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Government Polytechnic Mumbai

(Academically Autonomous Institute of Govt. of Maharashtra)

Information Technology Department

P23 Curriculum

First Semester

Implemented from July 2023

Government Polytechnic Mumbai

(Academically Autonomous Institute, Government of Maharashtra)

Programme Name	**Diploma In Information Technology**		
Programme Code	**IF**	**Year**	**2023-24**
Duration Of Programme	**6 Semester**	**Duration**	**16 WEEKS**
Semester	**First**	**Scheme**	**P23**

SR.NO	CourseTitle	Course Type	course code	Learning Scheme: Total IKS Hrs.for sem	Atual contact Hrs./Week: CL	TL	LL	self learning (TW+ ASSIGNMENT)	Notional learning /week	credits	paper Duration	ExaminationScheme(Marks): Theory: FA-TH T1 MAX	FA-TH T2 MAX	SA-TH MAX	Total MAX	Total MIN	BASED ON LL & TL: PRACTICAL: FA-PR MAX	FA-PR MIN	SA-PR OR MAX	SA-PR OR MIN	SA-PR PR MAX	SA-PR PR MIN	Based on Self learning: SLA MAX	SLA MIN	TOTAL MARKS
1	**Applied Physics**	DSC	SC23103	2	3		2	1	6	3	2hr-30min	20	20	60	100	40	25	10	_		25#	10	25	10	175
2	**Basic Mathematics**	AEC	SC23501	6	4	2		2	8	4	2hr-30min	20	20	60	100	40	25	10	_				25	10	150
3	**Basics of Electrical and Electronic**	AEC	CO23501		2		2	2	6	3							25	10	_		50@	20	25	10	100
4	**Web Technology**	SEC	IT23101		2		2	2	6	3							50	20	_		50@	20	25	10	125
5	**Logic Development Using C Programming**	DSC	IT23102		3		4	1	8	4	2hr-30min	20	20	60	100	40	25	10	_		50#	20	25	10	200
6	**Latex (SpokenTutorial)**	SEC	SL23601					4	4	2									_						
7	**UHVI**	VEC	UV23301	4	1			1	2	1									_				50	20	50
	Total			**12**	**15**	**2**	**10**	**13**	**40**	**20**															**800**

Abbreviations CL- Classroom Learning , TL- Tutorial Learning, LL-Laboratory Learning, FA - Formative Assessment,SA -Summative Assessment, IKS - Indian Knowledge System, SLA - Self Learning Assessment

Legends @ Internal Assessment, # External Assessment

Note 1 FA-TH represents two class tests of 20 marks each conducted during the semester.

2 If candidate is not securing minimum passing marks in FA-PR of any course then the candidate shall be declared as "Detained" in that semester.

3 If candidate is not securing minimum passing marks in SLA of any course then the candidate shall be declared as fail and will have to repeat and resubmit SLA work.

4 Notional Learning hours for the semester are (CL+LL+TL+SL)hrs * 15 Weeks

5 1 credit is equivalent to 30 Notional hrs.

6 * Self learning hours shall not be reflected in the Time Table

Course Category Discipline Specific Course Core (DSC) 2, Discipline Specific Elective (DSE) 0, Value Education Course (VEC) 1, Intern./Apprenti./Project./Community (INP) : 0,

AbilityEnhancement Course (AEC) 2, Skill Enhancement Course (SEC) 2, GenericElective (GE) 0

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Coordinator	In-Charge	Head of Department	Principal
Curriculum Development	Curriculum Development Cell	Department of Information Technology	
Department of Information Technology			

Programme : Diploma in CO/IT												
Course Code: SC23103					Course Title: APPLIED PHYSICS							
Compulsory / Optional: Compulsory												
Teaching Scheme and Credits						Examination Scheme						
CL	TL	LL	SLH	NLH	Credits	FA-TH		SA-TH (2:30Hrs.)	FA-PR	SA		SLA	Total
										PR	OR		
3	-	2	1	6	3	20	20	60	25	25#	-	25	175

Total IKS Hrs. for course: 2hrs.

Abbreviations: CL- Class Room Learning, TL- Tutorial Learning, LL- Laboratory Learning, SLH-Self Learning Hours, NLH-Notional Learning Hours, FA - Formative Assessment, SA -Summative assessment, SLA- Self Learning Assessment

Legends: @ Internal Assessment, # External Assessment, *# On Line Examination, @$ Internal Online Examination

Note:
1. FA-TH represents an average of two class tests of 20 marks each conducted during the term.
2. SA-TH represents the end term examination.
3. FA-PR represents the term work
4. SA-PR represents the end term practical examination.

I.Rationale:

The subject is included under the category of science. The special feature of the subject is to develop the laboratory skill using principles of scientific phenomenon. This course will serve to satisfy the need of the technical students for their development in technical field. The course is designed by selecting thetopics which will develop intellectual skills of the students and will guide students to solve broad based engineering problems. Ultimately the focus of the course is to develop psychomotor skills in the students.

II. Industry / Employer Expected Outcome

Physics is a fundamental science that plays a crucial role in various industries and has numerous outcomes that benefit society: Apply principles of physics to solve broad based relevant engineering problems.

III. Course Outcomes: Students will be able to achieve & demonstrate the following COs on completion of course based learning.

CO1	Classify the different physical quantities, identify the proper unit of it and to estimate error in the measurement of physical quantities.
CO2	Apply laws of motion in various engineering applications.
CO3	Analyze the concept of electric field in Engineering technology.
CO4	Apply knowledge of electricity and magnetism to explain natural physical processes and related technological advances.
CO5	Identify properties and application of light in Engineering field.

IV.Course Content Details:

Unit No.	Theory Learning Outcomes (TLO's)aligned to CO's	Topics / Sub-topics
1	**TLO 1a.** Explain physical quantities and its types with examples. **TLO 1b.** Differentiate between scalar and vector quantities with examples. **TLO 1c**. Apply dimensional analysis to check correctness of equation and conversion of units in different systems. **TLO 1d.** Estimate the errors in the measurement for the give problem. **TLO 1e.** Explain the working of ancient astronomical instruments to measure distance, time and hour angle	**Units and Measurements** 1.1 Fundamental Physical quantities, examples. 1.2 Derived physical quantities, examples. 1.3 Scalar and Vector Physical Quantities. 1.4 Definition and requirements of unit 1.5 System of units, C. G. S., M. K. S. and S. I. units. 1.6 Dimensions, dimensional formula 1.7 `Rules to write the unit and conventions of units and Significant figures, rules to write significant figures 1.8 Error – Definition, types of errors and estimation of errors. 1.9 Ancient astronomical instruments: Chakra, Dhanyata , Yasti and Phalak yantra,Numerical **Course Outcome: CO1** **Teaching Hours :5 hrs.** **Marks: 8**
2	**TLO2a.** Differentiate between velocity and speed. Identify changes in motion that produce acceleration. Able to calculate speed, velocity and acceleration of an object, analytically, Classify acceleration as positive, negative, and zero. **TLO2b.** Identify different periodic motion with examples such as oscillatory motion, Vibratory motion, circular motion. **TLO2c**. Explain angular motion with equation of angular motion, explain relation between linear velocity and angular Velocity, understand the concept of centripetal and centrifugal force **TLO2d.** Describe real-life situations that illustrate each of	**Motions** 2.1 **Linear motion** –Definition – distance, displacement, velocity, acceleration, retardation, equation of motions, acceleration due to gravity and equation motion under gravity, numerical 2.2 **Periodic motions:** a) Oscillatory motion, b) Vibratory motion, c) S.H.M. d) Circular motion. (only definition and examples) , terms related to S.H.M. : Definition: Time period,frequency, amplitude, wavelength, and phase 2.3 **Angular motion:** a) Definition: angular motion, Uniform circular motion, Radius vector,linear velocity, Angular velocity, Angular acceleration, b) Relation between linear velocity and angular

	Newton's laws of motion. **TLO2e.** Explain the ancient theory of gravitation and laws of motion.	Velocity(derivation), Radial or centripetal acceleration, Three equations of motion (no derivations), Centripetal and Centrifugal force,examples and applications. 2.4. Laws of Motion and it's applications. 2.5. Ancient theory of Gravitation and laws of motion, Numerical. **Course Outcome: CO2** **Teaching Hours :14hrs** **Marks: 16**
3	**TLO3a**.Explain the concept of charge, electric field, potential and potential difference, absolute electric potential **TLO3b.** Calculate force between two charges using Coulomb's law. **TLO3C**. Illustrate different properties of lines of force **TLO3d.** Determine electric intensity, potential due a Charge. **TLO 3e.** Explain the relation between electric flux and electric flux density	**Electrostatics** 3.1 Definition of charge 3.2 Coulomb's law, Definition of electric field, 3.3Definition and unit of electric field intensity(E) (No Derivation) 3.4 Definition and properties of electric lines of force 3.5 Definition of electric flux and electric flux density 3.6 Electric Potential (No Derivation) 3.7 Definition & Explanation of Electric Potential 3.8 Definition & Explanation of absolute Electric Potential, Numerical. **Course Outcome: CO3** **Teaching Hours :6hrs** **Marks: 10**
4	**TLO 4a**. Explain electric field, potential and potential difference, Ohm's law **TLO 4b.** Explain resistance, Specific resistance **TLO 4c.** Apply laws of series and parallel combination to the given electrical circuits. **TLO4d. Ob**tain the balancing condition of Wheatstone's network **TLO 4e.** Explain the Magnetic effect of current, magnetic induction. **TLO 4f.** Apply Fleming left hand rule, Fleming right hand rule	**4 Electricity and Electromagnetism** 4.1.1 Ohm's Law, Statement and mathematical expression 4.2 Resistance &unit of its, Specific resistance, unit of specific resistance. 4.3 Resistance in series and parallel combination, shunt Resistance 4.4 Wheatstone network, balancing condition for it **4.2 Electromagnetism** 4.2.1 Magnetic effect of current, magnetic induction 4.2.2Properties of magnetic lines of force, 4.2.3Laplace's law, Fleming left hand rule, Fleming right hand rule, Numerical **Course Outcome: CO4** **Teaching Hours :12hrs** **Marks: 14**

5	**TLO 5a.** Explain refraction and reflection of light. **TLO 5b.** Explain refraction of lit through prism. **TLO 5c.** Estimate refractive index of material of prism. **TLO 5d.** Derive Prism Formula. **TLO 5e.** Explain the phenomenon of total internal reflection. **TLO 5f.** Describe the workings and uses of fibre optics.	**5 Optics and Optical Fiber** 5.1 Optics 5.1.1 Revision of reflection and refraction of light. 5.1.2 Laws of refraction, Snell's law. 5.1.3 Prism formula (derivation), Numerical. **5.2 Optical Fibers:** 5.2.1 Principle of propagation of light through optical fiber. 5.2.2 Structure of Optical fiber. 5.2.3 Applications (electronics and medical) and comparison with electrical cable for communication. **Course Outcome: CO5** **Teaching Hours :8hrs** **Marks: 12**

V.Laboratory Learning Outcome and Aligned Practical / Tutorial Experiences.

