Syllabus Book

Diploma
(Civill Engineering)

P P Savani University

Institute of Diploma Studies

Effective From: 2024-25

Authored by: P P Savani University

CONTENT

FIRST YEAR DIPLOMA IN CIVIL 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**	5	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	60	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	2	0	0	**2**	2	40	60	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	**2**	1	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	**26**	**21**							**800**

P P Savani University
Institute of Diploma Studies

Department of Applied 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	
3	0	2	5	40	60	-	-	50	0	150

CE: Continuous Evaluation, ESE: End Semester Exam

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

- 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			
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 equation, Angle between two lines, Circle, Tangent and normal, Equation of tangent and normal.	6	15

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.	List of Tutorial	Hours
1.	Logarithm-1	2
2.	Logarithm-2	2
3.	Determinants and Matrices-1	2
4.	Determinants and Matrices-2	2
5.	Determinants and Matrices-3	2
6.	Trigonometry-1	2
7.	Trigonometry-2	2
8.	Trigonometry-3	2
9.	Co-ordinate geometry-1	2
10.	Co-ordinate geometry-2	2
11.	Vectors-1	2
12.	Vectors-2	2
13.	Mensuration-1	2
14.	Mensuration-2	2
15.	Mensuration-3	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
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 Outcome(s):

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

IDSH1010	**FUNDAMENTALS OF MATHEMATICS**
CO1	Outlining logarithmic properties
CO2	Implement the concept of determent and matrices to solve science and engineering problems.
CO3	Presenting application of geometry
CO4	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	Logarithm	1,2,3,5
2	Determination and Matrices	2,3,4,5
3	Trignometry	2,3,4,5,6
4	Co-ordinate geometry	2,3,5
5	Vectors	2,3,5
6	Mensuration	1,2,3,5

P P Savani University
Institute of Diploma Studies

Department of Applied Science & Humanities

Course Code: IDSH1020
Course Name: Engineering Physics
Prerequisite Course(s): Concept of Science up to 9th Standard

Teaching & Examination Scheme

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

CE: Continuous Evaluation, ESE: End Semester Exam

Objective(s) of the course:

- The student will demonstrate the ability to think in core concept of their engineering application by studying various topics involved in branch specific applications.
- The student will demonstrate the ability to use appropriate mathematical techniques and concepts to obtain quantitative solutions to problems in physics.
- In courses involving laboratory, the student will demonstrate the ability to collect and analyze data and to prepare coherent reports of his or her findings.

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.	07	15

	(Numerical on above topics)		
Section II			
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.	List of Practical	Hours
1.	To study about basic unit conversion and dimension analysis.	4
2.	To measure length and diameter of the given object using Vernier callipers.	2
3.	To measure the thickness of slit and diameter of wire with help of micrometer Screw Gauge.	2
4.	To determine the surface tension of water by capillary rise method.	4
5.	To Verify Ohm's Law by using an Ammeter & Voltmeter	2
6.	To determine the wavelength of sound produced (i) in an air column and the velocity of sound in air at room temperature using a resonance column and a tuning fork.	4
7.	To determine Young's modulus of a material of a beam by the method of bending of a beam.	4
8.	To determine the modulus of rigidity of the material of wire by dynamical method.	2
9.	To determine the value of 'g' by using a Simple Pendulum.	2
10.	Measurement of g: Use of a Kater's Pendulum.	2
11.	To measure the temperature of given material by any temperature measuring instrument.	2

Text Book:

Title	Author(s)	Publication
Basic physics for Diploma group -1	-	Atul Prakashan

Reference Books:

Title	Author(s)	Publication
Physics Part-I and II	Resnick and Haliday	Wiley Eastern Publication
Concept of Modern Physics	Arthur Beiser	Tata McGraw Hill
Concept of Physics	H C Verma	-
Fundamental of physics	Gomber & Gogia	Pradeep publications Jalandhar
NCERT Physics part 1 & 2	-	NCERT

Course Evaluation:

Theory:

- Continuous Evaluation Consist of Two Test Each of 30 Marks and 1 Hour of duration.
- 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 10 Marks.
- Internal Viva component of 10 Marks.
- Practical performance/quiz/drawing/test of 20 Marks during End Semester Exam.
- Viva/Oral performance of 10 Marks during End Semester Exam.

