PPSU

P P SAVANI UNIVERSITY

SCHOOL OF ENGINEERING

DIPLOMA

CIVIL ENGINERING

SYLLABUS BOOK

AY 2024-25

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

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

Graduates will demonstrate ability to:

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

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

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

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

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

Syllabus Book

Diploma
(Civil Engineering)

P P Savani University

School of Diploma Studies

Effective From: 2024-25

Authored by: P P Savani School of Diploma studies

CONTENT

FIRST YEAR DIPLOMA IN CIVL ENGINEERING

P P SAVANI UNIVERSITY															
SCHOOL OF ENGINEERING															
INSTITUTE OF DIPLOMA STUDIES															
TEACHING & EXAMINATION SCHEME FOR DIPLOMA CIVIL ENGINEERING PROGRAMME AY:2024-25															
Sem	**Course Code**	**Course Title**	**Offered By**	**Teaching Scheme**					**Examination Scheme**						
				Contact Hours				**Credit**	**Theory**		**Practical**		**Tutorial**		**Total**
				Theory	**Practical**	**Tutorial**	**Total**		**CE**	**ESE**	**CE**	**ESE**	**CE**	**ESE**	
1	IDSH1010	Fundamentals of Mathematics	SH	3	0	2	5	4	40	60	0	0	50	0	**150**
	IDSH1020	Engineering Physics	SH	3	2	0	5	4	40	60	20	30	0	0	**150**
	IDME1010	Basics of Mechanical & Civil Engineering	ME	2	4	0	6	4	40	60	40	600	0	0	**200**
	IDCE1010	Computer Applications	CE	3	4	0	7	5	40	60	40	60	0	0	**200**
	IDME1020	Engineering Workshop	ME	0	2	0	2	1	0	0	50	0	0	0	**50**
	CFLS1030	Functional English-I	CFLS	3	0	0	3	3	100	0	0	0	0	0	**100**
						Total	**27**	**21**							**850**
2	IDSH1040	Engineering Mathematics	SH	3	0	2	5	5	40	60	0	0	50	0	**150**
	IDSH1050	Fundamentals of Chemistry	SH	3	2	0	5	4	40	60	20	30	0	0	**150**
	IDCV1010	Engineering Mechanics	CV	3	2	0	5	4	40	60	20	30	0	0	**150**
	IDIT1010	Introduction to Computer Programming	IT	3	4	0	7	5	40	60	40	60	0	0	**200**
	IDSH1060	Electrical & Electronics Workshop	SH	0	2	0	1	2	0	0	50	0	0	0	**50**
	CFLS1040	Functional English-II	CFLS	2	0	0	2	2	40	60	0	0	0	0	**100**
						Total	**25**	**22**							**800**

SEMESTER 1

P P Savani University
School of Engineering
Institute of Diploma Studies

Department of Science & Humanities

Course Code: IDSH1010
Course Name: Fundamentals of Mathematics
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	00	02	05	40	60	00	00	50	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

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

Course Content:

SECTION-I			
Module No.	Content	Hours	Weightage in %
1.	**Logarithm** Basic concept of logarithm, Rules and related examples, Applications of logarithm.	5	14
2.	**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.	9	18
3.	**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 formulae, Inverse trigonometric function, Applications of trigonometry.	9	18
SECTION-II			
Module No.	Content	Hours	Weightage in %
4.	**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	6	15

	equation, Angle between two lines, Circle, Tangent and normal, Equation of tangent and normal.		
5.	**Vectors** Basic concept of vector and scalar, Addition and subtraction, Product of vectors, Geometric meaning of scalar and vector product, Angle between two vectors, Applications of dot and cross product, Work done and moment of force.	8	15
6.	**Mensuration** Basic concept of Mensuration, Area of Triangle, Square, Rectangle, Trapezium, Parallelogram, Rhombus and Circle surface, Volume of Cuboids, Cone, Cylinder and Sphere.	8	20

List of Tutorials:

Sr. No.	Name of Tutorial	Hours
1.	Logarithm-1	1
2.	Logarithm-2	1
3.	Determinants and Matrices-1	1
4	Determinants and Matrices-2	2
5.	Trigonometry-1	1
6.	Trigonometry-2	2
7.	Co-ordinate geometry-1	1
8.	Co-ordinate geometry-2	1
9.	Vectors-1	1
10.	Vectors-2	1
11.	Mensuration-1	1
12.	Mensuration-2	2

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
Basic Mathematics	G.C. Patel and Ami C. Shah	Atul Prakashan
Applied Mathematics for Polytechnics - 10th Edition	H. K. Dass	H. K. Dass
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 30 marks.
- MCQ based examination consists of 20 marks.

Course Outcomes:

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

IDSH1010	FUNDAMENTALS OF MATHEMATICS
CO 1	Explain logarithmic properties and solve exponential expressions.
CO 2	Demonstrate the ability to crack engineering related problems based on determent and matrices.
CO 3	Define properties of trigonometry and vectors in construction.
CO 4	Establish the knowledge of coordinate geometry, and ability to solve engineering problems.
CO 5	Explain the surface area and volume of different shapes and bodies.

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	Determinants and Matrices	2,3,4,5
3	Trigonometry	2,3,4,5,6
4	Coordinate geometry	2,3,5
5	Vectors	2,3,5
6	Mensuration	1,2,3,5

P P Savani University
School of Engineering
Institute of Diploma Studies

Department of Applied Science & Humanities

Course Code: IDSH1020
Course Name: Engineering Physics
Prerequisite Course(s): --

Teaching & Examination Scheme:

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

CE: Continuous Evaluation, ESE: End Semester Exam

Objective(s) of the Course:

To help learners to

- understand the 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:

Section I			
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

Section II			
Module No.	Content	Hours	Weightage in %
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 between them (no derivation), Stress- Strain diagram, Yield point, Ultimate stress, Breaking stress, Factor of safety. (Numerical on above topics)	08	18
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

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

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

Course Outcome(s):

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

IDSH1020	**ENGINEERING PHYSICS**
CO 1	Identify physical quantities, unit systems and estimate measurements with accuracy by minimizing errors to solve real life measurements.
CO 2	Classify different types of motion, interpreat the equation of motion and conservation law of momentum to describe motion of rocket, recoil of gun etc. derive relationships for work, energy and power and solve related problems.
CO 3	Understand the concept of elasticity, it's types and articulate in engineering applications, especially in civil engineering. the knowledge is extended to explore the properties of fluids, construct the concepts of viscosity and surface tension.
CO 4	Explain the basics of heat transfer and employ the knowledge of heat and thermodynamics in different engineering sectors especially mechanical and chemical.

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: IDME1010
Course Name: Basics of Mechanical and 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	
02	04	00	04	40	60	40	60	00	00	150

CE: Continuous Evaluation, ESE: End Semester Exam

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

- Acquire an inclusive knowledge of fundamental concept of Mechanical Engineering.
- Understand working of simple mechanical devices.
- Study and gain significance of Mechanical Engineering in various fields.
- Read and Interpret the building drawing
- Select different types of construction materials as per requirements

Course Content:

Section I			
Module No.	Content	Hours	Weightage in %
1.	**Introduction of Mechanical Engineering:** Introduction, Scope, Importance, Basic terminologies in mechanical engineering, Basic mechanical components used in routine, Pipe and pipe fittings, Hand tools, Power tools	02	7
2.	**Heat interactive equipment:** Heat transfer and its Modes, Boilers, Classification and Working, Concept of Accessories and Mountings – Types, Applications, Prime movers, Meaning, Classification, Steam turbine working, Layout of thermal power plant, Working and applications, Internal combustion engines – Definition, Classification, Components, Working of two-stroke and four-stroke engines, S.I. and C.I. engines	05	13
3.	**Power Transmission and Safety:** Power transmission: Importance, Modes, Types, Applications, Couplings in power transmission, Safety norms to be followed for preventing accidents.	06	11
4.	**Hydraulic and pneumatic devices:**	05	11

	Concept of theory of fluid flow, general properties of fluid flow, Pumps, Water turbines, and Air compressors – working principle, types, parts, performance, troubles and remedies, applications.		
5.	**Manufacturing processes:** Overview of manufacturing processes, Welding concept and overview, Types, Arc and Gas welding, Accessories and Consumables, Precautions and Safety during arc and gas welding, Casting - Introduction, Applications.	04	10
Section II			
6.	**Civil Engineering: An Overview** Introduction, Branches, Scope, Impact, Role of Civil Engineer, Unit of measurement, Unit conversion (Length, Area, Volume).	04	7
7.	**Civil Engineering Surveying:** Surveying & leveling (its importance and types), Necessity for leveling, Principals of surveying, Instrument/tools used for survey and level, Various methods of finding the field survey measurements, Chain and Compass Survey	07	16
8.	**Civil Engineering Drawing**: Types of building drawings, Abbreviation, conventions & symbols in civil drawing, building byelaws for planning of residential building and industrial building, Planning of simple residential and industrial building	06	13
9.	**Construction Materials**: Common construction materials such as cement, Brick, Stone, Timber, Steel and Concrete, Properties of each materials & their acceptable standards, Quality parameters of materials, Estimations and costing for simple structure (only the material cost)	06	12

List of Practical:

Sr. No.	Details of Practical	Hours
1.	Study of few selected boilers, accessories and mountings	02
2.	Numerical based on heat interactive equipment	02
3.	Study of power and motion transmission systems	04
4.	Numerical based on power transmission and safety	02
5.	Study of various pumps	04
6.	Numerical based on hydraulic and pneumatic devices	02
7.	Study and demonstration of basic machine tools	04
8.	Numerical based on manufacturing processes	02
9.	Machine parameters of wheel and differential axel apparatus	04
10.	Study and demonstration of basic mechanical equipment	04
11.	Unit Conversation Exercise	02
12.	Linear Measurement.	04
13.	Angular Measurement (Prismatic Compass)	04
14.	Angular Measurement (Surveyor Compass)	04

15.	Determine R.L of given point by Dumpy level without change point.	04
16.	Determine R.L of given point by Dumpy level with change point.	04
17.	Brick masonry bonds	04
18.	Aggregate experiments	02
19.	Brick masonry tests	02

Reference Book(s):

Title	Author/s	Publication
Elements of Mechanical engineering	P. S. Desai and S. B. Soni	Atul Prakashan
Theory of Machines	R. S. Khurmi and J. K. Gupta	S. Chand
Heat engine	Shah and Pandya	Charotar Publishing House
Hydraulic machines	Jagdish Lal	Metropolitan Book Company
Elements of Workshop	Hazara Chaudhary	Asia Publishing House
Text book on Surveying and Levelling	S. B. Junnarkar and H. J. Shah	Laxmi Publication

Course Evaluation:

Theory:

- Continuous evaluation consists of Unit tests and internal exams.
- 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

IDME1010	Basics of Mechanical and Civil Engineering
CO 1	Understand the mechanical engineering background.
CO 2	Discover heat transfer in context with engines and boilers.
CO 3	Differentiate power transmission working.
CO 4	Identify the scope of civil engineering based on field experience.
CO 5	Illustrate measurements of surveying & levelling & building components.

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 mechanical engineering	1,2
2	Heat Interactive equipment	1,2,3
3	Power transmission systems and safety	1,2,3,4
4	Hydraulic and pneumatic system	1,2,3,4,
5	Manufacturing Processes	1,2,3,4,6
6	Civil Engineering: An Overview	1,2
7	Civil Engineering Surveying	1,2,3,5
8	Civil Engineering Drawing	1,2,3,6
9	Construction Materials	1,2.3

P P Savani University
School of Engineering
Institute of Diploma Studies

Department of Computer Engineering

Course Code: IDCE1010
Course Name: Computer Applications
Prerequisite Course (s): --

Teaching & Examination Scheme:

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

CE: Continuous Evaluation, ESE: End Semester Exam

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

- Familiarize with components of computer and basic operations of it.
- Provide practical and hands-on experience of application used to create documents.
- Introduce internet and its usage.

