

Government Polytechnic Mumbai

(Academically Autonomous Institute of Govt. of Maharashtra)



Information Technology Department

P19R Curriculum

First Semester

Implemented from July 2022

GOVERNMENT POLYTECHNIC MUMBAI
(Academically Autonomous Institute, Government of Maharashtra)
Teaching and Examination Scheme (P19R)
With effect from AY 2022-23

Programme: Diploma in Information Technology (Sandwich Pattern)

Term/ Semester - I

Course Code	Course Title	Teaching Hours/Contact Hours				Credits	Examination Scheme (Marks)						
		L	P	TU	Total		Theory			PR	OR	TW	Total
							TH	TS1	TS2				
SC19R103	Applied Physics	3	2	--	5	5	60	20	20	25*	--	25	150
SC19R109	Basic Mathematics	4	--	--	4	4	60	20	20	--	--		100
EC19R210	Basics of Electrical and Electronic Engineering	2	2	--	4	4	--	--	--	50	--	25	75
IT19R201	Web Technology	2	4	--	6	6	--	--	--	50*	--	50	100
IT19R202	Logic Development using C Programming	3	4	--	7	7	60	20	20	50*	--	25	175
IT19R203	Latex (Spoken Tutorial)	--	4 [#]	--	4 [#]	4 [#]	--	--	--	--	--	--	--
UV19R101	Universal Human Values I	--	--	--	--	2	--	--	--	--	--	--	--
Total		14	16	--	30	32	180	60	60	175	--	125	600
Student Centered Activity (SCA)						05							
Total Contact Hours						35							

Abbreviations: L-Theory Lecture, P-Practical, TU-Tutorial, TH-Theory Paper, TS1 & TS2-Term Tests, PR-Practical, OR-Oral, TW: Term Work (progressive assessment)

* Indicates assessment by External Examiner else internal assessment, # indicates Self, on-line learning Mode, @ indicates on line

examination Note: Duration of Examination--TS1 & TS2-1 hour, TH-2 hours, PR/OR-3 hours per batch, SCA-Library-1 hour, Sports-2 hours, Creative Activity-2 hours

Self, on-line learning Mode through MOOCs/Spoken Tutorials/NPTEL/SWAYAM/FOSSEE etc.

Coordinator,
Curriculum Development,
Department of Information Technology

In-Charge
Curriculum Development Cell

Head of Department
Department of Information Technology

Principal

Programme: Diploma in Information Technology/Computer Engineering(IT/CO) (Sandwich pattern)										
Course Code: SC19R103				Course Title: Applied Physics						
Compulsory/Optional: Compulsory										
Teaching Scheme and Credits				Examination Scheme						
L	P	TU	Total	TH(2 Hrs30 minutes)	TS1(1Hr.)	TS2(1Hr.)	PR	OR	TW	Total
3	2	--	5	60	20	20	25*	--	25	150

Abbreviations: L- Theory Lecture, P-Practical, TU-Tutorial, TH- Theory Paper TS1 & TS2- Term Tests, PR-Practical, OR-Oral, TW: Term Work (progressive assessment) , * Indicates assessment by External Examiner else internal practical skill test , # indicates Self, on- line learning Mode, @ indicates on line examination Note: For Minimum passing marks under various heads, refer, examination rule AR26. Two practical skill tests are to be conducted. First skill test at mid term and second skill test at the end of the term

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 the topics 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.

Course Outcomes: Students should be able to

CO1	State the different physical quantities, identify the proper unit of fit and to estimate error in physical measurement.
CO2	Apply laws of motion in various Engineering applications
CO3	Apply the concept of electric field and electromagnetism in Engineering technology
CO4	Identify properties and application of light in Engineering field

Course Content Details:

Unit No	Topics/Sub-topics
1	<p>Units and Measurements</p> <p>1.1 Fundamental Physical quantities, examples. 1.2 Derived physical quantities, examples. 1.3 Definition and requirements of unit 1.4 System of units, C.G.S., M. K.S. and S.I. units. 1.5 Rules to write the unit and conventions of units and Significant figures, rules to write significant figures. 1.6 Error–Definition, types of errors and minimization of errors, 1.7 Numerical problems.</p> <p>Course Outcome: CO1 Teaching Hours :6 hrs Marks:8(R-2,U-2,A-4)</p>
2	<p>Motions</p> <p>2.1 Linear motion –Definition– distance, displacement, velocity, acceleration retardation, equations of motion, acceleration due to gravity, equation of motion under gravity, numerical problems. 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 Velocity (derivation), Radial or centripetal acceleration, Three equations of motion (no derivations) Centripetal and Centrifugal force, examples and applications.</p> <p>Course Outcome: CO2 Teaching Hours:10hrs. Marks:10 (R-2,U-4,A-4)</p>
3	<p>Electrostatics</p> <p>3.1 Definition of charge 3.2 Coulomb's law, Definition of electric field, Definition and unit of electric field intensity (E) 3.3 Definition and properties of electric lines of force 3.4 Definition of electric flux and electric flux density 3.5 Electric Potential 3.6 Definition & Explanation of Electric Potential 3.7 Definition & Explanation of absolute Electric Potential 3.8 Equation of electric potential (only equation)</p> <p>Course Outcome: CO3 Teaching Hours :6 hrs. Marks:8 (R-2, U-2,A-4)</p>
4	<p>Electricity</p> <p>4.1 Ohm's Law, Statement and mathematical expression 4.2 Resistance & unit of it, Specific resistance, unit of specific resistance. 4.3 Resistance in series and parallel combination, shunt Resistance 4.4 Wheatstone network, balancing condition for it 4.5 Numerical problems</p> <p>Course Outcome: CO3 Teaching Hours :8 hrs. Marks:12 (R-2, U-6,A-4)</p>

5	<p>Electromagnetism 5.1 Magnetic effect of current, magnetic induction 5.2 Properties of magnetic lines of force, 5.3 Laplace's law, Fleming's left hand rule 5.4 Magnetic induction at Centre of circular coil carrying current only equation 5.5 Force acting on conductor carrying current placed in magnetic field (no derivation) 5.6 Numerical problems.</p> <p>Course Outcome: CO3 Teaching Hours: 6hrs. Marks: 8 (R-2, U-2, A-4)</p>
6	<p>Optics and Optical Fiber 6.1 Optics 6.1.1 Revision of reflection and refraction of light. 6.1.2 Laws of refraction, Snell's law. 6.1.3 Prism formula (derivation) 6.1.4 Numerical problems. 6.2 Optical Fibers: 6.2.1 Principle of propagation of light through optical fiber. 6.2.2 Structure of Optical fiber. 6.2.3 Applications (electronics and medical) and comparison with electrical cable for communication.</p> <p>Course Outcome: CO4 Teaching Hours: 9hrs. Marks: 14 (R-4, U-6, A-4)</p>

Suggested Specifications Table (Theory):

Unit No	Topic Title	Distribution of Theory Marks			
		R Level	U Level	A Level	Total Marks
1	Units and Measurements	2	2	4	8
2	Motion	2	4	4	10
3	Electrostatic	2	2	4	8
4	Electricity	2	6	4	12
5	Electromagnetism	2	2	4	8
6	Optics and Optical Fiber	4	6	4	14
Total		14	22	24	60

List of experiments:

Sr. No.	Unit No	CO	List of Experiments	Hours
1	1	CO1	To know your Physics laboratory and use of scientific calculator.	2
2	1	CO1	To measure the dimensions of given object and to determine their Volume using Vernier caliper.	2
3	2	CO2	To determine Acceleration due to gravity by simple pendulum	2
4	4	CO3	To verify Ohm's Law.	2
5	4	CO3	To find resultant resistance when resistances are connected in series.	2
6	6	CO4	To find refractive index of a given prism by using pin method.	2
7	2	CO1	To measure the dimensions of given objects and to determine their Volume using micrometer screw gauge.	2
8	1	CO2	To determine stiffness constant by using helical spring.	2
9	3	CO3	To verify Coulomb's law of electrostatics.	2
10	4	CO3	To find resultant resistance when resistances are connected in parallel	2
11	4	CO3	To find unknown resistance by using Wheatstone's Bridge.	2
12	4	CO3	To verify principle of potentiometer.	2
13	5	CO3	To study properties of magnetic line of force.	2
14	6	CO4	To demonstrate spectrometer.	2
15	ALL	CO1	Showing Video on different applications related to units,	2
			Total	30

Note: Experiments No. 1 to 10 are compulsory and should map all units and Cos. Remaining 5 experiments are to be performed on the importance of topic.