Course Outcome(s):

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

IDSH1020	ENGINEERING PHYSICS
CO 1	Identify physical quantities, different systems of units and make measurements with accuracy by minimizing different types of errors to solve real life relevant problems.
CO 2	Analyze type of motions and apply the knowledge to solve equation of motion and conservation of momentum principle to describe motion of rocket, recoil of gun etc.
CO 3	Define scientific work, energy and power and their units. Derive relationships for work, energy and power and solve related problems.
CO 4	Learn about the concept of elasticity, it's types and applications from engineering perspectives.
CO 5	Describe the properties of fluids, understand the concepts of viscosity and surface tension and their respective applications.
CO 6	Apply the knowledge of heat and thermodynamics needed for different engineering tasks.

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	Introductory Concepts	3, 5
2	Mechanics	2, 4
3	Work, Energy and Power	1, 3
4	Mechanical properties of solids	2, 6
5	Properties of fluids	1, 5
6	Heat transfer	3, 4

P P Savani University
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	200

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 & Levelling	S. B. Junnarkar and H. J. Shah	Laxmi Publication

Course Evaluation:

Theory:

- Continuous Evaluation Consist of Two Test Each of 30 Marks and 1 Hour of duration.
- 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 10 Marks.
- Internal Viva component of 10 Marks.
- Practical performance/quiz/drawing/test of 20 Marks during End Semester Exam.
- Viva/Oral performance of 10 Marks during End Semester Exam.

Course Outcome(s):

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

IDME1010	BASICS OF MECHANICAL & CIVIL ENGINEERING
CO 1	Know the principles and working of basic mechanical systems
CO 2	Comprehend importance of mechanical engineering in various fields of engineering
CO 3	Interpret about different civil engineering fields with an overview of building material
CO 4	Identify the scope of Civil engineering in the practical field of engineering

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 Mechanical Engineering	1, 2
2	Heat Interactive equipment	1, 2, 4
3	Power Transmission and Safety	1, 2, 4
4	Hydraulic and pneumatic devices	1, 2, 4
5	Manufacturing Processes	1, 2
6	Civil Engineering: An Overview	1, 2, 3

7	Civil Engineering Drawing	2, 3, 6
8	Construction Materials	1, 2, 3

P P Savani University
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 formatting with text, Use Image and table formatting.	06	14
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	02

	formatting Using Microsoft Excel.	
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 in the sheet.	06
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	Learn and acquire basic knowledge about history of computer, functional role of different components of computer and memory architecture.
CO 2	Acquire the basic knowledge of computer hardware, software, role of operating system and other peripheral devices and their installation.
CO 3	Learn the concepts of Microsoft Office – Word, Excel, and PowerPoint and be able to work on them for better documentation and presentation.
CO 4	Recognize the role of network & related terminologies and internet.
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
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 and safety norms required in the workshop.
CO 2	Apply workshop trades such as welding, plumbing, drilling, grinding, fitting, and carpentry for preparation of job.
CO 3	Apply the use of machine tools, hand tools and power tools.

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

P P Savani University
School of Engineering
Department of 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	
3	0	2	5	40	60	-	-	50	0	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

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

Course Content:

Module No.	Content	Hours	Weightage in %
	Section I		
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** Introduction, Formation of differential equations, Solution of differential equations, Separation of variables, Homogeneous equations, Exact Differential Equations, Integrating factor method, Linear differential equation.	9	18
5.	**Complex Number**	6	18

	Introduction, Mathematical Operations, Polar form, Modulus, Amplitude Farm, De Movire's Theorem.		
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.	Name of Tutorial	Hours
1.	Functions and Limits-1	1
2.	Functions and Limits-2	1
3.	Differentiation-1	1
4	Differentiation-2	2
5.	Integration-1	1
6.	Integration-2	2
7.	Differential Equations of First order and First degree-1	1
8.	Differential Equations of First order and First degree-2	2
9.	Complex Number-1	1
10.	Complex Number-2	1
11.	Statistics-1	1
12.	Statistics-2	1

Text Book:

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

Reference Book:

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

Course Evaluation:

Theory:

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

Tutorial:

- Continuous evaluation consists of performance of tutorial which will be evaluated out of 10 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**
CO1	Apply differentiation and integration for solving engineering problems and The cumulative effect of the original quality or equation is the integration.
CO2	Implementing statistical methods for solving real world problems.
CO3	Develop the ability to apply differentiation to significant applied problems.
CO4	Evaluate the limiting value of algebraic and trigonometric functions.
CO5	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	1,2,3,5
2	Differentiation	2,3,4,5
3	Integration	2,3,4,5,6
4	Differential Equations of First order and First degree	2,3,5
5	Complex Number	2,3,5
6	Statics	1,2,3,5

P P Savani University
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	
3	2	0	4	40	60	20	30	0	0	150

CE: Continuous Evaluation, ESE: End Semester Exam

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

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

Course Content:

Module. No.	Content	Hours	Weightage in %
	Section I		
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.	04	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.	04	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	06	10

	examples, Application of pH in Industries.		
Section II			
5.	**Solutions** Definition, Methods of expressing concentration of a solution Molarity, Molality, Normality, Mole fraction and Percentage Mass – Simple problems.	04	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, Meerut.,2001

Reference Book(s):

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

Web Material Link(s):

https://onlinecourses.nptel.ac.in/noc21_cy45/preview

https://nptel.ac.in/noc/courses/noc17/SEM2/noc17-cy03/

Course Evaluation:

Theory:

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

Practical:

- Continuous Evaluation consists of 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	Implement and evaluate quality control procedures.
CO2	Perform and validate laboratory procedures to conduct tests.
CO3	Improve industrial or chemical processes and laboratory equipment.
CO4	Prepare and purify compounds using standard chemical procedure.

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 structures, 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
Faculty of Diploma Studies

Department of Mechanical 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 behavior of structural element under the influence of various loads.

Course Content:

Section I			
Module No.	**Content**	**Hours**	Weightage in %
1.	**Introduction 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			
4.	**Friction:** Introduction, Wet and Dry friction, Theory of Dry friction,	06	14

	Angle of friction, Angle of Repose, Cone of friction, Coulomb's laws of friction.		
5.	**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
6.	**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
20.	Coplanar Concurrent Forces	02
21.	Law of parallelogram	02
22.	Coplanar Non concurrent forces	02
23.	Lami's Theorem	02
24.	Coefficient of static friction	02
25.	Parallel force system	02
26.	Numerical practice on Force System	02
27.	Numerical practice on C.G.	02
28.	Numerical practice on M.I.	02
29.	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 numerical and it carried 10 marks of evaluation.
- End semester examination will consist of 60 marks exam.

Practical:

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

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

Course Outcome(s):

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

IDCV1010	**ENGINEERING MECHANICS**
CO1	Apply fundamental principles of mechanics, equilibrium, statics reactions and internal forces in statically determinate beams.
CO2	Apply principles of statics to determine C.G and M.I of a different geometrical shape and Understand basics of friction and its importance.
CO3	Critically analyze problems and solve the problem related to mechanical elements and analyze the deformation behavior 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 Institute of Diploma Studies

Department of Information Technology

Course Code: IDIT1010
Course Name: Introduction to Computer Programming
Prerequisite Course (s): NA

Teaching & Examination Scheme:

Teaching Scheme (Hours/Week)				Examination Scheme (Marks)						
Theory	Practical	Tutorial	Credit	Theory		Practical		Tutorial		Total
				CE	ESE	CE	ESE	CE	ESE	
03	04	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 II			
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	10
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.	08	18
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.	06	15
4.	**Conditional Statements:** Decision Making & Branching: Decision Making with If and If - else Statements, Nesting of If-else Statements, The Switch and	07	15

	go-to statements, Ternary (?:) Operator. Looping: The while Statement, The Break Statement & The Do. While loop, The FOR loop, Jump within loops - Programs.		
Section II			
5.	**Arrays:** Introduction, One-dimensional Arrays, Two-dimensional Arrays, Concept of Multidimensional Arrays.	07	14
6.	**Strings:** Declaring and Initializing String Variables, Arithmetic Operations on Characters, Putting Strings Together, Comparison of Two Strings, String Handling Functions.	06	14
7.	**User-Defined Functions:** Concepts of User-defined Functions, Prototypes, function Definition, Parameters, Parameter Passing, Calling a Function, Recursive Function, Macros and Macro Substitution	07	14

List of Practical:

Sr. No	Name 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 following course outcomes will be able to:

IDIT1010	**INTRODUCTION TO COMPUTER PROGRAMMING**
CO1	Understand foundation concepts, data representation, algorithms and coding methods in computer system.
CO2	Acquire the knowledge about programming language syntax.
CO3	Apply basic principles of imperative and structural programming to solve complex problems.
CO4	Able to develop, debug and test application programs.

