PPSU

P P SAVANI UNIVERSITY

SCHOOL OF ENGINEERING

DIPLOMA

CIVIL ENGINEERING

SYLLABUS BOOK

AY 2025-26

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, review research literature, and analyse complex engineering problems reaching substantiated conclusions using first-principles of mathematics, natural sciences and engineering sciences.
PO 3	Design/Development of Solutions: Design solutions for complex engineering problems and design system-components or processes that meet specified needs with appropriate consideration for public health & safety, cultural, societal and environmental considerations
PO 4	Conduct Investigations of Complex Problems: Use research-based knowledge and research methods including design of experiments, analysis & interpretation of data, and synthesis of information to provide valid conclusions for complex problems.
PO 5	Engineering Tool Usage: Create, select, and apply appropriate techniques, resources, and modern engineering & IT tools including prediction and modelling to engineering activities, with an understanding of their limitations.
PO 6	The Engineer and The World: Apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to professional engineering practice; understand the impact of engineering solutions in societal and environmental contexts, and demonstrate knowledge of, and need for, sustainable development. .
PO 7	Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of engineering practice.
PO 8	Individual and Collaborative Team Work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO 9	Communication: Communicate effectively on engineering activities with the engineering community and with society at large—such as being able to write reports, design documentation, make effective presentations and give/receive instructions.
PO 10	Project Management and Finance: Demonstrate knowledge and understanding of engineering and management principles and apply these to one's work, as a member or leader in a team in a multidisciplinary environment to manage projects..
PO 11	Life-Long Learning: Recognize the need for, and have the 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

Institute of Diploma studies

P P Savani University

School of Engineering

Effective From: 2025-26

Authored by: P P Savani University

CONTENT

FIRST YEAR DIPLOMA IN COMPUTER ENGINEERING

P P SAVANI UNIVERSITY															
SCHOOL OF ENGINEERING															
INSTITUTE OF DIPLOMA STUDIES															
TEACHING & EXAMINATION SCHEME FOR DIPLOMA ENGINEERING PROGRAMME AY:2025-26(BATCH:2025)															
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	IDSH1110	Mathematics-I	SH	3	0	2	5	5	40	60	0	0	100	0	200
	IDSH1140	Chemistry	CH	3	2	0	5	4	40	60	40	60	0	0	200
	IDCV1110	Basics of Civil Engineering	CV	3	0	2	5	5	40	60	0	0	40	60	200
	IDCE1110	Computer Fundamentals	CE	3	4	0	7	5	40	60	40	60	0	0	200
	CFLS2110	Elementary Communicative English-I	CLFS	3	0	0	3	3	100	0	0	0	0	0	100
						Total	**25**	**22**							**900**
2	IDSH1120	Mathematics-II	SH	3	0	2	5	5	40	60	0	0	100	0	200
	IDSH1130	Physics	SH	3	2	0	5	4	40	60	40	60	0	0	200
	IDME1110	Basics of Mechanical Engineering	ME	3	0	2	5	5	40	60	0	0	40	60	200
	IDIT1110	Python Programming	IT	3	2	0	5	4	40	60	40	60	0	0	200
	IDME1120	Workshop Fundamentals	ME	0	2	0	2	2	0	0	100	0	0	0	100
	CFLS2120	Elementary Communicative English-II	CLFS	2	0	0	2	2	100	0	0	0	0	0	100
						Total	**24**	**22**							**1000**

P P Savani University
School of Engineering
Institute of Diploma Studies

Department of Applied Science & Humanities

Course Code: IDSH1110
Course Name: Mathematics-1
Prerequisite Course(s): Algebra, Geometry, Trigonometry till 9th 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	00	200

CE: Continuous Evaluation, ESE: End Semester Exam

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

- outline logarithm properties.
- implement concepts of Determinants and Matrices for solving science and engineering problems.
- present usefulness of trigonometry.
- acquire knowledge of co-ordinate geometry and ability to work with applications to Engineering Mathematics.

Course Content:

Module No.	Content	Hours	Weightage in %
1.	**Logarithm** Basic concept of logarithm, Rules and related examples,Applications of logarithm.	5	11
2.	**Trigonometry** Basic concept of trigonometry, Units of angles (degree and radian), Allied & compound angles, Multiple–submultiples angles, Graph of sine and cosine, Periodic function, Sum and factor formula.	10	21
3.	**Co-ordinate geometry** Introduction, Point, Distance formula, Mid-point, Locus of a point, Straight lines, Slope of a line, Equation of a straight line, The general equation, Angle between two lines, Circle.	8	18
4.	**Statistics** Introduction, Central tendency, Mean, Mean of grouped data, Median, Median for grouped data, Mode for grouped data, Mode, Standard deviation, Standard deviation for grouped data.	10	23

5.	**Determinants and Matrices** Basic concept of determinants and matrices, Addition and subtraction, Product, Inverse up to 3X3 matrix, Solution of simultaneous equations up to three variables, Applications of determinants and matrices.	12	27
	TOTAL	**45**	**100**

List of Tutorials:

Sr. No.	List of Tutorial	Hours
1.	Logarithm-1	4
2.	Logarithm-2	2
3.	Trigonometry-1	2
4.	Trigonometry-2	2
5.	Trigonometry-3	2
6.	Co-ordinate geometry-1	4
7.	Co-ordinate geometry-2	2
8.	Statistics-1	2
9.	Statistics-1	2
10.	Statistics-2	2
11.	Determinants and Matrices-1	2
12.	Determinants and Matrices-2	2
13.	Determinants and Matrices-3	2
	TOTAL	**30**

Text Book:

Title	Author(s)	Publication
Diploma Engineering Mathematics	H. K. Dass	H. K. Dass
Engineering Mathematics - 3rd Edition	Anthony croft & others	Pearson Education Publication

Reference Book:

Title	Author(s)	Publication
Basic Mathematics	G.C. Patel and Ami C. Shah	Atul Prakashan
Advanced Mathematics for Polytechnic	Dr. N. R. Pandya	Macmillan Publication
Applied Mathematics	W. R.Neelkanth	Sapna Publication

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 75 marks.
- Viva of 25 marks.

Course Outcome(s):

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

IDSH1110	**MATHEMATICS-1**
CO 1	Apply algebraic concepts to solve engineering-related mathematical problems.
CO 2	Use trigonometric concepts and identities to solve engineering and real-world problems.
CO 3	Apply coordinate geometry concepts to analyze spatial relationships in engineering contexts.
CO 4	Analyze and interpret data sets using statistical methods to support decision-making in engineering applications.
CO 5	Solve engineering-related problems using determinants and matrices, including systems of linear equations.

Mapping of CO with PO

IDSH1110	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO 1	3	2	1								1
CO 2	3	2	1								1
CO 3	3	2									2
CO 4	3	2									1
CO 5	3	2									

Mapping of CO with PSO

IDSH1110	PSO1	PSO2	PSO3
CO 1	3	2	1
CO 2	3	2	1
CO 3	3	2	2
CO 4	3	2	2
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	Logarithm	1,2,3,5
2	Trigonometry	2,3,4,5,6
3	Coordinate geometry	2,3,4,5
4	Statistics	1,2,3,4,5
5	Determinants and Matrices	2,3,4,5

P P Savani University
School of Engineering
Institute of Diploma Studies

Department of Applied Science & Humanities

Course Code: IDSH1140
Course Name: Chemistry
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

- The student will understand the interdisciplinary nature of chemistry and to integrate knowledge of mathematics, physics and other disciplines to a wide variety of chemical problems.
- The student will understand the importance of the Periodic Table of the Elements, how it came to be, and its role in organizing chemical information.
- The student will acquire a foundation of chemistry of sufficient breadth and depth.

Course Content:

Module. No.	Content	Hours	Weightage in %
1.	**Atomic Mass and Molecular Structure** Atom, Fundamental particles of Atom their Mass, Charge and Location. Atomic number and Mass number, Octet Rule, Isotopes and Isobars with suitable examples, Formation of Cation and Anion by electronic concept of oxidation and reduction, Molecule, Molecular Formula, Molecular Mass, Mole, Avogadro Number, Avogadro's Hypothesis – Relationship between Molecular Mass and Vapour Density, Simple calculations.	10	20
2.	**Chemical Bonding** Chemical Bond, Valence, Valence Electrons, Bonding and Non Bonding Electrons, Lewis Symbols. Condition for Formation of Ionic Bond, Factors Governing Formation of Ionic Bond, Metallic Bond, Covalent Bond and Co-ordinate Covalent Bond: Hydrogen Bonding.	06	20
3.	**Acids and Bases** Theories of Acids and Bases, Arrhenius Theory, Lowry – Bronsted Theory, Lewis Theory, pH and pOH, Indicator, Buffer solution, Types of buffer solution with examples, Application of pH in Industries, Numericals	06	10
4.	**Solutions and Colloids** Methods of expressing concentration of a solution Molarity, Molality, Normality, Mole fraction and Percentage Mass – Simple problems. True solution and Colloidal solution, Definition, Differences, Types of colloids – Lyophilic and Lyophobic colloids. Industrial applications of colloids.	08	20

5.	**Electrochemistry** Electrolyte, Strong and Weak electrolytes, Electrolysis, Industrial application of Electrolysis, Electroplating, Preparation of surface, Process Factors affecting the stability of the coating, Applications of Electro plating.	08	15
6.	**Electrochemical-Cell** Electrochemical Cell definition, Representation of a Cell, Single Electrode Potential definition, Galvanic Cell, Formation of Daniel Cell, Electrochemical Series, Definition and Significance, Electrolytic Concentration Cell definition and Formation.	07	15
	TOTAL	**45**	**30**

List of Practical

Sr No	Name of Practical/Tutorial	Hours
1.	Using a chemical balance.	04
2.	Introduction to chemistry laboratory – Molarity, Normality, Primary, Secondary standard solutions, Volumetric titrations, Quantitative analysis, Quantitative analysis etc.	04
3.	Demonstration: Preparation of solutions of different concentrations	04
4.	Preparation of standard solution of Oxalic acid and Sodium Carbonate.	04
5.	Determination of strength of a given solution of Sodium Hydroxide by titrating it against standard solution of Oxalic acid.	04
6.	Determination of strength of a given solution of Hydrochloric acid by titrating it against standard Sodium Carbonate solution.	04
7.	Determination of temporary and permanent hardness in water sample using EDTA as standard solution.	04
8.	Determination of pH	02
	TOTAL	**30**

Text Book(s):

Title	Author/s	Publication
Text Book of Engineering Chemistry	Chawla S.	Dhanpat Rai & Co. Pvt. Ltd., Delhi, 2003.
Engineering Chemistry	Sharma B. K.	Krishna Prakashan Media (P) Ltd, Meerut.,2001

Reference Book(s):

Title	Author/s	Publication
Concise Inorganic Chemistry	J.D. Lee	Wiley India
Textbook of Engineering Chemistry (4th Edition)	R. Gopalan, D. Venkappaya, S. Nagarajan	Vikas Publishing house Ltd.

Web Material Link(s):
https://onlinecourses.nptel.ac.in/noc21_cy45/preview
https://nptel.ac.in/noc/courses/noc17/SEM2/noc17-cy03/

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 the performance of Practical which should be evaluated out of 10 marks for each practical and average of the same will be converted to 40 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 the completion of the course, the following course outcomes will be able to:

IDSH1140	**Chemistry**
CO1	Explain basic atomic structure, chemical bonding, and periodic trends.
CO2	Apply principles of acids, bases, solutions, and electrochemistry to solve problems.
CO3	Perform chemistry laboratory experiments safely using standard techniques.
CO4	Analyze electrochemical processes and industrial applications of chemistry.
CO5	Practice professional ethics, teamwork, and safety in laboratory and industrial work.

