Shirpur Education Society's

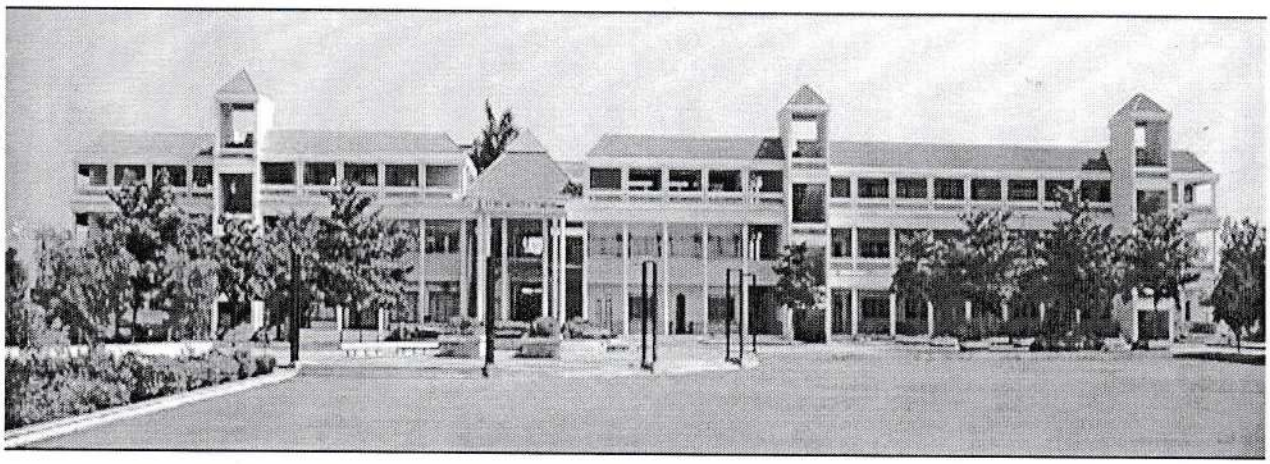
R. C. Patel Institute of Technology, Shirpur

(An Autonomous Institute)

Course Structure

Second Year B. Tech
(Department of Civil Engineering)

With effect from Year 2023-24



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SY BTECH CIVIL (Wef. 2023-24)

Semester-III

S. No.	Course Category	Course Code	Course Title	Teaching Scheme			Evaluation Scheme					Total	Credit
							Continuous Assessment (CA)				ESE		
				L	T	P	TA	Term Test 1 (TT1)	Term Test 2 (TT2)	Best of (TT1 & TT2)			
							[A]			[B]	[C]	[A+B+C]	
1	BS	22BSCE3010T	Engineering Mathematics-III	3	1		20	15	15	15	65	100	4
2	ES	22ESCE3020T	Mechanics of Solids	3	1		20	15	15	15	65	100	4
3	ESL	22ESCE3020L	Mechanics of Solids Laboratory			2	25				25	50	1
4	PC	22PCCE3030T	Surveying & Geomatics	3			20	15	15	15	65	100	3
5	PCL	22PCCE3030L	Surveying & Geomatics Laboratory			2	25				25	50	1
6	PC	22PCCE3040T	Concrete Technology	3			20	15	15	15	65	100	3
7	PCL	22PCCE3040L	Concrete Technology Laboratory			2	25				25	50	1
8	PC	22PCCE3050T	Building Construction & Materials	1			50					50	1
9	PCL	22PCCE3050L	Building Construction & Materials Laboratory			2	25				25	50	1
10	HM	22HMCE3060T	Universal Human Values	2			20	15	15	15	65	100	2
11	PJ	22PJCE3070L	Semester Project-I			2	25				25	50	1
			Total	15	2	10	275	75	75	75	450	800	22

Prepared by

Checked by

BOS Chairman

Dean Academic/Dy. Director

C.O.E

R. C. Patel Institute of Technology, Shirpur

Director

Semester-IV

S. No.	Course Category	Course Code	Course Title	Teaching Scheme			Evaluation Scheme						
							Continuous Assessment (CA)				ESE	Total	Credit
				L	T	P	TA	Term Test 1 (TT1)	Term Test 2 (TT2)	Best of (TT1 & TT2)			
							[A]			[B]	[C]	[A+B+C]	
1	BS	22BSCE4010T	Engineering Mathematics-IV	3	1		20	15	15	15	65	100	4
2	PC	22PCCE4020T	Fluid Mechanics	3	1		20	15	15	15	65	100	4
3	PCL	22PCCE4020L	Fluid Mechanics - Laboratory			2	25				25	50	1
4	ES	22ESCE4030T	Engineering Geology	2			20	15	15	15	65	100	2
5	ESL	22ESCE4030L	Engineering Geology Laboratory			2	25				25	50	1
6	ES	22ESCE4040T	Building Planning & Design	3			20	15	15	15	65	100	3
7	ESL	22ESCE4040L	Building Planning & Design Laboratory			2	25				25	50	1
8	PC	22PCCE4050T	Structural Analysis	3	1		20	15	15	15	65	100	4
9	HM	22HMCE4060T	Constitution of India	2									Audit
10	PJ	22PJCE4070L	Semester Project-II			2	25				25	50	1
11	HM	22HMCE4080L	Employability skills development program- I			2	50					50	1
			TOTAL	16	3	10	250	75	75	75	425	750	22

Prepared by

Checked by

BOS Chairman

Dean Academic/Dy. Director

C.O.E

R. C. Patel Institute of Technology

Director

Engineering Mathematics - III (22BSCE3010T)

Teaching Scheme
Lectures: 03 Hrs. /week
Tutorial : 01 Hr. /week
Credit 04

Examination Scheme
Term Test: 15 Marks
Teacher Assessment: 20 Marks
End SEM Exam: 65 Marks
Total Marks: 100 Marks

1. To provide sound foundation in the mathematical fundamentals necessary to formulate, solveand analyses engineering problems.
2. To study the basic principles of Laplace Transform, Fourier Series, Complex variables

COs	Course Outcomes	Blooms Level	Blooms Description
CO1	Use Laplace and inverse Laplace Transform to the Ordinary Differential Equations	L3	Apply
CO2	Identify analytic and harmonic functions	L1	Remember
CO3	Solve real integrals using complex integration	L3	Apply
CO4	Find Fourier Series of periodic functions and simplify infinite series	L4	Analyze
CO5	Solve certain partial differential equations analytically and numerically	L3	Apply
CO6	Correlate different variables of data	L4	Analyze

Course Contents

Unit-I Laplace, Inverse Laplace Transform and its applications 09 Hrs

Prerequisite: *Calculus*

LT of standard functions such as 1, t^n, e^{at}, sin at, cos at, sin at, cos at, Heaviside Unit step function, Dirac Delta function, Periodic functions Linearity property of Laplace Transform, First Shifting property, Second Shifting property, Change of Scale property of L.T. (without proof).

$$L\{t^n f(t)\}, \quad \frac{f(t)}{t}, \quad L\int_0^t f(u)du, \quad \frac{d^n f(t)}{d}$$

Inverse Laplace Transform

Linearity property, Partial fractions method and convolution theorem.

Applications to solve ordinary differential equations with one dependent variable with given boundary conditions.

Unit-II Complex Variables, Differentiation 06 Hrs

Analytic functions, Cauchy-Riemann equations in Cartesian and polar coordinates (only statement).

Milne-Thomson method to determine analytic function when it's real or imaginary or its combination is given.

Harmonic function, orthogonal trajectories.

Bilinear Transformation with fixed points, cross-ratio **(For Self-Study).**

$$\int f(cos\theta, sin\theta)d\theta, \int f(x)dx_{-\infty}^{\infty}$$

Unit-III Complex Integration

06 Hrs.

Line integral **(For Self-Study)**, Cauchy's theorem for analytic function, Cauchy's integral formula (All without proof). Taylor's and Laurent's series.

Residue at removable singularity, poles, isolated singularity, and its evaluation.

Residue theorem, application to evaluate real integral of type.

Unit-IV Fourier Series 06 Hrs.

Fourier series of periodic functions with period 2π & $2l$. Even and odd functions, Half range sine and cosine series, Parseval's identities (without proof). Complex form of Fourier series. Orthogonal and Orthonormal functions. **(For Self-Study)**

Unit-V **Partial Differential Equations** **06 Hrs.**

Numerical Solution of PDE using Bender-Schmidt Method and Crank- Nicolson method.
Partial differential equations governing transverse vibrations of an elastic string and its solution using Fourier series. Heat equation, steady-state configuration for heat flow **(For Self-Study).**

Unit-VI **Correlation, Regression** **06 Hrs.**

Correlation-Karl Pearson's coefficient of correlation, Spearman's Rank correlation, Regression analysis- lines of regression.

Textbooks:

1. Higher Engineering Mathematics, Dr. B. S. Grewal, Khanna Publication.
2. Advanced Engineering Mathematics, E Kreyszing, Wiley Eastern Limited.

References:

1. Higher Engineering Mathematics, B.V. Ramana, McGraw Hill Education, New Delhi.
2. Complex Variables: Churchill, Mc-Graw Hill.
3. Integral Transforms and their Engineering Applications, Dr B. B. Singh, Synergy Knowledge ware, Mumbai.
4. Numerical Methods, Kandasamy, S. Chand & CO.
5. Fundamentals of Mathematical Statistics by S.C. Gupta and Kapoor.

Evaluation Scheme:

Continuous Assessment (A):

Subject teacher will declare Teacher Assessment criteria at the start of semester.

Continuous Assessment (B):

1. Two term tests of 15 marks each will be conducted during the semester.
2. Total duration allotted for writing each of the paper is 1 hr.
3. Best of the marks scored in both the tests will be considered for final grading.

End Semester Examination (C):

1. Question paper will be based on the entire syllabus summing up to 65 marks.
2. Total duration allotted for writing the paper is 3 hrs.

Tutorial Minimum eight tutorials shall be conducted.

Mechanics of Solids (22ESCE3020T)

Teaching Scheme
Lectures : 03 Hrs./week
Tutorial : 01 Hr/week
Credit : 04

Examination Scheme
Term Test : 15 Marks
Teacher Assessment: 20 Marks
End Sem Exam : 65 Marks
Total Marks : 100 Marks

Course Objectives:

1. To gain knowledge of the effect of external action on elastic body.
2. To understand the different engineering properties of the materials.
3. To analyses the stress, strain and deformation of elastic bodies under external actions and to Compute design forces.

