PPSU

P P SAVANI UNIVERSITY

SCHOOL OF ENGINEERING

B. TECH. (CIVIL ENGINEERING)

SYLLABUS BOOK

AY 2023-24

INSTITUTE VISION
To emerge as an Institute of Excellence by imparting value-based education aided with Research, Innovation and Entrepreneurial skills.

INSTITUTE MISSION	
1.	To impart the holistic engineering education of highest quality & prepare socially responsible professionals with entrepreneurial skills.
2.	To prepare value-aided engineering professionals to meet up global industry requirements by imparting cutting edge professional education.
3.	To inculcate the attitude of research and innovation among the stake holders through experiential and project-based teaching-learning pedagogy.
4.	To acquire global talent pool by providing world class amenities for teaching, learning & research.

Graduates will demonstrate ability to:

PEO No	PROGRAMME EUCATIONAL OBJECTIVES
PEO 1	Solve real-world engineering problems, design and develop innovative and cost-effective solutions exhibiting engineering skills/fundamentals to cater needs of society.
PEO 2	Excel in Industry/technical profession, higher studies, and entrepreneurship exhibiting comprehensive competitiveness.
PEO 3	Exhibit professional ethics & values, effective communication, teamwork, multidisciplinary approach, and ability to relate engineering issues to broader societal framework.

PO No	PROGRAMME OUTCOMES
PO 1	Engineering knowledge: Apply knowledge of engineering fundamentals, science, mathematics & engineering specialization for the solution of complex engineering problems.
PO 2	Problem analysis: Identify, formulate and analyze complex engineering problems leading to substantial conclusions using basic principles of mathematics, science and engineering.
PO 3	Design/development of solutions: Develop solutions for complex engineering problems and design system components or processes meeting specified needs having due consideration for the safety and societal & environmental considerations.
PO 4	Conduct investigations of complex problems: Use research-based knowledge & methods like design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid & viable conclusions.
PO 5	Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools for prediction and modeling of complex engineering activities with an understanding of the limitations.
PO 6	The engineer and society: Apply cognitive learning by the contextual knowledge to assess societal, health, safety, legal and cultural issues and following responsibilities relevant to the professional engineering practice.
PO 7	Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge & skill needed for sustainable development.
PO 8	Values & Ethics: Apply basic moral values & ethical principles and pledge to professional ethics/norms and responsibilities of the engineering practice.
PO 9	Individual and team work: Function effectively as an individual/as a team member or as a leader in diverse teams, and in multidisciplinary settings.
PO 10	Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO 11	Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects in multidisciplinary environments.
PO 12	Life-long learning: Recognize the need, do necessary preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PSO No	PROGRAMME SPECIFIC OUTCOMES (PSO) CIVIL ENGINEERING
PSO 1	Apply advanced analytical techniques, latest technologies, and management skills in solving real-world challenges that involve technical aspects as well as human management.
PSO 2	Design solutions for complex civil engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health & safety, cultural, societal, and environmental considerations with modern engineering tools.
PSO 3	Design innovative, sustainable, and cost-effective Civil Engineering projects by giving importance to the required safety measures and ethical practices.

Credit Guidelines (General)			
Component	**Hour/Week**	**Credit**	**Total Hours/Semester**
Theory	1	1	15
Practical	2	1	30
Tutorial	1	1	15
Note: In specific cases; extra credits can be granted for specific/important subjects.			

CO-PO Mapping Guidelines		
Mapping Level	**% age Mapping**	**Indicator**
0 / -	0	No Mapping
1	0-33	Low Level (Slightly Mapped)
2	33-66	Medium Level (Moderately Mapped)
3	>66	High Level (Strongly Mapped)

Syllabus Book

B.Tech
(Civil Engineering)

P P Savani University

School of Engineering

Effective From: 2023-24

Authored by:

P P Savani University

CONTENT

FIRST YEAR B. TECH.

P P SAVANI UNIVERSITY

SCHOOL OF ENGINEERING

TEACHING & EXAMINATION SCHEME FOR FIRST YEAR B.TECH. PROGRAMME AY: 2023-24

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 OR 2	SESH1110	Calculus	SH	3	0	2	5	5	40	60	0	0	100	0	200
	SESH1120	Linear Algebra	SH	3	0	2	5	5	40	60	0	0	100	0	200
	SEME1110	Hardware Workshop	ME	0	4	0	4	4	0	0	100	0	0	0	100
	SECE1110	Software Workshop	CE	0	4	0	4	2	0	0	100	0	0	0	100
	SEIT1110	Cyberspace Awareness	IT	2	0	0	2	2	40	60	0	0	0	0	100
	SEIT1120	Competitive Quantitative Aptitude	IT	2	0	0	2	2	40	60	0	0	0	0	100
	SECE1120	Joy of Programming	CE	3	2	0	5	4	40	60	40	60	0	0	200
	SESH1130	Conceptual Experimental Physics	SH	3	2	0	5	4	40	60	40	60	0	0	200
	SECH1110	Fundamental Chemistry & Environmental Science	CH	3	2	0	5	4	40	60	40	60	0	0	200
	SEME1120	Fundamentals of Technical Drawing	ME	0	4	0	4	4	0	0	40	60	0	0	100
	SECV1110	Core Engineering Concepts	CV	3	2	0	5	4	40	60	40	60	0	0	200
	CFLS2130	Intermediate Communicative English	CFLS	2	2	0	4	3	100	00	100	0	0	0	200
	CLSC2070	Essentials of Entrepreneurship	CFLS/SLM	2	0	0	2	2	100	0	0	0	0	0	100
						Total	**52**	**45**							**2000**

P P SAVANI UNIVERSITY														
SCHOOL OF ENGINEERING														
TEACHING & EXAMINATION SCHEME FOR FIRST YEAR B.TECH. PROGRAMME AY: 2023-24														
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**	
Group 1	SESH1110	Calculus	SH	3	0	2	5	5	40	60	0	0	100	0	200
	SEME1110	Hardware Workshop	ME	0	4	0	4	4	0	0	100	0	0	0	100
	SEIT1110	Cyberspace Awareness	IT	2	0	0	2	2	40	60	0	0	0	0	100
	SESH1130	Conceptual Experimental Physics	SH	3	2	0	5	4	40	60	40	60	0	0	200
	SEME1120	Fundamentals of Technical Drawing	ME	0	4	0	4	4	0	0	40	60	0	0	100
	SECE1120	Joy of Programming	CE	3	2	0	5	4	40	60	40	60	0	0	200
	CFLS2130	Intermediate Communicative English	CFLS	2	2	0	4	3	100	0	100	0	0	0	200
						Total	**29**	**26**							**1100**
Group 2	SESH1120	Linear Algebra	SH	3	0	2	5	5	40	60	0	0	100	0	200
	SECE1110	Software Workshop	CE	0	4	0	4	2	0	0	100	0	0	0	100
	SEIT1120	Competitive Quantitative Aptitude	IT	2	0	0	2	2	40	60	0	0	0	0	100
	SECH1110	Fundamental Chemistry & Environmental Science	CH	3	2	0	5	4	40	60	40	60	0	0	200
	SECV1110	Core Engineering Concepts	CV	3	2	0	5	4	40	60	40	60	0	0	200
	CLSC2070	Essentials of Entrepreneurship	CFLS/ SLM	2	0	0	2	2	100	0	0	0	0	0	100
						Total	**23**	**19**							**900**

P P Savani University
School of Engineering

Department of Science and Humanities

Course Code: SESH1110
Course Name: Calculus
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	
03	-	02	05	40	60	-	-	100	-	200

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 convergence or divergence of any infinite series and power series for learning advanced Engineering Mathematics.
- acquire knowledge of partial differentiation and ability to work with applications to advanced Engineering Mathematics.
- application of concavity of graph and find out points of inflection.

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.	09	20
2.	**Sequence and Series-I** Convergence and Divergence, Comparison Test, Integral Test, Ratio Test, Root Test, Alternating Series, Absolute and Conditional Convergence.	09	20
3.	**Sequence and Series-II** Power series, Taylor and Maclaurin series, Indeterminate forms and L'Hospital's Rule.	05	10
Section II			
Module No.	Content	Hours	Weightage in %
1.	**Partial Derivatives**	11	30

	Function of several variables, Partial differentiation, Applications, Chain rule, Linear approximations, Maxima and Minima, Euler's theorem, Lagrange multiplier.		
2.	**Curve tracing** Tracing of Cartesian Curves, Polar Coordinates, Polar and Parametric Form of Standard Curves, Areas and Length in Polar co-ordinates	11	20
	TOTAL	45	100

List of Tutorials:

Sr. No.	**Name of Tutorial**	**Hours**
1.	Calculus-1	04
2.	Calculus-2	04
3.	Calculus-3	02
4.	Sequence and Series-1	04
5.	Sequence and Series-2	02
6.	Sequence and Series-3	02
7.	Partial Derivatives-1	04
8.	Partial Derivatives-2	02
9.	Curve tracing-1	04
10.	Curve tracing-2	02
	TOTAL	30

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	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 50 marks
- Continuous Evaluation consists of self-performance assignment to 20 marks.
- Internal Viva consists of 30 marks.

Course Outcome(s):

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

SESH1110	CALCULUS
CO 1	Recall the concepts of limit, continuity and differentiability for analysing mathematical problems.
CO 2	Analyze the series for its convergence and divergence to solve real world problems.
CO 3	Evaluate various limit problems using L' Hospital's rule.
CO 4	Identify the ordinary differentials and partial differentials and solve the maximum and minimum value of function.
CO 5	Construct the graphs for function with intervals and identify more application for function.

Mapping of CO with PO

SESH1110	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO 1	2	3	1	1								1
CO 2	3	2	1									1
CO 3	2	2	1									
CO 4	2	2	1	1								1
CO 5	2	2	1									1

Mapping of CO with PSO

SESH1110	PSO1	PSO2	PSO3
CO 1	3		
CO 2	1	1	
CO 3	1	2	
CO 4	3	2	
CO 5	1	1	

Level of Bloom's Revised Bloom's Taxonomy in Assessment

1: Remember	2: Understand	3: Apply
4: Analyze	5: Evaluate	6: Create

Module No	Content	RBT Level
1	Calculus	1, 2, 3, 4, 5
2	Sequence and Series – I	1, 2, 3, 4, 6
3	Sequence and Series – II	1, 2, 3, 4, 6
4	Partial Derivatives	1, 2, 3, 4, 5
5	Curve tracing	1, 2, 3, 4, 5, 6

P P Savani University
School of Engineering

Department of Science and Humanities

Course Code: SESH1120
Course Name: Linear Algebra
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	
03	-	02	05	40	60	-	-	100	-	200

CE: Continuous Evaluation, ESE: End Semester Exam

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

- Analyses and solve system of linear equations and understand characteristics of Matrices.
- 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.

Course Content:

Section I			
Module No.	Content	Hours	Weightage in %
1.	**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.	12	30
2.	**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.	11	20
Section II			
Module No.	Content	Hours	Weightage in %
1.	**Linear Transformation** Introduction of Linear Transformation, Kernal and Range, Rank and Nullity, Inverse of Linear Transformation, Rank Nullity Theorem, Composition of Linear Maps.	09	20
2.	**Inner Product Space** Inner Product, Angle and Orthogonality, Orthogonal projection, Gram-Schmidt process and QR Decomposition, least square decomposition.	08	20
3.	**Beta and Gamma function**	05	10

	Improper Integrals, Convergence, Properties of Beta and Gamma Function, Duplication Formula (without proof)		
	TOTAL	45	100

List of Tutorial:

Sr. No.	Name of Tutorial	Hours
1.	Matrix Algebra-1	04
2.	Matrix Algebra-2	02
3.	Vector Space-1	04
4.	Vector Space-2	02
5.	Linear Transformation-1	04
6.	Linear Transformation-2	02
7.	Inner Product Space-1	04
8.	Inner Product Space-2	02
9.	Beta and Gamma function-1	04
10.	Beta and Gamma function-2	02
	TOTAL	30

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 50 marks.
- Continuous Evaluation consists of self-performance assignment to 20 marks.
- Internal Viva consists of 30 marks.

Course Outcome(s):

After the completion of the course, the following course outcomes will be able to:

SESH1120	LINEAR ALGEBRA & CALCULUS
CO 1	Evaluate linear system using matrices and the knowledge of eigenvalues and eigenvectors for matrix diagonalization
CO 2	Determine the basis and dimension of vector spaces and subspaces.
CO 3	Discuss the matrix representation of a linear transformation given bases of the relevant vector space.
CO 4	Apply vectors, inner products, and linear transformations to real world situations.
CO 5	Classify gamma, beta functions & their relation which is helpful to evaluate some definite integral arising in various branch of engineering.

Mapping of CO with PO

SESH1120	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO 1	3	3	1	1								3
CO 2	3	2	1									2
CO 3	2	2	1									3
CO 4	2	2	1	1								1
CO 5	2	1	1									1

Mapping of CO with PSO

SESH1120	PSO1	PSO2	PSO3
CO 1	3	2	
CO 2	1	1	
CO 3	2	2	
CO 4	2	2	
CO 5			

Level of Bloom's Revised Bloom's Taxonomy in Assessment

1: Remember	2: Understand	3: Apply
4: Analyze	5: Evaluate	6: Create

Module No	Content	RBT Level
1	Matrix Algebra	1, 2, 3, 4, 5, 6
2	Vector Space	1, 2, 3, 4, 6
3	Linear Transformation	1, 2, 3, 4, 6
4	Inner Product Space	1, 2, 3, 4, 5, 6
5	Beta and Gamma Function	1, 2, 3, 4, 5

P P Savani University
School of Engineering

Department of Mechanical Engineering

Course Code: SEME1110
Course Name: Hardware 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	
-	04	-	04	-	-	100	-	-	-	100

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:

Sr. No.	Name of Practical	Hours
1.	Introduction and Demonstration of Safety Norms. Different Measuring Instruments. Introduction and Demonstration of Machine Shop. To Perform a Job of Fitting Shop.	12
2.	To Perform a Job of Carpentry Shop. Introduction and Demonstration of Plumbing Shop & Welding Process.	15
3.	(I) Identify computer hardware layout and components (II) Perform assembling and disassembling of PC	08
4.	Configure BIOS, disk, network and other hardware management	05
5.	Understanding the electronic components and study of Shouldering and Desoldering of electronic components on PCB Board.	04
6.	Understanding the connection on Breadboard and study of Alternate Flashing LED Lights using Breadboard.	06
7.	Verify the truth table of Logic gates and De morgan's theorem on IC trainer board.	04
8.	Study of Cathode Ray Oscilloscope.	06

Text Book(s):

Title	Author(s)	Publication
Elements of Workshop Technology	S K Hajra Choudhury	Media Promoters & Publishers
A text book in Electrical Technology	B L Theraja	S Chand and Co

Reference Book(s):

Title	Author(s)	Publication
Basic Electronics: A text lab manual	P.B. Zbar, A.P. Malvino, M.A. Miller	Mc-Graw Hill.
Digital Electronics	Subrata Ghoshal	Cengage Learning

Course Evaluation:

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 30 Marks.
- Faculty evaluation consists of 10 marks as per the guidelines provided by the Course Coordinator
- Internal Viva consists of 30 Marks.
- Practical performance/quiz/drawing/test will consist of 30 Marks.

Course Outcome(s):

After the completion of the course, the following course outcomes will be able to:

SEME1110	HARDWARE WORKSHOP
CO 1	Apply the application of mechanical workshop such as fitting, drilling and carpentry. Understand various tools of mechanical workshop and understand its applications.
CO 2	Identify and inspect hardware components and interpret latest development of the field.
CO 3	Make students capable of analysing and solving the varieties of problems coming up in the electrical measurements and also enable the students to design as well as trouble shoots the circuits and networks through hands-on mode.
CO 4	Develop skill to build, and troubleshoot digital circuits.

Mapping of CO with PO

SEME1110	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO 1	2	1	2	1		3	3		3	3	1	3
CO 2	2	1	1	1	2	2			2	2	1	2
CO 3	3	2	2	2	2	2	2	3	2	2	3	3
CO 4	2	3	2	3	3		3	3	1	2	1	2

Mapping of CO with PSO

SEME1110	PSO1	PSO2	PSO3
CO 1	3	1	1
CO 2	1	1	2
CO 3	1	3	3
CO 4	2	2	2

Level of Bloom's Revised Bloom's Taxonomy in Assessment

1: Remember	2: Understand	3: Apply
4: Analyze	5: Evaluate	6: Create

Practical No	Content	RBT Level
1	Introduction and Demonstration of Safety Norms. Different Measuring Instruments. Introduction and Demonstration of Machine Shop. To Perform a Job of Fitting Shop.	1,2,3,4
2	To Perform a Job of Carpentry Shop. Introduction and Demonstration of Plumbing Shop & Welding Process.	1,2,3,4
3	(I) Identify computer hardware layout and components (II) Perform assembling and disassembling of PC	1,2,3,4
4	Configure BIOS, disk, network and other hardware management	1,2,3
5	Understanding the electronic components and study of Shouldering and Desoldering of electronic components on PCB Board.	1,2,3
6	Understanding the connection on Breadboard and study of Alternate Flashing LED Lights using Breadboard.	1,2,3
7	Verify the truth table of Logic gates and De morgan's theorem on IC trainer board.	1,2,3,4
8	Study of Cathode Ray Oscilloscope.	1,2,3

P P Savani University
School of Engineering

Department of Computer Engineering

Course Code: SECE1110
Course Name: Software 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	
-	04	-	02	-	-	100	-	-	-	100

CE: Continuous Evaluation, ESE: End Semester Exam

Objective(s) of the Course:
To help learners to
- Provide a comprehensive knowledge of overall basic computer software tools and technology.
- Providing hands-on experience related to basic software installation, usage of Operating systems, and various essential software utilities.

Course Content:

Section I		
Module No.	Content	Weightage in %
1.	**Software Fundamentals** Introduction to Software, Types of software, Applications of software, Web based software, Understand Software specific requirements, Installation of Software	10
2.	**Operating System** Introduction of OS, Functions of Operating System, Types of OS, Installation of Windows and Linux OS, Linux architecture, Role of Device Drivers in OS, Shell scripting, Command structure, and general-purpose utility.	25
3.	**DOS Commands** Getting Started with DOS, Introduction to Command Prompt, System Files and Command, creating directories, traversing through directories, deleting directories, Viewing Files within a directory.	15
Section II		
Module No.	Content	Weightage in %
1.	**Application Software** Introduction to Application Software, Types of Application Software, Installation of Application Software, Logo Designing, Creating Flowcharts and diagrams, Introduction to Google Apps.	10

2.	**Data Analysis using Application Software** Introduction to Spreadsheets, Spreadsheet Functions to Organize Data, Introduction to Filtering, Pivot Tables, and Charts, VlookUp and HlookUp in Spreadsheets.	15
3.	**Website Creation** Creating a website using Google Sites, Creating Web Pages, Working with Images, Working with Documents on Web Pages. Introduction to WordPress, Installing Web Server and WordPress, Creating Web pages in WordPress.	25
	TOTAL	100

List of Practical:

Sr. No.	Name of Practical	Hours
1.	Study of Different Software.	02
2.	Installation of any 2 software with required plugins and libraries.	04
3.	Study of Different Operating Systems.	02
4.	Creation of Bootable Pen drive.	02
5.	Installation of Windows OS.	02
6.	Installation of Linux OS using VMWare.	02
7.	Study of Basic commands of Linux/UNIX.	04
8.	Study of Basic commands of DOS.	04
9.	Design logo using Canva.	02
10.	Draw a Flowchart to find maximum of two numbers in either draw.io or Microsoft Visio or Lucid Chart.	02
11.	Study of different Google Apps.	04
12.	Create a Google Doc and Google sheet and share with 2 classmates.	02
13.	Demonstrate working of HlookUp and VlookUp in Excel.	02
14.	Create different types of charts in Excel.	04
15.	Demonstrate Data Analysis in Excel.	04
16.	Create a Google Website with minimum two pages showing your personal details.	04
17.	Demonstrate embedding of a YouTube video and pdf document on a web page in google site.	04
18.	Demonstrate placing Map and hyperlinks on web page in Google Site.	04
19.	Create a WordPress site and create minimum three web pages and menu to navigate between the pages.	04
20.	Demonstrate the use of Accordion in WordPress.	02
	TOTAL	60

Text Book(s):

Title	Author/s	Publication
Fundamentals Of Computers, 2nd Edition	Reema Thareja	Oxford University Press
Excel 2019 Bible	Michael Alexander, Richard Kusleika, John Walkenbach	Wiley

Reference Book(s):

Title	Author/s	Publication
UNIX: Concepts and Applications | 4th Edition	Sumitabha Das	McGraw Hill Education

Web Material Link(s):

- https://sites.google.com/site/willkimbley/google-apps-tutorials
- https://www.cs.upc.edu/~robert/teaching/foninf/doshelp.html
- https://www.javatpoint.com/software-engineering
- https://www.wikihow.com/Create-a-Website-Using-Google-Sites
- https://www.wpbeginner.com/guides/

Course Evaluation:

Practical:

- Continuous Evaluation consists of performance of practical, which should be evaluated out of 10 marks per each practical and average of the same will be converted to 10 marks.
- Internal viva consists of 20 marks.
- Practical performance/quiz/test consists of 30 marks during Internal practical Exam.
- Mini Project performance consists of 40 marks during End Semester Exam.

Course Outcome(s):

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

SECE1110	Software Workshop
CO 1	Understand the types of computer software with their requirements and how to use as per the need.
CO 2	Install different Operating Systems and learn commands used in the OS.
CO 3	Get familiar with the application software and different applications of application software
CO4	Achieve some useful information from data through analysis and represent it with different views like charts, graphs etc.
CO 5	Learn the designing and development of website to have a global communication.

Mapping of CO with PO

SECE1110	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO 1	2	2	2	2	3		1		1	2	2	1
CO 2	3	1	1	1	1		1			1		1
CO 3		1	2	2	3	2	1		2	1	2	3
CO 4	2	1		2	1		1		1	1		
CO 5	1	1	1	2	1	3	1		1	1	2	1

Mapping of CO with PSO

SECE1110	PSO1	PSO2	PSO3
CO 1	1	3	1
CO 2		3	1
CO 3	2		2
CO 4	2		1
CO 5		1	

Level of Bloom's Revised Bloom's Taxonomy in Assessment

1: Remember	2: Understand	3: Apply
4: Analyze	5: Evaluate	6: Create

Module No	Content	RBT Level
1	Software Fundamentals	1,2
2	Operating System	1,2,3,6
3	Disk Operating System	2,3
4	Application Software	2,3,4,5
5	Data Analysis using Application Software	3,4,5,6
6	Website Creation	2,3,6

P P Savani University
School of Engineering

Department of Information Technology

Course Code: SEIT1110
Course Name: Cyberspace Awareness
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	
02	-	-	02	40	60	-	-	-	-	100

CE: Continuous Evaluation, ESE: End Semester Exam

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

- understand governance, regulatory, legal, economic, environmental, social, and ethical context of cyber security.
- equip students with the technical knowledge and skills needed to protect and defined against cyber threats.
- help students to protect the one's data, systems, and networks from malicious attacks and cyber threats.

Course Content:

Section I			
Module No.	Content	Hours	Weightage in %
1.	**Introduction to Cyber space** Cyber space, Cyber Crime and its Types, Overview of Cyber Security, Cyber Attacks in History, Internet Governance, Hacking and its Types, Cracking, Overview of System and Web Vulnerability, OWASP	06	20
2.	**Cyber Threats** Various Cyber Threats, Malware, Phishing, Password Attacks, DOS attack, Man in the Middle, Drive by download, Malvertising, Rogue Software, Cyber Warfare and its conflicts, Cyber Terrorism, Case Studies	09	30
Section II			
Module No.	Content	Hours	Weightage in %
1.	**Cyber security Practices** Cyber Security Practices and dos and don'ts, Data Privacy and Security, Security Controls, Overview of social media and its security, E-Commerce, Digital payments and its security, Tools and technology	05	15

	for cyber security, Platform to report and combat cyber-crime, Case studies		
2.	**Cyberspace and the Law** Cyber Security Regulations, Cyber Law, need for a Comprehensive Cyber Security Policy, Need for an International convention on Cyber space, Contemporary crime, Roles of International Law, the state and Private Sector in Cyberspace, Cyber Security Standards, The INDIAN Cyberspace, Indian IT Act 2000, Indian IT Act 2008, Case studies	06	15
3.	**Cyber Forensics** Introduction to Cyber Forensics, Handling Preliminary analysis, Investigating Investigations, Controlling an Investigation, Legal Policies, Case studies	04	20
	TOTAL	30	100

Text Book(s):

Title	Author/s	Publication
Cybersecurity for Beginners	Raef Meeuwisse	Cyber Simplicity Ltd

Reference Book(s):

Title	Author/s	Publication
Cyber Security	Nina Godbole, Sunit Belapure	Wiley India, New Delhi
The Indian Cyber Law	Suresh T. Vishwanathan;	Bharat Law House New Delhi

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.

Course Outcome(s):

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

SEIT1110	Cyberspace Awareness
CO 1	Understand Concepts of Cyber space.
CO 2	Analyze the Concepts of Cyber Threats.
CO 3	Elaborate the overview of social media and understanding cybercrimes.
CO 4	Identify cyber laws and cyber acts in India.
CO 5	Explore different case studies based on cyber-Forensics.

Mapping of CO with PO

SEIT1110	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO 1	3	3	3		3	3	3					

CO 2	3	3	3	3	3	3	3	3				
CO 3	3	3	3			2	3	3		3		3
CO 4	3	3		3		3	3	3			3	3
CO 5		3	3	3	3	3		3	3	3	3	3

Mapping of CO with PSO

SEIT1110	PSO1	PSO2	PSO3
CO 1	3	3	
CO 2		3	3
CO 3	3	3	
CO 4			3
CO 5		3	3

Level of Revised Bloom's Taxonomy in Assessment

1: Remember	2: Understand	3: Apply
4: Analyze	5: Evaluate	6: Create

Module No	**Content**	**RBT Level**
1	Introduction to Cyber space	1
2	Cyber Threats	1,2
3	Cyber security Practices	1,2,3
4	Cyberspace and the Law	1,2
5	Cyber Forensics	1,23

P P Savani University
School of Engineering

Department of Information & Technology Engineering

Course Code: SEIT1120
Course Name: Competitive Quantitative Aptitude
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	
02	-	-	02	40	60	-	-	-	-	100

CE: Continuous Evaluation, ESE: End Semester Exam

Objective(s) of the Course:

- This course is designed to suit the need of the outgoing students and to acquaint them with frequently asked patterns in quantitative aptitude and logical reasoning during various examinations and campus interviews.