Mapping of CO with PO

IDSH1140	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO 1	3	2	1								2	3
CO 2	3	3	2	2							2	3
CO 3	2	2	2	3	2				2	1	2	2
CO 4	2	3	3	2	3		2				2	2
CO 5					2	2	2	3	3	3	3	

Mapping of CO with PSO

IDSH1140	PSO1	PSO2	PSO3
CO 1	2	1	1
CO 2	3	2	2
CO 3	2	2	2
CO 4	3	3	2
CO 5	2	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	Atomic Mass and Molecular Structure	1, 2, 5
2	Chemical Bonding	1, 2, 3
3	Acids and Bases	2, 3, 4
4	Solutions and Colloids	2, 3, 4,5
5	Electrochemistry	1, 2, 5
6	Electrochemical-Cell	1, 2, 5

School of Engineering
Institute of Diploma Studies
Department of Civil Engineering

Course Code: IDCV1110
Course Name: Basics of Civil 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	05	40	60	-	-	40	60	200

CE: Continuous Evaluation, ESE: End Semester Exam

Objective(s) of the course:

To help learners to

- Scope and significance of civil engineering in infrastructural development.
- Surveying and levelling techniques and their importance in construction and land measurements.
- construction materials, their properties, and their selection based on strength, durability, economy, and environmental considerations.
- Highlight advancements in civil engineering, focusing on sustainable practices, smart city planning, and innovative systems for urban development.

Course Content:

Module No.	Content	Hours	Weightage in %
1.	**Introduction:** Branches of Civil Engineering, Scope of Civil Engineering, Role of Civil Engineer in Society. Impact of infrastructural development on the economy of a country.	4	8
2.	**Surveying and Levelling:** Definition of Surveying, Aims and applications, Fundamental principles of surveying, Classification of surveying, Plans and maps, Scales, and Units of measurement, Introduction to liner and angular measurements, Types of compass. Introduction to levelling, Aims and application of levelling, Methods of levelling.	10	22
3.	**Overview of Construction Material:** Scope of construction materials in Building Construction, Selection of materials for different civil engineering structures based on strength, durability, Eco friendly and economy.	9	20
4.	**Building Construction:** Introduction, Classification of buildings (types of buildings), Types of loads acting on buildings, Building Components and their functions and nominal dimensions, Bonds in brickwork.	6	13

5.	**Building Services:** Introduction, Water supply system in a building, drainage, House drainage system, Electrification, Building finishes.	8	19
6.	**Advancements in Civil Engineering:** Smart city and its features, Solid waste management systems, Mass transport systems, Bus Rapid Transit System (BRTS), Metro, Green Building, Features of earthquake resistance structures.	8	18
	TOTAL	**45**	**100**

List of Tutorials:

Sr. No.	List of Tutorial	Hours
1.	Units of Conversion exercise	4
2.	Preparation of sketches on Conventional signs, symbols and abbreviations	2
3.	Assignment of Surveying and levelling	2
4.	Chart preparation of various materials. Collection of rate and sample.	4
5.	Preparation of sketchbook showing various bonds.	4
6.	Preparation sketch of various building components.	4
7.	Assignment based upon house drainage system.	2
8.	Assignment based on green building.	2
9.	Case studies on smart cities.	2
10.	Case study on BRTS and metro.	4
	TOTAL	**30**

Text Book:

Title	Author(s)	Publication
Elements of Civil Engineering	Anurag Kandya	Charotar Publication
Building Construction	Dr.B.C.Punmia	Laxmi Publication

Reference Book:

Title	Author(s)	Publication
Surveying and leveling	N. N. Basak	Tata McGraw Hill Education
Engineering Material	S.C. Rangwala	Charotar Publication
Basic Civil Engineering	M.S.Palanichamy	McGraw Hill

Course Evaluation:

Theory:

- Continuous Evaluation consists of two tests, each of 30 marks and 1 hour of duration and the 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 the performance of the tutorial which will be evaluated out of 10 Marksfor each tutorial and the average of the same will be converted to 30 marks.

- MCQ-based examination consists of 20 marks.

Course Outcome(s):

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

IDCV1110	BASICS OF CIVIL ENGINEERING
CO 1	Understand the scope and applications of Civil Engineering.
CO 2	Describe the methods of levelling and demonstrate its applications in real-world scenarios.
CO 3	Evaluate materials based on strength, durability, eco-friendliness, and economic considerations for different civil engineering structures.
CO 4	Identify the various building components, methods of construction, and services.
CO 5	Describe the Concept of Smart Cities and promote sustainable civil engineering practices.

Mapping of CO with PO

IDCV1110	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO 1	3	2	1			2	2				
CO 2	3	3	2	1		1	2				
CO 3	3	2	3			3	3		1		1
CO 4	3	2	1		3	2	3				
CO 5	3	2	2	3				2		1	

Mapping of CO with PSO

IDCV1110	PSO1	PSO2	PSO3
CO 1	2	2	1
CO 2	3	3	2
CO 3	3	3	3
CO 4	2	3	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	1,2,3,4
2	Surveying and Levelling	2,3,4,5
3	Overview of Construction Material	2,3,4,5,6
4	Building Construction	1,2,3,5
5	Building Services	2,3,5
6	Advancements in Civil Engineering	1,2,3,5

P P Savani University
School of Engineering
Institute of Diploma Studies

Department of Computer Engineering

Course Code: IDCE1110
Course Name: Computer Fundamentals
Prerequisite Course(s): NA

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 understanding of basic concepts that can be used in programming language.
- develop the algorithm as well as flowchart for particular problem.
- enforce logical thinking.
- understand the fundamentals of programming concepts and methodology.

Course Content:

Module No.	Content	Hours	Weightage in %
1.	**Introduction to Computers** Evolution of Computers: Generations of Computers, Functional Components of a Computer, Types of Software: System Software, Application Software, Utility Programs, Number Systems: Binary, Octal, Decimal, and Hexadecimal, Introduction to Computer Networks and the Internet	7	15
2.	**Basics of C Programming:** Introduction to Computer Programming, Importance of Programming in Problem Solving, Programming Methodologies (Structured, Object-Oriented, etc.), Steps in Program Development, Overview of Programming Languages, Features of C and Its Importance, Writing, Compiling, and Executing C Programs, Understanding Errors: Syntax Errors, Logical Errors, and Runtime Errors	6	18
3.	**Data Types, Operators, and Tokens:** Data Types and Variables, Primitive Data Types in C, Variables and Constants, Scope and Lifetime of Variables, Operators, Types of Operators in C, Expressions and Operator Precedence, Tokens, Overview of Tokens: Keywords, Identifiers, Constants, Strings, and Operator	10	22
4.	**Control Structures in C:** Decision-Making, Simple If and If-Else Statements, Switch Case and Nested If-Else, Loops, For, While, and Do-While Loops, Using Break	8	25

	and Continue, Nested Loops		
5.	**Arrays and Strings:** Arrays, Introduction to Arrays, Accessing Elements and Array Operations, Applications of Arrays, Strings, Declaring and Initializing Strings, String Functions: strlen(), strcat(), strcpy(), strcmp(), Input and Output with Strings	14	20
	TOTAL	**45**	**100**

List of practical:

Sr. No.	List of Practical	Hours
1.	Identify CPU, RAM, Hard Disk, and other internal components.	2
2.	Compare various types of operating systems.	2
3.	Write and execute a "Hello, World!" program. Write a program to perform addition, subtraction, multiplication, and division of two numbers.	2
4.	Develop a program to calculate the area and perimeter of a rectangle.	4
5.	Declare and initialize variables of different data types.	4
6.	Write a program to evaluate a complex mathematical expression using arithmetic operators.	4
7.	Demonstrate the use of relational and logical operators in a program.	4
8.	Write a program to determine whether a number is positive, negative, or zero.	6
9.	Develop a program to calculate grade based on marks using `if-else` or `switch` statements.	6
10.	Write a program to display the multiplication table of a given number using a loop.	6
11.	Calculate the factorial of a number using a `for` loop.	4
12.	Write a program to generate pyramid patterns using nested loops.	4
13.	Develop a program to check whether a number is prime using nested control structures.	4
14.	Write a program to input and display elements of an array.	2
15.	Implement a program to search for a specific element in an array.	2
16.	Write a program to reverse a given string without using inbuilt function.	2
17.	Develop a program to count the number of vowels, consonants, and digits in a string.	2
	TOTAL	**60**

Text Book:

Title	Author(s)	Publication
Programming in ANSI C	E. Balagurusamy	McGraw Hill Education
Fundamentals of Computers	V. Rajaraman	PHI Learning Pvt. Ltd.

Reference Book:

Title	Author(s)	Publication
Computer Fundamentals	N.M. Desai	University Granth Nirman Board

Microsoft Office Guide	Hiren Desai	Parshwa Publication

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 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:

IDCE1110	**COMPUTER FUNDAMENTALS**
CO 1	Understand computer architecture, software types, number systems, and basics of networks.
CO 2	Use MS Office tools for document creation, data management, and multimedia presentations.
CO 3	Develop and debug basic C programs using programming methodologies.
CO 4	Implement solutions using data types, operators, and control structures in C programming.
CO 5	Solve problems with arrays and strings, including data manipulation and algorithm implementation.

Mapping of CO with PO

IDCE1110	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO 1	3	2		1	2	1				1	
CO 2	2	2	1		3				1	3	1
CO 3	3	3	2	1	3				1	1	
CO 4	3	3	2	2	3				1	1	
CO 5	3	3	2	2	3				1	1	

Mapping of CO with PSO

IDCE1110	PSO1	PSO2	PSO3
CO 1	2	1	1
CO 2	3	2	2
CO 3	3	2	2
CO 4	3	3	2
CO 5	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 to Computers	1,2,3,5
2	Essentials of MS Office	2,3,4,5
3	Basics of C Programming	2,3,4,5,6
4	Data Types, Operators, and Tokens:	2,3,5
5	Control Statements in C	2,3,5
6	Arrays and Strings	1,2,3,5

P P Savani University
School of Engineering
Institute of Diploma Studies

Department of Applied Science & Humanities

Course Code: IDSH1120
Course Name: Mathematics-II
Prerequisite Course(s): Algebra, Geometry, Trigonometry till 9th 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	00	200

CE: Continuous Evaluation, ESE: End Semester Exam

Objective(s) of the course:

To help learners to

- This course is designed to give a comprehensive coverage at an introductory level to the subject of Functions and Limits, Differentiation, Integration and First Order Differential Equations.
- Recognize importance of differentiation and integration for solving engineering problems.