Course Outcomes (COs): After completion of this course students will be able to:

COs	Course Outcomes	Blooms Level	Blooms Description
CO1	Evaluate stress, strain, deformation and properties of materials in determinate, homogeneous and composite structures	5	Evaluate
CO2	Draw Shear Force Diagram (SFD) and Bending Moment Diagram (BMD) for several types of loads and support conditions for a beam	3	Apply
CO3	Compute and plot bending and shear stresses across sections of a given beam, torsional shear stresses and strain energy for different loading conditions	3	Apply
CO4	Analyze axially and eccentrically loaded column, Explain the concept of principal stresses due to combined loading and able to compare the values of analytical and graphical (Mohr's circle) method	4	Analyze

Course Contents

Unit I **Simple Stresses and Strains** **(08 Hrs.)**

Prerequisite: Basic concepts of engineering mechanics, CG

Moment of Inertia:

Centroid, Area Moment of Inertia, Parallel Axis theorem, Polar Moment of Inertia, Principal axes, Principal moment of inertia.

Stress and strain:

Definitions of stress, strain, modulus of elasticity, modulus of rigidity, bulk modulus, and yield stress, ultimate stress, factor of safety and shear stress. Hooke's law, and stress – strain relationship, Poisson ratio, bars of varying sections, stress due to self-weight. Composite sections, volumetric strain, elastic constants and relations between them, temperature stresses.

Unit-II **Shear Force and Bending Moment Diagram** **(07 Hrs.)**

Prerequisite: Moments, Reaction of beams

Axial force, shear force and bending moment diagrams for statically determinate beams (excluding Beams with internal hinges), relationship between rates of loading, shear force and bending moment.

Unit III **Bending and Shear Stresses** **(08 Hrs.)**

Prerequisite: Concept of stress, strain, CG & MI

a) Concept and determination of Moment of Inertia for various cross-sections. Stress due to bending: theory of simple or pure bending, Assumptions, derivation of flexure formula, bending stress Distribution diagrams, Moment of Resistance of cross-section.

b) Shear stresses in beams: concept of shear, complimentary shear, derivation of shear stress formula, shear stress distribution for various cross sections, maximum and average shear stress for circular and rectangular sections and shear connectors.

Unit IV **Torsion and Strain Energy** **(06 Hrs.)**

Prerequisite: Concept of stress, strain, CG & MI

a) Torsion of circular shafts: Theory of pure torsion, torsional moment of resistance, power transmitted By shafts, torsional rigidity, shear stresses in shafts due to torsion, stress & strain in determinate shafts Of hollow or solid cross-sections.

b) Strain energy and impact: concept of strain energy, expression of strain energy for Axially loaded member under gradual, sudden and impact loads. Strain energy due to self-weight.

Unit-V Axially and Eccentrically Loaded Columns, Principal Stresses and Strains (10 Hrs.)

Prerequisite: Concept of stress, strain

a) Axially loaded columns: concept of critical load and buckling, Euler's formula for buckling load with hinged ends, concept of equivalent length for various end conditions, Rankine's formula, safe load on column and limitations of Euler's formula.

b) Direct and bending stresses for eccentrically loaded short column, the middle third rule. Resultant stress diagrams due to axial loads, uni-axial, and bi-axial bending.

Concept of core of section for solid and hollow rectangular and circular sections.

c) Concept of principal stresses and planes, normal and tangential stress on any oblique plane, determination of principal stresses and principal planes, Mohr's circle method.

Text Books:

1. S.B. Junnarkar, Mechanics of Structures Vol I, Charotar Publication house, 32th Edition, 2016, (ISBN-9385039024/978-9385039027).
2. S.S. Bhavikatti, Strength of Material, Vikas Publishing House Pvt. Ltd,3rd edition, 2013. (ISBN: 9789325971578/9325971577).
3. Strength of Materials- R.K.Rajput., S.Chand Publications. 7th Edition, 2018, (ISBN-9789352533695)
4. Strength of Materials" R.K.Bansal., Laxmi Publications. 6th Edition, 2018 (ISBN-10: 9788131808146, ISBN-13: 978-8131808146)
5. Strength of Materials" S Ramamrutham, Dhanpat Rai Publications.2017, ISBN-10: 9352164385, ISBN-13: 978-9352164387
6. E.P. Popov, Mechanics of Materials, Prentice Hall of India Pvt. Ltd., 2nd edition, 1976. (ISBN- 0135713560/978-0135713563).

Reference Books:

1. S. Timoshenko and Young, Engineering Mechanics, Tata McGraw Hill, 2013. (ISBN: 9781259062667/125906266X).
2. W. A. Nash Strength of Material, Schaum's Outline Series, McGraw Hill, 4th edition, 1998. (ISBN- 9780071830805/978-0071830805).
3. S. Timoshenko and Gere, Mechanics of Materials, PWS Publication Co. Ltd., 3rd edition, 1997. (ISBN-0534921744/9780534921743).
4. J. M. Gere, Mechanics of Materials, Brooks/Cole. Publishing Co., 6th edition, 2008. (ISBN-1111577730/9781111577735).
5. G.H. Ryder, Strength of Materials, Prentice Hall Publications, 3rd edition, 2002. (ISBN: 9780333935361/0333935365).

Evaluation Scheme:

Continuous Assessment (A):

Subject teacher will declare Teacher Assessment criteria at the start of Semester.

Continuous Assessment (B):

1. Two term tests of 15 marks each will be conducted during the semester.
2. Total duration allotted for writing each of the paper is 1 hr.
3. Best of the marks scored in both the two tests will be considered for final grading.

End Semester Examination (C):

1. Question Paper will be based on entire syllabus summing up to 65 marks
2. Total duration allotted for writing the paper is 3 hr.

Mechanics of Solids Laboratory (22ESCE3020L)

Practical Scheme
Practical : 02 Hrs./week
Credit : 01

Examination Scheme
Teacher Assessment : 25 Marks
End Sem Exam : 25 Marks
Total : 50 Marks

Course Objectives:
After successful completion of this course students shall be able to

1. Demonstrate behavior of different material under axial shear and bending forces.
2. Identify various types of stresses in various structural elements.
3. Determine strength of different construction materials.

Course Outcomes (COs): After completion of this course students will be able to:

COs	Course Outcomes	Blooms Level	Blooms Description
CO1	Ability to apply knowledge of mathematics and engineering in calculating the mechanical properties of structural materials.	3	Apply
CO2	Understanding properties of different metals and materials	3	Apply
CO3	Utilize appropriate materials in analysis and design considering engineering properties, sustainability, cost and weight.	3, 4	Apply, Analyze
CO4	Write individual and group reports: present objectives, describe test procedures and results, synthesize and discuss the test results, present conclusions	6	Create

Course content

List of the Experiments

Perform minimum five experiments from the below-suggested list which would help the learner to apply the concept learnt

1. Tensile test on Mild steel.
2. Torsion test on Mild steel.
3. Compression test on concrete
4. Rockwell hardness test on different metals.
5. To determine impact strength of steel.(By Izod test)
6. To determine impact strength of steel.(By Charpy test)
7. Bending test on timber
8. Graphical solution method for principal stress problems

Assignments:

Minimum five assignments based on syllabus will be conducted which would help the learner to apply the concept learnt.

Evaluation Scheme:

Continuous Assessment (A):

Laboratory work shall consist of minimum 6 experiments and subject specific lab assignment/ Case study

The distribution of marks shall be as follows:

1. Performance in Experiments: 05 Marks
2. Journal Submission: 05 Marks
3. Viva-voce: 05 Marks
4. Subject Specific Lab Assignment/Case Study: 10 Marks

The final certification and acceptance of laboratory journal/manual/report will be subject to Satisfactory performance of laboratory work and upon fulfilling minimum passing criteria in the Teacher assessment.

End Semester Examination (C):

Oral / Practical examination will be based on the entire syllabus including, the practical's performed During laboratory sessions.

Surveying & Geomatics (22PCCE3030T)

Teaching Scheme
Lectures : 02 Hrs./week
Credit:02

Examination Scheme
Term Test : 15 Marks
Teacher Assessment : 20 Marks
End Sem Exam : 65 Marks
Total Marks : 100 Marks

Course Objectives

1. To understand basic Principle of survey.
2. Ability to demonstrate scope of geodetic surveying
3. Ability to analyze and interpret data in application of remote sensing and data through GIS Software

Course Outcomes

COs	Course Outcomes	Blooms Level	Blooms Description
CO1	Explain Principles of surveying, Deduce Reduced level of a point by different methods.	2	Apply
CO2	Describe basics of theodolite survey in elevation and angular measurements.	3	Apply
CO3	Apply tachometric surveying in distance and height measurements.	3	Apply
CO4	Describe scope of geodetic surveying and explain principles of remote sensing and GIS	2	Understand

Course Contents

Unit-I Levelling **8 Hrs.**

Principle of surveying, Definitions of some common terms in leveling, Instruments for leveling, Types of levels, Leveling staff, Temporary adjustments of level, Principal axis of dumpy level, Types of bench mark, Computation of reduced level by height of instrument and rise and fall method, Curvature and refraction correction, Distance to visible horizon, Reciprocal leveling method, Profile leveling L section and cross section,

Unit-II Theodolite Traversing **8 Hrs.**

Adjustments of theodolite, Uses of theodolite, Measurement of horizontal angles, Measurement of vertical angles, Measurement of Magnetic bearing and deflection angle, Theodolite traverse, Computation of consecutive and independent coordinates, Adjustment and balancing of closed traverse, Gales traverse by coordinate method.

Unit-III Tachometry **8 Hrs.**

Principle of stadia system, Methods of tachometry- Fixed hair and Movable hair, Determination of Horizontal distance and Vertical elevation, If line of sight is inclined and staff is held vertical, Uses of tachometry in surveying, Characteristics and Uses of Contour lines, Plotting contour by interpolation method, Radial contouring.

Unit-IV Triangulation and its Adjustment **8 Hrs.**

Objects and methods of geodetic surveying, Triangulation figures, Classification of triangulation systems, Selection of stations, Inter-visibility and height of stations, Towers, signals and their classification, Measurement of angles, Methods of observation of angles, Satellite station, Laws of weights, Determination of the most probable values of quantities, method of least squares, Station adjustment and figure adjustment.

Unit-V Remote Sensing & GIS **8 Hrs.**

Basic principles of remote sensing, Sensors used in remote sensing, classification of sensors, Remote sensing platforms, Applications of remote sensing to Civil Engineering, Introduction to GIS, sources and types of data, elements of GIS, hardware and software requirements of GIS. Total Station.

