Syllabus Book

B. Tech.
(Civil Engineering)

P P Savani University

School of Engineering

Effective From: 2022-23

Authored by: P P Savani University

CONTENT

FIRST YEAR B.TECH

P P SAVANI UNIVERSITY

SCHOOL OF ENGINEERING

TEACHING & EXAMINATION SCHEME FOR B. TECH. CIVIL ENGINEERING PROGRAMME AY:2022-23

Sem	Course Code	Course Title	Offered By	Teaching Scheme					Examination Scheme						
				Contact Hours				Credit	Theory		Practical		Tutorial		Total
				Theory	Practical	Tutorial	Total		CE	ESE	CE	ESE	CE	ESE	
1	SESH1070	Fundamentals of Mathematics	SH	2	0	2	4	4	40	60	0	0	50	0	150
	SEME1010	Engineering Graphics	ME	3	4	0	7	5	40	60	40	60	0	0	200
	SEME1020	Engineering Workshop	ME	0	2	0	2	1	0	0	50	0	0	0	50
	SESH1210	Applied Physics	SH	3	2	0	5	4	40	60	20	30	0	0	150
	SEHV1010	Universal Human Value-I	SH	2	0	0	2	0	100	0	0	0	0	0	100
						Total	**20**	**14**							**650**
2	SESH1080	Linear Algebra & Calculus	SH	3	0	2	5	5	40	60	0	0	50	0	150
	SESH1240	Electrical & Electronics Workshop	ME	0	2	0	2	1	0	0	50	0	0	0	50
	SECV1040	Basics of Civil & Mechanical Engineering	CV	4	2	0	6	5	40	60	20	30	0	0	150
	SECV1080	Mechanics of Solids	CV	4	2	0	6	5	40	60	20	30	0	0	150
	SECE1010	Basics of Computer & Programming	CE	3	2	0	5	4	40	60	20	30	0	0	150
	CFLS1010	Linguistic Proficiency	CFLS	2	0	0	2	2	40	60	0	0	0	0	100
						Total	**26**	**22**							**750**

P P Savani University
School of Engineering

Department of Applied Science and Humanities

Course Code: SESH1070
Course Name: Fundamentals of Mathematics
Prerequisite Course(s): Algebra, Geometry, Trigonometry &Pre-Calculus till 12th Standard level

Teaching & Examination Scheme:

Teaching Scheme (Hours/Week)				Examination Scheme(Marks)						
Theory	Practical	Tutorial	Credit	Theory		Practical		Tutorial		Total
				CE	ESE	CE	ESE	CE	ESE	
2	0	2	4	40	60	-	-	50	0	150

CE: Continuous Evaluation, ESE: End Semester Exam

Objective(s) of the course:
To help learners to

- summarize concept of calculus to enhance ability of analysing mathematical problems.
- acquire knowledge and ability to work with differentiation and integration for applications of mathematical techniques in engineering.
- develop the tool of power series for learning advanced Engineering Mathematics.
- analyse and solve system of linear equations and understand characteristics of Matrices.

Course Content:

Section I			
Module No.	Content	Hours	Weightage in %
1.	**Calculus** Limits, Continuity, Types of Discontinuity, Successive Differentiation, Rolle's Theorem, LMVT, CMVT, Maxima and Minima.	8	28
2.	**Sequence and Series-I** Convergence and Divergence, Comparison Test, Integral Test, Ratio Test, Root Test, Alternating Series, Absolute and Conditional Convergence.	7	22
Section II			
Module No.	Content	Hours	Weightage in %
1.	**Sequence and Series-II** Power series, Taylor and Macluarin series, Indeterminate forms and L'Hospitals Rule.	6	20
2.	**Matrix Algebra** Elementary Row and Column operations, Inverse of matrix, Rank of matrix, System of Linear Equations, Characteristic Equation, Eigen values and Eigen vector, Diagonalization, Cayley Hamilton Theorem, Orthogonal Transformation	9	30

List of Tutorials:

Sr. No.	Name of Tutorial	Hours
1.	Calculus-1	2
2.	Calculus-2	2
3.	Integration	2
4	Sequence and Series-1	2
5.	Sequence and Series-2	2
6.	Sequence and Series-3	2
7.	Matrix Algebra-1	2
8.	Matrix Algebra-2	2
9.	Matrix Algebra-3	2
10.	Matrix Algebra-4	2

Text Book:

Title	Author(s)	Publication
Thomas' Calculus	George B. Thomas, Maurice D. Weir and Joel Hass	Pearson
Elementary linear Algebra	Howard Anton and Chrish Rorres	Wiley

Reference Book:

Title	Author(s)	Publication
Advanced Engineering Mathematics	E Kreyszig	John Wiley and Sons
A textbook of Engineering Mathematics	N P Bali and Manish Goyal	Laxmi
Higher Engineering Mathematics	B S Grewal	Khanna
Engineering Mathematics For First Year	T Veerarajan	Tata Mc Graw Hill
Engineering Mathematics-1 (Calculus)	H. K. Dass and Dr. Rama Verma	S. Chand

Course Evaluation:

Theory:

- Continuous Evaluation consists of two tests, each of 30 marks and 1 hour of duration and average of the same will be converted to 30 marks.
- Faculty evaluation consists of 10 marks as per the guidelines provided by the Course Coordinator.
- End Semester Examination consists of 60 marks.

Tutorial:

- Continuous Evaluation consists of performance of tutorial which will be evaluated out of 10 marks for each tutorial and average of the same will be converted to 30 marks
- MCQ based examination consists of 10 marks.
- Internal Viva consists of 10 marks.

Course Outcome(s):

After the completion of the course, the student will be able to

- make use of concepts of limit, continuity and differentiability for analysing mathematical problems.
- use concepts of Limit, Derivatives and Integrals.
- examine series for its convergence and divergence.
- solve linear system using matrices.

P P Savani University
School of Engineering

Department of Mechanical Engineering

Course Code: SEME1010
Course Name: Engineering Graphics
Prerequisite Course(s): --

Teaching & Examination Scheme:

Teaching Scheme (Hours/Week)				Examination Scheme (Marks)						
Theory	Practical	Tutorial	Credit	Theory		Practical		Tutorial		Total
				CE	ESE	CE	ESE	CE	ESE	
03	04	00	05	40	60	40	60	00	00	200

CE: Continuous Evaluation, ESE: End Semester Exam

Objective(s) of the Course:
To help learners to

- know conventions and the methods of engineering drawing.
- interpret engineering drawings using fundamental technical mathematics.
- construct basic and intermediate geometry.
- improve their visualization skills so that they can apply these skills in developing new products.
- improve their technical communication skill in the form of communicative drawings.
- comprehend the theory of projection.

Course Content:

Section I			
Module No.	Content	Hours	Weightage in %
1.	**Introduction:** Importance of the Course; Use of Drawing Instruments and accessories; BIS – SP – 46; Lettering, Dimensioning and Lines; Representative Fraction; Types of Scales (Plain and Diagonal Scales); Construction of Polygons.	03	05%
2.	**Engineering Curves:** Classification and Application of Engineering Curves; Construction of Conics, Cycloidal Curves, Involutes and Spiral along with Normal and Tangent to each.	06	15%
3.	**Principles of Projections:** Types of Projections; Introduction of Principle Planes of Projections. **Projection of Points & Line:** Projection of Points in all four Quadrants; Projection of Lines with its inclination to one Referral Plane & two Referral Planes. **Projection of Plane:** Projection of Planes (Circular and Polygonal) with inclination to one Referral Plane and two Referral Planes; Concept of Auxiliary Projection Method.	14	30%

Section II			
Module No.	Content	Hours	Weightage in %
4.	**Projection and Section of Solids:** **Projection of solids:** Polyhedral, Prisms, Pyramids, Cylinder, Cone, Auxiliary Projection Method, One View, Two View and Three View Drawings. Missing View, Rules for Selection of Views; Sectional View, Section Plane Perpendicular to the HP & VP and other Various Positions, True Shape of Sections.	08	14%
5.	**Orthographic Projection:** Types of Projections: Principle of First and Third Angle Projection - Applications & Difference; Projection from Pictorial view of Object, View from Front, Top and Sides; Full Section View.	07	18%
6.	**Isometric Projections and Isometric Drawing:** Isometric Scale, Conversion of Orthographic views into Isometric Projection, Isometric View or Drawing.	07	18%

List of Practical:

Sr. No.	Name of Practical	Hours
1.	Introduction sheet (dimensioning methods, different types of line, construction of different polygon, divide the line and angle in parts, use of stencil, lettering)	08
2.	Plane scale and diagonal scale	04
3.	Engineering curves	08
4.	Projection of Points & Lines	06
5.	Projection of Planes	08
6.	Projection of solid & Section of solid	10
7.	Orthographic projection	08
8.	Isometric projection	08

Text Book(s):

Title	Author(s)	Publication
A Text Book of Engineering Graphics	P J Shah	S. Chand & Company Ltd., New Delhi
Engineering Drawing	N D Bhatt	Charotar Publishing House, Anand

Reference Book(s):

Title	Author(s)	Publication
Engineering Drawing	P.S.Gill	S. K. Kataria & sons, Delhi
Engineering Drawing	B. Agrawal & C M Agrawal	Tata McGraw Hill, New Delhi
Engineering Drawing made Easy	K. Venugopal	Wiley Eastern Ltd

Web Material Link(s):

- http://nptel.ac.in/courses/105104148/

Course Evaluation:
Theory:

- Continuous Evaluation consists of two tests each of 30 marks and 1 hour of duration and average of the same will be converted to 30 marks.
- Faculty evaluation consists of 10 marks as per the guidelines provided by Course Coordinator.
- End Semester Examination will consist of 60 marks.

Practical:

- Continuous Evaluation consists of Performance of Practical/Tutorial which will be evaluated out of 10 for each practical/Tutorial and average of the same will be converted to 20 Marks.
- Internal Viva consists of 20 Marks.
- Practical performance/quiz/drawing/test will consist of 30 Marks during End Semester Exam.
- Viva/Oral performance will consist of 30 Marks during End Semester Exam.

Course Outcome(s):

After the completion of the course, the student will able to

- know and understand “Drawing is a language of Engineers.”
- interpret general assembly technical drawing.
- create traditions and the strategies for Engineering Drawing.
- evaluate basic and intermediate geometry.
- apply the knowledge of principles of projections.
- develop their hallucination/imagination skills.
- enhance their technical communication skill in the form of talkative drawings.

P P Savani University
School of Engineering

Department of Mechanical Engineering

Course Code: SEME1020
Course Name: Engineering Workshop
Prerequisite Course(s): -

Teaching & Examination Scheme:

Teaching Scheme (Hours/Week)				Examination Scheme (Marks)						
Theory	Practical	Tutorial	Credit	Theory		Practical		Tutorial		Total
				CE	ESE	CE	ESE	CE	ESE	
0	2	0	1	0	0	50	0	0	0	50

CE: Continuous Evaluation, ESE: End Semester Exam

Objective(s) of the Course:
To help learners to

- learn about the safety measures required to be taken while using working in workshop.
- learn about how to select the appropriate tools required for specific operation.
- learn about different manufacturing technique for production out of the given raw material.
- understand applications of machine tools, hand tools, power tools and welding process.

Course Content:

Section I			
Module No.	Content	Hours	Weightage in %
1.	**Introduction:** Introduction to Various Shops / Sections and Workshop Layouts, Safety Norms to be Followed in a Workshop.	-	-
2.	**Fitting Shop:** Introduction of Fitting Shop; Safety; Making a Job as per Drawing including Marking and other Performing Operations.	-	-
3.	**Carpentry and Drilling Shop:** Introduction of Carpentry Shop; Preparation of Job as per Drawing including Marking and other Performing Operations.	-	-
4.	**Sheet Metal Shop:** Introduction of Sheet Metal Shop; Preparation of Job as per Drawing including Marking and other Performing Operations	-	-
5.	**Smithy Shop:** Introduction of Sheet Metal Shop; Preparation of Job as per Drawing including Marking and other Performing Operations	-	-
6.	**Introduction to Machine Tools:**	-	-

	Introduction and Demonstration of various Machine Tools like Lathe, Drilling, Grinding, Hack Saw Cutting etc.		
7.	**Introduction to Welding & Plumbing:** Introduction and Demonstration of Welding process. Introduction and Demonstration of Plumbing Shop.	-	-

List of Practical:

Sr. No	Name of Practical	Hours
1.	Introduction and Demonstration of Safety Norms. Different Measuring Instruments.	02
2.	To Perform a Job of Fitting Shop.	06
3.	To Perform a Job of Carpentry Shop.	06
4.	To Perform a Job of Sheet Metal Shop.	06
5.	To Perform a Job of Black Smithy Shop.	04
6.	Introduction and Demonstration of Grinding & Hacksaw Cutting Machine.	02
7.	Introduction and Demonstration of Plumbing Shop & Welding Process.	04

Text Book(s):

Title	Author(s)	Publication
Elements of Workshop Technology Vol. I	Hajra Chaudhary S. K	Media promoters & Publishers
Workshop Technology Vol. I and II	Raghuvanshi B.S.	Dhanpat Rai & Sons

Reference Book(s):

Title	Author(s)	Publication
Workshop Technology Vol. I	W.A.J. Chapman	Edward Donald Publication
Workshop Practices	H S Bawa	Tata McGraw-Hill
Basic Machine Shop Practice Vol. I, II	Tejwani V.K	Tata McGraw-Hill

Web Material Link(s):

- http://nptel.ac.in/course.php

Course Evaluation:

Practical:

- Continuous Evaluation Consist of Performance of Practical which will be evaluated out of 10 for each practical/Tutorial and average of the same will be converted to 30 Marks.
- Internal Viva consists of 20 Marks.

