COURSE STRUCTURE & DETAILED SYLLABUS

ACE - R20

CIVIL ENGINEERING

B. TECH FOUR YEAR DEGREE COURSE

STRUCTURE & SYLLABUS

(2020 Batch)

II Year II Semester

ACE

Engineering College

Ankushapur(V), Ghatkesar(M) - 501 301

(An Autonomous Institution, Affiliated to JNTUH ,Hyderabad)

ACE
Engineering College
Ankushapur(V), Ghatkesar(M), Medchal.Dist - 501 301
(Autonomous)
B.TECH. FOUR YEAR DEGREE COURSE
CIVIL ENGINEERING
COURSE STRUCTURE
II Year II Semester

II Year							II Semester
S.No	Course Type	Course Code	Course Title	Periods Per Week			Credits
				L	T	P	
1	ESC	EE401ES	Principles of Electrical and Electronics Engineering	3	0	0	3
2	ESC	CE402ES	Basic Mechanical Engineering for Civil Engineers	2	0	0	2
3	PCC	CE403PC	Building Materials, Construction and Planning	3	0	0	3
4	PCC	CE404PC	Strength of Materials – II	3	0	0	3
5	PCC	CE405PC	Hydraulics and Hydraulic Machinery	3	0	0	3
6	PCC	CE406PC	Structural Analysis – I	3	0	0	3
7	PCC	CE407PC	Computer Aided Civil Engineering Drawing	0	0	3	1.5
8	ESC	EE409ES	Principles of Electrical and Electronics Engineering Lab	0	0	2	1
9	PCC	CE409PC	Hydraulics and Hydraulic Machinery Lab	0	0	3	1.5
10	MC	MC409	Gender Sensitization Lab	0	0	2	0
Total				**17**	**0**	**10**	**21**

EE401ES: PRINCIPLES OF ELECTRICAL AND ELECTRONICS ENGINEERING

B.Tech II Year II Semester								
Course Code	Category	Hours/Week			Credits	Max Marks		
EE401ES	Core	L	T	P	C	Cia	See	Total
		3	0	0	3	30	70	100
Contact Classes : 45	Tutorial Classes : 15	Practical Classes : Nil				Total Classes : 60		

Prerequisite : Principles Of Electrical And Electronics Engineering

Course Objectives:

1. To introduce the concepts of electrical circuits and its components
2. To understand magnetic circuits, DC circuits and AC single phase & three phase circuits and different types of DC/AC machines and Transformers.
3. To import the knowledge of various electrical installations.
4. To introduce the concepts of diodes & rectifiers, and to impart the knowledge of various configurations, characteristics & applications.

Course Outcomes:

1. To analyze electrical circuits using network laws and theorems.
2. To understand and analyze basic Electric and Magnetic circuits and to study the working principles of Electrical Machines.
3. To introduce components of Low Voltage Electrical Installations.
4. To identify and characterize Diodes and Rectifiers.
5. To identify and characterize various types of Transistors.

Unit-II	DC Circuits and A.C. Circuits	No. of classes : 12

D.C. CIRCUITS: Ohms law, Electrical circuit elements (R, L and C), voltage and current sources, KVL&KCL, Network reduction techniques, analysis of simple circuits with dc excitation.

A.C. CIRCUITS: Representation of sinusoidal waveforms, peak and rms values, phasor representation, real power, reactive power, apparent power, power factor, Analysis of single-phase ac circuits , Three-phase balanced circuits, voltage and current relations in star and delta connections.

Unit : II	Electrical Machines	No. of classes :12

Working principle of Single-phase transformer, equivalent circuit, losses in transformers, efficiency, Three-phase transformer connections. Construction and working principle of DC generators, EMF equation, working principle of DC motors, Torque equations and Speed control of DC motors, Construction and working principle of Three-phase Induction motor, Torques equations and Speed control of Three-phase induction motor. Construction and working principle of synchronous generators.

Unit : III	Electrical Installations	No. of classes :12

Components of LT Switchgear: Switch Fuse Unit (SFU), MCB, ELCB, MCCB, Types of Wires and Cables, Earthing. Energy storage devices: Lead acid cell battery, Nickle cadmium battery, Lithium ion battery, Important Characteristics for Batteries. Elementary calculations for energy consumption for residential load, power factor improvement and battery backup.

Unit: IV	Diodes & Rectifiers	No. of classes :12

Diodes: Principle of Operation Diode equation, Volt-Ampere characteristics, Temperature dependence, Ideal versus practical, Static and dynamic resistances, Equivalent circuit, Zener diode characteristics and applications.

Rectifiers: P-N junction as a rectifier - Half Wave Rectifier, Ripple Factor - Full Wave Rectifier, Bridge Rectifier, Harmonic components in Rectifier Circuits, Filters – Inductor Filters, Capacitor Filters, L- section Filters, π- section Filters

Unit : V	**Transistors**	**No. of classes :12**

Bipolar Junction Transistor (BJT): Construction, Principle of Operation, Static characteristics, BJT as a switch, BJT as a amplifier, CE, CB and CC configurations, Comparison of CE, CB and CC configurations.
Field Effect Transistor (FET): Construction, Principle of Operation, Static characteristics, FET as a switch, FET as a amplifier.
Construction and Principle of Operation of MOSFET, IGBT.
Comparison of BJT, FET, MOSFET and IGBT.

Text Books :

1. M S Sukija TK Nagasarkar - Basic Electrical and electronics Engineering - Oxford University, 3rd Edition, sep-2018.
2. D P Kothari. I J Nagarath - Basic Electrical and electronics Engineering- McGraw Hill Education, 4th addition, 2019.