Course Content:

Section I			
Module No.	Content	Hours	Weightage in %
1.	**Quantitative Ability (Basic Mathematics)** Number Systems, LCM and HCF, Decimal Fractions, Simplification, Square Roots and Cube Roots, Average, Problems on Ages, Surds & Indices, Percentages, Problems on Numbers, Quadratic Equations	05	15
2.	**Quantitative Ability (Applied & Engineering Mathematics)- Part I** Logarithm, Permutation and Combinations, Probability, Profit and Loss, Simple and Compound Interest	05	35
3.	**Quantitative Ability (Applied & Engineering Mathematics) -Part II** Time, Speed and Distance, Time & Work, Ratio and Proportion, Mixtures and Allegation	05	20
Section II			
Module No.	Content	Hours	Weightage in %
1.	**Data Interpretation** Data Interpretation, Tables, Column Graphs, Bar Graphs, Line Charts, Pie Chart, Venn Diagrams1	06	20

2.	**Logical Reasoning (Deductive Reasoning)** Analogy, Blood Relation, Directional Sense, Number and Letter Series, Coding – Decoding, Calendars, Clocks, Seating Arrangement, Syllogism	06	20
3.	**Mensuration & Trigonometry** Two-dimensional (2D) and Three-dimensional (3D) Mensuration, Degree and Radian Measures, Trigonometric Ratios, Complementary Angles, Height and Distance, Standard Identities, Area, Inequalities	03	10
		30	

Text Book(s):

Title	Author/s	Publication
Quantitative aptitude for Competitive examination	R S Agarwal	S. Chand
A Modern Approach to Verbal & Non-Verbal Reasoning	R S Agarwal	S. Chand

Reference Book(s):

Title	Author/s	Publication
Analytical and Logical reasoning	Sijwali B S	arihant

Web Material Link(s):

- https://prepinsta.com/
- https://www.indiabix.com/
- https://www.javatpoint.com/

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.

Course Outcome(s):

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

SEIT1120	Competitive Quantitative Aptitude
CO 1	Understand the basic concepts of quantitative ability
CO 2	Understand the basic concepts of logical reasoning Skills
CO 3	Acquire satisfactory competency in use of reasoning
CO4	Solve campus placements aptitude papers covering Quantitative Ability, Logical Reasoning Ability
CO 5	Compete in various competitive exams like CAT, CMAT, GATE, GRE, GATE, UPSC, GPSC Etc

Mapping of CO with PO

SEIT1120	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO 1	3	2	2	2	2	2	3		1	3	2	3
CO 2	2	2	3	2	3	2	3		3	3	2	2
CO 3	2	2	2	2	3	2	3		3	1	2	3
CO 4	3	2	3	3	3	2	2		3	3	2	3
CO 5	2	2	2	2	1	3	3		3	2	1	3

Mapping of CO with PSO

SEIT1120	PSO1	PSO2	PSO3
CO 1	3	2	3
CO 2	3	3	2
CO 3	3	3	3
CO 4	3	2	3
CO 5	2	1	2

Level of Bloom's Revised Bloom's Taxonomy in Assessment

1: Remember	2: Understand	3: Apply
4: Analyze	5: Evaluate	6: Create

Module No	Content	RBT Level
1	Quantitative Ability (Basic Mathematics)	1, 3, 5
2	Quantitative Ability (Applied & Engineering Mathematics)	1, 2, 3, 5
3	Data Interpretation	2, 3, 6
4	Logical Reasoning (Deductive Reasoning)	2, 4, 5
5	Mensuration & Trigonometry	1, 3, 5

P P Savani University
School of Engineering

Department of Computer Engineering

Course Code: SECE1120
Course Name: Joy of 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	
03	02	-	04	40	60	40	60	-	-	200

CE: Continuous Evaluation, ESE: End Semester Exam

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

- identify appropriate approach to computational problems.
- develop logic building and problem-solving skills.

Course Content:

Section I			
Module No.	Content	Hours	Weightage in %
1.	**Motivation of Programming:** Use of Programming, Importance of Programming, Discussion of different Case Study	05	14
2.	**Welcome to Programming:** Introduction of Programming, Flow Charts and Algorithms, Debugging, Tracing the execution of the Program, Watching Variables Values in Memory, Character Set, Keyword and Identifiers, Constants and Variables, Data Types - Declaration and Initialization, Basic Input, and Output Operations, Symbolic Constants, Overflow and Underflow of Data.	09	18
3.	**Conditional Statements and Looping Statements:** Decision Making & Branching: Decision Making with If and If - else Statements, Nesting of If-else Statements, The Switch and go-to statements. Looping: The while Statement, The Break Statement &The Do While loop, The FOR loop, Jump within loops - Programs.	09	18
Section II			
Module No.	Content	Hours	Weightage in %
1.	**Collection of Data:** Introduction, One-dimensional Arrays, Two-dimensional Arrays, Concept of Multidimensional Arrays, Declaring and	10	20

	Initializing String Variables, Arithmetic Operations on Characters, Putting Strings Together, Comparison of Two Strings, String Handling Functions, Dictionary, List, Tuples and Sets.		
2.	**Functions** Introduction to Functions, defining a Function, Calling a Function, Types of Functions, Function Arguments, Anonymous Functions, Global and Local Variables, Recursion	06	15
3.	**Building Desktop Application** Exploring the Tkinter Library in Python, Creating basic Desktop application using Tkinter	06	15
	TOTAL	45	100

List of Practical:

Sr. No.	Name of Practical	Hours
1.	Working with basic elements of C languages (different input functions, different output functions, different data types, and different operators).	2
2.	Working with control structures (if statement, if-else statement, nested if-else statement, switch statement, break statement, goto statement).	2
3.	Working with array and strings in C.	4
4.	Introduction to Python (Introduction to IDLE, different data types, Input Output in Python, Operators, Operator precedence).	2
5.	Implementation of Dictionaries, Sets, Tuples and Lists and its various methods in Python.	6
6.	Working with functions in C/Python.	2
7.	Working with recursive function in C/Python.	2
8.	Building desktop application of your own calculator in Python.	4
9.	Case Study: a. Sorting : Arrange the books b. Searching : Find in seconds c. Recursion : Tower of Hanoi	6
	TOTAL	30

 # 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
Python Programming: A modular Approach	Sheetal Taneja, Naveen Kumar	Pearson

Reference Book(s):

Title	Author(s)	Publication
Programming in C	Ashok Kamthane	Pearson
Python Cookbook	David Ascher, Alex Martelli Oreilly	O Reilly Media

Web Material Link(s):

- https://www.tutorialspoint.com/cprogramming/index.htm
- https://www.w3schools.com/c/
- https://www.tutorialspoint.com/python/
- https://www.w3schools.com/python/

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 consists of the performance of practical which will be evaluated out of 10 for each practical and average of the same will be converted to 20 marks.
- Internal viva consists of 20 marks.
- Practical performance/quiz/test consists of 30 marks during End Semester Exam.
- Viva/oral performance consists of 30 marks during End Semester Exam.

Course Outcomes:

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

SECE1120	JOY OF PROGRAMMING
CO 1	Immediately analyze the syntax and semantics of the computer languages and apply it in programs.
CO 2	Implement computing solutions using logic building and problem-solving skills of a given programming language.
CO 3	Interpret the fundamental language syntax, semantics and fluent in the use of python or any computer language control flow statements.
CO 4	Determine the methods to create and manipulate programs by utilizing the data structures like lists, dictionaries, tuples and sets with emphasis on Python.

Mapping of CO with PO

SECE1120	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO 1		2	1	1	2	2	1	1			1	
CO 2	2	1	2							2		1
CO 3	2	1		2								1
CO 4		1	1		1				1			

Mapping of CO with PSO

SECE1120	PSO1	PSO2	PSO3
CO 1	1		1
CO 2		2	
CO 3		1	1

CO 4			2

Level of Revised Bloom's Taxonomy in Assessment:

1: Remember	2: Understand	3: Apply
4: Analyze	5: Evaluate	6: Create

Module No	Content	RBT Level
1.	Motivation of Programming	1, 2, 4
2.	Welcome to Programming	1, 2, 3
3.	Conditional Statements and Looping Statements	1, 2, 3
4.	Collection of Data	1, 2, 3
5.	Functions	2, 3, 4, 6
6.	Building Desktop Application	2, 3, 4, 6

P P Savani University
School of Engineering

Department of Science & Humanities

Course Code: SESH1130
Course Name: Conceptual Experimental 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	
03	02	-	04	40	60	40	60	-	-	200

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 PHYSICS** (Prerequisites: Dual nature of radiation, Photoelectric effect Matter waves, wave nature of particles, de-Broglie relation, Davisson-Germer experiment). Introduction; De Broglie hypothesis of matter waves; Properties of matter waves; Phase velocity and group velocity and their relation; Heisenberg uncertainty principle; non-existence of electron in nucleus; Wave function; Physical interpretation of wave function; Schrodinger's time dependent wave equation; time independent wave equation; Quantum Computing (overview).	07	16
2.	**ACOUSTIC AND ULTRASONIC** (Prerequisites: Sound, propagation of sound, concept of frequency andwave length). Acoustic–Introduction, Classification and Characterization of Sound, Sabine's formula for reverberation (without derivation), Absorption Coefficients, Sound Absorbing Materials, factors affecting the acoustics of buildings and remedies, Sound Insulation. Ultrasonic – Introduction, Properties of Ultrasonic, Generation of Ultrasonic sound: Piezoelectric & Magnetostriction	07	16

	effect, Applications of Ultrasonic.		
3.	**LASER AND FIBRE OPTICS** (Prerequisites: Absorption, recombination, Valance and conduction bands, refractive index of a material, Snell's law) LASER – Introduction, Characteristics, Absorption, Spontaneous and stimulated emission; metastable state, population inversion, Pumping mechanism, components of LASER; Nd:YAG Laser, Applications of LASER. FIBRE OPTICS – Introduction, Optical Fiber construction, working principle and types, Numerical Aperture, Acceptance angle and Attenuation, Fiber optic communication system, Applications of Optical Fiber.	08	18
Section II			
Module	Content	Hours	Weightage in %
1.	**NANOSCIENCE AND NANOTECHNOLOGY** (Prerequisites: Nano scale and structures, general purpose of nano technology, method of formation of nano structure, fullerenes, carbon nanotubes). Nanomaterials: Properties (Physical, Mechanical, Optical, Electrical, Magnetic); Surface to Volume Ratio; Synthesis of Nanomaterials: Bottom up and Top down technique; Methods to synthesize nanomaterials: PVD & Sol-gel, Applications.	06	14
2.	**SUPERCONDUCTORS AND SUPERCAPACITORS** (Prerequisites: Electric current, flow of electric charges in a metallic conductor, drift velocity, mobility and their relation with electric current, Ohm's law, electrical resistance, V-I characteristics (linear and non- linear), electrical resistivity and conductivity temperature dependence of resistance). Superconductors: Introduction, Critical temperature, Properties of superconductors, Type of superconductors: Type I and Type II and high Tc superconductors, Applications: Magnets, Josephson effect, SQUID, Maglev, other. Supercapacitors: Principle, construction, materials and Applications, comparison with capacitor and batteries: Energy density, Power density.	08	18
3.	**SEMICONDUCTOR PHYSICS AND TECHNOLOGY** (Prerequisites: Intrinsic and extrinsic semiconductors, Energy bands in conductors, semiconductors and insulators, Semiconductor diode, I-V characteristics in forward and reverse bias) Direct & indirect band gap semiconductor; Fermi level; Fermi energy level in intrinsic & extrinsic semiconductors; effect of impurity concentration and temperature on fermi level; mobility, current density; Hall Effect; Fermi Level diagram for p-n junction (unbiased, forward bias, reverse bias); Applications of semiconductors: LED, Zener diode, Photovoltaic cell.	09	18

	TOTAL	45	100

List of Practical:

Sr. No	Name of Practical	Hours
1.	Analysis of errors.	04
2.	To measure diameter of a small spherical body using Vernier calipers and hencefind its volume.	04
3.	To measure the diameter of given object using micrometer screw gauge.	04
4.	Verify ohm's law using ammeter and voltmeter.	04
5.	To study the series and parallel connections of resistors.	02
6.	To study the series and parallel connections of capacitors.	02
7.	I-V characteristics of Light Emitting diode (LED).	02
8.	I-V characteristics of Zener diode.	04
9.	To determine Numerical aperture and acceptance angle of an optical fiber.	04
	TOTAL	30

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

Reference Book(s):

Title	Author/s	Publication
Engineering Physics	G Vijayakumari	Vikas Publishing house PVT LTD
Basic Electronics for Scientistsand 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, 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 and regular manual writing,
- Internal viva or practical performance consist of 20 Marks. Faculty evaluation consists of 10 marks as per the guidelines provided by the course coordinator.
- Practical performance/test of 30 marks during End Semester Exam.
- Viva/Oral performance of 30 marks during End Semester Exam.

Course Outcome(s):

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

SESH1130	**Conceptual Experimental Physics**
CO 1	Understand the framework of quantum mechanics and apply the knowledge ofbasic quantum mechanics to construct one dimensional Schrodinger's wave equation.
CO 2	Classify the phenomenon of acoustics and ultrasonic in various engineering field and apply it for various engineering and medical fields.
CO 3	Describe the laser and articulate the idea of optical fiber communications and apply the concepts of lasers and optical fiber communications in every possiblesector.
CO 4	Interpret the concept of Nanotechnology and understand the synthesis and applications of Nanomaterials from technological prospect. Discover the types and properties of Superconductors. Relate the behavior of superconductors at high temperatures
CO 5	Distinguish pure, impure semiconductors and characteristics of semiconductor devices. Thus, will be able to use basic concepts toanalyze and design a wide range of semiconductor devices.

Mapping of CO with PO

SESH1130	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO 1	2	2	2	2						1		
CO 2	1	3	2	3	1		1			1	2	
CO 3	1	1	1	1	1						1	
CO 4	2	2	1	2	1							
CO 5	1	1	1	1	1					1	2	

Mapping of CO with PSO

SESH1130	PSO1	PSO2	PSO3
CO 1	2	2	
CO 2		1	1
CO 3		2	2
CO 4	2	1	3

Level of Bloom's Revised Bloom's Taxonomy in Assessment

1: Remember	2: Understand	3: Apply
4: Analyze	5: Evaluate	6: Create

Module No	Content	RBT Level
1	Quantum Physics	2
2	Acoustic and Ultrasonic	3
3	Laser and Fibre Optics	2,3
4	Nanoscience and Nanotechnology	2,3,6
5	Superconductors and Supercapacitors	1, 2,3
6	Semiconductor Physics and Technology	1,6

P P Savani University
School of Engineering

Department of Chemical Engineering

Course Code: SECH1110
Course Name: Fundamental Chemistry & Environmental Science
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	-	04	40	60	40	60	-	-	200

CE: Continuous Evaluation, ESE: End Semester Exam

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

- Understand the basic concepts of chemistry, including atoms, molecules, and chemical processes.
- Apply the scientific method to examine chemical phenomena, including the design and execution of experiments, data analysis, and evidence-based conclusion drawing.
- Evaluate the causes and consequences of environmental problems and propose solutions based on scientific evidence.
- Integrate knowledge from multiple disciplines to analyze environmental problems and propose effective solutions.

Course Content:

Section I			
Module No.	Content	Hours	Weightage in %
1.	**Introduction to Chemistry** Overview of the scientific method and chemistry as a science, Basic concepts of matter, including atoms, molecules, and the periodic table, Introduction to chemical bonding and intermolecular forces, Basic principles of chemical reactions, including stoichiometry and reaction types	06	15
2.	**Chemical Thermodynamics and Kinetics** Introduction to thermodynamics and the laws of thermodynamics, Energy and enthalpy changes in chemical reactions, Introduction to chemical kinetics and reaction rates, Factors affecting reaction rates, including temperature, concentration, and catalysts	06	15
3.	**Properties of Matter and Solutions** Physical properties of matter, including states of matter and phase changes, Solutions and their properties, including solubility and colligative properties, Introduction to acids and bases and their properties, Chemical equilibrium and the equilibrium constant	05	10
4.	**Organic Chemistry**	06	10

	Introduction to organic chemistry and the basics of carbon chemistry, Functional groups and their properties, Nomenclature and isomerism in organic compounds, Introduction to organic reactions and mechanisms		
Section II			
Module No.	Content	Hours	Weightage in %
5.	**Introduction to Environment** Definition, principles and scope of Environmental Science, Impacts of development on Environment, Environmental Degradation, The interdisciplinary nature of environmental science, Concept of 4R's	06	10
6.	**Environmental Pollution** a) Water Pollution: Introduction – Water Quality Standards, Sources of Water Pollution, Classification of water pollutants, Effects of water pollutants. b) Air Pollution: Composition of air, Structure of atmosphere, Ambient Air Quality Standards, Classification of air pollutants, Sources of common air pollutants like PM, SO_2, NO_X, Auto exhaust, Effects of common air pollutants c) Noise Pollution: Introduction, Sound and Noise, Noise measurements, Causes and Effects. d) Solid Waste: Generation and management e) Bio-medical Waste: Generation and management f) E-waste: Generation and management	08	20
7.	**Social Issues and Environment** Sustainable Development, Equitable use of Resources for sustainable lifestyle and it's benefits, Water conservation, Climate Change, Global Warming and Green House Effect, Acid Rain, Depletion of Ozone layer, Carbon Footprint	08	20
	TOTAL	45	100

List of Practical:

Sr. No	Name of Practical	Hours
1.	Acid-base titration adding a base of known concentration to an acid of unknown concentration until the reaction is complete, and the concentration of the acid is determined.	02
2.	Determination of the boiling point of a liquid heating a sample of a liquid and observing the temperature at which it boils.	02
3.	Determination of the density of a liquid weighing a known volume of a liquid and calculating its density.	04
4.	Determination of the pH of a solution using a pH meter to measure the acidity or basicity of a solution.	04
5.	Flame test: burning a sample of a substance and observing the color of the flame to identify the presence of certain elements.	04
6.	Preparation of a salt reacting an acid and a base to form a salt and observing the reaction products.	02

7.	Testing of soil acidity	02
8.	Studying the effect of temperature on the solubility of a solid in water at different temperatures to see how temperature affects solubility.	02
9.	Studying the properties of acids and bases: Students can test the properties of different acids and bases (e.g., pH, conductivity) and compare their properties.	04
10.	Investigating the reaction between an acid and a metal and measure the amount of gas produced.	04
	TOTAL	30

Text Book(s):

Title	Author/s	Publication
Textbook of Environmental Chemistry and Pollution Control	Dr. S. S. Dara, Dr. D.D. Mishra	S Chand & Co Ltd
Environmental Studies	Benny Joseph	Mc.Graw hill education Pvt. Ltd.
Environmental Studies	Dr. S.K. Dhameja	S.K. Kataria & Sons

Reference Book(s):

Title	Author/s	Publication
Engineering Chemistry	Jain & Jain	Dhanpat Rai Publishing company
Environmental Studies (From crisis to cure)	R. Rajagopalan	OXFORD university press

Web Material Link(s):
https://www.iare.ac.in/sites/default/files/lecture_notes/IARE_ENS_LECTURE_NOTES_2.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 which will be evaluated out of 10 marks for each practical and average of the same will be converted to 20 marks.
- Internal Viva consists of 20 marks.
- Practical performance/quiz/drawing/test of 30 marks during End Semester Exam.
- Viva/Oral presentation consists of 30 marks during End Semester Exam.

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

SECH1110	Fundamental Chemistry & Environmental Science
CO 1	Develop a fundamental understanding of the principles and concepts of chemistry, including atomic structure, chemical reactions, and chemical bonding.

CO 2	Demonstrate an ability to apply chemical knowledge to real-world problems, such as calculating reaction yields and predicting chemical properties.
CO 3	Identify the types of pollution in society along with their sources.
CO 4	Realize the global environmental issues.

Mapping of CO with PO

SECH1110	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO 1	2					2			2		1	2
CO 2	1	1	1			3		3	3		1	3
CO 3	2		1	2		2	2		1	3	1	3
CO 4	2								3		2	3

Mapping of CO with PSO

SECH1110	PSO1	PSO2	PSO3
CO 1	1	3	2
CO 2			
CO 3	3	3	2
CO 4	3	3	3

Level of Bloom's Revised Bloom's Taxonomy in Assessment

1: Remember	2: Understand	3: Apply
4: Analyze	5: Evaluate	6: Create

Module No	Content	RBT Level
1	Introduction to Chemistry	2,1
2	Chemical Thermodynamics and Kinetics	4, 5
3	Properties of Matter and Solutions	1,2
4	Organic Chemistry	4,5
5	Introduction to Environment	1,2
6	Environmental Pollution	1,2,3
7	Social Issues and Environment	1,2,3

P P Savani University
School of Engineering

Department of Mechanical Engineering

Course Code: SEME1120
Course Name: Fundamentals of Technical Drawing
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	-	04	-	-	40	60	-	-	100

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.
- Basic knowledge of computer-aided drawing using AutoCAD.

Course Content:

Section I			
Module No.	Contents	Lab 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, Spiral, and Normal & Tangent to each curve.	12	15
3.	**Projections of points, lines & planes:** Types of Projections; Introduction of Principle Planes of Projections; Projection of Points in all four Quadrants; Projection of Lines inclined to one Referral Plane & two Referral Planes. True length and inclination with reference plane; Projection of Planes (Circular and Polygonal) with inclination to one Referral Plane and	15	30

	two Referral Planes; Concept of Auxiliary Projection Method.		

Section II			
Module No.	Content	Hours	Weightage in %
1.	**Orthographic Projection and Isometric Projections** 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. Isometric Scale, Conversion of Orthographic views into Isometric Projection, Isometric View, or Drawing of simple objects.	18	30
2.	**Residential Building Planning:** Introduction to buildings, Classification of buildings, Principles of building planning, Principles of architecture composition, Detail drawing, Line Plan, plan, elevation, section, Preparing working drawing of residential building.	06	10
3.	**Computer-Aided Drawing:** Introduction to AutoCAD, Basic commands for 2D drawing (Line, Circle, Polyline, Rectangle, Hatch, Fillet, Chamfer, Trim, Extend, Offset, Dim style, etc.)	06	10
	TOTAL	60	100

List of Practical:

Sr. No.	Name of Practical	Hours
1.	Introduction sheet (dimensioning methods, different types of lines,construction of various polygons, dividing the line and angle into parts, use of stencil, lettering), plane scale and diagonal scale	03
2.	Engineering curves	12
3.	Projection of points, lines & planes	15
4.	Orthographic projection	10
5.	Isometric projection	10
6.	Residential building drawing (Line plan, Plan, Elevation, Section, Schedule opening)	04
7.	Computer-Aided Drawing	06
	TOTAL	60

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
Building Planning, Designing and Scheduling	Gurucharan Singh	Standard Book

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
Building Drawing	M. G. Shah, C.M. Kale, S.Y. Patki	Tata McGraw Hill

Web Material Link(s):

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

Course Evaluation:

Practical:

- Continuous evaluation consists of performance of practical/tutorial which will be evaluated out of 20 marks for each practical/tutorial and average of the same will be converted to 20 marks.
- Internal viva consists of 20 marks.
- Practical test will consist of 30 marks and viva will consist of 30 marks during end semester exam.

Course Outcome(s):

After the completion of the course, the following course outcomes will be able to:

SEME1120	FUNDAMENTALS OF TECHNICAL DRAWING
CO 1	Apply BIS standards of building planning and conventions while drawing Lines, printing Letters, and showing dimensions.
CO 2	Explore the various methods to draw various engineering curves and their applications.
CO 3	Classify the orthographic projection systems concerning the observer, object, and reference planes.
CO 4	Develop 3D Isometric views in relation to 2D orthographic views.
CO 5	Software application in engineering drawing.

Mapping of CO with PO

SEME1120	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO 1	2	1	1	1				1			1	
CO 2	2		1	1	1			1			1	
CO 3	2		1	1				1			1	1
CO 4	2		1	2	1			1			1	1
CO 5	2	1	1	2	1			1			1	1

Mapping of CO with PSO

SEME1120	PSO1	PSO2	PSO3
CO 1	1	2	2
CO 2	2	2	3
CO 3	2	3	1
CO 4	3	3	3
CO 5	3	3	3

Level of Bloom's Revised Bloom's Taxonomy in Assessment

1: Remember	2: Understand	3: Apply
4: Analyze	5: Evaluate	6: Create

Module No	Content	RBT Level
1	Introduction	1, 2, 6
2	Engineering Curves	2, 6
3	Projection of Points, Line & Plane	1, 2, 3, 4
4	Orthographic Projection	2, 5, 4
5	Isometric Projections and Isometric Drawing	2, 5, 4
6	Computer-Aided Drawing	2,3,6

P P Savani University
School of Engineering

Department of Civil Engineering

Course Code: SECV1110
Course Name: Core Engineering Concepts.
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	-	04	40	60	40	60	-	-	200

CE: Continuous Evaluation, ESE: End Semester Exam

Objective(s) of the Course:
To help learners to
- Study the basic fundamentals of construction planning and material.
- Study significance of mechanical engineering systems in different fields of engineering.
- Study the basic concepts of electrical and electronics engineering.