Course Outcome(s):

After the completion of the course, the student will able to

- use various measuring instruments.
- know the importance of safety norms required in workshop.
- understand the application of various tools required for different operation.
- understand how to manufacture product from given raw material.
- know the use of machine tools, hand tools and power tools.

P P Savani University
School of Engineering

Department of Applied Science & Humanities

Course Code: SESH1210
Course Name: Applied Physics
Prerequisite Course(s): --

Teaching & Examination Scheme:

Teaching Scheme (Hours/Week)				Examination Scheme (Marks)						
Theory	Practical	Tutorial	Credit	Theory		Practical		Tutorial		Total
				CE	ESE	CE	ESE	CE	ESE	
3	2	0	4	40	60	20	30	0	0	150

CE: Continuous Evaluation, ESE: End Semester Exam

Objective(s) of the Course:
To help learners to

- prepare students for career in engineering where physics principles can be applied for the advancement of technology.
- think in core concept of engineering application by studying various topics involved in branch specific application.

Course Content:

Section I			
Module No.	Content	Hours	Weightage in %
1.	**Quantum Mechanics:** Wave-Particle Duality, De-Broglie Matter Wave, Phase and Group Velocity, Heisenberg Uncertainty Principle and its Applications, Wave Function and its Significance, Schrodinger's Wave Equation, Particle in One Dimensional Box	06	15
2.	**Acousic and Ultrasonic:** Introduction, Classification and Characterization of Sound, Absorption Coefficients, Sound Absorbing Materials, Sound Insulation, Ultrasonic, Properties of Ultrasonic, Generation of Ultrasonic Applications of Ultrasonic.	05	10
3.	**Solid State Physics** Introduction, Lattice Points and Space Lattice, Unit Cells and Lattice Parameters, Primitive Cell, Crystal Systems. The Bravais Space Lattices. Miller Indices, X-Ray Properties, Diffraction and Bragg's Law, Bragg's X-Ray Spectrum	06	10
4.	**Nanophysics** Nanoscale, Surface to Volume Ratio, Surface Effects on Nanomaterials, Quantum Size Effects, Nanomaterials and Nanotechnology, Unusual Properties of Nanomaterials, Synthesis of Nanomaterials, Applications of Nanomaterials	06	15

Section II			
Module No.	Content	Hours	Weightage in %
1.	**Non-Linear Optics:** Laser, Spontaneous and Stimulated Emission of Light, Applications of Laser. Fundamental Ideas about Optical Fibre, Advantages of Optical Fibre of Optical Fibre, Applications of Optical Fibre.	07	12
2.	**DC and AC Circuits Fundamentals** Introduction of Electrical Current, Voltage, Power and Energy; Sources of Electrical Energy Inductor and Capacitor, Fundamental Laws of Electric Circuits – Ohm's Law and Kirchhoff's Laws; Analysis of Series, Parallel and Series-Parallel Circuits. Alternating Voltages and Currents and their Vector and Time Domain Representations, Average and Rms Values, From Factor, Phase Difference, Power and Power Factor, Purely Resistive Inductive and Capacitive Circuits, R-L, R-C, R-L-C Series Circuits, Impedance and Admittance, Circuits in Parallel, Series and Parallel Resonance.	08	25
3.	**Electronics:** Semiconductors, Intrinsic and Extrinsic Semiconductor Advantages of Semiconductor Devices, Diodes, Transistors, Types of Bipolar Junction Transistor, Unijunction Junction Transistor, FET and MOSFETS.	07	13

List of Practical:

Sr. No.	Name of Practical	Hours
1.	Volt-Ampere Characteristics of Light Emitting Diode	02
2.	Volt-Ampere Characteristics of Zener Diode	02
3.	To determine value of Planck's constant (h) using a photovoltaic cell	02
4.	To determine the Hall coefficient (R) and carrier concentration of a given material (Ge) using Hall effect.	04
5.	To study the Capacitors in series and parallel DC circuit.	04
6.	To determine velocity of sound in liquid using Ultrasonic Interferometer	04
7.	To study RLC Series circuit.	02
8.	To determine numerical aperture of an optical fiber.	02
9.	Determination of Young's Modulus of given material.	04
10.	Analysis of errors.	04

Text Book(s):

Title	Author/s	Publication
Concept of the Modern Physics	A. Beiser	Tata McGraw-Hill Education
Basic electrical engineering	Kothari and Nagrath	Tata McGraw-Hill Education
Quantum Mechanics	P.M. Mathew, K. Venkatesan	Tata McGraw-Hill Education
Waves and Acoustics	Pradipkumar Chakrabarti Satyabrata Chawdhary	New Central Book Agency
Lasers and Nonlinear Optics	G.D. Baruah	Pragati Prakashan
Solid State Physics: Basic Electronics:	S.O. Pillai	New Age Internation Publishers
Basic Electronics for Scientists and Engineers	Dennis L. Eggleston	Cambridge University Press

Web Material Link(s):

- http:/nptel.ac.in/course.php

Course Evaluation:

Theory:

- Continuous Evaluation consists of two tests, each of 30 marks and 1 hour of duration and average of the same will be converted to 30 marks.
- Faculty evaluation consists of 10 marks as per the guidelines provided by the Course Coordinator.
- End Semester Examination consists of 60 marks.

Practical:

- Continuous Evaluation Consist of Performance of Practical which will be evaluated out of 10 marks for each practical and average of the same will be converted to 10 marks.
- Internal Viva consists of 10 marks.
- Practical performance/quiz/drawing/test of 20 marks during End Semester Exam.
- Viva/Oral performance of 10 marks during End Semester Exam.

Course Outcome(s):

After completion of the course, the student will be able to

- use appropriate mathematical techniques and concepts to obtain quantitative solutions to problems in physics & electrical.
- perform a literature search, to make use of appropriate computational of laboratory skill, and to make an effective written or oral presentation of the results of the project.

P P Savani University
School of Engineering

Department of Applied Science and Humanities

Course Code: SESH1080
Course Name: Linear Algebra & Calculus
Prerequisite Course(s): --

Teaching & Examination Scheme:

Teaching Scheme (Hours/Week)				Examination Scheme (Marks)						
Theory	Practical	Tutorial	Credit	Theory		Practical		Tutorial		Total
				CE	ESE	CE	ESE	CE	ESE	
3	0	2	5	40	60	-	-	50	0	150

CE: Continuous Evaluation, ESE: End Semester Exam

Objective(s) of the Course:
To help learners to

- learn about and work with vector space, linear transformation and inner product space.
- apply concepts of linear algebra for solving science and engineering problems.
- introduce the concept of improper integral and Beta-Gamma Function.
- develop the tool of Fourier series for learning advanced Engineering Mathematics.

Course Content:

Section I			
Module No.	Content	Hours	Weightage in %
1.	**Vector Space** Concept of vector space, Subspace, Linear Combination, Linear Dependence and Independence, Span, Basis and Dimension, Row Space, Column Space and Null Space, Rank and Nullity.	9	20
2.	**Linear Transformation** Introduction of Linear Transformation, Kernal and Range, Rank and Nullity, Inverse of Linear Transformation, Rank Nullity Theorem, Composition of Linear Maps, Matrix associated with linear map.	7	15
3.	**Inner Product Space** Inner Product, Angle and Orthogonality, Orthogonal projection, Gram-Schmidt process and QR Decomposition, Least square decomposition, Change of basis.	7	15
Section II			
Module No.	Content	Hours	Weightage in %
1.	**Beta and Gamma function** Improper Integrals, Convergence, Properties of Beta and Gamma Function, Duplication Formula (without proof)	6	14
2.	**Fourier Series**	8	18

	Periodic Function, Euler Formula, Arbitrary Period, Even and Odd function, Half Range Expansion, Parseval's Theorem		
3.	**Curve tracing** Tracing of Cartesian Curves, Polar Coordinates, Polar and Parametric Form of Standard Curves, Areas and Length in Polar co-ordinates	8	18

List of Tutorial:

Sr. No.	Name of Tutorial	Hours
1.	Vector Space-1	4
2.	Vector Space-2	2
3.	Linear Transformation-1	4
4	Linear Transformation-2	2
5.	Inner Product-1	4
6.	Inner Product-2	2
7.	Beta and Gamma Function-1	4
8.	Beta and Gamma Function-2	2
9.	Curve tracing-1	4
10.	Curve tracing-2	2

Text Book(s):

Title	Author/s	Publication
Thomas' Calculus	George B. Thomas, Maurice D. Weir and Joel Hass	Pearson
Elementary Linear Algebra	Howard Anton and Chrish Rorres	Wiley

Reference Book(s):

Title	Author(s)	Publication
Advanced Engineering Mathematics	E Kreyszig	John Wiley & Sons
A textbook of Engineering Mathematics	N P Bali and Manish Goyal	Laxmi
Higher Engineering Mathematics	B S Grewal	Khanna
Engineering Mathematics for First Year	T Veerarajan	Tata Mc Graw Hill
Engineering Mathematics-1 (Calculus)	H. K. Dass and Dr. Rama Verma	S. Chand

Course Evaluation:

Theory:

- Continuous Evaluation consists of two tests, each of 30 marks and 1 hour of duration and average of the same will be converted to 30 marks.
- Faculty evaluation consists of 10 marks as per the guidelines provided by the Course Coordinator.
- End Semester Examination consists of 60 marks.

Tutorial:

- Continuous evaluation consists of performance of tutorial which will be evaluated out of 10 Marks for each tutorial and average of the same will be converted to 30 marks.
- MCQ based examination consists of 10 marks.
- Internal Viva consists of 10 marks.

Course Outcome(s):

After completion of the course, the student will be able to

- understand the concepts of Vector Space, Linear Transformation and inner product
- space.
- evaluate functions like Gamma, Beta functions & their relation which is helpful to evaluate some definite integral arising in various branch of engineering.
- understand the concept of Fourier series.

P P Savani University
School of Engineering

Department of Applied sciences & Humanities

Course Code: SESH1240
Course Name: Electrical & Electronics Workshop
Prerequisite Course(s): --

Teaching & Examination Scheme:

Teaching Scheme (Hours/Week)				Examination Scheme (Marks)						
Theory	Practical	Tutorial	Credit	Theory		Practical		Tutorial		Total
				CE	ESE	CE	ESE	CE	ESE	
0	2	0	1	0	0	50	0	0	0	50

CE: Continuous Evaluation, ESE: End Semester Exam

Objective(s) of the Course:
To help learners to

- identify basic fundamental electronic components in circuits.
- learn to use common electronic component on breadboard.
- understand components of instruments, terminology and applications.

List of Practical:

Sr No	Name of Practical	Hours
1	Understanding of electronic component with specification.	**2**
2	Understanding of Galvanometer, Voltmeter, Ammeter, Wattmeter and Multimeter	**2**
3	Understanding of breadboard connections	**2**
4	Drawing and wiring of basic circuits on breadboard	**2**
5	Verification of Ohm's law	**2**
6	Half wave, full wave using centre tap transformer and full wave bridge rectifier	**3**
7	Kirchhoff's laws (KVL,KCL).	**3**
8	Faraday's laws of Electromagnetic Induction and Electricity Lab	**4**
9	LDR characteristics	**2**
10	Study of CRO, measurement of amplitude (voltage) & time period (frequency)	**4**
11	PCB designing	**4**

Text Book:

Title	Author/s	Publication
Electronic Principles	Albert Malvino and David J Bates	Mc Graw Hill(7th Edition)

Reference Book:

Title	Author/s	Publication
Electronic Devices	Thomas L. Floyd	Pearson (7th Edition)
Electronic Devices and Circuits	David A. Bell	Oxford Press (5th Edition)
Integrated Electronics	Jacob Millman, Christos	Tata McGraw Hill (2nd Edition)

Course Evaluation:

Practical:

- Continuous Evaluation Consist of Performance of Practical which should be evaluated out of 10 for each practical in the next turn and average of the same will be converted to 20 Marks.
- Internal viva consists of 20 marks.