Reference Books :

1. N. C. Jagan& C. Lakshminarayana - Network Theory, B.S. Publications –2017.
2. William Hayt and Jack E. Kemmerly -Engineering circuit analysis, McGraw Hill Company, 6th edition -2013.
3. R. L. Boylestad and Louis Nashelsky - Electronic Devices and Circuits, PEI/PHI, 9th Ed, 2006.
4. Raymond A. De Carlo and Pen-Min-Lin - Linear circuit analysis (time domain phasor and Laplace transform approaches) - by, Oxford University Press-2nd edition - 2004.

Web References :

1. https://nptel.ac.in/courses/basic_electrical engineering
2. https://nptel.ac.in/courses/Basic Electronics
3. https://www.sciencedirect.com/book/9780750646376/electrical-engineers-reference-book
4. https://www.pdfdrive.com/basic-electrical-engineering-books.html

CE402ES: BASIC MECHANICAL ENGINEERING FOR CIVIL ENGINEERS

B.Tech. II Year II Semester								
Course Code	Category	Hours/Week			Credits	Maximum Marks		
CE402ES	ESC	L	T	P	C	CIA	SEE	Total
		2	0	0	2	30	70	100
Contact Classes: 30	Tutorial Classes: 0	Practical Classes: 0				Total Classes: 30		

Prerequisite: Engineering Mechanics, Engineering Workshop & Engineering Physics.

Course Objectives: To familiarize civil engineering students with the

- Basic machine elements,
- Sources of Energy and Power Generation,
- Various manufacturing processes,
- Power transmission elements, material handling equipment.

Course Outcome: At the end of the course Student will able

- To understand the mechanical equipment for the usage at civil engineering systems,
- To familiarize with the general principles and requirement for refrigeratio manufacturing,
- To realize the techniques employed to construct civil engineering systems.

Unit: I	Introduction to Engineering Materials	No. of Classes: 06

Machine Elements: Cams: Types of cams and followers
Introduction to engineering materials-Metals, ceramics, composites-Heat treatment of metals Riveted joints- methods of failure of riveted joints-strength equations-efficiency of riveted joints - eccentrically loaded riveted joints.

Unit: II	Power Transmission Elements & Material Handling equipment	No. of Classes: 06

Power Transmission Elements: Gears terminology of spur, helical and bevel gears, gear trains. Belt drives (types). Chain drives.
Material Handling equipment: Introduction to Belt conveyors, cranes, industrial trucks, bull dozers.

Unit: III	Energy: Power Generation	No. of Classes: 06

Energy: Power Generation: External and internal combustion engines (layouts, element/component description, advantages, disadvantages, applications).
Refrigeration: Mechanical Refrigeration and types – units of refrigeration – Air Refrigeration system, details and principle of operation –calculation of COP
Modes and mechanisms of heat transfer – Basic laws of heat transfer –General discussion about applications of heat transfer.

Unit: IV	Manufacturing Processes, Welding, Casting	No. of Classes: 06

Manufacturing Processes: Sheet Metal Work: Introduction – Equipments – Tools and accessories – Various processes (applications, advantages / disadvantages).
Welding: Types – Equipments –Techniques employed –welding positions-defects-applications, advantages / disadvantages – Gas cutting – Brazing and soldering.
Casting: Types, equipments, applications

Unit: V	Machine Tools	No. of Classes: 06

Machine Tools: Introduction to lathe, drilling machine, milling machine, grinding machine-Operations performed.

Text Books:

1. Kumar, T., Leenus Jesu Martin and Murali, G., Basic Mechanical Engineering, Suma Publications, Chennai, 2007.

Reference Books:

1. Prabhu, T. J., Jai Ganesh, V. and Jebaraj, S., Basic Mechanical Engineering, SciTech Publications, Chennai, 2000.
2. Hajra Choudhary, S.K. and Hajra Choudhary, A. K., Elements of Workshop Technology Vols. I &II, Indian Book Distributing Company Calcutta,2007.
3. Nag, P.K., Power Plant Engineering, Tata McGraw-Hill, New Delhi,2008.
4. Rattan, S.S., Theory of Machines, Tata McGraw-Hill, New Delhi,2010.

Web References:

1. https://www.pdfdrive.com/basic-civil-and-mechanical-engineering-e57923705.html
2. https://www.studynama.com/community/threads/basic-mechanical-and-civil-engineering-quick-revision-pdf-notes-book-ebook-for-btech-first-year-free-download.447/
3. https://nptel.ac.in/courses/112/107/112107083/
4. https://nptel.ac.in/courses/112/104/112104219/
5. https://nptel.ac.in/courses/112/103/112103263/
6. https://nptel.ac.in/courses/112/106/112106293/

E-Text Books:

1. https://examupdates.in/elements-of-mechanical-engineering/
2. https://dl.flipkart.com/dl/basic-mechanical-engineering-civil-engineers-b-tech-ii-year-ii-sem-ce-r18-jntu-hyderabad-latest-2020/p/itmdae05cd9ac5c3?pid=RBKFZZ5U9SDFXEQF&cmpid=product.share.pp

CE403PC: BUILDING MATERIALS, CONSTRUCTION AND PLANNING

B.Tech. II Year II Semester								
Course Code	Category	Hours/Week			Credits	Maximum Marks		
CE403PC	PCC	L	T	P	C	CIA	SEE	Total
		3	0	0	3	30	70	100
Contact Classes: 45	Tutorial Classes: 0	Practical Classes: 0				Total Classes: 45		

Prerequisite: Engineering Physics, Chemistry.

Course Objectives: The objectives of the course is to

- List the construction material.
- Explain different construction techniques
- Understand the building bye-laws
- Highlight the smart building materials

Course Outcomes: After the completion of the course student should be able to

- Define the Basic terminology that is used in the industry
- Categorize different building materials, properties and their uses
- Understand the Prevention of damage measures and good workmanship
- Explain different building services

Unit: I	Stones and Bricks, Tiles	No. of Classes: 09

Stones and Bricks, Tiles: Building stones – classifications and quarrying – properties – structural requirements – dressing. Bricks – Composition of Brick earth – manufacture and structural requirements, Fly ash, Ceramics.