Course Content:

Section I			
Module No.	Content	Hours	Weightage in %
1.	**Basics of Computer System** Introduction and Characteristics, Generation, Classification, Applications, describe computer hardware and software, Identify I/O, Devices, describe functioning of CU, ALU and memory unit, differentiate various types of printers, Demonstrate various file handling operations, Introduction to Memory, Memory hierarchy, Primary memory and its type, Secondary memory, Classification of Secondary memory, Cache Memory and Virtual Memory.	08	20
2.	**Computer Software** Software concept Classification of Software, System software and Application Software, Overview of Operating System, Objectives and Functions of O.S, Types of Operating System, Batch Processing, Multiprogramming, Time Sharing OS, Features of DOS, Windows and UNIX, Programming Languages, Compiler, Interpreter, Computer Virus Different Types of computer virus, Detection and prevention of Virus Application of computers in different Domain. Installation of device drivers and other required software, need and method of backup.	08	15
3.	**Using MS-Word** Use basics text formatting features, manipulate text, use page Setup features, use spell and grammar utility, Work with graphics/ clipart, Create and manipulate table, use auto shapes and its	06	14

	formatting with text, Use Image and table formatting.		
Section II			
4.	**Using MS-Excel** Use basic formatting and data entry features, use formula and functions, Work with graphics, Create and manipulate charts, Use header and footer options, Setup page layout and print worksheet	07	20
5.	**Using MS - PowerPoint** Create new presentation and apply basic formatting features, use master slide, Create and manipulate table, Work with objects and clips, Work with video, Work with audio, use special effects, Use navigation and hyper linking, Custom Animation and Transitions	07	15
6.	**Multi Media, Internet usage and Google Applications** Introduction of Multimedia, Types of Multimedia, and Use of Multimedia in various platforms, Describe Internet, WWW and Web Browsers: Web Browsing software, Surfing the Internet, Chatting on Internet, Basic of electronic mail, Using Emails, Document handling, Network definition, Common terminologies: LAN, WAN, Node, Host, Workstation, bandwidth, Network Components: Severs, Clients, Communication Media. Introduction of Google Applications, Gmail, Google Drive, Docs, Spreadsheet	08	16

List of Practical(s):

Sr. No	List of Practical	Hours
1.	Introduction to different hardware components of PC and Assembling of PC.	02
2.	Installation of OS and other Software. Partitions of Drive, Compression Utilities: WinZip, Defragmenting Hard, Formatting Hard disk, etc.	04
3.	Use accessories utilities of windows OS the User Interface, Using Mouse and Moving Icons on the screen, The My Computer Icon, The Recycle Bin, Status Bar, Start and Menu & Menu-selection, Running an Application, Windows Explorer Viewing of File, Folders and Directories, Creating and Renaming of files and folders, Opening and closing of different Windows, Control Panels, Setting the date and Sound, Create Users and password.	02
4.	Entering and editing text in document file. Apply formatting features on Text like Bold, Italics, Underline, font type, color and size, Apply features like bullet, numbering in Microsoft word.	04
5.	Create and manipulate tables, create documents, insert images, format tables, Smart art, Chart in Microsoft word, Insert Hyperlink, Page number and textbox in word.	04
6.	Create Event Registration Form and Resume in Microsoft word.	04
7.	Entering and editing data in worksheet, Fill Series, fill with formatting and without formatting Using Microsoft Excel.	02
8.	Create and manipulate Charts, Shape, Sparkline Charts, Clipart, and table.	04
9.	Filter Data Using Filter and advanced filter function with more than 2 conditions, Freeze row & Column in Microsoft Excel.	02
10.	Create Mark sheet, and Pay slips using Excel, Apply various formula and functions	06

	in the sheet.	
11.	Print sheet using print area, Page setting, print titles, Adjusting margins, Page break, headers and footers.	02
12.	Basic operations of Power point, Create PPT and inset and delete slides in power point, Use of Master Slide in Presentation, Create Project presentations, Lecture presentations, Apply Custom animation & Transition. Apply basic formatting features in presentation like font, font size, font color, text fill, spacing and line spacing Formatting text boxes, word arts, styles bullet and numbering in Microsoft power point. Working with drawing tools, applying shape or picture styles, Applying object borders, object fill, object effects in Microsoft Power point.	16
13.	Working with video, Link to video and sound files using power point.	02
14.	Internet Searching, Browsers, Various functions of Browsers (Eg. Bookmark, Customize Settings), Study of components like switches, bridges, routers, Wi-Fi router,	02
15.	Introduction of Google application, Compose Gmail, File attachment, add signature.	02
16.	Demonstration of Google drive, Sharing File Using Google drive, Spreadsheet, Docs and Google slides	02

Reference Book(s):

Title	Author/s	Publication
Computer Course	R.Taxali	Tata McGraw Hills. New Delhi.
MS-Office for Dummies	Wallace Wang	Wiley India, New Delhi
Basic Computer Engineering	Petes S. J., Francis.	Tata McGraw-Hill Education, 2011

Web Material Link(s):

- http://www.digimat.in/nptel/courses/video/106104128/L01.html
- https://www.youtube.com/watch?v=3QiItmIWmOM

Course Evaluation:

Theory

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

Practical

- Continuous Evaluation Consist of Performance of Practical which should be evaluated out of 10 for each practical in the next turn and average of the same will be converted to 20 Marks.
- Internal Viva component of 20 Marks.
- Practical performance/quiz/test of 30 Marks during End Semester Exam.
- Viva/Oral performance of 30 Marks during End Semester Exam.

Course Outcome(s):

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

IDCE1010	COMPUTER APPLICATIONS
CO 1	Identify the components of a computer system and demonstrate basic proficiency in commonly used applications.

CO 2	Analyze, synthesize and evaluate school, work or home situations and use application software to complete information processing tasks efficiently and effectively.
CO 3	Apply the concepts of microsoft office – word, excel, and powerpoint to produce professional documentation and presentation.
CO 4	Access the internet and learn to use the browse, search and hyperlink capabilities of web browsers.
CO 5	Identify the significance of multimedia and its utilization in various platforms.

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

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

Module No	**Content**	**RBT Level**
1	Basics of Computer system	1, 2
2	Computer Software	1, 2
3	Using MS-Word	2, 3
4	Using MS-Excel	2, 3, 4
5	Using MS-Powerpoint	2, 3
6	Multi Media, Internet Usage and Google Applications	2, 3, 5

P P Savani University
School of Engineering
Institute of Diploma Studies

Department of Mechanical Engineering

Course Code: IDME1020
Course Name: Engineering Workshop
Prerequisite Course(s): -

Teaching & Examination Scheme:

Teaching Scheme (Hours/Week)				Examination Scheme (Marks)						
Theory	Practical	Tutorial	Credit	Theory		Practical		Tutorial		Total
				CE	ESE	CE	ESE	CE	ESE	
00	02	00	01	00	00	50	00	00	00	50

CE: Continuous Evaluation, ESE: End Semester Exam

Objective(s) of the Course:

To help learners to

- Understand basic know-how of various hand tools and their use in different sections of manufacturing
- Understand the use of workshop practices in day to day industrial as well domestic life that help to dissolve the routine problems
- Build the understanding of the complexity of the industrial job, along with time and skills requirements of the job
- Learn about the safety measures to be taken while working in workshop.
- Learn about operation wise tool selection.

Course Content:

Module No.	Content	Hours
1.	**Introduction and Demonstration of Safety Norms and various shops:** Introduction to various shops / sections and workshop layouts, Safety norms to be followed in a workshop.	-
2.	**Fitting shop:** Introduction of fitting shop, Safety, Making a job as per drawing including marking and performing other operations	-
3.	**Carpentry shop:** Introduction of carpentry shop, Safety, Making a job as per drawing including marking and performing other operations	-
4.	**Smithy shop:** Introduction of smithy shop, Safety, Making a job as per drawing including marking and performing other operations	-
5.	**Sheet metal shop:** Introduction of sheet metal shop, Safety, Making a job as per drawing including marking and performing other operations	
6.	**Pipe fitting:** Introduction of pipe fitting shop, Safety, understanding various pipe fitting tools and performing operations	-
7.	**Machine Shop:**	-

	Introduction and demonstration of various machines like Lathe, Drilling, Grinding, Hack Saw Cutting etc.	

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.	04
3.	To Perform a Job of Carpentry Shop.	06
4.	To Perform a Job of Black Smithy shop.	06
5.	To Perform a Job of Sheet metal Shop.	04
6.	To Perform a Job of Plumbing Shop	04
7.	Introduction to Machine Tool	04

Reference Book(s):

Title	Author/s	Publication
Workshop Technology-I	Hazra and Chaudhary	Media promoters & Publisher private limited.
Workshop practice manual	K.Venkata Reddy	B. S. Publications
Mechanical workshop practice	K.C. John	PHI

Course Evaluation:

Practical:

- Continuous Evaluation Consist of Performance of Practical which should be evaluated out of 10 for each practical in the next turn and average of the same will be converted to 20 Marks.
- Internal Viva component of 20 Marks.
- Practical performance/quiz/test of 30 Marks during End Semester Exam.
- Viva/Oral performance of 30 Marks during End Semester Exam.

Course Outcome(s):

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

IDME1020	ENGINEERING WORKSHOP
CO 1	Understand the various measuring instruments.
CO 2	Understand the safety norms required in the workshop.
CO 3	Understand the application of various tools required for different operations.
CO 4	Remember the process of manufacture from a given raw material.
CO 5	Explain various manufacturing processes in machine shop.

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 Demonstration of Safety Norms and Various Shops	1, 2, 3, 4
2	Fitting Shop	1, 2, 3
3	Carpentry Shop	1, 2, 3
4	Smithy Shop	1, 2, 3

5	Sheet metal shop	1, 2, 3
6	Pipe fittings	1, 2, 3
7	Machine Shop	1, 2, 3

SEMESTER 2

P P Savani University
School of Engineering
Institute of Diploma Studies

Department of Applied Science & Humanities

Course Code: IDSH1040
Course Name: Engineering Mathematics
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	00	02	05	40	60	00	00	50	0	150

CE: Continuous Evaluation, ESE: End Semester Exam

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

SECTION-I			
Module No.	Content	Hours	Weightage in %
1.	**Functions and Limits** Introduction, Function, Types of function, Classification of function, Limit of a function, Properties of limit, Standard limits, limit of trigonometric functions.	5	14
2.	**Differentiation** Introduction, Differentiation, Geometric meaning, Derivative using first principle, Derivative of standard functions, Working rules, Differentiation of composite function, Differentiation of parametric functions, Differentiation of implicit function, Derivative using logarithms, Successive differentiation, Applications of differentiation (Velocity, Acceleration, Maxima & Minima simple problems).	9	18
3.	**Integration** Introduction, Integration of standard functions, Integration by substitution, Integration by parts, Integration using partial fraction, Definite integrals, Theorem on definite integrals, Applications of Integration (Area and Volume simple problems).	9	18
SECTION-II			
4.	**Differential Equations of First order and First degree**	9	18

	Introduction, Formation of differential equations, Solution of differential equations, Separation of variables, Homogeneous equations, Exact Differential Equations, Integrating factor method, Linear differential equation.		
5.	**Complex Number** Introduction, Mathematical Operations, Polar form, Modulus, Amplitude Farm, De Movire's Theorem.	6	18
6.	**Statistics** Introduction, Central tendency, Mean, Mean of discrete observations, Mean of grouped data, Step deviation method, Median, Median for grouped data, Mode, Standard deviation, Standard deviation for grouped data.	7	14

List of Tutorials:

Sr. No.	List of Tutorial	Hours
1.	Functions and Limits-1	2
2.	Functions and Limits-2	2
3.	Differentiation-1	2
4.	Differentiation-2	2
5.	Differentiation-3	2
6.	Integration-1	2
7.	Integration-2	2
8.	Integration-3	2
9.	Differential Equations of First order and First degree-1	2
10.	Differential Equations of First order and First degree-2	2
11.	Complex Number-1	2
12.	Complex Number-2	2
13.	Complex Number-3	2
14.	Statistics-1	2
15.	Statistics-2	2

Text Book:

Title	Author(s)	Publication
Advanced Mathematics for Polytechnic	Dr. N. R. Pandya	Macmillan Publication
Engineering Mathematics - 3rd Edition	Anthony croft & 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 Marks for 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:

IDSH1040	**ENGINEERING MATHEMATICS**
CO 1	Apply differentiation and integration for solving engineering problems.
CO 2	Implementing statistical methods for solving real world problems.
CO 3	Develop the ability to apply differentiation to significant applied problems.
CO 4	Estimate the limiting value of algebraic and trigonometric functions.
CO 5	Represent complex numbers algebraically and geometrically for solving engineering related problems.