Course Content:

Section I			
Module No.	Content	Hours	Weightage in %
1.	**Basics of Construction material and techniques** Common materials used in construction, Aggregate, Sand, Cement, Bricks, Timber, Steel, Paints. Bonds in brick masonry techniques, Foam works, Curing, Compaction of concrete, Water proofing, Fire safety norms and requirement.	08	18
2.	**Building planning and Bye laws** Building by laws as per national building code, building by laws as per local authority, standards for residential, public, commercial, industrial and institutional buildings planning, planning of earth quake resistance building, overview of RERA and ODPS, Green building and LEED certification, general layout, maps and plan used at construction site.	08	18
3.	**Basic Electricity Principles** Concept of Charge, Potential Difference and Current, Resistor, capacitor, Inductor, Ohm's law, effect of Temperature on resistance, temperature coefficient, Series and parallel combinations of Resistors and capacitors, Lenz and Faraday's laws for electromagnetic induction, AC Electricity and DC Electricity. **Electrical Wiring:** Different types of conductors and cables. Basics of wiring-Star and delta connection. Voltage drop and losses across cables and conductors.	07	14

Section II			
Module No.	Content	Hours	Weightage in %
1.	**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.	08	18
2.	**Power Transmission Elements:** Construction and Applications of Couplings, Clutches and Brakes, Difference Between Clutch and Coupling, Types of Belt Drive and Gear Drive	08	18
3.	**DC Circuits and AC Circuits** DC Circuits: Introduction of Electrical circuit elements (prerequisites), voltage and current sources, Kirchoff's current and voltage laws, Thevenin and Norton Theorems. Time-domain analysis of first-order RL and RC circuits. AC Circuits: Representation of sinusoidal waveforms, peak and RMS values, Phasor representation of AC quantities, real power, reactive power, apparent power, power factor, Analysis of single-phase ac circuits consisting of R, L, C, RL, RC, RLC combinations (series and parallel), Series and parallel resonance. Three phase balanced circuits, voltage and current relations in star and delta connections, Power measurement in three phase circuits.	06	14
	TOTAL	45	100

List of Practical:

Sr. No.	Name of Practical	Hours
1.	Preparation of drawing sheet showing various bonds.	04
2.	Preparation of Basic plan of Construction site.	04
3.	Preparation sketch of various building component.	04
4.	Verify the series and parallel connections of resistors and capacitors.	04
5.	To understand construction and working of various types of boilers.	04
6.	To understand construction and working of mountings and accessories.	04
7.	To verify the Kirchoff's current and voltage laws and Network theorems.	02
8.	To understand construction and working 2 –stroke & 4 –stroke Petrol engines.	02
9.	To understand construction and working 2 –stroke & 4 –stroke Diesel engines.	02
	TOTAL	30

Text Book(s):

Title	Author(s)	Publication
Elements of Mechanical Engineering	Sadhu Singh	S. Chand Publications
Building construction	Dr. B C Punamia	Laxmi Publication
A text book in Electrical Technology	B L Theraja -	S Chand & Co.
Basic Electrical Engineering	D. C. Kulshreshtha	McGraw Hill, 2009

Reference Book(s):

Title	Author(s)	Publication
Basic Mechanical Engineering	T.S. Rajan	Wiley Eastern Ltd., 1996.
Town Planning	G. K. Hiraskar	Dhanpatrai Publications
Basic Electrical Engineering	Nagsarkar and Sukhija,	Oxford 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 andaverage 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 20marks for each practical and average of the same will be converted to 10 marks.
- Internal viva consists of 20 marks.
- Practical performance/quiz/drawing/test of 30 marks during End Semester Exam.
- Viva/Oral performance of 30 marks during End Semester Exam.

Course Outcome(s):

After the completion of the course, the following course outcomes will be able to:

SECV1110	CORE ENGINEERING CONCEPTS
CO 1	Understand basic properties of various construction materials.
CO 2	Understand the general rules and regulation of building planning.
CO3	Apply the principles of basic mechanical engineering.
C04	Comprehend the importance of mechanical engineering equipment like IC engine and power transmission elements.
CO5	Understand working of various instruments and equipments used for the measurement of various electrical engineering parameters like voltage, current, power, phase etc in industry as well as in power generation, transmission and distribution sectors.

Mapping of CO with PO

SECV1110	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO 1	2	1	1	1			2		1	1	2	1
CO 2	2		1	1	2		2		1	2	3	
CO 3	1		2	1	1	2	1		1	2	3	
CO 4	2		1	1						1		1
CO 5			1	2	1		1			1		

Mapping of CO with PSO

SECV1110	PSO1	PSO2	PSO3
CO 1	3		2
CO 2	3	1	1
CO 3	1	1	
CO 4		1	1
CO 5			1

Level of Bloom's Revised Bloom's Taxonomy in Assessment

1: Remember	2: Understand	3: Apply
4: Analyze	5: Evaluate	6: Create

Module No	Content	RBT Level
1	Basics of Construction material and techniques	1, 2, 3
2	Building planning and Bye laws	1, 2
3	Basic Electricity Principles	1,2,3
4	Power Transmission Elements	1, 2
5	Basics of I.C Engines	2
6	DC Circuits and AC Circuits	2,3,4
7	Basics of Steam Generators	1, 2

P P Savani University
School of Engineering

Centre for Language studies

Course Code: CFLS2130

Course Name: Intermediate Communicative English

Prerequisite Course/s: N/A

Teaching & Examination Scheme:

Teaching Scheme (Hours/Week)				Examination Scheme (Marks)				
Theory	Practical	Tutorial	Credit	Theory	Practical	Tutorial		Total
				CE	CE	CE	ESE	
2	0	0	2	100	0	0	0	100

CE: Continuous Evaluation, ESE: End Semester Exam

Objective (s) of the course:

To help learners to

- Describe the idea of LSRW English communication abilities, fordealing with people in typical social and/or professional circumstances.
- Infer and react to instructions, paragraphs, articles, official and informal communication, and reading and listening.
- Select and demonstrate the appropriate language, grammar, and pronunciation for typical social or professional contexts.
- Analyse and present instances of effective business-related spoken English.
- Organise your thoughts to create a paragraph that flows smoothly and develop a speech script.
- Make an effort to communicate, take part in a discussion in a small group, and write.

Course Content:

S.No.	Content	Hours	Weightage in %
	Section 1		
1.	**Listening** Listening to the recording on various topics and responding. The topics may be: Personal information, Travel Information, Listening to radio interviews and summarizing. Students will be expected to demonstrate a level of listening competence as outlined in listening outcomes.	15	25
	Section 2		
2.	**Reading and Language** Reading various online articles, short stories to develop content to present and discuss. Using collocations, Using a Dictionary. Guessing the context and summarising. Students will be expected to demonstrate a level of reading competence as outlined in reading outcomes.	15	25

Section 3			
3.	**Speaking Skills, Non-Verbal Aspects** Role-plays, Real-life speaking, Presentation by a Company Director, Listening to statistical information, Interview techniques. Students will be expected to demonstrate a level of speaking competence as outlined in learning outcomes.	15	25
Section 4			
4.	**Writing** Noting and changing appointments. Writing e-mails, Applying for a Job, Writing a Business Report, Summarising, Linking ideas and arguments. Students will be expected to demonstrate a level of Speaking competence as outlined in writing outcomes.	15	25

Text Book:

Title	Author(s)	Publication
Business Benchmark Pre-Intermediate to Intermediate	Norman Whitby	Cambridge

Reference Book:

Title	Author(s)	Publication
Business Benchmark Pre-Intermediate to Intermediate Student's Book	Norman Whitby	Cambridge
Business Benchmark Pre-Intermediate to Intermediate Teacher's Book	Norman Whitby	Cambridge

Online References:

https://www.academia.edu/34869668/Business_Benchmark_Pre_ Intermediate- To_Intermediate _Workbook_With_ Key

Course Evaluation:

Theory:

- Continuous Evaluation consists of four tests (LSRW), each of 25 marks and 1 hour of duration.

Course Outcome(s):

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

CFLS2130	Intermediate Communicative English
CO 1	Recognise the importance of the LSRW method for learning English.
CO 2	Read, hear, and decipher communications, letters, etc., and then react properly.
CO 3	Create a basic vocabulary and utilise his/her language abilities to find the information you need from a variety of sources.
CO 4	Identify various social and professional contexts
CO 5	Write and speak at a basic understanding level.

Level of Bloom's Revised Bloom's Taxonomy in Assessment

1: Remember	2: Understand	3: Apply
4: Analyze	5: Evaluate	6: Create

Module No	**Content**	**RBT Level**
1	Listening	1, 2, 3, 4, 5, 6
2	Reading and Language	1, 2, 3, 4, 5, 6
3	Speaking Skills, Non-Verbal Aspects	1, 2, 3, 4, 5, 6
4	Writing	1, 2, 3, 4, 5, 6

P P Savani University
school of Engineering

Centre for Life Skills Courses (CLSC)

Course Code: CLSC2070
Course Name: Essentials of Entrepreneurship
Teaching & Examination Scheme:

Teaching Scheme (Hours/Week)				Examination Scheme (Marks)						
Theory	Practical	Tutorial	Credit	Theory		Practical		Tutorial		Total
				CE	ESE	CE	ESE	CE	ESE	
02	00	00	2	100	00	00	00	00	00	100

CE: Continuous Evaluation, ESE: End Semester Exam

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

- To understand the basics of entrepreneurship and its traits
- To analyze the theory and models of entrepreneurships
- To evaluate different types and dimensions of entrepreneurship

Course Content:

Section I			
Module No.	**Content**	**Hours**	**Weightage in %**
1.	**Introduction to Entrepreneurship** Definition of Entrepreneurship, Entrepreneurship as a career choice, Benefits and Myths of Entrepreneurship, Characteristics, Qualities and Skills of an Entrepreneur, Model Traits of Entrepreneurs	07	30
2.	**Dimensions of Entrepreneurship** Entrepreneurship Theories, Intrapreneurship, Benefits of intrapreneurship, Difference between Entrepreneurs and Intrapreneurs Institutes for Entrepreneurship Development, startup Failures, Startup Success Stories	08	20
Module No.	**Content**	**Hours**	**Weightage in %**
1.	**Women Entrepreneurship** Women Entrepreneurship Meaning, Factors that influence women Entrepreneurship, Barriers to Women Entrepreneurship, Qualities of Women Entrepreneurs, Success stories of Women Entrepreneurs Lijjat Papad Case study, Jassuben Pizza Case study	08	30
2.	**Social Entrepreneurship and emerging trends** Social Entrepreneurship, Functions of Social Entrepreneurship, Difference between Entrepreneurship and Social Entrepreneurship How does an NGO run?, Case Study on Social Entrepreneurship, Emerging trends in Entrepreneurship	07	20

Text Book(s):

Title	Author/s	Publication
Entrepreneurship Business and Management	Dr. R C Bhatia	Sultan Chand and Sons

Reference Book(s):

Title	Author/s	Publication
Entrepreneurship	Trehan A	Dremtech

Web Material Link(s):

- https://www.startupindia.gov.in
- https://ediindia.ac.in
- https://www.ediindia.org

Theory:

- Continuous Evaluation consists of one test of 20 marks, 10 marks assignment, 10 marks presentation, 10 marks class participation and behavior.
- One live project of 50 marks

Course Outcome(s):

CLSC2070	Essentials of Entrepreneurship
CO 1	Students will be able to think of startup ideas
CO 2	Students will be able to apply the model of entrepreneurship practically
CO 3	Students will be able to further analyze other dimensions of Entrepreneurship

Level of Bloom's Revised Bloom's Taxonomy in Assessment

1: Remember	2: Understand	3: Apply
4: Analyze	5: Evaluate	6: Create

Module No	Content	RBT Level
1	Introduction to Entrepreneurship	1, 2, 3, 4, 5
2	Dimensions of Entrepreneurship	1, 2, 3, 4, 5
3	Women Entrepreneurship	1, 2, 3, 4, 6
4	Emerging Trends and Social Entrepreneurship	1, 2, 3, 4, 6

SECOND YEAR B.TECH

P P SAVANI UNIVERSITY															
SCHOOL OF ENGINEERING															
TEACHING & EXAMINATION SCHEME FOR B. TECH. CIVIL ENGINEERING PROGRAMME AY: 2024-25															
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	SESH2110	Differential Methods & Complex Variable	SH	3	0	2	5	5	40	60	0	0	100	0	200
	SECV2210	Mechanics of Solids	CV	3	2	0	5	4	40	60	40	60	0	0	200
	SECV2220	Building Materials & Construction Technology	CV	3	2	0	5	4	40	60	40	60	0	0	200
	SEME2230	Fluid Mechanics	CV	3	2	0	5	4	40	60	40	60	0	0	200
	SECV2240	Surveying & Levelling	CV	3	2	0	5	4	40	60	40	60	0	0	200
	CFLS2140	Upper Intermediate Communicative English	CFLS	2	0	0	2	2	100	0	0	0	0	0	100
	CLSC2020	IPDC-I	CLSC	2	0	0	2	2	100	0	0	0	0	0	100
						Total	**29**	**25**							**1200**
4	SESH2120	Numerical Methods & Statistics	SH	3	0	2	5	5	40	60	0	0	100	0	200
	SECV2251	Determinate Structural Analysis	CV	3	0	0	3	3	40	60	0	0	0	0	100
	SECV2260	Geology & Geotechnical Engineering	CV	3	2	0	5	4	40	60	40	60	0	0	200
	SECV2270	Building & Town planning	CV	3	2	0	5	4	40	60	40	60	0	0	200
	SECV2280	Concrete Technology	CV	3	2	0	5	4	40	60	40	60	0	0	200
	CLSC2030	IPDC-II	CLSC	2	0	0	2	2	100	0	0	0	0	0	100
						Total	**25**	**22**							**1000**

P P Savani University
School of Engineering

Department of Science & Humanities

Course Code: SESH2110
Course Name: Differential Methods & Complex Variable
Prerequisite Course(s): SESH1110- Calculus

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	05	40	60	-	-	100	-	200

CE: Continuous Evaluation, ESE: End Semester Exam

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

- learn orientation of calculus and its applications in solving engineering problems including differential equations.
- learn introduction of Partial Differential Equations with methods of its solutions.
- learn applications of Laplace Transforms for solving ODEs.
- learn introduction of Periodic functions and Fourier series with their applications for solving ODEs.
- Represent complex numbers algebraically and geometrically.

Course Content:

Section I			
Module No.	Content	Hours	Weightage in %
1.	Ordinary Differential Equation First order ODEs, Formation of differential equations, Exact, linear and Bernoulli's equations, Ordinary differential equations of higher orders, Homogeneous Linear ODEs of Higher Order, Homogeneous Linear ODEs with Constant Coefficients, Euler–Cauchy Equations Differential Operators Nonhomogeneous ODEs, Variation of Parameters.	10	20
2.	Partial Differential Equation Formation of First and Second order equations, Solution of First order Linear and Non-liner equations, Higher order equations with constant coefficients, Complementary function, Particular Integrals, Initial and boundary conditions, Modeling and solution of the Heat, Wave and Laplace equations.	08	17
3.	Laplace Transform	07	13

	Laplace Transform, Linearity, First Shifting Theorem, Existence Theorem, Transforms of Derivatives and Integrals, Unit Step Function, Second Shifting Theorem, Laplace Transformation of Periodic function, Inverse Laplace transform, Convolution, Systems of ODEs		
Section II			
Module No.	Content	Hours	Weightage in %
1.	Fourier Series Fourier Series of $2n$ periodic functions, Euler Formula, Arbitrary Period, Even and Odd function, Half-Range Expansions.	07	14
2.	Complex Variables Complex Variable – Differentiation, Complex number, polar form of complex number, Cauchy-Riemann equations, analytic functions, harmonic functions, Mobius transformations and their properties.	08	21
3.	Complex Variable - Integration Representation by Fourier Integral, Cauchy's integral theorem and formula, Taylor and Laurent series.	05	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	2
4.	Partial Differential Equation-1	2
5.	Partial Differential Equation-2	4
6.	Laplace Transform-1	4
7.	Laplace Transform-2	2
8.	Fourier Series-1	2
9.	Fourier Series-2	2
10.	Complex Variables -1	2
11.	Complex Variables -2	2
12.	Complex Variables -3	4

Text Book(s):

Title	Author/s	Publication
Advanced Engineering Mathematics	Erwin Kreyszig	Wiley India Pvt. Ltd.
Complex Variables and Applications,	J. W. Brown and R. V. Churchill	McGraw Hill.

Reference Book(s):

Title	Author/s	Publication
Higher Engineering Mathematics	B. S. Grewal	Khanna Publishers
A first course in complex analysis with applications	Dennis G. Zill, Patrick D. Shanahan	Jones and Bartlett Publishers Inc.
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):

- http://nptel.ac.in/courses/111105035/
- http://nptel.ac.in/courses/111106100/
- http://nptel.ac.in/courses/111105093/
- http://nptel.ac.in/courses/111108081/
- http://nptel.ac.in/courses/111/103/111103070/

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 50 marks.
- MCQ based examination consists of 20 marks.
- Internal Viva consists of 30 marks.

Course Outcome(s):

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

SESH2110	**DIFFERENTIAL METHODS & COMPLEX VARIABLE**
CO1	Describe 1st and 2nd order odes and pde's.
CO2	Classify differential equations and evaluate linear and nonlinear partial differential equations.
CO3	Apply Laplace transform as a tool which are used to evaluate differential equation.
CO4	Examine the various tests of power series and Fourier series for learning engineering.
CO5	Demonstrate understanding of the basic concepts underlying complex analysis to evaluate definite integrals and infinite series.

Mapping of CO with PO

SESH2110	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO 1	2	1	1	1								1
CO 2	1	1	1									1
CO 3	2	1	1	1								1
CO 4	2	1	1									1
CO 5	2	2	1	1								1

Mapping of CO with PSO

SECV2110	PSO1	PSO2	PSO3
CO 1	2	1	
CO 2	1	1	
CO 3	1	1	
CO 4	2		
CO 5	2	1	

Level of Bloom's Revised Bloom's Taxonomy in Assessment

1: Remember	2: Understand	3: Apply
4: Analyze	5: Evaluate	6: Create

Module No	**Content**	**RBT Level**
1	Ordinary Differential Equation	1, 2, 3, 5
2	Partial Differential Equation	1, 2, 4, 5
3	Laplace Transform	1, 2, 4, 5
4	Fourier Series	1, 2, 3, 5
5	Complex Variables	1, 2, 3, 4, 5
6	Complex Integration	1, 2, 3, 4, 5

P P Savani University
School of Engineering

Department of Civil Engineering

Course Code: SECV2210
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	
03	02	-	04	40	60	40	60	-	-	200

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 the behavior of structural elements 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.	05	11
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.	06	14
3.	**Centroid and Centre of Gravity:** Centroid of Lines, Plane Areas and Volumes, Examples Related to Centroid of Composite Geometry, Pappus –Guldinus Theorems.	05	11

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.	06	14
Section II			
Module No.	Content	Hours	Weightage in %
5.	**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.	04	12
6.	**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.	07	15
7.	**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.	12	23
	TOTAL	45	100

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
	TOTAL	30

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 20 marks.
- Internal viva consists of 20 marks.
- Practical performance/quiz/drawing/test consists of 30 marks during End Semester Exam.
- Viva/Oral performance consists of 30 marks during the End Semester Exam.

Course Outcome(s):

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

SECV2210	MECHANICS OF SOLIDS
CO 1	Identify fundamental principles of mechanics, equilibrium, statics reactions and internal forces in statically determinate beams.
CO 2	Understand,the basics of friction and its importance.
CO 3	Apply principles of statics to determine c.g and m.i of a different geometrical shape.
CO 4	Analyse problems and solve the problem related to mechanical elements and analyse the deformation behaviour for different types of loads.

Mapping of CO with PO

SECV2210	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO 1	2	1										
CO 2	2	1	1									
CO 3	2	1										
CO 4	2	1		1	1							

Mapping of CO with PSO

SECV2210	PSO1	PSO2	PSO3
CO 1	3		
CO 2	3		
CO 3	3		
CO 4	2		

Level of Bloom's Revised Bloom's Taxonomy in Assessment

1: Remember	2: Understand	3: Apply
4: Analyze	5: Evaluate	6: Create

Module No	Content	RBT Level
1	Introduction	1, 2,
2	Fundamental of Static	2, 3, 4
3	Centroid and Centre of Gravity	2, 4, 5
4	Moment of Inertia	3, 4, 5
5	Mechanical Properties of Materials	1, 2, 5
6	Simple Stress and Strain	2, 4, 5
7	Shear Force and Bending Moment	3, 4, 5

P P Savani University
School of Engineering

Department of Civil Engineering

Course Code: SECV2220
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	
03	02	-	04	40	60	40	60	-	-	200

CE: Continuous Evaluation, ESE: End Semester Exam

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

- develop conceptual knowledge in building materials & Construction.
- select appropriate material in a given field situation.
- develop ideas 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 & Conrete Masonary Blocks** 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	12	20

	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 Admixtures **Water:** Properties of Water use for construction **Concrete:** Requirements of concrete, Properties of fresh and hardened concrete, Types of concrete, Water-Cement ratio, Grades of concrete, Curing of concrete, Water-Cement ratio, Test on Concrete **Reinforced Concrete**: Pre -cast and cast -in -situ Construction		
Section II			
Module No.	Content	Hours	Weightage in %
5.	**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 • **Column Footing:**	05	08
6.	**Super Structure** 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 d) Column: e) Lintel: f) Beam: g) Slab: **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, flagstone, 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, precast concrete floor. **Roofs and Roof Coverings:** Introduction, requirements of good roof technical terms, classification, types of roof coverings for pitched	08	17

	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.		
7.	**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 (uncoursed) 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 **Cavity walls:** Brick cavity walls, position of cavity at foundation, roof and at opening levels.	06	08
8.	**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 **3D Printing:** Introduction	04	17
	TOTAL	45	100

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).	04
2.	Perform tests on given sample of brick such as ● Soundness ● Water absorption ● Compressive strength ● Length & width of 20 bricks	04
3.	Identification of different types of stones and lime	02
4.	Conduct field test on given sample of brick and cement	02
5.	Perform lab tests on given sample of cement ● Standard Consistency ● Initial and final setting time	04
6.	Conduct field test on given sample of fine and coarse aggregate	02
7.	Perform Sieve analysis test on given sample of fine aggregate	02
8.	Assess the quality of different types of timber and timber products (visit nearby saw mill or timber mart)	02
9.	Prepare Sketch Book for various Building components.	08
	TOTAL	30

Text Book(s):

Title	Author/s	Publication
Building Materials & Construction	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	Bhavikatti	Vikas 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 20 marks.
- Internal viva component of 20 marks.
- Practical performance/quiz/drawing/test of 30 marks during end semester exam.
- Viva/Oral performance of 30 marks during end semester exam.

Course Outcomes:

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

SECV2220	BUILDING MATERIALS & CONSTRUCTION TECHNOLOGY
CO 1	Execute the engineering principles relevant to civil engineering materials.
CO 2	Examine the properties and conduct tests on cement, brick & aggregate.
CO 3	Understand masonry, finishing and form work standards.

CO 4	Identify the components of building and differentiate various types of building materials depending on its function.
CO 5	Understand the impact of building construction on society.

Mapping of CO with PO

SECV2220	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO 1	1		1		1	2			3	3	2	
CO 2	1	1	2	3	2				3	3	2	
CO 3	1		1	1	1	2			3	3	2	
CO 4	1		1	1	1				3	3	2	
CO 5	1		1	1	1	3	3	1	3	3	2	

Mapping of CO with PSO

SECV2220	PSO1	PSO2	PSO3
CO 1	3	2	2
CO 2	3	2	2
CO 3	3	2	2
CO 4	3	2	2
CO 5	3	3	3

Level of Bloom's Revised Bloom's Taxonomy in Assessment

1: Remember	2: Understand	3: Apply
4: Analyze	5: Evaluate	6: Create

Module No	**Content**	**RBT Level**
1	Introduction	1, 2
2	Brick	1, 2, 3
3	Rocks	1, 2, 3
4	Concrete and Ingrideints of Conrete	2, 3, 4, 6
5	Miscellaneous Construction material	2, 3, 4
6	Foundation	2, 3, 4, 5
7	Super structure	2, 3
8	Masonry	2, 3
9	Miscellaneous	1, 2

P P Savani University
School of Engineering

Department of Mechanical Engineering

Course Code: SEME2230
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	-	04	40	60	40	60	-	-	200

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, 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	07	15
	Section II		
Module No.	Content	Hours	Weightage in %
5.	**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
6.	**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
7.	**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
	TOTAL	45	100

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
	TOTAL	30

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 20 marks.
- Internal viva consists of 20 marks.
- Practical performance/quiz/drawing/test consists of 30 marks during End Semester Exam.
- Viva/ Oral performance consists of 30 marks during End Semester Exam.

Course Outcome(s):

After the completion of the course, the following course outcomes will be able to:

SEME2230	FLUID MECHANICS
CO 1	Differentiate fluid properties and its behavior in static and dynamic mode.
CO 2	Apply dimensional analysis to design the system and interpret types of fluid flow.
CO 3	Determine major and minor losses through different pipes.
CO 4	Diagnose the viscosity of fluids.
CO 5	Diagnose pressure exerted by the fluids and rate of flow of fluids.

Mapping of CO with PO

SEME2230	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO 1	2			2					3			
CO 2	3	2	2	3					3			
CO 3	3	2		3					3			
CO 4	3	3		3					3			
CO 5	3	1		3					3			

Mapping of CO with PSO

SEME2230	PSO1	PSO2	PSO3
CO 1		2	
CO 2	3	3	
CO 3	3	3	
CO 4	3	3	
CO 5		2	

Level of Bloom's Revised Bloom's Taxonomy in Assessment

1: Remember	2: Understand	3: Apply
4: Analyze	5: Evaluate	6: Create

Module No	**Content**	**RBT Level**
1	Properties of Fluids	1, 2
2	Fluid Statics	1, 2, 5
3	Fluid Kinematics	1, 2, 5
4	Fluid Dynamics	2, 3, 4, 5
5	Dimensional Analysis	2, 3, 5
6	Flow Through Pipes & Open Channels	2, 3, 4, 5
7	Viscous Flow	2, 3, 4, 5
8	Boundary Layer Theory	2, 3, 4, 5

P P Savani University
School of Engineering

Department of Civil Engineering

Course Code: SECV2240
Course Name: Surveying & Levelling
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	-	04	40	60	40	60	-	-	200

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.	**Introduction** Introduction, Compass Surveying, Dumpy level, Chain Surveying, Tape, Benchmark, 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, Errors.	09	18
3.	**Trigonometric Surveying** Introduction, Different cases for determine height and elevation, Errors.	06	14
4.	**Setting Out Works:** Building, Culvert, Bridge, Tunnel (Any one).	03	04
Section II			
Module No.	Content	Hours	Weightage in %

5.	**Tacheometry Surveying** Introduction, Instruments used, Methods of tacheometry measurement, Distance and elevation measurement for fixed hair, movable hair and tangential method, Use of Analytic lens, Substance bar, Errors.	07	14
6.	**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, Errors.	10	26
7.	**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, Errors. **Features of Total Station**	05	10
	TOTAL	45	100

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
	TOTAL	30

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 20 marks.
- Internal viva component of 20 marks.
- Practical performance/quiz/drawing/test of 30marks during End Semester Exam.
- Viva/Oral performance of 30 marks during End Semester Exam.

Course Outcome(s):

After the completion of the course, the following course outcomes will be able to:

SECV2240	**SURVEYING & LEVELLING**
CO 1	Learn and practice various method used for surveying to determine the angles and distance.
CO 2	Prepare the various maps from the obtained data and to compute the area and volume of cut and fill.
CO 3	Understand fundamentals of curve surveying and the method used for the setting out of curves and buildings.
CO 4	Learn advanced surveying methods like total station, gps etc. and its application.