Reference Books:

1. Surveying- Fundamentals and Advanced practices by Dr. Narayan Chandak, Prof. Hemraj Kumavat, S K Katariya Publication New Delhi.
2. Surveying Vol.1 by Dr. B. C. Punmia, Laxmi Publication.
3. Surveying and Levelling by N.N.Basak, Tata Mac Graw Hill Publication.
4. Surveying and Levelling by S. K. Duggal, Tata Mac Graw Hill Publication.
5. Surveying and Levelling by T. P. Kanetkar, Laxmi publication.
6. Higher Surevying by A.M.Chandra
7. Principles of remote sensing by A.N. Patel, Surendra Singh
8. Advanced Surveying (Total Station, GIS and Remote Sensing) First edition 2007, Sathessh Gopi, Sathikumar, N Madhu.

Evaluation Scheme:

Continuous Assessment (A):

Subject teacher will declare Teacher Assessment criteria at the start of Semester.

Continuous Assessment (B):

1. Two term tests of 15 marks each will be conducted during the semester.
2. Total duration allotted for writing each of the paper is 1 hr.
3. Best of the marks scored in both the two tests will be considered for final grading.

End Semester Examination (C):

1. Question Paper will be based on entire syllabus summing up to 65 marks

2. Total duration allotted for writing the paper is 3 hr.

Surveying & Geomatics Laboratory (22PCCE3030L)

Practical Scheme
Practical : 02 Hrs./week
Credit : 01

Examination Scheme
Teacher Assessment : 25 Marks
End Sem Exam : 25 Marks
Total : 50 Marks

Course Objectives

1. To understand need and significance of vertical measurements, also basic concepts and methods, Instruments used for leveling with computational skills.
2. To understand the operation of various instruments in Surveying

Course Outcomes

COs	Course Outcomes	Blooms Level	Blooms Description
CO1	Deduce Reduced level of a point by different methods.	2	Apply
CO2	Describe basics of theodolite survey in elevation and angular measurements.	3	Apply
CO3	Apply tachometric surveying in distance and height measurements.	3	Apply
CO4	To understand the operation of various instruments in Surveying	2	Understand

List of Laboratory Experiments

List of Experiments

Term work shall consist of performing experimental sets from the list below any Seven.

1) Calculation of RL by height of instrument and Rise and fall method
2) Measurement of Horizontal Angle (Repetition and Reiteration) by 20" Theodolite
3) Measurement of Magnetic Bearing and Vertical Angle by 20" Theodolite
4) Determination of horizontal distance and vertical elevation by Tachometer.
5) Measurement of Horizontal Angle of triangle by 1" Theodolite
6) Adjustment of Braced quadrilateral by approximate method by 1" Theodolite
7) Introduction to Plane table Minor Instruments
8) conduct survey of plane table any one method
9) Study and use of Total Station
10) Study and use of Satellite image of remote sensing by ARCGIS software

Project Work

1) Road cross section and L section of 100m length
2) Radial tachometric contouring survey.

Evaluation Scheme:

Continuous Assessment (A):

Laboratory work shall consist of minimum 6 experiments and subject specific lab assignment and two filed projects

The distribution of marks shall be as follows:

1. Performance in Experiments: 05 Marks
2. Journal Submission: 05 Marks
3. Viva-voce: 05 Marks
4. Subject Specific Lab Assignment/Filed project: 10 Marks

The final certification and acceptance of laboratory journal/manual/report will be subject to Satisfactory performance of laboratory work and upon fulfilling minimum passing criteria in the Teacher assessment.

End Semester Examination (C):

Oral / Practical examination will be based on the entire syllabus including, the practical's performed during laboratory sessions.

Concrete Technology (22PCCE3040T)

Teaching Scheme
Lectures : 03 Hrs./week
Credit :03

Examination Scheme
Term Test : 15 Marks
Teacher Assessment : 20 Marks
End sem Exam : 65 Marks
Total Marks : 100 Marks

Course Objectives

1. To introduce the students Basic ingredients of concrete and their properties.
2. The students should be able to design and recommend the mix of concrete for given materials.
3. Students will able to Learn various NDT methods used for inspection of concrete.

COs	Course Outcomes	Blooms Level	Blooms Description
CO1	Students will able to learn the different Properties of Ingredients	1	Remembering
CO2	Students will able to understand manufacturing process of concrete	2	Understand
CO3	Students will able to Prepare Concrete mix Design	4	Analyzing
CO4	Students will able to Learn various NDT methods	5	Evaluating

Course Contents

Unit-I **Cement, Aggregate and water** **06 Hrs.**

Prerequisite: NA

Cement: - Manufacture of cement, chemical composition, setting and hydration of cement. Types of cement, Properties and testing of cement. Aggregates – Classification, properties, grading, impurities in aggregates and testing of aggregates, its effect on strength of concrete. Quantity of water for concrete.

Unit-II **Fresh and Hardened Concrete** **08 Hrs.**

Prerequisite: NA

Fresh Concrete: - Definition and its ingredients, grades of concrete, concreting process, Significance of water cement ratio. Properties of fresh concrete.
Hardened Concrete- Various properties of hardened concrete, factors affecting various properties, and stress - strain relation, Creep and Shrinkage testing of hardened concrete. Permeability and Durability of concrete.

Unit-III **Admixture and Special Concrete** **07 Hrs.**

Prerequisite: NA

Admixtures in Concrete: Types, Plasticizers and Super-plasticizers & their Effects on Workability.
Types of Concrete: - Lightweight concrete, polymer concrete, fiber reinforced concrete, ready mixed concrete, self-compacting and high performance concrete, Ferro cement concrete. Special concrete- Transparent concrete, cellular light wt. concrete, pre-stressed concrete, under water concreting, concreting in extreme weather conditions

Unit-IV **Concrete mix Design** **10 Hrs.**

Prerequisite: NA

Introduction, to concrete mix design object of mix design, factors to be considered, statistical quality control, different methods of mix design. Concrete mix design by I.S. (10262-456) method and IRC method.

Unit-V **Introduction to NDT & Deterioration of concrete** **8 Hrs.**

Introduction to non-destructive testing of concrete, rebound hammer, ultrasonic pulse velocity, pull out test, impact echo test. Deterioration of concrete Sulphate Attack, Alkali Aggregate Reaction (AAR) factors affecting on AAR, Deteriorating effects of AAR, Chloride Attack, Corrosion of Steel.

Text books:-

1. Concrete Technology by M. S. Shetty, S Chand Publication.
2. Concrete Technology by M. L. Gambhir, TMH Publication.
3. Concrete Technology by S.V.Deodhar, Central Techno Publication
4. Concrete Technology by N.V. Nayak& A.K. Jain, Narosa Publishing House Pvt. Ltd.

Reference books:-

1. Concrete Technology by A.N. Neville, J.J. Brooks, Addition Wesley
2. Concrete Technology by R.S. Varshney, Oxford & I B H.
3. Concrete Technology by P Kumar Mehta, GujratAmbuja

Evaluation Scheme:
Continuous Assessment (A):

Subject teacher will declare Teacher Assessment criteria at the start of Semester.

Continuous Assessment (B):

1. Two term tests of 15 marks each will be conducted during the semester.
2. Total duration allotted for writing each of the paper is 1 hr.
3. Best of the marks scored in both the two tests will be considered for final grading.

End Semester Examination (C):

1. Question Paper will be based on entire syllabus summing up to 65 marks
2. Total duration allotted for writing the paper is 3 hr.

Concrete Technology Laboratory (22PCCE3040L)

Practical Scheme
Practical : 02 Hrs./week
Credit : 01

Examination Scheme
Teacher Assessment : 25 Marks
End Sem Exam : 25 Marks
Total : 50 Marks

Course Objectives

The primary lab course objective is to find properties of Material
Learning Outcomes: Upon successful completion of this course the student will be able to:

1. To find the various properties of material used in concrete.
2. To observe the behavior of concrete in Fresh stage and Hardened stage
3. Students able to conduct various NDT test of concrete.

COs	Course Outcomes	Blooms Level	Blooms Description
CO1	Students will able to find the Properties of material	3	Applying
CO3	Students will able to Prepare Concrete mix Design	6	Creating
CO2	Students will able to Learn various NDT methods used for inspection of concrete	2	Understanding

Course Content

List of Experiments

Term work shall consist of performing minimum five experimental sets from the list below.

1) Testing of Cement: Consistency, Fineness, Setting Time, Specific Gravity,

2) Soundness and Strength Test for Cement

3) Testing of Aggregates: Specific Gravity, Sieve Analysis, Bulking of Fine Aggregate, Flakiness Index, Elongation Index and Percentage Elongation

4) Placement Tests on Concrete: Workability Tests: Slump, Compaction,

5) Strength Tests on Concrete: Compression, Flexure, Split & Tensile Test,

6) Effects of Admixture: Accelerator, Retarder, Super Plasticizer,

7) Exercise and verification of Concrete Mix Design,

8) Non-destructive Testing for Concrete.

Evaluation Scheme:

Continuous Assessment (A):

Laboratory work shall consist of minimum 6 experiments and subject specific lab assignment/ Case study

The distribution of marks shall be as follows:

1. Performance in Experiments: 05 Marks
2. Journal Submission: 05 Marks
3. Viva-voce: 05 Marks
4. Subject Specific Lab Assignment/Case Study: 10 Marks

The final certification and acceptance of laboratory journal/manual/report will be subject to Satisfactory performance of laboratory work and upon fulfilling minimum passing criteria in the Teacher assessment.

End Semester Examination (C):

Oral / Practical examination will be based on the entire syllabus including, the practical's performed During laboratory sessions.

Building Construction & Materials (22PCCE3050T)

Teaching Scheme
Lectures : 01 Hrs./week
Credit:01

Examination Scheme
Term Test : Nil
Teacher Assessment : 50 Marks
End Sem Exam : Nil
Total Marks : 50 Marks

Course Objectives

1. Identify the various Building Components in detail.
2. To select materials for engineering purpose is very much crucial activity in civil engineering any material of construction, the first and for most necessity is to know its properties, suitability, strength and durability.
3. Check and ensure quality of construction materials and components as per standards and practices.

COs	Course Outcomes	Blooms Level	Blooms Description
CO1	Students are able to understand the component of building with their function	1&2	Learn
CO2	Students are able to understand construction procedure of different components	1&3	Understand
CO3	Students will able to understand the basic construction material requirement.	3	Understand

Course Contents

Unit-I Types of building and foundation **03Hrs.**

Types of building, various parts of building, sub structure and super structure. Plinth, sill, floor, and roof etc.

Foundation: Purpose and classification, advantages and disadvantages of each and circumstances under which each is used. Factor considered for selection of foundation.

Unit-II Masonry and form work **02Hrs.**

Masonry: Principle of masonry construction, types of masonry,

Brick masonry: Various types of bond in brick masonry, reinforced brick masonry, precautions to be taken in masonry construction, Stone Masonry & its types, Composite Masonry, latest trends in construction industry.