Sr No	Practical / Tutorial / Laboratory Learning Outcome (LLO)	Laboratory Experiment / Practical Titles / Tutorial Titles	Number of hrs.	Relevant COs
1	**LLO a.** Use of measuring instruments **LLO b.** Find the least count and range of the instruments. **LLO c.** Interpretation of graph and use of scientific calculator.	To know your Physics laboratory and Use of Scientific Calculator	2	CO1
2	**LLO a.** Use Vernier caliper to Measure dimensions of given objects. Measure the dimensions of objects of known dimensions. **LLO b.** Estimate the errors in measurement.	To measure the dimensions of given objects and to determine their volume using Vernier caliper	2	CO1
3	**LLO a.** Identify types of motion **LLO b.** Determine the value of acceleration due to gravity.	To determine Acceleration due to gravity by simple pendulum	2	CO2
4	**LLO a.** Calculate permittivity of free space.	To determine permittivity of free space.	2	CO3
5	**LLO a.** Apply Ohm's law to solve circuit problems.	To verify Ohm's Law.	2	CO4
6	**LLO a.** Explain refraction of light. **LLO b.** Determine refractive index of a given prism	To find refractive index of a given prism by using pin method.	2	CO5

7	**LLO a.** Use Micrometer Screw gauge to: Measure dimensions of given objects. Measure the dimensions of objects of known dimensions. **LLO b.** Estimate the errors in measurement.	To measure the dimensions of given objects and to determine their Volume using micrometer screw gauge..	2	CO1
8	**LLO a.** Identify type of motion **LLO b.** Calculate the stiffness constant	To determine stiffness constant by using helical spring.	2	CO2
9	**LLO a.** Verify principle of potentiometer	To verify principle of potentiometer.	2	CO3
10	**LLO a.** Obtain the balancing condition of Wheatstone's network	To find unknown resistance by using Wheatstone's Bridge.	2	CO4
11	**LLO a.** Use magnetic compass to draw the magnetic lines of forces of magnet of different shapes and determine neutral points.	Determination of neutral points by magnetic compass.	2	CO5
12	**LLO a.** Verify law of series connection of resistors.	To find resultant resistance when resistances are connected in series and parallel.	2	CO4
13	**LLO a.** Determine the specific resistance of given wire.	Determination of specific resistance of given wire.	2	CO4
14	**LLO a.** Study the properties of light TIR **LLO b.** Determine the critical angle	To study total internal reflection and to determine the critical angle.	2	CO5
15	**LLO a.** Define unit and classify into different types of units	Showing Video on different applications related to units,	2	CO1

Note: 10 to 12 experiments should be performed in a term for completion of TW.

VI. Suggested Micro Project / Assignment/ Activities for Specific Learning / Skills Development (Self Learning): (Minimum 10 Assignments)

1. Convert the units of a given physical quantity from one system of units to another
2. Measure room temperature of hot baths / bodies by using mercury thermometer and convert it into different units.
3. Prepare a chart to summarize units and measurements.
4. Use a digital vernier calliper and micrometre screw gauge for measurements. (Lab- based).
5. Make a paper scale of least count e.g. 0.01 cm, 0.2cm, 0.5cm.
6. What is the difference between speed and velocity?
7. What is motion? Describe Straight line motion.
8. Explain Average speed and Average velocity.

9.Write in detail about your experience of various, types of motion while riding a bicycle on a road.

10.Identify the types of motion.

(a) Movement of the earth around the sun: ..... .
(b) Movement of a ceiling fan: .....
(c) A meteor falling from the sky: ..... .
(d) A rocket launched from the ground: .....
(e) A fish swimming in water: .....
f) The plucked string of a sitar: ...

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11. Sketch the electric lines of force for two- point charges q1 and q2 (q1 > q2) separated by a distance d.

12. What kind of charges are produced on each, when (i) a glass rod is rubbed with silk and (ii) an ebonite rod is rubbed with wool?

13. How the mass of a body is affected on charging?

14. Find the Answer:

S. No.	V (Volt)	I + (Ampere)	R (Ω)
1.	?	0.75	80
2	220	?	400
3	60	4	?
4	220	?	100
5	300	5	?

15. An electric motor takes 5A from an source of 220v . Determine the power of the motor and energy consumed in 2 hrs.

16. What are the advantages of connecting electrical devices in parallel with the battery instead of connecting them in series?

17.Prepare a simulation on Ohm's law.

18. Prepare a simulation on Fleming's left- hand right-hand rule

19.Solve 5 problems on law of resistances in series and parallel.

20. To demonstrate T.I.R and working of optical fiber.

VII. Specification Table:

Unit No	Topic Title	Distribution of Theory Marks			
		R Level	U Level	A Level	Total Marks
1	Unit and Measurements	2	4	2	8
2	Motions	4	4	8	16
3	Electrostatics	2	4	4	10
4	Electricity and Electromagnetism	4	4	6	14
5	Optics and Optical Fibers	2	4	6	12
	Total	**14**	**20**	**26**	**60**

VII.Assessment Methodologies/Tools

Formative assessment (Assessment for Learning)

Rubrics for continuous assessment based on process and product related performance indicators(25marks)
Summative Assessment (Assessment of Learning)

- End term examination, Viva-voce, Workshop performance (25 marks)

VIII.Suggested COs - POs Matrix Form(Computer Engineering)

Course Outcomes (COs)	Programme Outcomes (POs)							Programme Specific Outcomes (PSOs)		
	PO-1 Basic and Discipline Specific Knowledge	PO-2 Problem Analysis	PO-3 Design/ Development of Solutions	PO-4 Engineering Tools	PO-5 Engineering Practices for Society, Sustainability and Environment	PO-6 Project Management	PO-7 Life Long Learning	PSO - 1	PSO-2	PSO-3
CO1	3			2			2	1	2	
CO2	3						1	1		
CO3	3				1		2	1	2	
CO4	3			2	1		2	1	1	
CO5	3			2			2	1	2	

Legends: - High:03, Medium:02, Low:01, No Mapping: --

VIII.Suggested COs - POs Matrix Form(Information Technology)

Course Outcomes (COs)	Programme Outcomes (POs)							Programme Specific Outcomes (PSOs)		
	PO-1 Basic and Discipline Specific Knowledge	PO-2 Problem Analysis	PO-3 Design / Development of Solutions	PO-4 Engineering Tools	PO-5 Engineering Practices for Society, Sustainability and Environment	PO-6 Project Management	PO-7 Life Long Learning	PSO - 1	PSO- 2	PSO-3
CO1	3			2			2	1	2	
CO2	3						1	1		
CO3	3				1		2	1	2	
CO4	3			2	1		2	1	1	
CO5	3			2			2	1	2	

Legends: - High:03, Medium:02, Low:01, No Mapping: --

IX.Learning Materials / Books

Sr.No.	Author		Publisher
1	R K Gaur &; S L Gupta	Engineering Physics	Dhanpati Rai Pub.
2	Prof. Arthur Beiser	Applied Physics	Tata McGraw hill Pub.
3	D K Bhattacharya	Engineering Physics	Oxford University press
4	NCERT / MSBSHSE	Physics 1 & 2	NCERT/MSBSHSE
5	Halliday &Resnick Wiley	`Physics Vol 1 & 2	Wiley India
6	Brijlal& Subrahmanyam	Principle of physics	S. CHAND & COMPANY
7	R K Gaur & S L Gupta.	Engineering Physics	Dhanpati Rai Pub.

X. Learning Websites & Portals

Sr. No	Link / Portal	Description
1	https://sunitathorat1310.wixsite.com/website-1	Unit and measurement, Motion, Electrostatics, Electricity and Electromagnetism , Optics and Optical fiber,
2	www.physicsclassroom.com	Concept of basic physics
3	www.physics.org	Concept of basic physics
4	www.physics.brown.edu	Concept of basic physics
5	www.amazon.com/Basic-Physics	Concept of basic physics
6	http: //scienceworld.wolfram.com/physics/	Concept of basic physics
7	http: //en.wikipedia.org/wiki	Concept of basic physics
8	http: //hyperphysics.phy-astr.gsu.edu/hbase	Concept of basic physics
9	www.msu.edu/~brechtjo/physics	Concept of basic physics
10	www.answers.com/topic/list-of-basic-physics-topics	Concept of basic physics
11	www.answers.com/topic	Unit and Measurements. Motion, Electrostatics, Electricity and Electromagnetism. Optics and Optical fiber,
12	www.vlab.amrita.edu	All Experiments video
13	www.olabs.edu.in	All Experiments video
14	https: //praxilabs.com/en/	All Experiments video
15	www.phet.colorado.edu	Simulation of Topics

XI. Academic Consultation Committee/Industry Consultation Committee:

Sr. No	Name	Designation	Institute/Organization
1	Mr.Y.A. Mahajan	Selection grade Lecturer in physics	Bhausaheb Vartak Polytechnic, Vasai
2	Mr. S.S. Salve	Senior Lecturer in physics	S.B.M. Polytechnic, Vile -Parle
3	Mrs.B.J. Chaudhari	Lecturer in physics	Government Polytechnic, Thane
4	Mrs. S.A. Thorat	Lecturer in physics	Government Polytechnic, Mumbai

S.A. Thorat

Coordinator
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S.A. Thorat

Head of Departments
Department of Science & Humanities

I/C, Curriculum Development Cell

Principal

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	Programme : Diploma in EE / EC / IS / CE / ME / CO / IF/AI & ML / RT		
Course Code:SC23501		Course Title :BASIC MATHEMATICS	
	Compulsory / Optional: Compulsory		

Teaching Scheme and Credits						Examination Scheme							
CL	TL	LL	SLH	NLH	Credits	FA-TH		SA-TH (2H 30min.)	FA-PR	SA		SLA	Total
										PR	OR		
4	2	--	2	8	4	20	20	60	25	--	--	25	150

Total IKS Hrs. for course: 06 Hrs

Abbreviations: CL- ClassRoom Learning, TL- Tutorial Learning, LL- Laboratory Learning, SLH-Self Learning Hours, NLH-Notional Learning Hours, FA - Formative Assessment, SA -Summative assessment, SLA- Self Learning Assessment

Legends: @ Internal Assessment, # External Assessment, *# On Line Examination, @$ Internal Online Examination

Note:

1. FA-TH represents Total of two class tests of 20 marks each conducted during the term.
2. FA-PR represents Tutorial Term work of 25 Marks
3. SLA represents self learning Assessment of 25 Marks
4. SA-TH represents the end term examination of 60 Marks

I. Rationale

Basic Mathematics plays a crucial role in diploma programmes as it fosters the development of critical thinking skills, enhances quantitative literacy, prepares students for higher education, promotes problem-solving abilities, cultivates logical and abstract thinking and fosters mathematical literacy. By engaging with Mathematics, students acquire logical reasoning, problem-solving techniques and analytical thinking, which are valuable for lifelong learning and professional growth. Calculus is a branch of Mathematics thatcalculates how matter, particles and heavenly bodies actually move. Derivatives are useful to find maxima and minima of the function, velocity and acceleration are also useful for many engineering optimization problems. Statistics can be defined as a type of mathematical analysis which involves the method of collecting and analyzing data and then summing up the data into a numerical form for a given set of factual data or real-world observations. It equips individuals with the ability to interpret numerical information, make informed decisions and navigate real-world situations. Moreover, Mathematics provides a foundation for further studies in various disciplines and prepares students to tackle complex challenges. By exploring abstract concepts and logical structures, students develop their ability to reason, make connections, and approach problems with clarity and precision. Furthermore, studying Mathematics helps students appreciate the historical and cultural significance of Mathematics and its applications in diverse fields, thereby fostering mathematical literacy and a deeper understanding of the world. Hence the course provides the insight to analyze engineering problems scientifically using logarithms, matrices, trigonometry, straight line, differential calculus and statistics. By incorporating these topics, students comprehend to approach engineering problems from a mathematical perspective, enabling them to devise efficient and effective solutions and this leads to preparing Diploma graduates well-rounded, adaptable and capable of making significant contributions to the branch-specific problems.

ndustry / Employer Expected Outcome

ly the concept of Mathematics to solve industry-based technology problems.