Mapping of CO with PO

SECV2240	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO 1	1	3	2	3	3	2						1
CO 2	1	3	2	3	3							1
CO 3	1	3		3								1
CO 4	1	2	1	2	3		2					1

Mapping of CO with PSO

SECV2240	PSO1	PSO2	PSO3
CO 1	3	2	2
CO 2	3	2	2
CO 3	3	2	2
CO 4	3	2	2

Level of Bloom's Revised Bloom's Taxonomy in Assessment

1: Remember	2: Understand	3: Apply
4: Analyze	5: Evaluate	6: Create

Module No	Content	RBT Level
1.	Plane Table Surveying	2, 3
2.	Theodolite Traversing	2, 3, 6
3.	Trigonometric Leveling	2, 3, 6
4.	Setting Out Works	2, 3, 6
5.	Tacheometry Surveying	2, 3, 6
6.	Curve Surveying	2, 3, 6
7.	Computation of Area and Volume	2, 3, 5

P P Savani University

School of Engineering

Department of Science & Humanities

Course Code: SESH2120

Course Name: Numerical Method & Statistics

Prerequisite Course(s): SESH2110- Differential Methods and Complex Variable

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	05	40	60	-	-	100	00	200

CE: Continuous Evaluation, ESE: End Semester Exam

Objective(s) of the Course:

To help learner to

- provide the knowledge of numerical analysis & statistical methods to the students.
- mentally prepare the students to identify and formulate the engineering problem and obtain their solution.
- inculcate the analytical skill of the students to apply the Numerical & Statistical techniques to the problems of respective field.

Course Content:

Section I			
Module No.	Content	Hours	Weightage in %
1.	**Approximations and Errors:** Errors and Their computations, General error formula. **Solution of Algebraic and Transcendental Equations:** Bracketing Methods (Bisection, Secant, Method of False Position), Convergence of Iterative Methods, Newton-Raphson Method, Newton-Raphson Method	7	17
2.	**Numerical Solutions of Linear Equations** Gauss-Seidel Method Iteration Method, Jacobi's Method, Gauss-Seidel Method, Eigen Value Problem.	6	13
3.	**Numerical Differentiation and Integration** Finite Differences: Forward, Backward and Divided Differences Table, Newton's Forward, Backward and Divided Differences Interpolation Formula, Interpolation Polynomials, Lagrange Interpolation Formula Interpolation, Numerical Integration, Trapezoidal Rule, Simpson's 1/3-rule, Simpson's 3/8-rule.	10	20
Section II			
Module	Content	Hours	Weightage in %

1.	**Numerical Methods for ODEs**: Taylor's Series and Euler's Method, Modifications and Improvements in Euler's Method, Runge-Kutta 2nd Order & 4th Order Methods, Milne's Predictor-Corrector Methods, Boundary Value Problems.	7	16
2.	**Basics of Statistics** Elements, Variables, Observations, Quantitative and Qualitative data, Cross-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 line and regression coefficient, Karl Pearson's method	7	16
3.	**Probability Distribution** Introduction, Conditional probability, Independent events, independent experiments, Bayes' theorem, Probability distribution, Binomial distribution, Poisson distribution, Normal distribution.	8	18

List of Tutorials:

Sr. No.	Name of Tutorial	Hours
1.	Approximations and Errors	2
2.	Solution of Algebraic and Transcendental Equations	4
3.	Numerical Solutions of Linear Equations	2
4.	Numerical Differentiation and Integration-1	2
5.	Numerical Differentiation and Integration-2	2
6.	Ordinary Differential Equations-1	2
7.	Ordinary Differential Equations-2	4
8.	Basics of Statistics-1	4
9.	Basics of Statistics-2	2
10.	Probability-1	4
11.	Probability-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
Numerical Methods in Engineering & Science	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.
Statistics for Business and Economics	David R. Anderson, Dennis J. Sweeney, Thomas A.Williams	Cengage Learning

Web Material Link(s):

- http://nptel.ac.in/courses/111106094/
- http://nptel.ac.in/courses/111105035/
- http://nptel.ac.in/courses/111101003/
- http://nptel.ac.in/courses/111105090/
- http://nptel.ac.in/courses/111107105/
- http://nptel.ac.in/courses/110107114

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 50 marks.
- MCQ based examination consists of 20 marks.
- Internal Viva consists of 30 marks.

Course Outcome(s):

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

SESH2120	**NUMERICAL METHODS & STATISTICS**
CO 1	Derive numerical solution of linear and nonlinear system of equation.
CO 2	Acquire knowledge of finite differences, interpolation, numerical differentiation and numerical integration.
CO 3	Compare variety of numerical methods for solving ordinary differential Equation.
CO 4	Construct different statistical methods to collect, compare, interpret & evaluate data.
CO 5	Apply probability in decision making, artificial intelligence, machine learning etc.

Mapping of CO with PO

SESH2120	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO 1	3	1	1	1								1
CO 2	2	1	1	2								1
CO 3	2	2	1	1								1
CO 4	2	1	1	1								1
CO 5												

Mapping of CO with PSO

SESH2120	PSO1	PSO2	PSO3
CO 1		2	
CO 2		2	
CO 3		2	
CO 4		2	
CO 5			

Level of Bloom's Revised Bloom's Taxonomy in Assessment

1: Remember	2: Understand	3: Apply
4: Analyze	5: Evaluate	6: Create

Module No	Content	RBT Level
1	Solution of Algebraic and Transcendental Equations	1, 2, 3, 4, 6
2	Numerical Solutions of Linear Equations	1, 2, 3, 5
3	Numerical Differentiation and Integration	1, 2, 3, 5
4	Numerical Methods for ODEs	1, 2, 3, 5, 6
5	Basics of Statistics	1, 2, 3, 4, 5
6	Probability Distribution	1, 2, 3, 4, 5

P P Savani University
School of Engineering

Department of Civil Engineering

Course Code: SECV2251
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	
03	-	-	03	40	60	-	-	-	-	100

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 structures.
- able to analyse statically determinate trusses, beams, and frames and obtain internal stress.
- able to analyse the behaviour of Structural element under rolling/moving load

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.	05	15
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.	10	20
3.	**Force Method** Moment Area Method, Conjugate Beam Method	08	20
Section II			
Module No.	Content	Hours	Weightage in %
4.	**Displacement Method**	08	20

	Macaulay's Method		
5.	**Energy Method** Introduction, Castiglino's First Theorem, Unit Load Method for Beam and Truss.	14	25
	TOTAL	45	100

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.

Course Outcome(s):

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

SECV2251	DETERMINATE STRUCTURAL ANALYSIS
CO 1	Apply principles of statics to determine the reactions & internal forces to the statically determinate structures.
CO 2	Calculate the displacements of statically determinate structure.
CO 3	Determine the stress generated in the structure under different loading condition.
CO 4	Assess the strain energy stored in a body to rectify the deformed shape of the structural elements.
CO 5	Analyse the behaviour of Structural element under rolling/moving load.

Mapping of CO with PO

SECV2251	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO 1	3	3	3	3	3		3					3
CO 2	3	3	3	3	2		3					3
CO 3	3	3	3	3	3		3					3
CO 4	3	3	3	3	3		3					3
CO 5	3	3	3	3	3		3					3

Mapping of CO with PSO

SECV2251	PSO1	PSO2	PSO3
CO 1	3	2	
CO 2	3	2	
CO 3	3	2	
CO 4	3	2	
CO 5	3	2	

Level of Bloom's Revised Bloom's Taxonomy in Assessment

1: Remember	2: Understand	3: Apply
4: Analyze	5: Evaluate	6: Create

Module No	Content	RBT Level
1	Types of Structure and Determinacy	1, 2
2	Influence Line Diagram	2, 3, 4, 6
3	Force Method	2, 4, 5
4	Displacement Method	3, 4, 5
5	Energy Method	1, 2, 4, 5

P P Savani University
School of Engineering

Department of Civil Engineering

Course Code: SECV2260
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	-	04	40	60	40	60	-	-	200

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	10
2.	**Mineralogy** Physical properties of minerals, Monoclinic system, Quartz group, Felspar group, Pyroxenes group, Amphibole group, Hornblende: (compound-complex silicate), Mica group.	03	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.	03	10
4.	**Structural Geology and Geophysical Methods** Outcrop, Folds arts of a fold, Classification of folds, Causes of folding, fault & faulting, Joints and jointing.	03	10
5.	**Introduction of Soil and Soil Mechanics** Definition, Development of soil mechanics, Soil formation, Residual and transported soils, Some commonly used soil designations, Structure and texture of soils, Soil as construction material, Limitations of soil mechanics.	05	10
Section II			
Module No.	Content	Hours	Weightage in %

6.	**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.	06	06
7.	**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.	10	16
8.	**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
9.	**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
	TOTAL	45	100

List of Practical:

Sr. No.	Name of Practical	Hours
1.	Moisture Content	02
2.	Visual identification and specific gravity	02
3.	Soil Classification by Sieve Analysis	02
4.	Liquid and Plastic Limit Test	04
5.	Shrinkage limit Test	02
6.	In-situ Density-Core Cutter & Sand Replacement method	04
7.	Permeability Test: Constant and Variable Head	04
8.	Study of rock specimen	04
9.	Study of Strike and dip using models	04
10.	Geology Lab visit	02
	TOTAL	30

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

Soil Mechanics & Foundation	Dr. B. C. Punmia	Laxmi 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 20 marks.
- Internal viva component of 20 marks.
- Practical performance/quiz/test/assignment of 30 marks during end semester exam.
- Viva/Oral performance of 30 marks during end semester exam.

Course Outcome(s):

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

SECV2260	GEOLOGY & GEOTECHNICAL ENGINEERING
CO 1	Categorise and list various properties of rocks and minerals.
CO 2	Identify rocks and minerals.
CO 3	Compare various soil and solve three phase system problems.
CO 4	Solve any practical problems related to soil permeability and seepage.

Mapping of CO with PO

SECV2260	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO 1												1
CO 2												1
CO 3				1								
CO 4	1											

Mapping of CO with PSO

SECV2260	PSO1	PSO2	PSO3
CO 1		1	
CO 2			
CO 3			
CO 4	2		

Level of Bloom's Revised Bloom's Taxonomy in Assessment

1: Remember	2: Understand	3: Apply
4: Analyze	5: Evaluate	6: Create

Module No	Content	RBT Level
1	Introduction to physical geology	1, 2, 3,4
2	Mineralogy	1, 2, 3,4
3	Rock Classification	1, 2, 3,4
4	Structural Geology and Geophysical Methods	1, 2, 3,4
5	Introduction of Soil and Soil Mechanics	1,2
6	Composition of Soil Terminology, Index Properties and Relationships	1,2, 3, 4,5
7	Soil Classification & Particle Size Analysis	1,2, 3, 4,5
8	Soil Moisture	1,2, 3, 4,5
9	Soil Sub-Surface Investigations	2,5

P P Savani University
School of Engineering

Department of Civil Engineering

Course Code: SECV2270
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	-	04	40	60	40	60	-	-	200

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	08
2.	**Building Bye Laws** 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. National Bbuilding Code	10	18
3.	**Residential and Non 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, Non Residential Building planning.	10	14
4.	**Perspective Drawing**	06	10

	Elements of perspective views, Types of views such as one point, two-point perspective		
Section II			
Module No.	Content	Hours	Weightage in %
5.	**Town Planning Introduction** History, ancient planning in India, origin and Growth of Town Planning, Objects & importance of town planning, Principle of town planning, Stages in town planning, Forms of planning, Present position of town planning in India, Satellite town, Civic center, Planned City in india CBD, Ribbon Deveplopment	06	18
6.	**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	03	10
7.	**Land Use and Zoning** Land use planning and its percentage for category of town, Principle of land use, Zoning: Object, Principle, Advantage, Importance, Aspects.	03	10
8.	**Housing and Slums** Housing: Definition, Importance, Requirement of residential building, Classification, Housing agencies, HUDCO, HDFC, LIC. SLUMS: Definition, Causes, Prevention method, evils of Slum, Slum rehabilitation.	03	12
	TOTAL	45	100

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 (School, Complex, Hospital)	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.	Assignment based on Town Planning	04
	TOTAL	30

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 20 marks.
- Internal viva component of 20 marks.
- Practical performance/quiz/drawing/test of 30 marks during End Semester Exam.
- Viva/Oral performance of 30 marks during End Semester Exam.

Course Outcomes:

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

SECV2090	Building & Town Planning
CO 1	Discuss and apply various aspects of principles of building planning.
CO 2	Comprehend local building bye laws and provisions of national building code in respect of building & town planning.
CO 3	Understand, interpret and prepare working drawings, foundation plans, perspective drawings and other executable drawings.
CO 4	Implement various aspects of principles of building planning & architectural compositions
CO 5	Illustrate the concept of development of town, importance of survey in town planning & appraise of zoning, land use, housing, slums and latest form of urban planning.

Mapping of CO with PO

SECV2270	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO 1	2	1	2	1			2		3	3	3	3

CO 2	2	1	1			3		1	3	3	3	3
CO 3	2	1	3	1	1				3	3	3	3
CO 4	2	1	2	1			2		3	3	3	3
CO 5	2	1	3	3		3	2	3	3	3	3	

Mapping of CO with PSO

SECV2270	PSO1	PSO2	PSO3
CO 1	3	3	3
CO 2	3	3	3
CO 3	3	3	3
CO 4	3	3	3
CO 5	3	3	3

Level of Bloom's Revised Bloom's Taxonomy in Assessment

1: Remember	2: Understand	3: Apply
4: Analyze	5: Evaluate	6: Create

Module No	**Content**	**RBT Level**
1	Building Planning	1, 2, 4
2	Building Bye Laws	1, 2, 3
3	Residential Building Planning	1, 2, 3, 4, 5, 6
4	Perspective Drawing	1, 2, 3, 4, 5, 6
5	Town Planning Introduction	1, 2, 3, 4
6	Civic Survey and Neighbourhood planning	1, 2, 3, 4
7	Land use and Zoning	1, 2, 3, 4
8	Housing and Slums	1, 2, 3, 4

P P Savani University
School of Engineering

Department of Civil Engineering

Course Code: SECV2280
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	-	04	40	60	40	60	-	-	200

CE: Continuous Evaluation, ESE: End Semester Exam

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

- understand the 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** 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 %
6.	**Engineering Properties of Concrete** Compressive strength and parameters affecting it, tensile strength – direct and indirect, modulus of elasticity and Poisson's ratio, stress strain response of concrete.	05	11
7.	**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
8.	**Durability of Concrete** Introduction to durability, relation between durability and permeability, chemical attack of concrete, corrosion of steel rebars, other durability issues**.**	07	16
9.	**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 concrete.	04	10
	TOTAL	45	100

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
	TOTAL	30

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 20 marks.
- Internal viva consists of 20 marks.
- Practical performance/quiz/drawing/test consists of 30 marks during End Semester Exam.
- Viva/Oral performance consists of 30 marks during the End Semester Exam.

Course Outcome(s):

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

SECV220	**CONCRETE TECHNOLOGY**
CO 1	Understand the process of manufacturing of cement and also identify the materials used for the concrete production.
CO 2	Determine the various key properties of cement by performing various tests as per Indian standards.
CO 3	Prepare a mix design for different grades of concrete and evaluate the performance by conducing tests on fresh and hardened concrete.
CO 4	Discover and generate a report on various factors causing failure in concrete.
CO 5	Understand and determine the types of special cements used in the industry.

Mapping of CO with PO

SECV2280	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO 1	1	1	1	1		2	3	3	2	2	1	3
CO 2	1	2	3	3	2	2		1	2	3	2	3
CO 3	1	2	3	3	2	2		1	2	3	3	3
CO 4	1	2	3	3	1	2		1	2	3	3	3
CO 5	1	1						3	2	2	1	3

Mapping of CO with PSO

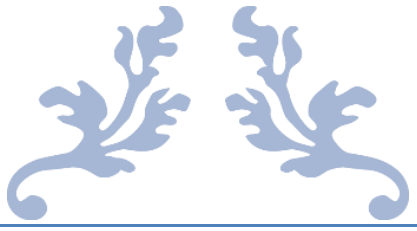
SECV2280	PSO1	PSO2	PSO3
CO 1	3	3	3
CO 2	3	2	3
CO 3	3	2	3

CO 4	3	2	3
CO 5	3	3	3

Level of Bloom's Revised Bloom's Taxonomy in Assessment

1: Remember	2: Understand	3: Apply
4: Analyze	5: Evaluate	6: Create

Module No	**Content**	**RBT Level**
1	Cement	1,2,3
2	Aggregates	1,2,3
3	Chemical and mineral admixtures	1,2,3
4	Concrete Mix Design	1,2,3
5	Concrete Production and Fresh Concrete	1,2,3
6	Engineering Properties of concrete	1,2,3
7	Dimensional Stability and Durability	1,2,3
8	Durability of concrete	1,2,3
9	Special Concretes	1,2,3



THIRD YEAR B.TECH

P P SAVANI UNIVERSITY															
SCHOOL OF ENGINEERING															
TEACHING & EXAMINATION SCHEME FOR B. TECH. CIVIL ENGINEERING PROGRAMME AY:2025-26															
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**	
5	SECV3211	Soil Mechanics & Foundation Engineering	CV	3	2	0	5	4	40	60	40	60	0	0	200
	SECV3221	Indeterminate Structural Analysis	CV	3	0	0	3	S3	40	60	0	0	0	0	100
	SECV3230	Environmental Engineering	CV	3	2	0	5	4	40	60	40	60	0	0	200
	SECV3240	Hydrology & Water Resource Management	CV	3	0	0	3	3	40	60	0	0	0	0	100
	SECV3250	Basics of Transportation Engineering	CV	3	0	0	3	3	40	60	0	0	0	0	100
		Language Training Elective Course	CFLS	3	0	0	2	2	100	0	0	0	0	0	100
		Life Skill Elective Course-I	CLSC	2	0	0	2	2	100	0	0	0	0	0	100
	SECV3920	Summer Training	CV	0	4	0	0	4	0	0	100	0	0	0	100
						Total	**24**	**26**							**1000**

P P SAVANI UNIVERSITY															
SCHOOL OF ENGINEERING															
TEACHING & EXAMINATION SCHEME FOR B. TECH. CIVIL ENGINEERING PROGRAMME AY:2025-26															
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	
6	SECV3272	Structural Design-I	CV	3	0	2	5	5	40	60	0	0	40	60	200
	SECV3281	Highway & Traffic Engineering	CV	3	2	0	5	4	40	60	40	60	0	0	200
	SECV3291	Irrigation & Hydraulic structures	CV	3	0	0	3	3	40	60	0	0	0	0	100
	SECV3300	Estimation & Costing	CV	3	4	0	7	5	40	60	40	60	0	0	200
	TNPC3010	Corporate Grooming & Etiquette	TNPC	3	0	0	3	3	100	0	0	0	0	0	100
	SECV3490	MOOC Course / University Elective		3	0	0	3	3	100	0	0	0	0	0	100
		Life Skill Elective Course-II	CLSC	2	0	0	2	2	100	0	0	0	0	0	100
						Total	**28**	**25**							**1000**

P P Savani University
School of Engineering

Department of Civil Engineering

Course Code: SECV3211
Course Name: Soil Mechanics & Foundation Engineering
Prerequisite Course/s: Geology & Geotechnical Engineering (SECV2060)

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	-	04	40	60	40	60	-	-	200

CE: Continuous Evaluation, ESE: End Semester Exam

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

- understand about the shear and compaction parameters of soil.
- understand the basic properties and strength nature of various soils and their settlement behaviour in foundations.
- understand about the stress distribution in soil.

Course Content:

Section I			
Module No.	Content	Hours	Weightage in %
1.	**Soil Compaction** Theory of compaction, Factors affecting compaction, Laboratory compaction tests, Effect of compaction on soil properties, Placement water content, Placement layer thickness, Field control of compaction, Proctor's needle, Methods of compaction used in field.	07	15
2.	**Shear Strength of Soil** Mohr's strength theory, Mohr- coulomb's strength theory, Modified Mohr coulomb's theory, Shear parameters, Test: Direct shear test, Unconfined compression test, lab. Vane shear test, Triaxial compression test, Shear tests based on drainage conditions.	09	20
3.	**Consolidation of Soil** Compressibility of soils, Definitions and mechanism of consolidation Spring analogy, Void ratio and effective stress relation, Related indices, Assumptions of Terzaghi's one dimensional consolidation theory, Time factor, one dimensional consolidation tests, Laboratory and theoretical time curves, Determination of pre-consolidation pressure, Estimation of consolidation settlement and rate of settlement for uniform pressure increment in a clay layer.	07	15
Section II			

Module No.	Content	Hours	Weightage in %
4.	**Earth Pressure** Types of lateral earth pressure, Rankine's and Coulomb's earth pressure, Theory and their application for determination of lateral earth pressure under different conditions, Rebhann's and Culmann's Graphical methods of determination of lateral earth pressures.	14	30
5.	**Shallow Foundation** Introduction of shallow foundation, Requirements of shallow foundation, Location and depth of shallow foundation, Terminologies, Bearing capacity of shallow foundation, settlement of shallow foundation,	08	20S
	TOTAL	45	100

List of Practical:

Sr. No	Name of Practical	Hours
1.	Proctor Compaction Test	02
2.	CBR Test	02
3.	Consolidation /Oedometer test	02
4.	Direct Shear Test	02
5.	Unconfined Compression Test	02
6.	Demonstration of Triaxial test	02
7.	Free swell potential	02
8.	Tutorials on shear strength of Soil	04
9.	Tutorials on Consolidation of Soil	04
10.	Tutorials on Earth Pressure	04
11.	Tutorials on Shallow foundation	04
	TOTAL	30

Text Book(s):

Title	Author/s	Publication
Soil Mechanics & Foundation Engineering	V. N. S. Murthy	Sai Kripa Technical Consultants, Bangalore

Reference Book(s):

Title	Author/s	Publication
Basic and applied soil mechanics	Gopal Ranjan, Rao A.S.R	New age int. (p) ltd.
Principles of Geotechnical Engineering	Das Braja M.	Thomson Asia Pvt. Ltd
Soil Mechanics and Foundation Engineering	P. Purushothama Raj	Pearson Education

Web Material Link(s):

- https://nptel.ac.in/courses/105103097/
- https://nptel.ac.in/courses/105103097/25
- https://www.aboutcivil.org/soil-mechanics.html
- https://www.brighthubengineering.com/structural-engineering/44795-what-is-soil-mechanics/
- https://www.britannica.com/science/soil-mechanics

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 20 marks.
- Internal viva consists of 20 marks.
- Practical performance/quiz/drawing/test consists of 30 marks during End Semester Exam.
- Viva/ Oral performance consists of 30 marks during End Semester Exam.

Course Outcome(s):

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

SECV3211	**SOIL MECHANICS & FOUNDATION ENGINEERING**
CO1	Resolving practical issues related to consolidation accounting and accounting time rate
CO2	Determine shear strength of soil.
CO3	Illustrate various tests of the soil for finding out compaction parameters, settlement parameters and shear strength.
CO4	Finding out compaction parameters of soil by using fundamental properties of soil mechanics.
CO5	Calculate bearing capacity of soil and propose appropriate foundation design.

Mapping of CO with PO

SECV3211	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO 1	1	1	1	1	1							1
CO 2		1	1	1	2							1
CO 3		1	1	2	1							1
CO 4		1	1	1	1							1
CO 5		1	2	1	1					1		

Mapping of CO with PSO

SECV3211	PSO1	PSO2	PSO3
CO 1	2		
CO 2	2		
CO 3	2		

CO 4	2		
CO 5	3	1	

Level of Bloom's Revised Bloom's Taxonomy in Assessment

1: Remember	2: Understand	3: Apply
4: Analyze	5: Evaluate	6: Create

Module No	**Content**	**RBT Level**
1	Soil Compaction	1, 2
2	Shear Strength of Soil	2, 3, 4, 6
3	Consolidation of Soil	2, 4, 5
4	Earth Pressure	3, 4, 5
5	Shallow Foundation	1, 2, 4, 5

P P Savani University
School of Engineering

Department of Civil Engineering

Course Code: SECV3221
Course Name: Indeterminate Structural Analysis
Prerequisite Course/s: Strength of Materials (SECV2011), Determinate Structural Analysis (SECV2051)

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	-	-	03	40	60	-	-	-	-	100

CE: Continuous Evaluation, ESE: End Semester Exam

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

- analyze the indeterminate structures.
- quickly chose a method for analysis.

Course Content:

Section I			
Module No.	Content	Hours	Weightage in %
1.	**Introduction** Review of basic concepts -Static and kinematic indeterminacy.	03	05
2.	**Analysis of Statically Indeterminate Structures by Displacement Methods** Review, development of slope-deflection equations for beams, frames without and with side sway, concept of stiffness, moment distribution method and applications plane truss with and without side sway, multistoried frames with side sway, beams with and without support settlement.	12	25
3.	**Influence Lines for Statically Indeterminate Structures** Moving loads and its effects on structural members, influence lines for beams, influence lines for simple trusses, Muller-Breslau principle.	07	20
Section II			
Module No.	Content	Hours	Weightage in %
4.	**Analysis of Statically Indeterminate Structures by Direct Stiffness Method** Application to beams, plane frames, truss, errors in analysis and fabrication of trusses because of temperature changes.	09	20

5.	**Analysis of Statically Indeterminate Structures by Flexibility Method** Introduction, axes and coordinates, flexibility matrix, analysis of continuous beams and plane trusses using system approach, analysis of simple orthogonal rigid frames using system approach with static indeterminacy ≤ 3.	09	20
6.	**Approximate Methods of Indeterminate Structural Analysis** Indeterminate trusses, industrial frames, building frames.	05	10
	TOTAL	45	100

Text Book(s):

Title	Author/s	Publication
Theory of Structures	S. Ramamrutham	Dhanpat Rai Publishing company
Structural Analysis	Devdas Menon	Narosa Publication
Matrix Methods of Structural Analysis	Dr. A. S. Meghre & S. K. Deshmukh	Charotar Publishing house Pvt. Ltd.

Reference Book(s):

Title	Author/s	Publication
Elementary Structural Analysis	S. Utku, C.H. Norris and J.B. Wilbur	McGraw Hill Book Company
Indeterminate Structural Analysis	C.K. Wang	McGraw Hill Book Company
Matrix Framed Structures.	W. Weaver and J.M. Gere	CBS Publishers, Delhi
Structural Analysis.	R.C. Hibbeler	Pearson Education Asia publication

Web Material Link(s):

- https://nptel.ac.in/courses/105101086/
- https://nptel.ac.in/courses/105105109/

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

Course Outcome(s):

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

SECV3221	INDETERMINATE STRUCTURAL ANALYSIS
CO1	Apply the equilibrium and compatibility equations to determine the response of indeterminate structures.

CO2	Evaluate the internal forces and displacement of statically indeterminate structures by classical, iterative, and matrix methods to get a structural response.
CO3	Calculate the reaction and internal force generated in the indeterminate structures due to moving loads.
CO4	Perceive the different stresses and strains developed in the structural member subjected to axial, bending, shear & torsional effect.