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	Functions and Limits	1,2,3,4
2	Differentiation	2,3,5
3	Integration	2,3,5
4	Differential Equations of First order and First degree	1,2,3,5
5	Complex Number	1,2,3,4,6
6	Statistics	1,2,3,4,5

P P Savani University
School of Engineering
Institute of Diploma Studies

Department of Chemical Engineering

Course Code: IDSH1050
Course Name: Fundamentals of Chemistry
Prerequisite Course(s): --

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

- 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:

Section I			
Module. No.	Content	Hours	Weightage in %
1.	**Atomic Structure, Molecular Mass, Acids and Bases** Atom Definition Fundamental particles of Atom their Mass, Charge and Location. Atomic number and Mass number, Definition Isotopes and Isobars with suitable examples. Formation of cation and anion by electronic concept of oxidation and reduction.	05	15
2.	**Molecular Mass** Molecule, Molecular Formula, Molecular Mass, Mole, Definition Simple calculations. Avogadro's Hypothesis – Relationship between Molecular Mass and vapour Density, Avogadro Number.	05	10
3.	**Chemical Bonding and Structure of Molecules** Chemical Bond, Valence, Valence Electrons, Bonding and Non-Bonding Electrons, Lewis Symbols, Octet Rule. Definition, Condition for Formation of Ionic Bond, Factors Governing Formation of Ionic Bond, Metallic Bond, Covalent Bond and Co-ordinate Covalent Bond: Hydrogen Bonding,	06	15
4.	**Acids and Bases** Theories of Acids and Bases, Arrhenius Theory, Lowry – Bronsted Theory, Lewis Theory, Advantages of Lewis Theory, pH and pOH Definition, Numerical problems, Indicator, Definition and Examples, Buffer solution, Definition, Types of buffer solution with examples, Application of pH in Industries.	06	10

Section II			
Module. No.	Content	Hours	Weightage in %
5.	**Solutions** Definition, Methods of expressing concentration of a solution Molarity, Molality, Normality, Mole fraction and Percentage Mass – Simple problems.	05	10
6.	**Colloids** True solution and Colloidal solution, Definition, Differences, Types of colloids – Lyophilic and Lyophobic colloids. Differences Properties, Tyndall effect, Brownian movement, Electrophoresis and Coagulation. Industrial applications of colloids, Smoke Precipitation by Cottrell's method, Purification of water, Cleansing action of soap, Tanning of leather and Sewage disposal.	06	15
7.	**Electrochemistry** Electrolyte definition, Strong and Weak electrolytes, Examples. Electrolysis definition, Mechanism, Industrial application of Electrolysis, Electroplating, Preparation of surface, Process Factors affecting the stability of the coating, Chrome plating, Electroless plating definition, Advantages of Electroless plating over electroplating ,Applications of Electroless plating.	06	15
8.	**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.	06	10

List of Practical

Sr No	Name of Practical/Tutorial	Hours
1.	Using a chemical balance.	02
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.	04
5.	Preparation of standard solution of Sodium Carbonate.	04
6.	Determination of strength of a given solution of Sodium Hydroxide by titrating it against standard solution of Oxalic acid.	04
7.	Determination of strength of a given solution of Hydrochloric acid by titrating it against standard Sodium Carbonate solution.	04
8.	Determination of temporary and permanent hardness in water sample using EDTA as standard solution.	02
9.	Conduct metric titration of strong acid vs. strong base	02

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

Course Outcome(s):

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

IDSH1050	FUNDAMENTALS OF CHEMISTRY
CO1	To outlining logarithmic properties
CO2	To implement the concept of determent and matrices to solve science and engineering problems.
CO3	To presenting application of geometry
CO4	To establish the knowledge of coordinate geometry, and ability to solve engineering problems.

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 Structure, Molecular Mass, Acids and Bases	1, 2
2	Molecular Mass	1, 2, 3
3	Chemical Bonding and Structure of Molecules	1, 2, 3
4	Acids and Bases	2, 3, 4
5	Solutions	2, 3, 4
6	Colloids	2, 3, 4
7	Electrochemistry	1, 2, 5
8	Electrochemical-Cell	1, 2, 5

P P Savani University
School of Engineering
Institute of Diploma Studies

Department of Civil Engineering

Course Code: IDCV1010
Course Name: Engineering Mechanics
Prerequisite Course/s: -

Teaching & Examination Scheme:

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

CE: Continuous Evaluation, ESE: End Semester Exam

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

- understand different types of forces, systematic evaluation of effect of these forces, behavior of rigid and deformable bodies subjected to various types of forces, at the state of rest or motion of the particles.
- understand the behavior of structural elements under the influence of various loads.

Course Content:

SECTION-I			
Module. No.	Content	Hours	Weightage in %
1.	**Introduction to Engineering Mechanics** Basic concepts: Definitions, Basic assumptions, Scalar & Vector quantities, Free, Forced and fixed vectors, Force System: Force, Classification & Representation.	04	09
2.	**Coplanar Concurrent Force system** Force as a Vector, Composition of forces, Parallelogram Law, Resolution, Principle of Transmissibility of forces, Resultant of coplanar force system., Equilibrium of coplanar force system, Free body diagrams, Determination of reactions, Equilibrium of a body under three forces, Lami's theorem.	10	22
3.	**Coplanar Non-Concurrent force systems:** Moment of a force, Vector representation, Moment for coplanar force system, Varignon's theorem, Couple, Vector representation, Resolution of a force into a force and a couple., force Systems: Coplanar Concurrent Force system and Coplanar Non-Concurrent force system.	09	19
SECTION-II			
1.	**Friction:** Introduction, Wet and Dry friction, Theory of Dry friction, Angle of friction, Angle of Repose, Cone of friction, Coulomb's laws of	06	14

	friction.		
2.	**Centre of Gravity:** Center of Gravity, Center of Mass and Centroid of curves, areas, volumes, Determination of centroid by integration, Centroid of composite bodies.	06	14
3.	**Moment of Inertia:** Definition of Moment of inertia of area, Perpendicular axis theorem and Polar moment of Inertia, Parallel axis theorem, Moment of inertia of simple areas by integration, Moment of Inertia of Composite Areas., Moment of Inertia of masses, Parallel axis theorem for mass moment of inertia, Mass moment of inertia of simple bodies by integration, Mass moment of inertia of composite bodies	10	22

List of Practical:

Sr. No.	Details of Practical	Hours
1	Coplanar Concurrent Forces	04
2	Law of parallelogram	04
3	Coplanar Non concurrent forces	02
4	Lami's Theorem	02
5	Coefficient of static friction	02
6	Parallel force system	02
7	Numerical practice on Force System	04
8	Numerical practice on C.G.	04
9	Numerical practice on M.I.	04
10	Numerical practice on Friction	02

Reference Book(s):

Title	Author/s	Publication
Applied Mechanics	S. B. Junnarkar & H. J. Shah	Charotar Publication
Engineering Mechanics,	Meriam and Karaige,	Wiley-India
Engineering Mechanics: Statics and Dynamics	S Rajsekaran	Vikas Publication
Engineering Mechanics of Solids	Popov E.P	Prentice Hall of India
Engineering Mechanics,	Meriam and Karaige,	Wiley-India

Course Evaluation:

Theory:

- Continuous evaluation consists of two tests each of 15 marks and 1 hour of duration.
- Submission of assignment which consists of solving 20 numericals and it carries 10 marks of evaluation.
- End semester examination will consist of 60 marks.

Practical:

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

Course Outcome(s):

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

IDCV1010	**ENGINEERING MECHANICS**
CO1	Identify fundamental principles of mechanics, equilibrium, statics reactions and internal forces in statically determinate beams.
CO2	Understand,the basics of friction and its importance.
CO3	Apply principles of statics to determine c.g and m.i of a different geometrical shape.
CO4	Analyse problems and solve the problem related to mechanical elements and analyse the deformation behaviour for different types of loads.

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 Engineering Mechanics	1, 2
2	coplanar concurrent force system	1,2,3
3	coplanar non-concurrent force system	1,2,3,5
4	Friction	1,2,3,4,5
5	center of gravity	1, 2, 4, 5
6	Moment of inertia	2, 2, 4, 5

P P Savani University
School of Engineering
Institute of Diploma Studies

Department of IT Engineering

Course Code: IDIT1010
Course Name: Introduction to Computer 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	04	00	05	40	60	40	60	00	00	200

CE: Continuous Evaluation, ESE: End Semester Exam

Objective(s) of the Course:

To help learners to

- 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:

SECTION-I			
Module No.	Content	Hours	Weightage in %
1.	**Introduction to Programming Language** Classification of Programming Languages, Generations of Programming Languages - Machine Language, Assembly Language, High-Level Language, 4GL.	04	05
2.	**Introduction to C, Constants, Variables and Data Types:** Features of C Language, the Structure of C Program, Flow Charts and Algorithms Types of Errors, Debugging, Tracing the Execution of the Program, Watching Variables Values in Memory. Character Set, C Tokens, Keyword and Identifiers, Constants and Variables, Data Types - Declaration and Initialization, User Define Type Declarations - Typedef, Enum, Basic Input, and Output Operations, Symbolic Constants, Overflow and Underflow of Data.	07	15
3.	**Operators, Expressions, and Managing I/O Operations:** Introduction to Operators and its Types, Evaluation of Expressions, Precedence of Arithmetic Operators, Type Conversions in Expressions, Operator Precedence and Associatively. Introduction to Reading a Character, Writing a Character, Formatted Input and Output.	07	15

4.	**Conditional Statements:** Decision Making & Branching: Decision Making with If and If - else Statements, Nesting of If-else Statements, The Switch and go-to statements, Ternary (? :) Operator. Looping: The while Statement, The Break Statement & The Do. While loop, The FOR loop, Jump within loops - Programs.	05	15
SECTION-II			
1.	**Arrays:** Introduction, One-dimensional Arrays, Two-dimensional Arrays, Concept of Multidimensional Arrays.	07	15
2.	**Strings:** Declaring and Initializing String Variables, Arithmetic Operations on Characters, Putting Strings Together, Comparison of Two Strings, String Handling Functions.	07	15
3.	**User-Defined Functions:** Concepts of User-defined Functions, Prototypes, function Definition, Parameters, Parameter Passing, Calling a Function, Recursive Function, Macros and Macro Substitution	08	20

List of Practical:

Sr. No	List of Practical	Hours
1.	Introduction to C programming environment, compiler, Linker, loader, and editor. C Program to display "HELLO PPSU"	04
2.	Working with basic elements of C languages (different input functions, different output functions, different data types, and different operators)	08
3.	Working with C control structures (if statement, if-else statement, nested if-else statement, switch statement, break statement, goto statement)	10
4.	Working with C looping constructs (for loop, while loop, do-while and nested for loop)	10
5.	Working with the array in C (1-D array, and 2-D array)	08
6.	Working with strings in C (input, output, different string inbuilt functions)	08
7.	Working with user-defined functions in C (function with/without return type, function with/without argument, function and array)	08
8.	Working with recursive function in C	04

Text Book(s):

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

Reference Book(s):

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

Web Material Link(s):

- http://www.digimat.in/nptel/courses/video/106104128/L01.html
- https://www.youtube.com/watch?v=3QiItmIWmOM

Course Evaluation:

Theory:

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

Practical:

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

Course Outcome(s):

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

- learn the fundamentals of programming.
- develop efficient programs with their own logic & capabilities.
- understand the syntax and semantics of the C language.

Course Outcome(s):

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

IDIT1010	**INTRODUCTION TO COMPUTER PROGRAMMING**
CO 1	Infer the basic concepts of data representation, algorithms and coding methods in computer system.
CO 2	Interpret the knowledge about c programming syntax.
CO 3	Apply basic principles of imperative and structural programming to solve complex problems.
CO 4	Design, develop and debug programs of c programming language.

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 Programming Language	1, 2
2	Introduction to C, Constants, Variables and Data Types	1, 2, 3
3	Operators, Expressions, and Managing I/O Operations	2,3,4,6
4	Conditional Statements	2,4,5
5	Arrays	2, 4,6
6	Strings	2, 4,6
7	User-Defined Functions	2,4,6

P P Savani University
School of Engineering
Institute of Diploma Studies

Department of Physics

Course Code: IDSH1060
Course Name: Electrical & Electronics Workshop
Prerequisite Course(s): Concept of Science up to 9th Standard

Teaching & Examination Scheme

Teaching Scheme (Hours/Week)				Examination Scheme (Marks)						
				Theory		Practical		Tutorial		
Theory	Practical	Tutorial	Credit	CE	ESE	CE	ESE	CE	ESE	Total
00	02	00	01	00	00	20	30	00	00	50

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

- think in core concept of their engineering application by studying various topics involved in branch specific applications.
- identify basic fundamental electronic components in circuits.
- learn to use common electronic component on breadboard.
- understand components of instruments, terminology and applications.
- demonstrate the ability to collect and analyze data and to prepare coherent reports of his or her findings.