Timber, Aluminum, Glass, Paints and Plastics: Wood - structure – types and properties – seasoning – defects; alternate materials for Timber – GI / fibre – reinforced glass bricks, steel & aluminum, Plastics.

Unit: II	Cement & Admixtures	No. of Classes: 09

Cement & Admixtures: Ingredients of cement – manufacture – Chemical composition – Hydration - field & lab tests. Admixtures – mineral & chemical admixtures – uses.

Unit: III	Building Components & Building Services	No. of Classes: 09

Building Components: Lintels, Arches, walls, vaults – stair cases – types of floors, types of roofs flat, curved, trussed; foundations – types; Damp Proof Course; Joinery – doors – windows materials – types.

Building Services: Plumbing Services: Water Distribution, Sanitary – Lines & Fittings; Ventilations: Functional requirements systems of ventilations. Air-conditioning - Essentials and Types; Acoustics – characteristic – absorption – Acoustic design; Fire protection – Fire Hazards – Classification of fire- resistant materials and constructions

Unit: IV	Mortars, Masonry and Finishing's Mortars	No. of Classes: 09

Mortars, Masonry and Finishing's Mortars: Lime and Cement Mortars Brick masonry – types – bonds; Stone masonry – types; Composite masonry – Brick-stone composite; Concrete, Reinforced brick.

Finishers: Plastering, Pointing, Painting, Claddings – Types – Tiles – ACP.

Form work: Types: Requirements – Standards – Scaffolding – Design; Shoring, Underpinning.

Unit: V	Building Planning	No. of Classes: 09

Building Planning: Principles of Building Planning, Classification of buildings and Building by laws.

Text Books:

1. Building Materials and Construction – Arora & Bindra, Dhanpat RoyPublications.
2. Building Materials and Construction by G C Sahu, Joygopal Jena McGraw hill Pvt Ltd2015.
3. Building Construction by B. C. Punmia, Ashok Kumar Jain and Arun Kumar Jain Laxmi Publications (P) ltd., NewDelhi.

Reference Books:

1. Building Materials by Duggal, New AgeInternational.
2. Building Materials by P. C. Varghese,PHI.
3. Building Construction by PC VarghesePHI.
4. Construction Technology – Vol – I & II by R. Chubby, Longman UK.
5. Alternate Building Materials and Technology, Jagadish, Venkatarama Reddy and others; New Age Publications.

Web References:

1. https://www.youtube.com/playlist?list=PL8BA090E69BF01BC2

E-Text Books:

1. https://www.pdfdrive.com/building-materials-construction-planning-textbook-free-e37863771.html
2. https://www.pdfdrive.com/construction-technology-and-building-materials-pdf-e33451551.html
3. https://www.pdfdrive.com/building-and-construction-materials-e7792156.html

CE404PC: STRENGTH OF MATERIALS – II

<table>
<tr><td colspan="8">B.Tech. II Year II Semester</td></tr>
<tr><td colspan="2">Course Code</td><td colspan="2">Category</td><td colspan="3">Hours/Week</td><td>Credits</td><td colspan="3">Maximum Marks</td></tr>
<tr><td colspan="2" rowspan="2">CE404PC</td><td colspan="2" rowspan="2">PCC</td><td>L</td><td>T</td><td>P</td><td>C</td><td>CIA</td><td>SEE</td><td>Total</td></tr>
<tr><td>3</td><td>0</td><td>0</td><td>3</td><td>30</td><td>70</td><td>100</td></tr>
<tr><td colspan="2">Contact Classes: 45</td><td colspan="2">Tutorial Classes: 0</td><td colspan="4">Practical Classes: 0</td><td colspan="3">Total Classes: 45</td></tr>
<tr><td colspan="11">Prerequisite: Engineering Mechanics and Strength of Materials - I</td></tr>
<tr><td colspan="11">Course Objectives: The objective of this Course is
• To understand the nature of stresses developed in simple geometries shafts, springs, columns & cylindrical and spherical shells for various types of simple loads
• To calculate the stability and elastic deformation occurring in various simple geometries for different types of loading.
• To understand the unsymmetrical bending and shear center importance for equilibrium conditions in a structural member of having different axis of symmetry.</td></tr>
<tr><td colspan="11">Course Outcome: On completion of the course, the student will be able to:
• Describe the concepts and principles, understand the theory of elasticity, and perform calculations, relative to the strength of structures and mechanical components in particular to torsion and direct compression;
• To evaluate the strains and deformation that will result due to the elastic stresses developed within the materials for simple types of loading
• Analyze strength and stability of structural members subjected to Direct, and Direct and Bending stresses;
• Understand and evaluate the shear center and unsymmetrical bending.
• Frame an idea to design a system, component, or process</td></tr>
<tr><td>Unit: I</td><td colspan="7">Torsion Of Circular Shafts & Springs</td><td colspan="3">No. of Classes: 09</td></tr>
<tr><td colspan="11">Torsion Of Circular Shafts: Theory of pure torsion – Derivation of Torsion equation - Assumptions made in the theory of pure torsion – Polar section modulus – Power transmitted by shafts – Combined bending and torsion – Design of shafts according to theories of failure.
Springs: Introduction – Types of springs – deflection of close and open coiled helical springs under axial pull and axial couple – springs in series and parallel.</td></tr>
<tr><td>Unit: II</td><td colspan="7">Columns and Struts, Beam Columns</td><td colspan="3">No. of Classes: 09</td></tr>
<tr><td colspan="11">Columns And Struts: Introduction – Types of columns – Short, medium and long columns – Axially loaded compression members – Crushing load – Euler’s theorem for long columns-assumptions- derivation of Euler’s critical load formulae for various end conditions – Equivalent length of a column – slenderness ratio – Euler’s critical stress – Limitations of Euler’s theory– Long columns subjected to eccentric loading – Secant formula – Empirical formulae — Rankine – Gordon formula- Straight line formula – Prof. Perry’s formula.
Beam Columns: Laterally loaded struts – subjected to uniformly distributed and concentrated loads.</td></tr>
<tr><td>Unit: III</td><td colspan="7">Direct And Bending Stresses</td><td colspan="3">No. of Classes: 09</td></tr>
<tr><td colspan="11">Direct And Bending Stresses: Stresses under the combined action of direct loading and bending moment, core of a section – determination of stresses in the case of retaining walls, chimneys and dams – conditions for stability-Overturning and sliding – stresses due to direct loading and bending moment about both axis.</td></tr>
</table>