Course Content:

Module No.	Content	Hours	Weightage in %
1.	**Complex Number** Introduction, Mathematical Operations, Polar form, De Movire's Theorem.	6	13
2.	**Functions and Limits** Introduction of Function, Types of function, Classification of function, Limit of a function, Properties of limit, Standard limits, limit of trigonometric functions.	8	18
3.	**Differentiation** Introduction of Differentiation, Derivative of standard functions, Working rules, Differentiation of composite function, Differentiation of parametric functions, Differentiation of implicit function, Derivative using logarithms, Successive differentiation, Application of Derivative (Maxima, Minima, Velocity & Acceleration).	12	27
4.	**Integration** Introduction of Integration, Integration of standard functions, Integration by substitution, Integration by parts, Integration using partial fraction.	10	22
5.	**Mensuration** Basic concept of Mensuration, Area of Triangle, Square,	9	20

	Rectangle, Trapezium, Parallelogram, Rhombus and Circle surface, Volume of Cuboids, Cone, Cylinder and Sphere.		
	TOTAL	**45**	**100**

List of Tutorials:

Sr. No.	List of Tutorial	Hours
1.	Complex Number-1	2
2.	Complex Number-2	2
3.	Complex Number-3	2
4.	Functions and Limits-1	4
5.	Functions and Limits-2	2
6.	Differentiation-1	2
7.	Differentiation-2	2
8.	Differentiation-3	2
9.	Integration-1	2
10.	Integration-2	2
11.	Integration-3	2
12.	Mensuration-1	4
13.	Mensuration-2	2
	TOTAL	**30**

Text Book:

Title	Author(s)	Publication
Advanced Mathematics for Polytechnic	Dr. N.R. Pandya	Macmillan Publication
Engineering Mathematics - 3rd Edition	Anthony croft and others	Pearson Education Publication

Reference Book:

Title	Author(s)	Publication
Applied Mathematics for Polytechnics - 10th Edition	H. K. Dass	H. K. Dass
Applied Mathematics	W. R.Neelkanth	Sapna Publication
Polytechnic Mathematics	Deshpande S P	Pune Vidyarthi Gruh Prakashan,1984
Polytechnic Mathematics	Prakash D S	S Chand,1985

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 Marksfor each tutorial and average of the same will be converted to 75 marks.
- Viva of 25 marks.

Course Outcome(s):

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

IDSH1120	MATHEMATICS-II
CO 1	Apply the properties and algebraic operations of complex numbers, including polar form and De Moivre's Theorem, to solve engineering problems.
CO 2	Analyze functions and evaluate limits, including standard and trigonometric limits, to model engineering problems.
CO 3	Apply differentiation techniques to determine rates of change and solve engineering problems involving maxima, minima, velocity, and acceleration.
CO 4	Use integration techniques to compute areas, volumes, and solve engineering problems involving physical quantities.
CO 5	Compute areas, perimeters, surface areas, and volumes of standard geometrical shapes to solve real-world engineering problems in mensuration.

Mapping of CO with PO

IDSH1120	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO 1	3	2									
CO 2	3	3									1
CO 3	3	3	1								2
CO 4	3	3	2								1
CO 5	3	3	2								1

Mapping of CO with PSO

IDSH1120	PSO1	PSO2	PSO3
CO 1	3	2	1
CO 2	3	2	1
CO 3	3	3	2
CO 4	3	3	2
CO 5	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	Complex Number	1,2,3,4,6
2	Function and Limits	1,2,3,4
3	Differentiation	2,3,5

4	Integration	2,3,5
5	Mensuration	1,2,3,5

P P Savani University
School of Engineering
Institute of Diploma Studies

Department of Applied Science & Humanities

Course Code: IDSH1130

Course Name: Physics

Prerequisite Course(s): Concept of Science up to 9th Standard

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 principles of physics and apply for the advancement of engineering and technology.
- experimenting the laboratory concepts to apply in their career of engineering.

Course Content:

Module No.	Content	Hours	Weightage in %
1.	**Introductory concepts:** Need of measurement and unit in engineering and science, definition of unit, requirements of standard unit, systems of units-CGS, MKS and SI, fundamental and derived quantities and their units Definition of accuracy, precision and error, estimation of errors -absolute error, relative error and percentage error, rules and identification of significant figures. (Numerical on above topics)	08	18
2.	**Mechanics:** The concept of Force, Newton's 1st law of motion, Newton's 2nd law of motion, Newton's 3rd law of motion, Conservation of momentum, Applications of Conservation of linear momentum, Impulse. (Numerical on above topics)	07	15
3.	**Work, Energy and Power:** Work done by a constant force and a variable force, Kinetic energy, Work-energy theorem, Power, Notion of potential energy, Potential energy of a spring, Conservative forces, Conservation of mechanical energy (kinetic and potential energies), Non-conservative forces. (Numerical on above topics)	07	15
4.	**Mechanical properties of solids:** Deforming force, Restoring force, Elastic and plastic body, Stress and Strain with their types, Elastic limit, Hooke's law, Young's modulus, Bulk modulus, Modulus of rigidity and Relation	08	18

	between them (no derivation), Stress- Strain diagram, Yield point, Ultimate stress, Breaking stress, Factor of safety. (Numerical on above topics)		
5.	**Properties of fluids:** Pascal's law and its applications (hydraulic lift and hydraulic brakes), Viscosity, Stokes' law, terminal velocity, streamline and turbulent flow, critical velocity, Bernoulli's theorem and its applications, Surface energy and surface tension, angle of contact. (Numerical on above topics)	08	18
6.	**Heat transfer:** Introduction to thermodynamics, Temperature and Heat, Transmission of heat - Conduction, Convection and Radiation, Law of thermal conductivity, Coefficient of thermal conductivity and its S.I. unit, Heat capacity and Specific heat of materials, Celsius, Fahrenheit and Kelvin temperature scales and their conversion formula. (Numerical on above topics)	07	16
	TOTAL	**45**	**100**

List of Practical:

Sr. No.	Name of Practical	Hours
1.	To study about basic unit conversion and dimension analysis.	04
2.	To measure diameter and the dimension of regular body of known mass using Vernier Calipers.	04
3.	To measure the thickness of a sheet and diameter of a wire with the help of Micrometer Screw Gauge.	04
4.	To determine the radius of curvature of a given spherical surface by a spherometer.	04
5.	To verify ohm's law by using ammeter and voltmeter.	02
6.	To determine the coefficient of viscosity of a given viscous liquid by measuring the terminal velocity of a given spherical body.	04
7.	To determine the value of 'g' using simple pendulum.	04
8.	To study the relationship between the temperature of a hot body and time by plotting a cooling curve.	04
	TOTAL	**30**

Text Book(s):

Title	Author/s	Publication
Physics Part-I and II	Resnick and Haliday	Wiley Eastern Publication
Concept of the Modern Physics	A. Beiser	Tata McGraw-Hill Education
Concept of Physics	H.C. Verma	Bharati Bhawan
Fundamentals of Physics	Gomber and Gogia	Pradeep publications
NCERT Physics part 1 & 2		NCERT

Course Evaluation:

Theory:

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

Practical:

- Continuous Evaluation consists of Performance of Practical which will be evaluated out of 20 marks for each practical and average of the same will be converted to 10 Marks.
- Internal viva and practical performance consist 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 students will be able to:

IDSH1130	**PHYSICS**
CO 1	Identify physical quantities, different systems of units and make measurements with accuracy by minimizing different types of errors to solve real life relevant problems.
CO 2	Analyze type of motions and apply the knowledge to solve equation of motion and conservation of momentum principle to describe motion of rocket, recoil of gun etc.
CO 3	Define scientific work, energy and power and their units. Derive relationships for work, energy and power and solve related problems.
CO 4	Learn about the concept of elasticity, it's types and applications from engineering perspectives.
CO 5	Describe the properties of fluids, understand the concepts of viscosity and surface tension and their respective applications.

Mapping of CO with PO

IDSH1130	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO 1	3	2	1	2	1		1		1		1
CO 2	3	3	1	2	1				1		1
CO 3	3	3	1	2					1		1
CO 4	3	2	2	1		1	1		1		1
CO 5	3	2	2	1		2	1		1		1

Mapping of CO with PSO

IDSH1130	PSO1	PSO2	PSO3
CO 1	3	2	1
CO 2	3	2	1
CO 3	3	2	1
CO 4	3	3	2
CO 5	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**
01	Introductory Concepts	3,5

02	Mechanics	1,4
03	Work, Energy and Power	1,3
04	Mechanical properties of solids	2,6
05	Properties of fluids	1,5
06	Heat transfer	3,4

P P Savani University
School of Engineering
Institute of Diploma Studies

Department of Mechanical Engineering

Course Code: IDME1110
Course Name: Basics of Mechanical Engineering
Prerequisite Course(s): Zeal to learn the course

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

- Use relevant mechanical power and hand tools in real life applications.
- Recognize the various properties of gases, steams and their applications in an engineering industry.
- Explore the working principles of different prime movers like IC Engine, Boilers
- Select relevant power transmission mode in simple engineering situations.
- Identify and comprehend various hydro-pneumatic devices/equipment, brakes, clutch and couplings.

Course Content:

Module No.	Content	Hours	Weightage in %
1.	**Introduction and Basic Mechanical Applications** Concept of Force, Pressure, Energy, Work, Power, System, Heat, Temperature, Specific heat capacity, Prime movers and its types. Basic Mechanical Components and its applications like bolts, nuts, washers, bearings, valves, bushes, springs, levers, rivets, keys, shafts, axles.	6	15
2.	**Properties of Gases** Difference between vapour and gas, perfect gas, gas laws, Boyle's law, Charle's law, Combined gas law, Gas constant and universal gas constant, N.T.P, S.T.P	6	15
3.	**Steam Generators** Introduction, I.B.R, Classification of boilers, Cohran and Babcock and Wilcox boiler, only Functioning of different mountings (Only Purposes) and accessories.	6	10
4.	**Pumps** Types, Construction and working of Reciprocating, Centrifugal pumps and Rotary pumps	4	10

5.	**Internal Combustion Engines** Introduction, Difference between I.C. Engine and E.C. Engine, Classification of I.C. Engine, Main Components of Engine and their functions, working four- stroke cycle Petrol/Diesel engines, Comparison between Petrol cycle and diesel cycle. Basic concept of CNG and EV. (No Numericals)	8	15
6.	**Transmission of Motion and Power** Shaft and axle, Various types of Belt drive, Chain drive, Friction drive, Gear drive.	8	15
7.	**Couplings, Clutches and Brakes** Concept and applications of Couplings (Box; Flange; Pin type flexible; Universal and Oldham), Clutches (Disc and Centrifugal), and Brakes (Block; Shoe; Band, and Disc).	7	20
	TOTAL	**45**	**100**

List of Tutorials:

Sr. No.	List of Tutorial	Hours
1.	Demonstration of various types of boilers.	4
2.	Demonstration of different boiler mountings and accessories.	4
3.	Demonstration of four stoke petrol/diesel engines.	2
4.	Demonstration of centrifugal, reciprocating, and rotary pump.	4
5.	Demonstration of various belt drives and chain drive.	4
6.	Demonstration of various gear drives.	2
7.	Demonstration of various couplings.	2
8.	Demonstration of various brakes.	2
9.	Demonstration of various clutches.	2
	TOTAL	**30**

Text Book:

Title	Author(s)	Publication
Elements of Mechanical Engineering	N M Bhatt and J R Mehta	Mahajan Publishing House
Elements of Mechanical Engineering	Sadhu Singh	S. Chand Publication

Reference Book:

Title	Author(s)	Publication
Elements of Mechanical Engineering	P. S. Desai and S. B. Soni	Atul Prakashan
Basic Mechanical Engineering	Pravin Kumar	Pearson Education

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 Marksfor each tutorial and average of the same will be converted to 30 marks.
- MCQ based examination consists of 20 marks.

Course Outcome(s):

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

IDME1110	**BASICS OF MECHANICAL ENGINEERING**
CO 1	Use relevant mechanical power and hand tools in real-life applications
CO 2	Describe the various properties of gases, steams and their applications in the engineering industry
CO 3	Explain the working principles of different prime movers like IC Engine, Boilers
CO 4	Explain the relevant power transmission mode in simple engineering situation.
CO 5	Summarize various hydro-pneumatic devices/equipment, brakes, clutch and couplings.