1. Course Outcomes: Students will be able to achieve & demonstrate the following COs on completion of course based learning.

CO1	Apply the concepts of algebra to solve engineering (discipline) related problems.
CO2	Utilize trigonometry to solve branch specific engineering problems.
CO3	Solve area specific engineering problems under given conditions of straight lines.
CO4	Apply differential calculus to solve discipline specific problems.
CO5	Use techniques and methods of statistics to crack discipline specific problems.

Course Content Details:

Unit No.	Theory Learning Outcomes (TLO's)aligned to CO's.	Topics / Sub-topics
1	TLO 1.1 Solve the given simple problem based on laws of logarithm. TLO 1.2 Solve given system of linear equations using matrix inversion method. TLO 1.3 Obtain the proper and improper partial fraction for the given simple rational function. TLO 1.4 Solve simultaneous equations by using concept given in Ancient Indian Mathematics	**Unit - I Algebra** 1.1 Logarithm: Concept and laws of logarithm. 1.2 Matrices: Matrices, algebra of matrices, transpose, value of determinant of matrix of order 3x3, adjoint and inverse of matrices. 1.3 Matrices: Solution of simultaneous equations by matrix inversion method. 1.4 Partial Fractions: Types of partial fraction based onnature of factors and related Problems. 1.5 Algebra in Indian Knowledge System: Solution ofsimultaneous equations (Indian Mathematics)..
	Course Outcome : CO1 **Teaching Hours :12 hrs** **Marks: 12**	
2	TLO 2.1 Apply the concept of Compound angle, allied angle and multiple angles to solve the given simple engineering problem(s). TLO 2.2 Apply the concept of Sub- multiple angle to solve the given simple engineering related problem(s). TLO 2.3 Apply concept of factorization and de-factorization formulae to solve the given simple engineering problem(s). TLO 2.4 Investigate given simple problems by utilizing inverse trigonometric ratios. TLO 2.5 Use concept given in Ancient Indian Mathematics for trigonometry to solve given problems.	**Unit - II Trigonometry** 2.1 Trigonometric ratios of allied angles, compound angles, multiple angles (2A, 3A), submultiples angles.(without proof) 2.2 Factorization and De factorization formulae.(without proof). 2.3 Inverse Trigonometric Ratios and relatedproblems. 2.4 Principle values and relation between trigonometric and inverse trigonometric ratios. 2.5 Trigonometry in Indian Knowledge System: TheEvolution of Sine Function in India. 2.6 Indian Trigonometry: Basic Indian Trigonometry-Introduction and Terminology (From Ancient Beginnings to Nilakantha). 2.7 Trigonometry in Indian Knowledge System:Pythagorean triples in Sulabasutras.
	Course Outcome : CO2 **Teaching Hours :16 hrs** **Marks: 12**	
3	TLO 3.1 Calculate angle between given two straight lines. TLO 3.2 Formulate equation of straight lines related to given engineering problems. TLO 3.3 Identify perpendicular distance from the given point to the line. TLO 3.4 Calculate perpendicular distance between the given two parallel lines. TLO 3.5 Use geometry given in Sulabasutras to	**Unit - III Straight Line** 3.1 Straight line and slope of straight line: Angle between two lines, Condition of parallel and perpendicular lines. 3.2 Various forms of straight lines: Slope point form, two-point form, Double intercept form, General form. 3.3 Perpendicular distance from a point on the line. 3.4 Perpendicular distance between two parallel lines. 3.5 Geometry in Sulabasutras in Indian Knowledge System (construction of square, circling the square).

	solve the given problems.	(Indian Mathematics).
	Course Outcome : CO3 **Teaching Hours :6 hrs** **Marks: 06**	
4	TLO 4.1 Solve the given simple problems based on functions. TLO 4.2 Solve the given simple problems based on rules of differentiation. TLO 4.3 Obtain the derivatives of composite, implicit, parametric, inverse, logarithmic, exponential functions. TLO 4.4 Apply the concept of differentiation to find given equation of tangent and normal. TLO 4.5 Apply the concept of differentiation to calculate maxima, minima and radius of curvature for given function. TLO 4.6 Familiar with concept of calculus givenin Indian Mathematics.	**Unit - IV Differential Calculus** 4.1 Functions and Limits: Concept of function andsimple examples. 4.2 Functions and Limits: Concept of limits withoutexamples. 4.3 Derivatives: Rules of derivatives such as sum,Product, Quotient of functions. 4.4 Derivatives: Derivative of composite functions(chain Rule), implicit and parametric functions. 4.5 Derivatives: Derivatives of inverse, logarithmicand exponential functions. 4.6 Applications of derivative: Second order derivativewithout examples, Equation of tangent and normal, Maxima and minima, Radius of curvature. 4.7 Calculus in Indian Knowledge System: The Discovery of Calculus by Indian Astronomers.(IndianMathematics).
	Course Outcome : CO4 **Teaching Hours :16 hrs** **Marks: 18**	
5	TLO 5.1 Obtain the range and coefficient of range of the given grouped and ungrouped data. TLO 5.2 Calculate mean and standard deviation of ungrouped and grouped data related to the given simple engineering problem(s). TLO 5.3 Determine the variance and coefficient of variance of given grouped and ungrouped data. TLO 5.4 Justify the consistency of given simple sets of data.	**Unit - V Statistics** 5.1 Range, coefficient of range of discrete and grouped data. 5.2 Mean deviation and standard deviation from meanof grouped and ungrouped data. 5.3Variance and coefficient of variance. 5.4 Comparison of two sets of observation.
	Course Outcome : CO5 **Teaching Hours :10 hrs** **Marks: 12**	

IV. Laboratory Learning Outcome and Aligned Practical / Tutorial Experiences.

Practical / Tutorial / Laboratory Learning Outcome (LLO)	Sr No	Laboratory Experiment / Practical Titles / Tutorial Titles	Number of hrs.	Relevant COs
LLO 1.1 Solve simple problems of Logarithmsbased on given applications.	1	Solve simple problems of Logarithms based on givenapplications.	2	CO1
LLO 2.1 Solve elementary problems on Algebraof matrices for branch specific engineering related applications.	2	Solve elementary problems on Algebra of matrices forbranch specific engineering related applications.	2	CO1
LLO 3.1 Apply the concept of matrix to solveengineering problems.	3	Solve solution of Simultaneous Equation usinginversion method.	2	CO1
LLO 4.1 Apply the concept of matrix to solveengineering problems.	4	Apply Matrix Inversion method to determine currents through various branches of given electrical networks.	2	CO1
LLO 5.1 Apply the concept of matrix to solveengineering problems.	5	Determine inverse of a non-singular matrix by usingopen source software.	2	CO1
LLO 6.1 Apply the concept of partial fraction tosolve engineering problems.	6	Resolve into partial fraction using linear non-repeated,repeated, and irreducible quadratic factors.	2	CO1
LLO 7.1 Solve problems on Compound, Allied,multiple and sub multiple angles for related shapes.	7	Solve problems on Compound, Allied, multiple and submultiple angles for related shapes.	2	CO2
LLO 8.1 Utilize the concept of trigonometry tosolve engineering problems.	8	Practice problems on factorization and de factorization.	2	CO2
LLO 9.1 Utilize the concept of trigonometry tosolve engineering problems.	9	Solve problems on inverse trigonometric ratios basedon applications.	2	CO2

LLO 10.1 Solve branch specific engineeringproblems under given conditions of straight lines.	10	Practice problems on equation of straight lines usingdifferent forms.	2	CO3
LLO 11.1 Solve branch specific engineering problems under given conditions of straight lines.	11	Solve problems on perpendicular distance, distance between two parallel lines and angle between two lines.	2	CO3
LLO 12.1 Solve branch specific engineeringproblems under given conditions of straight lines.	12	Use given form of straight line to calculate the speed,distance and time of moving object.	2	CO3
LLO 13.1 Apply the concept of derivative tosolve engineering problems.	13	Solve problems to find derivatives of implicit functionand parametric function.	2	CO4
LLO 14.1 Apply the concept of derivative tosolve engineering problems.	14	Solve problems to find derivative of logarithmic andexponential functions for engineering applications.	2	CO4
LLO 15.1 Apply the concept of equation oftangent and normal to solve engineering problems.	15	Solve problems based on finding equation of tangentand normal for engineering applications.	2	CO4
LLO 16.1 Apply the concept of maxima,minima and radius of curvature to solve engineering problems.	16	Solve problems based on finding maxima, minima offunction and radius of curvature at a given point for engineering applications.	2	CO4
LLO 17.1 Apply the concept of equation oftangent and normal to solve engineering problems.	17	Use the concept of tangent and normal to solve thegiven problem of Engineering Drawing.	2	CO4
LLO 18.1 Apply the concept of Maxima andMinima to solve engineering problems.	18	Use the concept of Maxima and Minima to obtainoptimum value for given engineering problem.	2	CO4
LLO 19.1 Apply the concept of radius ofcurvature to solve engineering problems.	19	Use the concept of radius of curvature to solve givenbranch specific engineering problem.	2	CO4
LLO 20.1 Utilize the concept of derivative tosolve engineering problems.	20	Use the concept of derivative to find the slope of abending curve for given engineering problem.	2	CO4
LLO 21.1 Use concept of range and mean deviation to crack branch specific problems.	21	Solve problems on finding range, coefficient of rangeand mean deviation for given applications.	2	CO5
LLO 22.1 Use concept of standard deviation andcoefficient of variance to crack branch specific problems.	22	Solve problems on standard deviation, coefficient ofvariation and comparison of two sets.	2	CO5
LLO 23.1 Use concept of standard deviation tocrack branch specific problems.	23	Calculate the Standard Deviation for Concrete with thegiven data for given engineering applications.	2	CO5

Note: 1. Take any 10-12 tutorials out of 23 and ensured that all the units are covered. 2. Take tutorial in the batch size of 20 to 30 students. 3. Give students at least 10 problems to solve in each tutorial.

Suggested Micro Project / Assignment/ Activities for Specific Learning / Skills Development (Self Learning):

- Collect examples based on real world applications of logarithm and prepare a pdf file.
- Solve the simultaneous system of equation in two variables by Matrix Inversion Method. Write down a Mathematical programmingusing any open source software to verify the result.
- Collect an examples on coding theory using applications of matrices and prepare a pdf file.
- Represent the Graph of Trigonometric function, Logarithmic function on Geogebra and interpret the nature of graph and Make a pdffile.
- Measure height of trees in surrounding locations using trigonometry and prepare presentation.
- Find the derivative of y= x^sinx and visualize the graph of the function and its derivative using any open source software geometrically.
- Find height of room or distance between two pillars by using concept of

straight line.
Collect at least 10 examples based on real world applications of standard deviation/variance.
- Collect at least 10 examples based on real world uses of applications of derivative.
- Attempt any 5-7 Assignment, out of the given list.