Unit: IV	Thin Cylinders & Thick Cylinders	No. of Classes: 09
Thin Cylinders: Thin seamless cylindrical shells – Derivation of formula for longitudinal and circumferential stresses – hoop, longitudinal and Volumetric strains – changes in dia, and volume of thin cylinders – Thin spherical shells. Thick Cylinders: Introduction - Lame's theory for thick cylinders – Derivation of Lame's formulae – distribution of hoop and radial stresses across thickness – design of thick cylinders – compound cylinders – Necessary difference of radii for shrinkage.		
Unit: V	Unsymmetrical Bending & Shear Centre	No. of Classes: 09
Unsymmetrical Bending: Introduction – Centroidal principal axes of section –Moments of inertia referred to any set of rectangular axes – Stresses in beams subjected to unsymmetrical bending – Principal axes – Resolution of bending moment into two rectangular axes through the centroid – Location of neutral axis. Shear Centre: Introduction - Shear centre for symmetrical and unsymmetrical (channel, I, T and sections)		
Text Books: 1. Strength of Materials by R.K Rajput, S. Chand & CompanyLtd. 2. Mechanics of Materials by Dr. B. C Punmia, Dr. Ashok Kumar Jain and Dr. Arun KumarJain. 3. Strength of Materials by R. Subramanian, Oxford University Press.		
Reference Books: 1. Mechanics of Materials by R.C. Hibbeler, Pearson Education. 2. Engineering Mechanics of Solids by Popov E.P. Prentice-Hall Ltd. 3. Strength of Materials by T.D.Gunneswara Rao and M.Andal, Cambridge Publishers. 4. Strength of Materials by R. K. Bansal, Lakshmi Publications House Pvt. Ltd. 5. Fundamentals of Solid Mechanics by M. L. Gambhir, PHI Learning Pvt. Ltd.		
Web References: 1. nptel.ac.in/courses/105/105/105105108/		
E-Text Books: 1. civildatas.com/download/a-textbook-of-strength-of-materials-by-bansal 2. engineering108.com/Data/Engineering/Mechanical/SM/Strength_Of_Materials_parts_IandIi-Timoshenko.pdf		

CE405PC: HYDRAULICS AND HYDRAULIC MACHINERY

B.Tech. II Year II Semester								
Course Code	Category	Hours/Week			Credits	Maximum Marks		
		L	T	P	C	CIA	SEE	Total
CE405PC	PCC	3	0	0	3	30	70	100
Contact Classes: 45	Tutorial Classes: 0	Practical Classes: 0				Total Classes: 45		

Prerequisite: Fluid Mechanics.

Course Objectives: The objective of the course is

- To Define the fundamental principles of water conveyance in open channels.
- To Discuss and analyze the open channels in uniform and Non-uniform flow condition
- To Study the characteristics of hydroelectric power plant and its components.
- To analyze and design of hydraulic machinery and its modeling

Course Outcomes: At the end of the course the student will able to

- Apply their knowledge of fluid mechanics in addressing problems in open channels an hydraulic machinery.
- Understand and solve problems in uniform, gradually and rapidly varied flows in ope channel in steady state conditions.
- Apply dimensional analysis and to differentiate the model, prototype and similitu conditions for practical problems.
- Get the knowledge on different hydraulic machinery devices and its principles that wi be utilized in hydropower development and for other practical usages.

Unit: I	Open Channel Flow – I & Critical Flow	No. of Classes: 09

Open Channel Flow – I: Introduction to Open channel flow-Comparison between open channel flow and pipe flow, Classification of open channels, Classification of open channel flows, Velocity distribution. Uniform flow – Characteristics of uniform flow, Chezy's, Manning's and Bazin formulae for uniform flow – Factors affecting Manning's Roughness Coefficient "n". Most economical sections. Computation of Uniform flow, Normal depth.
Critical Flow: Specific energy – critical depth - computation of critical depth – critical, sub critical and super critical flows-Channel transitions.

Unit: II	Open Channel Flow – II & Rapidly varied flow	No. of Classes: 09

Open Channel Flow – II: Non-uniform flow – Gradually Varied Flow - Dynamic equation for G.V.F; Classification of channel bottom slopes – Classification and characteristics of Surface profiles – Computation of water surface profiles by Numerical and Analytical approaches. Direct step method. Rapidly varied flow: Elements and characteristics (Length and Height) of Hydraulic jump in rectangular channel– Types, applications and location of hydraulic jump, Energy dissipation and other uses – Positive and Negative Surges (Theory only).

Unit: III	Dimensional Analysis and Hydraulic Similitude	No. of Classes: 09

Dimensional Analysis and Hydraulic Similitude: Dimensional homogeneity – Rayleigh's method and Buckingham's pi methods – Dimensionless groups. Similitude, Model studies, Types of models. Application of dimensional analysis and model studies to fluid flow problems. Distorted models. Basics of Turbo Machinery: Hydrodynamic force of jets on stationary and moving flat, inclined and curved vanes, Jet striking centrally and at tip, Velocity triangles at inlet and outlet, expressions for work done and efficiency –Angular.