Mapping of CO with PO

IDME1110	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO 1	3	2	1			2	2				
CO 2	3	3	2	1		1	2				
CO 3	3	2	3			3	3		1		1
CO 4	3	2	1		3	2	3				
CO 5	3	2	2	3				2		1	

Mapping of CO with PSO

IDME1110	PSO1	PSO2	PSO3
CO 1	3	2	2
CO 2	3	2	1
CO 3	3	3	2
CO 4	3	3	2
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 and Basic Mechanical Applications	1,2,3

2	Properties of Gases	1,2,3,4
3	Steam Generators	1,2,3
4	Pumps	1,2,3
5	Internal Combustion Engines	1,2,3,4
6	Transmission of Motion and Power	1,2,3,4
7	Couplings, Clutches and Brakes	1,2,3,4

Institute of Diploma Studies
Department of Information Technology

Course Code: IDIT1110
Course Name: Python 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

- To understand basic of python programming.
- To implement various control structures on different data types and analyze the use of different data structures in Python.
- Develop logic building and problem-solving skills.

Course Content:

Module No.	Content	Hours	Weightage in %
1.	**Introduction to Python** History, Features and application of python, installing Python, Basic structure of python program, Input and Output Functions in Python, Variable, Identifiers, Basic Operators, Expressions and Types of Data Int, Float, Complex, String, List, Tuple, Set, Dictionary and its Methods, Type Conversions, Comments, Input Processing and output.	06	14
2.	**Control Flow Structures in Python** Conditional Blocks Using if, if_Else and Else If, Simple for Loops in Python, For Loop Using Ranges, String, List and Dictionaries Use of While Loops in Python, Loop Manipulation Using Pass, Continue, Break and Else	07	18
3.	**Array and Strings** Array, Advantages of array, Creating an array, Importing the array module, Indexing and slicing on arrays, Processing the arrays, Types of arrays. Introduction to String, Access String elements using index operator, String functions: Basic functions: len, max, min, Testing functions: isalnum, isalpha, isdigit, isidentifier, islower, isupper, Searching functions: endswith, startswith, find, rfind, count, Manipulation functions: capitalize, lower, upper, title, swapcase, replace, lstrip, rstrip, strip	08	18

4.	**Lists, Tuples, Sets, and Dictionaries** Dictionaries, Accessing Values in Dictionaries, Working with Dictionaries, Properties, Functions and Methods. Sets, Accessing Values in Set, Working with Set Properties, Functions and Methods, Tuple, Accessing Tuples, Operations, Working, Functions and Methods. List, Accessing List, Operations, Working With Lists, Function and methods, two-dimensional lists.	08	15
5.	**Functions, Modules and Packages** Introduction to Functions, defining a Function, Calling a Function, Types of Functions, Function Arguments, Anonymous Functions, Global and Local Variables, Importing Module, Math Module, Random Module, Introduction to Packages: Numpy, Pandas, Matplotlib.	08	15
6.	**File Handling** Introduction to Text files, File Handling functions: Basic functions: open, close, Reading file: read, readline, readlines, Writing file: write, append, writelines	08	20
	TOTAL	**45**	**100**

List of Practical:

Sr. No.	List of Practical	Hours
1.	Introduction to Python (Introduction to IDLE, different data types, Input Output in Python, Operators, Operator precedence).	04
2.	Implementation of Dictionaries, Sets, Tuples and Lists and its various methods in Python.	06
3.	Working with decision structures in Python	04
4.	Working with array in Python	04
5.	Manipulation of Strings.	02
6.	Working with functions in Python.	04
7.	Working with modules and packages in Python.	04
8.	Implementation of file handling in Python.	02
	TOTAL	**30**

Text Book:

Title	Author(s)	Publication
Python approach Programming: A modular	Sheetal Taneja, Naveen Kumar	Pearson

Reference Book:

Title	Author(s)	Publication
Think Python: How to Think Like a Computer Scientist	Allen Downey	Green Tea Press
Python Cookbook	David Ascher, Alex Martelli Oreilly	O Reilly Media

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 Marksfor each tutorial and average of the same will be converted to 30 marks.
- MCQ based examination consists of 20 marks.

Course Outcome(s):

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

IDIT1110	**PYTHON PROGRAMMING**
CO 1	Interpret the fundamental Python syntax and semantics and control flow statements.
CO 2	Determine the methods for creating and manipulating Python programs by utilizing data structures like lists, dictionaries, tuples, and sets.
CO 3	Apply a modular programming approach to solve the given problems using user-defined functions.
CO 4	Perform string manipulation and file handling operations.
CO 5	Utilize Python modules, packages, and libraries (Math, Random, NumPy, Pandas, and Matplotlib to develop efficient, reusable, and data-oriented Python applications.

Mapping of CO with PO

IDIT1110	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO 1	3	2			1						1
CO 2	3	3	2		2						1
CO 3	2	3	3	1	2						2
CO 4	2	2	2	1	2				1		1
CO 5	2	2	3	2	3			1	1		2

Mapping of CO with PSO

IDIT1110	PSO1	PSO2	PSO3
CO 1	3	2	1
CO 2	3	2	2
CO 3	3	3	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 to Python	1,2,4
2	Control Flow Structures in Python	1,2,3
3	Array and Strings	1,2,3
4	Lists, Tuples, Sets, and Dictionaries	2,3,4
5	Functions, Modules, and Packages	2,3,4
6	File Handling	3,4,5

Department of Mechanical Engineering

Course Code: IDME1120
Course Name: Workshop Fundamentals
Prerequisite Course(s):--

Teaching & Examination Scheme:

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

CE: Continuous Evaluation, ESE: End Semester Exam

Objective(s) of the course:

To help learners to

- Introduce essential tools and machines used in workshops, emphasizing their functions, handling, and maintenance.
- Provide practical training in machining, fitting, carpentry, and other foundational manufacturing techniques.
- Instill the importance of workshop safety protocols to prevent accidents and ensure a secure working environment.
- Bridge the gap between classroom learning and real-world applications by implementing engineering principles in practical tasks.

Course Content:

Module No.	Content	Weightage in %
1.	**Introduction to Workshop Practice** Workshop Layout, Overview of workshop safety rules and regulations, Importance of various sections/shops in workshop, Understanding tools, materials, and machinery.	7
2.	**Carpentry, Fitting and Bench work** Basic wood types and their properties, Tools: saws, chisels, planes, hammer, and clamps, Preparation of Job as per Drawing including Marking and other Performing Operations Tools: files, hammers, punches, and measuring instruments, Techniques: filing, drilling, tapping, and sawing.	33
3.	**Introduction to Machine Tools and Sheet Metal Work** Introduction and Demonstration of various Machine Tools like Lathe, Drilling, Grinding, Hack Saw Cutting etc. Introduction to sheet metal materials and their uses, Tools: snips, mallets, and stakes, Techniques: bending, cutting, joining, and soldering	26
4.	**Welding and Plumbing** Types of welding: gas, arc, and MIG/TIG welding, Tools and safety equipment for welding, Welding techniques and applications. Introduction and Demonstration of Plumbing Shop.	7

5.	**Forging and Smithy** Tools: hammers, anvils, and tongs, Techniques: heating, bending, and shaping metals Applications of forging in engineering.	13
6.	**Measurement and Metrology** Introduction to measuring tools: Vernier calipers, micrometers, and gauges, Precision and accuracy in measurements.	7
7.	**Electrical and Electronic Skill** Use of Multimeter, Soldering of electrical circuits having discrete components (R, L, C & diode) and ICs on PCB, connections on Breadboard	7
	TOTAL	**100**

List of Practical:

Sr. No.	List of Practical	Hours
1.	Introduction and Demonstration of Safety Norms and various shops.	02
2.	To Perform a Job of Fitting Shop.	08
3.	To Perform a Job of Carpentry Shop.	04
4.	To Perform a Job of Black Smithy shop.	04
5.	To Perform a Job of Sheet metal Shop.	08
6.	To Perform a Job of Plumbing Shop	02
7.	Introduction to Machine Tool	02
	TOTAL	**30**

Text Book:

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:

Title	Author(s)	Publication
A Textbook of Workshop Technology	Deepak Dhounchak and Lalit Kumar Biban	White Falcon Publishing; 1st edition
Elements Of Workshop Technology Vol 2 Machine	S. K. Hajra Choudhury and Nirjhar Roy	Media Promoter and Publishers Pvt. Ltd.
Basic Electronics: A text lab manual	P.B. Zbar, A.P. Malvino, M.A. Miller	Mc-Graw Hill.

Course Evaluation:
Practical:

- Continuous Evaluation consists of Performance of Practical/Tutorial which will be evaluated outof 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:

IDME1120	WORKSHOP FUNDAMENTALS
CO 1	Students will demonstrate proficiency in basic workshop operations such as carpentry, fitting, welding, and machining.
CO 2	Understand the proper use and maintenance of hand tools, power tools, and workshop machinery, and sheet metal work
CO 3	Adopt essential safety protocols to ensure a hazard-free workshop environment.
CO 4	Identify and utilize various materials effectively, understanding their properties and applications in engineering projects.
CO 5	Use precision measuring instruments and electrical/electronic tools such as Vernier calipers, micrometers, multimeters, soldering equipment, and breadboards to carry out accurate measurements and basic circuit assembly.

Mapping of CO with PO

IDME1120	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO 1	2			1	2				2		1
CO 2	2				3			3	3		1
CO 3	2			1	2				1		1
CO 4	2								3		2
CO 5	3			1	1	1			2		2

Mapping of CO with PSO

IDME1120	PSO1	PSO2	PSO3
CO 1	3	2	2
CO 2	3	2	2
CO 3	2	2	3
CO 4	3	3	3
CO 5	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 to Workshop Practice	1,2
2	Carpentry, Fitting, and Benchwork	1,2,3
3	Introduction to Machine Tools and Sheet Metal Work	1,2,3,4
4	Welding and Plumbing	1,2,3,4
5	Forging and Smithy	1,2,4
6	Measurement and Metrology	1,2,3,4,5
7	Electrical and Electronic Skill	1,2,3

SECOND YEAR DIPLOMA IN CIVIL ENGINEERING

P P SAVANI UNIVERSITY															
SCHOOL OF ENGINEERING															
INSTITUTE OF DIPLOMA STUDIES															
TEACHING & EXAMINATION SCHEME FOR DIPLOMA ENGINEERING PROGRAMME AY:2025-26(BATCH:2025)															
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	IDCV2130	Building Materials & Construction Technology	CV	2	2	0	4	3	40	60	40	60	0	0	200
	IDCV2140	Hydraulics	CV	2	2	0	4	3	40	60	40	60	0	0	200
	IDCV2151	Strength of Materials	CV	3	2	0	5	4	40	60	40	60	0	0	200
	IDCV2160	Surveying	CV	3	2	0	5	4	40	60	40	60	0	0	200
	IDME2010	Basics of Engineering Drawings	ME	2	4	0	6	4	40	60	40	60	0	0	200
						Total	**24**	**18**							**1000**
4	IDCV2170	Concrete Technology	CV	2	2	0	4	3	40	60	40	60	0	0	200
	IDCV2180	Environment Engineering	CV	2	2	0	4	3	40	60	40	60	0	0	200
	IDCV2182	Structural Analysis	CV	3	0	2	5	5	40	60	0	0	40	60	200
	IDCV2200	Transportation Engineering	CV	2	2	0	4	3	40	60	40	60	0	0	200
	IDCV2210	Soil Mechanics	CV	2	2	0	4	3	40	60	40	60	0	0	200
						Total	**21**	**17**							**1000**

P P Savani University
School of Engineering
Institute of Diploma Studies

Department of Civil Engineering

Course Code: IDCV2130
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	
02	02	00	03	40	60	40	60	00	00	200

CE: Continuous Evaluation, ESE: End Semester Exam

Objective(s) of the Course:

To help learners to

- develop conceptual knowledge in building materials.
- develop awareness about the latest building materials.
- understand different types of technology used in construction works.