References/Books:

Sr. No.	Title	Author, Publisher, Edition and Year of publication	ISBN
1	Applied Physics	Manikpure & Deshpande, S. Chand & Company	10:8121919541 13:9788121919548
2	Applied Physics	B.G. Bhandarkar, Vrinda Publication	0071779795
3	Optics & Optical Fibers	Brijlal Subhramanyan	978-3-662-52764-1
4	Engineering Physics	Gaur and S.L. Gupta S. Chand & Company	0-07-058502
5	Physics	Resnick and Halliday Tata McGraw Hills	978-0-07-175548-3
6	Physics part I & II	H.C. Varma	9788177091878
7	Properties of Matter	D.S. Mathur	13: 978-8121908153

E-References:

1. www.physics.org
2. www.physicsclassroom.com
3. www.youtube.com/physics
4. www.ferrophysics.com
5. <http://hperphysics.phastr.gsu.edu/hbase/hph.htm>
6. www.sciencejoywagon.com/physicszone
7. <https://www.vedantu.com/ncert-solutions/ncert-solutions-class-12-physics>
8. MYCBSEGUIDE
9. <https://ndl.iitkgp.ac.in/>

COVs, PO and COVs, PSO Mapping (COMPUTER ENGINEERING)

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	3			2			1	1	2	
CO2	3							1		
CO3	3				1			1	2	
CO4	3			2	1			1	1	

COVs.PO and COVs.PSO Mapping (INFORMATION TECHNOLOGY)

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	3			2			1		1	
CO2	3								1	
CO3	3				1				1	
CO4	3			2	1				1	

Industry Consultation Committee:

Sr. No	Name	Designation	Institute/Organisation
1	Mr. Akshay Mahapadi	Sr. Software Specialist	Mastek, Mahape Ghansoli
2	Mrs. B.J. Choudhary	Lecturer in Physics	Govt. Polytechnic Thane
3	Mrs S.A. Thorat	Lecturer in Physics	Govt. Polytechnic Mumbai
4	Dr. D.S. Nikam	Lecturer in Physics	Govt. Polytechnic Mumbai

Coordinator,

Curriculum Development,

Department of Sci. & Humanities

Department of Sci. & Humanities D

I/C, Curriculum Development Cell

Principal

Programme: Diploma in CE/ME/IT/CO/EC/IS/EE (Sandwich Pattern)										
Course Code: SC19R109				Course Title: BASIC MATHEMATICS						
Compulsory/Optional: Compulsory										
Teaching Scheme and Credits				Examination Scheme						
L	P	TU	Total	TH (2Hrs. 30 Min.)	TS1(1Hr)	TS2(1Hr)	PR	OR	TW	Total
04	-	-	04	60	20	20	-	-	-	100

Abbreviations: L- Theory Lecture, P-Practical, TU-Tutorial, TH- Theory Paper TS1 & TS2- Term Tests, PR- Practical, OR-Oral, TW: Term Work (progressive assessment) , *

Indicates assessment by External Examiner else internal practical skill test , # indicates Self, on-line learning Mode, @ indicates on line examination Note: For Minimum passing marks under various heads, refer, examination rule AR26. Two practical skill tests are to be conducted. First skill test at mid term and second skill test at the end of the term

Rationale:

This subject is kept under the branch of sciences. This subject intends to teach student basic facts, concepts, principles, and procedure of mathematics as a tool to analyze engineering problems and as such lays down foundation for understanding the engineering and core technology subject.

Course Outcomes: Students should be able to

CO1	Identify the basic principles of mathematics about the field analysis of any engineering problem.
CO2	Apply rules, concept and properties to solve the basic problems.
CO3	Establish relation between two variables.

Course Content Details:

Unit No	Topics/Sub-topics
1	<p>1. Trigonometry:</p> <p>1.1 Trigonometric ratios of allied angles, compound angles, multiple angles (2A, 3A), Submultiple angles</p> <p>1.2 Factorization and De-factorization Formulae</p> <p>1.3 Inverse Circular function (definition and simple problems).</p> <p>Course Outcome: CO1 Teaching Hours: 10hrs Marks: 10 (R-4, U-4, A-2)</p>
2	<p>2. Vectors:</p> <p>2.1 Definition of vector, position vector</p> <p>2.2 Algebra of vectors (Equality, addition, subtraction and scalar multiplication)</p> <p>2.3 Dot (Scalar) product & Vector (Cross) product with properties.</p> <p>Course Outcome: CO3 Teaching Hours: 10hrs Marks: 10 (R-2, U-4, A-4)</p>
3	<p>3. Logarithms:</p> <p>3.1 Definition of logarithm</p> <p>3.2 Laws of logarithm</p> <p>3.3 simple examples based on laws.</p> <p>Course Outcome: CO2 Teaching Hours: 10hrs Marks: 10 (R-4, U-4, A-2)</p>
4	<p>4. Probability:</p> <p>4.1 Definition of random experiment, sample space, event, occurrence of event and types of event (Impossible, mutually exclusive, exhaustive, equally likely)</p> <p>4.2 Definition of Probability</p> <p>4.3 Addition & Multiplication Theorems of probability without proof, simple examples</p> <p>Course Outcome: CO1 Teaching Hours: 10hrs Marks: 10 (R-4, U-4, A-2)</p>
5	<p>5. Determinants:-</p> <p>5.1 Definition of Determinant</p> <p>5.2 Expansion of Determinant of order 2X3</p> <p>5.3 Cramer's rule to solve simultaneous equations in 3 unknowns</p> <p>Course Outcome: CO2 Teaching Hours: 10hrs Marks: 10 (R-2, U-4, A-4)</p>
6	<p>6. Matrices:</p> <p>6.1 Definition of a matrix of order m x n</p> <p>6.2 Types of matrices</p> <p>6.3 Algebra of matrices - equality, addition, subtraction, multiplication & scalar multiplication.</p> <p>6.4 Transpose of matrix.</p> <p>6.5 Minor, co-factor of an element.</p> <p>6.6 Adjoint & inverse of a matrix by adjoint method.</p> <p>6.7 Solution of simultaneous equations by matrix inversion method.</p> <p>Course Outcome: CO3 Teaching Hours: 10hrs Marks: 10 (R-2, U-4, A-4)</p>

Suggested Specifications Table (Theory):

Unit No	Topic Title	Distribution of Theory Marks			
		R Level	U Level	A Level	Total Marks
1	Trigonometry	04	04	02	10
2	Vectors	02	04	04	10
3	Logarithms	04	04	02	10
4	Probability	04	04	02	10
5	Determinants	02	04	04	10
6	Matrices	02	04	04	10
Total		18	24	18	60

References/Books:

Sr. No.	Title	Author, Publisher, Edition and Year of publication	ISBN
1	Mathematics for Polytechnic Students	S.P. Deshpande, Pune Vidyavardhini Graha Prakashan	-
2	Mathematics for Polytechnic Students (Volume I)	H.K. Dass, S. Chand Prakashan	9788121935241
3	Companions to Basic Maths	G.V. Kumbhojkar, Phadke Prakashan	10-B07951HJDQ 13-B07951HJDQ
4	Applied Mathematics	N. Raghvendra Bhatt late, Tata McGraw Hill Publications R. Mohan Singh	9789339219567, 9339219562

E-References:

1. www.math-magic.com
2. www.Scilab.org/-SCI Lab
3. www.mathworks.com/Products/Matlab/-MATLAB
4. www.wolfram.com/mathematica/-Mathematica
5. <https://www.khanaacademy.org/math?gclid=CNqHuabCys4CFdoJaAoddHoPig>
6. www.dplot.com/-Dplot
7. www.allmathcad.com/-MathCAD
8. www.easycalculation.com
9. <https://www.vedantu.com/ncert-solutions/ncert-solutions-class-12-maths>
10. MYCBSEGUIDE

CO Vs PO and CO Vs PSOM Mapping (CIVIL ENGINEERING)

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	3			2			1	1		1
CO2	3	2					1	1		1
CO3	3			2			1	1		1

COVsPO and COVsPSO Mapping(MECHANICAL ENGINEERING)

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
CO1	3			2			1	1	
CO2	3	2					1	1	
CO3	3			2			1	1	

COVsPO and COVsPSO Mapping(COMPUTER ENGINEERING)

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	3			2			1	1		
CO2	3	2					1	1		
CO3	3			2			1	1		

COVsPO and COVsPSO Mapping(INFORMATION TECHNOLOGY)

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	3			2			1	1		1
CO2	3	2					1	1		1
CO3	3			2			1	1		1

COVsPO and COVsPSO Mapping(ELECTRONICS ENGINEERING)