Mapping of CO with PO

SECV3221	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO 1	3	3	3	3	3							1
CO 2	3	3	3	3	3							1
CO 3	3	3	3	3	3							1
CO 4	3	3	3	3	3							1

Mapping of CO with PSO

SECV3221	PSO1	PSO2	PSO3
CO 1	3	3	2
CO 2	3	3	2
CO 3	3	3	2
CO 4	3	3	2

Level of Bloom's Revised Bloom's Taxonomy in Assessment

1: Remember	2: Understand	3: Apply
4: Analyze	5: Evaluate	6: Create

Module No	**Content**	**RBT Level**
1	Introduction	1, 2
2	Analysis of Statically Indeterminate Structures by Displacement Methods	2, 3, 4, 6
3	Influence Lines for Statically Indeterminate Structures	2, 4, 5
4	Analysis of Statically Indeterminate Structures by Direct Stiffness Method	1, 2, 4, 5
5	Analysis of Statically Indeterminate Structures by Flexibility Method	1, 2, 4, 5
6	Approximate Methods of Indeterminate Structural Analysis	2, 4, 5, 6

P P Savani University
School of Engineering

Department of Civil Engineering

Course Code: SECV3230
Course Name: Environmental 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	-	04	40	60	40	60	-	-	200

CE: Continuous Evaluation, ESE: End Semester Exam

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

- design various units of a water treatment plant.
- identify the physical, chemical and biological characteristics of sewage.
- estimate sewage and storm water discharge and thereby design sewer pipeline and storm water drain.
- design modern and low-cost wastewater treatment plants.
- characterize solid wastes and methods of their collection and transportation.
- manage solid wastes using different techniques.

Course Content:

Section I			
Module No.	Content	Hours	Weightage in %
1.	**Introduction** Man and Environment: Overview (socio-economic structure & occupational exposures), Scope of Environmental Engineering, pollution problems due to urbanization & industrialization	05	11
2.	**Air Pollution** **Causes of air pollution** Types & sources of air pollutants, Climatic & Meteorological effect on air pollution concentration, Formation of smog and fumigation **Analysis of Air Pollutants** Collection of Gaseous Air Pollutants, Collection of Particulate Pollutants, Analysis of Air Pollutants like: Sulphur dioxide – Nitrogen oxide – Carbon monoxide – Oxidants &Ozone – Hydrocarbons – Particulate Matter. **Methods & Approach of Air Pollution Control** Controlling smoke nuisance – Develop air quality criteria and practical emission standards – Creating zones suitable for industry based on micrometeorology of air area – Introducing artificial methods of	08	13

	removal of particulate and matters of waste before discharging to open atmosphere		
3.	**Water Sources Origin of waste water** Types of water pollutants and their effects **Different Sources of Water Pollution** Biological Pollution (point & non-point sources) – Chemical Pollutants: Toxic Organic & Inorganic Chemicals – Oxygen demanding substances – Physical Pollutants: Thermal Waste – Radioactive waste – Physiological Pollutants: Taste affecting substances – other forming substances **Water Pollution & Its Control** Adverse effects on: Human Health & Environment, Aquatic life, Animal life, Plant life — Water Pollution Measurement Techniques – Water Pollution Control Equipment & Instruments – Indian Standards for Water Pollution Control.	10	26
Section II			
Module No.	Content	Hours	Weightage in %
4.	**Soil Pollution** Liquid & Solid Wastes, Domestic & Industrial Wastes, Pesticides Toxic, Inorganic & Organic Pollutants, soil Deterioration, Poor Fertility, Septicity, Ground Water Pollution, Concentration of Infecting Agents in Soil.	05	12
5.	**Noise Pollution & Control** Noise Pollution, Intensity, Duration – Types of Industrial Noise – Ill effects of Noise – Noise Measuring & Control – Permissible Noise Limits.	04	09
6.	**Municipal Solid Waste Management** Characteristics, generation, collection and transportation of solid wastes, engineered systems for solid waste management (reuse, recycle, energy recovery, treatment and disposal). Industrial waste minimization: Volume and strength reduction of industrial wastes, need, strategies and methods of neutralization, equalization and proportioning, zero waste discharge and concept of good house-keeping.	10	22
7.	**Environmental Legislations, Authorities & Systems** Air & Water Pollution Control Acts & Rules (Salient Features only) – Functions of State / Central Pollution Control Boards – Environmental Management System: ISO 14 000 (Salient Features only)	03	07
	TOTAL	45	100

List of Practical:

Sr. No	Name of Practical	Hours
1.	Measurement of Ph for water & Waste water	02
2.	Introduction to Standards, Sampling, Collection and Preservation of Samples	04

3.	Measurement of conductivity for water & waste water	02
4.	Determination of acidity for water & waste water	02
5.	Determination of hardness by EDTA method	04
6.	Determination of residual chlorine.	02
7.	Determination of optimum coagulant dose by jar test	04
8.	Determination of sulphate content	02
9.	Determination of chlorides content	02
10.	Determination of suspended, settle able, volatile and fixed solids	04
11.	Determination of turbidity by using nephelometer	02
	TOTAL	30

Text Book(s):

Title	Author/s	Publication
Elements of Environmental Engineering	K. N. Duggal	S. Chand & Company Publications
Environmental Engineering Vol. I	S. K. Garg	Khanna Publisher, New Delhi

Reference Book(s):

Title	Author/s	Publication
Waste Water Engineering	Punamia & Jain	Laxmi Publications (P) Ltd., New Delhi.
Environmental Engineering	Pevy	McGraw-Hill Publishing Company Ltd.
Solid Waste Treatment and Disposal	G. Tchabanoglous	McGraw-Hill Publishing Company Ltd.

Web Material Link(s):

- https://en.wikipedia.org/wiki/Environmental_engineering
- https://www.conserve-energy-future.com/sources-effects-methods-of-solid-waste-management.php
- https://en.wikipedia.org/wiki/Waste_management
- https://www.slideshare.net/dushyantchhatrola/quantity-and-quality-of-water-for-supply-in-town-city
- http://www.who.int/water_sanitation_health/dwq/monograph42.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 which will be evaluated out of 10 marks for each practical and average of the same will be converted to 20 marks.
- Internal viva consists of 20 marks.
- Practical performance/quiz/drawing/test consists of 30 marks during End Semester Exam.
- Viva/Oral performance consists of 30 marks during End Semester Exam.

Course Outcome(s):

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

SECV3230	ENVIRONMENTAL ENGINEERING
CO 1	Know the basics, importance, and methods of water supply.
CO 2	Study the various sources and properties of water.
CO 3	Understand the various methods of conveyance of water.
CO 4	Learn the objectives and methods of water treatment and to study the features and function of different water treatment units.

Mapping of CO with PO

SECV3230	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO 1				1								
CO 2							1					
CO 3				1								
CO 4		1		1			2					

Mapping of CO with PSO

SECV3230	PSO1	PSO2	PSO3
CO 1			
CO 2		1	2
CO 3			
CO 4		1	1

Level of Bloom's Revised Bloom's Taxonomy in Assessment

1: Remember	2: Understand	3: Apply
4: Analyze	5: Evaluate	6: Create

Module No	Content	RBT Level
1	Introduction	1,2
2	Air pollution	1,2,3
3	Water sources, origin of waste water	2,3,6
4	soil pollution	2,3,6
5	noise pollution and control	2,3,6
6	municipal solid waste management	2,3,6
7	Environmental legislations, authorities and system	2,3

P P Savani University
School of Engineering
Department of Civil Engineering

Course Code: SECV3240
Course Name: Hydrology and Water Resources Management
Prerequisite Course/s: Fluid Mechanics (SECV2030)

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	-	-	03	40	60	-	-	-	-	100

CE: Continuous Evaluation, ESE: End Semester Exam

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

- develop understanding about precipitation, infiltration, evapotranspiration, hydrograph, capacity of reservoir.
- enable the students for estimation of runoff, infiltration, evaporation, floods and reservoir capacity.
- create understanding about features of various types of dam.

Course Content:

Section I			
Module No.	Content	Hours	Weightage in %
1.	**Introduction** Hydrologic cycle, Climate and water availability, Water balances, Precipitation Forms, Classification, Variability, Measurement, Data analysis, Evaporation and its measurement, Evapotranspiration and its measurement, Penman Monteith method, Infiltration, Factors affecting infiltration, Horton's equation and Green Ampt method.	07	18
2.	**Hyetograph and Hydrograph Analysis** Hyetograph, Runoff, drainage basin characteristics, Hydrograph concepts, assumptions and limitations of unit hydrograph, Derivation of unit hydrograph, S- hydrograph, Flow duration curve, Groundwater and it's Occurrence, Darcy's law, Well hydraulics, Well losses, Yield, Pumping and recuperation test.	09	18
3.	**Flood Management** Indian rivers and floods, Causes of floods, Alleviation, Leeves and floodwalls, Floodways, Channel improvement, Flood damage analysis. **Hydrologic Analysis:** Design flood, Flood estimation, Frequency analysis, Flood routing through reservoirs and open channels.	07	14

Section II			
Module No.	Content	Hours	Weightage in %
4.	**Drought Management and Water Harvesting** Definition of drought, Causes of drought, measures for water conservation and augmentation, drought contingency planning. Water harvesting: rainwater collection, small dams, runoff enhancement, runoff collection, ponds, tanks.	04	10
5.	**GIS for Water Resource Engineering.** Introduction to GIS, Raster data, Vector data, Mosaic, Clipping tool, Shape file, DEM, DTM, Lidar, LULC Mapping, Curve Number Generation, Watershed Delineation.	08	18
6.	**Modelling Technique in Water Resource Engineering.** Overview of Hydrology and Hydraulic Engineering Importance of Modeling in Water Resources Managemessnt Introduction to HEC-HMS and HEC-RAS: Features, Capabilities, and Applications Understanding Watershed Hydrology, Components of HEC-HMS: Basin Models Meteorological Models Control Specifications HEC-HMS Methods and Processes: Rainfall-Runoff Modeling Unit Hydrographs and Routing Techniques Hands-On: Creating a Basic Watershed Model in HEC-HMS	10	22
	TOTAL	45	100

Text Book(s):

Title	Authors	Publication
Hydrology and Water Resources Engineering	Garg S.K.	Tata McGraw Hill, New Delhi
Hydrology and Water Resources Engineering	R.K. Sharma and T.K. Sharma	Dhanpat Rai Publications

Reference Book(s):

Title	Authors	Publication
Engineering Hydrology	Subramanya, K.,	Tata McGraw Hill, New Delhi.
Hydrology – Principles, Analysis and Design	Raghunath, H.M.	Wiley Eastern Ltd., New Delhi
Groundwater Hydrology	Todd, D.K.	John Wiley & Sons
Hydrologic Modelling System HEC-HMS	Arlen D. Feldman	US Army Corps of Engineers
Remote Sensing and Geographical Information System	M. Anji Reddy	BS Publication

Web Material Link(s):

- https://nptel.ac.in/courses/105104103/
- http://www.nptelvideos.in/2012/11/water-resources-engineering.html
- http://www.groundwatermanagement.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.

Course Outcome(s):

After the completion of the course, the following course outcomes will be able to:

SECV3240	**Hydrology and Water resource management**
CO 1	Understand and analyze the important meteorological parameter which affect the watershed hydrology and outflow from watershed.
CO 2	Compute the yield of the well, aquifer parameters and to understand the construction of wells
CO 3	Carryout hydrologic analysis and understand importance of it for hydraulic structure.
CO 4	Analyze the behaviour of Hydrologic system using advance tools and factor affecting it..
CO 5	Formulate effective drought management and water harvesting plan for water scarces area.

Mapping of CO with PO

SECV3240	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO 1	2	3	1	3	3		2					3
CO 2	2	3	2	3	3		2					3
CO 3	2	3	2	3	3		3					3
CO 4	1	2	2	1	1		2					3
CO 5	1	1	1	1	1		3					3

Mapping of CO with PSO

SECV3240	PSO1	PSO2	PSO3
CO 1	3	2	
CO 2	3	2	
CO 3	3	2	
CO 4	3	2	1
CO 5	3	3	3

Level of Bloom's Revised Bloom's Taxonomy in Assessment

1: Remember	2: Understand	3: Apply
4: Analyze	5: Evaluate	6: Create

Module No	Content	RBT Level
1.	Introduction	1, 2, 3
2.	Hyetograph and Hydrograph Analysis	1, 2, 3, 4
3.	Reservoir and Dams	1, 2
4.	Hydroelectric Power	1, 2
5.	Flood Management & Hydrologic Analysis:	2, 3, 4, 5
6.	Drought Management and Water Harvesting	1, 2

P P Savani University
School of Engineering

Department of Civil Engineering

Course Code: SECV3250
Course Name: Basics of Transportation 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	-	-	03	40	60	-	-	-	-	100

CE: Continuous Evaluation, ESE: End Semester Exam

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

- comprehend basic requirements of the highway.
- understand highway development and planning.
- comprehend basic concepts and components of railways, bridges, docks and harbour.
- understand the design of the railway track geometry.
- get idea about concepts of tunnelling.

Course Content:

Section I			
Module No.	Content	Hours	Weightage in %
1.	**Introduction:** Importance of Transportation, Different modes of transportation, Overview of Road, Rail, Air and Water Transportation, Comparison of various modes of Transportation. Organizations and their functions - Central Road Research Institute (CRRI), Indian Road Congress (IRC), Railway Board (RB), Inland Waterways Authority of India (IWAI), Airport Authority of India (AAI), International Civil Aviation Organization (ICAO), Directorate General of Civil Aviation (DGCA).	05	14
2.	**Road Transportation:** Historical development of road construction, highway development in india, necessity of highway panning, classification of roads, road patterns, planning surveys, highway alignment, engineering surveys for highway location, drawing and report, highway project.	08	18
3.	**Rail Transportation:** Brief history of Indian railways, Indian railways at present, recent development in Indian railways, importance of railways, functions of rails, requirements of an ideal rails, types of rails, functions of sleepers, requirements of sleepers, types of sleepers, ballast, functions of ballast, requirements of a good ballast, types of ballast	09	18

Section II			
Module No.	Content	Hours	Weightage in %
4.	**Water Transportation:** Harbour: Classification, components, site selection. Definitions: Harbour, Port, Plimsoll Line, Beam, Draft, Hull, Structures and functions: Jetty, Breakwater, Wharf, Dock, Lock, Quay, Mole, Dolphin. Mooring, Dredging. Natural Phenomenon: Tides, Waves, Wind, Currents. Navigational Aids: Lighthouse, Lightships, Buoys.	7	15
5.	**Air Transportation:** Airport: Classification, Master plan, Site selection, Zoning laws, imaginary surfaces. Aircraft parts, Importance and Purpose: Wind rose diagram, Runway Orientation, Taxiway, Apron, terminal building, Marking and lighting on Runway, Taxiway and Apron.	8	15
6.	**Bridge and Tunnell Engineering:** History, components, classification, types, requirements. Culverts and causeways: Layout plan, advantages and disadvantages, site suitability, and selection criteria.	8	20
	TOTAL	45	100

Text Book(s):

Title	Author/s	Publication
Highway Engineering	Dr. S.K. Khanna and Dr. C.E. G. Justo	Khanna Publishers
Harbors, Dock and Tunnel Engineering	R. Srinivasan	Tata McGraw Hill Publication
Bridge Engineering	Rangwala	Charotar Publishing House
Railway Engineering	Satish Chandra and M.M. Agrawal	Oxford University Press
Airport Engineering	S. C. Rangwala	Charotar Publishing House

Reference Book(s):

Title	Author/s	Publication
Highway Engineering	L.R. Kadiyali	Khanna Publishers, New Delhi
Principles, Practice & Design of Highway Engineering	S.K. Sharma	S. Chsand & Co., New Delhi.
Roads, Railways, Bridges and Tunnels Engineering	Ahuja T.D. and Birdi G. S	Standard Book House,Delhi
Bridge Engineering	Ponnuswamy S.	Tata McGraw Hill Publication, New Delhi

Web Material Link(s):

- https://nptel.ac.in/courses/105103097/
- https://nptel.ac.in/courses/105103097/25

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.

Course Outcome(s):

After the completion of the course, the following course outcomes will be able to:

SECV3250	BASICS OF TRANSPORTATION
CO1	Understand about highway engineering and highway development planning and its classification.
CO2	Explain the fundamentals of railway engineering and railway components.
CO3	Understand the principles of highway geometrics design as per irc standards.
CO4	Identify and practice knowledge about harbour, dock, tunnel & bridge.

Mapping of CO with PO

SECV3250	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO 1		1	2	1	2	2			3	3	2	
CO 2		1	1	1	2	2	1		3	3	2	
CO 3		1	1	1	2	2			3	3	2	
CO 4		1	2	1	2	2	1		3	3	2	

Mapping of CO with PSO

SECV3250	PSO1	PSO2	PSO3
CO 1	3	2	2
CO 2	3	2	2
CO 3	3	2	2
CO 4	3	2	2

Level of Bloom's Revised Bloom's Taxonomy in Assessment

1: Remember	2: Understand	3: Apply
4: Analyze	5: Evaluate	6: Create

Module No	Content	RBT Level
1	Highway Engineering	1,2
2	Highway Development and Planning	1,2,6
3	Railway Engineering	1,2
4	Railway components	1,2
5	Geometric design of Track	1.2.4,5

6	Bridge Engineering	1,2,3,4,5,6
7	Tunnelling	1,2,5
8	Docks and Harbors Engineering	1.2

P P Savani University
School of Engineering
Department of Civil Engineering

Course Code: SECV3920
Course Name: Summer Training
Prerequisite Cours/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	-	04	-	-	100	-	-	-	100

CE: Continuous Evaluation, ESE: End Semester Exam

Objective(s) of the Course:

To help learners to

- have first-hand experience the real time situations in industrial scenario.
- get familiar with engineering applications in industrial spectrum.
- learn to adapt themselves in professional scenario.

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
	TOTAL	**100**

Course Outcome:

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

- apply their theoretical knowledge into reality.
- learn to adapt the workplace situations when they will be recruited.
- be prepared for the real-world situations in their future.

Report Writing Guidelines

A. Report Format:

- 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.
- Project Certification Form
- [The form should be duly filled signed by the supervisors.]
- 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.]
- Table of Contents/Index with page numbering
- List of Tables, Figures, Schemes
- Summary/abstract of the report.
- Introduction/Objectives of the identified problem
- Data Analysis and Finding of Solution
- Application of the identified solution
- Future Scope of enhancement of the Project and Conclusion
- "Learning during Project Work", i.e. "Experience of Journey during Project Duration"
- References(must)
- Bibliography
- 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

Course Outcome(s):

After the completion of the course, the following course outcomes will be able to:

SECV 3920	SUMMER TRAINING
CO 1	Construct company profile by compiling brief history, management structure, products/services offered, key achievements and market performance for the company visited during internship.
CO 2	Determine the challenges and future potential for his/her internship organization in particular and the sector in general.
CO 3	Test the theoretical learning in practical situations by accomplishing the tasks assigned during the internship period.
CO 4	Apply various soft skills such as time management, positive attitude and communication skills during performance of the tasks assigned in internship organization.
CO 5	Analyze the functioning of internship organization and recommend changes for improvement in processes.

Mapping of CO with PO

SECV 3920	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO 1		2	3	3	3	3	3	3	3	3	3	3
CO 2	3	2	3	3	3	3	3	3	3	3	3	3
CO 3	3	2	3	3	3	3	3	3	3	3	3	3
CO 4	3	2	3	3	3	3	3	3	3	3	3	3
CO 5		2	3	3	3	3	3	3	3	3	3	3

Mapping of CO with PSO

SECV3920	PSO1	PSO2	PSO3
CO 1	2	3	3
CO 2	2	3	3
CO 3	2	3	3
CO 4	2	3	3
CO 5	2	3	3

Level of Bloom's Revised Bloom's Taxonomy in Assessment

1: Remember	2: Understand	3: Apply
4: Analyze	5: Evaluate	6: Create

Module No	Content	RBT Level
1	Summer Training	1,2,3,4,5,6

P P Savani University
School of Engineering
Department of Civil Engineering

Course Code: SECV3272
Course Name: Structural Design-I
Prerequisite Course/s: Strength of Materials (SECV2011), Concrete Technology (SECV3030)

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	05	40	60	-	-	40	60	200

CE: Continuous Evaluation, ESE: End Semester Exam

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

- understand the basics of modern concrete.
- understand various design philosophies to be used in the design of structural elements.
- understand the behavior of various elements under different loading conditions.

Course Content:

Section I			
Module No.	Content	Hours	Weightage in %
1.	**Introduction** Introduction: Objectives, Properties of Reinforced Concrete and Structural Steel, Loads & load combinations, Methods of Analysis, Codes & specifications.	05	10
2.	**Basics of Concrete Structure Design:** Stress-strain relation of concrete, Assumptions – Role osssf reinforcement – Bond between steel and concrete – Development of micro-crack and formation of isolated cracks. Limit state of collapse & serviceability, partial safety factors for material & loading. **Limit State of Flexure**: Stress-strain characteristics of concrete & reinforcing steel, Type of section-under reinforced, over reinforced & balance section, Neutral Axis depth, Moment of Resistance for 08 22 singly reinforced, doubly reinforced and flanged sections. Limit State of Shear and Torsion, combined flexure & torsion, Bond & Anchorage, Development length, splicing	10	20
3.	**Design of Beams**	07	15

	Design procedures for critical sections for moment and shears. Anchorages of bars, check for development length, reinforcement requirements, slenderness limits for beams to ensure lateral stability, design examples for simply supported and cantilever beams for rectangular and flanged sections.		
Section II			
Module No.	Content	Hours	Weightage in %
4.	**Design of Slabs** General consideration of design of slabs, rectangular slabs spanning one direction, rectangular slabs spanning in two directions for various boundary conditions. Design of simply supported, cantilever and continuous slabs as per IS: 456 – 2000.	06	15
5.	**Design of Columns** General aspects, effective length of column, loads on columns, slenderness ratio for columns, minimum eccentricity, design of short axially loaded columns, design of column subject to combined axial load and uniaxial moment and biaxial moment using SP – 16 charts.	06	15
6.	**Design of Footings** Introduction, loads for footing, design basis for limit state method, design of isolated rectangular footing for axial load, uniaxial and biaxial moment, design of pedestal.	05	15
7.	**Design of Stair Cases** General features, types of stair case, loads on staircases, effective span as per IS code provisions, distribution of loading on stairs, design of stair case with waist slabs.	06	10
	TOTAL	45	100

List of Tutorial(s):

Sr. No.	Name of Tutorial	Hours
1.	Loads and Strength	02
2.	Ultimate strength of RC Section	04
3.	Flexure and Ssserviceability Limit States	04
4.	Design of Beams	06
5.	Design of Slabs	04
6.	Design of Columns	04
7.	Design of Footings	04
8.	Design of Stair Cases	02
	TOTAL	30

Text Book(s):

Title	Author(s)	Publication
Reinforced concrete Design	Pillai and Menon	TMH Education Private Limited

Reference Book(s):

Title	Author(s)	Publication
Limit State Design of Reinforced concrete	P.C. Varghese	PHI Learning Private Limited
Fundamentals of Reinforced concrete Design	M. L. Gambhir	PHI Learning Private Limited
Reinforced concrete Design	S. N. Shinha	TMH Education Private Limited

Web Material Link(s):

- https://nptel.ac.in/courses/105105105/
- https://nptel.ac.in/downloads/105105105/

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 assessment in tutorials which will be evaluated out of marks each and average of the same shall be considered of 60 marks.
- MCQ based test consists of 20 marks.
- Internal viva consists of 20 marks.

Course Outcome(s):

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

SECV3272	STRUCTURAL DESIGN -I
CO1	Understand the significance of various provisions made in the Indian standard codes (IS 456:2000 and SP: 16) for RCC structures adapting various design philosophies.
CO2	Calculate various loads acting on the structure and the load combinations considered under various conditions.
CO3	Design various elements like slab, beam, column, footing and staircase with necessary checks as per limit state method provisions given in is 456:2000.
CO4	Assess the various critical conditions of the structural elements and ensure the safety and durability of the structure.

Mapping of CO with PO

SECV3272	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO 1	1	3	2	3	3	2			2	3	2	3
CO 2	1	3	2	3	3	2			2	3	2	3
CO 3	2	3	2	3	3	2			2	3	2	3
CO 4	1	3	2	3	3	2			2	3	2	3

Mapping of CO with PSO

SECV3272	PSO1	PSO2	PSO3
CO 1	3	3	3
CO 2	3	3	3
CO 3	3	3	3
CO 4	3	3	3

Level of Bloom's Revised Bloom's Taxonomy in Assessment

1: Remember	2: Understand	3: Apply
4: Analyze	5: Evaluate	6: Create

Module No	**Content**	**RBT Level**
1	General Features of Reinforced Concrete	1,2
2	Principles of limit state design and ultimate strength of RC Sections	2,3
3	Flexure and serviceability limit states	2,3,4
4	Design of beams	4,5,6
5	Design of slabs	4,5,6
6	Design of columns	4,5,6
7	Design of footings	4,5,6
8	Design of staircases	4,5,6

P P Savani University
School of Engineering

Department of Civil Engineering

Course Code: SECV3291
Course Name: Irrigation & Hydraulic Structure
Prerequisite Course/s: Fluid Mechanics (SECV 2030), Hydrology & Water Resource Management (SECV 3051)

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	-	-	03	40	60	-	-	-	-	100

CE: Continuous Evaluation, ESE: End Semester Exam

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

- understand the basic types of irrigation methods, irrigation standards and crop water assessment.
- study the different aspects of design of hydraulic structures such as energy dissipaters, head and cross regulators, canal falls, and structures involved in cross drainage works.
- understand the analysis of seepage and hydraulic jump into design different types of dams.