Course Content:

Module No.	Content	Hours	Weightage in %
1.	**Introduction:** Physical, Chemical and engineering properties of building materials. Applications of building materials, Alternative materials for the given items in building construction.	03	11
2	**Bricks:** Classification of brick, composition of brick, manufacture of brick, qualities of good brick, tests for bricks, comparison between clamp burning and kiln burning brick.	04	13
3	**Rocks & Stones:** Classification of rocks, sources of rocks, texture of rocks, Characteristics of stones, uses of stones, Standard requirement of stones.	04	13
4.	**Cement Concrete:** Types of Cement with their specific use, Engineering properties of cement, Field & Laboratory test of cement, Methods of storing the cement, Types of aggregate as per BIS, Requirement of aggregate, Engineering properties of aggregate, Test on aggregate.	04	13
5.	**Introduction of Construction Technology:** Civil engineering structures, Functions of various components of building & Other structures.	02	6
6.	**Foundations:** Classification and types of foundation, Selection types of foundation for required structure and as per situation, Foundation in black cotton soil, loose soils, etc., Failure in foundation precautions & remedial measures.	05	17

7.	**Construction Machinery:** Purpose, advantages & disadvantages, suitability of each. Ready mix concrete plant, Batch mix concrete plant.	05	17
8.	**Miscellaneous Construction Materials:** Plastics and PVC, Ceramic products, Paints and Varnish, Glass, Fiber, Steel, Concrete blocks. Timber, Lime.	03	10
		TOTAL	**45**

List of Practical:

Sr. No.	Details of Practical	Hours
1.	Conduct local market survey for different civil engineering materials with respect to application, cost and quality	Assignment
2.	Sketches for Building Component, Types of Foundations, Lay out Plan, Brick & Stone Masonry,	10
2.	Determination of Shape and Size of Brick	02
3.	Determination of water absorption of brick	02
4.	Determination of Compressive strength test of brick	02
5.	Determination of Consistency of Standard Cement Paste	02
6.	Determination of Final & Initial Setting Time of Standard Cement Paste.	04
7.	Perform a sieve analysis test on given sample of fine aggregate	02
8.	Conduct field tests on fine aggregate & coarse aggregate.	02
9.	Arrange field visits at construction sites where various construction activities are in progress.	04
	TOTAL	**30**

Text Book(s):

Title	Author/s	Publication
Building Materials & Contraction	B. C.Punamia	Laxmi Publications
Building Construction	Sushil Kumar	Standard Publication

Reference Book(s):

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

Course Evaluation:

Theory:

- Continuous evaluation consists of Unit tests and internal exam.
- End semester exam.

Practical:

- Continuous evaluation consists of practical performance of practical.
- Internal viva.
- Practical performance/ Quiz test

Course Outcome(s):

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

IDCV2130	Building Materials & Construction Technology
CO 1	Understanding about materials used in construction and various building components.
CO 2	Explain different uses of stone and rocks.
CO 3	Describe the properties of cement, aggregate, and bricks.
CO 4	Identify the components of the building, differentiate super structure, and sub structures.
CO 5	Identify the use of various construction machinery and miscellaneous construction materials.

Mapping of CO with PO

IDCV2130	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO 1	3	2	1	-	-	2	1	-	-	-	1
CO 2	3	2	1	-	-	2	1	-	-	-	1
CO 3	3	2	2	-	1	-	1	-	-	-	1
CO 4	2	2	2	-	-	2	1	-	-	-	1
CO 5	2	1	1	-	3	-	-	-	-	2	1

Mapping of CO with PSO

IDCV2130	PSO1	PSO2	PSO3
CO 1	3	2	2
CO 2	2	2	2
CO 3	3	3	3
CO 4	2	3	2
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.	Introduction	1, 2
2.	Bricks	1, 2, 3
3.	Rocks & Stones	1, 2, 3
4.	Cement Concrete	1, 2, 3, 4
5.	Introduction of Construction Technology	1, 2, 3, 4
6.	Foundations	1, 2, 3, 4,
7.	Construction Machinery	1, 2, 3, 4,
8.	Miscellaneous Construction Materials	1, 2, 3

P P Savani University
School of Engineering
Institute of Diploma Studies

Department of Civil Engineering

Course Code: IDCV2140
Course Name: Hydraulics
Prerequisite Course/s: -

Teaching & Examination Scheme:

Teaching Scheme (Hours/Week)				Examination Scheme (Marks)						
Theory	Practical	Tutorial	Credit	Theory		Practical		Tutorial		Total
				CE	ESE	CE	ESE	CE	ESE	
03	02	00	04	40	60	40	60	00	00	200

CE: Continuous Evaluation, ESE: End Semester Exam

Objective(s) of the Course:

To help learners to

- To introduce the importance of study of open channel flow, to give brief description on different types of flows and channels and hydraulic design principles of channels.
- To learn the fundamentals of Uniform and Non-Uniform flow in open channels.
- To give an idea about the gradually varied flow and rapidly varied flow and their equations and computations.
- To impart the knowledge on pumps and turbines

Course Content:

Module No.	Content	Hours	Weightage in %
1.	**Properties of Liquids:** Scope and importance of hydraulics in Civil Engineering. Definition and properties of liquids-as mentioned in specific objectives Formulae of Dynamic viscosity, Surface tension and Kinematic Viscosity.	03	07
2.	**Liquid Pressure and its Measurement:** Atmospherics pressure, Gauge Pressure, Absolute pressure, Vacuum pressure, Types of Gauges. liquid column gauge and mechanical gauges, uses and its application. Pressure of fluid, pressure head of a liquid, Depth pressure relation, Pascal's law, Hydraulics. pressure, Normal pressure exerted by fluid, Total pressure, center of pressure, pressure diagrams.	07	15
3.	**Fluid Kinematics:** Laminar flow and turbulent flow, Uniform and Non-uniform flow, steady flow and unsteady flow, Equation of continuity, mean velocity, Rate of flow. Potential, Kinetic and pressure energy in Water Establish relation between total energy at two sections, Venturi meter, orifice meter, Pitot tube, Prandtl tube, Momentum equations.	03	07
4.	**Fluid Dynamics:** the fundamentals of fluid mechanics, pressure, statics,buoyancy, well as the dynamics of flow, including pipe flow, open channel flow, and laminar and turbulent flow boundary layer analysis, dimensional analysis, wave mechanics, and computational fluid dynamics **03**	03	06

5.	**Flow through orifices and mouthpieces:** Physical significance of Hydraulic coefficients, coefficients of contraction, coefficients of velocity, coefficient of discharge. Large orifice submerged and partially submersed orifice, Time of emptying a uniform vessel. Internal and External cylindrical mouthpiece.	07	15
6.	**Flow over Notches & Weirs:** Rectangular and triangular notch and its advantages, calibration of notch Francis's formula, computation of a discharge over board crested and submersed weirs, Discharges over a spillway.	08	18
7.	**Flow through pipes:** Characteristics of pipe flow, Different types of losses in pipe, Hydraulic gradient and total energy. gradient, Darcy Weisbach equation to calculate head loss due to friction.	06	14
8.	**Flow through open Channels:** Characteristics of open channel flow, hydraulic mean depth, Chezy and Bazin's formula, Manning's formula to calculate mean velocity and discharge through open channel, Velocity distribution over cross section of a channel	08	18
		TOTAL	**45**

List of Practical:

Sr. No.	Details of Practical	Hours
1.	Determination of coefficient of discharge of a small orifice by constant head method and variable Head Method	02
2.	Determination of Cc of an orifice by finding Cv and Cd.	02
3.	Determination of coefficient of discharge of a mouthpiece by constant head method.	02
4.	Determination of Cc of an orifice by finding Cv and Cd.	06
5.	Verification of Bernoulli's theorem	02
6.	Determination of coefficient of a discharge of a Venturi meter	02
7.	Determination of the coefficients of friction of pipe flow.	02
8.	Determination of Chezy's constant from flow through open channel.	02
9.	Study of reciprocating pump and centrifugal pump.	04
10.	Study of turbines – Pelton wheel, Francis and Kaplan turbines.	06
	TOTAL	**30**

Reference Book(s):

Title	Author/s	Publication
Hydraulics	R.S. Khurmi	S. Chand
Hydraulics	Rangwala	Laxmi Publication Pvt. Ltd.

Course Evaluation:

Theory:

- Continuous evaluation consists of Unit tests and Internal exam.
- End semester exam.

Practical:

- Continuous evaluation consists of performance of practical.
- Internal viva.
- Practical performance/ Quiz test

Course Outcome(s):

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

IDCV2140	**Hydraulics**
CO 1	Understand the fundamental concepts of fluid mechanics.
CO 2	Define various properties of fluid.
CO 3	Explain various types of flow, pressure and its measurements.
CO 4	Illustrate fluid measuring devices like venture meter, orifice meter, notches, orifice and mouthpiece.
CO 5	Apply the bernoulli's equation to solve the problem of fluid.

Mapping of CO with PO

IDCV2140	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO 1	3	2	-	-	-	-	-	-	-	-	1
CO 2	3	2	-	-	-	-	-	-	-	-	1
CO 3	3	2	1	1	-	-	-	-	-	-	1
CO 4	2	2	2	2	3	-	-	-	-	-	1
CO 5	3	3	2	-	-	-	-	-	-	-	1

Mapping of CO with PSO

IDCV2140	PSO1	PSO2	PSO3
CO 1	3	2	2
CO 2	3	2	2
CO 3	3	3	2
CO 4	3	3	2
CO 5	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.	Properties of Liquids	1, 2
2.	Liquid Pressure and its Measurement:	1, 2, 3, 4
3.	Fluid Kinematics :	1, 2, 3, 4
4.	Fluid Dynamics:	1, 2, 3, 4
5.	Flow through orifices and mouthpieces:	1, 2, 3, 4, 5
6.	Flow over Notches & Weirs:	2, 3, 4, 5, 6
7.	Flow through pipes	2, 3, 4, 5,
8.	Flow through open Channels:	2, 3, 4, 5,

P P Savani University
School of Engineering
Institute of Diploma Studies

Department of Civil Engineering

Course Code: IDCV2151
Course Name: Strength of material
Prerequisite Course/s: Engineering Mechanics (IDCV1010)

Teaching & Examination Scheme:

Teaching Scheme (Hours/Week)				Examination Scheme (Marks)						
Theory	Practical	Tutorial	Credit	Theory		Practical		Tutorial		Total
				CE	ESE	CE	ESE	CE	ESE	
03	02	00	04	40	60	40	60	00	00	200

CE: Continuous Evaluation, ESE: End Semester Exam

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

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

Course Content:

Section I			
Module No.	Content	Hours	Weightage in %
1.	**Fundamental of Static:** Force, types of forces, Characteristics of a force, System of forces, Composition and resolution of forces.	03	
2.	**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.	05	
3.	**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.	05	
4.	**Centroid and Centre of Gravity**: Centroid of lines, plane areas and volumes, Examples related to centroid of composite geometry, Pappus Guldinus theorems.	05	

5.	**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.	05	
6.	**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.	03	09
7.	**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.	10	20
8.	**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.	09	20
		TOTAL	**45**

Text Book(s):

Title	Author/s	Publication
Mechanics of Structures	S.B Junarkar	Charotar Publishing House
Strength of Materials & Mechanics of Structures	Dr. B.C. Punmia	Laxmi Publications (p) Ltd.