Unit: IV	Hydraulic Turbines – I & Hydraulic Turbines – II	No. of Classes: 09

Hydraulic Turbines – I: Elements of a typical Hydropower installation – Heads and efficiencies – Classification of turbines – Pelton wheel – Francis turbine – Kaplan turbine – working, working proportions, velocity diagram, work done and efficiency, hydraulic design. Draft tube – Classification, functions and efficiency.

Hydraulic Turbines – II: Governing of turbines – Surge tanks – Unit and specific turbines – Unit speed – Unit quantity – Unit power – Specific speed – Performance characteristics – Geometric similarity – Cavitation. Selection of turbines.

Unit: V	Centrifugal Pumps & Hydropower Engineering	No. of Classes: 09

Centrifugal Pumps: Pump installation details – classification – work done – Manometric head – minimum starting speed – losses and efficiencies – specific speed. Multistage pumps – pumps in parallel – performance of pumps – characteristic curves – NPSH – Cavitation.

Hydropower Engineering: Classification of Hydropower plants – Definition of terms – load factor, utilization factor, capacity factor, estimation of hydropower potential.

Text Books:

1. Fluid Mechanics by Modi and Seth, Standard BookHouse.
2. Fluid Mechanics and Hydraulic machines by Manish Kumar Goyal, PHI learning Private Limited,2015.
3. Fluid mechanics & Hydraulic Machines, Domkundwar & Domkundwar Dhanpat Rai& Co.

Reference Books:

1. Fluid Mechanics by R. C. Hibbeler, Pearson India Education Services Pvt. Ltd
2. Fluid Mechanic & Fluid Power Engineering by D. S. Kumar (Kataria & Sons Publications Pvt. Ltd.).
3. Open channel flow by V.T. Chow (McGraw Hill Book Company).
4. Introduction to Fluid Mechanics and Fluid Machines by SK Som, Gautam Biswas, Suman Chakraborthy, Mc Graw Hill Education (India) Private Limited
5. Hydraulic Machines by Banga & Sharma (Khanna Publishers).

Web References:

1. https://nptel.ac.in/courses/105/103/105103095/
2. https://nptel.ac.in/courses/105/107/105107059/
3. https://nptel.ac.in/courses/105/103/105103096

E-Text Books:

1. https://books.google.co.in/books?id=FzQz6A6SnyoC&printsec=frontcover#v=onepage&q&f=false

CE406PC: STRUCTURAL ANALYSIS – I

B.Tech. II Year II Semester								
Course Code	Category	Hours/Week			Credits	Maximum Marks		
		L	T	P	C	CIA	SEE	Total
CE406PC	PCC	3	0	0	3	30	70	100
Contact Classes: 45	Tutorial Classes: 0	Practical Classes: 0				Total Classes: 45		

Prerequisite: Strength of Materials - I

Course Objectives: The objective of the course is to

- Differentiate the statically determinate and indeterminate structures.
- To understand the nature of stresses developed in perfect frames and three hinged arches for various types of simple loads
- Analyse the statically indeterminate members such as fixed bars, continuous beams and for various types of loading.
- Understand the energy methods used to derive the equations to solve engineering problems
- Evaluate the Influence on a beam for different static & moving loading positions

Course Outcomes: At the end of the course the student will able to

- An ability to apply knowledge of mathematics, science, and engineering
- Analyse the statically indeterminate bars and continuous beams
- Draw strength behavior of members for static and dynamic loading.
- Calculate the stiffness parameters in beams and pin jointed trusses.
- Understand the indeterminacy aspects to consider for a total structural system.
- Identify, formulate, and solve engineering problems with real time loading

Unit: I	Analysis Of Perfect Frames	No. of Classes: 09

Analysis Of Perfect Frames: Types of frames - Perfect, Imperfect and Redundant pin jointed plane frames - Analysis of determinate pin jointed plane frames using method of joints, method of sections and tension coefficient method for vertical loads, horizontal loads and inclined loads.

Unit: II	Energy Theorems & Three Hinged Arches	No. of Classes: 09

Energy Theorems: Introduction-Strain energy in linear elastic system, expression of strain energy due to axial load, bending moment and shear forces - Castigliano's theorem-Unit Load Method - Deflections of simple beams and pin- jointed plane frames - Deflections of statically determinate bent frames.

Three Hinged Arches – Introduction – Types of Arches – Comparison between Three hinged and Two hinged Arches - Linear Arch - Eddy's theorem - Analysis of Three hinged arches - Normal Thrust and radial shear and bending moment - Geometrical properties of parabolic and circular arches - Three hinged parabolic circular arches having supports at different levels.

Unit: III	Propped Cantilever And Fixed Beams	No. of Classes: 09

Propped Cantilever And Fixed Beams: Determination of static and kinematic indeterminacies for beams- Analysis of Propped cantilever and fixed beams, including the beams with different moments of inertia - subjected to uniformly distributed load - point loads - uniformly varying load, couple and combination of loads - Shear force, Bending moment diagrams and elastic curve for Propped Cantilever and Fixed Beams - Deflection of Propped cantilever and fixed beams - effect of sinking of support, effect of rotation of a support.

Unit: IV	Continuous Beams & Slope Deflection Method	No. of Classes: 09

Continuous Beams: Introduction-Continuous beams - Clapeyron's theorem of three moments-Analysis of continuous beams with constant and variable moments of inertia with one or both ends fixed-continuous beams with overhang - effect of sinking of supports.
Slope Deflection Method: Derivation of slope-deflection equation, application to continuous beams with and without sinking of supports - Determination of static and kinematic indeterminacies for frames - Analysis of Single Bay, Single storey Portal Frames by Slope Deflection Method including Side Sway - Shear force and bending moment diagrams and Elastic curve.