Course Outcome(s):

- After completion of the course, the students will be able to design elementary combinational and sequential circuits.

P P Savani University
School of Engineering

Department of Civil Engineering

Course Code: SECV1040
Course Name: Basics of Civil & Mechanical Engineering
Prerequisite Course(s): --

Teaching & Examination Scheme:

Teaching Scheme (Hours/Week)				Examination Scheme (Marks)						
Theory	Practical	Tutorial	Credit	Theory		Practical		Tutorial		Total
				CE	ESE	CE	ESE	CE	ESE	
4	2	0	5	40	60	20	30	0	0	150

CE: Continuous Evaluation, ESE: End Semester Exam

Objective(s) of the Course:
To help learners to

- study the fundamentals of mechanical systems.
- study and appreciate significance of mechanical engineering in different fields of engineering.
- carry out simple land survey and recent trends in civil engineering.
- understand components of building, building terminology and construction materials.

Course Content:

Section I			
Module No.	Content	Hours	Weightage in %
1.	**Civil Engineering: An Overview** Introduction, Branches, Scope, Impact, Role of Civil Engineer, Unit of Measurement, Unit Conversion (Length, Area, Volume)	03	04
2.	**Introduction to Surveying and Levelling:** Introduction, Fundamental Principles, Classification **Linear Measurement:** Instrument Used, Chaining on Plane Ground, Offset, Ranging **Angular Measurement:** Instrument Used, Meridian, Bearing, Local Attraction **Levelling:** Instrument Used, Basic Terminologies, Types of Levelling, Method of Levelling **Modern Tools:** Introduction to Theodolite, Total Station, GPS	07	12
3.	**Building Materials and Construction:** Introduction (Types and Properties) to Construction Materials Like Stone, Bricks, Cement, Sand, Aggregates, Concrete, Steel. Classification of Buildings, Types of Loads Acting on Buildings, Building Components and their Functions, Types of Foundation and Importance, Symbols Used in Electrical Layout, Symbols Used for Water Supply, Plumbing and Sanitation	10	14
4.	**Construction Equipment:** Types of Equipment- Functions, Uses. Hauling Equipment-Truck, Dumper, Trailer. Hoisting Equipment- Pulley, Crane, Jack, Winch,	04	08

	Sheave Block, Fork Truck. Pneumatic Equipment-Compressor. Conveying Equipment- Package, Screw, Flight/scrap, Bucket, Belt Conveyor. Drill, Tractor, Ripper, Rim Pull, Dredger, Drag Line, Power Shovel, JCB, HOE.		
5.	**Recent Trends in Civil Engineering:** Mass Transportation, Rapid Transportation, Smart City, Sky Scarper, Dams, Rain Water Harvesting, Batch Mix Plant, Ready Mix Concrete Plant, Green Building, Earth Quake Resisting Building, Smart Material	06	12
Section II			
Module No.	Content	Hours	Weightage in %
1.	**Basic Concepts of Thermodynamics:** Prime Movers - Meaning and Classification; the Concept of Force, Pressure, Energy, Work, Power, System, Heat, Temperature, Specific Heat Capacity, Internal Energy, Specific Volume; Thermodynamic Systems, All Laws of Thermodynamics	04	06
2.	**Fuels and Energy:** Fuels Classification: Solid, Liquid and Gaseous; their Application, Energy Classification: Conventional and Non-Conventional Energy Sources, Introduction and Applications of Energy Sources like Fossil Fuels, Solar, Wind, and Bio-Fuels, LPG, CNG, Calorific Value	04	06
3.	**Basics of Steam Generators:** Introduction, Classification, Cochran, Lancashire and Babcock and Wilcox Boiler, Functioning of Different Mountings and Accessories	LAB	12
4.	**Basics of I.C Engines:** Construction and Working of 2 Stroke & 4 Stroke Petrol and Diesel Engines, Difference Between 2-Stroke - 4 Stroke Engine & Petrol-Diesel Engine, Efficiency of I. C. Engines	12	14
5.	**Power Transmission Elements:** Construction and Applications of Couplings, Clutches and Brakes, Difference Between Clutch and Coupling, Types of Belt Drive and Gear Drive	10	12

List of Practical:

Sr. No.	Name of Practical	Hours
1.	Unit conversation Exercise and Chart preparation of building components	02
2.	Linear measurements	02
3.	Angular measurements	02
4.	Determine R. L of given point by Dumpy level. (Without Change Point)	02
5.	Determine R. L of given point by Dumpy level. (With Change Point)	02
6.	Presentation on various topics as in module about recent trends	04
7.	To understand construction and working of various types of boilers	04
8.	To understand construction and working of mountings	04
9.	To understand construction and working of accessories	04
10.	To understand construction and working 2 –stroke & 4 –stroke Petrol Engines	02
11.	To understand construction and working 2 –stroke & 4 –stroke Diesel Engines	02

Text Book(s):

Title	Author(s)	Publication
Elements of Mechanical Engineering	S. B. Mathur,	Dhanpat Rai & Sons Publications

	S. Domkundwar	
Elements of Mechanical Engineering	Sadhu Singh	S. Chand Publications
Elements of Civil Engineering	Anurag A. Kandya	Charotar Publication
Surveying Vol. I & II	Dr. B. C. Punamia	Laxmi Publication

Reference Book(s):

Title	Author(s)	Publication
Thermal Engineering	R. K. Rajput	Laxmi Publications
Basic Mechanical Engineering	T.S. Rajan	Wiley Eastern Ltd., 1996.
Surveying and Levelling	N. N. Basak	Tata McGraw Hill
Surveying Vol. I	S. K. Duggal	Tata McGraw Hill
Surveying and Levelling	R. Subramanian	Oxford University
Building Construction and Construction Material	G. S. Birdie and T. D. Ahuja	Dhanpat Rai Publishing
Engineering Material	S.C. Rangwala	Charotar Publication

Web Material Link(s):

- http://nptel.ac.in/course.php
- http://nptel.ac.in/courses/105107157/
- http://nptel.ac.in/courses/105101087/
- http://nptel.ac.in/courses/105107121/
- http://nptel.ac.in/courses/105104100/

Course Evaluation:

Theory:

- Continuous evaluation consists of two tests each of 30 marks and 1 hour of duration and average of the same will be converted to 30 marks.
- Faculty evaluation consists of 10 marks as per the guidelines provided by Course Coordinator.
- End Semester Examination will consist of 60 marks.

Practical:

- Continuous Evaluation consists of performance of practical which will be evaluated out of 10 marks for each practical and average of the same will be converted to 10 marks.
- Internal viva consists of 10 marks.
- Practical performance/quiz/drawing/test of 15 marks during End Semester Exam.
- Viva/Oral performance of 15 marks during End Semester Exam.

Course Outcome(s):

After completion of the course, the student will be able to

- know the principles and working of basic mechanical systems.
- comprehend importance of mechanical engineering in various fields of engineering.
- know about different civil engineering fields with an overview of building material, building construction and recent developments in civil engineering.

P P Savani University
School of Engineering

Department of Civil Engineering

Course Code: SECV1080
Course Name: Mechanics of Solids
Prerequisite Course(s): -

Teaching & Examination Scheme:

Teaching Scheme (Hours/Week)				Examination Scheme (Marks)						
Theory	Practical	Tutorial	Credit	Theory		Practical		Tutorial		Total
				CE	ESE	CE	ESE	CE	ESE	
4	2	0	5	40	60	20	30	0	0	150

CE: Continuous Evaluation, ESE: End Semester Exam

Objective(s) of the Course:
To help learners to

- understand different types of forces, systematic evaluation of effect of these forces, behavior of rigid and deformable bodies subjected to various types of forces at the state of rest or motion of the particles.
- understand the stresses developed under the application of force.
- understand the physical and mechanical properties of materials.
- understand behavior of structural element under the influence of various loads.

Course Content:

Section I			
Module No.	Content	Hours	Weightage in %
1.	**Introduction:** Definition of Rigid Body, Deformable Body, Scalar and Vector Quantities, Fundamental Principles of Mechanics: Principle of Transmissibility, Principle of Superposition, Law of Parallelogram of Forces.	5	8
2.	**Fundamental of Static:** Force, Types of Forces, Characteristics of a Force, System of Forces, Composition and Resolution of Forces. **Concurrent Forces:** Resultant of Coplanar Concurrent Force System by Analytical Method, Law of Triangle of Forces, Law of Polygon of Forces, Equilibrium Conditions for Coplanar Concurrent Forces. **Non-Concurrent Forces:** Moments & Couples, Characteristics of Moment And Couple, Varignon's Theorem, Resultant of Non-Concurrent Forces by Analytical Method, Equilibrium Conditions of Coplanar Non-Concurrent Force System.	10	17
3.	**Centroid and Centre of Gravity:** Centroid of Lines, Plane Areas and Volumes, Examples Related to Centroid of Composite Geometry, Pappus –Guldinus Theorems.	5	8

4.	**Moment of Inertia:** Parallel and Perpendicular Axis Theorems, Polar Moment of Inertia, Radius of Gyration of Areas, Examples related to moment of Inertia of Composite geometry.	10	17
Section II			
Module No.	Content	Hours	Weightage in %
1.	**Mechanical Properties of Materials:** Introduction, Classification of Materials, Properties Related to Axial, Bending, and Torsional & Shear Loading, Toughness, Hardness, Ductility, Brittleness. Proof stress, Factor of Safety, Working Stress, Load Factor.	7*	12
2.	**Simple Stress and Strain:** Definition of Stress and Strain, Tensile & Compressive Stresses: Shear and Complementary Shear Strains, Linear, Shear, Lateral, Thermal and Volumetric. Hooke's Law, Stresses and Strain in bars of Varying, Tapering & Composite Section, Principle of Superposition. Elastic Constant, Relation between Elastic Constants.	9	15
3.	**Shear Force and Bending Moment:** Introduction, Types of Loads, Supports and Beams, Shear Force, Bending Moment, Sign Conventions for Shear Force & Bending Moment. Statically Determinate Beam, Support Reactions, SFD and BMD for Concentrated Load and Uniformly Distributed Load, Uniformly Varying Load, Point of Contra-flexure.	14	23

*(To be covered during lab hours)

List of Practical (Any Ten):

Sr. No	Name of Practical	Hours
1.	Equilibrium of coplanar concurrent forces	02
2.	To verify the law of parallelogram of forces	02
3.	To verify the law of polygon of forces	02
4.	To verify the Lami's theorem	02
5.	Equilibrium of parallel force system – simply supported beam	02
6.	Tensile test on Ductile materials.	02
7.	Compression test on Ductile materials	02
8.	Compression test on Brittle Materials	02
9.	Determination of hardness of metals (Brinell/ Rockwell hardness test)	02
10.	Determination of impact of metals (Izod/ Charpy impact test)	02
11.	Tutorial on concurrent & Non-concurrent forces	04
12.	Tutorials on C. G & MI	02
13.	Tutorials on SFD & BMD	04

Text Book(s):

Title	Author(s)	Publication
Applied Mechanics	S. B. Junnarkar & H. J. Shah	Charotar Publication
Strength of Materials (SI Units)	R S Khurmi, N Khurmi	S. Chand & Company Pvt. Ltd.

Reference Book(s):

Title	Author(s)	Publication
Engineering Mechanics,	Meriam and Karaige,	Wiley-India
Engineering Mechanics: Statics and Dynamics	S Rajsekaran	Vikas Publication
Engineering Mechanics of Solids	Popov E.P	Prentice Hall of India
Strength of Materials (SI Units)	Er. R . K. Rajput	S. Chand & Company Pvt. Ltd.
Mechanics of Structure-Vol.I	Dr. H.J. Shah & S. B. Junarkar	Charotar Publishing House Pvt. Ltd.
Strength of materials	R. Subramanian	Oxford Publications
Strength of materials	S. Ramamrutham	DhanpatRai Publishing Company
Strength of Materials (SI Units)	Er. R . K. Rajput	S. Chand & Company Pvt. Ltd.

Web Material Link(s):

- http://nptel.ac.in/courses/122104014/
- http://nptel.ac.in/courses/112103108/

Course Evaluation:

Theory:

- Continuous Evaluation consists of two tests each of 30 marks and 1 hour of duration and average of the same will be converted to 30 marks.
- Faculty evaluation consists of 10 marks as per the guidelines provided by Course Coordinator.
- End Semester Examination will consist of 60 marks.

Practical:

- Continuous Evaluation consists of performance of practical which should be evaluated out of 10 marks for each practical and average of the same will be converted to 10 marks.
- Internal viva consists of 10 marks.
- Practical performance/quiz/drawing/test consists of 15 marks during End Semester Exam.
- Viva/Oral performance consists of 15 marks during End Semester Exam.