V. Specification Table:

Unit No	Topic Title	Distribution of Theory Marks			
		R Level	U Level	A Level	Total Marks
1	Algebra	2	4	6	12
2	Trigonometry	2	4	6	12
3	Straight Line	2	2	2	6
4	Differential Calculus	2	8	8	18
5	Statistics	2	4	6	12
	Total	**10**	**22**	**28**	**60**

VI. Assessment Methodologies/Tools

Formative assessment (Assessment for Learning)

- TH- Progressive /Periodic Test test each of 20 Marks
- TL - Continuous Assessment of Tutorials for 25 Marks
- SL - Continuous Assessment of Self Learning for 25 Marks

Summative Assessment (Assessment of Learning)

- **TH -** Term End examination of 60 Marks

Course Outcomes (COs)	Programme Outcomes (POs)							Programme Specific Outcomes (PSOs)		
	PO-1 Basic and Discipline Specific Knowledge	PO-2 Problem Analysis	PO-3 Design/ Development of Solutions	PO-4 Engineering Tools	PO-5 Engineering Practices for Society, Sustainability and Environment	PO-6 Project Management	PO-7 Life Long Learning	PSO-1	PSO-2	PSO-3
CO1	3	1	--	1	--	1	1			
CO2	3	1	--	--	1	1	1			
CO3	3	--	--	--	--	--	--			
CO4	3	1	1	1	--	1	--			
CO5	3	2	1	1	1	1	1			

Legends: - High:03, Medium:02, Low:01, No Mapping: --

VII. Suggested Learning Materials / Books

Sr.No	Author	Title	Publisher
1	Grewal B. S.	Higher Engineering Mathematics	Khanna publication New Delhi , 2013 ISBN:8174091955
2	Dutta. D	A text book of Engineering Mathematics	New age publication New Delhi, 2006 ISBN: 978-81-224-1689-3
3	Kreysizg, Ervin	Advance Engineering Mathematics	Wiley publication New Delhi 2016 ISBN: 978-81-265-5423-2
4	Das H.K.	Advance Engineering Mathematics	S Chand publication New Delhi 2008 ISBN:9788121903455
5	Marvin L. Bittinger David J. Ellenbogen Scott A. Surgent	Calculus and Its Applications	Addison-Wesley 10th Edition ISBN-13: 978-0-321-69433-1
6	C. S. Seshadri	Studies in the History of Indian Mathematics	Hindustan Book Agency, New Delhi 110016. ISBN978-93-80250-06-9
7	George Gheverghese Joseph	Indian Mathematics Engaging with the World from Ancient to Modern Times	World Scientific Publishing Europe Ltd. 57 ISBN978-17-86340-61-0
8	Deepak Singh	Mathematics-I	Khanna Book Publishing Co. (P) Ltd. ISBN: 978-93-91505-42-4
9	Garima Singh	Mathematics-II	Khanna Book Publishing Co. (P) Ltd. ISBN: 978-93-91505-52-3
10	Gareth James, Daniela Witten, Trevor Hastie Robert and Tibshirani	An Introduction to Statistical Learning with Applications in R	Springer New York Heidelberg Dordrecht London ISBN 978-1-4614-7137-0 ISBN 978-1-4614-7138-7 (eBook)
11	Gunakar Muley	Sansar Ke Mahan Ganitagya	First Edition, Rajkamal Prakashan, ISBN-10.8126703571, ISBN-13. 978-8126703579.
12	T.S. Bhanumurthy	A Modern introduction to Ancient Indian Mathematics	New Age International Private Limited, 1 January2008 ISBN- 10. 812242600X, ISBN-13. 978-8122426007
13	M.P. Trivedi and P.Y. Trivedi	Consider Dimension and Replace Pi	Notion Press; 1st edition (2018), ISBN-978-1644291795

VIII. Learning Websites & Portals

Sr.No	Link /Portal	Description
1	http://nptel.ac.in/courses/106102064/1	Online Learning Initiatives by IITs and IISc
2	www.scilab.org/ -SCI Lab	Signal processing, statistical analysis, imageenhancement.
3	www.mathworks.com/product/matlab/ -MATLAB	Applications of concepts of Mathematics tocoding.
4	Spreadsheet Applications	Use of Microsoft Excel, Apple Numbers, GoogleSheets.
5	https://ocw.mit.edu/	MIT Course ware
6	https://www.khanacademy.org/math?gclid=CNqHuabCys4CFdOJaddHoPig	Concept of Mathematics through video lecturesand notes
7	http://ocw.abu.edu.ng/courses/mathematics/	List of Mathematical Courses.

	https://libguides.furman.edu/oer/subject/mathematics	Open Education Resources (OER) inMathematics.
9	https://phet.colorado.edu/en/simulations/filter?subjects=math&type=html,prototype	Phet Simulation for Mathematics.
10	https://libguides.cmich.edu/OER/mathematics	Mathematics with OER.

IX.Academic Consultation Committee/Industry Consultation Committee:

Sr. No	Name	Designation	Institute/Organization
1	Mrs.Sanchita Datta	Lecturer in Mathematics (Selection Grade)	St.Xavier's Institute of Technology,Mahim
2	Mr.Abhijit Sadashiv Patil	Lecturer in Mathematics	Government Polytechnic,Mumbai
3	Mr.Vinod Shantaram Patil	Lecturer in Mathematics	Government Polytechnic,Mumbai

Coordinator,
Curriculum Development,
Department of _____ Engineering

Head of Department
Department of Science & Humanities

I/C, Curriculum Development Cell

Principal

APPROVED COPY
CDC Co-ordinator
G. P. Mumbai

Programme : Diploma in Computer Engineering and Information Technology (Sandwich Pattern)												
Course Code:CO23501					Course Title : Basics of Electrical & Electronics Engineering							
Compulsory / Optional: Compulsory												
Teaching Scheme and Credits						Examination Scheme						
CL	TL	LL	SLH	NLH	Credits	FA-TH	SA-TH	FA-PR	SA		SLA	Total
									PR	OR		
02		02	02	06	03	--	--	25	50@		25	100

Total IKS Hrs. for course:

Abbreviations: CL- ClassRoom Learning, TL- Tutorial Learning, LL- Laboratory Learning, SLH-Self Learning Hours, NLH-Notional Learning Hours, FA - Formative Assessment, SA -Summative assessment, SLA- Self Learning Assessment

Legends: @ Internal Assessment, # External Assessment, *# on Line Examination, @$ Internal Online Examination

Note:
1. FA-TH represents a two class tests of 20 marks each conducted during the term.
2. SA-TH represents the end term examination.

I. Rationale

The foundation for working of computer and its peripherals are based on electronics. Circuits used in computer and its peripherals utilize electrical energy for their operations. The course has been designed to give fundamental knowledge of electrical and electronics circuits. It will develop skills in students to understand simple electrical and electronic components and circuits, so that they will be able to handle computer hardware and its peripherals.

II. Industry / Employer Expected Outcome

1. Apply electrical and electronics fundamentals.

II. Course Outcomes: Students will be able to achieve & demonstrate the following COs on completion of course based learning

CO1	Represent different number system.
CO2	Explain fundamentals of alternating quantities and its behavior with resistive, inductiveand capacitive circuits.
CO3	Apply AC and DC circuit's fundamental.
CO4	Design and experiment with various application circuits using diodes and transistors.
CO5	Explain the working and Use of various semiconductor devices.

Course Content Details:

Unit No.	Theory Learning Outcomes (TLO's)aligned to CO's.	Topics / Sub-topics
1	**TLO 1.1Describe types of signals and systems. Compare analog and digital signals, analog system and digital system.** **TLO 1.2 Understand the concept of base of number system.** **TLO 1.3 Describe Decimal number system and its conversion in other number systems.** **TLO 1.4 Describe Binary number system and its conversion in other number systems.** **TLO 1.5 Describe Octal number system and its conversion in other number systems.** **TLO 1.6 Describe Hexadecimal number system and its conversion in other number systems.** **TLO 1.7 Explain types of codes and its conversions.**	**Number Systems and codes** 1.1 Introduction to digital signal, Difference between analog signal and digital signal, Advantages of digital systems over analog systems, positive and negative logic 1.2 Concept of base of number system 1.3 Decimal number system 1.4 Binary number system, 1.5 Octal number system 1.6 Hexadecimal number system 1.7 Types of codes : BCD, Excess 3, Gray code **Course Outcome : CO1** **Teaching Hours :6hrs** **Marks: Marks: R- NA, U-NA, A-NA**
2	**TLO 2.1 Derive mathematical expression for ac quantities.** **TLO 2.2 Represent the given ac quantities with phasor diagram.** **TLO 2.3 Understand the quantities their units and derive equation for resistors in series and parallel.**	**AC fundamentals** 2.1 Alternating Current, Sinusoidal waveforms Mathematical Expression of alternating quantity. 2.2 Definition of Waveform instantaneous value, Cycle, Time period, Frequency, Amplitude, Peak value, Average value and RMS value, Form factor and Peak factor forsinusoidal wave, Phase, Phase difference, Phasor representation of sinusoidal quantities. 2.3 Electrical circuit elements: Resistors, Inductors, Capacitors.Their properties, units, symbols, Resistors in series and parallel Capacitors in series and parallel. **Course Outcome : CO2** **Teaching Hours :4hrs** **Marks: Marks: R- NA, U-NA, A-NA**

3	**TLO 3.1 Calculate the impedance, current, power factor of ac circuits.** **TLO 3.2 Represent ac quantities with phasor diagram.** **TLO 3.3 Differentiate between ac current and dc current.** **TLO 3.4Derive equation for equivalent resistors connected in series and apply voltage divider rule,** **TLO 3.5 Derive equation for equivalent resistors connected in parallel and apply current divider rule. Read the terms related the circuits and apply KCL and KVL.**	**AC and DC Circuits** 3.1 Performance of AC when it passes through Pure R, Pure L and Pure C, Concept of inductive reactance and capacitive reactance and impedance. 3.2 Circuit diagram, phasor diagram and waveform for RL, series, RC series and RLCseries circuit. Impedance and Impedance Triangle. Active power, Reactive power and apparent power, power factor. (only Definitions) 3.3 Direct current definition and waveform, Difference between AC and DC 3.4 DC series circuit: Concept, Equation for equivalent resistance connected in series,Voltage division rule, Application of series circuit. 3.5 DC Parallel circuit: Concept, Equation for equivalent resistance connected in parallel,Current division rule, Application of Parallel circuit, Series parallel circuit, Application of series parallel circuit. Definition of Circuit, Parameter, Linear circuit, Nonlinear circuit, Bilateral circuit, Unilateral circuit, Electric network, Passive-Network, Active network, Node, Branch, Loop, Mesh. Kirchhoff's current law, Kirchhoff's voltage law, signs convention. **Course Outcome : CO3** **Teaching Hours :8hrs** **Marks: Marks: R- NA, U-NA, A-NA**
4	**TLO 4.1 Understand and explain semiconductor and its types.** **TLO 4.2 Draw VI characteristics of zener diode and calculate its voltage.** **TLO 4.3 Explain working of transistors and VI characteristics in all modes. Compare BJT and FET.** **TLO 4.4 Explain working of MOSFET.**	**Semiconductor Devices** 4.1 Semiconductors: Intrinsic, Extrinsic semiconductor, P type, N type semiconductor 4.2 Semiconductor Diode: PN junction diode, Zener diode, (Symbol, working, VI characteristics, applications) Transistors: 4.3 BJT: NPN, PNP transistors (symbol, working, Active, cut off, saturation region. FET: N channel, P channel (symbol, working), Difference between BJT and FET 4.4 MOSFET (symbol, working, applications) **Course Outcome : CO4** **Teaching Hours :6hrs** **Marks: Marks: R- NA, U-NA, A-NA**