Course Content:

Section I			
Module No.	Content	Hours	Weightage in %
1.	**Introduction** Irrigation, necessity, Types of irrigation, Methods of supplying water, Assessment of irrigation water, Consumptive use and its determination water requirement of various crops – Duty – Delta – Base period and crop period, Principal Indian crops, Gross command area, Culturable command area, Intensity of irrigation, Duty and delta relation, Introduction to various methods of application of irrigation water, Irrigation efficiency, assessment of irrigation water.	10	22
2.	**Diversion Works** Different stages of a river and their flow characteristics, Weir and barrages, Various parts of a weir and their functions, Exit gradient, Principles of weir design on permeable formations -Bligh's creep theory and Khosla's theory.	06	14
3.	**Storage and Outlet works** Types of earthen dams, Seepage in earth dams, Gravity dams, Forces acting on a gravity dam, Rock-fill dams, Spillways, Types of spillways, Spillways gates and energy dissipation works.	06	14
Section II			
Module No.	Content	Hours	Weightage in %

4.	**Distribution Works** Modes of conveying irrigation water- Types of irrigation canals contour canal, ridge canal, side sloping canals, Canal sections-filling, cutting, partial cutting and partial filling, Balanced depth, Canal FSL, Capacity factor and Time factor, L-section, Losses of canal water, Silting and scouring of canals, Method of design of unlined section of irrigation canal, Silt theories, Lined canals, Design of lined canal, Link canals.	11	22
5.	**Regulating and Cross Drainage Works** Canal falls, Cross drainage works, Types of cross drainage works, Canal escapes, Head regulator and Cross regulator, Silt ejector, Flow meters – Parshall flume, Irrigation outlets and types of outlets.	08	18
6.	**Water Logging** Definition, causes, Reclamation, Drainage principles and practice, Indian case study and prevention.	04	10
	TOTAL	45	100

Text Book(s):

Title	Author/s	Publication
Irrigation and Hydraulics Structures	Garg, S.K.	Khanna Publishers

Reference Book(s):

Title	Author/s	Publication
Irrigation and Water Power Engineering	Punmia, B.C.	Standard Publishers
Irrigation, Water Power & Water Resources Engineering	Dr. K. R. Arora	Standard Publishers Distributors
Irrigation Engineering	S.K. Mazumder	Tata McGraw-Hill Publishing Company
Principles and Practice of Irrigation Engg.	Sharma, S.K.	S. Chand & Co.

Web Material Link(s):

- https://onlinecourses.nptel.ac.in/noc18_ar07/

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.

Course Outcome(s):

After the completion of the course, the following course outcomes will be able to:

SECV3291	IRRIGATION AND HYDRAULIC STRUCTURE
CO 1	Recognize the terms associated with irrigation and remember methods of irrigation.
CO 2	Analyse the weir design on permeable strata.
CO 3	Summarize the function and need of various components of irrigation scheme.
CO 4	Evaluate and design the irrigation channels in different conditions.

CO 5	Formulate effective water application method to prevent water logging and increase efficiency.

Mapping of CO with PO

SECV3291	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO 1	3	2	3	2		3	3		3	3	3	1
CO 2	2	2	3	2		3	3		3	3	3	1
CO 3	2	2	3	2		3	3		3	3	3	1
CO 4	2	2	3	2		3	3		3	3	3	1
CO 5	2	2	3	2		3	3		3	3	3	1

Mapping of CO with PSO

SECV3291	PSO1	PSO2	PSO3
CO 1	3	3	3
CO 2	3	3	3
CO 3	3	3	3
CO 4	3	3	3
CO 5	3	3	3

Level of Bloom's Revised Bloom's Taxonomy in Assessment

1: Remember	2: Understand	3: Apply
4: Analyze	5: Evaluate	6: Create

Module No	**Content**	**RBT Level**
1.	Introduction	1, 2, 3, 4
2.	Diversion Works	2, 3, 6
3.	Storage and Outlet works	2
4.	Distribution Works	2, 3, 4, 6
5.	Regulating and Cross Drainage Works	2
6.	Water Logging	2

P P Savani University
School of Engineering

Department of Civil Engineering

Course Code: SECV3300
Course Name: Estimation & Costing
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	-	07	40	60	40	60	-	-	200

CE: Continuous Evaluation, ESE: End Semester Exam

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

- realize how individual components add up costs
- understand how construction costs can be optimized

Course Content:

Section I			
Module No.	Content	Hours	Weightage in %
1.	**Estimation and Modes of Measurement** Types of estimate and Data required, Overhead charges, contingencies, water charges, provisional sum, prime cost, provisional quantities, spot items, day work, General rules for the measurements and its units of different items of civil engineering work, Quality and duties of good estimator.	05	10
2.	**Specifications of Civil Works** Importance specification, Types of specification, Principle of writing specification, Specification of Earthwork in Excavation, cement concrete, Brick masonary, R.C.C. Work, Plastering Work, Painting, Flooring.	08	18
3.	**Rate Analysis of Civil Works** Task Work and influencing factors, Labour required for different works and Labour rates, Market rates of construction materials, Schedule of Rates (SOR) Rate analysis and factors affecting it rate analysis , Rate analysis for earthwork in excavation, C.C.Work, Brick masonry Work, R.C.C. Work, Plastering, flooring work.	10	22

Section II			
Module No.	Content	Hours	Weightage in %
4.	**Estimation of Civil Works**	22	50

	Methods of detailed estimation, One/ two room building, Two storied buildings (RCC footings, Column, beams, slab) RCC retaining wall/ Culverts, Methods of calculating earthwork quantities for roads and canals.		
	TOTAL	45	100

List of Practical:

Sr. No	Name of Practical	Hours
1.	Rate analysis for different construction activities.	04
2.	Estimation for One/Two Room Building	04
3.	Estimation for Two Storied Buildings	10
4.	BBS for Slab	10
5.	BBS for Beam	08
6.	BBS for Column	08
7.	Detailed estimation for culverts.	04
8.	Estimating quantities for RCC retaining walls.	04
9.	Calculation of cut and fill quantities for roads.	08
	TOTAL	60

Text Book(s):

Text Book	Author	Publication
Estimating and Costing in Civil Engg.	B.N.Dutta	Ubspd, New Delhi
Estimating and Costing in Civil Engg.	S.C.Rangwala	Charotar Publication, Anand, Gujarat

Reference Book(s):

Title	Author/s	Publication
Estimation and Costing	M.C Chakraborti	Chakraborti (2006)

Web Material Link(s):

- https://nptel.ac.in/courses/105104161/6
- https://nptel.ac.in/courses/105103023/35

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 tutorial which will be evaluated out of 20 marks for each tutorial and average of the same will be converted to 20 marks.
- Internal viva consists of 10 marks.
- Quiz/drawing/test consists of 10 markss.

Course Outcome(s):

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

SECV3300	ESTIMATION & COSTING
CO 1	Identify and calculate the units for various quantities for item of work.
CO 2	Develop detailed specifications and work out rate analysis for all works related to civil engineering projects.
CO 3	Understand the preparation of an abstract estimate and detailed estimate of building.
CO 4	Design and prepare bar bending schedule for reinforcement works.
CO 5	Calculation of earth work quantity for roads and canals.

Mapping of CO with PO

SECV3300	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO 1	2				2	2			3	3		3
CO 2	1				1	2			3	3		3
CO 3	1				2	2			3	3		3
CO 4	1				2	2			3	3		3
CO 5	2				1	2			3	3		3

Mapping of CO with PSO

SECV3300	PSO1	PSO2	PSO3
CO 1	3	3	3
CO 2	3	3	3
CO 3	3	3	3
CO 4	3	3	3
CO 5	3	3	3

Level of Bloom's Revised Bloom's Taxonomy in Assessment

1: Remember	2: Understand	3: Apply
4: Analyze	5: Evaluate	6: Create

Module No	Content	RBT Level
1	Estimation and Modes of Measurement	1, 2, 4
2	Specifications of Civil Works	1, 2, 3, 4
3	Rate Analysis of Civil Works	1, 2, 3, 4, 5, 6
4	Estimation of Civil Works	1, 2, 3, 4, 5, 6

P P Savani University
School of Engineering

Department of Civil Engineering

Course Code: SECV3101
Course Name: Water & Waste Water Engineering
Prerequisite Course/s: - Environmental Engineering (SECV3040)

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	-	04	40	60	20	30	-	-	150

CE: Continuous Evaluation, ESE: End Semester Exam

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

- test raw water as per the standard practices.
- prepare lay out plan and maintain water distribution and sewer-networks.
- maintain the pipe-network for water supply and Sewage disposal effectively.
- plan and implement house plumbing work effectively.

Course Content:

Section I			
Module No.	Content	Hours	Weightage in %
1.	**Planning for Water Supply System** Public water supply system, Planning, Objectives, Design period, Population forecasting, Water demand, Sources of water and their characteristics, Surface and Groundwater, Impounding Reservoir Well hydraulics, Development and selection of source, Water quality, Characterization and standards, Impact of climate change.	08	17
2.	**Conveyance of Water** Types of pipes used for conveyance, Pipe joints, Laying of Pipes, Distribution system, Types of valves, Types of Meters, Pipe fittings and fixtures, Necessity, Methods to prevent leaks, Measures for conservation of water.	06	15
3.	**Water Distribution and Supply to Buildings** Requirements of water distribution, Components, Service reservoirs, Functions and drawings, Network design, Economics, Appurtenances, operation and maintenance, Methods. Principles of design of water supply in buildings, House service connection, Systems of plumbing, and drawings of types of plumbing.	09	18
Section II			
Module No.	Content	Hours	Weightage in %
4.	**Sanitation System**	08	18

	Introduction, Objective of sewage disposal, Methods of sewage collection, Conservancy system, Water carriage system, Classification of Drains, Sewer section, Sewer joint, Manhole, Flushing tank, Catch basin, Laying of sewer, Hydraulic testing of sewer pipe, Maintenance of sewer, Procedure for maintenance of sewerage system, Causes of trouble and odor, Sewer cleaning operations, Explosives in sewers, Safety measures for sewer-men.		
5.	**Waste Water Engineering** Physical, chemical and biological characteristics of sewage. Generation and collection of wastewaters, sanitary, storm and combined sewerage systems, Quantities of sanitary wastes and storm water. Design of sewerage system. Characteristics of sewage, Sampling of sewage, Treatment of sewage, B.O.D. Test, C.O.D. test, Methods of sewage disposal.	08	18
6.	**House Plumbing** Plumbing terms, Plumbing tools, Pipes and pipe fittings, Fixing and jointing pipes and accessories, Traps, House drainage plant, Plumbing practice and operations, Safety and precautions, Sanitary fittings.	06	14
	TOTAL	45	100

List of Practical:

Sr. No	Name of Practical	Hours
1	Introduction to standards, collection and preservation of samples, sampling techniques and laboratory equipment	02
2	Determine Turbidity of water sample	02
3	BOD test for water and waste water	02
4	COD test for water and waste water	02
5	Determination of D.O. by Winkler's methods	02
6	Design septic tank	04
7	Visit water treatment plant & Making visit report	02
8	Visit Sewage treatment plant & Making visit report	02
9	Treatability study of domestic wastewater	02
10	Determination of dose of chemicals for removal of hardness of given water Sample	02
11	Determination of langelier's saturation index	02
12	Prepare Sketches	06
	TOTAL	30

Text Book(s):

Title	Author/s	Publication
Text book of water supply & Sanitary Engg.	S. K. Hussain	Oxford & IBH
Water supply & Sanitary Engg.	Vazirani & Chandola	Khanna Publishers

Reference Book(s):

Title	Author/s	Publication

Water and Waste water Engineering	Gorden, Fair & Gayer Okun	John Willey & Sons
A Text book of water supply engineering	V.N. Gharpure	Allied Book Stall, Baroda
Water supply and Sanitary Engineering	J S Birdie	Dhanpat Rai and Sons Publication, New Delhi

Web Material Link(s):

- https://en.wikipedia.org/wiki/Water_supply_network
- https://www.isws.illinois.edu/iswsdocs/wsp/ppt/MAC_12_10_07.pdf
- http://www.allianceforwaterefficiency.org/uploadedFiles/Resource_Center/Library/United_States/Rhode_Island/RI-water-efficiency-and-management-rules.pdf
- http://ecoursesonline.iasri.res.in/mod/page/view.php?id=2571

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 students will be able to

SECV3101	**WATER & WASTE WATER ENGINEERING**
CO 1	Understand need of proper treatment of the water and waste water before supply and disposal as per government standards.
CO 2	Interpret and summarize various elements of water conveyance/distribution, their need and suitability.
CO 3	Understand and use various components of sewer network, maintenance of sewer network and allied risk in maintaining it.
CO 4	Design the component of waste water treatment plant and factor which govern the design of it.
CO 5	Identify various physical, chemical and biological parameter for deciding proper treatment method and doses determination.

Mapping of CO with PO

SECV3101	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO 1	2	2	2	1	1	3	3	1		1		3
CO 2	2	2	3	3	1	2	1			1		3
CO 3	2	2	3	3	1	2	1			1		3
CO 4	2	3	3	3	1	2	2			1		3
CO 5	2	2	3	3	2	2	1			1		3

Mapping of CO with PSO

SECV3101	PSO1	PSO2	PSO3
CO 1	2	3	3
CO 2	2	2	3
CO 3	2	2	3
CO 4	3	2	3
CO 5	3	3	3

Level of Bloom's Revised Bloom's Taxonomy in Assessment

1: Remember	2: Understand	3: Apply
4: Analyze	5: Evaluate	6: Create

Module No	Content	RBT Level
1	Planning for Water Supply System	1, 2, 4
2	Conveyance of Water	1, 2, 3, 4
3	Water Distribution and Supply to Buildings	1, 2, 3, 4, 5, 6
4	Sanitation System	1, 2, 3, 4, 5, 6
5	Waste Water Engineering	1, 2, 3, 4, 5
6	House Plumbing	1, 2, 3, 4

P P Savani University
School of Engineering

Department of Civil Engineering

Course Code: SECV3281
Course Name: Highway & Traffic Engineering
Prerequisite Course(s): Basics of Transportation Engineering (SECV3070)

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	-	04	40	60	20	30	-	-	150

CE: Continuous Evaluation, ESE: End Semester Exam

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

- gain knowledge about highly efficient traffic flow through ample research and innovative design efforts.
- use research for designing roadways and highways that increase traffic safety (strategic implementation of stop signs, traffic signs, and traffic lights).
- understand geometric and structural design of highway.
- understand traffic parameters and traffic control.
- understand accident causes and remedies.

Course Content:

Section I			
Module No.	Content	Hours	Weightage in %
1.	**Introduction** Scope of Highway Engineering, Highway Planning and Development in India, Classification of Rural and Urban Roads, Road Patterns, Planning and Alignment Surveys.	03	07
2.	**Traffic Characteristics** Road user's characteristics - general human characteristics, physical, mental and emotional factors, factors affecting reaction time, PIEV theory, Vehicular characteristics: (static and dynamic), Characteristics affecting road design-width, height, length and other dimensions. Weight, power, speed and braking capacity of a vehicle.	08	18
3.	**Highway Geometric Design** Introduction; highway cross section elements, sight distance, design of horizontal alignment, design of vertical alignment, super-elevation, widening, gradients.	11	25
Section II			

Module No.	Content	Hours	Weightage in %
4.	**Highway material and construction** Pavement materials- Materials used in Highway Construction- Soils, Stone aggregates, bituminous binders, bituminous paving mixes; Portland cement and cement concrete: desirable properties, tests, requirements for different types of pavements. Problems.	05	11
5.	**Pavement Design** Types and component parts of pavements, Factors affecting design and performance of pavements. Stresses and Deflections in Flexible Pavements: Stresses and deflections in homogeneous masses. Burmister's two layer theory, three layer and multi-layer theories; wheel load stresses, various factors in traffic wheel loads; ESWL of multiple wheels. Repeated loads and EWL factors; sustained loads. Pavement behaviour under transient traffic loads. Flexible Pavement Design Methods For Highways and design of flexible pavements as per IRC.	10	22
6.	**Traffic engineering** Basic parameters, Traffic studies, Different traffic control devices, Signs, markings, signals, Traffic management and regulation, Concepts of at-grade & grade separated intersections, highway capacity, level of service.	08	17
	TOTAL	45	100

Text Book(s):

Title	Author/s	Publication
Highway Engineering	Dr. S.K. Khanna and Dr. C.E. G. Justo	Nem Chand & Bros., Roorkee
Traffic Engineering and Transport Planning	L.R. Kadiyali	Khanna Publishers, Delhi

Reference Book(s):

Title	Author/s	Publication
Highway Engineering	L.R. Kadiyali	Khanna Publishers, New Delhi
Principles, Practice & Design of Highway Engineering	S.K. Sharma	S. Chand & Co., New Delhi.
IRC – 37 Guidelines for Design of flexible Pavements, IRC, New Delhi – 2001.		
IRC – 67 Code of Practice for Road Signs, IRC, New Delhi – 2001.		
IRC: 58, 2002: "Guidelines for the Design of Plain Jointed Rigid Pavements for Highways", IRC, N. Delhi, December, 2002.		

Web Material Link(s):

- https://nptel.ac.in/courses/105103097/
- https://nptel.ac.in/courses/105103097/25

List of Practical:

Sr. No	Name of Practical	Hours
1.	California Bearing Ratio (CBR) Test	04
2.	Aggregate crushing Test	02
3.	Aggregate Impact Test	02
4.	Flakiness Index and Elongation Index Test for Aggregate	02
5.	Los Angeles Abrasion Test / Deval Abrasion Test	02
6.	Marshall stability test on Bitumen mix.	02
7.	Specific gravity and Water Absorption test for Aggregate.	02
8.	Penetration test for Bitumen.	02
9.	Softening point test for Bitumen.	02
10.	Ductility test for Bitumen.	02
11.	Flash and Fire Point test for Bitumen.	04
12.	Specific gravity test for Bitumen	02
13.	Viscosity Test for Bitumen.	02
	TOTAL	30

Course Evaluation:

Theory:

- Continuous Evaluation consists of two tests each of 30 marks and of 1 Hour 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 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 of 15 marks during End Semester Exam.

Course Outcome(s):

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

SECV3281	HIGHWAY & TRAFFIC ENGINEERING
CO 1	Understand the importance of highway engineering.
CO 2	Discuss traffic engineering and its characteristics.
CO 3	Determine various tests on the materials used in highway construction work.
CO 4	Review various aspects related to the construction and maintenance of highways
CO 5	Evaluate the various methods of pavement design.

Mapping of CO with PO

SECV3281	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO 1		1	2	1	2	2	1		3	3	2	1
CO 2		1	2	2	2	2	2		3	3	2	1
CO 3		1	2	3	2	2	1		3	3	3	1
CO 4		1	2	2	2	2	2		3	3	2	1
CO 5		1	2	2	3	2	1		3	3	3	1

Mapping of CO with PSO

SECV3281	PSO1	PSO2	PSO3
CO 1	3	2	1
CO 2	3	2	1
CO 3	3	2	1
CO 4	3	2	1
CO 5	2	2	1

Level of Bloom's Revised Bloom's Taxonomy in Assessment

1: Remember	2: Understand	3: Apply
4: Analyze	5: Evaluate	6: Create

Module No	Content	RBT Level
1	Introduction	1, 2
2	Traffic Characteristics	1,2,4,6
3	Highway Geometric Design	1,2,3,4,5
4	Highway material and construction	1,2,4,5
5	Pavement Design	1,2
6	Traffic engineering	1,2,3,4,5

FOURTH YEAR B. TECH

P P SAVANI UNIVERSITY															
SCHOOL OF ENGINEERING															
TEACHING & EXAMINATION SCHEME FOR B. TECH. CIVIL ENGINEERING PROGRAMME AY: 2026-27															
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**	
7															
	SECV4211	Structural Design - II	CV	3	0	2	5	5	40	60	0	0	40	60	200
	SECV4221	Professional Practice & Valuation	CV	3	4	0	7	5	40	60	40	60	0	0	200
	SECV4230	Construction Management & Equipment	CV	3	2	0	5	4	40	60	40	60	0	0	200
		Elective-I	CV	3	0	0	3	3	40	60	0	0	0	0	100
	TNPC3020	Creativity, Problem Solving & Innovation	TNPC/SOE	2	0	0	2	2	100	0	0	0	0	0	100
	SECV4950	Project/Summer Internship	CV	0	5	0	0	5	0	0	100	0	0	0	100
						Total	**22**	**24**							**900**
8	SECV4960	Project/Training	CV	23			23	23	0	0	200	300	0	0	500
						Total	**23**	**23**							**500**
						Total	**177**	**190**							**6600**

TEACHING & EXAMINATION SCHEME FOR B. TECH. CIVIL ENGINEERING PROGRAMME AY: 2023-24 LIST OF ELECTIVES														
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**	
SECV4610	Advanced Structural Mechanics	CV	3	0	0	3	3	40	60	0	0	0	0	100
SECV4620	Basics of Earthquake Engineering	CV	3	0	0	3	3	40	60	0	0	0	0	100
SECV4630	Environmental Laws for Engineers	CV	3	0	0	3	3	40	60	0	0	0	0	100
SECV4640	Soil Improvement Techniques & Geotextile Engineering	CV	3	0	0	3	3	40	60	0	0	0	0	100
SECV4650	Legal Aspects in Construction Practice	CV	3	0	0	3	3	40	60	0	0	0	0	100
SECV4660	Modern Transportation system	CV	3	0	0	3	3	40	60	0	0	0	0	100
SECV4670	Modern Civil Engineering Equipment & Software	CV	0	6	0	3	3	40	0	100	0	0	0	100

P P Savani University

School of Engineering
Department of Civil Engineering

Course Code: SECV4211
Course Name: Structural Design-II
Prerequisite Course(s): SECV3062 - Structural Design-I

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	05	40	60	-	-	40	60	200

CE: Continuous Evaluation, ESE: End Semester Exam

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

- understand Limit state design with code of practice for general construction.
- understand the design concept of various connections and structural members.
- apply plastic design of steel structures like water tank and roof truss.

Course Content:

Module No.	Content	Hours	Weightage in %
1.	**Introduction** Introduction to Engineering Structures - Principles of Design, Loads, Factor of Safety, Properties of Steel.	04	10
2.	**Design of Connections in Steel Structures** Bolted and Welded Connections, Different Types of Joints, Design of Various Types of Riveted and Welded Connections Subjected to Direct Loads and Moments. **Design of Tension Members** Selection of Section, IS- Specifications, Design of Axially Loaded Tension Members, Design of Members for Axial Tension and Bending, End Connections, Design of Lug Angles and Tension Splices.	08	20
3.	**Design of Compression Members** Theory of Buckling, Design of Column, Cross Section (Single and Built Up Sections), Design of Angle Struts, Eccentrically Loaded Columns, Column Splices, Lacings and Battens Design of Beams: Laterally Stability, Design of Single and Built Up Beams, Plated Beams and Curtailment of Flange Plates	05	15

Module No.	Content	Hours	Weightage in %
4.	**Design of Column Bases and Column Footings** Slab Base-Gusseted Base Foundation and Column Bases, Subjected to Moment, Introduction to Plastic Design of Members and Load Resistance Factored Design (Lrfd) Method, Independent Column Footing	08	20
5.	**Design of foot-over bridges** Structural system of through & deck type bridges, design of foot-over bridge & its Supporting systems	05	08
6.	**Design of Roof Trusses** Types of Trusses, Roofs and Side Coverage, Types of Loadings and Load Combinations, Design of Members and Connections.	05	10
7.	**Design of Industrial Roof** Analysis and Design of Typical Industrial Roof Trusses with Gantry Girder and Portal Frames	06	10
8.	**Introduction to Plastic Design** Concept of elastic vs plastic behavior of steel, Elastic moment (Me) and plastic moment (Mp); Shape Factor (k), Types of mechanisms: Beam mechanism, Sway mechanism, Combined mechanisms	04	07
	TOTAL	45	100

List of Tutorials:

Sr. No	Name of Tutorial	Hours
1.	Bolted and welded connections	02
2.	Tension members	04
3.	Compression members	04
4.	Column base & slab base	04
5.	Design of foot-over bridges	04
6.	Roof truss	04
7.	Design of Industrial Roof	04
8.	Introduction to Plastic Design	04
	TOTAL	30

Text Book(s):

Title	Author/s	Publication
Design of Steel Structures	P. Dayaratnam	S. Chand of Co.

Reference Book(s):

Title	Author/s	Publication
Design of Steel Structure	Dugal S K	Tata Mc Graw Hill Publication, New Delhi
Steel Structures	B.C.Punamia	Laxmi Publication
Design of Steel Structures	Negi K S	Tata Mc Graw Hill Publisher Co. Ltd

Web Material Link(s):

- https://nptel.ac.in/courses/105105162/

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 masrks as per the guidelines provided by the course coordinator.
- End Semester Examination consists of 60 marks.

Tutorial:

- 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 20 marks.
- Internal viva consists of 20 marks.
- Practical performance/quiz/drawing/test consists of 30 marks during End Semester Exam.
- Viva/Oral performance consists of 30 marks during the End Semester Exam.

Course Outcome(s):

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

SECV4211	**STRUCTURAL DESIGN -II**
CO1	Understand the significance of various provisions made in the Indian standard codes (is 800:2007) for steel structures adapting various design philosophies.
CO2	Identify, sketch, understand and design various connections in steel structures.
CO3	Design compression, tension and flexure members using limit state method provisions in Indian standard.
CO4	Adapt and propose different column bases and design the base plates for the steel structures.
CO5	Design of industrial roof truss along with gantry girder using limit state method and working stress method.

Mapping of CO with PO

SECV4211	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO 1	1	3	2	2	1	2			2	3	3	3
CO 2	1	3	2	2	1	2			2	3	3	3
CO 3	1	3	2	2	1	2			2	3	3	3
CO 4	1	3	2	2	1	2			2	3	3	3
CO 5	1	3	2	2	1	2			2	3	3	3

Mapping of CO with PSO

SECV4211	PSO1	PSO2	PSO3
CO 1	3	2	3
CO 2	3	2	3
CO 3	3	2	3
CO 4	3	2	3
CO 5	3	2	3

Level of Bloom's Revised Bloom's Taxonomy in Assessment

1: Remember	2: Understand	3: Apply
4: Analyze	5: Evaluate	6: Create

Module No	**Content**	**RBT Level**
1	Introduction	1,2
2	Design of connections in steel structures and design of tension members	2,3,4,5
3	Design of compression members	2,3,4,5,6
4	Design of column bases and colsumn footings	4,5,6
6	Design of roof trusses	4,5,6
7	Design of Industrial Roof	5,6
8	Introduction to Plastic Design	5,6

P P Savani University
School of Engineering

Department of Civil Engineering

Course Code: SECV4221
Course Name: Professional Practice & Valuation
Prerequisite Course(s): SECV3090 - Estimating and Costing

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	-	05	40	60	40	60	-	-	200

CE: Continuous Evaluation, ESE: End Semester Exam

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

- develop a basic understanding of the scope of professional practice.
- gain knowledge on types of contracts.
- understand about tendering system.
- evaluate valuation for building and land.
- understand the building procurement process.