Reference Book(s):

Title	Author/s	Publication
Strength of Material	Singer and Pytel	Harper Collins Publishers.
Elements of Strength of Materials	Timoshenko & Young	Mc Graw Hill Book Co

List of Practical:

Sr. No.	Name of Practical	Hours
1.	Compressive Strength Test	04
2.	Impact Test (Izod)	02
3.	Impact Test (Charpy)	04
4.	Tensile Strength Test	04
5.	Rockwell Hardness Test	04
6.	Brinnal's Hardness Test	04
7.	Tutorials	04
8.	Tutorials	04

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

IDCV2151	**STRENGTH OF MATERIAL**
CO 1	Understand and analyze different types of forces and force systems acting on particles and rigid bodies.
CO 2	Analyze concurrent and non-concurrent force systems and determine resultant and equilibrium conditions.
CO 3	Explain mechanical properties of materials and stress–strain behavior under different loading conditions.
CO 4	Understand the physical properties of materials
CO 5	Analyze simple structures such as beams for shear force, bending moment, and stress distribution.

Mapping of CO with PO

IDCV2151	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO 1	3	2	-	–	–	–	–	–	–	–	1
CO 2	3	3	1	–	–	–	–	–	–	–	1
CO 3	3	2	1	–	–	–	–	–	–	–	1
CO 4	3	2	2	–	–	–	–	–	–	–	1
CO 5	3	3	2	–	–	–	–	–	–	1	1

Mapping of CO with PSO

IDCV2151	PSO1	PSO2	PSO3
CO 1	3	2	1
CO 2	3	3	1
CO 3	3	3	2
CO 4	2	2	2
CO 5	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.	Fundamental of Static	1, 2, 3, 5
2.	Concurrent Forces	1, 2, 3, 4, 5
3.	Non-Concurrent Forces	1, 2, 3, 4, 6
4.	Center of Gravity	1, 2, 3, 4
5.	Moment of Inertia:	3, 4, 6
6.	Mechanical Properties of Materials	3, 4, 6
7.	Simple Stress and Strain	3, 4, 6
8.	Shear Force and Bending Moment	3, 4, 6

P P Savani University
School of Engineering
Institute of Diploma Studies

Department of Civil Engineering

Course Code: IDCV2160
Course Name: Surveying
Prerequisite Course/s: -

Teaching & Examination Scheme:

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

CE: Continuous Evaluation, ESE: End Semester Exam

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

- Define various survey terminology and carry out necessary corrections for errors.
- Comprehend the principle, purpose, equipment, and error corrections in a plane table and theodolite surveying.
- Gather skill towards modern surveying instrument with knowledge of the purpose and different methods.

Course Content:

Module No.	Content	Hours	Weightage in %
1	**Introduction of Traditional Surveying Methods:** Linear Measurements Compass Survey Leavalling and Contouring	03	07
2	**Theodolite Survey:** Introduction, definitions, vernier transit theodolite, temporary and permanent adjustment of theodolite, measuring horizontal and vertical angles, methods of traversing, closing error, computation of latitudes and departure, check in closed and open traverse, balancing of traverse.	06	13
3	**Trigonometric Levelling:** Principle and necessity of Trigonometric levelling, Indirect levelling, Heights and distances, Methods, Direct levelling on steep ground.	05	11
4	**Tachometric Survey:** Introduction, purpose, Principle, Instruments, Methods of tachometry, Stadia constants, Field work in tachometry, Reduction of readings, Errors, and precisions.	05	11
5	**Curves:** Introduction, classification of curves, elements of a simple circular, designation of curve, methods of setting out a simple circular curve, elements of a compound and reverse curves, transition curve, types of transition curves, combined curve, types of vertical curves.	07	15

6	**Plane table Surveying**: Objectives, principles and use of plane table surveying, instruments & accessories used in plane table surveying, Statements of two point and three-point problem, errors in plane table surveying and their corrections, Precautions in plane table surveying.	06	15
7	**Geodetic Surveying:** Introduction, triangulation, principle and uses of triangulation, triangulation systems and its classification, well-conditioned triangles, strength of figure, selection of triangulation stations and their inter-visibility, stations marks, signals, towers and scaffolds, base line, site selection and base line measurement, tape corrections, the base net, extension of base line, satellite station and reduction to Centre.	07	14
8	**Modern Surveying Instruments:** Introduction, electromagnetic spectrum, electromagnetic distance measurement, types of EDM instruments, electronic digital theodolites, total station, digital levels, scanners for topographical survey, global positioning system.	06	14
		TOTAL	**45**

List of Practical:

Sr. No.	Details of Practical	Hours
1.	To determine the horizontal angle by using transit Theodolite	02
2.	To determine the Vertical angle by using transit Theodolite	02
3.	To measure included angles between various points around the instrument station.	02
4.	Tacheometry Survey Project	02
5.	Setting out simple circular curve by different methods	02
6.	Plane table traversing by intersection methods	02
7.	Setting out combined curve	04
8.	(Transition - Circular – Transition)	04
9.	Plane table traversing by radiation methods	04
10.	Plane table traversing by intersection methods	04
11.	Introduction to modern surveying Instruments.	02
	TOTAL	**30**

Reference Book(s):

Title	Author/s	Publication
Surveying and Levelling, Vol-I	B.C. Punmia	Laxmi Publication
Surveying, Vol. I	K.R.Arora	Standard Book House Publication
Surveying and Levelling Vol. I	Sanjay Mahajan	Satya Prakashan Publication

Course Evaluation:
Theory:
- Continuous evaluation consists of Unit tests and internal exam.
- End semester exam.

Practical:
- Continuous evaluation consists of practical performance.
- Internal viva.
- Practical performance/ Quiz test

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

IDCV2160	Surveying
CO1	Establish horizontal angle and vertical angle by traversing and triangulation.
CO2	Collect and analyse surveying data.
CO3	Define the curve and determine the various component of curve in order to plot it.
CO4	Understand the geodetic surveying method and its importance.
CO5	Discuss advance methods of surveying i.e, EDM, GPS, Total Station, etc.

Mapping of CO with PO

IDCV2160	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO 1	3	2	1	–	1	–	–	–	–	–	1
CO 2	2	3	–	2	1	–	–	–	–	–	1
CO 3	3	2	2	–	–	–	–	–	–	–	1
CO 4	2	1	–	1	–	2	1	–	–	–	1
CO 5	2	1	1	–	3	–	–	–	–	–	1

Mapping of CO with PSO

IDCV2160	PSO1	PSO2	PSO3
CO 1	3	3	2
CO 2	3	3	2
CO 3	3	3	2
CO 4	2	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 of Traditional Surveying Methods	1, 2, 3
2.	Theodolite Survey	2, 3, 4, 6
3.	Trigonometric Levelling	2, 3, 4, 6
4.	Tachometric Survey	2, 3, 4, 6
5.	Curves	2, 3, 4, 6
6.	Plane table Surveying	2, 3, 4, 6
7.	Geodetic Surveying	2, 3, 4, 6
8.	Modern Surveying Instruments	1, 2

P P Savani University
School of Engineering
Institute of Diploma Studies
Department of Mechanical Engineering

Course Code: IDME2200
Course Name: Basics of Engineering Drawing
Prerequisite Course(s): None

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	04	00	04	40	60	40	60	00	00	200

CE: Continuous Evaluation, ESE: End Semester Exam

Objective(s) of the Course:
To help learners to
- Understand the language and familiarize with Indian Standards related to engineering drawings
- Develop drafting and sketching skills, application of drawing equipment's.
- Read various engineering curves, projections and dimensioning styles.

Course Content:

Module No.	Content	Hours	Weightage in %
1.	**Introduction:** BIS SP-46, Drawing Instruments and their uses, Letters and numbers – Standard Sizes and Layout of drawing sheets-Types of lines and their applications- Different types of Dimensioning techniques.	02	05
2.	**Scale:** Scale (reduced, enlarged & full size), plain scale and diagonal scale, Geometrical constructions.	02	05
3.	**Orthographic projections of points:** Introduction to orthographic projection, First angle and Third angle method, their symbols. Conversion of pictorial view into Orthographic Views – object containing plain surfaces, slanting surfaces, slots, ribs, cylindrical surfaces. Projections of points	06	12
4.	**Projections of lines:** Lines in different quadrants, inclinations, True lengths of the lines projections on auxiliary planes	04	07
5.	**Application of lines:** Typical applications of lines & traces	02	06
6.	**Projections of plane figures:** Different cases of plane figures (of different shapes) making different angles with one or both reference planes and lines lying in the plane figures making different given angles (with one or both reference planes).	04	23
7.	**Projection of solids:** Types of Solid. Projection of Cone, Cylinder, Prism &pyramids.	06	22

	Simple cases when solid are placed in different positions Axis faces and tines lying in the faces of the solid making given angles.		
8.	**Isometric projection:** Introduction to isometric projections. Isometric scale and Natural scale. Isometric view and isometric projection. Illustrative problems related to objects containing lines, circles and arcs shape only	04	20
	Total	45	100

List of Practical:

Sr No	Name of Practical	Hours
1.	Letters and numbers, Dimensioning techniques, Scale (reduced, enlarged & full size), plain scale and diagonal scale, Geometrical constructions.	02
2.	Orthographic projections of points and lines:	15
3.	Projections of plane figures	15
4.	Projection of solids	12
5.	Isometric projection	16

Text Book(s):

Title	Author/s	Publication
Engineering Drawing	N D Bhatt	Charotar Publishing House, Anand

Reference Book(s):

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

Web Material Link(s):

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

Course Evaluation:

Theory:

- Continuous Evaluation consists of two tests each of 30 marks and 1 Hour of duration, which will be converted to 30 marks.
- Faculty evaluation consists of 20 marks as per the guidelines provided by the course coordinator.

Practical:

- Continuous Evaluation consists of Performance of Practical/Tutorial which will be evaluated out of 10 for each practical/Tutorial and average of the same will be converted to 20 Marks.
- Internal Viva consists of 30 Marks.
- Practical performance/quiz/drawing/test of 50 marks during End Semester Exam.

Course Outcome(s):

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

IDME2200	BASICS OF ENGINEERING DRAWING
CO 1	Know and understand “Drawing is a language of Engineers.”
CO 2	Interpret general assembly technical drawing.
CO 3	Create traditions and the strategies for Engineering Drawing.
CO 4	Evaluate basic and intermediate geometry.
CO 5	Apply the knowledge of principles of projections.

Mapping of CO with PO

IDME2200	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO 1	3	2	1								1
CO 2	3	2	1								1
CO 3	3	2	1								2
CO 4	3	2									1
CO 5											

Mapping of CO with PSO

IDME2200	PSO1	PSO2	PSO3
CO 1	3	2	1
CO 2	3	3	2
CO 3	3	3	2
CO 4	2	2	1
CO 5	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	2
2	Scale	2, 3, 4, 5, 6
3	Orthographic projections of points and lines	2, 3, 4, 5, 6
4	Projections of lines	2, 3, 4, 5, 6
5	Applications of lines	2, 3
6	Projection of Plane figures	2, 3, 4, 6
7	Projection of Solids	2, 3, 4, 6
8	Isometric Projection	2, 3, 4, 6

SEMESTER 4

P P Savani University
School of Engineering
Institute of Diploma Studies

Department of Civil Engineering

Course Code: IDCV2170
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	
02	02	00	03	40	60	20	30	00	00	150

CE: Continuous Evaluation, ESE: End Semester Exam

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

- Comprehend the properties of Fresh Concrete, & manufacturing process of concrete.
- Understand the properties of hardened concrete, factors affecting Elasticity, creep & Shrinkage in concrete.
- Understand the concept of mix design of concrete & its importance in estimation of composition of materials.
- Know various types of special concretes & its application.