Unit-III **03Hrs**

Types of lintel, detailing of R.C.C. lintel, precast lintel and stone lintel. Doors and windows: Type of Floor and roof: Ground floor, upper floor, mezzanine floor, design and constructional requirements, various types of floor finishes used, advantage and disadvantages, special flooring...

Unit-IV Truss and its type **02 Hrs**

Steel trusses: Types, Methods of connections, connecting materials. Scaffolding, shoring, under pinning and strutting.

Unit-V Study of various material used in construction **03Hrs.**

Stone: Natural bed of stone, stone quarrying, uses of stones and qualities of good building Stone, test's on stone. Bricks: Composition of good brick earth, classification of burnt brick, manufacturing of bricks, qualities of good bricks, test on bricks Timber: Properties and uses, testing, conservation and sawing, defects in timbers, artificial timber, veneers, and plywood and block board. Other miscellaneous materials: Aluminium, glass, heat insulating materials, sound absorbent materials

Textbooks

1. Building Construction: Dr. B.C. Punmia, A.K.Jain, A.R.Jain,Laxmi Publication., New Delhi.
2. A Building Construction: S.C. Rangwala, Charotar Publications, Gujarat, India.
3. Concrete Technology by N.V. Nayak& A.K. Jain, Narosa Publishing House Pvt. Ltd.
4. Concrete Technology by Kulkarni P.D. Ghosh, R.K. Phull Y.R., New Age International.
5. Building Construction: S.P. Arora, Dr.S.P. Bindra,DhanpatRai Publication, New Delhi

Reference Books

1. Engineering Materials: S.R. Rangwala,Charotar Publications.
2. Architectural Materials science: D. Anapetor, Mir Publishers.
3. Introduction to Engineering Materials: B. K. Agrawal, Tata McGraw Hill, NewDelhi.
4. Relevant codes: BIS, ACI & BS.

Evaluation Scheme:
Continuous Assessment (A):

Subject teacher will declare Teacher Assessment criteria at the start of Semester.

Building Construction & Materials Laboratory (22PCCE3050L)

Practical Scheme
Practical : 02 Hrs./week
Credit : 01

Examination Scheme
Teacher Assessment : 25 Marks
ESE: 25 Marks
Total :50Marks

Course Objectives

1. Identify the various Building Components in detail.
2. Select and deploy suitable construction technique and methods for various construction of masonry works.
3. Check and ensure quality of construction materials and components as per standards and practices.

COs	Course Outcomes	Blooms Level	Blooms Description
CO1	Students are able to understand the component of building and its Importance	1&2	Learn
CO2	Students are able to Draw the various parts of building in detailed	1&3	Understand
CO3	Students are able Identify the various Latest material in construction Industry.	3	Understand

List of Laboratory Experiments

List of Experiments

1) Draw a cross section of building.

2) C.C.T.W. Panelled door: plan, elevation, section

- To know the various types doors and draw the sketches.
- To describe the various types windows and draw the sketches.

3) Flush door: plan, elevation and section

- To know the various types doors and draw the sketches.
- To describe the various types windows and draw the sketches.

4) Lintel/ Arches in stone and bricks.

- To know various types lintel and arches and draw the sketches

5) Stone masonry: U.C.R., C.R. and Ashlars.

- To study various types of bonds in brick masonry, reinforced brick masonry.

6) Report writing of (Latest Market survey of Construction Material Rate/Types of Material Available /New Material in Market etc.)

Evaluation Scheme:

Continuous Assessment (A):

Laboratory work shall consist of minimum 6 Assignments from above group-I and Two form group-II The distribution of marks shall be as follows:

1. Performance in Experiments: 05 Marks
2. Journal Submission: 05 Marks
3. Viva-voce: 05 Marks
4. Subject Specific Lab Assignment/Case Study: 10 Marks

The final certification and acceptance of laboratory journal/manual/report will be subject to Satisfactory performance of laboratory work and upon fulfilling minimum passing criteria in the Teacher assessment.

End Semester Examination (C):

Oral / Practical examination will be based on the entire syllabus including, the practical's performed During laboratory sessions.

Universal Human Values (22HMCE3060T)

Teaching Scheme
Lectures : 2 Hrs./week
Credit :02

Examination Scheme
Term Test :15 Marks
Teacher Assessment : 20 Marks
End Sem Exam : 65 Marks
Total Marks : 100Marks

Objectives:

1. Development of a holistic perspective based on self-exploration about themselves (human being), family, society, and nature/existence.
2. Understanding (or developing clarity) of the harmony in the human being, family, society, and nature/existence.
3. Strengthening of self-reflection.
4. Development of commitment and courage to act.

COs	Course Outcomes	Blooms Level	Blooms Description
CO1	1. Become more aware of themselves, and their surroundings (family, society, and nature); they would become more responsible in life, and in handling problems with sustainable solutions, while keeping human relationships and human nature in mind. They would have better critical ability.	1	Remember
CO2	2. Become sensitive to their commitment towards what they have understood (human values, human relationships, and human society).	1	Remember
CO3	Apply what they have learnt to their own self in different day-to-day settings in real life, at least a beginning would be made in this direction.	1	Remember

Course Contents

Unit-I **02 Hrs.**

Introduction: Need, Basic Guidelines, Content and Process for Value Education Purpose and motivation for the course. Self-Exploration–what is it? - Its content and process; 'Natural Acceptance' and Experiential Validation- as the process for self-exploration.
Continuous Happiness and Prosperity- A look at basic Human Aspirations.
Right understanding, Relationship and Physical Facility- the basic requirements for fulfilment of aspirations of every human being with their correct priority. Understanding Happiness and Prosperity correctly- A critical appraisal of the current scenario. Method to fulfil the above human aspirations: understanding and living in harmony at various levels.

Unit-II **02 Hrs.**

Understanding Harmony in the Human Being - Harmony in Myself! Understanding human being as a co-existence of the sentient 'I' and the material 'Body'. Understanding the needs of Self ('I') and 'Body' - happiness and physical facility. Understanding the Body as an instrument of 'I' (I am being the doer, seer and enjoyer). Understanding the characteristics and activities of 'I' and harmony in 'I'. Understanding the harmony of I with the Body: Sanyam and Health; correct appraisal of Physical needs, meaning of Prosperity in detail. Programs to ensure Sanyam and Health.

Unit-III **02 Hrs.**

Understanding Harmony in the Family: Harmony in Human-Human Relationship. Understanding values in human-human relationship; meaning of Justice (nine universal values in relationships) and program for its fulfilment to ensure mutual happiness; Trust and Respect as the foundational values of relationship. Understanding the meaning of Trust
Difference between intention and competence. Understanding the meaning of Respect, Difference between respect and differentiation; the other salient values in relationship

Unit-VI **02 Hrs.**

Understanding the harmony in society (society being an extension of family): Resolution, Prosperity, fearlessness (trust) and co-existence as comprehensive Human Goals. Visualizing a universal harmonious order in society- Undivided Society, Universal Order- from family to world family.

Unit-V **02 Hrs.**

Understanding Harmony in Nature and Existence: Whole existence as Coexistence Understanding the harmony in the Nature. Interconnectedness and mutual fulfilment among the four orders of nature recyclability and self-regulation in nature. Understanding Existence as Co-existence of mutually interacting units in all pervasive space. Holistic perception of harmony at all levels of existence.

Unit-VI **02 Hrs.**

Implications of the above Holistic Understanding of Harmony on Professional Ethics: Natural acceptance of human values. Definitiveness of Ethical Human Conduct. Basis for Humanistic Education, Humanistic Constitution and Humanistic Universal Order. Competence in professional ethics: a. Ability to utilize the professional competence for augmenting universal human order, b. Ability to identify the scope and characteristics of people friendly and eco-friendly production systems, c. Ability to identify and develop appropriate technologies and management patterns for above production systems.
Case studies of typical holistic technologies, management models and production systems. Strategy for transition from the present state to Universal Human Order: a. At the level of individual: as socially and ecologically responsible engineers, technologists, and managers, b. At the level of society: as mutually enriching institutions and organizations.

Books Recommended:

Text books:

1. Human Values and Professional Ethics by R R Gaur, R Sangal, G P Bagaria, Excel Books, New Delhi, 2010.

Reference Books:

1. Jeevan Vidya: Ek Parichaya, A Nagaraj, Jeevan Vidya Prakashan, Amarkantak, 1999.
2. Human Values, A.N. Tripathi, New Age Intl. Publishers, New Delhi, 2004.
3. The Story of Stuff (Book).
4. The Story of My Experiments with Truth - by Mohandas Karamchand Gandhi.
5. Small is Beautiful - E. F Schumacher. 6. Slow is Beautiful - Cecile Andrews.
7. Economy of Permanence - J C Kumarappa.
8. Bharat Mein Angreji Raj – PanditSunderlal.
9. Rediscovering India - by Dharampal.
10. Hind Swaraj or Indian Home Rule - by Mohandas K. Gandhi.
11. India Wins Freedom - Maulana Abdul Kalam Azad.
12. Vivekananda - Romain Rolland. (English)
13. Gandhi - Romain Rolland. (English)

Evaluation Scheme:

Continuous Assessment (A):

Subject teacher will declare Teacher Assessment criteria at the start of Semester.

Continuous Assessment (B):

1. Two term tests of 15 marks each will be conducted during the semester.
2. Total duration allotted for writing each of the paper is 1 hr.
3. Best of the marks scored in both the two tests will be considered for final grading.

End Semester Examination (C):

1. Question Paper will be based on entire syllabus summing up to 65 marks
2. Total duration allotted for writing the paper is 3Hrs.

Semester Project – I (22PJCE3070 L)

Teaching Scheme		Examination Scheme
Practical : 02 Hrs./week		Teacher Assessment : 25Mark
Credit : 01		End Semester 25 marks
	Marks	Total Marks : 50

Course Objectives:

Students are expected to design, simulate/implement a project based on the knowledge acquired from Current semester subjects.

COs	Course Outcomes	Blooms Level	Blooms Description
CO1	Conduct a survey of several available literatures in the preferred field of study.	4	Analyze
CO2	Demonstrate various/alternate approaches to complete a Project.	2	Understand
CO3	Ensure a collaborative project environment by interacting And dividing project work among team members.	3	Apply
CO4	Present their project work in the form of a technical report / paper and thereby improve the technical communication skill.	3	Apply
CO5	Demonstrate the ability to work in teams and manage the conduct of the research study.	2	Understand

Semester Project:

The purpose of introducing semester project at second year level is to provide exposure to students With a variety of projects based on the knowledge acquired from the semester subjects. This activity Is supposed to enrich their academic experience and bring enough maturity in student while selecting The project. Students should take this as an opportunity to develop skills in implementation, Presentation and discussion of technical ideas/topics. Therefore, proper attention shall be paid to the Content of semester project report which is being submitted in partial fulfillment of the requirements Of the Second Year and it is imperative that a standard format be prescribed for the report.
Each student shall work on project approved by departmental committee approved by the Head Of Department, a group of 03 to 05 students (max allowed: 5 students in extraordinary cases, subject To the approval of the department committee and the Head of the department) shall be allotted for Each Semester Project. Each group shall submit at least 3 topics for the Semester Project. The Departmental committee shall finalize one topic for every group. Semester Project Title or Theme Should be based on knowledge acquired during semester. The project work shall involve sufficient work So that students get acquainted with deferent aspects of knowledge acquired from semester subjects.
Student is expected to:

_ Select appropriate project title based on acquired knowledge from current semester subjects.