Course Outcome(s):

After the completion of the course, the student will be able to

- understand fundamental principles of mechanics, equilibrium, statics reactions and internal forces in statically determinate beams.
- apply principles of statics for determine C.G and M.I of a different geometrical shape and Understand basics of friction and its importance.
- critically analyze problem and solve the problem related to mechanical elements and analyze the deformation behavior for different types of loads.

- understand the different types of stresses and strains developed in the member subjected to axial, bending, shear & torsional effects.
- understand the physical properties of materials.

P P Savani University
School of Engineering

Department of Computer Engineering

Course Code: SECE1010
Course Name: Basics of Computer and Programming
Prerequisite Course(s): --

Teaching & Examination Scheme:

Teaching Scheme (Hours/ Week)				Examination Scheme (Marks)						
Theory	Practical	Tutorial	Credit	Theory		Practical		Tutorial		Total
				CE	ESE	CE	ESE	CE	ESE	
3	2	0	4	40	60	20	30	0	0	150

CE: Continuous Evaluation, ESE: End Semester Exam

Objective(s) of the Course:
To help learners to

- understand basic components of computer system.
- identify appropriate approach to computational problems.
- develop logic building and problem solving skill.

Course Content:

Section I			
Module No.	Content	Hours	Weightage in %
1.	**Introduction to Computer and its Architecture:** Introduction and Characteristics, Generation, Classification, Applications, Central Processing Unit, Communication between Various Units, Processor Speed, Various Input and Output Devices.	03	10
2.	**Memory and Operating Systems:** Introduction to Memory, Memory Hierarchy, Primary Memory and its Type, Secondary Memory, Classification of Secondary Memory, Various Secondary Storage Devices and their Functioning, their Merits and Demerits, Evolution of Operating System, Types and Functions of Operating Systems,	06	15
3.	**Recent Advances in Computer:** Introduction to Emerging Areas like Artificial Intelligence, IoT tools, Data Science, Sensors, 3D Printing, Automization in the field of Civil, Mechanical and Chemical.	05	10
4.	**Computer Programming Language:** Introduction to different types of Programming Languages, Flowcharts and Algorithms. Introduction to C Programming Language, Features of C, Structure of C Program, Development of Program, Types of Errors, Debugging and Tracing Execution of Program.	08	15
Section II			

Module No.	Content	Hours	Weightage in %
1.	**Constants, Variables and data Types:** Character Set, C tokens, Keyword, Constants and Variables, Data Types - Declaration and Initialization, User define type Declarations Typedef, Enum, Basic Input and Output Operations, Symbolic Constants	05	10
2.	**Operators and Expression and Managing I/O operations**: Introduction to Operators and its Types, Evaluation of Expressions, Precedence of Arithmetic Operators, Type Conversions in Expressions, Operator Precedence and Associativity. Managing Input and Output, Reading a Character, Writing a Character, Formatted Input, Formatted Output.	07	16
3.	**Conditional statement and branching:** Decision Making & Branching: Decision Making with If & If ... Else Statements, If - Else Statements (Nested Ladder), The Switch & go - to Statements, The Ternary (?:) Operator Looping: The While Statement, The Break Statement & The Do. While Loop, The FOR Loop, Jump Within Loops - Programs.	06	12
4.	**Arrays and Strings:** Introduction to Array, One Dimensional Array, Two Dimensional Arrays, Declaring and Initializing String Variables, Arithmetic Operations on Characters, Putting Strings Together, Comparison of Two Strings, Basic String Handling Functions	05	12

List of Practical:

Sr. No	Name of Practical	Hours
1.	Introduction to Basic Command	04
2.	Word Processing, Spreadsheets and Presentation Exercises	06
3.	Introduction to Octave Environment	04
4.	Implementation in C for conditional statement and branching Implementation of if, if...else, nested if...else and switch statements Implementation of while loop, do...while loop and for loop	06
5.	Implementation of 1-D and 2-D array	06
6.	Implementation of in built string functions, application programs of array and strings	04

 # Use of different libraries will be covered in Practical Assignments.

Text Book(s):

Title	Author(s)	Publication
Programming in ANSI C	E. Balagurusamy	Tata McGraw Hill
Introduction to Computer Science	ITL Education Solutions Limited	Pearson Education

Reference Book(s):

Title	Author(s)	Publication
Programming in C	Ashok Kamthane	Pearson
Let Us C	Yashavant P. Kanetkar	Tata McGraw Hill
Introduction to C Programming	Reema Thareja	Oxford Higher Education
Programming with C	Byron Gottfried	Tata McGraw Hill

Course Evaluation:

Theory:

- Continuous Evaluation consists of two tests of 30 marks and 1 hour of duration and average of the same will be converted to 30 marks.
- Faculty evaluation consists of 10 marks as per the guidelines provided by Course Coordinator.
- End Semester Examination consists of 60 marks.

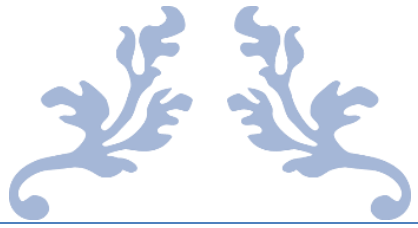
Practical:

- Continuous Evaluation consists of the performance of practical, which will be evaluated out of 10 per each practical. At the end of the semester, the average of the entire practical will be converted to 10 marks.
- Internal viva consists of 10 marks.
- Practical performance/quiz/test consists of 15 marks during End Semester Examination.
- Viva/Oral performance consists of 15 marks during End Semester Examination.

Course Outcomes:

After completion of the course, the student will be able to

- explore new emerging areas of the field.
- apply programming fundamentals to solve real time problems.



SECOND YEAR B.TECH

P P SAVANI UNIVERSITY															
SCHOOL OF ENGINEERING															
TEACHING & EXAMINATION SCHEME FOR B. TECH. CIVIL ENGINEERING PROGRAMME AY: 2021-22															
Sem	**Course Code**	**Course Title**	**Offered By**	**Teaching Scheme**					**Examination Scheme**						
				Contact Hours				**Credit**	**Theory**		**Practical**		**Tutorial**		**Total**
				Theory	**Practical**	**Tutorial**	**Total**		**CE**	**ESE**	**CE**	**ESE**	**CE**	**ESE**	
3	SESH2011	Differential Equations	SH	3	0	2	5	5	40	60	0	0	50	0	150
	SECV2102	Advanced Solid Mechanics	CV	3	2	0	5	4	40	60	20	30	0	0	150
	SECV2020	Building Materials & Construction Technology	CV	4	2	0	6	5	40	60	20	30	0	0	150
	SEME2060	Fluid Mechanics	ME	3	2	0	5	4	40	60	20	30	0	0	150
	SECV2041	Surveying	CV	3	2	0	5	4	40	60	20	30	0	0	150
	SECV2910	Industrial Exposure	CV	2			0	2	0	0	100	0	0	0	100
	CFLS1020	Global Communication skill	CFLS	2	0	0	2	2	40	60	0	0	0	0	100
						Total	**28**	**26**							**950**
4	SESH2022	Numerical & Statistical Analysis	SH	3	0	2	5	5	40	60	0	0	50	0	150
	SECV2051	Determinate Structural Analysis	CV	4	0	1	5	5	40	60	0	0	50	0	150
	SECV2060	Geology & Geotechnical Engineering	CV	3	2	0	5	4	40	60	20	30	0	0	150
	SECV2090	Building & Town Planning	CV	3	2	0	5	4	40	60	20	30	0	0	150
	SECV2110	Concrete Technology	CV	3	2	0	5	4	40	60	20	30	0	0	150
	CFLS3010	Foreign Language -I	CFLS	2	0	0	2	2	40	60	0	0	0	0	100
	SEPD3040	Integrated Personality Development Course-I	SEPD	2	0	0	2	1	100	0	0	0	0	0	100
						Total	**29**	**25**							**950**

P P Savani University
School of Engineering

Department of Science & Humanities

Course Code: SESH2011
Course Name: Differential Equations
Prerequisite Course(s): Elementary Mathematics for Engineers (SESH1010)

Teaching & Examination Scheme:

Teaching Scheme (Hours/Week)				Examination Scheme (Marks)						
Theory	Practical	Tutorial	Credit	Theory		Practical		Tutorial		Total
				CE	ESE	CE	ESE	CE	ESE	
03	00	02	05	40	60	00	00	50	00	150

CE: Continuous Evaluation, ESE: End Semester Exam

Objective(s) of the Course:
To help learners to

- provide orientation of calculus and its applications in solving engineering problems through differential equations.
- introduce partial differential equations with solution methods.
- learn application of Laplace transforms to solve linear differential equations.
- learn introduction of periodic functions and Fourier series with their applications for solving ODEs.

Course Content:

Section I			
Module No.	Content	Hours	Weightage in %
1.	**Ordinary Differential Equation** First order ODEs, Formation of differential equations, Solution of differential equation, Solution of equations in separable form, Exact first order ODEs, Linear first order ODEs, Bernoulli Equation, ODEs of Second and Higher order, Homogeneous linear ODEs, Linear Dependence and Independence of Solutions, Homogeneous linear ODEs with constant coefficients, Differential Operators Nonhomogeneous ODEs, Undetermined Coefficients, Variation of Parameters.	10	20
2.	**Partial Differential Equation** Formation of First and Second order equations, Solution of First order equations, Linear and Non-liner equations of first, Higher order equations with constant coefficients, Complementary function, Particular Integrals.	7	18
3.	**Applications of ODE and PDE** Orthogonal trajectories, Method of Separation of Variables, D'Albert's solution of wave equation, Solution of heat equation.	5	12
Section II			
Module No.	Content	Hours	Weightage in %
1.	**Laplace Transform** Laplace Transform, Linearity, First Shifting Theorem, Existence Theorem,	10	20

	Transforms of Derivatives and Integrals, Unit Step Function, Second Shifting Theorem, Dirac's Delta function, Laplace Transformation of Periodic function, Inverse Laplace transform, Convolution, Integral Equations, Differentiation and Integrations of Transforms, Application to System of Differential Equation.		
2.	**Fourier Series** Periodic function, Euler Formula, Arbitrary Period, Even and Odd function, Half-Range Expansions, Applications to ODEs.	7	15
3.	**Fourier Integral and Transformation** Representation by Fourier Integral, Fourier Cosine Integral, Fourier Sine Integral, Fourier Cosine Transform and Sine Transform, Linearity, Fourier Transform of Derivatives.	6	15

List of Tutorials:

Sr No	Name of Tutorial	Hours
1.	Ordinary Differential Equation-1	2
2.	Ordinary Differential Equation-2	2
3.	Ordinary Differential Equation-3	4
4.	Partial Differential Equation-1	2
5.	Partial Differential Equation-2	4
6.	Applications of ODE and PDE	2
7.	Laplace Transform-1	2
8.	Laplace Transform-2	2
9.	Laplace Transform-3	4
10.	Fourier Series-1	2
11.	Fourier Series-2	2
12.	Fourier Integral and Transformation	2

Text Book(s):

Title	Author/s	Publication
Advanced Engineering Mathematics	Erwin Kreyszig	Wiley India Pvt. Ltd.

Reference Book(s):

Title	Author/s	Publication
Higher Engineering Mathematics	B. S. Grewal	Khanna Publishers
Advanced Engineering Mathematics	R. K. Jain, S.R.K. Iyengar	Narosa Publishing House Pvt. Ltd.
Differential Equations for Dummies	Steven Holzner	Wiley India Pvt. Ltd.
Higher Engineering Mathematics	H.K. Dass, Er. Rajnish Verma	S. Chand& Company Pvt. Ltd.

Web Material Link(s):

1) http://nptel.ac.in/courses/111105035/
2) http://nptel.ac.in/courses/111106100/
3) http://nptel.ac.in/courses/111105093/
4) http://nptel.ac.in/courses/111108081/

Course Evaluation:

Theory:

- Continuous Evaluation consists of two tests each of 30 marks and 1 Hour of duration, which will be converted to 30 marks.
- Faculty evaluation consists of 10 marks as per the guidelines provided by the course coordinator.
- End Semester Examination consists of 60 marks.

Tutorial:
- Continuous Evaluation consists of performance of tutorial which will be evaluated out of 10 marks for each tutorial and average of the same will be converted to 30 marks.
- MCQ based examination consists of 10 marks.
- Internal Viva consists of 10 marks.

Course Outcomes:
After completion of the course, the student will be able to
- grasp the respective 1st and 2nd order ODE and PDE.
- analyze engineering problems (growth, decay, flow, spring and series/parallel electronic circuits) using 1st and 2nd order ODE.
- classify differential equations and solve linear and non-linear partial differential equations.
- apply understanding of concepts, formulas, and problem-solving procedures to thoroughly investigate relevant real-world problems.