Unit: V	Moving Loads And Influence Lines	No. of Classes: 09

Moving Loads And Influence Lines: Introduction maximum SF and BM at a given section and absolute maximum shear force and bending moment due to single concentrated load ,uniformly distributed load longer than the span, uniformly distributed load shorter than the span, two point loads with fixed distance between them and several point loads-Equivalent uniformly distributed load- Focal length - Definition of influence line for shear force and bending moment - load position for maximum shear force and maximum bending Moment at a section - Point loads, uniformly distributed load longer than the span, uniformly distributed load shorter than the span-Influence lines for forces in members of Pratt and Warren trusses - Equivalent uniformly distributed load -Focallength.

Text Books:

1. Structural Analysis Vol –I & II by V.N. Vazirani and M.M. Ratwani, Khanna Publishers.
2. Structural Analysis Vol I & II by G.S.Pandit and S.P. Gupta, Tata McGraw Hill Education Pvt. Ltd.
3. Structural analysis T. S Thandavamoorthy, Oxford university Press.

Reference Books:

1. Structural Analysis by R. C. Hibbeler, Pearson Education.
2. Basic Structural Analysis by K.U. Muthu et al., I.K. International Publishing House Pvt. Ltd.
3. Mechanics of Structures Vol – I and II by H.J. Shah and S.B. Junnarkar, Charotar Publishing House Pvt. Ltd.
4. Basic Structural Analysis by C. S. Reddy., Tata McGraw Hill Education Pvt. Ltd.
5. Fundamentals of Structural Analysis by M.L. Gamhir, PHI Learning Pvt. Ltd.

Web References:

1. https://nptel.ac.in/courses/105/105/105105166/#

E-Text Books:

1. https://www.pdfdrive.com/structural-analysis-volume-2-statically-indeterminate-structures-d188630674.html
2. http://myliveonlinecasino.com/structural_analysis_by_thandavamoorthy.pdf

CE407PC: COMPUTER AIDED CIVIL ENGINEERING DRAWING

B.Tech. II Year II Semester

Course Code	Category	Hours/Week			Credits	Maximum Marks		
		L	T	P	C	CIA	SEE	Total
CE407PC	PCC	0	0	3	1.5	30	70	100
Contact Classes: 0	Tutorial Classes: 0	Practical Classes: 60				Total Classes: 60		

Prerequisite: Engineering Graphics and Basic Knowledge of Computers.

Course Objectives: The objective of this lab is to teach the student usage of Auto cad and basic drawing fundamentals in various civil engineering applications, specially in building drawing.

Course Outcomes:
At the end of the course, the student will be able to:

- Use the Autocad commands for drawing 2D & 3D building drawings required for different Civil Engg applications.
- Plan and draw Civil Engineering Buildings as per aspect and orientation.
- Presenting drawings as per user requirements and preparation of technical report

Experiment	List of Experiments	No. of Classes
1	Introduction to computer aided drafting and different coordinate system	5
2	Drawing of Regular shapes using Editor mode	5
3	Introduction GUI and drawing of regular shapes using GUI	5
4	Exercise on Draw tools	5
5	Exercise on Modify tools	5
6	Exercise on other tools (Layers, dimensions, texting etc.)	5
7	Drawing of building components like walls, lintels, Doors, and Windows. using CAD software	5
8	Drawing a plan of Building and dimensioning	5
9	Drawing a plan of a residential building using layers	5
10	Developing a 3-D plan from a given 2-Dplan	5
11	Developing sections and elevations forgiven a) Single storied buildings b) multi storied buildings	5
12	Auto CAD applications in surveying, mechanics etc.	5

Text Books:

1. Computer Aided Design Laboratory by M. N. Sesha Praksh & Dr. G. S. Servesh – Laxmi Publications.
2. Engineering Graphics by P. J. Sha – S. Chand & Co.

Web References:

1. https://youtu.be/tHrfxjgFQt8
2. https://youtu.be/c1kGuiYEHh0
3. https://youtu.be/UKpCFYWK7q4

List of Equipments :

SL. NO.	NAME	TOTAL NUMBERS
1	COMPUTER SYSTEMS	30
2.	AUTOCAD SOFTWARE(LICENSED)	30
3.	QGIS SOFTWARE(OPEN SOURCE)	30
4	LAPTOPS	3
5	PRINTE R	1
6	AMPLIFIER	1
7	MIKE SET	5
8	PROJECTOR	5
9	SPEAKERS	2

EE409ES: PRINCIPLES OF ELECTRICAL AND ELECTRONICS ENGINEERING LAB

B.Tech. II Year II Semester								
Course Code	Category	Hours/Week			Credits	Maximum Marks		
EE409ES	ESC	L	T	P	C	CIA	SEE	Total
		0	0	2	1	30	70	100
Contact Classes: Nil	Tutorial Classes: Nil	Practical Classes: 45				Total Classes: 45		

Prerequisite: PRINCIPLES OF ELECTRICAL AND ELECTRONICS ENGINEERING

Course Objectives:

1. To introduce the concepts of electrical circuits and its components
2. To understand magnetic circuits, DC circuits and AC single phase & three phase circuits and different types of DC/AC machines and Transformers.
3. To import the knowledge of various electrical installations.
4. To introduce the concepts of diodes & rectifiers, and to impart the knowledge of various configurations, characteristics & applications.

Course Outcomes:

1. To analyze electrical circuits using network laws and theorems.
2. To understand and analyze basic Electric and Magnetic circuits and to study the working principles of Electrical Machines.
3. To introduce components of Low Voltage Electrical Installations.
4. To identify and characterize Diodes and Rectifiers.
5. To identify and characterize various types of Transistors.