_ Maintain Log Book of weekly work done (please see attached log book format).

_ Report weekly to the project guide along with log book.

Assessment Criteria:

_ at the end of the semester, after conformation by the project guide, each project group will Submit project completion report in prescribed format for assessment to the departmental committee (including project guide).

_ Assessment of the project (at the end of the semester) will be done by the departmental committee (including project guide).

Prescribed project report guidelines:
Size of report shall be of minimum 25 pages. Project Report should include appropriate content for:

_ Introduction
_ Literature Survey
_ Related Theory
_ Implementation detail
_Project Outcomes
_ Conclusion
_ References

Assessment criteria for the departmental committee (including project guide) for Continuous Assessment: Guide will monitor weekly progress and marks allocation will be as per Table 2. Assessment criteria for the departmental committee (including project guide) for End Semester Exam: Departmental committee (including project guide) will evaluate project as per Table 3.Each group shall present/publish a paper based on the semester project in reputed/peer Reviewed Conference/Journal/Tech Fest/Magazine/ before the end of the semester.

Table 1 Log Book format

S.NO.	Week (Start date / End date)	Work done	Sign of Guide	Sign of Coordinator
1				
2				

Table 2 Continuous Assessment sheet

S.NO.	Exam Seat No	Name of Student	Student Attendance	Log Book Maintain	Literature review	Depth of Understanding	Report	Total
			5	5	5	5	5	25

Table 3 Evaluation sheet

S.NO.	Exam Seat No	Name of Student	Project Selection	Design Simulation logic	PCB hardware programing	Result Verification	Presentation	Total
			5	5	5	5	5	25

SEM-IV

Engineering Mathematics IV (22BSCE4010T)

Teaching Scheme
Lectures : 03 Hrs./week
Tutorial :01 Hrs/week
Credit :04

Examination Scheme
Term Test : 15 Marks
Teacher Assessment : 20 Marks
End Sem Exam : 65 Marks
Total Marks : 100 Marks

Course Objectives

1. To inculcate an ability to relate engineering problems to mathematical context
2. To provide a solid foundation in mathematical fundamentals required to solve engineering problem
3. To study the basic principles of Vector analyses, complex integration, probability, test of hypothesis and correlation between data.
4. To prepare students for competitive exams.

COs	Course Outcomes	Blooms Level	Blooms Description
CO1	Identify diagonalizable and derogatory matrices and find functionsas a square matrix using eigenvalues and eigenvectors.	L1	Knowledge
CO2	Evaluate vector integrals	L5	Evaluate
CO3	Use probability to solve real-life engineering problems	L3	Apply
CO4	Draw conclusions on population based on large and small samplestaken.	L3	Apply
CO5	Analyze the variances of multiple variables simultaneously	L4	Analyze

Course Contents

Unit-I **Linear Algebra** **08 Hrs.**

Characteristic equation, Eigenvalues and Eigenvectors with properties. Cayley-Hamilton theorem to find higher order matrices and inverse of matrix Diagonalizability of similar matrices Functions of a matrix Quadratic Forms: Canonical form using congruent transformations, Orthogonal Transformation to find rank, index, signature and value class

Unit-II **Vector differentiation** **06 Hrs.**

Scalar and vector point functions. Gradient of a scalar function, Divergence, curl and Scalar Potential of a vector function. Solenoidal, Irrotaional and conservative Fields.

Unit-III **05 Hrs.**

Line integrals **(For Self-Study)**, Green's theorem (without proof) for planes and verification of line integrals.

Stokes theorem and Gauss divergence theorem (without proof and verification).

Unit-IV **Probability** **08 Hrs.**

Discrete and Continuous random variables, Probability mass and density function, Probability distribution for random variables, Expected value, Variance.

Probability Distributions: Binomial, Poisson, and Normal Distributions (for detailed study).

Unit-V **Sampling Theory** **08 Hrs.**

Sampling distribution. Test of Hypothesis. Level of significance, critical region. One tailed and two tailed tests. Interval Estimation of population parameters. Large and small sample.

Test of significance for large samples: Test for significance of the difference between samples mean and population means, Test for significance of the difference between the means of two samples.

Student's t-distribution and its properties. Test of significance of small samples: Test for significance of the difference between samples mean and population means, Test for significance of the difference between the means of two Samples, paired t-test.

Chi-square test, Test for the Goodness of fit, Association of attributes.

Unit-VI **04 Hrs.**

ANOVA (For Self-Study)

Analysis of Variance (F-Test): One-Way classification, Two-way classification (short-cut method).

Reference Books

1. Higher Engineering Mathematics, B.V. Ramana, McGraw Hill Education, New Delhi
2. Integral Transforms and their Engineering Applications, Dr B. B. Singh, Synergy Knowledgeware, Mumbai
3. Numerical Methods, Kandasamy, S. Chand & CO
4. Fundamentals of Mathematical Statistics by S.C. Gupta and Kapoor

Text Books

1. Higher Engineering Mathematics, Dr B. S. Grewal, Khanna Publication
2. Advanced Engineering Mathematics, E Kreyzig, Wiley Eastern Limited

Evaluation Scheme:

Continuous Assessment (A):

Subject teacher will declare Teacher Assessment criteria at the start of semester.

Continuous Assessment (B):

1. Two term tests of 15 marks each will be conducted during the semester.
2. Total duration allotted for writing each of the paper is 1 hr.
3. Average of the marks scored in both the tests will be considered for _nal grading.

End Semester Examination (C):

1. Question paper will be based on the entire syllabus summing up to 65 marks.
2. Total duration allotted for writing the paper is 3 hrs.

Tutorial Minimum eight tutorials shall be conducted.

Fluid Mechanics (22PCCE4020T)

Teaching Scheme
Lectures : 03 Hrs./week
Tutorial :01 Hr/Week
Credit : 04

Examination Scheme
Term Test : 15 Marks
Teacher Assessment : 20 Marks
End Sem Exam : 65 Marks
Total Marks : 100 Marks

Course Objectives:
After successful completion of course, students should able to:

1. Understand basic properties of fluids.
2. Study of Fluid statics conditions.
3. Measurement of flow with orifice, mouth piece, notches, weirs.

COs	Course Outcomes	Blooms Level	Blooms Description
CO1	Define the basic concept of fluid and fluid properties. Including concept of buoyancy and flotation.	L2	Understand
CO2	Measure the fluid pressure in various conditions	L4	Analyzing
CO3	Apply continuity equations to solve problems in fluid mechanics.	L3	Apply
CO4	Apply the Bernoulli equation to solve problems in fluid mechanics.	L3, L5	Apply, Evaluate
CO5	Measure fluid flow with help of orifice, notches.	L1, L3	Remember, Apply

Course Contents

Unit-I **Introduction** **06 Hrs.**

Definition of fluid, distinction between solid, fluid & gases Fluid Properties: Mass density, specific volume, specific weight, specific gravity - Definitions, units and dimensions, Viscosity, Newton's law of viscosity, Newtonian & non-Newtonian fluids, ideal & real fluids, Compressibility, Vapor Pressure, Surface tension, and Capillary. Buoyant force and center of buoyancy, Archimedes principle, meta-center, Stability of floating bodies

Unit-II **Fluid Statics** **07 Hrs.**

Fluid pressure at a point, Variation of fluid pressure with depth, pressure head, atmospheric, gauges, vacuum pressure, relationship with diagram, pressure measurement using simple and differential manometer with formation of gage equation. Hydrostatics pressure on various surface, Center of pressure and total pressure for fluid masses subjected to horizontal, vertical and inclined plane surface.

Unit-III **Fluid Kinematics** **06 Hrs.**

Types of fluid flows, rate of flow of discharge, continuity equation for one, two and three dimensional flows, Velocity and acceleration, Velocity potential function and stream function, vortex flow, flow nets concept.

Unit-IV **Fluid Dynamics** **7 Hrs.**

Equation of motion, Euler's equation of motion, Bernoulli's equation, and practical Applications of Bernoulli's equation: Venturi meter, orifice meter, Pitot tube, Momentum Equation. Free liquid jet.

Unit-V **Flow Measurement** **6 Hrs.**

Classification of Orifices, Mouthpieces, Determination of hydraulic co-efficient (Cv, Cc, Cd), Classification of Notches and weirs, Discharge over rectangular notch, triangular notch, trapezoidal notch and weirs. Time required to empty a reservoir or a tank with triangular/rectangular notch. Ventilation of weir, Types of weirs.

Text Books

1. Hydraulics and fluid mechanics including Hydraulic machines by Dr. P. N. Modi and S. M. Seth, Latest edition, Standard book house.
2. Theory and application of fluid mechanics by K Subramanya, Tata McGraw Hill Publishing Company Ltd New Delhi.
3. A textbook of Fluid Mechanics & Hydraulic Machines by R. K. Bansal.
4. Fluid Mechanics- by D.S.Kumar, S.K.Katariya & Sons, Delhi.

Reference Books:

1. Fluid Mechanics & Hydraulic Machines by S. C. Gupta, Darling Kindersley (I) pvt. Ltd. Pearson licensee, Nodia, UP.
2. Fluid Mechanics – Fundamentals and applications by Yunus cengel, Jhon M Cimbala, Tata McGraw Hill Publishing Company Ltd New Delhi, latest edition/ reprint.
3. Fluid mechanics through problems, 2nd ed.: R. J. Garde, Wiley Eastern Ltd

Evaluation Scheme:

Continuous Assessment (A):

Subject teacher will declare Teacher Assessment criteria at the start of Semester.

Continuous Assessment (B):

1. Two term tests of 15 marks each will be conducted during the semester.
2. Total duration allotted for writing each of the paper is 1 hr.
3. Best of the marks scored in both the two tests will be considered for final grading.

End Semester Examination (C):

1. Question Paper will be based on entire syllabus summing up to 65 marks
2. Total duration allotted for writing the paper is 3 hr.