P P Savani University
School of Engineering

Department of Civil Engineering

Course Code: SECV2102
Course Name: Advanced Solid Mechanics
Prerequisite Course(s): Engineering Mechanics (SECV1030), Solid Mechanics (SECV1070)/ Mechanics of Solids (SECV1080)

Teaching & Examination Scheme:

Teaching Scheme (Hours/Week)				Examination Scheme (Marks)						
Theory	Practical	Tutorial	Credit	Theory		Practical		Tutorial		Total
				CE	ESE	CE	ESE	CE	ESE	
03	02	00	04	40	60	20	30	00	00	150

CE: Continuous Evaluation, ESE: End Semester Exam

Objective(s) of the Course:
To help learners to understand

- the stresses developed under the application of force.
- the effect of torsion on material.
- behavior of structural element under the influence of various stresses.

Course Content:

Section I			
Module No.	Content	Hours	Weightage in %
1.	**Bending Stress in Beam** Theory of simple bending, Assumptions, Derivation of flexural formula, Position of Neutral axis, Section modulus, Second moment of area of common cross sections (rectangular, I,T,C) with respective centroid & parallel axes, Bending stress distribution diagrams,	08	18
2.	**Shear Stress in Beam** Shearing stresses at a section, Derivations of shear stress distribution formula for different sections, shear stress distribution diagrams for common symmetrical sections, Maximum and average shears stresses, Shear connection between flange & web.	08	18
3.	**Direct & Bending Stress** Eccentric loading, Symmetrical column with eccentric loading about one axis, Symmetrical columns with Eccentric loading about two axis, Unsymmetrical columns with Eccentric loading.	07	14
Section II			
Module No.	Content	Hours	Weightage in %
1.	**Dams**	08	18

	Introduction, Types of dams, Rectangular dam, Stress across the section of the dam, Trapezoidal dam, stability of dam.		
2.	**Column & Strut** Introduction, Failure of a column, Assumptions in Eural's Theory, End conditions for long column, Expression for crippling load when both ends of the column are hinges, Expression for crippling load when both ends of the column are Fixed, Expression for crippling load when both ends of the column are Free, Expression for crippling load when one end of the column is fixed and other is hinged, Effective length of column, Limitations of Eural's formula, Rankine's formula.	07	16
3.	**Torsion** Derivation of equation of torsion, Assumptions, Application of theory of torsion equation to solid & hollow circular shaft, Torsional rigidity, Power Transmitted by shaft, Polar moment of Inertia.	07	16

List of Practical:

Sr. No.	Name of Practical	Hours
1.	Torsion Test	02
2.	Fatigue Test	02
3.	Tutorials on Bending Stress in Beam	04
4.	Tutorials on Shear Stress in Beam	04
5.	Tutorials on Direct and Bending Stress, Torsion	04
6.	Tutorials on Dam	06
7.	Tutorials on Column & Strut	04
8.	Tutorials on Torsion	04

Text Book(s):

Title	Author/s	Publication
Strength of Materials (SI Units)	Dr. R. K. Bansal	Laxmi Prakashan

Reference Book(s):

Title	Author/s	Publication
Strength of Materials (SI Units)	R. S. Khurmi	S. Chand & Company Pvt. Ltd.
Strength of Materials (SI Units)	Er. R . K. Rajput	S. Chand & Company Pvt. Ltd.
Mechanics of Structure-Vol. I	Dr. H.J. Shah & S. B. Junarkar	Charotar Publishing House Pvt. Ltd.
Strength of materials	R. Subramanian	Oxford Publications
Strength of materials	S. Ramamrutham	Dhanpat Rai Publishing Company

Course Evaluation:

Theory:

- Continuous Evaluation consists of two tests each of 30 marks and 1 Hour of duration, which will be converted to 30 marks.
- Faculty evaluation consists of 10 marks as per the guidelines provided by the course coordinator.
- End Semester Examination consists of 60 marks.

Practical:

- Continuous Evaluation consists of performance of practical which will be evaluated out of 10 marks for each practical and average of the same will be converted to 10 marks.

- Internal viva consists of 10 marks.
- Practical performance/quiz/drawing/test consists of 15 marks during End Semester Exam.
- Viva/ Oral performance consists of 15 marks during End Semester Exam.

Course Outcomes:

After completion of the course, the student will be able to

- apply mathematical knowledge to calculate the deformation behavior of simple structure.
- critically analyze problem and solve the problem related to mechanical elements and analyze the deformation behavior for different types of loads.
- understand the different types of stresses and strains developed in the member subjected to axial, bending, shear & torsional effects.
- understand the physical properties of materials.

P P Savani University
School of Engineering

Department of Civil Engineering

Course Code: SECV2020
Course Name: Building Materials & Construction Technology
Prerequisite Course(s): --

Teaching & Examination Scheme:

Teaching Scheme (Hours/Week)				Examination Scheme (Marks)						
Theory	Practical	Tutorial	Credit	Theory		Practical		Tutorial		Total
				CE	ESE	CE	ESE	CE	ESE	
04	02	00	05	40	60	20	30	00	00	150

CE: Continuous Evaluation, ESE: End Semester Exam

Objective(s) of the Course:
To help learners to

- develop the conceptual knowledge in building materials & Construction.
- select appropriate material in given field situation.
- develop idea about various building components.
- develop awareness about Smart building materials.

Course Content:

Section I			
Module No.	Content	Hours	Weightage in %
1.	**Introduction** Physical, chemical and engineering properties of building materials. Factors Affecting Choice of Materials, Application of building materials.	02	03
2.	**Brick** Classification of clay products, Types of bricks, Properties and requirements of bricks, Manufacturing process of bricks, Test on bricks, Standard requirements and grades of bricks as per BIS.	04	07
3.	**Rocks** Classification of rocks, Rock products, Characteristics of stones - Structure, texture, strength, gravity, porosity, absorption, hardness, durability, weight. etc., Standard requirement of building stone, Important stones used in construction with its suitability.	04	07
4.	**Concrete and Ingredient of Concrete** **Lime:** Sources and classification of Lime, Uses of lime with specific field situation, Types of pozzolanic materials, Advantages of addition of pozzolanic material. **Cement:** Types of cement with their specific use, Grade of cement as per BIS, Engineering properties of cement, Field and laboratory test of cement as per BIS. **Aggregate:** Types of aggregate as per BIS, Requirements of aggregate as per BIS, Engineering properties of aggregate, Test on aggregate. **Steel:** Classification of Ferrous materials (With Grade), Properties of Steel, Requirements of Steel, Uses of Steel for Construction **Admixtures:** Types of Admixture, Requirements of Admixtures, Use of	12	20

	Admixtures **Water:** Propertied of Water use for construction **Concrete:** Requirements of concrete, Properties of fresh and harden concrete, Types of concrete, Water-Cement ratio, Grades of concrete, Curing of concrete, Water-Cement ratio, Test on Concrete **Plain and Reinforced Concrete**: Pre -cast and cast -in -situ Construction		
5.	**Miscellaneous Construction Materials** Timber: Types of timber, Uses and application of timber, Defects in timber and wood, Seasoning, Wood products with specific uses Plastics and PVC, Ceramic products, Paints and Varnish, Materials for damp proofing, water proofing, Materials for anti-termite treatment, Glass and fiber, Materials used for false ceiling, Asbestos, Concrete blocks, Epoxy Materials, Fly Ash, Slag, Bitumen, Rubber, Geotextile Advance Concretes: Pervious, Light Transmitting, Floating	08	13
Section II			
Module No.	Content	Hours	Weightage in %
1.	**Foundation** Function and requirements of a good foundation, Types of foundations, • **Shallow Foundations:** Types of Shallow foundation, Strip footing, Spread or isolated footing, Combined footing Strap, Mat or raft Foundation. • **Deep Foundation:** Caisson & Pile foundation	05	08
2.	**Super Structure** **Doors, Windows & Ventilators:** a) Doors: Location, technical terms, size, types, construction, suitability. b) Windows: Factors affecting selection of size, shape, location and no. of windows, types, construction, suitability, fixtures and fastenings. c) Ventilators: Ventilators combined with window, fan light **Stairs and Staircases:** Definition, technical terms, requirements of good stair, fixing of going and rise of a step, types of steps, classification, example – stair planning, elevators, escalators. **Floorings:** Introduction, essential requirements of a floor, factors affecting selection of flooring material, types of ground floors, brick, flag stone, tiled cement concrete, granolithic, terrazzo, marble, timber flooring, upper floor - timber, timber floor supported on RSJ flag stone floor resting on RSJ, jack arch floor, reinforced concrete floor, ribbed floor, pre-cast concrete floor. **Roofs and Roof Coverings:** Introduction, requirements of good roof technical terms, classification, types of roof coverings for pitched roof. A.C. sheet roofs – fixing of A.C. sheets, G.I. Sheets roofs, slates, flat roof – advantages, Dis-advantages, types of flat terraced roofing.	10	17
3.	**Masonry** **Brick masonry**: Technical terms, bonds in brick work- English bond, single & double Flemish bond, garden wall bond, raking bond, Dutch bond. **Stone masonry**: Technical terms, lifting appliances, joints, types – random (un-coursed) rubble, coursed rubble, dry rubble masonry, Ashlar masonry- Ashlar fine, chamfered fine. **Composite masonry**: Stone facing with brick backing, brick facing with concrete backing, Hollow concrete blocks and construction, AAC blocks	05	08

	Cavity walls: Brick cavity walls, position of cavity at foundation, roof and at opening levels.		
4.	**Miscellaneous** Wall Finishes: Plastering, pointing and painting **Temporary Works:** Timbering in trenches, types of scaffoldings, shoring, underpinning **Special Treatments:** Fire resistant, water resistant, thermal insulation, acoustical construction and anti -termite treatment. **Green building:** Definition, materials construction, rating system, case study	10	17

List of Practical:

Sr. No.	List of Practical/Exercise	Hours
1.	Conduct local market survey and Prepare a report for different civil engineering materials with respect to applications, cost and quality (Home assignment).	4
2.	Perform tests on given sample of brick such as • Soundness • Water absorption • Compressive strength • Length & width of 20 bricks	4
3.	Identification of different types of stones and lime	2
4.	Conduct field test on given sample of brick and cement	2
5.	Perform lab tests on given sample of cement • Standard Consistency • Initial and final setting time	4
6.	Conduct field test on given sample of fine and coarse aggregate	2
7.	Perform Sieve analysis test on given sample of fine aggregate	2
8.	Assess the quality of different types of timber and timber products (visit nearby saw mill or timber mart)	2
9.	Prepare Sketch Book for various Building components.	8

Text Book(s):

Title	Author/s	Publication
Building Materials & Contraction	B. C. Punamia	Laxmi Publications

Reference Book(s):

Title	Author/s	Publication
Building Construction	Sushil Kumar	Standard Publication
Building Construction	Rangwala	Charator Publishing house
Building Materials	S. K. Duggal	New Age Publications
Building Materials	Varghese	PHI learning pvt.Ltd.
Building Construction	Bhavikhatti	Vikash Publishing

Web Material Link(s):

- http://www.nptelvideos.in/2012/11/building-materials-and-construction.html
- https://sites.google.com/a/mitr.iitm.ac.in/iitmcivil/ce2330
- http://www.vssut.ac.in/lecture_notes/lecture1424085991.pdf
- http://nptel.ac.in/courses/105102088/13
- https://www.classle.net/category/tagskeywords/civil-building-materials-and-construction

- http://www.geethanjaliinstitutions.com/engineering/coursefiles/downloads/civil/bmcp.pdf
- https://theconstructor.org

Course Evaluation:
Theory:
- Continuous Evaluation consists of two tests each of 30 marks and 1 Hour of duration, which will be converted to 30 marks.
- Faculty evaluation consists of 10 marks as per the guidelines provided by the course coordinator.
- End Semester Examination consists of 60 marks.

Practical:
- Continuous Evaluation consists of performance of practical/tutorial/sketch book which will be evaluated out of 10 marks for each practical/tutorial/sketch book and average of the same will be converted to 10 marks.
- Internal viva component of 10 marks.
- Practical performance/quiz/drawing/test of 15 marks during end semester exam.
- Viva/Oral performance of 15 marks during end semester exam.

Course Outcomes:
After completion of the course, the students will be able to
- understand various types of building materials, their properties and applications.
- understand components of Sub-structure and super structure, their classification and application.
- understand new concept and materials used for building.

P P Savani University
School of Engineering

Department of Civil Engineering

Course Code: SEME2060
Course Name: Fluid Mechanics
Prerequisite Course(s): --

Teaching & Examination Scheme:

Teaching Scheme (Hours/Week)				Examination Scheme (Marks)						
Theory	Practical	Tutorial	Credit	Theory		Practical		Tutorial		Total
				CE	ESE	CE	ESE	CE	ESE	
03	02	00	04	40	60	20	30	00	00	150

CE: Continuous Evaluation, ESE: End Semester Exam

Objectives of the Course:
To help learners to

- comprehend basic fundamentals of Fluid Mechanics, which is used in the applications of Aero-dynamics, Hydraulics & Hydraulic structures, Marine Engineering, Gas dynamics, Irrigation Systems etc.
- learn about Fluid Properties and characteristics.
- understand the importance of flow measurement and its applications in Industries and to study the various loss of flow in a flow system.