Sr. No.	List of Practical	Hours
1	To Understand & Draw the symbols of various electronic devices.	2
2	To identify resistors, capacitors using Different codes.	2
3	Verification of Truth tables of Logic Gates (NAND, NOR, EX-OR, AND, OR, NOT).	4
4	To study cathode ray oscilloscope and perform measurements.	4
5	To study digital multi-meter and perform testing of various components.	2
6	To study soldering- de-soldering techniques.	2
7	To study wiring diagram of ceiling Fan.	2
8	How Fluorescent Lights Work.	2
9	To study about stair case wiring two-way switch.	2
10	Explaining the function of Refrigerator and Air conditioner.	4
11	Explaining the core concept of power transmission.	4

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:

CO 1	Identify the ability to design various electronic circuit on a bread board
CO 2	Recognize the basic electronic devices and components in a circuit connection.
CO 3	Identify the ability to design a pcb.
CO 4	Define the practical side of basic physics laws.

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	Electronic Components	1,2,3,4
2	Electronic Devices	1,2,3,4
3	Understanding of Breadboard	1,2,4,5,6
4	Wiring of Breadboard	1,2,4,5,6
5	Ohm’s Law	1,2,3,4
6	Rectifiers	1,2,3,5,6
7	KCL & KVL	1,2,3,4,6
8	LDR	1,2,3,6
9	Electricity Lab	1,2,3,4
10	CRO	1,2,4,5
11	PCB	1,2,6

SECOND YEAR DIPLOMA IN CIVIL ENGINEERING

P P SAVANI UNIVERSITY															
SCHOOL OF ENGINEERING															
TEACHING & EXAMINATION SCHEME FOR DIPLOMA CIVIL ENGINEERING PROGRAMME AY:2024-25															
Sem	**Course Code**	**Course Title**	**Offered By**	**Teaching Scheme**					**Examination Scheme**						
				Contact Hours				**Credit**	**Theory**		**Practical**		**Tutorial**		**Total**
				Theory	**Practical**	**Tutorial**	**Total**		**CE**	**ESE**	**CE**	**ESE**	**CE**	**ESE**	
3	IDCV2110	Building Materials & Construction Technology	CV	2	2	0	4	4	40	60	100	0	0	0	**200**
	IDCV2020	Hydraulics	CV	3	2	0	5	4	40	60	20	30	0	0	**150**
	IDCV2031	Strength of Materials	CV	3	2	0	5	4	40	60	20	30	0	0	**150**
	IDCV2040	Surveying	CV	3	2	0	5	4	40	60	20	30	0	0	**150**
	IDME2010	Basics of Engineering Drawings	ME	2	4	0	6	4	50	0	100	0	0	0	**150**
						Total	**27**	**21**							**900**
4	IDCV2120	Concrete Technology	CV	2	2	0	4	3	40	60	20	30	0	0	150
	IDCV2060	Environment Engineering	CV	3	2	0	5	4	40	60	20	30	0	0	150
	IDCV2072	Structural Analysis	CV	3	0	2	5	5	40	60	0	0	50	0	150
	IDCV2080	Transportation Engineering	CV	3	2	0	5	4	40	60	20	30	0	0	150
	IDCV2090	Soil Mechanics	CV	3	2	0	5	4	40	60	20	30	0	0	150
		Language Training Elective Course	CFLS	3	0	0	3	3	100	0	0	0	0	0	100
						Total	**27**	**23**							**850**

SEMESTER 3

P P Savani University
School of Engineering
Institute of Diploma Studies

Department of Civil Engineering

Course Code: IDCV2110
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	100	00	00	00	150

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:

SECTION I			
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
SECTION -II			
Module No.	**Content**	**Hours**	**Weightage in %**
1.	**Introduction of Construction Technology:** Civil engineering structures, Functions of	02	6

	various components of building & Other structures.		
2..	**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
3.	**Construction Machinery:** Purpose, advantages & disadvantages, suitability of each. Ready mix concrete plant, Batch mix concrete plant.	05	17
4.	**Miscellaneous Construction Materials:** Plastics and PVC, Ceramic products, Paints and Varnish, Glass, Fiber, Steel, Concrete blocks. Timber, Lime.	03	10

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

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

IDCV2010	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 and differentiate super structure and sub structures.
CO 5	Identify the use of various construction machinery and miscellaneous construction materials.

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: IDCV2020
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	20	30	00	00	150

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:

SECTION I			
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 & Dynamics:** 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.	06	13
4.	**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	07	15

	of emptying a uniform vessel. Internal and External cylindrical mouthpiece.		
SECTION II			
Module No.	**Content**	**Hours**	**Weightage in %**
1.	**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
2.	**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
3.	**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

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

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

IDCV2020	**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.

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 & Dynamics:	1, 2, 3, 4
4	Flow through orifices and mouthpieces:	1, 2, 3, 4, 5
5	Flow over Notches & Weirs:	2, 3, 4, 5, 6
6	Flow through pipes	2, 3, 4, 5,
7	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: IDCV2031
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	20	30	00	00	150

CE: Continuous Evaluation, ESE: End Semester Exam

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

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

Course Content:

Section I			
Module No.	Content	Hours	Weightage in %
1	**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
2	**Simple Stress and Strain** Definition of stress and strain, Tensile &compressive Stresses: Shear and complementary shear Strains, Linear, shear, lateral, thermal and volumetric. Hooke's law, Stresses and strain in bars of Varying, Tapering & Composite section, Principle of Superposition. Elastic constant, Relation between Elastic constants.	14	20
Section II			
1	**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	14	20

	BMD for concentrated load and uniformly distributed load, uniformly varying load, Point of contra-flexure.		
2	**Center of Gravity & Moment of Inertia** Centroid of lines, plane areas and volumes, Examples related to centroid of composite geometry, Pappus –Guldinus theorems, Parallel and Perpendicular axis theorems, Polar moment of inertia, Radius of gyration of areas, Examples related to moment of inertia of composite geometry.	14	20

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

IDCV2031	STRENGTH OF MATERIAL
CO 1	Apply mathematical knowledge to calculate the deformation behavior of simple structure.
CO 2	Critically analyze problem and solve the problem related to mechanical elements and analyze the deformation behavior for different types of loads
CO 3	Understand the different types of stresses and strains developed in the member subjected to axial, bending, shear & torsional effects.
CO 4	Understand the physical properties of materials

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	Mechanical Properties of Materials	1, 2, 3, 5
2	Simple Stress and Strain	1, 2, 3, 4, 5
3	Shear Force and Bending Moment	1, 2, 3, 4, 6
4	Center of Gravity & Moment of Inertia	1, 2, 3, 4

P P Savani University
School of Engineering
Institute of Diploma Studies

Department of Civil Engineering

Course Code: IDCV2040
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:

SECTION I			
Module No.	**Content**	**Hours**	**Weightage in %**
1	**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
2	**Trigonometric Levelling:** Principle and necessity of Trigonometric levelling, Indirect levelling, Heights and distances, Methods, Direct levelling on steep ground.	05	11
3	**Tachometric Survey:** Introduction, purpose, Principle, Instruments, Methods of tachometry, Stadia constants, Field work in tachometry, Reduction of readings, Errors, and precisions.	05	11
4	**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

SECTION II			
1	**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.	07	15
2	**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.	09	21
3	**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

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

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:

IDCV2040	**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.

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.	Theodolite Survey	2, 3, 4, 6
2.	Trigonometric Levelling	2, 3, 4, 6
3.	Tachometric Survey	2, 3, 4, 6
4.	Curves	2, 3, 4, 6
5.	Plane table Surveying	2, 3, 4, 6
6.	Geodetic Surveying	2, 3, 4, 6
7.	Modern Surveying Instruments	1, 2

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

Course Code: IDME2010
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	50	00	100	00	00	00	150

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:

Section I			
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, Scale (reduced, enlarged & full size), plain scale and diagonal scale, Geometrical constructions.	05	12
2.	**Orthographic projections of points and lines:** 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 Projections of lines in different quadrants, inclinations, True lengths of the lines projections on auxiliary planes	12	25
3.	**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).	06	13
Section II			
1.	**Projection of solids:** Types of Solid. Projection of Cone, Cylinder, Prism &pyramids. Simple cases when solid are placed in different positions Axis faces and tines lying in the faces of the solid making given angles.	11	25

2.	**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	11	25

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

Reference Book(s):

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

Web Material Link(s):

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

Course Evaluation:

Theory:

- Continuous Evaluation consists of two tests each of 30 marks and 1 Hour of duration, 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:

IDME2010	BASICS OF ENGINEERING DRAWING
CO 1	Interpret engineering drawing as a technical communication language.
CO 2	Understand different dimensioning methods and its use in drawings.
CO 3	Relate the use of engineer's scale to different engineering fields.
CO 4	Identify the use of orthographic & isometric projection in real time applications.

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	Orthographic projections of points and lines	1, 2, 3, 4, 5, 6
3	Projections of plane figures	1, 2, 3, 4, 5, 6
4	Projection of Solids	1, 2, 3, 4, 5, 6
5	Isometric projection	1, 2, 3, 4, 6

SEMESTER 4

P P Savani University
School of Engineering
Institute of Diploma Studies

Department of Civil Engineering

Course Code: IDCV2120
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
SECTION-II			
1	**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
2	**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.		
3	**Tests on hardened concrete** – Compressive strength, split tensile strength, flexural strength, non-destructive testing of concrete	03	10
4	**Special purpose concrete:** Introduction to ready mix concrete, high strength concrete, lightweight concrete, fiber reinforced concrete. Ferrocement and its uses.	03	10

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

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

IDCV2050	CONCRETE TECHNOLOGY
CO 1	Identify the materials used for the concrete production.
CO 2	Determine the various key properties of cement by performing various tests as per indian standards.
CO 3	Prepare a mix design for different grades of concrete and evaluate the performance by conducing tests on fresh and hardened concrete.
CO 4	Discover and generate a report on various factors causing failure in concrete.
CO 5	Understand and determine the types of special cements used in the industry.

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

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

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

P P Savani University
School of Engineering
Institute of Diploma Studies

Department of Civil Engineering

Course Code: IDCV2060
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	20	30	00	00	150

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** Water Treatment & distribution of treated water, Sewage Treatment, Industrial Wastewater Treatment	04	9
2.	**Water Treatment Plant & Distribution System** Collection of water sample, Water analysis: Physical, Chemical and Bacteriological, Treatment plant, Location, Unit/Process to be adopted, Detention period, Size of Units, Requirement of chemicals for treatment process, Efficiency of Treatment Unit/Process Requirement of Disinfectant Types of reservoirs for treated water, Determination of storage capacity of reservoir, Types of distribution system	08	17
3.	**Sewage Treatment Process & Design** Necessity of Sewage Treatment, Sample collection, Properties of sewage, Location of Treatment Plant, Design period, Layout of Treatment Plant, Miscellaneous treatment methods, Design Component of sewage treatment plant, Advance Treatment of wastewater	11	24
Section II			
1.	**Design of Sewer** Sources of sewage, Factors affecting sanitary sewer, Storm water calculation (Rational method/Empirical method), Velocity of flow from sewer, Method of design of sewer	10	22
2.	**Industrial Wastewater Treatment** Water pollution by industrial waste, Industrial effluent	12	28

	Characteristics, Industrial effluent standards for disposal into stream and on land, Industrial wastewater treatments. Dairy ,Pulp and Paper mill, Dyeing Industry, Pharmaceutical Industry		

List of Practical:

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

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:

IDCV2060	**Environment Engineering**
CO1	Know the basics, importance, and methods of water supply.
CO2	Study the various sources and properties of water.
CO3	Understand the various methods of conveyance of water.
CO4	Learn the objectives and methods of water treatment and to study the features and function of different water treatment units.