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	3			2			1		1	1
CO2	3	2					1		1	1
CO3	3			2			1		1	1

CO Vs PO and CO Vs PSOMapping (ELECTRICAL ENGINEERING)

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	3			2			1		1	
CO2	3	2					1		1	
CO3	3			2			1		1	

CO Vs PO and CO Vs PSOMapping (INSTRUMENTATION ENGINEERING)

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
CO1	3			2			1	1	1
CO2	3	2					1	1	1
CO3	3			2			1	1	1

Industry Consultation Committee:

Sr. No	Name	Designation	Institute/Organisation
1	Neelamkumar R. Sawant	State Head Technical Services for (Maharashtra and Goa)	JSW Cement Ltd. Mumbai Head Office
2	Mrs. Deepawali S. Kaware	Lecturer in Mathematics	Government polytechnic Vikaramgad
3	Mr. A. S. Patil	Lecturer in Mathematics	Government polytechnic Mumbai
4	Mr. V. S. Patil	Lecturer in Mathematics	Government polytechnic Mumbai

Head of Department

Coordinator,
Curriculum Development,
Humanities Department of Science and Humanities

Department of Science and

I/C, Curriculum Development Cell

Principal

Programme: Diploma in Information Technology and Computer Engineering (Sandwich Pattern)										
Course Code: EC19R210				Course Title: Basics of Electrical and Electronics Engineering						
Compulsory/ Optional: Compulsory										
Teaching Scheme and Credits				Examination Scheme						
L	P	TU	Total	TH (2 Hrs 30 min)	TS1(1Hr)	TS2(1Hr)	PR	OR	TW	Total
2	2	--	4	--	--	--	50	--	25	75

Abbreviations: L-Theory Lecture, P-Practical, TU-Tutorial, TH-Theory Paper TS1 & TS2-Term Tests, PR-Practical, OR-Oral, TW: Term Work (progressive assessment), * Indicates assessment by External Examiner else internal practical skill test, # indicates Self, on-line learning Mode, @ indicates on line examination **Note:** For Minimum passing marks under various heads, refer, examination rule AR26. Two practical skill tests are to be conducted. First skill test at mid term and second skill test at the end of the term

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.

Course Outcomes: Students should be able to

CO1	Explain fundamentals of alternating quantities and its behavior with resistive, inductive and capacitive circuits.
CO2	Apply KCL, KVL, Voltage division rule, and current division rule to a series or parallel circuit.
CO3	Explain the working of various semiconductor devices.
CO4	Design and experiment with various application circuits using diodes and transistors.
CO5	Use optoelectronic devices in various electronic circuits

Course Content Details:

Unit No	Topics/Sub-topics
1	<p>AC fundamentals</p> <p>1.1 Alternating Current, Sinusoidal waveforms Mathematical Expression of alternating quantity.</p> <p>1.2 Definition of Waveform instantaneous value, Cycle, Time period, Frequency, Amplitude, Peak value, Average value and RMS value, Form factor and Peak factor for sinusoidal wave, Phase, Phase difference, Phasor representation of sinusoidal quantities.</p> <p>1.3 Electrical circuit elements: Resistors, Inductors, Capacitors Their properties, units, symbols</p>