Course Content:

Section I			
Module No.	Content	Hours	Weightage in %
1.	**Properties of Fluids** Mass density, specific weight, specific gravity, specific volume, vapour pressure, compressibility and Bulk modulus, elasticity, surface tension, capillarity; Newton's law of viscosity, classification of fluids.	02	05
2.	**Fluid Statics** Force and Pressure, Pascal's law of Pressure at a point, Pressure measurement by Manometers – U tube, Inclined U tube, Differential U-tube, Centre of Pressure, Hydrostatic forces on surface – Vertical, Horizontal and Inclined, Forces on curved Surfaces, Buoyancy and Buoyant Force, Centre of Buoyancy and Meta Centre, Determination of Metacentric Height, Stability of Floating and Submerged Body, Position of metacenter relative to Centre of buoyancy.	07	15
3.	**Hydrostatic Forces on Surfaces** Total pressure and Centre of Pressure, Vertical Plane Surface Sub-merged in Liquid, Horizontal Plane Surface Sub- merged in Liquid, Inclined Plane Surface Sub- merged in Liquid, Curved Plane Surface Sub- merged in Liquid, Total pressure and Centre of Pressure on Lock Gates.	06	15
4.	**Fluid Kinematics** Steady and Unsteady Flow, Laminar and Turbulent Flow, Compressible and Incompressible Flow, One – two and three Dimensional Flow,	07	15

	Uniform and Non Uniform Flow, Rotational and Irrotational Flow, Stream Lines and Stream Function, Velocity Potential Function, Relation between stream and velocity potential function, Flow nets, Continuity Equation for 2D and 3D flow in Cartesian co-ordinates system, Source Flow, Sink Flow. Vortex flow		
Section II			
Module No.	Content	Hours	Weightage in %
1.	**Fluid Dynamics** Newton's law of motion, Euler's Equation and its applications, Bernoulli's Equation and its applications, Momentum Equation, Pitot Tube, Determination of volumetric flow with pitot tube, Principle of Venturimeter, Pipe Orifice and Rotameter, Orifice and Mouthpieces, Classification of Orifices, Flow through an orifices, Flow through Mouthpiece, Classification of Notches and Weir, Flow through Weir, Flow through Notches, hydraulics Co-efficient (Cv, Cc, Cv).	10	25
2.	**Flow Through Pipes** Major and Minor Losses in Pipes, Losses in Pipe Fittings, Hydraulic Gradient line and Total energy line, Equivalent Pipes, Pipes in series and parallel, Syphon, Power transmission through pipe, Flow through Nozzle, Water Hammer in Pipes.	08	15
3.	**Forces on Submerged Bodies** Drag and Lift, Expression for Drag and Lift, Drag on Sphere and Cylinder, Development of Lift on a Circular Cylinder, Development of Lift on an Airfoil.	05	10

List of Practical: (Any 12 practicals leading to 30 Hours of performance)

Sr No	Name of Practical	Hours
1.	Measurement of viscosity (Verification of Stokes law)	02
2.	Study of pressure measurement devices	02
3.	Hydrostatic force and center of pressure on flat/curved surfaces	02
4.	Determine metacentric height of floating body	02
5.	Verification of Bernoulli's Equation	02
6.	Study of Reynold's apparatus	02
7.	Measurement of velocity of flow using Pitot tube	02
8.	Calibration of Flow measuring devices: Venturimeter and Orificemeter	02
9.	Calibration and Discharge over Notches (V –notch, Rectangular notch, Trapezoidal notch)	02
10.	Determination of drag forced on immersed body	02
11.	Measurement of Friction factor for Different pipes. (Losses due to pipe fittings)	02
12.	Determination of Loss of Head Due To Sudden Enlargement	02
13.	Determination of Loss of Head Due To Sudden Contraction	02
14.	Determination of coefficients of an orifice (Cd, CC, Cv).	02
15.	Determine Co-efficient of Discharge by Rotameter.	02

Text Book(s):

Title	Authors	Publication
Textbook of Fluid Mechanics and Hydraulic Machines	R. K. Bansal	Laxmi Publications

Introduction to Fluid Mechanics and Fluid Machines	S. K. Som & Biswas. G	Tata McGraw Hill Publication

Reference Books:

Title	Author/s	Publication
Fluid Mechanics	Frank M. White	Tata McGraw Hill Publication
Fluid Mechanics	R. K. Rajput	S. Chand Publication

Web Material Link(s):

- http://nptel.ac.in/courses/112105171/1

Course Evaluation:

Theory:

- Continuous Evaluation consists of two tests each of 30 marks and 1 Hour of duration, which will be converted to 30 marks.
- Faculty evaluation consists of 10 marks as per the guidelines provided by the course coordinator.
- End Semester Examination consists of 60 marks.

Practical:

- Continuous Evaluation consists of performance of practical which will be evaluated out of 10 marks for each practical and average of the same will be converted to 10 marks.
- Internal viva consists of 10 marks.
- Practical performance/quiz/drawing/test consists of 15 marks during End Semester Exam.
- Viva/ Oral performance consists of 15 marks during End Semester Exam.

Course Outcome(s):

After completion of the course, the student will be able to

- understand fundamentals of fluids.
- analyze various flow problems and flow characteristics.
- determine major and minor losses through different pipes.
- apply the concept of fluid mechanics to design various systems.
- apply the concept of designing hydraulic structure & Irrigation system.

P P Savani University
School of Engineering

Department of Civil Engineering

Course Code: SECV2041
Course Name: Surveying
Prerequisite Course(s): Elements of Civil Engineering (SECV1020)

Teaching & Examination Scheme:

Teaching Scheme (Hours/Week)				Examination Scheme (Marks)						
Theory	Practical	Tutorial	Credit	Theory		Practical		Tutorial		Total
				CE	ESE	CE	ESE	CE	ESE	
03	02	00	04	40	60	20	30	00	00	150

CE: Continuous Evaluation, ESE: End Semester Exam

Objectives of the Course:
To help learners to

- understand the engineering approach about surveying.
- understand process of measuring the direct and in direct measurement.
- carry out simple land survey process and area computation.
- understand components of instruments, terminology and applications.

Course Content:

Section I			
Module No.	Content	Hours	Weightage in %
1.	**Plane Table Surveying** Introduction, working principle, precise plane table equipment, Temporary adjustments, setting up the plane table, methods of plane tabling, advantages, sources of errors.	05	14
2.	**Theodolite Traversing** Introduction, Classification, Definitions, Essentials of theodolite, Temporary and Permanent adjustment of theodolite, Measurement methods of horizontal and vertical angles, lines and relation, Sources of errors, methods of traversing, closing error, computation of traverse, check in closed and open traverse, balancing of traverse, Gale's table, traverse area, omitted measurements.	09	18
3.	**Trigonometric Leveling** Introduction, Different cases for determine height and elevation.	06	14
4.	**Setting Out Works:** Building, Culvert, Bridge, Tunnel	03	04

Section II			
Module No.	Content	Hours	Weightage in %
1.	**Tacheometry Surveying**	07	14

	Introduction, Instruments used, Methods of tacheometry measurement, Distance and elevation measurement for fixed hair, moveable hair and tangential method, Use of Analytic lens, Substance bar.		
2.	**Curve Surveying** Introduction, Classification, Definitions, Simple circular curve: Elements, Designation, Setting out methods, Elements of compound curve, Reverse curve and its elements, Transit curve: super elevation, length, ideal transit curve.	10	26
3.	**Computation of Area and Volume** Introduction, Methods of computing area: from plan, from offset, from coordinate, By planimeter, Volume from cross sections, Trapezoidal and Prismoidal formulae, Prismoidal correction, Curvature correction, capacity of reservoir.	05	10

List of Practical:

Sr. No	Name of Practical	Hours
1	Locating the given building point by plane table using method of radiation.	02
2	Plane Table Traversing	04
3	Three Point Problem	04
4	Measurement of horizontal angle using theodolite by method of repetition.	02
5	Measurement of horizontal angle using theodolite by method of reiteration.	04
6	Measurement of vertical angle using theodolite.	02
7	Determination of multiplying and additive constants of a Tacheometer	02
8	Determination of horizontal and vertical distance with tacheometery.	04
9	Setting out simple circular curve using Rankine's Deflection angle method	02
10	Setting out simple circular curve using Rankine's Two Theodolite Method	04

Text Book(s):

Title	Author/s	Publication
Surveying Volume I & II	Dr. B.C. Punamia, Dr. Ashok K. Jain	Laxmi Publication

Reference Book(s):

Title	Author/s	Publication
Surveying Volume I & II	S.K. Duggal	McGraw Hill
Surveying and Leveling	N. N. Basak	Tata McGraw Hill
Surveying and Leveling	R. Subramanian	Oxford University
Surveying Volume I and II	K.R. Arora	Standard Book House
Surveying and Leveling, Advance	R. Agor	Khanna

Web Material Link(s):

- http://nptel.ac.in/courses/105107122/2
- http://nptel.ac.in/courses/105104101/1
- http://nptel.ac.in/courses/105104101/

Course Evaluation:
Theory:

- Continuous Evaluation consists of two tests each of 30 marks and 1 Hour of duration, which will be converted to 30 marks.
- Faculty evaluation consists of 10 marks as per the guidelines provided by the course coordinator.
- End Semester Examination consists of 60 marks.

Practical:
- Continuous Evaluation consists of performance of practical and noted the same in manual and record book which should be evaluated out of 10 marks for each practical and average of the same will be converted to 10 marks.
- Internal viva component of 10 marks.
- Practical performance/quiz/drawing/test of 15marks during End Semester Exam.
- Viva/Oral performance of 15marks during End Semester Exam.

Course Outcome(s):
After completion of the course, the student will be able to
- get an adequate knowledge of surveying practices applied for real life problems.
- work with various surveying equipment, like, Theodolite, Plane table, Tacheometry etc. in order to apply the theoretical knowledge to carry out practical field work.
- understand carry out measurements with various surveying equipment employed in practice.

P P Savani University
School of Engineering

Department of Civil Engineering

Course Code: SECV2910
Course Name: Industrial Exposure
Prerequisite Course(s): --

Teaching & Examination Scheme:

Teaching Scheme (Hours/Week)				Examination Scheme (Marks)						
Theory	Practical	Tutorial	Credit	Theory		Practical		Tutorial		Total
				CE	ESE	CE	ESE	CE	ESE	
00	00	00	02	00	00	100	00	00	00	100

CE: Continuous Evaluation, ESE: End Semester Exam

Objective of the Course:
To help learners to

- get exposed to the industrial spectrum.
- learn the mechanisms of industry/ workplace.
- be aware about work culture and policies of industries.

Outline of the Course:

Sr. No	Content
1.	Selection of Companies
2.	Company Information collection
3.	Report Writing
4.	Presentation & Question-Answer

Course Evaluation:

Sr. No.	Evaluation criteria	Marks
1	Actual work carried & Report Submission	50
2	Final Presentation & Question-Answer session	50
	Grand Total:	**100**

Course Outcome:
After completion of the course, the student will be able to

- get acquainted with the industrial scenario.
- be aware about his future prospects in the respective field.
- gain knowledge of work culture and industrial expectations.

Report Writing Guidelines

A. Report Format:

1. Title Page (to be provided by the respective supervisor)

The title page of the project shall give the following information in the order listed:

- Full title of the project as approved by the Mentor;
- The full name of the student/Group of students with enrollment number;
- The qualification for which the project is submitted;
- The name of the institution to which the project is submitted;
- The month and year of submission.