5	**TLO 5.1 Draw diagrams of all types of semiconductor devices and draw its VI characteristics.** **TLO 5.2 Describe types of Filters and rectifiers with circuit diagram.** **TLO 5.3 Explain applications of diode .Explain working of transistor as switch and amplifier.**	**Semiconductor Devices Applications** 5.1 LED, LASER diodes, 7 segment display, Photodiode, Phototransistor 5.2 Rectifiers and filters: Half Wave Rectifier, Full Wave Rectifier and Bridge rectifierwith RC, LC, II filter (Circuits, waveforms, applications, comparison, No mathematical analysis) 5.3 Diode as clipper (Circuits, waveform,working), Positive clipper, Negative clipper) ,Diode as clamper: Positive clamper, Negative clamper, Zener diode as a voltage regulator,Transistor as an amplifier Transistors as a switch. **Course Outcome : CO5** **Teaching Hours :6hrs** **Marks: Marks: R- NA, U-NA, A-NA**

IV. Laboratory Learning Outcome and Aligned Practical / Tutorial Experiences.

Sr No	Practical / Tutorial / Laboratory Learning Outcome (LLO)	Laboratory Experiment / Practical Titles / Tutorial Titles	Number of hrs.	Relevant COs
1	LLO: 1. Build a series resistive and parallel resistive circuit. 2. Measure its voltages and currents. 3. Verify voltage division and current division rule.	Measure voltages and currents in series and parallel resistive circuit and verify voltage division rule and current divisionrule.	02	CO1
2	LLO: 1. Build a KVL and KCL circuit. 2. Observe its readings. And verify laws.	Verify KCL and KVL	02	CO2
3	LLO: 1. Build a half wave rectifier. 2. Observe its input and output waveform. 3. Calculate its amplitude and frequency.	To construct and test half wave rectifier. Observe and measure input and output waveforms (Amplitude, frequency)	02	CO5
4	LLO: 1. Build a Zener voltage regulator. 2. Draw the observation table and calculate line and load regulation.	To construct and test Zener voltage regulator. Find out loadand line regulation.	02	CO4
5	LLO: 1. Build a R, L, C ac circuits. 2. Measure its phase relation between voltages and current and draw phasor diagram.	Measure the phase relation between voltage and current inpure resistive, inductive and capacitive circuit.	02	CO3

6	LLO: 1. Build a ac circuit. 2. Observe sinusoidal waveform. 3. Calculate its amplitude and frequency.	Measure amplitude, frequency of a sinusoidal waveform onoscilloscope	02	CO2
7	LLO: 1. Build a full wave rectifier. 2. Observe its input and output waveform. 3. Calculate its amplitude and frequency.	To construct and test full wave rectifier. Observe and measure input and output waveforms (Amplitude, frequency)	02	CO5
8	LLO: 1. Build a Bridge rectifier. 2. Observe its input and output waveform. 3. Calculate its amplitude and frequency.	To construct and test Bridge rectifier. Observe and measureinput and output waveforms (Amplitude, frequency)	02	CO5
9	LLO: 1. Build a transistor as a switch. 2. Observe its output and on off state.	To construct and test transistor as a switch.	02	CO5
10	LLO: 1. Build a clipper and clamper circuit. 2. Observe its input and output waveform. 3. Calculate its amplitude and frequency.	To construct and see the waveforms of any type of clipper & clamper	02	CO5
11	LLO: 1. Build a circuit according to topic. 2. Draw its circuit diagram and observe readings or show the output.	Mini Project (Electronic hobby kit)	02	All CO

Note: if any

V. Suggested Micro Project / Assignment/ Activities for Specific Learning / Skills Development (Self Learning):

1. Make a poster showing various representations of number system.
2. Make a poster showing various semiconductors devices.
3. Make a poster showing types of Rectifiers.

VI. Specification Table: NA

VII. Assessment Methodologies/Tools

Formative assessment (Assessment for Learning)

Rubrics for continuous assessment based on process and product related performance indicators(___ marks)

Summative Assessment (Assessment of Learning)

End term examination, Viva-voce, Workshop performance (__marks)

VIII. Suggested COs - POs Matrix Form

Course Outcomes (COs)	Programme Outcomes (POs) (Information Technology)							Programme Specific Outcomes (PSOs)		
	PO-1 Basic and Discipline Specific Knowledge	PO-2 Problem Analysis	PO-3 Design/ Development of Solutions	PO-4 Engineering Tools	PO-5 Engineering Practices for Society, Sustainability and Environment	PO-6 Project Management	PO-7 Life Long Learning	PSO - 1	PSO - 2	PSO - 3
CO1	1			2			1		1	
CO2	1			2			1	2		
CO3	2			2	1				2	
CO4	2			3	1		2		3	1
CO5	2			3					3	1

Legends: - High:03, Medium:02, Low:01, No Mapping: --

Course Outcomes (COs)	Programme Outcomes (POs) (Computer Engineering)							Programme Specific Outcomes (PSOs)		
	PO-1 Basic and Discipline Specific Knowledge	PO-2 Problem Analysis	PO-3 Design/ Development of Solutions	PO-4 Engineering Tools	PO-5 Engineering Practices for Society, Sustainability and Environment	PO-6 Project Management	PO-7 Life Long Learning	PSO - 1	PSO - 2	PSO - 3
CO1	1			2			1		1	
CO2	1			2			1	2	1	
CO3	2			2	1			1	2	
CO4	2			3	1		2		3	2
CO5	2			3				1	3	1

Legends: - High:03, Medium:02, Low:01, No Mapping: --

IX. Suggested Learning Materials / Books

Sr.No	Author	Title	Publisher
1	V. K. Mehta, Rohit Mehta, S.Chand, First, 1996	Principles of Electrical Engineering and Electronics	81-219-2729-3
2	B. L. Theraja, A. K. Theraja, S.Chand, First, 2006	Electrical Technology Volume I	81-219-2440-5
	B. L. Theraja, A. K. Theraja, S.Chand, First, 2006	Electrical Technology Volume IV	978-81-219-2667-6
	Hughes, Pearson, Ninth, 2005	Electrical and ElectronicTechnology	978-81-317-1468-3

X. Learning Websites & Portals

Sr.No	Link / Portal	Description
1	www.electricaltechnology.org	
2	www.electronics-tutorials.ws	
3	www.allaboutcircuits.com	
4	www.electronics.wisc-online.com	
5	www.alldatasheet.com	

XI. Academic Consultation Committee/Industry Consultation Committee:

Sr. No	Name	Designation	Institute/Organization
1	Prof.P.S.Sadafule	Lecturer In Computer Engineering	Govt Polytechnic Mumbai
2	Prof.Jijnasa Patil	Lecturer In Computer Engineering	Govt Polytechnic Mumbai

Coordinator,
Curriculum Development,
Department of Computer Engineering

Head of Department
Department of Computer Engineering

I/C, Curriculum Development Cell

APPROVED COPY
CDC Co-ordinator
G. P. Mumbai

Principal

Programme : Diploma in Information Technology(Sandwich Pattern)												
Course Code: IT23101			Course Title : Web Technology									
Compulsory / Optional: Compulsory												
Teaching Scheme and Credits						Examination Scheme						
CL	TL	LL	SLH	NLH	Credits	FA-TH	SA-TH	FA-PR	SA		SLA	Total
									PR	OR		
2	-	2	2	6	3	--	--	25	50@	--	25	100

Total IKS Hrs. for course:

Abbreviations: CL- Class Room Learning, TL- Tutorial Learning, LL- Laboratory Learning, SLH-Self Learning Hours, NLH-Notional Learning Hours, FA - Formative Assessment, SA -Summative assessment, SLA- Self Learning Assessment

Legends: @ Internal Assessment, # External Assessment, *# On Line Examination, @$ Internal Online Examination

Note:
1. FA-PR represents term work.
2. SA-TH represents the end term practical examination.

I. Rationale

The foundation for working of computer and its peripherals are based on electronics. Circuits used in computer and its peripherals utilize electrical energy for their operations. The course has been designed to give fundamental knowledge of electrical and electronics circuits. It will develop skills in students to understand simple electrical and electronic components and circuits, so that they will be able to handle computer hardware and its peripherals.

II. Industry / Employer Expected Outcome:

Students should able to build static web site.

Students will be able to develop front end dynamic website.

III. Course Outcomes: Students will be able to achieve & demonstrate the following COs on completion of course based learning

CO1	Visualize the basic concept of HTML.
CO2	Recognize the tags of HTML.
CO3	Develop Table and Frames on webpages
CO4	Develop CSS code for HTML file.
CO5	Develop a fully functioning static website with web publishing.

Course Content Details:

Unit No	Theory Learning Outcomes (TLO's)aligned to CO's	Topics / Sub-topics
1	**TLO 1.1 students will understand what is web page ,URL of website with different types of it** **TLO 1.2 students will able to understand navigation in web pages in website (Dynamic website)** **TLO 1.3 students will understand different networking terminologies with use.**	**INTRODUCTION TO WEB TECHNOLOGY-** **Careers in Web Technologies and Job Profile** **1.1 Web Site Design Principles** – How the Website Works? Five Golden rules of web designing, analyze your Audience, build a Web Site Development Team, File Names and URLs, DirectoryStructure, Diagram the Site. **1.2 Planning Site Navigation**– Creating Usable Navigation, Using Text Based Navigation, Using Graphics-Based Navigation. **1.3 Fundamental of World wide web:** World Wide Web: Introduction, Internet, Intranet, Cloud, Web Sites, web pages, URL, web servers, basic settings of web browsers history, extension, default page, default search engine, creating and retrieving bookmarks, use search engines effectively for searching the content Web Services: email, Chat, Video Conferencing, e-learning, e-shopping, e-reservation, e- Groups.Social Networking **CourseOutcome:CO1** **TeachingHours:04 Marks: R-NA, U-NA, A-NA**
2	**TLO 2.1 Understand basic structure of HTML code format.** **TLO 2.2 Understand Block level tags and HR tags.** **TLO 2.3 Use of text level tags.** **TLO 2.4 Use of different types of Lists on web page.** **TLO 2.5 Students will make two pages link with each other using anchor <a> tag.** **TLO 2.6 students can add images with different background color on web page using tags.**	**HTML4.01: INTRODUCTION TO ELEMENTS OF HTML** **2.1 Basic Structure Tags: ! DOCTYPE**, HTML, HEAD, TITLE, BODY with attributes **2.2 Block level tags and Horizontal Rules:** Headings, Paragraphs Breaks, Divisions, Cent Text, BlockQuotes, Preformatted Text, Address, HR tag. **2.3 Text level tags and Special characters:** Bold, Italic, Teletype, Underline,Strike through, Super script, Sub script , DIV tag **2.4 Working with Lists:** Ordered Lists, Unordered Lists, Definition Lists, Nested Lists. **2.5URL and Anchor tag: URL**: Types of URLs, Absolute URLs, Relative URLs. **Anchor Tag:** Linking Various Documents for internal and external links, Marquee Tag. **2.6IMAGES, COLORS AND BACKGROUNDS:** IMG tag and different Image formats, colors and backgrounds. **Course Outcome: CO2** **Teaching Hours:08 Marks: R-NA, U-NA, A-NA**
3	**TLO 3.1 Study different types of Table tags to display data in table format.**	**TABLE, FRAME AND FORMS** **3.1Working with Table:** TABLE tag with attributes, TABLE, TR, TH, TD tags, border, cell spacing, cell padding, width, align, bg color attributes.