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	Operations, 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 Science & Humanities

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	Credit	Theory		Practical		Tutorial		Total
				CE	ESE	CE	ESE	CE	ESE	
0	2	0	1	00	00	20	30	0	0	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:

IDSH1060	**ELECTRICAL & ELECTRONIC WORKSHOP**
CO1	Recognize the basic rules for wiring and developing the ability to wire the discrete
CO2	Demonstrate the ability to think in core concept of their engineering application by studying various topics involved in branch specific applications.
CO3	Develop the ability to collect and analyze data and to prepare coherent reports of his or her findings.
CO4	Recognize the PCBs which is inserted in any of the electronic gadgets.

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	Logic Gates	1, 2, 3, 5, 6
4	CRO	1, 2, 4, 5
5	Digital Multimeter	1, 2, 3, 4, 5
6	Soldering & Desoldering	1, 2, 3, 4, 5, 6
7	Wiring of ceiling fan	1, 2, 3, 4, 5, 6
8	Wiring of two switch	1, 2, 3, 4, 5, 6
9	Working of AC Refrigerator	1, 2, 3, 4, 5
10	Concept of Power transmission	1, 2, 3, 4, 5
11	Working of Fluorescent Light	1, 2, 3, 5, 6

SECOND YEAR DIPLOMA IN CIVIL ENGINEERING

P P SAVANI UNIVERSITY														
SCHOOL OF ENGINEERING														
TEACHING & EXAMINATION SCHEME FOR DIPLOMA CIVIL ENGINEERING PROGRAMME AY:2023-24														
Sem	**Course Code**	**Course Title**	**Offered By**	**Teaching Scheme**					**Examination Scheme**					
				Contact Hours				**Credit**	**Theory**		**Practical**		**Tutorial**		**Total**
				Theory	**Practical**	**Tutorial**	**Total**		**CE**	**ESE**	**CE**	**ESE**	**CE**	**ESE**	
3	IDCV2110	Building Materials & Construction Technology	CV	2	2	0	4	3	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**
	CLSC2010	Universal Human Values	CLSC	2	0	0	2	2	100	0	0	0	0	0	**100**
						Total	**27**	**21**							**900**
4	IDCV2120	Concrete Technology	CV	2	4	0	6	4	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	CLSC	3	0	0	3	3	100	0	0	0	0	0	**100**
						Total	**27**	**23**							**850**

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	20	30	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:**	02	6

	Civil engineering structures, Functions of 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

IDCV2110	**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 of emptying a uniform vessel. Internal and External cylindrical mouthpiece.	07	15
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	02
2.	Impact Test (Izod)	02
3.	Impact Test (Charpy)	02
4.	Tensile Strength Test	02
5.	Rockwell Hardness Test	02
6.	Brinnal's Hardness Test	02
7.	Tutorials	02
8.	Tutorials	02

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		
Theory	Practical	Tutorial	Credit	CE	ESE	CE	ESE	CE	ESE	Total
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,	07	15

	types of vertical curves.		
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 Setting out combined curve (Transition - Circular – Transition)	02
7.	Plane table traversing by radiation methods	02
8.	Plane table traversing by intersection methods	02
9.	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	11	25

	Natural scale. Isometric view and isometric projection. Illustrative problems related to objects containing lines, circles and arcs shape only		

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: IDCV2050
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	04	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

- 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	04
2	To determine the initial and final setting time of cement	04
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	04
7	To determine the bulk density of coarse aggregate and fine aggregate	02
8	To determine flakiness and elongation index of coarse aggregate	04
9	To determine the concrete mix proportion by the Indian standard Recommended method IS 10262-2009	06
10	To determine the compressive strength of hardened concrete using a rebound hammer	04
11	To determine the compressive strength of hardened concrete using an ultrasonic pulse velocity test	04
12	To arrange a site visit to the RMC plant and preparation of the report.	06
13	To arrange a construction site visit and preparation of report.	06
14	Presentation on various topics	10

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 Characteristics, Industrial effluent standards for disposal into	12	28

	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 SF and BM diagrams for each case.	09	18

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