Tutorial

Min five tutorials shall be conducted

Fluid Mechanics Laboratory (22PCCE4020L)

Practical Scheme
Practical : 02 Hrs./week
Credit : 01

Examination Scheme
Teacher Assessment : 25 Marks
End Sem Exam : 25 Marks
Total : 50 Marks

Course Objectives

1) To understand principles and to study fundamentals of different apparatus in laboratories.
2) To understand basic concepts of fluid flow.

COs	Course Outcomes	Blooms Level	Blooms Description
CO1	Acquire knowledge of basic principles of fluid mechanics.	1	Learning
CO2	Able to determine metacentric height of ship	3	Applying
CO3	Able to measure fluid pressure on various devices.	5	Evaluating
CO4	Students are able to perform the verification Bernoulli's theorem.	4	Analyzing
CO5	Able to understand concept of flow net	2	Understanding

Course content

List of Experiments:

1. Study variation of viscosity of oil with temperature.
2. Determination of metacentric height
3. Study of pressure measuring devices (simple and differential manometers).
4. Verification of Bernoulli's equation.
5. Laminar flow by Reynolds Experiment.
6. Study the concept of flow net with electrical analogy test
7. Calibration of Venturimeter.
8. Calibration of rectangular / Triangular notch.
9. Determination of Hydraulic Coefficients for an orifice.

PRACTICAL EXAMINATION

The practical examination shall consist of term work assessment and viva- voce based on syllabus.

Evaluation Scheme:

Continuous Assessment (A):

Laboratory work shall consist of minimum 6 experiments and subject specific lab assignment/ Case study

The distribution of marks shall be as follows:

1. Performance in Experiments: 05 Marks

2. Journal Submission: 05 Marks

3. Viva-voce: 05 Marks

4. Subject Specific Lab Assignment/Case Study: 10 Marks

The final certification and acceptance of laboratory journal/manual/report will be subject to Satisfactory performance of laboratory work and upon fulfilling minimum passing criteria in the Teacher assessment.

End Semester Examination (C):

Oral / Practical examination will be based on the entire syllabus including, the practical's performed During laboratory sessions

Engineering Geology (22ESCE4030T)

Teaching Scheme
Lectures : 02 Hrs./week
Credit :02

Examination Scheme
Term Test : 15 Marks
Teacher Assessment : 20 Marks
End Sem Exam : 65 Marks
Total Marks : 100 Marks

Course Objectives

1. To study and identify different types natural materials like rocks & minerals and soil.
2. To understand the various natural dynamic processes their influence on the surfacial features, natural material and their consequences.
3. To know the physical properties of rocks & minerals, To know the importance of geological maps and language helpful for Civil Engineering projects

COs	Course Outcomes	Blooms Level	Blooms Description
CO1	As a students in the Bachelor of Engineering (Civil Engineering) will undertake courses in geology Such as Rock and mineral.	2	Understand
CO2	Students are able to know the different geological hazards and its mitigation, Students are able to understand the different method of geological exploration	3	Apply
CO3	As a students in the Bachelor of Engineering (Civil Engineering) will undertake courses in geology Such as Rock and mineral.	5	Evaluate
CO4	Students are able to understand the different geological structures and their impact on civil engineering structure.	2	Understand

Course Contents

Unit-I 06 Hrs.

Introduction and scope of Geology and subdivision ,Internal structure of the earth, Weathering, erosion and denudations process on earth material and natural agencies, Geological work of wind, river underground water and glaciers. Earthquakes: Basics of earthquake, earthquake history, seismic activity, concept of intensity and magnitude of earthquake, causes of earthquake, influence on civil structures and engineering consideration, seismic zonation, Stratigraphy of INDIA-Introduction

Unit-II 07 Hrs.

Study of physical properties of mineral and study of common rock forming minerals & way of Formation of minerals, Study of three types of rocks with reference to their formation, identification, textural and structural features Rocks and natural materials as a construction material

Unit-III 06 Hrs.

Outcrop, stratification, dip and strike relation, Unconformity, joints their types and genesis Faults and folds with their types and causes, Engineering consideration of joints, folds and faults

Unit-IV 7 Hrs.

Basics of Engineering Geology, Importance of geological studies to Engineers and significance of geological Investigations for civil engineering projects, Geology for Site selection of Dam, Tunnel, Reservoir and Highways

Unit-V 6 Hrs.

Ground water and occurrence, investigations, quality, artificial recharging, Hydrogeological Cycle

Text Books:

1. Mukharjee, P.K., A text book of Geology, The World Press Pvt. Ltd.
2. Kesavulu, C., Textbook of Engineering Geology, Macmillan India Ltd, 1993, NewDelhi
3. Bangar, K.M, Principles of Engineering Geology, Standard Publishers Distributors, 1995, New Delhi
4. Billings, M.P., Structural Geology, Prentice-Hall India, 1974, New Delhi
5. Blyth, F.G.H and de Freitas, M.H. Geology for Engineers, ELBS, 1974London

Reference Books:

1. Gokhale, KVG.K and Rao, D.M., Experiments in Engineering Geology, Tata-McGraw Hill, 1981, New Delhi
2 Kesavulu, C. Textbook of Engineering Geology, Macmillan, India Ltd., 1993,New Delhi
3. Lilesand, T.M. and Ralph W. Keifer., Remote sensing and ImageInterpretation, John Wiley & Sons, 1987, New York.
4. Reddy, V. Engineering Geology for Civil Engineers; Oxford & IBH, 1997,New Delhi
5. Todd, D.K. Groundwater Hydrology, John Wiley & Sons, 1980, New York
6. Parbin Singh, Engineering Geology

Evaluation Scheme:

Continuous Assessment (A):

Subject teacher will declare Teacher Assessment criteria at the start of Semester.

Continuous Assessment (B):

1. Two term tests of 15 marks each will be conducted during the semester.
2. Total duration allotted for writing each of the paper is 1 hr.
3. Best of the marks scored in both the two tests will be considered for final grading.

End Semester Examination (C):

1. Question Paper will be based on entire syllabus summing up to 65 marks
2. Total duration allotted for writing the paper is 3 hr.

Engineering Geology Laboratory (22ESCE4030L)

Practical Scheme
Practical : 02 Hrs./week
Credit :01

Examination Scheme
Teacher Assessment : 25 Marks
End Sem Exam : 25 Marks
Total : 50 Marks

Course Objectives

1. To study and identify different types natural materials like rocks & minerals and soil.
2. To understand the various natural dynamic processes their influence on the surficial features, natural material and their consequences.
3. To know the physical properties of rocks & minerals, To know the importance of geological maps and language helpful for Civil Engineering projects

COs	Course Outcomes	Blooms Level	Blooms Description
CO1	As a students in the Bachelor of Engineering (Civil Engineering) will undertake courses in geology Such as Rock and mineral.	2	Understand
CO2	Students are able to know the different geological hazards and its mitigation, Students are able to understand the different method of geological exploration	3	Apply
CO3	As a students in the Bachelor of Engineering (Civil Engineering) will undertake courses in geology Such as Rock and mineral.	5	Evaluate
CO4	Students are able to understand the different geological structures and their impact on civil engineering structure.	2	Understand

Course content

List of Experiments: Conduct any five from List

1) Fundamental of Geology
2) Study of Physical Properties of Minerals
3) Identification of Minerals and Rock sample
4) Megascopic Study of Rock Forming Minerals (Hand Specimen Study)
5) Megascopic Study of Igneous Rocks
6) Megascopic Study of Sedimentary Rocks
7) Megascopic Study of Metamorphic Rocks

Introduction to Geological Maps for different structural features. Presentation of Beds along Section and Construction of Geological History

Evaluation Scheme:

Continuous Assessment (A):

Laboratory work shall consist of minimum 6 experiments and one filed Project / Case study

The distribution of marks shall be as follows:

1. Performance in Experiments: 05 Marks
2. Journal Submission: 05 Marks
3. Viva-voce: 05 Marks
4. Subject Specific Lab Assignment/Filed project Case Study: 10 Marks

The final certification and acceptance of laboratory journal/manual/report will be subject to Satisfactory performance of laboratory work and upon fulfilling minimum passing criteria in the Teacher assessment.

End Semester Examination (C):

Oral / Practical examination will be based on the entire syllabus including, the practical's performed During laboratory sessions

Building Planning and Design (22ESCE4040T)

Teaching Scheme
Lectures : 03 Hrs./week
Credit:03

Examination Scheme
Average of Term Test (T1&T2) : 15 Marks
Continuous Assessment : 20 Marks
End Sem Exam : 65 Marks
Total Marks : 100 Marks

Course Objectives

1 To identify the basic drawing principles of building.

2 To developed basic planning skills, Functional design of Residential/Public building using byelaws and buildings services.

3 To draw elevation, section and aesthetics of proposed building by perspective view.

COs	Course Outcomes	Blooms Level	Blooms Description
CO1	Students will be able to understand basic concepts of scale, symbols of material, types of building, and use of building materials.	2	Understand
CO2	Students will able to learn various building byelaws relating to planning of buildings and different building services.	3	Applying
CO3	Students will able to prepare submission and working drawing of a Load bearing and framed structure.	6	Creating
CO4	Students will able to draw one- and two-point perspective view of object and building	6	Creating
CO5	Students will able to plan public and administrative building according occupant's requirements.	5	Evaluating

Course Contents

Unit-I Principles and Codes of Practices for Planning and Designing of Buildings 06 Hrs.

a) Study of IS 962-1989- Code of practice for architectural and building drawings – sizes of drawings, layout of drawings, scales, projection, line work – types thickness, spacing of lines, lettering and dimensioning, graphical symbols, conventional representation of materials in section, numbering of buildings and parts of buildings.

b) Principles of planning for Residential buildings – Aspect, prospect, grouping, circulation, Orientation, roominess, flexibility, privacy, space utilization, sanitation, ventilation, functional relations of different units.

c) Types of building as per occupancy.

Unit-II Study of Building byelaws, and Building Services 09 Hrs.

a) Study of building Byelaws- Necessity of building bye laws, plot sizes, road width, open spaces, floor area ratio (F.A.R.), marginal distances, building line, control line, height regulation, room sizes, types of area calculations – built-up area, floor area, and carpet area. Rules for ventilation, lighting, Vertical circulation, Sanitation and parking of vehicles. Sun shading devices, Minimum standard dimensions.

b) Ventilation- Necessity of Ventilation, Natural ventilation and Mechanical ventilation.

c) Air Conditioning Systems- Classification, object and necessity of air conditioning.

d) Plumbing- One pipe and Two pipe system, Water storage and disposal arrangement, septic tank, Plumbing systems, and various types of traps, Fixtures and Fittings.

Unit-III Planning of Residential Building - Load bearing Structure 08 Hrs.