	TLO 3.2 study to divide web page in different Frames with different orientation with different actions. **TLO 3.3 Create different types Forms using different form tags.** **TLO 3.4 Create different types of action button for form action performance.**	**3.2Working with Frame:** Types of Frames with the attributes Creating frames: FRAMESET tag– rows, cols attributes, FRAME tag–name, frame border, margin, height, margin width, src, resize, scrolling attributes. Use of NO FRAMES tag, Frame targeting. **3.3Working with forms and controls:** Creating basic form: FORM tag, action and method attributes **Form fields**: Single line text field, password field, multiple line text area, radio buttons, and check boxes. **Pull down menus**: SELECT and OPTION tags. **3.4Buttons**: submit, reset and generalized buttons **3.5 IFRAME** **Course Outcome:CO2** **Teaching Hours :06 Marks: R-NA, U-NA,A-NA**
4	**TLO 4.1 understand how to add style to web page using CSS.** **TLO 4.2 understand different CSS properties and type of CSS.** **TLO 4.3 adding different color use in css** **TLO 4.4 understanding CSS 3.0**	**CASCADING STYLE SHEETS 2.0** **4.1 Introduction to CSS 2.0** Types of Style Sheets (Inline, Internal and External) Creating Style Sheet **4.2CSS Properties** CSS Styling (Background, Text Format, Controlling Fonts) Working with block elements and objects Working with Lists and Tables CSS Id and Class Box Model (Introduction, Border properties, Padding Properties, Margin properties) **4.3 CSS Color** Creating page Layout and Site Designs. **4.4 Introduction to CSS3-NEW CSS3.0** PROPERTIES: CSS Rounded Corners, Border Images,Border Shadows, CSS Gradients, CSS Background properties, Text-Shadow Property, Text-Stroke Property **Course Outcome-CO3** **Teaching Hours– 08** **Marks : R-NA, U-NA,A-NA**
5	**TLO 5.1 Understand HTML 5 version** **TLO 5.2 study of XHLML in web page** **TLO 5.3 Difference between HTML and XHTML** **TLO 5.4 Understand concept of web server and publishing website process.**	**HTML5 & PUBLISHING AND MAINTAINING YOUR WEBSITE** **5.1 What's new in HTML5**: New Structure Tags (SECTION, NAV, ARTICLE, ASIDE, HEADER,FOOTER), New Form Tags (search, tel, url, email, number and range), HTML5 DocType **5.2 XHTML** (Extensible Hyper Text Markup Language) **5.3Difference between HTML XHTML** Introduction to Doc types (Strict, Transitional and

		Mobile) Publishing Your Website Testing Your Web Refining and Updating Your Content **5.4 Attracting Notice to Your Web Site-Create Web Sites and Publishing on free webservers (Zoomla,Yola)**

IV .Laboratory Learning Outcome and Aligned Practical / Tutorial Experiences.

Sr.No	Practical / Tutorial / Laboratory Learning Outcome (LLO)	Laboratory Experiment / Practical Titles / Tutorial Titles	Number of hrs	Relevant COs
1	LLO : understand fundamental of computer and netwok.	1. Study of internal and external devices 2.Formatting word documents and excel sheets, table 3.3.Accessing Internet and study of web pages	2	CO1
2	LLO: to understand development teams of website with respect to project.	Build a Website Development Team, analyze your Audience Identify the Contents, decide Filenames and URL, create Directory Structure for your website, Diagram your selected web Site. For Example: 1. Website for Information Technology / Computer Department. 2. Website for any Vehicle Showroom 3. Website for Travel and Tourism Agency 4. Website for any Sport. (Ex. Cricket, Tennis etc.) **Any other suggested pic by subject teacher.**	2	CO1
3	LLO: understanding and creating basic webpage with their structural tags.	Write a HTML code for creating Web page using structure tags Create a web page for displaying a paragraph using Block level, HR tags, Text level tags and special characters.	2	CO2
4	LLO: understanding of list and links as relate to creating hyperlink to link with different web page or section.	1.Create a webpage for implementing different types of Lists 2.Create a webpage to link A different webpage of same site A different location on the same webpage. A specific location on different webpage in the same site	2	CO2
5	LLO: understand how design interactive web pages .	Create a webpage for applying Background, Text Format, and Controlling Fontsusing CSS	2	CO4
6	LLO: understanding and creating contact form and registration form.	Create static webpage for students Registration form using FORM tag,CSS,Table	2	CO3
7	LLO : understanding how to deploy website on hosting server.	1.Install a web server and publish a website on internet 2.Publish a website on internet by acquiring	2	CO5

		space on free hosting site		
	LLO: understand interactive color combination of link.	Create a web page for changing colors of links using BODY tag attributes	2	CO2
9	LLO: understanding and creating image as background image and image as button icon and link.	Create a webpage using IMG tag implementing various attributes, implementing image as a button and setting image as background.	2	CO2
10	LLO: understanding of mail active links .	1. Create a webpage link to: An External Page of Different Website To an Email ID 2. Write a tags to change color of links		
11	LLO: creating web page with different types of CSS.	Create a webpage for demonstration of applying Internal/External/Inline style	2	CO4
12	LLO: understand the structure of HTML5	Create a webpage using HTML5 tags(Structure Tags, Form Tags)	2	CO5
13	LLO: create webpages using CCS 3.0	Working with List, HTML elements box, Positioning and BlockProperties In CSS3.0	2	CO4
14	LLO: understand creation of table on web page	Create web page to display Students Marks data in Table .	2	CO3
15	LLO: Develop mini project using implementation of all HTML,HTML5,CSS,CSS 3.0	Mini project Creation and Publishing Finalizing Mini Project containingminimum Ten web pages from above practical and Publishing It..	2	CO1,2, 3,4,5

I. Suggested Micro Project / Assignment/ Activities for Specific Learning / Skills Development(Self Learning)

i. **Develop webpage to display grocery shop list in table format.**

ii. **Develop web page to display dynamic tabs with XHTML**

iii. **Develop webpage to create pamphlet for college using Frame.**

iv. **Develop website for college using HTML, XHTML, CSS**

II. Assessment Methodologies/Tools

Formative assessment (Assessment for Learning)

Rubrics for continuous assessment based on process and product related performance indicators (25 marks)

Summative Assessment (Assessment of Learning)

End term examination, Viva-voce, Workshop performance (@50 marks)

III .Suggested COs - POs Matrix Form

Course Outcomes (COs)	Programme Outcomes (POs)							Programme Specific Outcomes (PSOs)		
	PO-1 Basic and Discipline Specific Knowledge	PO-2 Proble m Analysis	PO-3 Design/ Development of Solutions	PO-4 Engineering Tools	PO-5 Engineering Practices for Society, Sustainabilit y and Environment	PO-6 Project Manageme nt	PO-7 Life Long Learning	PSO - 1	PS O - 2	PSO - 3
CO1	3	--	--	1	--	2	2	3	1	
CO2	3	--	3	2	--	3	2	3		
CO3	3	--	3	2	--	1	2	3		
CO4	3	--	3	2	--	2	2	3		
CO5	3	---	3	2	--	2	2	3		

Legends: - High:03, Medium:02, Low:01, No Mapping: --

IV. Suggested Learning Materials / Books

Sr.No	Author	Title	Publisher
1	Thomas Powel	HTML and XHTML – The complete reference	Tata McGraw Hill ,New Delhi
2	Anne Bohem	HTML,XHTML and CSS	Murach's Publication
3	Jennifer Niederst Robbins	Learning Web Design	Robbin's, O' Reilly

V.Learning Websites & Portals

Sr.No	Link / Portal
1	https://www.w3schools.com/html/
2	https://www.tutorialspoint.com/html/index.htm
3	https://www.geeksforgeeks.org/html/

VI. Academic Consultation Committee/Industry Consultation Committee:

Sr. No	Name	Designation	Institute/Organization
1	Mr.Pratap Bangosavi	Software Developer	Lauren InfoTech, Khar Road
2	Ms. Sadaf Shaikh	Lecturer in Information Technology	Government Polytechnic, Thane
3	Ms.D.B.Gosavi	Lecturer in Information Technology	Government Polytechnic, Mumbai

Coordinator,
Curriculum Development,
Department of I.T. ~~Engineering~~

Head of Department
Department of I.T. ~~Engineering~~

I/C, Curriculum Development Cell

Principal

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CDC Co-ordinator
G. P. Mumbai

	Programme : Diploma in Information Technology and Computer Engineering (Sandwich Pattern)												
Course Code:IT23102						Course Title: Logic Development using C Programming							
	Compulsory / Optional: Compulsory												
Teaching Scheme and Credits							Examination Scheme						
CL	TL	LL	SLH	NLH	Credits	FA-TH		SA-TH (2 Hr. 30 min)	FA-PR	SA		SLA	Total
										PR	OR		
3	-	4	1	8	4	20	20	60	25	50#	-	25	200

Total IKS Hrs. for course:00

Abbreviations: CL- Class Room Learning, TL- Tutorial Learning, LL- Laboratory Learning, SLH-Self Learning Hours, NLH-Notional Learning Hours, FA - Formative Assessment, SA -Summative assessment, SLA- Self Learning Assessment

Legends: @ Internal Assessment, # External Assessment, *# On Line Examination, @$ Internal Online Examination

Note:

1. FA-TH represents a cumulative addition of two class tests of 20 marks each conducted during the term.
2. SA-TH represents the end term examination.
3. FAPR represents the term work.
4. SA-PR represents end term practical examination

I. Rationale

In today's information technology era, computer Technology plays an important role. Computer applications are all pervasive in day to day life of human being. It became compulsory to all employable to have sound knowledge of how computer works and process data and information. This subjectcovers from the basic concept of C to pointers in C. This course will act as "programming concept developer" for students. It will also act as "Backbone " for subjects like OOPS, VB,Windows Programming, JAVA, OOMD, etc.

II. Industry / Employer Expected Outcome

Students should be able to develop application in C programming.

