

Solid ground curing(SGC): Models and specifications, Process, Working principle, Applications, Advantages and disadvantages, Case studies

UNIT-III

Solid based AM systems: Laminated object manufacturing(LOM): Models and specifications, Process, Working principle, Applications, Advantages and disadvantages, Case studies.

Fused Deposition Modeling (FDM): Models and specifications, Process, Working principle, Applications, Advantages and disadvantages, Case studies.

UNIT-IV

Powder based AM systems: Selective laser sintering(SLS): Models and specifications, Process, Working principle, Applications, Advantages and disadvantages, Case studies.

Three dimensional printing (3DP): Models and specifications, Process, Working principle, Applications, Advantages and disadvantages, Case studies.

UNIT-V

Applications of AM systems: Applications in aerospace industry, automotive industry, jewellery industry, coin industry, GIS Application, arts and architecture.

RP medical and bio engineering Application: planning and simulation of complex surgery, customized implant and prosthesis , design and production of medical devices, forensic science and anthropology, visualization of bio-molecules.

Learning Resources:

1. Chua C.K., Leong K.F. abd LIM C.S., "World Rapid prototyping : Principles and Applications", 2nd Editon, Scientific Publications, 2004
2. D.T.Pham and S.S.Dimov, "Rapid Manufacturing", Springer, 2001.
3. AmithabaGhose, "Rapid prototyping", Eastern Law House, 1997.
4. Paul F.Jacobs, "Stereolithography and other RP & M Technologies", ASME Press, 1996.
5. Paul F.Jacobs, "Rapid Prototyping & Manufacturing", ASME Press, 1996.

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

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

Duration of Internal Test: 90 minutes

DEPARTMENT OF MECHANICAL ENGINEERING

Industrial Administration and Financial Management (Open Elective-IV)

SYLLABUS FOR B.E.VI-SEMESTER

L:T: P (Hrs/Week):3:0:0	SEE Marks: 60	Course Code: **U18OE620ME**
Credits: 3	CIE Marks: 40	Duration of SEE : 3 Hours

COURSE OBJECTIVES The objectives of this course are to:	**COURSE OUTCOMES** On completion of the course, students will be able to
1. aware about types of business forms, organization structures, plant layouts, merits, demerits and applications. 2. understand method study procedure, PME, time study techniques and wage incentives. 3. importance of PPC and improving quality by control charts and sampling plants. 4. optimization of inventory to minimize total cost and other optimization techniques like LPP, project management techniques. 5. estimate selling price of a product, TVM and budgeting techniques, depreciation methods.	1. understand business forms, organization structures and plant layouts. 2. implementation of method study and estimation of standard time. 3. understand types of production, functions of PPC, quality control by charts and sampling. 4. implement optimization techniques like LPP, assignment and project management techniques. 5. understand BEA, estimation of depreciation, selling price of a product and capital budgeting techniques.

UNIT – I

Industrial Organization : Types of various business organisations. Organisation structures and their relative merits and demerits. Functions of management.

Plant location and layouts: Factors affecting the location of plant and layout. Types of layouts and their merits and demerits.

UNIT – II

Work study: Definitions, Objectives of method study and time study. Steps in conducting method study. Symbols and charts used in method study.

Principles of motion economy. Calculation of standard time– by– time study and work sampling. Performance rating factor. Types of ratings. Jobs evaluation and performance appraisal. Wages, incentives, bonus, wage payment plans.

UNIT – III

Inspection and quality control: Types and objectives of inspection S.Q.C., its principles quality control by chart and sampling plans. Quality circles, introduction to ISO.

Production planning and control: Types of manufacture. Types of production. Principles of PPC and its function. Production control charts.

UNIT – IV

Optimisation: Introduction to linear programming and graphical solutions. Assignment problems.

Project Management: Introduction to CPM and PERT. Determination of critical path.

Material Management: Classification of materials. Materials planning. Duties of purchase manager. Determination of economic order quantities. Types of materials purchase.

UNIT – V

Cost accounting: elements of cost. Various costs. Types of overheads. Break even analysis and its applications. Depreciation. Methods of calculating depreciation fund. Nature of financial management. Time value of money. Techniques of capital budgeting and methods. Cost of capital. financial leverage.

Learning Resources:

1. Pandey I.M., "Elements of Financial Management", Vikas Publ. House, New Delhi, 1994
2. Khanna O.P., "Industrial Engineering and Management", Dhanapat Rai & Sons.
3. Everrete E Admaa & Ronald J Ebert , "production and Operations Management", 5th Ed. , PHI , 2005
4. S N Chary, "Production and Operations Management", 3rd Ed. , Tata McGraw Hill, , 2006
5. Pannerselvam, "production and Operations Management", Pearson Education, 2007

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Duration of Internal Test: 90 minutes

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

DEPARTMENT OF HUMANITIES AND SOCIAL SCIENCES
(OPEN ELECTIVE) - B.E 3/4 -VI SEMESTER

ENGLISH FOR COMPETITIVE EXAMINATIONS
(Common to all branches)

L: T: P (Hrs/Week): 3:0:0	SEE Marks: 60	Course Code: U18OE610EH
Credits: 3	CIE Marks: 40	Duration of SEE: Hours: 3

COURSE OBJECTIVES	COURSE OUTCOMES
The course will enable the students to:	**On completion of the course, students will be able to:**
➢ To familiarise the students to various types of competitive examinations.	➢ The student will be able to solve various types of questions in competitive English examinations effectively.
➢ To practice questions and prepare for GATE, GRE, CAT, TOEFL.	➢ Provide logical conclusions for the questions on aptitude and reasoning within the stipulated time.

GATE :

- Concentrating on English grammar
- Recognizing suitable option in sentence completion
- Solving verbal analogies
- Categorizing word groups
- Ignoring distractions in critical reasoning questions
- Providing reasoning in verbal deduction

GRE :

VERBAL REASONING:

- Analysing and drawing add value to incomplete data; identify the perception of the author
- Identifying vital points and differentiating between relevant and irrelevant points
- Understanding and summarising the structure of a text
- Understanding the given words, sentences and entire texts; ability to focus on the meaning of the entire sentence
- Understanding relationships among words and concepts

ANALYTICAL WRITING:

- Articulating complex ideas effectively and with clarity
- Supporting ideas with relevant reasons and examples
- Examining claims and accompanying evidence
- Sustaining a well-focused, coherent discussion

CAT :

VERBAL ABILITY AND READING COMPREHENSION:

- Reading comprehension (antonyms/synonyms)
- Sentence correction
- Fill in the blanks & cloze passage
- Jumbled sentences
- Jumbled paragraph (word meaning based questions)
- Analogies
- Para odd one out
- Summary (facts, assumptions, judgements
- Verbal reasoning (paragraph formation)

TOEFL:

- Basic understanding, speed and accuracy, learning from reading, pronoun reference, author's point of view.

- Good delivery including clarity of speech, fluidity, natural pacing and correct intonation patterns.
- Correct use of language showing a good grasp of grammar, vocabulary and speech structures.
- Topic development in which you are able to show a well-structured. organized response that effectively connects ideas with enough support for each point you are making.
- Writing strategy and format execution skills.

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