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 Treatment Plant & Distribution System	2
3.	Sewage Treatment Process & Design	2
4.	Design of Sewer	2, 3, 6
5.	Industrial Wastewater Treatment	2

P P Savani University
Institute of Diploma Studies

Department of Civil Engineering

Course Code: IDCV2072
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.	**Fixed Beam** Explain determinate and indeterminate beam with examples, Difference between fixed beam and simply supported beam, SF diagram for fixed beam subjected to Central point load, UDL on entire span, Central point load and UDL on entire span, Fixed End Moment (FEM) by moment area method subjected to Central point load, UDL on entire span, Central point load and UDL on entire span, BM diagram for fixed beam subjected to, Central point load, UDL on entire span, Central point load and UDL on entire span	07	16
2.	**Continuous Beam** Explain theorem of three moment (Clayperon's theorem), Use theorem of three moment for a continuous beam of two spans and two equations only, With only central point load on each span, With full UDL on each span, With central point load on one span and full UDL on other span, With central point load and full UDL combined on each span, Problems to draw SF and BM diagrams for each case.	07	16
3.	**Moment Distribution Method (MDM)** Explain stiffness factor, explain distribution of moment, explain carryover moment, FEM for span subjected to central point load and full UDL, Use of MDM for a continuous beam of not more than three spans, with only central point load on each span, with full UDL on each span, with central point load on one span and full UDL on other span, with central point load and full UDL combined on each span, Problems to draw	09	18

	SF and BM diagrams for each case.		
Section II			
1.	**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 with Central Point Load, U.D.L. On Entire Span. Central Point Load With U.D.L. On Entire Span.	12	27
2.	**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.	10	23

List of Tutorial:

Sr. No	Tutorial	Hours
1	Fixed Beam	6
2	Continuous Beam	6
3	Moment Distribution Method (MDM)	6
4	Slope And Deflection	6
5	Principal Planes and Principal Stresses	6

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:

IDCV2072	**Structural analysis**
CO 1	Distinguish the determinant and indeterminant structure
CO 2	Evaluate the structural section under various loading conditions.
CO 3	Develop shear force and bending moment diagram and estimate the slope and deflection at any given point using various methods.
CO 4	To be able to determine shear stress and shear plane.
CO 5	Determine the stress generated in the structure through axial and eccentric loading.

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 2080
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 and Road Geometric:** 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
2.	**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.	8	17
3.	**Drainage and Maintenance of road:** Importance of drainage, Purpose of drainage, Methods of Surface and Sub-surface drainage, Maintenance of drainage system	7	16
SECTION- II			
Module No.	Content	Hours	Weightage in %

1.	**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
2.	**Station yards and Maintenance of Railways**: Classification of Yards, Function of Various Yards, Requirement of Track Maintenance, Daily and periodical Maintenance, Maintenance of Alignment, Drainage, Track Material and its components, Point and crossing and level crossing	6	14
3.	**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

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

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 student will be able to

IDCV 2080	**TRANSPORTATION ENGINEERING**
CO 1	Understand the principles of highway geometrics design as per irc standards.
CO 2	Understand types of pavements & materials required for highway construction.
CO 3	Understand railway track geometrics, train resistance, points and crossings and signaling.
CO 4	Understand types of volume count, o d survey and parking survey.

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	Road materials and its construction aspects	1,2,3,6
3	Drainage and Maintenance of road	1,2
4	Introduction and Permanent way	1,2,3,4
5	Station yards and Maintenance of Railways	1,2
6	Introduction to Traffic Engineering and Traffic Survey:	1,2,3,4,5

P P Savani University
School of Engineering
Institute of Diploma Studies

Department of Civil Engineering

Course Code: IDCV2090
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	20	30	00	00	150

CE: Continuous Evaluation, ESE: End Semester Exam

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

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

Course Content:

Module No.	Content	Hours	Weightage in %
Section I			
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. code Coarse & Fine Sieve analysis sedimentation analysis, Grading Curves and different coefficients i.e. CU and CC, Clay, silt, sand and gravel as per particle size, 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 content (OMC), Maximum dry density (MDD), Proctor test, Light compaction, Heavy compaction test, Light compaction test on a given soil sample, Factors affecting compaction like water content, nature of soil (fine or course grained), Grading of soil, compaction energy, thickness of layer, Compaction and Consolidation, Role of O.M.C in the field, Methods of Field Compaction & various Equipment for compaction	07	15
Section II			
5.	**Permeability & Seepage:** Permeable and Impermeable soils, Permeability and Impermeability, Flow of water through pipe and Through soil, Factors affecting the permeability, The factors affecting permeability i. of soil, Factors used to control the permeability of soil to desired extent in various Civil engineering structures, Methods to find Coefficient of Permeability, Constant Head Method, Falling Head Method, Coefficient of permeability, Seepage pressure, Quick sand condition, Flow net, its characteristics and application.	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, Procedure of direct shear test (Box shear test), Types of soil C-soil, φ-soil, C-φ soil., Draw failure envelope by drawing Mohr's circle from the data obtained during direct shear test, 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, Liquefaction, Definition, Occurrence & effect Effects of Liquefaction Remedial for Liquefaction.	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

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.	Hydrometer Analysis	2
5.	Liquid limit Test	2
6.	Plastic Limit Test	2
7.	Shrinkage limit Test	2
8.	In-situ Density-Core Cutter	4
9.	Sand Replacement method	2
10.	Permeability Test: Constant and Variable Head	4
11.	Soil Compaction Test	4

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:

IDCV2090	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.

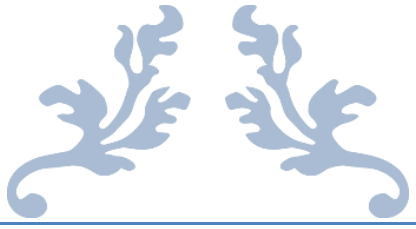
Level of Bloom's Revised Bloom's Taxonomy in Assessment

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

THIRD YEAR DIPLOMA IN CIVIL ENGINEERING

P P SAVANI UNIVERSITY															
SCHOOL OF ENGINEERING															
TEACHING & EXAMINATION SCHEME FOR DIPLOMA CIVIL ENGINEERING PROGRAMME AY:2024-25															
Sem	**Course Code**	**Course Title**	**Offered By**	**Teaching Scheme**					**Examination Scheme**						
				Contact Hours				**Credit**	**Theory**		**Practical**		**Tutorial**		**Total**
				Theory	**Practical**	**Tutorial**	**Total**		**CE**	**ESE**	**CE**	**ESE**	**CE**	**ESE**	
5	IDCV3010	Estimation Costing & Valuation	CV	2	0	4	6	6	40	60	0	0	50	0	**150**
	IDCV3022	Structural Design-I	CV	3	0	2	5	5	40	60	0	0	50	0	**150**
	IDCV3031	Irrigation Engineering & Water Resource Management	CV	3	0	0	3	3	40	60	0	0	0	0	**100**
	IDCV3040	Construction Management	CV	2	0	1	3	3	40	60	0	0	50	0	**150**
	IDCV3050	Building Drawing	CV	2	0	2	4	4	40	60	0	0	100	0	**200**
	IDCV3750	MOOC Course	SEC	CV	3	0	3	3	100	0	0	0	0	0	100
		Life Skill Elective Course	VAC	CLSC	2	0	0	2	100	0	0	0	0	0	100
	IDCV3910	Summer Training	CV	4					0	4	0	0	100	0	**100**
						Total	**26**	**30**							**1050**
6	IDCV3063	Structural Design-II	CV	3	0	2	5	5	40	60	0	0	50	0	**150**
		Elective	CV	3	0	0	3	3	40	60	0	0	0	0	**100**
	TNPC3010	Corporate Grooming & Etiquette	TNPC	3	0	0	3	3	0	0	50	50	0	0	**100**
	IDCV3930	Project/Training	CV	11			11	11	0	0	200	300	0	0	**500**
						Total	**22**	**22**							**850**



SEMESTER 5

P P Savani University
School of Engineering
Institute of Diploma Studies

Department of Civil Engineering

Course Code: IDCV3010
Course Name: Estimation Costing & Valuation
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	
2	0	4	6	40	60	0	0	50	0	150

CE: Continuous Evaluation, ESE: End Semester Exam

Objective(s) of the Course:

To help learners to •

- prepare estimate and cost of a civil engineering project.
- estimate the material quantities.
- prepare a bill of quantities.
- make specifications and prepare tender documents.
- prepare value estimates.

Course Content:

Module No.	Content	Hours	Weightage in %
Section I			
1	**Estimation & Modes of measurement:** estimating, Types of estimate and Data required, Overhead charges, contingencies, water charges, provisional sum, prime cost, provisional quantities, spot items, day work. General rules for the measurements and its units of different items of civil engineering work. Quality and duties of good estimator	04	13
2	**Specifications of Civil Works:** Importance specification, Types of specification, Principle of writing specification, Specification of Earthwork in Excavation, cement concrete, Brick masonry, R.C.C. Work, Plastering Work, Painting, Flooring,	05	17
3	**Rate Analysis of Civil Works:** Task Work and Factors affecting it, Labour required for different works and Labour rates, Market rates of construction materials, Schedule of Rates (SOR), Rate analysis and factors affecting it rate analysis, Rate analysis for earthwork in excavation, C.C. Work, Brick masonry Work, R.C.C. Work, Plastering, flooring work.	06	20
Section II			
4	**Estimation of Civil Works:** Methods of detailed estimation, One/ two room building, two storied buildings (RCC footings, Column, beams, slab), RCC	8	27

	retaining wall/ Culverts, Methods of calculating earthwork quantities for roads and canals.		
5	**Valuation of Civil Engineering projects**: Necessity, Basics of value engineering, Capitalised value, Depreciation, Escalation, Calculation of Standard rent, Mortgage, Lease, Valuation of Building, Loss assessment	07	23

List of Tutorial:

Sr. No.	Details of Tutorial	Hours
1.	List of various items to be provided to learn the modes of measurements according to prevailing IS 1200.	02
2.	Collect specifications for at least 10 items of construction work 08	08
3.	Analyze rate for at least 10 items of residential building construction	08
4.	Estimate in detail for load bearing structure, RCC retaining wall, RCC culverts, earthwork for road works, etc.	30
5.	Solve at least 10 examples related to various form of value, depreciation, loan amount, annual rent, capitalized value, year purchase, etc.	10

Text Book(s):

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

Reference Book(s):

Title	Author/s	Publication
Estimating and Costing	M. C. Chakraborty	Chakraborti (2006)
A textbook of Estimating and Costing	D D Kohli, Ar. R. C. Kohli	S. Chand & Company PVT. LTD.
A textbook of Estimating and Costing	G.S. Birdie	Dhanpat Rai Publishing Company

Web Material Link(s):

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

Course Evaluation:

Theory:

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

Tutorial Evaluation:

- Continuous Evaluation consists of tutorial which will be evaluated out of 20 for each tutorial and average of the same will be converted to 20 marks.
- Internal viva consists of 10 marks.
- MCQ based questions consists of 20 marks.

Course Outcome(s):

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

IDCV3010	**ESTIMATION COSTING & VALUATION**
CO 1	Explain types of estimate and duties of an Estimator.
CO 2	Undertake rate analysis of civil engineering works.
CO 3	Determine the rates of various items of civil works.
CO 4	Calculate estimated cost of civil construction projects.
CO 5	Evaluate the actual value of any property.

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

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

Module No	**Content**	**RBT Level**
1	Estimation & Modes of measurement	1,2,3
2	Specifications of Civil Works	1,2,3,4,5,6
3	Rate Analysis of Civil Works	1,2,3,4,5
4	Estimation of Civil Works	1,2,3,4,5,6
5	Valuation of Civil Engineering projects	1,2,3,4,5

P P Savani University
School of Engineering
Institute of Diploma Studies

Department of Civil Engineering

Course Code: IDCV3022
Course Name: Structural Design - I
Prerequisite Course(s): Structural Analysis, Concrete Technology

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 provide a comprehensive knowledge of basic mathematics essential for diploma students.
To help learners to

- Understand the basic concept of Reinforced Cement Concrete.
- Analyze stresses and load carrying capacity in various structural elements.
- Design and detail the structural elements as per IS Codes.
- Identify the application of various available structural software for designing various structural elements.