III. Course Outcomes: Students will be able to achieve & demonstrate the following COs on completion of course based learning

CO1	Illustrate the Flow chart and describe an algorithm for a given program.
CO2	Understand I/O statements in C
CO3	Use Conditional and iterative statements in C programs
CO4	Demonstrate arrays and strings
CO5	Demonstrate the use of user defined functions to solve real time problems
CO6	Understand Structures and unions and Files.
CO7	Describe the use of pointers

Course Content Details:

Unit No.	Theory Learning Outcomes (TLO's)aligned to CO's	Topics / Sub-topics
1	**TLO 1.1:** Explain what is algorithm how to write the algorithm and pseudocode. **TLO 1.2**: Explain how to write algorithms for different problems like – (i) Exchange the values of two variables with and without temporary variable, (ii) Counting positive numbers from a set of integers, (iii) Summation of set of numbers, (iv) Reversing the digits of an integer, (v) Find smallest positive divisor of an integer other than 1, (vi) Find G.C.D. and L.C.M. of two as well as three positive integers, (vii) Generating prime numbers. **TLO 1.3:** Explain what is flowchart and different symbols used in flowchart and how to develop the flowchart.	**Program Logic development** 1.1 Fundamentals of algorithms: Notion of an algorithm. Pseudo-code conventions like assignment statements and basic control structures. 1.2 Algorithmic problems: Develop fundamental algorithms for (i) Exchange the values of two variables with and without temporary variable. (ii) Counting positive numbers from a set of integers, (iii) Summation of set of numbers, (iv) Reversing the digits of an integer, (v) Find smallest positive divisor of an integer other than 1, (vi) Find G.C.D. and L.C.M. of two as well as three positive integers, (vii) Generating prime numbers. 1.3 Flow chart: Draw flow charts for all algorithms developed **Course Outcome- CO1 Teaching Hours – 05 Marks: 10(R-02 U-02 A-06)**
2	**TLO 2.1:** Explain the different programming approaches - Procedural approach, Object Oriented approach, Event Driven approach with examples. **TLO 2.2 :** Explain what is structure of C with diagram and each section of the diagram. Explain the use of comments and compilation of the program. **TLO 2.3:** Explain Data Concepts: Variables, Constants, data types like: int, float char, double and void with different example programs. Qualifiers: short and long size qualifiers, signed and unsigned qualifiers. Declaring variables, Scope of the variables according to block, Hierarchy of data types with different example programs. **TLO 2.4:** Explain different operators in C - Logical , Arithmetic, Bitwise, Relational, Assignment with example programs.	**Basics of C programming** 2.1 Different approaches in programming: Procedural approach, Object Oriented approach, Event Driven approach. 2.2 Structure of C: Header and body. Use of comments. Compilation of a program. 2.3Data Concepts: Variables. Constants. data types like: int, float char, double and void. Qualifiers: short and long size qualifiers. signed and unsigned qualifiers. Declaring variables, Scope of the variables according to block, Hierarchy of data types. 2.4 Operators in C:Logical , Arithmetic. Bitwise. Relational, Assignment 2.5 Basic Input output: C program structure. Input and output using printf() and scanf().

	Qualifiers: short and long size qualifiers, signed and unsigned qualifiers. Declaring variables, Scope of the variables according to block, Hierarchy of data types with different example programs. **TLO 2.4:** Explain different operators in C - Logical, Arithmetic, Bitwise, Relational, Assignment with example programs. **TLO 2.5**: Explain different Input output statements - Input and output using printf() and scanf() character I/O.(Programs based on I/O) with different example programs.	2.4 Operators in C: Logical, Arithmetic, Bitwise, Relational, Assignment 2.5 Basic Input output: C program structure, Input and output using printf() and scanf(), character I/O. (Programs based on I/O) **Course Outcome- CO2 Teaching Hours – 08 Marks:08(R-02 U-02 A-04)**
3	**TLO 3.1:** Explain different Decision making like - If Statement, If else statement, Nesting of if-else using syntax and examples and student should be able to write programs. **TLO 3.2:**Describe branching statement The switch statement with syntax and examples. **TLO 3.3:** Explain the looping statement While loop, Do-while loop, For loop with syntax and example programs. **TLO 3.4:**: Describe the Ternary operator with syntax and example programs. **TLO 3.5:** Explain the Go to statement with syntax and example programs. **TLO 3.6:** Explain the use of break and continue statements with syntax and example programs.	**Control Structures** 3.1 Decision making: If Statement, If else statement, Nesting of if-else 3.2 branching: The switch statement 3.3 Looping: While loop, Do-while loop, For loop 3.4 Ternary operator 3.5 Go to statement 3.6 Use of break and continue statements **Course Outcome- CO3 Teaching Hours – 10 Marks:10 (R-02 U-04 A-04)**
4	**TLO 4.1:** Explain One dimension, two dimension and multidimensional arrays with syntax and example programs. **TLO 4.2**: Describe and explain Array declaration with examples. **TLO 4.3**: Explain Array initiatialisation with examples. **TLO 4.4**: Describe and explain calculating the	**Arrays and Strings** 4.1 One dimension, two dimension and multidimensional arrays 4.2 Array declaration 4.3 Array initialization 4.4 calculating the length of an array

	length of an array with examples. **TLO 4.5**: List and explain different operations on array. **TLO 4.6**: List different String input/output. **TLO 4.7** : List different String operations. **TLO4.8**: Explain Array of strings	4.5 Operation on array 4.6 String input/output 4.7 String operations 4.8 Array of strings **Course Outcome- CO4 Teaching Hours – 08 Marks:10 (R-02 U-04 A-04)**
5	**TLO 5.1:** Uses and concept of Library functions. **TLO 5.2** : List different String functions (comparison, concatenation, length) with example programs **TLO 5.3**: User-defined functions and example programs. **TLO 5.4** : Define Local & global variables and give examples. **TLO 5.5**: Describe Parameter passingwith example programs **TLO5.6**: Name and explain different Storage classes	**Functions** 5.1 Concept of library functions 5.2 String functions (comparison, concatenation, length) 5.3 User-defined functions 5.4 Local & global variables 5.5 Parameter passing 5.6 Storage classes **Course Outcome- CO5 Teaching Hours – 05 Marks:08 (R-02 U-02 A-04)**
6	**TLO 6.1:** Explain Basic Concept of Structure and Union and Files. **TLO 6.2** : Describe Structure declaration, initialization with examples. **TLO 6.3** : Explain Structure within structure with example program. **TLO 6.4** : Describe Structure within structure with example programs. **TLO 6.5** :: DescribeArray of Structure. **TLO 6.6** :Describe and Explain Union. **TLO 6.7**: Describe and Explain Creating a file. **TLO 6.8** : List and explain CRUD operations on File.	**Structure and Union and Files** 6.1 Basic Concept 6.2 Structure declaration, initialization 6.3 Structure within structure 6.4 Nested Structures 6.5: Array of Structure 6.6 Union 6.7 Creating a file 6.8 CRUD operations on File. **Course Outcome- CO6 Teaching Hours:05 Marks:08 (R-02 U-02 A-04)**

7	**TLO 7.1**: ExplainBasic concept of Pointers. **TLO 7.2**: Describe Pointer & arrays **TLO 7.3**: Describe Pointer & functions **TLO 7.4**: ExplainPointer arithmetic	**Pointers** 7.1Basic concept 7.2Pointer & arrays 7.3Pointer & functions 7.4 Pointer arithmetic **Course Outcome- CO7 Teaching Hours:06 Marks:08 (R-02 U-02 A-04)**

IV. Laboratory Learning Outcome and Aligned Practical / Tutorial Experiences.

Sr No	Practical / Tutorial / Laboratory Learning Outcome (LLO)	Laboratory Experiment / Practical Titles / Tutorial Titles	Number of hrs.	Relevant Cos
1	**LLO a**: AbletoWrite an algorithm and draw the flow chart To find out number is odd or even. **LLO b:** Able to Write an algorithm and draw the flow chart to find out factorial value of a number. **LLO c:**Able to Write an algorithm and draw the flow chart To check a number is prime number or not.	Write an algorithm and draw the flow chart for following: a) To find out number is odd or even. b) To find out factorial value of a number. c) To check a number is prime number or not.	4	CO1
2	**LLO a**: Able to write program to find out number is odd or even. **LLO b**: Able to write programto find out factorial value of a number. **LLO c**: Able to write program to check a number is prime number or not.	Program based on Input/output statement. a) To find out number is odd or even. b) To find out factorial value of a number. c) To check a number is prime number or not.	4	CO2

3	**LLO a**: Understand and write program to find whether the input number is even or odd. **LLO b**: Understand and write program to find whether the number entered is positive or negative. **LLO c**: Understand and write program tofind the greatest number among three numbers usingnested if d) Program that asks user an arithmetic operator („+","-„,"*" or „/") and take two operands and perform the corresponding calculation on the operands using switch case	Program using control structures: Branching a) To find whether the input number is even or odd. b) To find whether the number entered is positive or negative. c) To find the greatest number among three numbers using nested if d) Program that asks user an arithmetic operator („+","-„,"*" or „/") and take two operands and perform the corresponding calculation on the operands using switch case	4	CO3
4	**LLO a**: Understand and write program to find the sum of first n natural numbers where n isentered by user. **LLO b**: Understand and write program to Find Number of Digits in a Number. **LLO c**: Understand and write program to check whether a number is palindrome or not. **LLO d**: Understand and write program to Generate Multiplication Table.	Program using control structures: Looping(using loops) To find the sum of first n natural numbers where n isentered by user. b) To Find Number of Digits in a Number. c) To check whether a number is palindrome or not. d) To Generate Multiplication Table.	4	CO3
5	**LLO a**: Understand and write program to accept values in 2-Dimensional 3 by 3 arrays anddisplay the sum of all the elements. **LLO b**: Understand and write program to compute the sum of all elements stored in an arrayusing pointers	Program for arrays – a) to accept values in 2-Dimensional 3 by 3 arrays and display the sum of all the elements. b)Program to compute the sum of all elements stored in an arrayusing pointers	4	CO4
6	**LLO**:Able to write Program using array of strings.	Program using array of strings.	4	CO4
7	**LLO :**Able to writeProgram to perform different operations on string.	Program to perform different operations on string.	4	CO4
8	**LLO a**: Understand and write program using function (call by value) to	Program using function (call by value) a) to swap to numbers b) to find square of given number	4	CO5

	swap to numbers **LLO b**: Understand and write program to find square of given number using functions.			
9	**LLO a**: Understand and write program using structure and union to store information of 3 students (Name, Roll No, Marks) **LLO b**: Understand and write programto store information of 2 employees (empid, name, salary) and display the details of the employee having salary greater thanRs. 5000.	Program using structure and union a) To store information of 3 students (Name, Roll No, Marks) b) To store information of 2 employees (emp_id, name, salary) and display the details of the employee having salary greater than Rs. 5000.	4	CO6
10	**LLO**: Able to write Programto print following pattern * ** ****	Write a program to print following pattern * ** ****	4	CO6
11	**LLO**: Understand and Able to writeProgram using pointer.	Program using pointer.	4	CO7
12	**LLO**: Understand and Able to write Programusing pointer Arithmetic.	Program using pointer Arithmetic.	4	CO7
13	**LLO**: Understand and Able to write Programto perform CRUD operations on Files	Write a program to perform CRUD operations on Files	4	CO6
14	LLO: Understand and Able to do Mini Project .	Mini Project	4	ALL
		Total	60	

V. Suggested Micro Project / Assignment/ Activities for Specific Learning / Skills Development (Self Learning):

1. Bank Management System
2. Calendar Application Project
3. Contact Management System
4. Departmental Store Management
5. Personal Diary Management
6. Quiz Game Project

VI. Specification Table:

Unit No	Topic Title	Distribution of Theory Marks			
		R Level	U Level	A Level	Total Marks
1	Program Logic development	2	2	4	8
2	Basics of C programming	2	2	4	8
3	Control Structures	2	4	4	10
4	Arrays and Strings	2	4	4	10
5	Functions	2	2	4	8
6	Structure and Union	2	2	4	8
7	Pointers	2	2	4	8
	Total	**14**	**18**	**28**	**60**

VII. Assessment

Methodologies/Tools

Formative assessment (Assessment for Learning)

- Rubrics for continuous assessment based on process and product related performance indicators(___ marks)

Summative Assessment (Assessment of Learning)

- End term examination, Viva-voce, Workshop performance (__marks)