Introduction – Minimum standard dimension of all load bearing components. Drawing of single-story load bearing residential building with staircase. Data drawing – Developed ground floor plan, Elevation, Section passing through staircase and WC bath, site plan, schedule of opening, construction notes with specification, Area of Statement, Foundation plan.

Unit-IV Planning of Residential Building – Framed Structure 08 Hrs.

a) Development of ground floor plan, elevation, sections, site plan, layout plan and schedule of openings of residential buildings such as –Bungalows, Row houses, Apartments using Framed Structure.

b) Perspective Drawings– One point and Two-point perspective of an object and simple Residential building.

Unit-V Planning of Public Building 08 Hrs.

Functional requirements and planning of industrial buildings, commercial buildings, Educational Building (School, Colleges), Hostel, Library building, Restaurant/ Hotel building, Primary Health Center/ Hospital, Shopping complex, Community/marriage halls, post offices, banks. Two dimensioned line plans of above public buildings.

Text Books:

1. Shah M.G., Kale C.M. and Patki S.Y., "Building drawing an Integrated approach to Built environment", Tata McGraw Hill (Fifth edition)
2. Building Planning & Drawing by Dr. N. KumaraSwamy, A. Kameswara Rao, 7th edition, Charotar Publishing House.
3. Y.S.Sane, "Planning and Designing Buildings", Engineering Book Publishing Co., Pune – 16, Edition 1996
4. S.P.Arora and S.P. Bindra, "A Text Book of Building Construction", Dhanpat Rai& Sons, Delhi, Edition 1996

Reference Books:

1. National Building Code of India 2005, Bureau of Indian Standard, New Delhi.
2. Dr. B.C. Punmia, "Building Construction" Laxmi Publications Pvt. Ltd., New Delhi, Edition, 1998
3. I.S. 962 – 1989 Code for Practice for Architectural and Building Drawings.
4. Building science and planning by Dr. S. V. Deodhar, Khanna Publishers.
5. National Building Code of India – 2005 (NBC 2005)
6. A Course in Civil Engineering Drawing", by V. B. Sikka, S. K.Kataria & Sons.

Evaluation Scheme:

Continuous Assessment (A):

Subject teacher will declare Teacher Assessment criteria at the start of Semester.

Continuous Assessment (B):

1. Two term tests of 15 marks each will be conducted during the semester.
2. Total duration allotted for writing each of the paper is 1 hr.
3. Best of the marks scored in both the two tests will be considered for final grading.

End Semester Examination (C):

1. Question Paper will be based on entire syllabus summing up to 65 marks
2. Total duration allotted for writing the paper is 3 hr.

Building Planning and Design Lab (22ESCE4040L)

Practical Scheme
Lectures : 00 Hrs./week
Practical : 02 Hrs./week
Credit : 01

Examination Scheme
Continuous Assessment : 25 Marks
End Sem Exam : 25 Marks
Total : 50 Marks

Course Objectives

1 To develop basic planning skills, and design residential /public buildings/commercial buildings on paper.
2 To draw elevation, section and aesthetics of proposed building by perspective view.
3 To prepare working and submission drawing of a building.

COs	Course Outcomes	Blooms Level	Blooms Description
CO1	Students will be able to understand different scales of drawings	2	Understand
CO2	Students will able to plan residential and public buildings according occupant's requirements.	5	Evaluating
CO3	Students will able to prepare working and submission drawing of residential and public buildings.	6	Creating
CO4	Students will able to draw one- and two-point perspective view of object and building.	6	Creating

Course content

List of Experiments

A) Group A- Planning of Residential Building -

a) Planning of a small residential buildings/bungalow/duplex from given data (load bearing or framed structure).

1. Draw different floor detailed plans with furniture arrangement.
2. Draw front elevation, sections (preferably through staircase).
3. Site plan, built up area calculations.
4. Schedules of area and openings.

b) Perspective views of different objects and small residential building plan with suitable scale.

B) Group B- Planning of Public Building (From Unit V)-

1. Typical floor plans- Draw all details units of each floor./ Front or Road side elevations.
2. Sections- Draw section through staircase and toilet with all constructional details.
3. Foundation Plan- Draw all foundation details.
4. Layout plan and site plan project building including water supply and drainage arrangements
5. Site Visit – Visit of any advanced on-going building construction site, (visit report should
6. contain- Details of the location of site visit, stage of construction, sketches of components
7. with cross section & dimensions, materials used and site plan, and photographs etc.)

Laboratory:
Oral examination will be based on the entire syllabus including, the experiments performed during Filed and laboratory sessions.

The final certification and acceptance of term work will be subject to satisfactory performance of laboratory work and upon fulfilling minimum passing criteria in the term work.

Evaluation Scheme:

Continuous Assessment (A):

Laboratory work shall consist of minimum 8 experiments from above group A and B

The distribution of marks shall be as follows:

1. Performance in Experiments: 05 Marks

2. Journal Submission: 05 Marks

3. Viva-voce: 05 Marks

4. Subject Specific Lab Assignment/Case Study: 10 Marks

The final certification and acceptance of laboratory journal/manual/report will be subject to Satisfactory performance of laboratory work and upon fulfilling minimum passing criteria in the Teacher assessment.

End Semester Examination (B):

Oral / Practical examination will be based on the entire syllabus including, the practical's performed

During laboratory sessions.

Structural Analysis (22PCCE4050T)

Teaching Scheme
Lectures : 03 Hrs./week
Tutorial :01
Credit : 04

Examination Scheme
Term Test : 15 Marks
Teacher Assessment : 20 Marks
End Sem Exam : 65 Marks
Total Marks : 100 Marks

Course Objectives

1. To understand the concept of determinate and indeterminate structures, analyses of determinate and indeterminate structures.
2. The student should be able to categories the different types of actions, quantify their corresponding deformations and appreciate the final displaced shape of structures.
3. The course runs through a number of techniques which are used for the analysis of civil engineering structures.

COs	Course Outcomes	Blooms Level	Blooms Description
CO1	Students will able to understand the basic concept of static and kinematic indeterminacy, slope and deflection of determinate beams.	1, 4	Remember, Analyze
CO2	Students will able to understand and analyze indeterminate beams.	2, 4	Understanding , Analyze
CO3	Students will be able to apply fundamental concepts of slope-deflection method for analysis of indeterminate structures.	3, 4	Applying, Analysing
CO4	Students will be proficient in analyzing determinate and indeterminate trusses.	4	Analyze create
CO5	Students will be able to analyze arch structures.	4, 5	Analyze , Evaluating

Course Contents

Unit I **Introduction to Structural Analysis and Deflections in Determinate Beams** **8 Hours**

a) Introduction, types of structure, equilibrium and compatibility conditions, stress-strain relations, force-displacement relations, Static and kinematic indeterminacy of structures: concept, theories, and numerical.

b) Approaches to compute deflections in determinate beams – Calculations of deflection for determinate beams by Moment area method, Conjugate beam method and Macaulay's method of double integration.

Unit II **Analysis of Indeterminate Beams** **8 Hours**

a) Fixed Beams- Fundamentals, advantages and disadvantages, fixed end moment and reactions for standard cases of loading, numerical examples considering effect of sinking of support, SFD and BMD.

b) Continuous Beams - Analysis of continuous beam by Clapyeron's theorem of three moments.

Unit III **Slope Deflection Method** **8 Hours**

Analysis of continuous beams, analysis of rigid frames, frames without sway and with sway, effects of settlement.

Unit IV **Analysis of Trusses** **8 Hours**

a) Analysis of truss using method of joints and method of section

b) Deflection of trusses- Analysis of determinate plane trusses by Castigliano's first theorem

c) Analysis of redundant trusses by Castiglino's second theorem considering effects of Pre-strains (lack of fit) and change in temperature.

Unit V **Analysis of Arches** **7 Hours**

a) Three hinged arches- Theory of arches, Eddy's theorem, Concept of three hinged arch, calculations for support reactions, horizontal thrust, normal thrust and radial shear. Calculations for maximum positive and negative bending moment. BMD for circular and parabolic three hinged arches.

b) Two hinged arches- Theory, calculations for horizontal thrust. Calculations for maximum positive and negative bending moment. BMD for parabolic arch due to various loading conditions.

Reference Books:

- Ramamrutham S., "Theory of structures", Dhanpatrai Publishing Company.
- Reddy C. S., "Basic Structural Analysis", Tata McGraw Hill.3rd edition 2010
- Wang C.K., "Statically Indeterminate Structures", McGraw Hill
- Vazirani V.N., Ratwani M.M and Duggal S.K., "Analysis of Structures - Vol. I", ISBN NO:
- 978-81-7409-140-8
- Punmia B.C., "Structural Analysis", Laxmi Publications
- Bhavikatti S.S., "Structural analysis" Vol –I, II , Vikas Publishing House Pvt. Ltd.
- Junnarkar S. B.and Dr. Shah H.J., "Mechanics of structures" Vol – II by, Charotar Publishing House.

Evaluation Scheme:

Internal Continuous Assessment (A):

Subject teacher will declare Teacher Assessment criteria at the start of Semester.

Continuous Assessment (B):

1. Two term tests of 15 marks each will be conducted during the semester.
2. Total duration allotted for writing each of the paper is 1 hr.
3. Best of the marks scored in both the two tests will be considered for final grading.

End Semester Examination (C):

1) Question Paper will be based on entire syllabus summing up to 65 marks
2) Total duration allotted for writing the paper is 3 hr.
3) Minimum Five tutorials shall be conducted.

Constitution of India (22HMCE4060T)

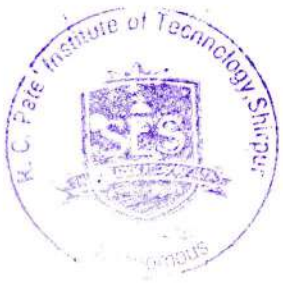
Teaching Scheme
Lectures : 2 Hrs./week
Credit :Audit

Examination Scheme
Term Test :Nil
Teacher Assessment : Nil
End Sem Exam : Nil
Total Marks :Nil

Objectives:

1. To provide basic information about Indian constitution.
2. To identify individual role and ethical responsibility towards society.
3. To understand human rights and its implications.

COs	Course Outcomes	Blooms Level	Blooms Description
CO1	Have general knowledge and legal literacy and thereby take up competitive examinations	L1	Learn
CO2	Understand state and central policies, fundamental duties.	L2	Understand
CO3	Understand powers and functions of Municipalities, Panchayats and Co-operative Societies.	L3	Apply
CO4	Understand Engineering ethics and responsibilities of Engineers.	L1	Learn
CO5	Understand Engineering Integrity & Reliability		



Course Contents

Unit-I **06 Hrs**

Introduction to the Constitution of India:

The Making of the Constitution and Salient features of the Constitution.
Preamble to the Indian Constitution Fundamental Rights & its limitations.