2. Project Certification Form
   [The form should be duly filled signed by the supervisors.]
3. Acknowledgements
   [All persons (e.g. supervisor, technician, friends, and relatives) and organization/authorities who/which have helped in the preparation of the report shall be acknowledged.]
4. Table of Contents/Index with page numbering
5. List of Tables, Figures, Schemes
6. Summary/abstract of the report.
7. Introduction/Objectives of the identified problem
8. Data Analysis and Finding of Solution
9. Application of the identified solution
10. Future Scope of enhancement of the Project and Conclusion
11. "Learning during Project Work", i.e. "Experience of Journey during Project Duration"
12. References(must)
13. Bibliography
14. Annexures (if any)

B. Guideline for Report Formatting:

- Use A4 size page with 1" margin all sides
- Header should include Project title and footer should contain page number and enrollment numbers
- Chapter Name should be of Cambria font, 20 points, Bold
- Main Heading should be of Cambria font, 14 points, Bold
- Sub Heading should be of Cambria font, 12 points, Bold
- Sub Heading of sub heading should be of Cambria font, 12 points, Bold, Italic
- Paragraph should be of Cambria font, 12 points, no margin at the start of the paragraph
- Line spacing for all content – 1.15, before - 0, after - 0
- No chapter number for references
- Before chapter 1, give page numbers in roman letter

P P Savani University
School of Engineering

Department of Science & Humanities

Course Code: SESH2022
Course Name: Numerical & Statistical Analysis
Prerequisite Course(s): SESH1020-Linear Algebra & Vector Calculus, SESH2011-Differential Equations/SESH2031-Differential Methods for Chemical Engineers

Teaching & Examination Scheme:

Teaching Scheme (Hours/Week)				Examination Scheme (Marks)						
Theory	Practical	Tutorial	Credit	Theory		Practical		Tutorial		Total
				CE	ESE	CE	ESE	CE	ESE	
03	00	02	05	40	60	00	00	50	00	150

CE: Continuous Evaluation, ESE: End Semester Exam

Objective(s) of the Course:
To help learners to

- acquire the knowledge of numerical analysis & statistical methods to the students.
- mentally prepare them to identify and formulate the engineering problem and and obtain their solutions.
- inculcate the analytical skills to the students to apply the Numerical & Statistical techniques to the problems of Civil, Mechanical & Chemical engineering.

Course Content:

Section I			
Module No.	Content	Hours	Weightage in %
1.	**Complex Variables** Complex numbers with operators and geometric representation, Analytic function, Derivative of complex function, Cauchy-Riemann equation, Trigonometric and Hyperbolic functions, Complex Integration, Conformal Mapping, Linear functional transformations, Cauchy's Integral, Calculation of residue	10	20
2.	**Numerical Solutions of Linear and Non-linear Equations** Errors and their computations, General error formula, Bisection Method, Iteration Method, Newton-Raphson Method, Solution of system of non-linear equation, Solution of linear system, Gauss Elimination	6	13
3.	**Numerical Differentiation and Integration** Interpolation, Finite Differences, Error in numerical differentiation, Cubic Splines Method, Differentiation Formulae, Numerical solution of ODEs, Picard's Method, Euler's Method, Runge-Kutta Method, Numerical Integration, Trapezoidal Rule, Simpson's 1/3-rule, Simpson's 3/8-rule, Euler-Maclaurin Formulae	7	17
Section II			
Module No.	Content	Hours	Weightage in %
1.	**Basics of Statistics**	7	15

	Elements, Variables, Observations, Quantitative and Qualitative data, Corss-sectional and Time series data, Frequency distribution, Dot plot, Histogram, Cumulative distribution, Measure of location, Mean, Median, Mode, Percentile, Quartile, Measure of variability, Range, Interquartile Range, Variance, Standard Deviation, Coefficient of Variation, Regression Analysis, Regression line and regression coefficient, Karl Pearson's method		
2.	**Probability Distribution** Introduction, Conditional probability, Independent events, independent experiments, Theorem of total probability and Bayes' theorem, Probability distribution, Binomial distribution, Poisson distribution, Uniform distribution, Normal distribution.	8	18
3.	**Testing of Hypothesis** Introduction, Sampling, Tests of significance for parametric test, Null Hypothesis, Type 1 and Type 2 errors, Level of significance, Chi-square test, Student's t-test, Seducer's f-test	7	17

List of Tutorial:

Sr No	Name of Practical/Tutorial	Hours
1.	Complex Variables-1	4
2.	Complex Variables-2	2
3.	Numerical Solutions of Linear and Non-linear Equations-1	2
4.	Numerical Solutions of Linear and Non-linear Equations-2	4
5.	Numerical Differentiation and Integration-1	2
6.	Numerical Differentiation and Integration-2	2
7.	Basics of Statistics-1	2
8.	Basics of Statistics-2	4
9.	Probability-1	2
10.	Probability-2	2
11.	Testing of Hypothesis-1	2
12.	Testing of Hypothesis-2	2

Text Book(S):

Title	Author/s	Publication
Advanced Engineering Mathematics	Erwin Kreyszig	Wiley India Pvt. Ltd., New Delhi
Probability and Statistics for Engineers	Richard A. Johnson Irwin Miller, John Freund	Pearson India Education Services Pvt. Ltd., Noida

Reference Book(s):

Title	Author/s	Publication
Higher Engineering Mathematics	B. S. Grewal	Khanna Publishers, New Delhi
Advanced Engineering Mathematics	R. K. Jain, S. R. K. Iyengar	Narosa Publishing House, New Delhi.
Introductory Methods of Numerical Analysis	S. S. Sastry	PHI Learning Pvt. Ltd., New Delhi.

Web Material Link(s):

- http://nptel.ac.in/courses/111106094/
- http://nptel.ac.in/courses/111106084/
- http://nptel.ac.in/courses/111105035/

- http://nptel.ac.in/courses/111101003/
- http://nptel.ac.in/courses/111105090/

Course Evaluation:
Theory:
- Continuous Evaluation consists of two tests each of 30 marks and 1 Hour of duration, which will be converted to 30 marks.
- Faculty evaluation consists of 10 marks as per the guidelines provided by the course coordinator.
- End Semester Examination consists of 60 marks.

Tutorial:
- Continuous Evaluation consists of performance of tutorial which will be evaluated out of 10 Marks for each tutorial and average of the same will be converted to 30 marks.
- MCQ based examination consists of 10 marks.
- Internal Viva consists of 10 marks.

Course Outcome(s):
After completion of the course, the student will be able to
- derive numerical solution of linear and non-linear system of equation.
- acquire knowledge of finite differences, interpolation, numerical differentiation and numerical integration.
- select appropriate method to collect data and construct, compare, interpret and evaluate data by different statistical methods.
- apply concept of probability in decision making, artificial intelligence, machine learning etc.

P P Savani University
School of Engineering

Department of Civil Engineering

Course Code: SECV2051
Course Name: Determinate Structural Analysis
Prerequisite Course(s): Strength of Material (SECV2011)/Solid Mechanics (SECV1070)

Teaching & Examination Scheme:

Teaching Scheme (Hours/Week)				Examination Scheme (Marks)						
Theory	Practical	Tutorial	Credit	Theory		Practical		Tutorial		Total
				CE	ESE	CE	ESE	CE	ESE	
04	00	01	05	40	60	00	00	50	00	150

CE: Continuous Evaluation, ESE: End Semester Exam

Objective(s) of the Course:
To help learners to

- understand the structural behavior before and after application of loads.
- able to determine deflections of beams and frames using classical methods.
- ability to idealize and analyze statically determinate and indeterminate structures.
- able to analyze statically determinate trusses, beams, and frames and obtain internal loading.
- able to analyze cable and arch structures

Course Content:

Section I			
Module No.	Content	Hours	Weightage in %
1.	**Types of Structure and Determinacy** Introduction, Types of Statically Determinate and Indeterminate structures, Static and kinematic Indeterminacy, Stability of structures, Computation of Internal forces in Statically Determinate structures such as Truss, Portals, Gables, Grids, Beams curved in plan, Shear Force and Bending moment diagram for Beam and Plane Frame.	08	13
2.	**Influence Line Diagram** Define and Use of Influence line Diagram, Properties of influence lines, ILD for support reaction, Shear Force and Bending moment Computation of Maximum Moment and Maximum Shear for a series of Concentrated loads and udl for beams, Absolute maximum Shear, Bending moments, ILD for trusses.	12	20
3.	**Force Method** Moment Area Method, Conjugate Beam Method	10	17

Section II			
Module No.	Content	Hours	Weightage in %
1.	**Displacement Method**	10	18

	Double Integration Method, Macaulay's Method		
2.	**Energy Method** Introduction, Castiglino's First Theorem, Unit Load Method for Beam and Truss.	10	16
3.	**Analysis of Arches Cables and Suspension Bridge** Introduction, Analysis of Three Hinge and Two Hinge Arches, Cable and Suspension Bridge.	10	16

Text Books:

Title	Author/s	Publication
Theory of Structures	Khurmi R.S.	S Chand
Structural Analysis	S. Ramamurtham	Wiley

Reference Bookss:

Title	Author/s	Publication
Struct Anal SI Units	Pandit & Gupta	Tata MacGrawHill
Structural Analysis	Hibller	Pearson

Web Material Link(s):

- http://www.nptel.ac.in/courses/Webcoursecontents/IIT%20Kharagpur/Structural%20Analysis/pdf/m1l1.pdf
- http://nptel.ac.in/courses/Webcoursecontents/IIT%20Kharagpur/Structural%20Analysis/pdf/m7l37.pdf
- https://gradeup.co/force-methods-flexibility-method-study-notes-for-civil-engineering-i-0e7ccce0-8f13-11e7-885e-82ae4c75fae5
- http://www.brainkart.com/article/Structural-Analysis--Flexibility-Method_4580/
- http://www.nptel.ac.in/courses/Webcoursecontents/IIT%20Kharagpur/Structural%20Analysis/pdf/m1l5.pdf
- http://nptel.ac.in/courses/Webcoursecontents/IIT%20Kharagpur/Structural%20Analysis/pdf/m5l31.pdf

Course Evaluation:

Theory:

- Continuous Evaluation consists of two tests each of 30 marks and 1 Hour of duration, which will be converted to 30 marks.
- Faculty evaluation consists of 10 marks as per the guidelines provided by the course coordinator.
- End Semester Examination consists of 60 marks.

Tutorial:

- Internal viva of 20 marks.
- Submission of class note and assignment consists of 30 marks.

Course Outcome(s):

After completion of the course, the student will be able to

- apply principles of statics to determine reactions & internal forces in statically determinate structures.
- determine displacements of statically determinate structures.
- determine stresses due to axial & eccentric loading.
- determine strain energy stored in a body.
- determine stresses in thin cylinders and spherical vessels.

P P Savani University
School of Engineering

Department of Civil Engineering

Course Code: SECV2060
Course Name: Geology & Geotechnical Engineering
Prerequisite Course(s): --

Teaching & Examination Scheme:

Teaching Scheme (Hours/Week)				Examination Scheme (Marks)						
Theory	Practical	Tutorial	Credit	Theory		Practical		Tutorial		Total
				CE	ESE	CE	ESE	CE	ESE	
03	02	00	04	40	60	20	30	00	00	150

CE: Continuous Evaluation, ESE: End Semester Exam

Objective of the Course:
To help learners to
- understand the properties and behaviour of soil for the design of structures.
- introduce students with basic principles of geosciences and their applications in Civil Engineering.

Section I			
Module No.	Content	Hours	Weightage in %
1.	**Introduction to Physical Geology** Scope of geology in civil engineering, Branches of geology, Weathering, Landform and Process associated with ground water, Causes & Classification of earthquake.	03	04
2.	**Mineralogy** Physical properties of minerals, Monoclinic system, Quartz group, Felspar group, Pyroxenes group, Amphibole group, Hornblende: (compound-complex silicate), Mica group.	04	10
3.	**Rock Classification** Igneous rocks, Textures of igneous rocks, Forms of igneous rocks, Important igneous rocks, briefly explain about sedimentary rocks, Important sedimentary rocks, lime stones, metamorphic rocks, Classification of metamorphic rocks.	04	10
4.	**Structural Geology and Geophysical Methods** Outcrop, Folds arts of a fold, Classification of folds, Causes of folding, fault & faulting, Joints and jointing, Geophysical investigations, Seismic methods, Gravitational methods, Magnetic methods.	04	10
5.	**Application of Geological Investigations** Geological conditions necessary for construction of dam definition, Selection of sites, Geological characters for investigation, Tunnels, assessment of environmental hazards, Geological considerations in tunneling, Folding, Faulting, Roads and highways, Road cut.	04	08
6.	**Introduction of Soil and Soil Mechanics** Definition, Development of soil mechanics, Soil formation, Residual and transported soils, Some commonly used soil designations, Structure and	04	08

	texture of soils, Soil as construction material, Limitations of soil mechanics.		
Section II			
Module No.	Content	Hours	Weightage in %
1.	**Composition of Soil Terminology, Index Properties and Relationships** Composition of soil, Phase diagram, Basic terms and definitions, Water content, Soil Relative density, Functional relationships, Determination of index properties, Relative density for granular soil, Consistency limits and its determination, different indices, Field moisture equivalent, Activity, Sensitivity & Thixotropy of soil.	03	06
2.	**Soil Classification & Particle Size Analysis** Objectives, Basis, Textural, Unified soil classification, IS classification method, group index. Field identification and General characteristics of the soil, Size and nomenclature of soil particles as per IS, Sieve analysis, Sedimentation analysis, Particle size distribution curve and its uses.	07	16
3.	**Soil Moisture** Water type, Effect of moisture content on soil, Ground water, Hygroscopic moisture, Capillary water, Apparent cohesion, Natural and effective pressure, Seepage velocity. **Capillary:** Capillary rise in soil, Introduction of seepage and flow net. **Permeability:** Permeability derivation and definition, Laboratory Permeability, Field permeability, Permeability of layered soil.	08	18
4.	**Soil Sub-Surface Investigations** Planning soil exploration, Methods of exploration, Soil borings, sounding, Sampling, Spacing and depth of borings, Stand and penetration test, Record of field investigation.	04	10