List of Experiments: The following 1-12 experiments are to be conducted compulsorily

1. Verification of KVL and KCL
2. (i) Measurement of Voltage, Current and Real Power in primary and Secondary Circuits of a Single-Phase Transformer
   (ii) Verification of Relationship between Voltages and Currents (Star-Delta, Delta-Delta, Delta-star, Star-Star) in a Three Phase Transformer
3. Measurement of Active and Reactive Power in a balanced Three-phase circuit
4. Performance Characteristics of a Separately Excited DC Shunt Motor
5. Performance Characteristics of a Three-phase Induction Motor
6. No-Load Characteristics of a Three-phase Alternator
7. Study and operation of (i) Multi-meters (ii) Function Generator (iii) Regulated Power Supplies (iv) CRO.
8. PN Junction diode characteristics
9. Zener diode characteristics and Zener as voltage Regulator
10. Input & Output characteristics of Transistor in CB / CE configuration
11. Full Wave Rectifier with & without filters
12. Input and Output characteristics of FET in CS configuration.

List of Equipment/Software(with Specifications or Range) Required:

1. Verification of KVL and KCL kit
2. (i) Measurement of Voltage, Current and Real Power in primary and Secondary Circuits of a Single-Phase Transformer panel
   (ii) Verification of Relationship between Voltages and Currents (Star-Delta, Delta-Delta, Delta-star, Star-Star) in a Three Phase Transformer panel
3. Measurement of Active and Reactive Power in a balanced Three-phase circuit panel
4. Performance Characteristics of a Separately Excited DC Shunt Motor panel

5. Performance Characteristics of a Three-phase Induction Motor panel
6. No-Load Characteristics of a Three-phase Alternator panel
7. Study and operation of (i) Multi-meters (ii) Function Generator (iii) Regulated Power Supplies (iv)CRO. kit
8. PN Junction diode characteristics kit
9. Zener diode characteristics and Zener as voltage Regulator kit
10. Input & Output characteristics of Transistor in CB / CE configuration kit
11. Full Wave Rectifier with & without filters kit
12. Input and Output characteristics of FET in CS configuration kit

CE409PC: HYDRAULICS AND HYDRAULIC MACHINERY LAB

B.Tech. II Year II Semester								
Course Code	Category	Hours/Week			Credits	Maximum Marks		
CE409PC	PCC	L	T	P	C	CIA	SEE	Total
		0	0	3	1.5	30	70	100
Contact Classes: 0	Tutorial Classes: 0	Practical Classes: 60				Total Classes: 60		

Prerequisite: Fluid Mechanics, Hydraulics and Hydraulic Machinery

Course Objectives:

- To identify the behavior of analytical models introduced in lecture to the actual behavior of real fluid flows.
- To explain the standard measurement techniques of fluid mechanics and their applications.
- To illustrate the students with the components and working principles of the Hydraulic machines- different types of Turbines, Pumps, and other miscellaneous hydraulics machines.
- To analyze the laboratory measurements and to document the results in an appropriate format.

Course Outcomes: Students who successfully complete this course will have demonstrated ability to:

- Describe the basic measurement techniques of fluid mechanics and its appropriate application.
- Interpret the results obtained in the laboratory for various experiments.
- Discover the practical working of Hydraulic machines- different types of Turbines, Pumps, and other miscellaneous hydraulics machines.
- Compare the results of analytical models introduced in lecture to the actual behavior of real fluid flows and draw correct and sustainable conclusions.
- Write a technical laboratory report

Experiment	List of Experiments	No. of Classes
1	Verification of Bernoulli's equation	5
2	Determination of Coefficient of discharge for a small orifice by a constant head method	5
3	Calibration of Venturimeter / Orifice Meter	5
4	Calibration of Triangular / Rectangular/Trapezoidal Notch	5
5	Determination of Minor losses in pipe flow	5
6	Determination of Friction factor of a pipeline	5
7	Determination of Energy loss in Hydraulic jump	5
8	Determination of Manning's and Chezy's constants for Open channel flow.	5
9	Impact of jet on vanes	4
10	Performance Characteristics of Pelton wheel turbine	4
11	Performance Characteristics of Francis turbine	4
12	Performance characteristics of Keplan Turbine	4

13	Performance Characteristics of a single stage / multi stage Centrifugal Pump.	4

Text Books:

1. Laboratory Manual of Fluid Mechanics and Machines by Gupta V P, Jagdish Chandra, Gupta K S, CBS Publishers and Distributors.
2. Fluid Mechanics and Hydraulic Machines: A Lab Manual by T.S. Desmukh, Laxmi Publications.
3. Fluid Mechanics and Machinery Laboratory Manual by Dr.N.Kumara Swamy, Charotar Publishing House Private Limited.

References:

1. Hydraulics & Fluid Mechanics Including Hydraulics Machines by Dr. P.N. Modi, Dr. S.M. Seth, Standard Book House.
2. Fluid Mechanics and Hydraulic Machines by RK Rajput, S. Chand Publishing.
3. Engineering Fluid Mechanics by Prof. K L Kumar, S. Chand Publishing.
4. Fluid Mechanics with Laboratory Manual by Bireswer Majumdar, PHI Learning.