Unit-II **06 Hrs**

Directive Principles of State Policy:
Relevance of Directive Principles State Policy Fundamental Duties.
Union Executives – President, Prime Minister Parliament Supreme Court of India.

Unit-III **06 Hrs.**

State Executives:
Governor, Chief Minister, State Legislature High Court of State.
Electoral Process in India, Amendment Procedures, 42nd, 44th, 74th, 76th,
86th & 91stAmendments.

Unit-VI **06 Hrs.**

Special Provisions:
Provisions for Backward class section of society, Provision for Women, Children & Backward Classes Emergency Provisions

Unit-V **02 Hrs**

Human Rights:
Meaning and Definitions, Legislation Specific Themes in Human Rights- Working of National Human Rights Commission in India, Powers and functions of Municipalities, Panchayats and Co–Operative Societies.

Unit-VI **02 Hrs**

Scope & Aims of Engineering Ethics:
Responsibility of Engineers Impediments to Responsibility.
Risks, Safety and liability of Engineers, Honesty, Integrity & Reliability in Engineering

Text books:

1. Introduction to the Constitution on India, (Students Edn.) by Durga Das Basu: Prentice –Hall EEE, 19th / 20th Edn., 2001.
2. Engineering Ethics, by Charles E. Haries, Michael S Pritchard and Michael J. Robins Thompson Asia, 2003-08-05.

Reference Books:

1. An Introduction to Constitution of India, by M. V. Pylee, Vikas Publishing, 2002.
2. Engineering Ethics, by M. Govindarajan, S. Natarajan, V. S. Senthilkumar, Prentice – Hall of India Pvt.
Ltd. New Delhi, 2004.
3. Introduction to the Constitution of India, by Brij Kishore Sharma, PHI Learning Pvt. Ltd., New Delhi, 2011.

Evaluation Scheme:

Continuous Assessment (A):

Subject teacher will declare Teacher Assessment criteria at the start of semester.

Continuous Assessment (B): 1) Nil **End Semester Examination (C):**

1) Nil

Semester Project – II (22PJCE4070 L)

Teaching Scheme	Examination Scheme
Practical : 02 Hrs./week	Teacher Assessment : 25Marks
Credit : 01	End Semester 25 marks
Marks	Total Marks : 50

Course Objectives:

Students are expected to design, simulate/implement a project based on the knowledge acquired from Current semester subjects.

COs	Course Outcomes	Blooms Level	Blooms Description
CO1	Conduct a survey of several available literatures in the preferred field of study.	4	Analyze
CO2	Demonstrate various/alternate approaches to complete a Project.	2	Understand
CO3	Ensure a collaborative project environment by interacting And dividing project work among team members.	3	Apply
CO4	Present their project work in the form of a technical report / paper and thereby improve the technical communication skill.	3	Apply
CO5	Demonstrate the ability to work in teams and manage the conduct of the research study.	2	Understand

Semester Project:

The purpose of introducing semester project at second year level is to provide exposure to students with a variety of projects based on the knowledge acquired from the semester subjects. This activity is supposed to enrich their academic experience and bring enough maturity in student while selecting the project. Students should take this as an opportunity to develop skills in implementation, Presentation and discussion of technical ideas/topics. Therefore, proper attention shall be paid to the Content of semester project report which is being submitted in partial fulfillment of the requirements Of the Second Year and it is imperative that a standard format be prescribed for the report. Each student shall work on project approved by departmental committee approved by the Head of Department, a group of 03 to 05 students (max allowed: 5 students in extraordinary cases, subject To the approval of the department committee and the Head of the department) shall be allotted for Each Semester Project. Each group shall submit at least 3 topics for the Semester Project. The Departmental committee shall finalize one topic for every group. Semester Project Title or Theme Should be based on knowledge acquired during semester. The project work shall involve sufficient work So that students get acquainted with deferent aspects of knowledge acquired from semester subjects. Student is expected to:

_ Select appropriate project title based on acquired knowledge from current semester subjects.

_ Maintain Log Book of weekly work done (please see attached log book format).

_ Report weekly to the project guide along with log book.

Assessment Criteria:

_ at the end of the semester, after conformation by the project guide, each project group will

Submit project completion report in prescribed format for assessment to the departmental committee (including project guide).

_ Assessment of the project (at the end of the semester) will be done by the departmental committee (including project guide).

Prescribed project report guidelines:

Size of report shall be of minimum 25 pages. Project Report should include appropriate content for:

_ Introduction
_ Literature Survey
_ Related Theory
_ Implementation details

_Project Outcomes

_ Conclusion

_ References

Assessment criteria for the departmental committee (including project guide) for Continuous Assessment: Guide will monitor weekly progress and marks allocation will be as per Table 2. Assessment criteria for the departmental committee (including project guide) for End Semester Exam: Departmental committee (including project guide) will evaluate project as per Table 3.Each group shall present/publish a paper based on the semester project in reputed/peer Reviewed Conference/Journal/Tech Fest/Magazine/ before the end of the semester.

Table 1 Log Book format

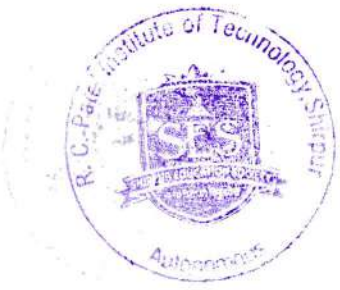
S.NO.	Week (Start date / End date)	Work done	Sign of Guide	Sign of Coordinator
1				
2				

Table 2 Continuous Assessment sheet

S.NO.	Exam Seat No	Name of Student	Student Attendance	Log Book Maintain	Literature review	Depth of Understanding	Report	Total
			5	5	5	5	5	25

Table 3 Evaluation sheet

S.NO.	Exam Seat No	Name of Student	Project Selection	Design Simulation logic	PCB hardware programing	Result Verification	Presentation	Total
			5	5	5	5	5	25



Employability Skill Development Program – I
(22HMCE4080L)

Teaching Scheme
Practical: 02 Hrs/Week
Credit:01

Examination Scheme
Teacher Assessment: 50 Marks
Total: 50 Marks

Pre-requisite: Basic Mathematics, Basic knowledge of C programming

Course Objectives

1. To enhance the problem solving skills.
2. To improve the basic mathematical skills for solving real life examples.
3. Able to implement the algorithms and draw flowcharts for solving Mathematical and Engineeringproblems.
4. Demonstrate an understanding of computer programming language concepts.

COs	Course Outcomes	Blooms Level	Blooms Description
CO1	Understand and apply the basic concepts of Quantitative Ability i. e. profit, loss, time, work and geometry.	2 and3	Understand, Apply
CO2	Understand and apply the concepts of Quantitative Ability for theproblem solving.	2 and3	Understand, Apply
CO3	Illustrate the concept of Variables and Functions	2 and3	Understand, Apply
CO4	Understand and illustrate the concept of Multithreading andstring handling	2 and3	Understand, Apply
CO5	Understand and describe the fundamental of object-oriented programming	2 and3	Understand

Course Contents

Unit-I **Aptitude**

Quantitative Aptitude : Algebra, Profit and Loss, Average & Allegation / Mixture, Time and Work, Geometry Mensuration, Numbers , Percentage, Permutation and Combination, Probability, Ratios & Proportion, Time and Distance.

Reasoning: Analytical, Puzzles, Blood relationship, Data Interpretation, Data sufficiency

Unit-II **Fundamental of Programming**

Variables: Local variables, Global variables, global keyword, Rules of Identities

Functions: Introduction, Prototype, Classification of functions, No arguments and No return values, with arguments and with return values

No arguments and With return values : With arguments and No return values, Recursion, Argument type functions, Default arguments functions, Required arguments functions, Keyword arguments functions, Variable arguments function

Operators: Arithmetic Operators, Relational operators, Logical operators, Bitwise operators, Shift operators.

Unit-III **Statements**

Control Statements: Conditional Control Statements, if, if-else, if-elif-else, nested-if, Loop Control Statements, While, for

Branching Statements: Break, Continue, pass, return, exit

Exception Handling: Introduction, The need of exception handling, Getting exceptions, Default exception handler, Handling exception, Try, Except

Try with multiple except blocks: Handling exceptions using Exception class, finally, block, Releasing resources using finally block, Raise, Creating a user exception class., Raise exception manually, Exceptions based application

Unit-IV **Multithreading**

Multithreading : Introduction, Multitasking, Multitasking v/s Multithreading, threading module, Thread class introduction, Creating thread, The life cycle of a thread, Single-threaded application, Multi-threaded application, Sleep() method. Sleep() v/s run(), Join() v/s Sleep(), Multiple custom threads creation, The execution time of single-threaded application, The execution time of multi- threaded application, Synchronization of threads.

Inner classes: Basic syntax of inner class, Advantages of Inner classes, Access class level members of inner classes, Access object level members of inner classes, Local inner classes, Complex inner classes, Accessing data of inner classes.

Regular expressions: re module, Match (), Search (), find () etc, and actual projects web scrappingMail extraction: Date extraction, Mobile number extraction, Vehicle number extraction, zoom chatanalysis

Expressions using operators and symbols: Split string into characters, Split string into words, Lambdaexpressions

String handling using regex: Introduction to Strings, Indexing and Slicing, Special operators in Stringhandling, Old style String formatting, String library methods, Quotes and Escape characters in a String representation, String Immutability, Logical programs using Strings.

Unit-V **Object Oriented Programming**

Object Oriented Programming : Introduction to OOPs, Classes, Objects, Structure to OOP application, Contexts of OOP application, Class level members, Object level members, self-variable, Constructor and Initialization of object.

Access modifiers: Private, Protected, Public, Program codes. Encapsulation Rules, Implementation, Abstraction, Polymorphism Inheritance Introduction, Types of Inheritance, Single inheritance, Multi- Level inheritance, Method overriding, Object initialization using constructor, multiple inheritances, Hierarchical inheritance, Method overriding in Multi-level inheritance

Reference Books

1. Quantitative Aptitude for Competitive Examinations by Dr. R S Aggarwal, S Chand Publication.
2. Programming Techniques through C, by M. G. Venkateshmurthy, Pearson Publication.
3. A Computer Science Structure Programming Approaches using C, by Behrouz Forouzan, Cen-gage Learning.
4. Let Us C, by Yashwant Kanetkar, BPB Publication.

Evaluation Scheme

Continuous Assessment (CA)

Teacher's assessment (TA) will carry weightage of 50 marks. Components of TA are:

1. MCQ Test based on Aptitude: 20 Marks
2. MCQ Test based on Programming skills: 20 Marks.
3. Mock Interview: 10 Marks

Any other component recommended by BOS and approved by Dean Academic