Course Content:

SECTION-I			
Module No.	Content	Hours	Weightage in %
1.	**Introduction to Reinforced Concrete** Introduction, design loads, materials for reinforced concrete and code requirements, design philosophies, factor of safety, Design loads.	9	20
2.	**Singly and Doubly Reinforced Beams** Introduction, limit state design – stress block diagram for singly and doubly reinforced beams, under – reinforced section, balanced section, over – reinforced section, solved examples for singly and doubly reinforced beams. **Flanged Beams** Introduction to concept and application of flanged beams, solved examples for design of flanged beams.	9	20
3.	**Bond, Anchorage, Development length and Torsion** Introduction, Design bond stress, Development length, anchoring reinforcing bars, Reinforcement splicing, Torsion in RC members.	6	12
SECTION-II			
Module No.	Content	Hours	Weightage in %
4.	**Slabs** Introduction, Design of continuous one-way slab and two – way slab, check for shear and deflection, Cantilever Slab.	7	16
5.	**Columns and footings**	7	16

	Introduction, concept of axial, uniaxial and biaxial bending in columns, design column and column footings.		
6.	**Staircase and Lintel** Introduction, various types of staircases, illustrative example for the design of dog-legged staircase, concept of lintel and design example.	7	16

List of Tutorials:

Sr. No.	Name of Tutorial	Hours
1.	Design Philosophies	2
2.	Limit state of strength and serviceability	2
3.	Design of singly reinforced beam	2
4	Design of doubly reinforced beam	4
5.	Design of one-way slab	2
6.	Design of two-way slab	4
7.	Design of column	4
8.	Design of column footing	4
9.	Design of staircase	2
10.	Detailing of structural Elements	4

Text Book:

Title	Author(s)	Publication
Reinforced concrete by limit state Design	Ashok K. Jain	Nem Chand & Bros
Design Of Reinforced Concrete Structures	Unnikrishnan Pillai and Devdas Menon	Tata McGraw Hill Publications
Fundamentals of Reinforced concrete Design	M. L. Gambhir	PHI Learning Private Limited
Limit State Design of Reinforced concrete	P.C. Varghese	PHI Learning Private Limited
Reinforced concrete Design	S. N. Shinha	TMH Education Private Limited

Reference Book:

Title	Author(s)	Publication
Code of Practice for Plain & Reinforced Concrete.	IS 456 – 2000	BIS
Limit State Theory And Design Of Reinforced Concrete	Karve S R and Shah V L	Vidyarthi Prakashan
Reinforced Concrete Design IS 456 – 2000 Principles & Practice	Raju N.K	New Age International Publishers

Course Evaluation:

Theory:

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

Tutorial:

- Continuous evaluation consists of performance of tutorial which will be evaluated out of 10 Marks for each tutorial and average of the same will be converted to 30 marks.
- MCQ based examination consists of 20 marks.

Course Outcomes:

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

IDCV3022	STRUCTURAL DESIGN - I
CO 1	Illustrate the concepts of RCC and will be able to compare various design methodologies for various load conditions.
CO 2	Design singly and doubly reinforced beams.
CO 3	Differentiate between one-way and two-way slabs and design them safe and economically.
CO 4	Design column and column footings economically and suitably recommend the appropriate type according to site conditions.
CO 5	Design staircase and lintels economically and safe.

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 Reinforced Concrete	1,2,3
2	Singly and Doubly Reinforced Beams, Flanged beams	2,3,4,5
3	Bond, Anchorage, Development length and Torsion	2,3
4	Slabs	2,3,4,5
5	Column and column footings	2,3,4,5
6	Staircase and Lintel	2,3,4,5

P P Savani University
Institute of Diploma Studies

Department of Civil Engineering

Course Code: IDCV3031
Course Name: Irrigation Engineering and Water Resource management.
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	00	00	03	40	60	00	00	00	00	100

CE: Continuous Evaluation, ESE: End Semester Exam

Objective(s) of the course: To provide a comprehensive knowledge of Water Resource and Irrigation methods and structures for diploma students.
To help learners to

- Understand the terminologies related to irrigation and its importance for plant growth.
- Gain the knowledge about canal operation, design and important components of irrigation scheme.
- Acknowledge importance of Hydrological analysis for designing dams and hydraulic structures.
- Understand well hydraulics and soil-water plant relationship.

Course Content:

SECTION-I			
Module No.	Content	Hours	Weightage in %
1.	**Introduction** Irrigation, Impact of Irrigation on Human Environment, Water Resources of India, Need of Irrigation in India, Development of Irrigation in India, Major and Medium Irrigation Schemes of India, Minor Irrigation, Command Area Development, Planning of Irrigation Projects, Crops and Crop Seasons.	3	6
2.	**Hydrology** Hydrology, Hydrologic Cycle, Precipitation, Abstraction from, Precipitation, Runoff, Stream Flow, Hydrographs, Floods	11	24
3.	**Soil-Water Relations and Ground Water** Soil-Water Relationships, Root-Zone Soil Water, Infiltration, Consumptive Use (or Evapotranspiration), Irrigation Requirement, Frequency of Irrigation, Methods of Irrigation, Quality of Irrigation, Water, Ground Water Resources, Well Irrigation, Occurrence of Ground Water, Flow of Water through Porous Media, Well Hydraulics, Ground Water Exploration, Pumping Tests (or Aquifer Tests), Design of Water Wells, Methods of Well Construction, Well Completion, Development of Wells, Pumping Equipment for Water Wells	9	20
SECTION-II			
Module No.	Content	Hours	Weightage in %
1.	**Canal Irrigation** Canals, Command Areas, Planning of an Irrigation Canal System, Alignment of Irrigation Canals, Curves in Canals, Duty of Water, Canal	8	18

	Losses, estimation of Design Discharge of a Canal, Canal Outlets, Canal Regulation, Delivery of Water to Farms, Flow Measurement, Assessment of Charges of Irrigation Water, Waterlogging, Drainage of Irrigated Lands		
2.	**Canal Falls and Cross drainage work** General, Canal Fall, Historical Development of Falls, Types of Canal Falls, Cistern Element, Roughening Measures for Energy Dissipation , Trapezoidal Notch, Sarda Fall, Glacis Fall, Distributary Head Regulator, Cross Regulator, Design Criteria for Distributary Head Regulator and Cross Regulator, Control of Sediment Entry into an Off taking Channel, Canal Escapes, Need of Cross-Drainage Structures, Types of Cross-Drainage Structures.	8	18
3.	**Dams and Canal Headworks** Canal headworks and its components, Earthen dams: Types, Construction methods, Filters, Failure modes, Gravity dams: Forces acting on it, Stability condition, joints, galleries, Keys and Water seals.	6	14

Text Book:

Title	Author(s)	Publication
Irrigation and Water resource engineering	G I Asawa	New age International

Reference Book:

Title	Author(s)	Publication
Irrigation and Hydraulic structures	S K Garg	Khanna Publication
Irrigation Engineering	S.K. Mazumder	Tata McGraw-Hill Publishing Company
Irrigation and Water Power Engineering	Punmia, B.C.	Standard 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.

Course Outcomes:

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

IDCV3031	Irrigation Engineering and Water Resource management.
CO 1	Compute the yielding and construction of the well, Evaluate the aquifer parameters
CO 2	Carryout hydrologic analysis and understand importance of it for hydraulic structure.
CO 3	Recognize the need of the canal headworks and allied structure and its operation.
CO 4	Conceive the knowledge about the Types of Dams and Its allied structure.

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	Hydrology	1, 3, 4
3	Soil-Water Relations and Ground Water	1, 2, 4
4	Canal Irrigation	1, 2
5	Canal Falls and Cross drainage work	1, 2
6	Dams and Canal Headworks	1, 2

P P Savani University
School of Engineering
Institute of Diploma Studies

Department of Civil Engineering

Course Code: IDCV3040
Course Name: Construction Management
Prerequisite Course/s: -

Teaching & Examination Scheme:

Teaching Scheme (Hours/Week)				Examination Scheme (Marks)						
				Theory		Practical		Tutorial		Total
Theory	Practical	Tutorial	Credit	CE	ESE	CE	ESE	CE	ESE	
02	00	01	03	40	60	00	00	50	00	150

CE: Continuous Evaluation, ESE: End Semester Exam

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

- prepare networks and bar charts for the given construction project.
- apply safety measures at construction site.
- explain and develop work breakdown structures.
- manage various resources for optimized completions of construction management.
- categorize construction operations, equipment.

Course Content:

SECTION - I			
Module No.	**Content**	**Hours**	**Weightage in %**
1	**Construction Industry & Management:** Organization-objectives, Types of organization government/public and private construction industry roles of various personal in construction organization. Agencies associated with construction work-owner, promotor, builder, designer, architecture. Job layout for construction site.	03	10
2	**Construction Planning & Scheduling:** Objective and function of Construction Management, Importance of construction planning, Stages of construction planning, Work Break Down Structure, Construction planning, Scheduling & monitoring, Bar charts. Elements of Network, Network rules, Critical path analysis of CPM network, Activity times & floats, Optimization through CPM technique, Program Evaluation & Review Techniques (PERT) & its three-time estimates.	12	40
SECTION-II			
1	**Safety in Construction:** Safety in construction industry-causes of accidents, Remedial and preventive measures. Safety campaign and safety devices, safety training, Fire safety.	03	10
2	**Contracts:** Essentials of Contract, Various types of Contracts, General conditions and principles, Methods of tendering, Earnest	07	23

	Money, Security Money, Arbitration, Termination of Contract.		
3	**Construction Equipment:** Selection of construction equipment, Cost of owning and operating, Engineering fundamentals of equipment, Excavating & transporting equipments, Hauling & conveying equipments.	05	17

List of Tutorial:

Sr. No.	Details of Tutorial	Hours
1	Prepare the organizational chart of any government/public sector organization executing any major civil engineering projects in your area.	02
2	Prepare the organizational chart of any private sector organization executing any major civil engineering projects in your area.	02
3	Develop a WBS structure for the construction of one storied building	02
4	Prepare the bar chart for given construction project.	02
5	Prepare a network for given construction project to identify the critical activity in a project.	03
6	Prepare the action plan to reduce the accidents on given construction project.	02
7	Prepare the charts/power point presentation on various safety devices used at construction site.	02
8	A site visit of heavy construction project should be arranged to show the working of construction equipment's like dragline, bull dozers, clamshell, belt conveyors, scrappers, compactors, etc.	--

Text Book(s):

Title	Author/s	Publication
Construction Project Management	Kumar Neeraj Jha	Pearson Education
Construction Planning & Management	U. K. Shrivastava	Galgotia Publications Pvt. Ltd

Reference Book(s):

Title	Author/s	Publication
Construction Planning & Management	P. S. Gahlot and B.M. Dhir	New Age International (P) Limited Publishers,2012
Construction Planning Equipment and methods	R.L. Peurity	McGraw-Hill Publishing Company, 2011
Construction Planning & Management	B.C. Punmia	Laxmi Publications

Web Material Link(s):

- https://en.wikipedia.org/wiki/Construction_management
- https://nptel.ac.in/courses/105104161/
- https://www.youtube.com/watch?v=JcwqysQ1jRU
- https://www.thebalancesmb.com/construction-schedule-techniques-844480
- https://www.designingbuildings.co.uk/wiki/Line_of_balance_(LOB)

Course Evaluation:
Theory:

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

Tutorial Evaluation:

- Continuous Evaluation consists of tutorial which will be evaluated out of 20 for each tutorial and average of the same will be converted to 20 marks.
- Internal viva consists of 10 marks.
- MCQ based questions consists of 20 marks.

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

IDCV3040	**CONSTRUCTION MANAGEMENT**
CO 1	Analyze and support in effective functioning of organization.
CO 2	Optimize the cost and time of a Project by using CPM & PERT Techniques.
CO 3	Understand the fundamentals of safety management systems in construction industry.
CO 4	Understand the legal implications of contract, common, and regulatory law to manage a construction project.
CO 5	Analyze methods, materials, and equipment used to construct projects.