Web References:

1. https://nptel.ac.in/courses/105/103/105103095/
2. https://nptel.ac.in/courses/105/107/105107059/
3. https://nptel.ac.in/courses/105/103/105103096/

List of Equipments :

S.No	Name of the Equipment	Total No.
1	Experimental set-up for verification of Bernoulli's equation.	1
2	Experimental set-up for determination of coefficient of discharge for a small orifice & mouth piece by a constant head method and variable head method	1
3	Experimental set-up for calibration of Venturimeter / Orifice Meter	1
4	Experimental set-up (Mini-Hydraulic flume) for calibration of Triangular / Rectangular / Trapezoidal Notch/ Broad crested weir/ Venturi flume, determination of energy loss in hydraulic jump & determination of Manning's and Chezy's constants for open channel flow	1
5	Experimental set-up for determination of friction factor of a pipe line & minor losses in pipe flow	1
6	Experimental set-up for impact of jet on vanes	1
7	Experimental set-up for performance characteristics of Pelton wheel turbine	1
8	Experimental set-up for performance characteristics of Francis turbine	1
9	Experimental set-up for performance characteristics of Kaplan turbine	1
10	Experimental set-up for performance characteristics of a single stage	1
11	Experimental set-up for performance characteristics of a multi stage centrifugal pump	1
12.	Experimental set-up for performance characteristics of a reciprocating pump	1

MC409HS: GENDER SENSITIZATION LAB

B.Tech. II Year II Semester								
Course Code	**Category**	**Hours/Week**			**Credits**	**Maximum Marks**		
		L	**T**	**P**	**C**	**CIA**	**SEE**	**Total**
MC409HS	**MC**	-	-	2	0	30	70	100
Contact Classes: 30	**Tutorial Classes: Nil**	**Practical Classes: Nil**				**Total Classes: 30**		

COURSE DESCRIPTION

This course offers an introduction to Gender Studies, an interdisciplinary field that asks critical questions about the meanings of sex and gender in society. The primary goal of this course is to familiarize students with key issues, questions and debates in Gender Studies, both historical and contemporary. It draws on multiple disciplines – such as literature, history, economics, psychology, sociology, philosophy, political science, anthropology and media studies – to examine cultural assumptions about sex, gender, and sexuality.

This course integrates analysis of current events through student presentations, aiming to increase awareness of contemporary and historical experiences of women, and of the multiple ways that sex and gender interact with race, class, caste, nationality and other social identities. This course also seeks to build an understanding and initiate and strengthen programmes combating gender- based violence and discrimination. The course also features several exercises and reflective activities designed to examine the concepts of gender, gender-based violence, sexuality, and rights. It will further explore the impact of gender-based violence on education, health and development.

Course Objectives:

1. To develop students' sensibility with regard to issues of gender in contemporary India.
2. To provide a critical perspective on the socialization of men and women.
3. To introduce students to information about some key biological aspects of genders.
4. To expose the students to debates on the politics and economics of work.
5. To help students reflect critically on gender violence.
6. To expose students to more egalitarian interactions between men and women.

Course Outcomes:

1. Students will have developed a better understanding of important issues related to gender in contemporary India.
2. Students will be sensitized to basic dimensions of the biological, sociological, psychological and legal aspects of gender. This will be achieved through discussion of materials derived from research, facts, everyday life, literature and film.
3. Students will attain a finer grasp of how gender discrimination works in our society and how to counter it.
4. Students will acquire insight into the gendered division of labour and its relation to politics and economics.
5. Men and women students and professionals will be better equipped to work and live together as equals.
6. Students will develop a sense of appreciation of women in all walks of life.
7. Through providing accounts of studies and movements as well as the new laws that provide protection and relief to women, the textbook will empower students to understand and respond to gender violence.

Unit - 1	UNDERSTANDING GENDER

Introduction: Definition of Gender-Basic Gender Concepts and Terminology-Exploring Attitudes towards Gender-Construction of Gender-Socialization: Making Women, Making Men - Preparing for Womanhood. Growing up Male. First lessons in Caste.

Unit - 2	GENDER ROLES AND RELATIONS

Two or Many? -Struggles with Discrimination-Gender Roles and Relations-Types of Gender Roles- Gender Roles and Relationships Matrix-Missing Women-Sex Selection and Its Consequences- Declining Sex Ratio. Demographic Consequences-Gender Spectrum: Beyond the Binary

Unit - 3	GENDER AND LABOUR

Division and Valuation of Labour-Housework: The Invisible Labor- "My Mother doesn't Work." "Share the Load."-Work: Its Politics and Economics -Fact and Fiction. Unrecognized and Unaccounted work.

-Gender Development Issues-Gender, Governance and Sustainable Development-Gender and Human Rights-Gender and Mainstreaming

Unit - 4	GENDER - BASED VIOLENCE

The Concept of Violence- Types of Gender-based Violence-Gender-based Violence from a Human Rights Perspective-Sexual Harassment: Say No! -Sexual Harassment, not Eve-teasing- Coping with Everyday Harassment- Further Reading: "*Chupulu".*

Domestic Violence: Speaking OutIs Home a Safe Place? -When Women Unite [Film]. Rebuilding Lives. Thinking about Sexual Violence Blaming the Victim-"I Fought for my Life…."

Unit - 5	GENDER AND CULTURE

Gender and Film-Gender and Electronic Media-Gender and Advertisement-Gender and Popular Literature- Gender Development Issues-Gender Issues-Gender Sensitive Language-Gender and Popular Literature - Just Relationships: Being Together as Equals

Mary Kom and Onler. Love and Acid just do not Mix. Love Letters. Mothers and Fathers. Rosa Parks- The Brave Heart.

Note: **Since it is Interdisciplinary Course, Resource Persons can be drawn from the fields of English Literature or Sociology or Political Science or any other qualified faculty who has expertise in this field from engineering departments.**

- ***Classes will consist of a combination of activities: dialogue-based lectures, discussions, collaborative learning activities, group work and in-class assignments. Apart from the above prescribed book, Teachers can make use of any authentic materials related to the topics given in the syllabus on"Gender".***

ESSENTIAL READING: The Textbook, "*Towards a World of Equals: A Bilingual Textbook on Gender" written* by A.Suneetha, Uma Bhrugubanda, DuggiralaVasanta, Rama Melkote, Vasudha Nagaraj, Asma Rasheed, GoguShyamala, Deepa Sreenivas and Susie Tharu**published by Telugu Akademi, Telangana Government in 2015.**

ASSESSMENT AND GRADING:

1. Discussion & Classroom Participation:20%
2. Project/Assignment:30%
3. End Term Exam:50%