VIII. COs - POs Matrix Form

Course Outcomes (COs)	Programme Outcomes (POs)							Programme Specific Outcomes (PSOs)		
	PO-1 Basic and Discipline Specific Knowledge	PO-2 Problem Analysis	PO-3 Design/ Development of Solutions	PO-4 Engineering Tools	PO-5 Engineering Practices for Society, Sustainability and Environment	PO-6 Project Management	PO-7 Life Long Learning	PSO - 1	PSO - 2	PSO - 3
CO1	3	-	-		2	1	-	2		1
CO2	1	3	2	2	-	-	1		2	-
CO3	-	2	-	-	1	1	2	2	-	-
CO4	2	-	2	--	-	2	-	1	-	-
CO5	2	-	-	2	2	-	1	-	2	-
CO6	-	2	-	-	3	1	-	1		1
CO7	1	-	1	2	-	-	1	-	1	-

Legends: - High:03, Medium:02, Low:01, No Mapping: --

IX. Suggested Learning Materials / Books

Sr. No	Author/ Publisher	Title	ISBN
1	Brian W. Kernighan, Dennis Ritchie Prentice Hall	The C Programming language	978-0131103627
2	E. Balgurusamy The Mc-Graw Hill	Programming in ANSI C	978-9339219666
3	YashawantKanetkar BPB Publications	Let us C	978-9387284494

X. Learning Websites & Portals

Sr.No	Link / Portal
1	https://www.w3schools.com
2	https://www.tutorialspoint.com
3	www.cppinstitute.org/
4	https://www.programiz.com › c-programming
5	https://www.javatpoint.com › c-programming-language-tutorial
6	https://beginnersbook.com › 2015/02 › simple-c-programs
7	https://www.udemy.com › c-programming-for-beginners

XI. Academic Consultation Committee/Industry Consultation Committee:

Sr. No	Name	Designation	Institute/Organization
1	Mr. Vaibhav Ashok Wankhade	Software Engineer	Software Engineer, WhiteCode Canada
2	Ms. Sree Latha Komuguri	Lecturer in Information Technology	Government Polytechnic Mumbai
3	Ms. Pradnya Natekar	Lecturer in Computer engineering	Shree Baghubai Maftalal Polytechnic, Mumbai

Coordinator, Wankhade
Curriculum Development,
Department of ~~Engineering~~ Information Technology

Head of Department
Department of ~~Engineering~~ Information Technology

I/C, Curriculum Development Cell

Principal

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CDC Co-ordinator
G. P. Mumbai

Programme : Diploma in ME/CE/EE/CO/IF/IS/EC/RT/LT/LG/AIML (Sandwich Pattern)

Course Code: UV23301 | **Course Title : Universal Human Values-I**

Compulsory / Optional: Compulsory

Teaching Scheme and Credits						Examination Scheme						
CL	TL	LL	SLH	NLH	Credits	FA-TH	SA-TH	FA- PR	SA		SLA	Total
									PR	OR		
01	–	–	01	02	01	–	–	–	–	–	50	50

Total IKS Hrs. for course: 04

Abbreviations: CL- Classroom Learning, TL- Tutorial Learning, LL- Laboratory Learning, SLH- Self Learning Hours, NLH-Notional Learning Hours, FA - Formative Assessment, SA -Summative assessment, SLA- Self Learning ssessment

Legends: @ Internal Assessment, # External Assessment, *# Online Examination, @$ Internal Online Examination

Note:

1. FA-TH represents an average of two class tests of 30 marks each conducted during the term.
2. SA-TH represents the end term examination.

Rationale:

Human beings have materially developed to a great extent through technological development. Still the scarcity of happiness and satisfaction result in personal and social conflicts. The value system develops the frame of reference of the individual to benchmark his/ her behavioral pattern respecting the righteousness during life. The appreciation and inculcation of a value system can develop a person as a creative contributor for society, nation and by-large the world.

By inculcating universal values, not only can a person resolve the personal, social and professional situations positively but also can lead toward an enriched life. Once these values are inculcated in a student's personality, it will result in the sustainable development of a student.

This course is designed to make the student think that by observing the universally accepted human values, it is easy to become a good human being, a good citizen and make their own life goal-oriented, cladded with happiness and satisfaction. The core universal values to be inculcated: personal values, social values and professional values. The aspirations and concerns to be explored at the level of individual, at the level of family, at the level of society and at the level of nature.

Industry / Employer Expected Outcome

To demonstrate value based behavior at the workplace.

Course Outcomes:

On completion of this course, Students will be able to achieve & demonstrate the following COs on completion of course based learning

CO1	Appreciate universal human values to ensure sustained happiness and prosperity, which are the core aspirations of all human beings.
CO2	Develop a holistic approach to environment, family and society.
CO3	Develop more confidence in self .
CO4	Derive joy of giving .
CO5	Improve understanding and perform acts of kindness.

Course Content Details:

Sr. No.	CO	Activity	Related Value/s	Methodology of Implementation	Student's Role	Mentor's role	Resources Required
01	CO1 CO3	Prepare a self-introduction sheet i)Name, School passed from, achievements up to 10th standard ● What are your goals in your life? ● What are your expectations from institute, Family, Society? ● Information of family members ● Most happy moments and difficult moments in your life, Special trips, Hobbies , Sports, Music , etc	Honesty, Self-exploration	Preparing a note and presenting in front of peers	Thoughtfully answer the questions in an honest manner.	Provide information about the institute and motivate students to honestly express themselves.	Official website of the institute

02	**CO1 CO2**	List behavioral characteristics and analyze self, friend, family members, ● Do you like these characters yes/no – why	Self-exploration , Honesty	Preparing a presentation	Honestly and sincerely analyse self and others	Create a stress-free environment and see that there will be no conflict of expression.	Provide a list of character traits by referring to various resources like internet, books, etc. For e.g. https://www.teachervision.com/writing/character-traits-list-examples
03	**CO2 CO3**	Identify your needs and desires	Honesty Self-exploration	Making a list of needs and desires	Reflect and identify needs and desires.	Stay wary of controversial subjects	list of historical personalities who set the example.
04	**CO2 CO5**	Singing a patriotic song in group ● Make group , select song, explain meaning, use music/karaoke and demonstrate to class	Patriotism	Forming group of interested students. Students will rehearse the activity and will perform in groups	Diligently practice and cooperate with others.	Manage the logistics of creating groups and assigning roles.	Music system, list of patriotic songs.

05	CO1 CO3	Essay writing ● My dreams as an Engineer ● India a Super power in my views ● Society & I ● Indian culture and values ● My role models in life **IKS hours-** Religious and cultural history of India- Indus civilization	Self – exploration Patriotism Accountability	Selecting a topic from the list and writing an essay on it	Thoughtfully write the essay on a selected topic.	Display the best essays on the notice board.	notice board, panel of judges
06	CO2 CO3	Play Music instruments/ Singing/ Drawing/Any stage performance/ photography/any creative art **IKS hours -** History of Indian classical music.	Derive the joy	**Present to peers**	Pursue your creative interest	Identify and categorize students. Create groups accordingly	logistical support
07	CO2 CO4 CO5	Visit a nature park, identify the flora & fauna, ecological factors & their role in our life. (e.g Maharashtra nature park society , Dharavi , Mumbai)	Environment Conservation	Students to arrange visit under supervision of mentor	Study various flora & fauna in a disciplined manner.	Assure safety of students and manage activities.	https://maharashtranaturepark.org/
08	CO2 CO4	Tree plantation and caring for it.	Environment Conservation	Students to arrange activity under supervision of mentor	Plant the appropriate saplings according to instructions.	Assure safety of students and provide adequate instructions.	saplings, soil, shovels, fertilizer

09	**CO3**	List the distractors which are responsible to deviate you from integrity and find out the solution	Integrity, Righteousness	Observation and identification of common distracters.	Identify distracters like TV shows, movies and bad habits	Provide historical case studies of previous students.	Case studies
10	**CO2 CO5**	Prepare the chart DOs and DONTs for different situations like local trains, travel, public place, classroom, examination, etc.	Conscientiousness, honesty, social gratitude	Preparing the chart	Identify DOs and DONTs and prepare various charts	Create groups and assign topics.	Official websites of respective administrations like railways, Municipal corporation, etc..
11	CO4	Beach cleaning, institute cleaning	Environment conservation, Health consciousness	Organizing a visit to clean the venue.	Clean the venue as per instructions.	Assure safety and aid in organization.	https://www.unitedwaymumbai.org/cleanshores

12	CO4 CO5	a) To prepare a first aid box to be kept at home b) Preparation of a report on industrial accident	Care for others, accountability	Collection of information from various available sources and use it for intended purpose.	a) Prepare a list of contents for a first aid box to be kept at home b) Prepare a first aid box as per prepared list c) Prepare a list of various accidental hazards at home. d) Prepare a display of safety precautions for use of gas stove. e) Collect information of one industrial accident , its effects, probable causes from various resources and prepare a report.	To explain and monitor the task	Medicine, Box, paper

Methodology:

1. The course teacher will be the mentor.
2. In consultation and under supervision of a mentor, the student/ Group of students has to complete the activity.
3. The mentor will work as a facilitator/ advisor.
4. The strategies to learn the course is "Self- Exploratory" and "Experiential Learning"
5. The onus of responsibility for completing the activities is with students.
6. The student has to complete at least **five** no. of activities throughout the term. Each activity carries 10 marks.

Assessment methodologies/Tools:

Formative Assessment(Assessment for Learning)

The student has to complete at least **five** no. of activities throughout the term. Each activity carries 10 marks

Criterion No.	Criterion	Max. Marks	Not Satisfactory	Satisfactory	Good	Excellent
1	Attendance	02	0	1	2	2
2	Knowledge	04	1	2	3	4
3	Presentation / Performance	04	1	2	3	4
	Total	10				

Suggested CO-PO Matrix form:

Course Outcomes (COs)	Programme Outcomes (POs)							Programme Specific Outcomes* (PSOs)		
	PO-1 Basic and Discipline Specific Knowledge	PO-2 Problem Analysis	PO-3 Design/ Development of Solutions	PO-4 Engineering Tools	PO-5 Engineering Practices for Society, Sustainability and Environment	PO-6 Project Management	PO-7 Life Long Learning	PSO-1	PSO-2	PSO-3
CO1	-	-	-	-	2	1	3	1		
CO2	-	1	1	-	1	1	2		2	
CO3		1	-	-	1	1	2		2	
CO4	-	-	-	-	1	-	2			1
CO5	-	-	-	-	1	-	2		1	

Legends :- High:03, Medium:02,Low:01, No Mapping: -
*CO PSOs mapping to be formulated at department level

References/ Books:

Sr. No.	Title	Author, Publisher, Edition and Year Of publication	ISBN
1	A Foundation Course in Human Valuesand Professional Ethics	R.R. Gaur, R. Sangal, G.P. Bagaria, Excel Books, New Delhi, 2010	978-8-174-46781-2
2	Human Values	A.N. Tripathy, New Age International Publishers, 2003	978-8-122-42589-5
3	Teacher's Manual - A Foundation Course in Human Values and Professional Ethics	R.R. Gaur, R. Sangal, G.P. Bagaria, Excel Books, New Delhi, 2010	-
4	Science and Humanism, Towards a Unified World View	PL Dhar, RR Gaur, Commonwealth Publications, 1992	978-8-171-69222-4
5	Education for values in schools- a framework	NCERT	
6	Value oriented education	E N Gawande	

E-References:

1) **https://youtu.be/kOJu1vj_BVk(The 10 MostImportant Human Values)**
2) **Dr. Prakash Baba Amte- Movie**
3) **https://youtu.be/QeogOlzG2ls (alue of Education -short film)**

E-References for mentors:

1) **https://www.edutopia.org/**

2) **https://sdgs.un.org/goals**

Consultation Committee:

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