Course Content:

Module No.	Content	Hours	Weightage in %
1.	**Professional Roles & Ethics** Stakeholders in civil engineering practice: government, regulatory bodies, professional institutions, Roles and responsibilities of clients/owners, developers, architects/consultants, contractors, vendors/service agencies, Introduction to professional ethics: definitions (business ethics, corporate ethics, engineering ethics, personal ethics), Code of Ethics for engineers: conflict of interest, gift vs bribery, duty to society, duty to environment, negligence	04	10
2.	**Legal Frameworks & Intellectual Property** Key legislation relevant to civil engineering practice, labour laws and service conditions, Regulatory bodies, codes and standards, Intellectual Property Rights (IPR) overview: patents, copyrights, trademarks in construction industry, Dispute resolution: Arbitration, litigation, mediation	06	10
3.	**P.W.D. Accounts and Procedure of Works** Organizational Set up, Classification of work, Execution of work, Measurement Book, Store Procedure, Mode of Payments, Public works Accounting System.	06	10

4.	**Contracts** Introduction, Types of contracts, Formation of contract, Contract conditions, Contract for labour, material, design, construction, drafting of contract documents based on IBRD / MORTH Standard bidding documents	06	15
5.	**Tenders** Tender Notices, Types, Tender Procedures, Drafting Model Tenders, E-Tendering - Digital Signature Certificates, Encrypting, Decrypting, Reverse Auctions.	06	10
6.	**Valuation** Definitions, Classification of Valuations, Valuation Methods, Purpose of Valuation, Types of Property, Depreciation, Sinking Fund, Lease Hold and Free Hold Property, Obsolescence, Gross Income, Outgoing and Net Income, Capitalized Value and Year's Purchase; Rental Method of Valuations, and Typical Problems, Escalation, Valuation of Land, Buildings, Calculation of Standard Rent, Mortgage, Lease.	08	20
7.	**Construction safety management** Evolution of safety, Accident causation theory, Unsafe conditions, Unsafe acts health and safety act and regulation cost of accidents, Roles of safety personnel, Accident causes and principles of safety, Safety and health management system	04	10
8.	**Emerging Issues & Professional Practice Trends** Use of modern tools: BIM, quantity surveying software, digital dashboards, IoT/Smart sensors in construction, Sustainability, ethics and corporate social responsibility in civil engineering practice, Green building standards (e.g., Green Rating for Integrated Habitat Assessment (GRIHA)), life-cycle costing, whole-life value, Globalisation of professional practice: international contracts, FIDIC/IPC standard forms, cross-border engineering services, Future of professional practice: digital tendering, e-procurement, smart contracts/blockchain, dispute avoidance/adjudication boards	05	15
	TOTAL	45	100

List of Practical:

Sr. No	Name of Practical	Hours
1.	Professional Roles & Ethics	04
2.	Legal Frameworks & Intellectual Property	08
3.	P.W.D. Accounts and Procedure of Works	08
4.	Contracts	08
5.	Tenders	08

6.	Valuation	08
7.	Construction safety management	08
8.	Emerging Issues & Professional Practice Trends	08
	TOTAL	60

Text Book(s):

Title	Author/s	Publication
Estimating, Coasting & Valuation	S.C.Rangwala	Charotar Publication

Reference Book(s):

Title	Author/s	Publication
Professional Practice	Rashan Nanavati	Lakhani book Depot, Mumbai
PWD Handbook & Survey	Govt. of India	
Indian Standard Code-1200	Govt. of India	
Construction Project Management	K K Chitkara	Tata Mac Grow Hill

Web Material Link(s):

- https://en.wikipedia.org/wiki/Contract
- https://eprocure.gov.in/eprocure/app
- http://www.civilprojectsonline.com/civil-projects/methods-of-valuation-of-a-building/
- https://en.wikipedia.org/wiki/Easement
- https://en.wikipedia.org/wiki/Arbitration

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 consists of 60 marks.

Practical:

- 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 consists of 60 marks.

Course Outcome(s):

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

SECV4221	Professional Practice & Valuation
CO 1	Understand about office procedure, entrepreneurship development, IPR & easement.
CO 2	Execute and understanding work flow of PWDfor initiating of works.
CO 3	Analyze and apply industry professional knowledge.
CO 4	Apply knowledge of tendering and contracting in civil engineering practices.
CO5	Analyze property data and trends to determine property value for a property.

Mapping of CO with PO

SECV4221	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO 1	1					3		3	3	3	2	3
CO 2	1					3		3	3	3	2	3
CO 3	1					3		3	3	3	2	3
CO 4	1					3		3	3	3	2	3
CO 5	2	2				3		3	3	3	3	

Mapping of CO with PSO

SECV4221	PSO1	PSO2	PSO3
CO 1	3	2	2
CO 2	2	2	3
CO 3	2	2	3
CO 4	3	2	2
CO 5	3	1	3

Level of Bloom's Revised Bloom's Taxonomy in Assessment

1: Remember	2: Understand	3: Apply
4: Analyze	5: Evaluate	6: Create

Module No	Content	RBT Level
1	Professional Roles & Ethics	1, 2, 3

2	Legal Frameworks & Intellectual Property	1, 2, 3, 4
3	P.W.D. Accounts and Procedure of Works	1, 2, 3, 4, 5, 6
4	Contracts	1, 2, 3, 4
5	Tenders	1, 2, 3, 4, 5, 6
6	Valuations	1, 2, 3, 4, 5, 6
7.	Construction safety management	1, 2, 3, 4, 5, 6
8.	Emerging Issues & Professional Practice Trends	5,6

P P Savani University
School of Engineering

Department of Civil Engineering

Course Code: SECV4230
Course Name: Construction Management & Equipment
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	-	04	40	60	40	60	-	-	200

CE: Continuous Evaluation, ESE: End Semester Exam

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

- define and describe construction processes and various engineering roles involved.
- describe, interpret, and differentiate between project delivery systems in construction projects.
- explain and desvelop work breakdown structures.
- develop construction plans and schedules.
- categorize construction operations, equipment.

Course Content:

Module No.	Content	Hours	Weightage in %
1.	**Construction Management** Introduction of Construction Management, Objectives and Scope of Construction Management. A Construction Project, Phases of Construction Project, Importance of Construction and Construction Industry, Indian Construction Industry Need of Construction Management, Stakeholders of Construction Management	04	10
2.	**Construction Planning** Types of Project Plans, Work Break Down Structure, Planning Techniques, Bar Charts, CPM and PERT Network Analysis, Line of Balance Method, Project Scheduling and Resource Leveling, Resource Allocation, Importance of Project Scheduling	08	20
3.	**Construction Quality Management** Construction Quality, Inspection, Quality Control and Quality Assurance in Projects, Total Quality Management.	05	10

4.	**Construction Equipment** Introduction to Construction Equipment and their Contribution and Importance in Construction Industry. Classification of Equipment, Financial Aspects related to Construction Equipment: Discounted Present Worth Analysis, Depreciation, Cost of Owning and Operating Construction Equipment, Basics of Equipment Replacement Policy	06	15
5.	**Excavating Equipment** Power Shovels, Draglines, Hoes, Clam Shells and Trenching Machines, their Basic Parts, Operation, Output Estimation, Factors Influencing output and Methods to Enhance it, Tractors and Related Equipment: Bulldozers, Rippers, Scrapers & Overview of Other Equipment	05	10
6.	**Cost Control & Safety in Construction** Cost control techniques: direct cost vs indirect cost, time-cost trade-offs, value engineering, Safety management in construction: hazard identification, accident prevention, safety rules for equipment operations, inspections, documentation, Legal & contractual aspects: equipment hire contracts, equipment insurance, claims, downtime analysis.	06	15
7.	**Belt Conveyor System** Terminology, Classification, Components, Power Requirement Estimation and Design. **Hauling Equipment** Trucks and Wagons, Operation and Guideline for Selection and Deployment.	05	10
8.	**Emerging Technologies & Sustainable Practices in Equipment Use** Mechanisation vs automation: robotics in construction, drones for site monitoring, IoT sensors in equipment, Building Information Modelling (BIM) for equipment planning and scheduling, Green construction equipment: fuel-efficient machines, emission control, lifecycle costing, Case studies of large-scale projects: selection & management of equipment for high-rise, bridge, tunnel projects	06	10
	TOTAL	45	100

List of Practical:

Sr. No	Name of Practical	Hours
1	Write a scope and objectives of construction management.	01
2	Draw a work break down structure for a given job and draw a job layout for given construction project.	01
3	Example based on Bar charts,	02
4	Example based on Milestone charts.	02
5	Example based on line of balance technique.	02
6	Tutorial based on CPM & PERT.	02
7	Tutorial based on resource allocation and resource scheduling.	02

8	Tutorial based on construction equipment like classification of equipment, financial aspect, depreciation, cost of owning and operating.	02
9	Write in brief about hauling equipment, excavating equipment and belt conveyor system with neat sketches.	01
	TOTAL	15

Text Book(s):

Title	Author/s	Publication
Project Planning and control with PERT & CPM	B.C. Punmia and K.K Khandelwal	Laxmi Publication Pvt. Ltd. New Delhi.

Reference Book(s):itle	Author/s	Publication
A Management Guide to PERT/ CPM	J. D. Weist and F.K. Levy	Prentice Hall of India Pvt. Ltd.
Construction Project Management (Theory & Practice)	Kumar Neeraj Jha	Pearson
Construction Planning and Managementss	P.S. Gahlot and B.M. Dhir	New Age International Pvt. Ltd., New Delhi.

Web Material Link(s):

- https://en.wikipedia.org/wiki/Construction_management
- http://www.interventions.org/pertcpm/
- https://www.smartsheet.com/blog/5-strategies-of-construction-pm
- https://www.thebalancesmb.com/construction-schedule-techniques-844480
- https://www.designingbuildings.co.uk/wiki/Line_of_balance_(LOB)

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 consists of 60 marks.

Practical:

- Continuous Evaluation consists of tutorial which will be evaluated out of 10 for each tutorial and average of the same will be converted to 10 marks.
- Internal viva consists of 10 marks.
- Viva/Oral performance of 30 marks during End Semester Exam.

Course Outcome(s):

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

SECV4230	CONSTRUCTION MANAGEMENT & TECHNIQUE
CO 1	Understand the different construction management techniques and application of different construction equipment.

CO 2	Learn the concept of construction management and different job layout with cost control and safety.
CO 3	Develop the CPM and pert network of various construction activities.
CO 4	Develop concepts related with construction management & equipment management.
CO 5	Categorize construction equipment in relation to their functional application on projects.

Mapping of CO with PO

SECV4230	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO 1	1			1	1	2	3	3	3	3	3	3
CO 2					1	2	3	3	3	3	3	3
CO 3	2	1			1		3	3	3	3	3	3
CO 4					1	2	3	3	3	3	3	3
CO 5				1	1	2	3	3	3	3	3	3

Mapping of CO with PSO

SECV4230	PSO1	PSO2	PSO3
CO 1	3	3	3
CO 2	2	3	2
CO 3	2	2	3
CO 4	3	3	3
CO 5	2	3	2

Level of Bloom's Revised Bloom's Taxonomy in Assessment

1: Remember	2: Understand	3: Apply
4: Analyze	5: Evaluate	6: Create

Module No	**Content**	**RBT Level**
1	Construction Management	1, 2, 3
2	Construction Planning	1, 2, 3,4
3	Construction Quality Management	1, 2, 3, 4
4	Construction Equipment	1, 2, 3, 4, 5, 6
5	Excavating Equipment	1, 2, 3, 4
6	Cost Control & Safety in Construction	3,4,6
7	Belt Conveyor Systems & Hauling Equipment	1, 2, 3, 4

8	Emerging Technologies & Sustainable Practices in Equipment Use	3,4,6

P P Savani University
School of Engineering

Department of Civil Engineering

Course Code: SECV4610
Course Name: Advanced Structural Mechanics
Prerequisite Course(s)s: Engineering Mechanics (SECV1030), Strength of Material (SECV2011)

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	-	-	03	40	60	-	-	-	-	100

CE: Continuous Evaluation, ESE: End Semester Exam

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

- have a good grasp of all the fundamental issues in these advanced topics in structural analysis.
- have a good understanding of how standard software packages function.

Course Content:

Module No.	Content	Hours	Weightage in %
1.	**Review of Basic Concepts in Structural Analysis** Structural elements (structural elements, joints and supports, stability, rigidity and static indeterminacy, kinematic indeterminacy), loads (direct actions, indirect loading), response (equilibrium, compatibility, force-displacement relations) levels of analysis, analysis of statically determinate structures (trusses, beams, frames), applications of principle of virtual work and displacement-based and force-based energy principles, deriving stiffness and flexibility coefficients.	03	06
2.	**Review of Analysis of Indeterminate Structures** Force methods: Statically indeterminate structures (method of consistent deformations, theorem of least work). Displacement Methods: Kinematically indeterminate structures (slope-deflection method, moment distribution method).	04	09
3.	**Matrix Concepts and Matrix Analysis of Structures** Matrix, vector, basic matrix operations, rank, solution of linear simultaneous equations, eigenvalues and eigenvectors, coordinate systems, displacement and force transformation matrices, Contra-gradient principle, element and structure stiffness matrices, Element and structure flexibility matrices, equivalent joint loads, stiffness and flexibility approaches.	06	13
4.	**Matrix Analysis of Structures with Axial Elements** Introduction: Axial stiffness and flexibility, stiffness matrices for an axial element (two d.o.f), plane truss element (four d.o.f) and space truss element (six d.o.f), One-dimensional axial structures: Analysis by	10	22

	conventional stiffness method (two d.o.f per element) and reduced element stiffness method (single d.o.f),Analysis by flexibility method, Plane trusses: Analysis by conventional stiffness method (four d.o.f per element) and reduced element stiffness method (single d.o.f),Analysis by flexibility method, Space trusses: Analysis by conventional stiffness method (six d.o.f per element) and reduced element stiffness method (single d.o.f).		
5.	**Matrix Analysis of Beams and Grids** Conventional stiffness method for beams: Beam element stiffness (four d.o.f), generation of stiffness matrix for continuous beam, dealing with internal hinges, hinged and guided-fixed end supports, accounting for shear deformations, Reduced stiffness method for beams: Beam element stiffness (two d.o.f), dealing with moment releases, hinged and guided-fixed end supports, Flexibility method for fixed and continuous beams: Force transformation matrix, element flexibility matrix, solution procedure, (including support movements), Stiffness method for grids: Introduction, torsional stiffness of grid element and advantage of torsion release, analysis by conventional stiffness method using grid element with six d.o.f, analysis by reduced stiffness method (three d.o.f per element).	08	18
6.	**Matrix Analysis of Plane and Space Frames** Conventional stiffness method for plane frames: Element stiffness (six d.o.f), generation of structure stiffness matrix and solution procedure, dealing with internal hinges and various end conditions, Reduced stiffness method for plane frames: Element stiffness (three d.o.f), ignoring axial deformations, dealing with moment releases, hinged and guidedfixed end supports, Flexibility method for plane frames: Force transformation matrix, element flexibility matrix, solution procedure (including support movements), Ignoring axial deformations, Stiffness method for space frames: Introduction, element stiffness matrix of space frame element with 12 d.o.f and 6 d.o.f, coordinate transformations, analysis by reduced stiffness method (six d.o.f per element).	06	14
7.	**Analysis of Elastic Instability and Second-Order Effects** Effects of axial force on flexural stiffness: Review of buckling of ideal columns, Flexural behaviour and stiffness, measures for beam-columns - braced and unbraced, under axial compression, Solution by slope deflection method: Slope deflection equations for prismatic beam columns using stability functions, Modifications for pinned and guided-fixed-end conditions, Fixed end moments in beam-columns, Solution by matrix method: Stiffness matrix for prismatic beam, column element, estimation of critical elastic buckling loads, second-order analysis.	06	13

8.	**Introduction to Finite Element Method:** Introduction, Discretisation of a structure, Displacement functions, Truss element, Beam element, Plane stress and Plane strain, Triangular elements.	02	05

Text Book(s):

Title	Author/s	Publication
Advanced Structural Analysis	Devdas Menon	Narosa Publishing House
Matrix Analysis of Structures	Asslam Kassimali	Brooks/Cole Publishing Co., USA.

Reference Book(s):

Title	Author/s	Publication
Structural Analysis	Devdas Menon	Narosa Publishing House, 2008.
Structural Analysis: A Unified Classical and Matrix Approach	Amin Ghali, Adam M Neville and Tom G Brown	Sixth Edition, 2007, Chapman & Hall.

Web Material Link(s):

- https://nptel.ac.in/courses/105106050/1

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.

Course Outcome(s):

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

SECV4610	Advanced Structural Mechanics
CO 1	Explain the fundamental concepts of structural behavior, including stability, determinacy, and kinematic indeterminacy, and classify different types of struc tures and loadings.
CO 2	Analyze statically determinate and indeterminate structures using classical methods such as the force (flexibility) and displacement (stiffness) methods, including slope-deflection and moment distribution techniques.
CO 3	Develop and apply matrix methods for structural analysis, including the formulation of stiffness and flexibility matrices for truss, beam, grid, and frame elements in plane and space structures.
CO 4	Evaluate the effects of axial forces and second-order behavior (P–Δ effects) on structural stability and perform buckling and beam-column analyses using matrix-based approaches.
CO 5	Apply the fundamentals of the finite element method (FEM) to model and analyze truss, beam, and plane stress/strain elements, demonstrating an understanding of discretization and displacement functions

Mapping of CO with PO

SECV4610	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO 1	1	3	3	3	3		3		2		2	3
CO 2		3	2	3	1	3	3	3	2		2	3
CO 3	1	3	3	3	3	3	3	3	2		2	3
CO 4		1	1	1	1	2	3	3	3	3		3
CO 5		2	1	2	2	2	3	3	3			3

Mapping of CO with PSO

SECV4610	PSO1	PSO2	PSO3
CO 1	3	3	3
CO 2	2	2	3
CO 3	3	3	2
CO 4	2	3	3
CO 5	3	2	2

Level of Bloom's Revised Bloom's Taxonomy in Assessment

1: Remember	2: Understand	3: Apply
4: Analyze	5: Evaluate	6: Create

Module No	**Content**	**RBT Level**
1.	Review of Basic Concepts in Structural Analysis	3, 4,5
2.	Review of Analysis of Indeterminate Structures	3, 4,5
3.	Matrix Concepts and Matrix Analysis of Structures	3, 4,5
4.	Matrix Analysis of Structures with Axial Elements	3, 4,5
5.	Matrix Analysis of Beams and Grids	3, 4,5
6.	Matrix Analysis of Plane and Space Frames	3, 4,5
7.	Analysis of Elastic Instability and Second-Order Effects	3, 4,5
8.	Introduction to Finite Element Method	3, 4,5

P P Savani University
School of Engineering

Department of Civil Engineering

Course Code: SECV4620
Course Name: Basics of Earthquake Engineering
Prerequisite Course(s): - Structure Design I and II (SECV3062 & SECV4011)

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	-	-	03	40	60	-	-	-	-	100

CE: Continuous Evaluation, ESE: End Semester Exam

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

- Understand ground motion, magnitude, intensity, frequency and plate tectonics
- Compute ground motion intensity measures and attenuation relationships.
- Understand the earthquake hazard and design response spectra for the same.
- Apply building code earthquake requirements in design of structural systems.
- Apply the basics of structural dynamics in analysis of structures subjected to earthquakes

Course Content:

Module	Content	Hours	Weightage in %
1.	**Introduction** Inner & Outer core of earth plate tectonics & its circulation – Earthquake types – Types of faults – Different types of seismic waves – Measuring instruments of earthquake – Strong ground motion & it's characteristics – Magnitudes intensity of earthquake	03	14
2.	**Seism tectonic / Seismic Environment of Indian Region** Seismic Geography and tectonic features of India – Seismic zones earthquake in India	04	16
3.	**Seismic effect on Structures & Seismic Design Philosophy** Inertia force in structures & its foundation deformations in structure – Horizontal & vertical movement of structures – Drift – Twisting of structures during earthquake – Building codes. Earthquake Design philosophy – Acceptance damage & ductility of building & capacity design concept – Quality control – Importance of Flexibility of structures – Indian seismic codes.	04	20

4.	**Seismic Effects on Masonry Structures** Behaviour of Brick Masonry & stone masonry under earthquake engineering – Construction aspects to improve the behaviour of masonry wall – selection of building materials – Structure configuration of masonry buildings – Earthquake resistant features of masonry work, Earthquake Structure.	04	10
5.	**Seismic effect on Reinforced Concrete Building** Reinforced concrete buildings – Role of slab & masonry works – Behaviour R C Beams under seismic loadings, infill wall effect, shear wall position & effect.	03	10
6.	**Base Isolation System** Introduction to seismic dampers – viscous damper – Friction dampers – Yielding devices, active isolation method.	04	10
7.	**Earthquake-Resistant Design of Structural Components** Behavior of RC and steel frames under seismic loading. Detailing of RC members (beams, columns, joints) for ductility (IS 13920), Shear walls: design and detailing, Base isolation and energy dissipation devices.	04	10
8.	**Seismic Evaluation and Retrofitting of Structures** Common causes of building failures during earthquakes, Seismic evaluation methods (rapid visual screening, detailed evaluation), Retrofitting techniques: jacketing, FRP wrapping, shear wall addition, base isolation, Case studies of past earthquakes and retrofitted buildings	04	10
	TOTAL	30	100

Text Book(s):

Text Book	Author	Publication
Earthquake Resistant Design of Structures" 1st edition	Pankaj Agrawal & Manish Sprikhande	Prentice Hall of India Pvt Ltd, New Delhi.
An Introduction to seismic Isolation	Skinner R I & Robinson W H	Isolation Jonn wiley & sons, New York.
Design for Earthquakes	Ambrose J S Vergun D	John Wiley & Sons INC, New York
Seismic Design of reinforced Concrete & Masonry buildings	Paulay T & Priestley M J N,	John Wiley & Sons, New York
Earthquake Resistant Concrete Structures	Penelis G G & Kappos A J	E & FN Son, UK
Relevant Indian Standard Earthquake coded	IS: 1893-2000, 13920-1993, 13828- 1993, 4326 -1996	Gov. of India

Web Material:

- NPTEL :: Civil Engineering – Introduction to Earthquake Engineering

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.

Course Outcome(s):

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

SECV4620	**EARTHQUAKE ENGINEERING**
CO1	Classify the earthquake and differentiate the magnitude and intensity of the earthquake.
CO2	Categorize the geography and tectonic features of India to facilitate earthquake severity.
CO3	Estimate the distress generation in the structural member due to earthquake wave propagation.
CO4	Evaluate the seismic performance behavior of RC frame structure and masonry structure.
CO5	Adapt base isolation techniques to control the adverse effect of the seismic waves.

Mapping of CO with PO

SECV4620	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO 1	1	3	3	3	3		3		2		2	3
CO 2		3	2	3	1	3	3	3	2		2	3
CO 3	1	3	3	3	3	3	3	3	2		2	3
CO 4		1	1	1	1	2	3	3	3	3		3
CO 5		2	1	2	2	2	3	3	3			3

Mapping of CO with PSO

SECV4620	PSO1	PSO2	PSO3
CO 1	3	1	3
CO 2	2	1	2
CO 3	3	3	3
CO 4	3	2	2
CO 5	3	3	3

Level of Bloom's Revised Bloom's Taxonomy in Assessment

1: Remember	2: Understand	3: Apply
4: Analyze	5: Evaluate	6: Create

Module No	**Content**	**RBT Level**
1	Introduction	1, 2
2	Seism tectonic / Seismic Environment of Indian Region	1, 2
3	Seismic effect on Structures & Seismic Design Philosophy	2, 3, 5, 6
4	Seismic Effects on Masonry Structures	2, 3, 5, 6

5	Seismic effect on Reinforced Concrete Building	2, 3, 4, 5, 6
6	Base Isolation System	2, 4, 6
7	Earthquake-Resistant Design of Structural Components	2, 3, 4, 5, 6
8	Seismic Evaluation and Retrofitting of Structures	2, 3, 4, 5, 6

P P Savani University
School of Engineering

Department of Civil Engineering

Course Code: SECV4630
Course Name: Environmental Laws for Engineers
Prerequisite Course(s): Global Environmental Challenges & Management (SECV1050)

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	-	-	03	40	60	-	-	-	-	100

CE: Continuous Evaluation, ESE: End Semester Exam

Objective(s) of the Course:
To help learners to
- understand various Environmental laws.
- understand various National and International Environmental laws.
- understand environmental Impact Policies.

Course Content:

Module No.	Content	Hours	Weightage in %
1.	**Introduction to Environmental Law** Introduction to environmental law and Overview of Environment & Law, Origin of Environmental Law, Concept of Law & Policy, Sustainable Development and Environment, Understanding Climate Change and its processes CDP, CDMs and Carbon Off Setting.	04	10
2.	**National Environmental Law and policy** **Introduction to National Environmental Laws** Environmental Law and the Indian Constitution, Other Laws and Environment (IPC, Cr.PC, Torts), Protection Act, 1986. **Law and Policy Frameworks related to Forest and Wildlife** The Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 and Forest Conservation Act, 1980, Panchayats Extension to Scheduled Areas (PESA) Act 1996 Wildlife Protection Act, 1972, Coastal Regulation Zone & Coastal Regulation Management., Land Acquisition Act, 1894, Tenure & Property Rights and Community Rights, Introduction to displacement and rehabilitation, Displacement and Environment Concerns.	04	20
3.	**Environment Impact & Policy** Introduction to Environmental Impact Assessment, EIA Infrastructure Projects & Environment, Introduction to Environmental Public, Hearing (EPH) & Processes, Introduction to displacement and rehabilitation Displacement and Environmental Concerns. **Environmental Disasters**	04	20

	Introduction to Environmental Disasters, Oil Spills & Gas Leaks Marine Pollution Industrial Accidents.		
4.	**International Environmental Law and Policy** Emergence of International Environmental Law, Fundamental, Principles and Application of International Environmental Law, Introduction to Trade & Environment, Right to Environment as Human Right, International Humanitarian Law and Environment, Environment and Conflict Management, UNFCCC & Kyoto Protocol, Treaty on Antarctic & Polar Regions – 1961, UN Convention of Law of the Sea and Regional Seas Convention, Law on International Watercourses.	04	10
5.	**Introduction to Environment and IPR** Environment and IPR, Traditional Knowledge and Environment, International Convention for the Protection of New Varieties of Plants (UPOV Convention).	02	10
6.	**International Environmental Organizations and Dispute Settlement** Nature and Origin of International Environmental Organizations, (IEOs), International Environmental Organizations and Negotiations, MEAs and Dispute Settlement Mechanisms.	04	10
7.	**Land Use, Noise, and Coastal Regulation** Land acquisition and environmental concerns, Land degradation, mining, and reclamation policies, Noise Pollution (Regulation and Control) Rules, 2000, Coastal Regulation Zone (CRZ) notifications and restrictions, Urban environmental planning and sustainable land use	04	10
8.	**Recent Developments and Case Studies** Sustainable Development Goals (SDGs) and environmental policy integration, Climate change legislation and carbon trading, Role of ISO 14000 Environmental Management Systems, Case studies on major environmental litigations (e.g., Bhopal Gas Tragedy, Ganga Pollution, Sterlite, Vizag Gas Leak), Ethical and professional responsibilities of engineers	04	10
	TOTAL	30	100

Text Book(s):

Title	Author/s	Publication
Environmental Law & Policy in India	Armin Rozencaranz; Shyam Divan & Marhta L Noble	Tripathi publications, 1999

Reference Book(s):

Title	Author/s	Publication
Basic and applied soil mechanics	Gopal Ranjan, Rao A.S.R	New age int. (p) ltd.
Principles of Geotechnical Engineering	Das Braja M.	Thomson Asia Pvt. Ltd
Soil Mechanics and Foundation Engineering	P. Purushothama Raj	Pearson 2) Education.