Course Content:

SECTION - I			
Module No.	**Content**	**Hours**	**Weightage in %**
1	**Introduction:** Definition of concrete, brief introduction to properties of concrete, advantages of concrete uses of concrete in comparison to other building materials.	03	10
2	**Water:** Introduction, qualities of water, Use of Sea Water for Mixing Concrete Mixes	02	6
3	**Admixtures:** Types of admixtures – mineral and chemical admixtures.	04	14
4	**Proportioning of concrete:** Object of proportioning of concrete, controlled concrete and ordinary concrete. Strength required for various types of concrete mixes. Methods of concrete mix design, fineness modulus method, water cement ratio. Importance of water quality.	06	20
5	**Properties of concrete:** Quality control of concrete, workability, tests on workability, factors affecting workability, segregation, bleeding properties of concrete in the hardened state, strength, toughness, durability, hardness impermeability and dimensional changes admixtures, accelerators and retarders and their use. Concreting under special conditions, cold weather concreting and hot weather concreting.	05	16
6	**Durability of concrete:** Factors affecting durability,	04	14

	permeability of concrete, Sulphate attack, thermal properties and fire resistance, expansion and contraction joints, repair of cracks.		
7	**Tests on hardened concrete:** Compressive strength, split tensile strength, flexural strength, non-destructive testing of concrete	03	10
8	**Special purpose concrete:** Introduction to ready mix concrete, high strength concrete, lightweight concrete, fiber reinforced concrete. Ferrocement and its uses.	03	10
		TOTAL	**45**

List of Practical:

Sr. No.	Details of Practical	Hours
1	To determine the standard consistency of cement	02
2	To determine the initial and final setting time of cement	02
3	To determine the grading zone and fineness modulus of fine aggregate	02
4	To determine the gradation of coarse aggregate	02
5	To determine the specific gravity and water absorption of fine aggregate	02
6	To determine the specific gravity and water absorption of coarse aggregate	02
7	To determine the bulk density of coarse aggregate and fine aggregate	02
8	To determine flakiness and elongation index of coarse aggregate	02
9	To determine the concrete mix proportion by the Indian standard Recommended method IS 10262-2009	02
10	To determine the compressive strength of hardened concrete using a rebound hammer	02
11	To determine the compressive strength of hardened concrete using an ultrasonic pulse velocity test	02
12	To arrange a site visit to the RMC plant and preparation of the report.	04
13	To arrange a construction site visit and preparation of report.	04
	TOTAL	**30**

Reference Book(s):

Title	Author/s	Publication
Concrete Technology	M.S Shetty	S.Chand & Company Ltd.
Concrete Technology	Aminul Laskar	Laxmi Publications
Concrete Technology	M L Gambhir	Tata Mc-Graw-Hill

Course Evaluation:

Theory:

- Continuous evaluation consists of Unit tests and internal exam.
- End semester exam.

Practical:

- Continuous evaluation consists of performance of practical.
- Internal viva.
- Practical performance/ Quiz test

Course Outcome(s):

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

IDCV2170	CONCRETE TECHNOLOGY
CO1	Identify the materials used for the concrete production.
CO2	Determine the various key properties of cement by performing various tests as per indian standards.
CO3	Prepare a mix design for different grades of concrete and evaluate the performance by conducing tests on fresh and hardened concrete.
CO4	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

IDCV2140	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO 1	3	1	1	–	–	–	–	–	–	–	1
CO 2	3	2	_	2	2	–	–	–	–	–	1
CO 3	3	3	3	2	2	–	1	–	–	–	1
CO 4	2	3	2	3	–	1	1	–	–	1	1
CO 5	3	1	1	–	–	–	1	–	–	–	1

Mapping of CO with PSO

IDCV2140	PSO1	PSO2	PSO3
CO 1	3	2	2
CO 2	3	3	2
CO 3	3	3	3
CO 4	3	3	3
CO 5	2	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.	Water	1,2,3
3.	Admixture	1,2,3
4.	Proportioning of concrete	1,2,3
5.	Properties of concrete	1,2,3
6.	Durability of concrete	1,2,3
7.	Tests on hardened concrete	1,2,3
8.	Special purpose concrete	1,2,3

P P Savani University
School of Engineering
Institute of Diploma Studies

Department of Civil Engineering

Course Code: IDCV2180
Course Name: Environment Engineering
Prerequisite Course(s):

Teaching & Examination Scheme

Teaching Scheme (Hours/Week)				Examination Scheme (Marks)						
Theory	Practical	Tutorial	Credit	Theory		Practical		Tutorial		Total
				CE	ESE	CE	ESE	CE	ESE	
03	02	00	04	40	60	40	60	00	00	200

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

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

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	03	8
2.	**AIR POLLUTION & IT'S SOURCES** 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 dioxid, Nitrogen oxide, Carbon monoxide, Oxidants &Ozon, Hydrocarbons, Particulate Matter.	05	11
3.	**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 removal of particulate and matters of	06	11
4.	**WATER POLLUTION & IT'S SOURCES** Types of water pollutants and their effects Biological Pollution (point & non-point sources), Chemical Pollutants: Toxic Organic & Inorganic Chemicals, Oxygen	05	11

	demanding substances, Physical Pollutants: Thermal Waste, Radioactive waste, Physiological Pollutants: Taste affecting substances, other forming substances		
5.	**WATER POLLUTION 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.	05	11
6.	**SOIL POLLUTIONG** 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	11
7.	**NOISE POLLUTION & CONTROL** Noise Pollution, Intensity, Duration, Types of Industrial Noise, Ill effects of Noise, Noise Measuring & Control, Permissible Noise Limits.	06	12
8.	**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	25
		TOTAL	**45**

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	Determination of pH of water	02
3	Determine Turbidity of water sample	02
4	Determination of Alkalinity of water	02
5	Determination of Acidity of water	02
7	Hardness determination (Total, Temporary & Permanent)	02
8	Chloride content determination	02
9	Visit water treatment plant & Making visit report	04
12	Visit Sewage treatment plant & Making visit report	04
13	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

Suggested Student Activities

- Visit nearby Water treatment plant for design point of view.
- Visit nearby wastewater treatment plant for design point of view.
- Visit nearby industries and understand the process and point of wastewater generation.

Evaluation:

- 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 30 marks

Course Outcome(s):

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

IDCV2180	**Environment Engineering**
CO1	Explain the interrelationship between man and environment, socio-economic structure, occupational exposures, and the scope of environmental engineering.
CO2	Identify sources, types, and effects of air, water, soil, and noise pollutants and explain their impact on human health and the environment.
CO3	Apply various analytical techniques and measurement methods for assessing air and water pollution levels.
CO4	Describe and analyze different control measures for air, water, soil, and noise pollution as per environmental standards.
CO 5	Explain the principles and processes of solid waste management and industrial waste minimization, including reuse, recycling, and energy recovery.

Mapping of CO with PO

IDCV2180	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO 1	2	1	–	–	–	3	3	–	1	–	1
CO 2	3	2	–	–	–	3	3	–	1	–	1
CO 3	3	3	–	3	2	–	–	–	–	–	1
CO 4	3	3	2	2	1	2	3	–	–	–	1
CO 5	3	2	2	–	–	3	3	–	–	1	1

Mapping of CO with PSO

IDCV2140	PSO1	PSO2	PSO3
CO 1	2	2	3
CO 2	3	2	3
CO 3	3	3	2
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
2	Air pollution & it's sources	2
3	Methods & approach of air pollution control	2
4	Water pollution & it's sources	2, 3, 6
5	Water pollution control	2
7	Noise pollution & control	1,2,3
8	Municipal solid waste management	1, 2, 3

P P Savani University
Institute of Diploma Studies

Department of Civil Engineering

Course Code: IDCV2192
Course Name: Structural Analysis
Prerequisite Course/s: Engineering Mechanics (IDCV1010), Strength of Materials (IDCV2031)

Teaching & Examination Scheme

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

CE: Continuous Evaluation, ESE: End Semester Exam

Objective(s) of the Course:
To help learners to understand
- the stresses developed under the application of force.
- the effect of torsion on material.
- behavior of structural element under the influence of various stresses.

Course Content:

Section I			
Module No	Content	Hours	Weightage in %
1.	**Introduction to Structural Analysis** Structure and its components – types of structures (determinacy, stability). Conditions of equilibrium. Determination of support reactions for beams and frames.	03	09
2.	**Analysis of Plane Trusses** Basic assumptions in truss analysis. Analysis of simple trusses by Method of Joints and Method of Sections.	06	13
3.	**Deflection of Beams** Concept of slope and deflection. Double integration and Macaulay's method for simply supported and cantilever beams.	06	13
4.	**Strain Energy and Theorems of Work** Concept of strain energy, Castigliano's theorem, and Maxwell's reciprocal theorem (simple applications).	06	13
5.	**Influence Lines and Moving Loads** Concept of Influence Line Diagrams (ILD). ILD for reactions, shear, and bending moment for simply supported beams. Maximum bending moment under moving loads.	06	13
6.	**Slope and Deflection** Concept of Slope and Deflection with Relation To Each Other. Location for Minimum & Maximum Slope and Deflection for Cantilever and Simply Supported with Uniform Loading. Formula for a Maximum Slope and Deflection for A Cantilever Beam with Point Load At Free End. U.D.L. On Entire Span. Point Load Including U.D.L. On Entire Span. Calculate Problems Based on Explain Formula for Maximum Slope and Deflection for A Simply Supported Beam	06	13

	with Central Point Load, U.D.L. On Entire Span. Central Point Load With U.D.L. On Entire Span.		
7.	**Introduction to Indeterminate Structures** Degree of static indeterminacy. Analysis of propped cantilever and fixed beams (simple cases). Comparison with determinate structures.	04	10
8.	**Principal Planes and Principal Stresses** Concept of compound stress, Concept of complimentary shear stress, Normal and tangential stress on an inclined plane due to Normal stresses acting at right angles to each other, Normal stresses acting at right angles to each other along with shear stresses, Define principal plane and principal stress, Formula to find principal planes and principal stresses, Problems based on Mohr's circle method, Selection of axis for the stresses Graphical concept of normal and tangential stresses Position of different planes on space diagram and Mohr's circle Diagram, Mohr's circle for different stress conditions Manipulation of required result in the form of stresses, Determination of normal, tangential and resultant stresses from Mohr's circle, Location of principal plane and value of principal stresses.	06	16
		TOTAL	**45**

List of Tutorial:

Sr. No	Tutorial	Hours
1	Analysis of Plane Trusses	04
2	Continuous Beam	04
3	Deflection of Beams	04
4	Strain Energy and Theorems of Work	04
5	Influence Lines and Moving Loads	04
6	Slope and Deflection	04
7	Principal Planes and Principal Stresses	06

Text Book(s):

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

Reference Book(s):

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

Course Evaluation:

Theory:

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

- End Semester Examination consists of 60 marks.

Course Outcome(s):

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

IDCV2192	**Structural analysis**
CO 1	Understand the concept of equilibrium and types of structures.
CO 2	Analyze statically determinate beams, trusses, and arches.
CO 3	Determine internal forces and deflections and Principal stresses.
CO 4	Interpret influence lines and moving load effects.
CO 5	Introduce the concept of indeterminate structures.