List of Practical:

Sr. No.	Name of Practical	Hours
1.	Moisture Content	2
2.	Visual identification and specific gravity	2
3.	Sieve Analysis	2
4.	Liquid and Plastic Limit Test	4
5.	Shrinkage limit Test	2
6.	In-situ Density-Core Cutter & Sand Replacement method	4
7.	Permeability Test: Constant and Variable Head	4
8.	Study of rock specimen.	4
9.	Study of Strike and dip using models.	4
10.	Case study: Geologic problems encountered during civil engineering projects.	2

Text Book(s):

Title	Author/s	Publication
Engineering and general Geology	Parbin Singh	S. K. Kataria& Sons.
Basic & Applied Soil Mechanics	Gopal Ranjan & Rao A. S. R	New Age International Publication

Reference Book(s):

Title	Author/s	Publication
Soil Mechanics and Foundation Engineering	V. N. S. Murthy	Dhanpatrai Engineering
Laboratory Testing for Soils, Rocks and Aggregates.	Sivakugan, Arulrajah	J. Ross Publishing
Engineering Geology for Civil Engineers	P. C. Varghese	PHI Learning Pvt. Ltd
Geotechnical Engineering (Soil Mechanics)	T.G. Sitharam & T.N. Ramamurthy	S. Chand
Geotechnical Engineering	C. Venkatramaiah	Universities Press
Geotechnical Engineering	Manoj Datta, Shashi K Gulhati	Tata MacGrawHill
Laboratory Testing for Soils, Rocks and Aggregates.	Sivakugan, Arulrajah, Bo	J. Ross Publishing

Web Material Links:

- https://www.vidyarthiplus.com/vp/thread-36461.html#.WjzMdt-WY2w
- http://www.soest.hawaii.edu/martel/Courses/GG454/index.html
- https://web.viu.ca/earle/geol111/lecture-notes.htm
- http://nptel.ac.in/downloads/105101001/
- http://www.vssut.ac.in/lecture_notes/lecture1428371514.pdf
- http://www.vssut.ac.in/lecture-notes.php?url=civil-engineering
- https://drshahpak.weebly.com/uploads/5/6/3/3/5633102/intro.pdf

Course Evaluation:

Theory:

- Continuous Evaluation consists of two tests each of 30 marks and 1 Hour of duration, which will be converted to 30 marks.
- Faculty evaluation consists of 10 marks as per the guidelines provided by the course coordinator.
- End Semester Examination consists of 60 marks.

Practical

- Continuous Evaluation consists of performance of practical/tutorial which should be evaluated out of 10 for each practical/tutorial and average of the same will be converted to 10 marks.
- Internal viva component of 10 marks.
- Practical performance/quiz/test/assignment of 15 marks during end semester exam.
- Viva/Oral performance of 15 marks during end semester exam.

Course Outcome(s):

After completion of the course, the student will be able to

- understand the fundamentals of geology, Structural features of rocks & various geological investigations.
- developed the ability to classify soils and to evaluate soil parameters such as Atterberg limits, Density, Specific gravity, permeability.

P P Savani University
School of Engineering

Department of Civil Engineering

Course Code: SECV2090
Course Name: Building & Town Planning
Prerequisite Course(s): --

Teaching & Examination Scheme:

Teaching Scheme (Hours/Week)				Examination Scheme (Marks)						
Theory	Practical	Tutorial	Credit	Theory		Practical		Tutorial		Total
				CE	ESE	CE	ESE	CE	ESE	
03	02	00	04	40	60	20	30	00	00	150

CE: Continuous Evaluation, ESE: End Semester Exam

Objectives of the Course:
To help learners to

- understand the building typology and symbols used in practice.
- understand importance of bye law for building construction.
- carry out design of building planning, working drawing, perspective view.
- understand process of planning the urban area.

Course Content:

Section I			
Module No.	Content	Hours	Weightage in %
1.	**Building Planning** Introduction to buildings, Classification of buildings, Principles of building planning, Principles of architecture composition, Standard conventional signs and symbols & abbreviations, ISI nomenclature: Size of scale, standard method of dimensioning	04	10
2.	**Building Bye Law** Introduction, Necessities, Importance, Standards for residential buildings, Different building by–laws, Provision of bye laws as per local authority, standards for industrial, public, commercial and institutional buildings.	08	18
3.	**Residential Building Planning** Minimum size requirement, Line diagram, Detail drawing, :plan, elevation, section, Preparing working drawing of residential building: detached, semidetached, row houses and apartments with scale proportion, open spaces standard as per permissible F.S.I. , Building services like water supply, drainage, electrification etc. for modern buildings, Auto CAD application in planning.	07	12
4.	**Perspective Drawing** Elements of perspective views, Types of views such as one point, two-point perspective	03	10
Section II			

Module No.	Content	Hours	Weightage in %
1.	**Town Planning Introduction** History, ancient planning in India, origin and Growth of Town Planning, Objects & importance of town planning, Principal of town planning, Stages in town planning, Forms of planning, Planning of Mohenjo-Daro, Lothal and Indus valley civilization, Present position of town planning in India.	05	10
2.	**Civic Survey & Neighborhood planning** Necessity for Planning purpose, Types of survey, Methods of Data collection, its presentation and analysis, Application of data in planning, Neighborhood planning; Principle, Features	07	18
3.	**Land Use and Zoning** Land use planning and its percentage for category of town, Principle of land use, Zoning: Object, Principle, Advantage, Importance, Aspects.	05	10
4.	**Housing and Slums** Housing: Definition, Importance, Requirement of residential building, Classification, Housing agencies, HUDCO, HDFC, LIC. SLUMS: Definition, Causes, Prevention method.	06	12

List of Practical:

Sr. No.	List of Practical	Hours
	Note: Minimum Four A1 Size Drawing sheet	
1.	Residential Building Planning: Two storied Building with Plans, elevation, section, lay-out plan, key plan, site plan, area table, schedule of opening in the scale of 1:100.	07
2.	Public Building: Ground Floor plan, typical floor plan, elevation, section, lay-out plan, key plan, site plan, area table, schedule of opening	07
3.	Working Drawing: sheet should accommodate minimum six types with sectional details like Furniture plan, Drainage lay out, Toilet Detail, Wood work detail, Kitchen detail, Electrical plan etc	06
4.	Perspective Drawing: Two-point perspective of sheet -1 planning/ any other problem	06
5.	Neighborhood layout planning	04

Text Book(s):

Title	Author/s	Publication
Building Planning, Designing and Scheduling	Gurcharan Singh	Standard Book
Town Planning	S.C. Rangwala	Charotar

Reference Book(s):

Title	Author/s	Publication
Civil Engineering Drawing	V. B. Sikka	S.K. Kataria & Sons
Building Drawing	M. G. Shah, C.M. Kale, S.Y. Patki	Tata McGraw Hill
Planning and Designing Building	Y. S. Sane	
G.D.C.R.	S.U.D.A./ S.M.C.	S.U.D.A./ S.M.C.

Web Material Links:

- http://bis.org.in/sf/mtd/MTD32(5079)W.pdf
- http://www.sudaonline.org/gdcr/

- https://www.studentartguide.com/articles/one-point-perspective-drawing
- http://www.ancientindia.co.uk/index.html

Course Evaluation:
Theory:
- Continuous Evaluation consists of two tests each of 30 marks and 1 Hour of duration, which will be converted to 30 marks.
- Faculty evaluation consists of 10 marks as per the guidelines provided by the course coordinator.
- End Semester Examination consists of 60 marks.

Tutorial:
- Continuous Evaluation consists minimum 4 drawing sheets which should be evaluated out of 10 marks for each sheet and average of the same will be converted to 10 marks.
- Internal viva component of 10 marks.
- Practical performance/quiz/drawing/test of 15 marks during End Semester Exam.
- Viva/Oral performance of 15 marks during End Semester Exam.

Course Outcomes:
After completion of the course, the student will be able to
- understand local building bye-laws in respect of building and town planning.
- discuss various aspects of principles of planning and architecture in building planning.
- prepare working drawings, foundation plans and other executable drawings with proper details with hand and with Auto-CAD software for residential buildings.
- understand concept of development of town, important of survey in town planning.
- understand importance of zoning, land use and latest form of urban planning.

P P Savani University
School of Engineering

Department of Civil Engineering

Course Code: SECV2110
Course Name: Concrete Technology
Prerequisite Course(s): --

Teaching & Examination Scheme:

Teaching Scheme (Hours/Week)				Examination Scheme (Marks)						
Theory	Practical	Tutorial	Credit	Theory		Practical		Tutorial		Total
				CE	ESE	CE	ESE	CE	ESE	
03	02	00	04	40	60	20	30	00	00	150

CE: Continuous Evaluation, ESE: End Semester Exam

Objective(s) of the Course:
To help learners to

- understand basics of modern concrete.
- use mineral and chemical admixtures.
- understand the material properties of concrete with emphasis on its durability.
- design the required concrete mix based on the field conditions.

Course Content:

Section I			
Module No.	Content	Hours	Weightage in %
1.	**Cement** Production, composition and properties, cement chemistry, types of cements, special cements.	03	07
2.	**Aggregates** Mineralogy, properties, tests and standards.	05	11
3.	**Chemical and Mineral Admixtures** Water reducers, air entrainers, set controllers, specialty admixtures structure properties, and effects on concrete properties, introduction to supplementary cementing materials and pozzolans, fly ash, blast furnace slag, silica fume, and metakaolin - their production, properties, and effects on concrete properties, other mineral additives - reactive and inert.	06	13
4.	**Concrete Mix Design** Basic principles, IS method, ACI method, new approaches based on rheology and particle packing.	07	16
5.	**Concrete Production & Fresh Concrete** Batching of ingredients, mixing, transport and placement. Consolidation, finishing, and curing of concrete, initial and final set - significance and measurement. Workability of concrete and its measurement.	02	03
Section II			
Module No.	Content	Hours	Weightage in %
1.	**Engineering Properties of Concrete**	05	11

	Compressive strength and parameters affecting it, tensile strength - direct and indirect, modulus of elasticity and Poisson's ratio, stress strain response of concrete.		
2.	**Dimensional Stability and Durability** Creep and relaxation, parameters affecting, shrinkage of concrete - types and significance, parameters affecting shrinkage, measurement of creep and shrinkage**.**	06	13
3.	**Durability of Concrete** Introduction to durability, relation between durability and permeability, chemical attack of concrete, corrosion of steel rebars, other durability issues**.**	07	16
4.	**Special Concretes** Properties and Applications of: High strength - high performance concrete, reactive powder concrete, lightweight, heavyweight, and mass concrete, fibre reinforced concrete, self-compacting concrete, shotcrete, other special concretes.	04	10

List of Practical:

Sr. No.	Name of Practical	Hours
1.	Fineness of Cement	02
2.	Soundness of Cement	02
3.	Slump cone test	02
4.	Compaction factor test	02
5.	Vee Bee Consistometer test	02
6.	Flow table test	02
7.	Compressive strength Tests	02
8.	Split Tensile Test	02
9.	Mix design	06
10.	Young's Modulus and Poisson's Ratio of concrete	04
11.	Rebound Hammer Test	02
12.	Ultrasonic Pulse Velocity Test	02

Text Book(s):

Title	Author/s	Publication
Concrete Technology	A.M. Neville and J.J. Brooks	ELBS
Concrete Technology	M.S. Shetty	S. Chand

Reference Book(s):

Title	Author/s	Publication
Concrete Structure, Material and Properties	P.K. Mehta	Prantice Hall Inc.
Cement based composites: Materials, Mechanical Properties and Performance	A.M. Brandt	E & FN Spon.

Web Material Link(s):

- https://onlinecourses.nptel.ac.in/noc18_ce20/preview
- https://onlinecourses.nptel.ac.in/noc18_ce21/preview

Course Evaluation:

Theory:

- Continuous Evaluation consists of two tests each of 30 marks and 1 Hour of duration, which will be converted to 30 marks.
- Faculty evaluation consists of 10 marks as per the guidelines provided by the course coordinator.
- End Semester Examination consists of 60 marks.

Practical:

- Continuous Evaluation consists of performance of practical which will be evaluated out of 10 marks for each practical and average of the same will be converted to 10 marks.
- Internal viva consists of 10 marks.
- Practical performance/quiz/drawing/test consists of 15 marks during End Semester Exam.
- Viva/Oral performance consists of 15 marks during End Semester Exam.

Course Outcome(s):

After completion of the course, the student will be able to

- thoroughly understand the concrete production process.
- understand how each additive affects the properties of the concrete.
- be able to design a required concrete mix.