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

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

Module No	**Content**	**RBT Level**
1	Construction Industry & Management	1,2,3
2	Construction Planning & Scheduling	1,2,3,4,5,6
3	Safety in Construction	1,2,3,4
4	Contracts	1,2,3,5
5	Construction Equipment	1,2,3,4,5

P P Savani University
School of Engineering
Institute of Diploma Studies

Department of Civil Engineering

Course Code: IDCV 3050
Course Name: Building Drawing
Prerequisite Course(s): -

Teaching & Examination Scheme:

Teaching Scheme (Hours/Week)				Examination Scheme (Marks)						
Theory	Practical	Tutorial	Credit	Theory		Practical		Tutorial		Total
				CE	ESE	CE	ESE	CE	ESE	
02	00	02	04	40	60	00	00	100	00	200

CE: Continuous Evaluation, ESE: End Semester Exam

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

- prepare building drawing for the given construction project.
- apply building bye laws for any project.
- Explain and develop planning for different Structures.
- Assurance of Proper planning, functioning, utilization and channelization of different utilities

Course Content:

SECTION-I			
Module No.	Content	Hours	Weightage in %
1.	**Introduction:** Types of drawing with appropriate scale & uses an index map, key plan, village map, site plan, layout plan, Types of Projection adopted in Building, Drawing Scales for various types of Drawings, Working drawing, large scale drawing enlarges scale drawing, Symbols, Conventions and Abbreviations for - Electrical fittings, water supply, sanitary fittings, material for construction, etc., Sizes of various standard papers	07	22
2.	**Building, regulation, byelaws and Principal of Planning:** building bye laws of local body for residential building (show local authority publication) -plot area, built up area, carpet area, FSI, size of rooms, margins, heights, passages, ventilation, circulation and others, principles of planning for residential building in detail such as - Room dimension, area, heights, privacy, roominess factor ,orientation, grouping, drainage, aspect, prospect, drainage, economy ,Color code for alteration and addition in existing building, Approval procedure with respect to bye laws.	08	18
3.	**Planning of Residential Building:** Concept plan and drawing of residential single and two storied buildings, Concept plan of public buildings such as hospital ,school, shopping center , office building and industrial unit, Given situation & Plot area, preparation of detailed drawing of a single storied and double storied residential building with detail of Line plan, Detailed Plan, Ground floor Plan, First floor plan, Elevation and Section	08	26
SECTION-II			

Module No.	Content	Hours	Weightage in %
4.	**Perspective Drawings and modeling**: On of perspective view and other related terms, Perspective view of single room residential building and simple public buildings, Elements of perspective drawing, Model preparation of simple buildings.	04	13
5.	**Construction al details drawing of buildings:** Drawings of Parts of buildings such as staircases, chajjas, projections, columns, pier, slabs, footings etc., provisions in drawings for building services such as air conditioning, plumbing, water supply and firefighting, elevators, lifts, and escalators etc., Electrification plan and drawings:, Show building service like water supply, sanitary, electrification on line plan.	4	13

Text Book:

Title	Author(s)	Publication
Building planning and drawing	Dr. N. Kumara swamy A. Kameswara Rao	Charotar Publishers
Building planning and drawing	Bhavikatti S S Chitawadagi M V	I K International

Course Evaluation:
Theory:

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

Practical Evaluation:

- Continuous Evaluation consists of tutorial which will be evaluated out of 20 for each tutorial and average of the same will be converted to 40 marks.
- Internal viva consists of 20 marks.
- MCQ based questions consists of 40 marks

Course Outcomes:

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

IDCV 3050	BUILDING DRAWING
CO 1	prepare building drawing for the Specified construction project.
CO 2	Ability to prepare building Drawing by proper application of bye laws.
CO 3	Explain and develop planning for different Structures.
CO 4	Orientation of Proper planning, functioning, and channelization of different utilities.

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

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

Module No	Content	RBT Level
1	Introduction	1, 2, 3
2	Building, regulation, byelaws and Principal of Planning	1,2,3,4,5,6

3	Planning of Residential Building	1,2,3,4,5,6
4	Perspective Drawings and modeling	1,2,3,4,5,6
5	Construction al details drawing of buildings	1,2,3,4,5,6

P P Savani University
School of Engineering
Institute of Diploma Studies

Department of Civil Engineering

Course Code: IDCV 3910
Course Name: Summer Training
Prerequisite Course(s): -

Teaching & Examination Scheme:

Teaching Scheme (Hours/Week)				Examination Scheme (Marks)						
Theory	Practical	Tutorial	Credit	Theory		Practical		Tutorial		Total
				CE	ESE	CE	ESE	CE	ESE	
04			04	00	00	100	00	00	00	100

CE: Continuous Evaluation, ESE: End Semester Exam

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

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

outline of course:

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

Report Writing Guidelines

A. Report Format:

- Title Page (to be provided by the respective supervisor)
- The title page of the project shall give the following information in the order listed: Full title of the project as approved by the Mentor.
- The full name of the student/Group of students with enrollment number;
- The qualification for which the project is submitted.
- The name of the institution to which the project is submitted;
- The month and year of submission.
- Project Certification Form.
- [The form should be duly filled signed by the supervisors.].
- Acknowledgements
  [All persons (e.g. supervisor, technician, friends, and relatives) and organization/authorities who/which have helped in the preparation of the report shall be acknowledged.].
- Table of Contents/Index with page numbering
- List of Tables, Figures, Schemes.
- Summary/abstract of the report.
- Introduction/Objectives of the identified problem.

- Data Analysis and Finding of Solution.
- Application of the identified solution.
- Future Scope of enhancement of the Project and Conclusion.
- "Learning during Project Work", i.e. "Experience of Journey during Project Duration"
- References(must)
- Bibliography
- Annexures (if any)

B. Guideline for Report Formatting:

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

Course Outcomes:

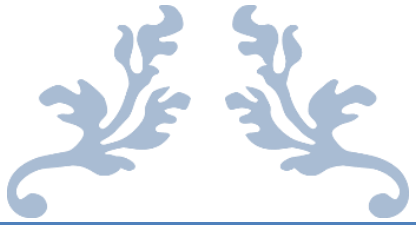
After the completion of the course, the student will be able to

IDCV 3910	SUMMER TRAINING
CO 1	Construct company profile by compiling brief history, management structure, products/services offered, key achievements and market performance for the company visited during internship.
CO 2	Determine the challenges and future potential for his/her internship organization in particular and the sector in general.
CO 3	Test the theoretical learning in practical situations by accomplishing the tasks assigned during the internship period.
CO 4	Apply various soft skills such as time management, positive attitude and communication skills during performance of the tasks assigned in internship organization.
CO 5	Analyze the functioning of internship organization and recommend changes for improvement in processes.

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

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

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



SEMESTER 6

P P Savani University
School of Engineering
Institute of Diploma Studies

Department of Civil Engineering

Course Code: IDCV3063
Course Name: Structural Design - II
Prerequisite Course(s): Structural Analysis

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 provide a comprehensive knowledge of basic mathematics essential for diploma students.
To help learners to

- Understand various loads and load combinations acting on a structure.
- Apply the concepts of steel design starting with riveted, welded and bolted connections and eccentric connections based on IS:800-1984 and IS:800-2007.
- Design the tension, compression members and flexural members based on IS: 800-2007.
- Understand the failure concepts and design the steel structure to be safe for various load conditions and ensure the structure to be economical

Course Content:

SECTION-I			
Module No.	Content	Hours	Weightage in %
1.	**Introduction** Properties of structural steel, rolled steel sections as per IS specifications, factor of safety, working stress design, limit state design, load and load combinations.	9	20
2.	**Connections** Introduction, types of connections and its applications, Bolted and welded connections and their types, numerical examples on bolted and welded connections subjected to direct loads and moments.	9	20
3.	**Tension Member** Net sectional area, permissible stresses, design of axially loaded tension member, design of member subjected to axial tension and bending.	6	12
SECTION-II			
Module No.	Content	Hours	Weightage in %
4.	**Compression Member - column** Introduction, modes of failure of a column, Euler's theory, effective length, slenderness ratio, design of compression members, design of built-up compression members: laced and battened columns, design of column splice.	7	16
5.	**Columns Bases and Grillage foundation** Introduction, Design of slab base and gusset base, design of grillage foundation.	7	16

6.	**Beams** Introduction, types of beams, section classification, lateral stability of beam, lateral torsional buckling of symmetrical section, design strength of beam (laterally supported and unsupported), web buckling and web crippling, shear strength and deflection.	7	16

List of Tutorials:

Sr. No.	Name of Tutorial	Hours
1.	Introduction	2
2.	Bolted connections	2
3.	Welded connections	2
4	Compression Members	4
5.	Column bases	2
6.	Grillage foundation	4
7.	Supported beams	4
8.	Unsupported beams	4
9.	Numerical examples	2
10.	Detailing of steel structural Elements	4

Text Book:

Title	Author(s)	Publication
Design of Steel Structures	N. Subramanian	Oxford Publication
Design of Steel Structures	Arya and Ajmani	Nem Chand Brothers
Design of Steel structures, Vol. I & Vol. II	Ramachandra	Standard Publishers Distributors
Design of Steel Structure	Duggal S K	Tata Mc Graw Hill Publication, New Delhi

Reference Book:

Title	Author(s)	Publication
Code of Practice for General construction in steel.	IS 800 – 2007	BIS
Design of Steel Structures	P. Dayaratnam	S. Chand of Co.
Steel Structures	B.C.Punamia	Laxmi Publication
Design of Steel Structures	Negi K S	Tata McGraw Hill Publisher Co. Ltd

Course Evaluation:

Theory:

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

Tutorial:

- Continuous evaluation consists of performance of tutorial which will be evaluated out of 10 Marks for each tutorial and average of the same will be converted to 30 marks.
- MCQ based examination consists of 20 marks.

Course Outcomes:

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

IDCV3063	STRUCTURAL DESIGN - II
CO 1	Calculate load and load combinations required on structure for the design of steel

	structure members.
CO 2	Design different type of joints and connections.
CO 3	Design of tension, compression and flexural members of the steel structures.
CO 4	Design column bases and various foundations for various load conditions
CO 5	Design the various steel structural members safe and economical.

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

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

Module No	**Content**	**RBT Level**
1	Introduction	1,2,3
2	Connections	3,4,5
3	Tension Member	3,4,5
4	Compression Member - column	3,4,5
5	Columns Bases and Grillage foundation	2,3,4,5
6	Beams	2,3,4,5

P P Savani University
Institute of Diploma Studies

Department of Civil Engineering

Course Code: IDCV3510
Course Name: Quality Control and Monitoring
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	00	00	03	40	60	00	00	00	00	100

CE: Continuous Evaluation, ESE: End Semester Exam

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

- TQM is the foundation of business strategy.
- They should be able to understand the impact of quality on profitability and application of quality tools, recognize the meaning of innovation and change.
- The role of manager and leaders in sustainable business excellence.

Course Content:

SECTION-I			
Module No.	Content	Hours	Weightage in %
1.	**Total Quality Management (TQM) in Construction:** Concept of quality control, Quality assurance, Quality management, Aims of TQM, Development and design Concept of TQM, Accuracy, and precision in observation, reading theodolite, digital theodolite, total station, calibration, etc., Accuracy in calculation, finding area, volume, etc.	5	14
2.	**Construction Quality Control Inspection Program:** Duties, responsibilities, and qualifications of staff in the organization. Checklists for: Quality of Materials Masonry, Plastering, Concrete construction, Batching, Mixing, Transporting, Placing, Compaction, Finishing, Curing Reinforcement Work, Formwork, Timber & steel construction, Doors & windows, Plumbing & drainage.	9	18
3.	**Statistical Quality Control& Monitoring:** Statistical Quality Control, Quality Measurement: Attributes and Variables, Statistical Process Control (SPC) Methods, Control Charts for Attributes: p-Charts, Proportion Defective c-Charts, Number of Defects Per Unit, Control Charts for Variables, Other Types of Attribute-Sampling Plans, Acceptance Sampling.	9	18
SECTION-II			
Module No.	Content	Hours	Weightage in %
4.	**Quality References** Quality standards in construction related to Building materials and other inputs for construction processes, Quality standards for Construction outputs, products and services. Indian Standard Code (a) Methods of referring it (b) Use of IS for quality references, National Building code (NBC	6	15

	2005) (a) Why to refer & How to refer (b) Methods of referring it & application, Study of International Organization for Standardization (ISO) (a) ISO9000, ISO14000 & certification procedures.		
5.	**Sustainable Built Environment - Green Building:** Green Building, Green Construction, Sustainable building, Goals of Green building, Advantages and disadvantages, Certification Agencies – GRIHA, LEED (Highlights & Criteria), Life cycle assessment (LCA), Siting and structure design efficiency, Energy efficiency, Water efficiency, Materials efficiency, Indoor environmental quality enhancement, Operations and maintenance optimization Waste reduction	8	15

Text Book:

Title	Author(s)	Publication
Total Quality Management	G .Kanji	Springer Science & Business Media
Fundamentals of Quality Control &Improvement	Amitva Mitra	Wiley India Private Limited

Reference Book:

Title	Author(s)	Publication
Manual on Quality Control		Gujarat Engineering Research Institute
National Building Code		

Course Evaluation:

Theory:

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

Tutorial:

- Continuous evaluation consists of performance of tutorial which will be evaluated out of 10 Marks for each tutorial and average of the same will be converted to 30 marks.
- MCQ based examination consists of 20 marks.