Web Material Link(s):

- http://pages.mtu.edu/~jwsuther/erdm/env_law.pdf
- https://www.crcpress.com/Environmental-Law-for-Engineers-and-Geoscientists/Aston/p/book/9781566705752
- https://onlinelibrary.wiley.com/doi/abs/10.1002/9781119304418.ch3

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.

Course Outcome(s):

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

SECV4630	Engineering Environmental Sustainability
CO 1	Understand about the Constitutional provision for Environmental Protection.
CO 2	Get Information about various Environmental Laws and their evolution in India.
CO 3	Get knowledge of major Acts and Rules for preventing and controlling the pollution.
CO 4	Get information about Notifications under Environmental Protection Act.
CO 5	Get knowledge about Regulation and Control rules and also about management and handling rules.

Mapping of CO with PO

SECV4630	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO 1	1	3	3	3	3		3		2		2	3
CO 2		3	2	3	1	3	3	3	2		2	3
CO 3	1	3	3	3	3	3	3	3	2		2	3
CO 4		1	1	1	1	2	3	3	3	3		3
CO 5		2	1	2	2	2	3	3	3			3

Mapping of CO with PSO

SECV4630	PSO1	PSO2	PSO3
CO 1	3	3	3
CO 2	1	1	3
CO 3	3	3	3
CO 4	2		3
CO 5	2	2	2

Level of Bloom's Revised Bloom's Taxonomy in Assessment

1: Remember	2: Understand	3: Apply
4: Analyze	5: Evaluate	6: Create

Module No	Content	RBT Level
1.	Introduction to Environmental Law	1, 2, 3

2.	National Environmental Law and policy Introduction to National Environmental Laws	1, 2, 3
3.	Environment Impact & Policy	1, 2, 3
4.	International Environmental Law and Policy	1, 2, 3
5.	Introduction to Environment and IPR	1, 2, 3
6.	International Environmental Organizations and Dispute Settlement	1, 2, 3
7.	Land Use, Noise, and Coastal Regulation	4,5,6
8.	Recent Developments and Case Studies	4,5,6

P P Savani University
School of Engineering
Department of Civil Engineering

Course Code: SECV4640
Course Name: Soil Improvement Techniques & Geotextile Engineering
Prerequisite Course(s): Geology & Geotechnical Engineering (SECV2060), Soil Mechanics (SECV3011)

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	-	-	03	40	60	-	-	-	-	100

CE: Continuous Evaluation, ESE: End Semester Exam

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

- understand the different types of Ground Improvement techniques.
- understand type of technique use for different soil condition.
- evaluate the different properties of Soil including different tests for best suitable technique.
- analyze the functions of geotextile and its suitability.
- design different structures using geosynthetics according to various applications.

Course Content:

Module No.	Content	Hours	Weightage in %
1.	**Introduction** Need of Ground Improvement, Different methods of Ground improvement, General Principal of Compaction: Mechanics, field procedure, quality control in field. Ground Improvement in Granular Soil: In place densification by (i) Vibrofloatation (ii) Compaction pile (iii) Vibro Compaction Piles (iv) Dynamic Compaction (v) Blasting.	03	10
2.	**Ground Improvement in Cohesive Soil** Compressibility, vertical and radial consolidation, preloading methods. Types of Drains, Design of vertical Drains, construction techniques. Stone Column: Function Design principles, load carrying capacity, construction techniques, settlement of stone column foundation.	04	10
3.	**Soil Stabilization** Lime stabilization-Base exchange mechanism, Pozzolanic reaction, lime-soil interaction, line columns, Design of Foundation on lime columns. Cement stabilization: Mechanism, amount, age and curing. Fly-ash - Lime Stabilization, Soil Bitumen Stabilization.	04	10

4.	**Geotextile** Definitions, functions, properties, and application of Geotextiles, design of Geotextile applications. **Geomembrane** Definitions, functions, properties and applications of geomembranes, design of geomembranes applications, Geotextiles associated with geomembranes, testing on geotextiles, environmental efforts, ageing and weathering.	04	20
5.	**Soil Reinforcement** Mechanism, Types of reinforcing elements, reinforcement-soil interaction, Reinforcement of soil beneath the roads, foundation. Geosynthetics and their application.	04	15
6.	**Grouting in soil** Different types and properties, desirable characteristics, grouting pressure, grouting methods.	03	15
7.	**Ground Improvement Using Energy and Biological Methods** Dynamic consolidation, blasting densification, Thermal stabilization (heating/freezing techniques), Case studies of modern ground improvement technologies	04	10
8.	**Case Studies, Field Applications, and Recent Advances** Case studies of soil improvement in highways, embankments, and foundations, Ground improvement for liquefaction mitigation, Sustainability and environmental considerations	03	10
	TOTAL	30	100

Text Book(s):

Title	Authors	Publication
Ground Improvement Techniques	P. Purushothama Raj	Tata McGraw-Hill
Text Book On Engineering with Geotextiles	G. V. Rao and G. V. S. Rao	Tata McGraw-Hill

Reference Book(s):

Title	Author/s	Publication
Soil Mechanics	Karl Terzaghi	Chapman and Hall
Handbook on Geosynthetics and their applications	Sanjay Kumar Shukla	Thomas Telford, 2002
ASTM and Indian Standards on Geotextiles		

Web Material Link(s):

- https://nptel.ac.in/courses/105101143/
- https://onlinecourses.nptel.ac.in/noc17_ce08/
- https://nptel.ac.in/courses/105106052/

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.

Course Outcome(s):

After the completion of the course, the following course outcomes will be able to:

SECV4640	**Soil Improvement Techniques & Geotextile Engineering**
CO 1	Explain the need for ground improvement and describe various methods and principles of soil compaction and densification techniques for granular soils.
CO 2	Analyze the behavior of cohesive soils and design suitable ground improvement methods such as preloading, vertical and radial drains, and stone column foundations.
CO 3	Evaluate different soil stabilization techniques using lime, cement, fly ash, and bitumen, and apply appropriate stabilization methods based on soil characteristics
CO 4	Understand the functions, properties, and design principles of geotextiles, geomembranes, and other geosynthetics, and assess their applications in soil reinforcement and environmental engineering
CO 5	Describe various grouting materials and methods, and select suitable grouting techniques for improving the strength and permeability characteristics of problem soils

Mapping of CO with PO

SECV4640	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO 1	1	3	3	3	3		3		2		2	3
CO 2		3	2	3	1	3	3	3	2		2	3
CO 3	1	3	3	3	3	3	3	3	2		2	3
CO 4		1	1	1	1	2	3	3	3	3		3
CO 5		2	1	2	2	2	3	3	3			3

Mapping of CO with PSO

SECV4640	PSO1	PSO2	PSO3
CO 1	1	3	2
CO 2	3	3	3
CO 3	3	1	3
CO 4	1	3	2
CO 5	3	3	3

Level of Bloom's Revised Bloom's Taxonomy in Assessment

1: Remember	2: Understand	3: Apply
4: Analyze	5: Evaluate	6: Create

Module No	**Content**	**RBT Level**

1.	Introduction	1, 2
2.	Ground Improvement in Cohesive Soil	1, 2
3.	Soil Stabilization	1, 2
4.	Geotextile & Geomembrane	1, 2, 4, 5
5.	Soil Reinforcement	2, 4, 3
6.	Grouting in soil	2
7.	Ground Improvement Using Energy and Biological Methods	4, 5, 6
8.	Case Studies, Field Applications, and Recent Advances	4, 5, 6

P P Savani University
School of Engineering

Department of Civil Engineering

Course Code: SECV4650
Course Name: Legal Aspects in Construction Practice
Prerequisite Course(s): Estimation & Costing (SECV3090)

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	-	-	03	40	60	-	-	-	-	100

CE: Continuous Evaluation, ESE: End Semester Exam

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

- study the various types of construction contracts and their legal aspects and provisions.
- study the tenders, arbitration, legal requirements, labor and human rights regulations.

Course Content:

Module No.	Content	Hours	Weightage in %
1.	**Introduction to Construction Law** Need for Legal Issues in Construction in the Indian Judicial System – Context of Construction Industry, Principles of a Contract, Indian Contract Act 1872 – Provisions for Construction Industry, Essentials of a Valid Contract, Types of Contracts, Alternate Contract Methods, Concept of Completion of a Contract, IT Law 2000 and its Influence on Construction Contract.	04	15
2.	**Construction Tendering Process** Introduction to Construction Process, Need for Tendering, Process of Tendering in Construction, Importance of Specifications and Estimates in Construction, Concept of Completion of the contract, Sub-Contracts and requirements, Tendering Models and Strategies, Prequalification of Bidders, Documents Forming a BID and a Contract, Agreements and Bonds in Tendering Process	03	15
3.	**Construction Administration** Duties and Responsibilities – Project Manager, Owner, Engineers and Contractors, Important Site Documents, Process of Building	04	10
	Permissions, Provision for Scheduling delays and accelerations, Environmental Provisions for Construction Contracts		

4.	**Disputes and Liabilities in Construction** Major Sources of disputes in Construction, Delays – Types, Claims and Solutions, Labor Laws in India, Worker Compensation and Insurance Laws, Construction Liabilities and Litigations, Disputes in Land Development	04	10
5.	**Dispute Resolution in Construction** Dispute Resolution in Construction, Judicial Process in Dispute Resolution, Alternate Dispute Resolution Methods, Arbitration and Conciliation Act 1996, Importance of Arbitration in Construction, Arbitration Process, Arbitration Clause in Contracts	04	10
6	**Environmental, Safety, and Regulatory Laws in Construction** Environmental Laws: Environment (Protection) Act, 1986, Water (Prevention and Control of Pollution) Act, 1974, Air (Prevention and Control of Pollution) Act, 1981, National Green Tribunal (NGT) Act, 2010 Land Acquisition and RERA, Building Bye-laws, Development Control Regulations, and Local Authority Approvals. Occupational Health and Safety (OHS), Ethical and Legal Responsibilities of Engineers	05	20
7	**Safety, Environmental, and Insurance Laws** Construction safety and legal obligation, Environmental protection laws applicable to construction projects: Water Act, Air Act, Environment Protection Act, Legal aspects of accidents, liabilities, and indemnities	03	10
8	**Professional Ethics, Regulatory Bodies, and Case Studies** Role of professional bodies: Institution of Engineers (India), Council of Architecture, RERA, Code of ethics for engineers and consultants, Case studies: contractual disputes, arbitration awards, negligence, and ethical issues in construction	03	10
	TOTAL	30	100

Text Book(s):

Title	Author/s	Publication
Indian Contract Act 1872	-	Universal Law Publishing, New Delhi, India
Indian Arbitration and Conciliation Act,1996	-	Ministry of Law and Justice , Law literature Publication, India
Laws Relating to Building and Engineering Contracts in India	Gajaria G T	M.M.Tripathi Private Ltd., Bombay

Reference Book(s):

Title	Author/s	Publication
Gujrat B & C Code , 1986	Gopal Ranjan, Rao A.S. R	New age int. (p) ltd.
Contracts and the Legal Environment for Engineers and Architects	Joseph T. Bockrath	McGraw Hill, 2000

Construction Contracts	Jimmie Hinze	McGraw Hill

Web Material Link(s):

- https://nptel.ac.in/courses/105103097/

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.

Course Outcome(s):

After the completion of the course, the following course outcomes will be able to:

SECV4650	**Legal Aspects in Construction Practice**
CO 1	Recognize the rights and duties under various legal acts.
CO 2	Identify parties involved in contracts and the different types of contracts used in the construction industry
CO 3	Understand the tendering process.
CO 4	Practice using contracts for assigning roles and responsibilities.
CO 5	Understand the value of documentation and arbitration process in resolving construction disputes.

Mapping of CO with PO

SECV4650	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO 1	1	3	3	3	3		3		2		2	3
CO 2		3	2	3	1	3	3	3	2		2	3
CO 3	1	3	3	3	3	3	3	3	2		2	3
CO 4		1	1	1	1	2	3	3	3	3		3
CO 5		2	1	2	2	2	3	3	3			3

Mapping of CO with PSO

SECV4650	PSO1	PSO2	PSO3
CO 1	2	3	2
CO 2	3	3	3
CO 3	2	2	3
CO 4	3	2	2
CO 5	2	3	3

Level of Bloom's Revised Bloom's Taxonomy in Assessment

1: Remember	2: Understand	3: Apply
4: Analyze	5: Evaluate	6: Create

Module No	**Content**	**RBT Level**
1.	Introduction to Construction Law	1, 2

2.	Construction Tendering Process	2
3.	Construction Administration	3,4,5
4.	Disputes and Liabilities in Construction	3,4,5
5.	Dispute Resolution in Construction	3,4,5
6.	Environmental, Safety, and Regulatory Laws in Construction	3,4,5,6
7.	Safety, Environmental, and Insurance Laws	4, 5, 6
8.	Professional Ethics, Regulatory Bodies, and Case Studies	4, 5, 6

P P Savani University
School of Engineering
Department of Civil Engineering

Course Code: SECV4660
Course Name: Modern Transportation System
Prerequisite Course/s: Basics of Transportation Engineering (SECV3070)

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	-	-	03	40	60	-	-	-	-	100

CE: Continuous Evaluation, ESE: End Semester Exam

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

- reduce the impact of peripherality by improving external links to the north east by rail, road, sea and air.
- enhance the efficiency of the transport networks.
- ensure whole-life, long-term value of transport networks, in capital and running.

Course Content:

Module No.	Content	Hours	Weightage in %
1.	**Introduction** Historical Development of Transport in India, 20-year Road Plans, National Transport Policy Recommendations, IRC, CRRI, Vision 2021, NHDP, PMGSY. Characteristics of Different Modes of Transport and their Integration and Interactions, Impact on Environment.	05	16
2.	**Planning of railway** Passenger and Goods Terminals, Layout, Passenger Facilities, Traffic Control.	04	14
3.	**Airport Planning** Requirements and components. Design of Runway and Taxiway, Apron, Parking Configuration, Terminal Requirements, Airport Marking and Lighting, Air Traffic Control.	04	15
4.	**Intelligent Transportation Systems** Introduction to Intelligent Transportation Systems (ITS) – Definition of ITS and Identification of ITS Objectives, Historical	04	17

	Background, Benefits of ITS - ITS Data collection techniques – Detectors, Automatic Vehicle Location (AVL), Automatic Vehicle Identification (AVI), Geographic Information Systems (GIS), Video Data Collection.		
5.	**ITS functional areas** Advanced Traffic Management Systems (ATMS), Advanced Traveler Information Systems (ATIS), Commercial Vehicle Operations (CVO), Advanced Vehicle Control Systems (AVCS), Advanced Public Transportation Systems (APTS), Advanced Rural Transportation Systems (ARTS).	03	10
6.	**ITS User Needs and Services** Travel and Traffic Management, Public Transportation Management, Electronic Payment, Commercial Vehicle Operations, Emergency Management, Advanced Vehicle Safety Systems, Information Management.	04	10
7.	**Automated Highway Systems** Vehicles in Platoons, Integration of Automated Highway Systems, ITS Programs in the World, Overview of ITS Implementations in Developed Countries, ITS in Developing Countries.	03	10
8.	**Emerging Trends and Case Studies in Modern Transportation** Smart mobility solutions: ride-sharing, e-mobility, and micro-mobility, Future directions: hyperloop, maglev trains, and sustainable transportation	03	08
	TOTAL	30	100

Text Book(s):

Title	Author/s	Publication
Traffic Engineering and Transport Planning	L. R Kadiyali	Khanna Publisher
Smart Transportation Systems	Qu, X., Zhen, L., Howlett, R., Jain, L.C. (Eds.)	Springer
Railway Engineering	Satish Chandra, M. M. Agarwal	Oxford
Airport Planning	S.R.Rangwala	Charotar Publication
Intelligent transportation system	Pradipkumar Sarkar, Amitkumar Jain	PHI Publication

Reference Books(s):

Title	Author/s	Publication
Advanced Transportation System	Milan Janić Butterworths,	Springer

Web Material Link(s):

- https://frame-online.eu/wp-content/uploads/2014/10/PlanningGuide.pdf
- https://www.transport.gov.scot/media/36472/a21-modern-transport-system.pdf
- https://jalopnik.com/the-ten-most-advanced-transportation-systems-in-the-wor-1729614271

- https://www.kontron.com/blog/mobility/modern-transport-system

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.

Course Outcomes

After the completion of the course, the following course outcomes will be able to:

SECV4660	**MORDEN TRANSPORTATION SYSTEM**
CO 1	Understand the historical development of transport systems in India, national transport policies, and various road development plans; evaluate the characteristics, integration, and environmental impact of different modes of transport
CO 2	Analyze and design the layout and functional elements of railway systems, including passenger and goods terminals, traffic control, and passenger facilities..
CO 3	Apply principles of airport planning and design, including runway and taxiway geometry, apron configuration, terminal requirements, and air traffic control, in accordance with international standards.
CO 4	Demonstrate knowledge of Intelligent Transportation Systems (ITS) — their objectives, components, data collection technologies, and functional areas such as ATMS, ATIS, AVCS, and APTS
CO 5	Evaluate ITS applications and programs for traffic management, public transport, electronic payment, emergency management, and automated highway systems in both developed and developing countries.

Mapping of CO with PO

SECV4660	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO 1	1	3	3	3	3		3		2		2	3
CO 2		3	2	3	1	3	3	3	2		2	3
CO 3	1	3	3	3	3	3	3	3	2		2	3
CO 4		1	1	1	1	2	3	3	3	3		3
CO 5		2	1	2	2	2	3	3	3			3

Mapping of CO with PSO

SECV4660	PSO1	PSO2	PSO3
CO 1	3	2	3
CO 2	3	2	3
CO 3	3	3	3
CO 4	3	2	3
CO 5	2	3	3

Level of Bloom's Revised Bloom's Taxonomy in Assessment

1: Remember	2: Understand	3: Apply
4: Analyze	5: Evaluate	6: Create

Module No	Content	RBT Level
1	Introduction	1, 2,4
2	Planning of railway	1, 2,6
3	Airport Planning	1, 2,4,5
4	Intelligent Transportation Systems	1,2,3,4,6
5	ITS functional areas	1,2,4,6
6	ITS User Needs and Services	1,2,3,6
7	Automated Highway Systems	1,2,4

P P Savani University
School of Engineering
Department of Civil Engineering

Course Code: SECV4670
Course Name: Modern Civil Engineering Equipment & Software
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	
-	06	-	06	-	-	100	-	-	-	100

CE: Continuous Evaluation, ESE: End Semester Exam

Objective of the Course:
To help learners to
- Analyze structural components like beams, truss
- Understand behavior of components by changing design and loading pattern
- Design beam column slab footing according to standards

Note: Students have to learn two software in the course

List of Theory/Practical:

Sr. No	Name of Theory/Practical	Hours
1.	Study and Demonstration of Earthmoving Equipment	06
2.	Study of Compaction Equipment	06
3.	Study of Material Handling Equipment	08
4.	Demonstration of Concrete Production Equipment	08
5.	Surveying with Total Station / GPS	08
6.	Introduction to AutoCAD for Civil Engineering Drawing	08
7.	Project Scheduling and Management using MS Project / Primavera	08
8.	Quantity Estimation using Excel / BIM-based Tools	08
	TOTAL	60

Text Book(s):

Title	Authors	Publication
Staad Pro V8i for Beginners	T.S. Sharma	Notion Press; 1 edition
Theory of Structures	S. Ramamrutham	Dhanpat Rai publishing company; ninth edition edition
Reinforced Concrete Design	Devdas Menon	McGraw Hill Education; 3 edition

Web Material Link(s):
- https://www.youtube.com/channel/UCSKDRIXmpja7b719rQhAw8Q/videos

Course Evaluation:

Theory:
Theory portion is supplementary teaching for hands on practice only.

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 30 marks.
- Manual verification of the software results consists of 10 marks.
- Internal viva consists of 10 marks.
- Practical performance/quiz/test consists of 30 marks during end semester exam.
- Viva/oral performance during end semester examination of 20 marks.

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

SECV4670	**MODERN CIVIL ENGINEERING EQUIPMENT & SOFTWARE**
CO1	Understand the working principles, components, and field applications of modern construction and earthmoving equipment used in civil engineering projects.
CO2	Demonstrate knowledge of compaction, material handling, and concrete production equipment, and evaluate their efficiency and suitability for different site conditions.
CO3	Apply modern surveying techniques using Total Station and GPS for accurate data collection, mapping, and layout in civil engineering projects
CO4	Develop digital civil engineering drawings using AutoCAD and prepare project planning and scheduling using MS Project or Primavera
CO 5	Prepare quantity estimation, costing, and resource management reports using Excel or BIM-based tools, enhancing decision-making and project efficiency.

Mapping of CO with PO

SECV4670	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO 1	1	3	3	3	3		3		2		2	3
CO 2		3	2	3	1	3	3	3	2		2	3
CO 3	1	3	3	3	3	3	3	3	2		2	3
CO 4		1	1	1	1	2	3	3	3	3		3
CO 5		2	1	2	2	2	3	3	3			3

Mapping of CO with PSO

SECV4670	PSO1	PSO2	PSO3
CO 1	3	2	3
CO 2	2	2	3
CO 3	3	3	2
CO 4	3	2	3
CO 5	2	3	2

Level of Bloom's Revised Bloom's Taxonomy in Assessment

1: Remember	2: Understand	3: Apply
4: Analyze	5: Evaluate	6: Create

Module No	Content	RBT Level
1	Study and Demonstration of Earthmoving Equipment	1, 2, 3, 4
2	Study of Compaction Equipment	1, 2, 3, 4
3	Study of Material Handling Equipment	1, 2, 3, 4
4	Demonstration of Concrete Production Equipment	1, 2, 3, 4
5	Surveying with Total Station / GPS	1, 2, 3, 4
6	Introduction to AutoCAD for Civil Engineering Drawing	2, 3, 4, 5, 6
7	Project Scheduling and Management using MS Project / Primavera	2, 3, 4, 5, 6
8	Quantity Estimation using Excel / BIM-based Tools	2, 3, 4, 5, 6

P P Savani University
School of Engineering
Department of Civil Engineering

Course Code: SECV4950
Course Name: Project/Summer Internship
Prerequisite Cours/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	
-	05	-	05	-	-	100	00	-	-	100

CE: Continuous Evaluation, ESE: End Semester Exam

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

- have first-hand experience the real time situations in industrial scenario.
- get familiar with engineering applications in industrial spectrum
- learn to adapt themselves in professional scenario

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
	TOTAL	**100**

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

SECV4960	Project/Summer Internship
CO 1	Apply fundamental and disciplinary concepts and methods in ways appropriate to their principal areas of study.
CO 2	Determine the challenges and future potential for his/her internship organization in particular and the sector in general.

CO 3	Test the theoretical learning in practical situations by accomplishing the tasks assigned during the internship period.
CO 4	Apply various soft skills such as time management, positive attitude and communication skills during performance of the tasks assigned in internship organization.
CO 5	Analyze the functioning of internship organization and recommend changes for improvement in processes.

Mapping of CO with PO

SECV4950	PO1	PO2	PO3	PO4	PO5	PO6	P07	PO8	PO9	P010	PO11
CO 1	3	3	1	3		3	3	2	3	3	3
CO 2	1	1	3	2	3	3	3	3	2	3	1
CO 3	3	3	3	1	3	3	2	3	2	3	3
CO 4	3	1	1	2	3	3	3	3	3	2	3
CO 5	2	2	1	3	3	3	3	3	3	3	3

Mapping of CO with PSO

SECV4950	PSO1	PSO2	PSO3
CO 1	3	1	3
CO 2	3	3	3
CO 3	3	3	2
CO 4	1	3	1
CO 5	3	3	3

Level of Bloom's Revised Bloom's Taxonomy in Assessment

1: Remember	2: Understand	3: Apply
4: Analyze	5: Evaluate	6: Create

Module No	**Content**	**RBT Level**
1.	Selection of Companies	3
2.	Company Information collection	3, 5, 6
3.	Report Writing	5, 6
4.	Presentation & Question-Answer	1, 2, 3, 4, 5, 6

P P Savani University
School of Engineering

Department of Civil Engineering

Course Code: SECV4960
Course Name: Project/Training
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	
-	23	-	23	-	-	200	300	-	-	500

CE: Continuous Evaluation, ESE: End Semester Exam

Outline of the Course:

Project

- The project will be aligned with the aims of the engineering programme and its areas of specialization and shall be based on the recent trends in technology.
- The student shall carry out a comprehensive project at relevant academic / R&D / industrial organization.
- The student is required to submit a project report based on the work carried out.

Training

- The aim of this course is to use the internship experience to enable students to develop their engineering skills and practices.
- The student will be placed in industry/organization for 12 to 18 weeks and assessed for academic credit.
- The students may select industry on their own or one which is offered by institute.
- Students are expected to experience a real-life engineering workplace and understand how their engineering and professional skills can be utilized in industry.
- The student is required to submit a project report based on the work carried out.

Course Outcome(s):

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

SECV4960	**Project/Training**
CO 1	Discriminate the theoretical learning with practice and integrate knowledge for engineering applications
CO 2	Integrate real time industry exposure and experience
CO 3	Manage the challenging projects for commercial, societal and environment benefit.
CO 4	Evaluate the importance of planning, documentation, punctuality and work ethics.
CO 5	Formulate the documentation of the work which is carried out on site with industry standards.

Mapping of CO with PO

SECV4960	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO 1	2	3	3	3	3	3	3	3	3	3	3	3
CO 2	2	3	3	3	3	3	3	3	3	3	3	3
CO 3	2	3	3	3	3	3	3	3	3	3	3	3
CO 4	2	3	3	3	3	3	3	3	3	3	3	3
CO 5		2	3	3	3	3	3	3	3	3	3	3

Mapping of CO with PSO

SECV4960	PSO1	PSO2	PSO3
CO 1	3	3	3
CO 2	3	3	3
CO 3	3	3	3
CO 4	3	3	3
CO 5	3	3	3

Level of Bloom's Revised Bloom's Taxonomy in Assessment

1: Remember	2: Understand	3: Apply
4: Analyze	5: Evaluate	6: Create

Module No	Content	RBT Level
1	Project/Training	1,2,3,4,5,6