Mapping of CO with PO

IDCV2192	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO 1	3	2	–	–	–	–	–	–	–	–	1
CO 2	3	3	1	–	–	–	–	–	–	–	1
CO 3	3	3	2	–	–	–	1	–	–	–	1
CO 4	3	3	2	1	–	–	–	–	–	–	1
CO 5	2	2	2	–	–	–	–	–	–	1	1

Mapping of CO with PSO

IDCV2192	PSO1	PSO2	PSO3
CO 1	3	2	1
CO 2	3	3	2
CO 3	3	3	3
CO 4	3	3	2
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.	Fixed Beam	2, 4
2.	Continuous Beam	2, 4
3.	Moment Distribution Method (MDM)	2, 4
4.	Slope And Deflection	2, 4
5.	Principal Planes and Principal Stresses	2, 4

P P Savani University
School of Engineering
Institute of Diploma Studies

Department of Civil Engineering

Course Code: IDCV 2210
Course Name: 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	02	00	04	40	60	20	30	00	00	150

CE: Continuous Evaluation, ESE: End Semester Exam

Objective(s) of the course: To provide a comprehensive knowledge of basic mathematics essential for diploma students.
To help learners to

- Introduce the principles and practice of transportation engineering which focuses on Traffic and Transportation Engineering and Highway Engineering.
- Introduce the recent advancements in the field of Sustainable Urban Development, Traffic Engineering and Management, Systems Dynamics Approach to Transport Planning, Highway Design and Construction, Economic and Environment Evaluation of Transport Projects.
- Know how to be efficient Transport Engineers.

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).	8	17
2.	**Geometric Design of Road:** Importance & Classification of roads, Modes of transportation. Requirements of good roads and its advantages, Road alignment and their types, Importance of road alignment, Factors affecting the alignment, Cross section of road showing its component as per IRC. Function of each component, Terms used in road geometry Camber, sight distance, Super elevation, Widening of Road, Transition curve and Road Gradient.	8	17

3.	**Road materials and its construction aspects:** Types of Pavement, Necessity of Soil Stabilization and its methods, Types of materials used in road Construction, Various tests on Aggregate and bitumen, Construction of Flexible and Rigid Pavement, Types of Failures in roads, Maintenance of roads and its components.	7	16
4.	**Introduction and Permanent way:** Typical cross section of various permanent way as per IRS, Function of Various Components, Method of fixing the rails with slippers, Function of Rail joints. Railway gauge, Types of Rail gauge and uniformity of gauge, Function of point and crossing, Factors affecting point and crossing, Components of Turnouts and types of crossings.	8	18
5.	**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.	6	14
6.	**Bridge and Tunnel Engineering:** History, components, classification, types, requirements. Culverts and causeways: Layout plan, advantages and disadvantages, site suitability, and selection criteria.		
7.	**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.	**Introduction to Traffic Engineering and Traffic Survey:** Growth of Traffic engineering, its function and measure for operation of traffic, Types of Volume count and its purposes, Uses Equipment used in various count methods, Necessity of O and D survey and its methods. Analysis and presentation of Data, Need and methods of parking survey.	8	18
		TOTAL	**45**

List of Practical:

Sr. No.	Details of Practical	Hours
1	To determine the Specific gravity and water absorption of an aggregate sample.	02
2	To determine the impact value of an aggregate sample.	02
3	To determine the abrasion value of coarse aggregate by using a Los Angles machine.	02
4	To determine the shape test of aggregate	02
5	To determine the crushing strength of aggregate	02
6	To determine the penetration value of bitumen	02
7	To determine the flash and fire point test on bitumen	02
8	To determine the traffic volume study of manual method	02
9	To determine the spot speed study by pavement marking method	04
10	Sketches of cross section of road (with function of each part of road) , road junction, road curve and widening	04

11	Sketches of cross section of permanent way & points & crossing (with function of each part of road)	04
12	Site visit for railway engineering	02
	TOTAL	**30**

Text Book:

Title	Author(s)	Publication
Highway Engineering	S.K.Khanna & C.E.G. Justo	Nem Chand & Bros
A course on Highway engineering	S.P.Bindra	Dhanpat Rai Publications
Railway Engineering	S.C. Rangawala	Charotar publications
Bridge Engineering	S.C. Rangawala	Charotar publications
Highway Engineering	S.C. Rangawala	Charotar publications

Reference Book:

Title	Author(s)	Publication
A Text Book Of Transportation Engineering	S.P.Chandola	S. Chand
Principles, practices & design of Highway Enginnering.	S.K. Sharma	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.

Course Outcomes:

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

IDCV 2210	**TRANSPORTATION ENGINEERING**
CO 1	Understand the importance and functions of various modes of transportation systems (Road, Rail, Air, and Water) and their governing organizations.
CO 2	Explain the principles of geometric design of roads and identify the components, requirements, and factors affecting road alignment as per IRC standards.
CO 3	Describe the materials, construction methods, and maintenance practices for flexible and rigid pavements, and perform basic tests on road materials.
CO 4	Recognize the components, layout, and operational features of railway, waterway, and bridge systems, including their functions and classifications.
CO 5	Interpret the fundamentals of air transportation and traffic engineering, conduct basic traffic surveys, and analyze data for effective traffic management.

Mapping of CO with PO

IDCV2210	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO 1	2	1	–	–	–	3	2	–	1	–	1
CO 2	3	2	3	–	1	–	1	–	–	–	1
CO 3	3	2	2	2	2	–	1	–	–	–	1
CO 4	2	1	1	–	–	2	1	–	–	–	1
CO 5	3	3	2	–	2	2	1	–	1	1	1

Mapping of CO with PSO

IDCV2210	PSO1	PSO2	PSO3
CO 1	2	2	2
CO 2	3	3	3
CO 3	3	3	3
CO 4	3	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 and Road Geometric	1,2.4,5
2.	Geometric Design of Road	1,2,3
3.	Road materials and its construction aspects	1,2,3,6
4.	Introduction and Permanent way	1,2,3,4
5.	Water Transportation	1,2
6.	Bridge and Tunnel Engineering	1,2,3
7.	Air Transportation	1,2
8.	Introduction to Traffic Engineering and Traffic Survey	2, 3, 4, 5

P P Savani University
School of Engineering
Institute of Diploma Studies

Department of Civil Engineering

Course Code: IDCV2220
Course Name: Soil Mechanics
Prerequisite Course/s: -

Teaching & Examination Scheme:

Teaching Scheme (Hours/Week)				Examination Scheme (Marks)						
Theory	Practical	Tutorial	Credit	Theory		Practical		Tutorial		Total
				CE	ESE	CE	ESE	CE	ESE	
03	02	00	04	40	60	40	60	00	00	200

CE: Continuous Evaluation, ESE: End Semester Exam

Objective(s) of the Course:

To help learners to

- develop the conceptual knowledge in building materials.
- develop awareness about latest building materials.
- understand different types of technology used in construction works.

Course Content:

Module No.	Content	Hours	Weightage in %
1.	**Introduction:** History, List structures where soil is used as construction material, Soil-formation in Geological cycle, State the types of failures due to soil in Civil Engineering structure, General characteristics of different types of soils, Overview of different types of soils in Gujarat / India.	03	7
2.	**Index Properties & Interrelationship:** Three phase diagram, State three constituents of soil, Sketch showing three i. phases of soil, Assumptions in drawing a ii. phase diagram, Properties of soil like Density, Field density, Dry density, Saturated density, Void ratio, Porosity, Specific Gravity , Degree of saturation, Moisture content, Density Index, Different Soil relation ships	06	13
3.	**Soil Classification:** Classification of soil (Grain size) as per Indian Standard, Basis /criteria of classification. Mechanical Analysis of soil, Difference between course grained and fine grained Soil on the basis of range of grain size and engineering properties, Sieves designation as per I.S. Consistency Limits like Liquid limit, Plastic limit, Shrinkage, Limit and Plasticity Index.	07	15
4.	**Compaction:** Compaction and its Application, Effects of compaction on different soil properties like permeability, shear strength, soil settlements-stability of embankments, Maximum dry density and O.M.C., Typical compaction curve, Optimum moisture	07	15

	content (OMC), Maximum dry density (MDD), Proctor test, Light compaction, Heavy compaction test, Light compaction test on a given soil sample, Factors affecting compaction		
5.	**Permeability & Seepage:** Permeable and Impermeable soils, Permeability and Impermeability, Factors affecting the permeability, Methods to find Coefficient of Permeability, Constant Head Method, Falling Head Method, Coefficient of permeability,	05	12
6.	**Shear Strength:** Definition, define: (a) Cohesion (b) internal friction (c) Shear strength, Coulomb's law for shear strength $S = C + \sigma n \tan\varphi$, Shear strength of soil, Different shear tests used to determine shear strength of soil in laboratory, Calculate the values C and φ, From the failure envelope, direct shear test on soil	06	13
7.	**Bearing Capacity of soil:** Bearing capacity of soil, Net Bearing capacity, Safe Bearing Capacity, Ultimate Bearing Capacity, Bearing Capacity of various soil, Methods, Plate Load Test, Penetration Test & using C – Φ parameters for determining bearing capacity of soil and to improve bearing capacity of soil. Foundation on soils of various bearing Capacity,	08	18
8.	**Soil Investigation & Exploration:** Purposes of exploration of soil, Planning of exploration program, Soil samples and collection, Field penetration Test:SPT, Introduction to geophysical methods.	03	7
		TOTAL	**45**

List of Practical:

Sr. No.	Details of Practical	Hours
1.	Visual identification and specific gravity	2
2.	Oven Drying	2
3.	Sieve Analysis	2
4.	Liquid limit Test	2
5.	Plastic Limit Test	2
6.	Shrinkage limit Test	2
7.	In-situ Density-Core Cutter	2
8.	Sand Replacement method	4
9.	Permeability Test: Constant and Variable Head	2
10.	Soil Compaction Test	4
11.	Direct Shear Test	4
	TOTAL	**30**

Text Book(s):

Title	Author/s	Publication
Basic & Applied Soil Mechanics	Gopal Ranjan & Rao A. S. R	New Age International Publication

Reference Book(s):

Title	Author/s	Publication
Soil Mechanics and Foundation Engineering	V. N. S. Murthy	Dhanpatrai Engineering
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	J. Ross Publishing

Course Evaluation:

Theory:

- Continuous evaluation consists of Unit tests and internal exams.
- End semester exam.

Practical:

- Continuous evaluation consists of the performance of practical.
- Internal viva.
- Practical performance/ Quiz test

Course Outcome(s):

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

IDCV2220	Soil mechanics
CO 1	Classify the factor responsible for the soil and rock formation, and Recall the properties and relationship between properties.
CO 2	Evaluate the compaction, and the required degree of compaction. Distinguish the test to check the compacted density of soil.
CO 3	Measure the Permeability of soil considering its importance in various hydraulic structures.
CO 4	To determine/calculate the shear capacity and bearing capacity of soil and to understand its importance in foundation design.
CO 5	Illustrate the shear capacity and bearing capacity of soil and assess the methods used for soil investigation on the field.

Mapping of CO with PO

IDCV2220	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO 1	3	2	–	–	–	–	–	–	–	–	1
CO 2	3	3	1	2	1	–	–	–	–	–	1
CO 3	3	2	1	2	1	–	–	–	–	–	1
CO 4	3	3	3	–	–	–	1	–	–	–	1
CO 5	3	3	2	2	1	–	1	–	–	1	1

Mapping of CO with PSO

IDCV2220	PSO1	PSO2	PSO3
CO 1	3	2	2
CO 2	3	3	2
CO 3	3	3	2
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
2.	Index Properties & Interrelationship	2, 4, 5,
3.	Soil Classification	2, 3, 4, 5, 6
4.	Compaction	2, 3, 4, 5
5.	Permeability & Seepage	2, 3, 4, 5
6.	Shear Strength	2, 3, 4, 5
7.	Bearing Capacity of soil	2, 3, 4, 5
8.	Soil Investigation & Exploration	2, 3, 4, 5

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