Course Outcomes:

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

IDCV3510	QUALITY CONTROL AND MONITORING
CO 1	Apply total quality management in civil construction.
CO 2	Check the quality in civil construction works.
CO 3	Identify the variations in quality of civil works.
CO 4	Use various standard codes in civil construction works.
CO 5	Design energy efficient buildings.

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	Total Quality Management (TQM) in Construction	1, 2, 3, 4
2	Construction Quality Control Inspection Program	1, 2, 4
3	Statistical Quality Control & Monitoring	1, 2, 4, 5
4	Quality References	1, 2, 4, 5
5	Sustainable Built Environment - Green Building	1, 2, 3, 4, 5

P P Savani University
Institute of Diploma Studies

Department of Civil Engineering

Course Code: IDCV3521
Course Name: Advanced Surveying
Prerequisite Course(s): Surveying (IDCV2040)

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	00	03	40	60	00	00	00	00	100

CE: Continuous Evaluation, ESE: End Semester Exam

Objective(s) of the course: To provide a comprehensive knowledge of Water Resource and Irrigation methods and structures for diploma students.
To help learners to

- Apply principles of theory of errors for correction in measurements.
- Explain use of aerial camera, aerial photographs and procedure of aerial survey.
- Utilize total station and other modern survey instruments.
- Apply GIS in solving engineering problems.

Course Content:

SECTION-I			
Module No.	Content	Hours	Weightage in %
4.	**Geodetic Surveying** Principle and Classification of triangulation system- Selection of base line and stations- Orders of triangulation- Triangulation figures- Station marks and signals- marking signals- Extension of base, Reduction of Centre, Selection and marking of stations	5	10
5.	**Theory of Errors** Introduction, types of errors, definitions, laws of accidental errors, laws of weights, theory of least squares, rules for giving weights and distribution of errors to the field observations, determination of the most probable values of quantities.	9	20
6.	**Aerial photogrammetry** Introduction, Principle, Uses, Aerial camera, Aerial photographs, Definitions, Scale of vertical and tilted photograph, Ground Co-ordinates, Displacements and errors, Ground control, Procedure of aerial survey, Photomaps and mosaics, Stereoscopes, Parallax bar.	9	20
SECTION-II			
Module No.	Content	Hours	Weightage in %
6.	**Modern Surveying Instruments** Introduction, Electromagnetic spectrum, Electromagnetic distance measurement, Total station, Digital self-levelling levels, scanners for topographical survey.	6	14
7.	**Remote Sensing**	8	18

	Introduction, Principles of energy interaction in atmosphere and earth surface features, Image interpretation techniques, visual interpretation, Digital image processing, Global Positioning system		
8.	**Geographical Information System** Definition of GIS, Key Components of GIS, Functions of GIS, Spatial data, spatial information system Geospatial analysis, Integration of Remote sensing and GIS, and Applications in Civil Engineering.	8	18

Text Book:

Title	Author(s)	Publication
Surveying and Leveling	N N Basak	Tata Macgraw hill

Reference Book:

Title	Author(s)	Publication
Surveying Vol. I, II and III	Dr. B C Punamia	Laxmi Publication
Surveying and Leveling	Subramanian R.	Oxford University press
Remote Sensing and GIS	B Bhatia	Oxford University press

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 student will be able to

IDCV3521	Advanced Surveying
CO 1	Apply the mathematical principle to remove the errors from survey network.
CO 2	Comprehend the basics of aerial photography.
CO 3	Understand the principal behind the remote sensing and GPS survey.
CO 4	Carryout analysis using GIS tools for various civil engineering use.

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	Geodetic Surveying	1, 2
2	Theory of Errors	2, 3
3	Aerial photogrammetry	1, 2
4	Modern Surveying Instruments	2, 3, 4, 5, 6
5	Remote Sensing	2, 4, 5, 6
6	Geographical Information System	2, 3, 4, 5, 6

P P Savani University
School of Engineering
Institute of Diploma Studies

Department of Civil Engineering

Course Code: IDCV 3541
Course Name: Highway & Traffic Engineering
Prerequisite Course(s): Traffic Engineering

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	00	03	40	60	00	00	00	00	100

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

- To provide a coherent development to the students for the courses in sector of Engineering like Transportation & Traffic Engineering etc.
- To present the foundations of many basic Engineering tools and concepts related Highway Engineering.
- To give an experience in the implementation of Engineering concepts which are applied in field of Transportation Engineering
- To involve the application of scientific and technological principles of planning, analysis, design and management to highway engineering.

Course Content:

SECTION-I			
Module No.	Content	Hours	Weightage in %
1.	**Stresses in Flexible Pavements:** Types of component parts of pavements, highway and airport pavements, materials used in pavement, layered system concepts, stress solution for one, two- and three-layered systems, fundamentals of design concepts, IRC method of flexible pavement design.	5	14
2.	**Stresses in Rigid Pavements:** Westergaard's theory and assumptions, stresses due to curling, stresses and deflections due to loading, frictional stresses, stresses in dowel bars and tie bars, IRC methods of rigid pavement design.	9	18
3.	**Factors Affecting Pavement Design:** Variable considered in pavement design, classification of axle types, standard and legal axle loads, tyre pressure, contact pressure, ESWL, EWLF, and EAL concepts, traffic analysis: AADT, growth factor, lane distribution factor, directional distribution factor and vehicle damage factor.	9	18
SECTION-II			
Module No.	Content	Hours	Weightage in %
4.	**Traffic Engineering:**	6	15

	Traffic Engineering-Definition, Functions & Importance; Road User Characteristics, Human Factors Governing Road User Behavior, Vehicle Characteristics, Slow Moving Traffic Characteristics In Indian Conditions.		
5.	**Highway capacity analysis:** Cases of different types of highways, Highway capacity; Design of Intersection; Parking types; Off street parking; Facilities.	8	15
6.	**Traffic control devices:** Channelization, rotary and Traffic signals, Traffic Signs and Road markings, Road Accidents.	8	20

Text Book:

Title	Author(s)	Publication
Traffic Engineering & Transportation Planning	L. R. Kadyali, 4th Edition	Khanna Publishers
Highway Engineering	S. K. Khanna & C. E. G. Justo	Khanna Publishers,

Reference Book:

Title	Author(s)	Publication
Principle of Transportation Engineering	Parth Chakroborty and Animesh Das	PHI
A Text Book of Transportation Engineering	S.P Chandola	S.Chand

Course Evaluation:

Theory:

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

Tutorial:

- Continuous evaluation consists of performance of tutorial which will be evaluated out of 10 Marks for each tutorial and average of the same will be converted to 30 marks.
- MCQ based examination consists of 20 marks.

Course Outcomes:

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

IDCV 3541	HIGHWAY & TRAFFIC ENGINEERING
CO 1	Explain the principles & factors affecting pavement design.
CO 2	Design of flexible and rigid pavements using IRC, AASHTO and other important methods of design.
CO 3	Identify the different aspects of traffic engineering.
CO 4	Design traffic facilities.
CO 5	Explain the concept of transportation planning.

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	Stresses in Flexible Pavements	2,3,4,5
2	Stresses in Rigid Pavements	2,3,4,5

3	Factors Affecting Pavement Design	1,2,3,4,5
4	Traffic Engineering	2,3,5,6
5	Highway capacity analysis	1,2,3,4,5
6	Traffic control devices	1,2,3,5

P P Savani University
School of Engineering
Institute of Diploma Studies

Department of Civil Engineering

Course Code: IDCV3531
Course Name: Foundation Engineering
Prerequisite Course(s): Soil Mechanics (IDCV2090)

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	00	03	40	60	00	00	00	00	200

CE: Continuous Evaluation, ESE: End Semester Exam

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

- Select the appropriate foundation design.
- Different types of the soil testing methods and select proper method according to the soil type.
- Construction on the expensive soil.
- Get knowledge of the geotextile.

Course Content:

SECTION-I			
Module No.	Content	Hours	Weightage in %
4.	**Foundation Classification and Soil exploration/investigation:** Types of foundation, Factors affecting the selection of type of foundations, steps in choosing types of foundation based on soil condition, Objectives and planning of exploration program, methods of exploration-depth of boring, Soil samples and samplers- Methods of sampling, field penetration tests: SPT, SCPT, DCPT. Introduction to geophysical methods, Bore log and report writing and Data interpretation.	9	20
5.	**Shallow Foundation:** Introduction, significant depth, design criteria, modes of shear failures. Detail study of bearing capacity theories (Prandtl, Meyerhoff, Terzaghi, Skempton, Vesic etc), bearing capacity determination using IS Code (IS 6403), Presumptive bearing capacity. Settlements: components of settlement & its estimation (IS 8009), permissible settlement, Proportioning of footing for equal settlement, Allowable bearing pressure. Bearing capacity from in-situ tests (SPT, SCPT, PLT, DCPT), Factors affecting bearing capacity. Bearing capacity of raft/mat foundation as per codal provisions, Contact pressure under rigid and flexible footings. Floating foundation. Types of pavements & its design.	14	30
SECTION-II			
Module No.	Content	Hours	Weightage in %
3.	**Pile Classifications & Load Transfer Principle of Pile Foundation:**	14	30

	Introduction, load transfer mechanism, types of piles and their function, factors influencing selection of pile, their method of installation and their load carrying characteristics for cohesive and granular soils, piles subjected to vertical loads- pile load carrying capacity from static formula, dynamic formulae (ENR and Hiley), penetration test data & Pile load test (IS 2911). Pile group: Carrying capacity, Group Efficiency and settlement. Negative skin friction.		
4.	**Foundations on problematic soil & Introduction to Geosynthetics:** Significant characteristics of expansive soil, footing on such soils, Problems and preventive measures. Under-reamed pile foundation-its concept, design & field installation. Introduction to geosynthetics-types and uses.	8	20

Text Book:

Title	Author(s)	Publication
Analysis & Design of Foundations & Retaining Structures	Swami Saran, Gopal Ranjan	Sarita Prakashan.
Foundation Analysis and Design	Bowles, J.E	McGraw Hill, New York, 1995

Reference Book:

Title	Author(s)	Publication
Foundation Engineering.	Peck hanson & Thronburg	John Wiley & Sons.
Analysis and design of Sub structures	Swami Saran	Oxford & IBH
Foundation Engineering	Naryana S Naik	Dhanphat Rai publishers, New Delhi

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 student will be able to

IDCV3531	Foundation Engineering
CO 1	Select appropriate soil investigation/testing technique/method and get true sub soil parameters used for selection of type of foundation as per codal guidelines.
CO 2	Select and design appropriate (Shallow/ Deep) foundation system for different structures, that satisfy the allowable bearing capacity and settlement requirements based on soil properties.
CO 3	Define properties of trigonometry and vectors in construction.
CO 4	Design vertical piles and pile groups for various types of loading, soil conditions and settlement requirements.
CO 5	Explain engineering behavior of expansive soils and selection of suitable foundation type for such soils, suggest suitable type of geosynthetics for various foundation issues and its proper implications.

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	Foundation Classification and Soil exploration/investigation:	1,2,3,5
2	Shallow Foundation	2,3,4,5
3	Pile Classifications & Load Transfer Principle of Pile Foundation	2,3,4,5,6
4	Foundations on problematic soil & Introduction to Geosynthetics	2,3,5

P P Savani University
School of Engineering
Institute of Diploma Studies

Department of Civil Engineering

Course Code: IDCV 3920
Course Name: Project/Training
Prerequisite Course(s): -

Teaching & Examination Scheme:

Teaching Scheme (Hours/Week)				Examination Scheme (Marks)						
Theory	Practical	Tutorial	Credit	Theory		Practical		Tutorial		Total
				CE	ESE	CE	ESE	CE	ESE	
00	11	00	12	00	00	200	300	00	00	500

CE: Continuous Evaluation, ESE: End Semester Exam

Outline of the Course:

Project

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

Training

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

Course Outcomes:

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

IDCV 3920	PROJECT/TRAINING
CO 1	Discriminate the theoretical learning with practice and integrate knowledge for engineering applications.
CO 2	Integrate real time industry exposure and experience.
CO 3	Manage the challenging projects for commercial, societal and environment benefit.
CO 4	Evaluate the importance of planning, documentation, punctuality and work ethics.
CO 5	Formulate the document of the work which carried out on site with industry standards.

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

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

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

P P Savani School of Engineering

P P Savani University Campus, NH 48, GETCO, Near Biltech,
Village: Dhamdod, Kosamba, Dist.: Surat – 394125