	<p>1.4 Resistors in series and parallel 1.5 Capacitors in series and parallel</p> <p>Course Outcome: CO1 Teaching Hours: 04 Marks: R-NA, U-NA, A-NA</p>
2	<p>DCCircuits 2.1 Direct current definition and waveform, Difference between AC and DC 2.2 DC series circuit: Concept, Equation for equivalent resistance connected in series, Voltage division rule, Application of series circuit. 2.3 DC Parallel circuit: Concept, Equation for equivalent resistance connected in parallel, Current division rule, Application of Parallel circuit 2.4 Series parallel circuit, Application of series parallel circuit. 2.5 Definition of Circuit, Parameter, Linear circuit, Nonlinear circuit, Bilateral circuit, Unilateral circuit, Electric network, Passive-Network, Active network, Node, Branch, Loop, Mesh. 2.6 Kirchhoff's current law, Kirchhoff's voltage law, signs convention.</p> <p>Course Outcome: CO2 Teaching Hours: 06 Marks: R-NA, U-NA, A-NA</p>
3	<p>AC circuits 3.1 Performance of AC when it passes through Pure R, Pure L and Pure C 3.2 Concept of inductive reactance and capacitive reactance and impedance. 3.3 Circuit diagram, phasor diagram and waveform for RL, series, RC series and RLC series circuit. Impedance and Impedance Triangle. 3.4 Active power, Reactive power and apparent power, power factor. (only Definitions) 3.5 Transformer: Faraday's law of electromagnetic induction, Fleming's right hand rule, Lenz's law (Only statements), Working principle and main parts of transformer, types of transformer based on transformation ratio (k)</p> <p>Course Outcome: CO1 Teaching Hours : 05 Marks: R-NA, U-NA, A-NA</p>
4	<p>Semiconductor Devices 4.1 Semiconductors: Intrinsic, Extrinsic semiconductor, P type, N type semiconductor 4.2 Semiconductor Diode: PN junction diode, Zener diode, (Symbol, working, V characteristics, applications) 4.3 Transistors: 4.3.1 BJT: NPN, PNP transistors (symbol, working, necessity of biasing, biasing methods, Active, cut off, saturation region. 4.3.2 FET: N channel, P channel (symbol, working) 4.4 Difference between BJT and FET 4.5. MOSFET (symbol, working, applications)</p> <p>Course Outcome: CO3 Teaching Hours: 06 Marks: R-NA, U-NA, A-NA</p>
5	<p>Optoelectronic Devices 5.1 LED, LASER diodes, 7 segment display 5.2 Photodiode 5.3 Photovoltaic or solar cells 5.4 Phototransistor</p>

	5.5 Optocoupler (Only Symbols, working and Applications of all these devices)
	Course Outcome: CO5 Teaching Hours: 03 Marks: R- NA, U-NA, A-NA
6	Applications of Semiconductor Devices 6.1. Rectifiers and filters: Half Wave Rectifier, Full Wave Rectifier and Bridge rectifier with RC, LC, π filter (Circuits, waveforms, applications, comparison, No mathematical analysis) 6.2. Diode as clipper : Series diode clipper, Parallel diode clipper (Circuits, waveform, working), Positive clipper, Negative clipper) 6.3. Diode as clamper: Positive clamper, Negative clamper 6.4. Zener diode as a voltage regulator 6.5. Transistor as an amplifier 6.6. Transistor as a switch Course Outcome: CO4 Teaching Hours: 06 Marks: R-NA, U-NA, A-NA

List of experiments: First six experiments are compulsory. Any 4 experiments out of 7 to 13. Mini project is compulsory.

Sr. No.	Unit No	CO	List of Experiments	Hours
1	1	CO1	Measure voltages and currents in series and parallel resistive circuit and verify voltage division rule and current division rule.	02
2	2	CO2	Verify KCL and KVL	02
3	4 & 6	CO3 CO4	To construct and test half wave rectifier. Observe and measure input and output waveforms (Amplitude, frequency)	02
4	4 & 6	CO3 CO4	To construct and test Zener voltage regulator. Find out load and line regulation.	02
5	5	CO5	To construct electronic circuit using optocoupler and test it.	02
6	3	CO1	Measure the phase relation between voltage and current in pure resistive, inductive and capacitive circuit.	02
7	1	CO1	Measure amplitude, frequency of a sinusoidal waveform on oscilloscope	02
8	3	CO1	Determine impedance, phase angle, active, reactive and apparent power in RL series circuit.	02
9	6	CO3 CO4	To construct and test full wave rectifier. Observe and measure input and output waveforms (Amplitude, frequency)	02
10	6	CO3 CO4	To construct and test Bridge rectifier. Observe and measure input and output waveforms (Amplitude, frequency)	02
11	6	CO3 CO4	To construct and test transistor as a switch.	02
12	6	CO4	To construct and see the waveforms of any type of clipper	02
13	6	CO4	To construct and see the waveforms of any type of clamper	02
14	4,5,6	CO1 to CO5	Mini Project (Electronic hobby kit)	04
			Total	30

References/Books:

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

E-References:

1. www.electricaltechnology.org
2. www.electronics-tutorials.ws
3. www.allaboutcircuits.com
4. www.alldatasheet.com
5. www.electronics.wisc-online.com
6. www.vlab.co.in

COVs PO and COVs PSO Mapping (Information Technology)

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
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

COVs PO and COVs PSO Mapping (Computer Engineering)

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
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

Industry Consultation Committee:

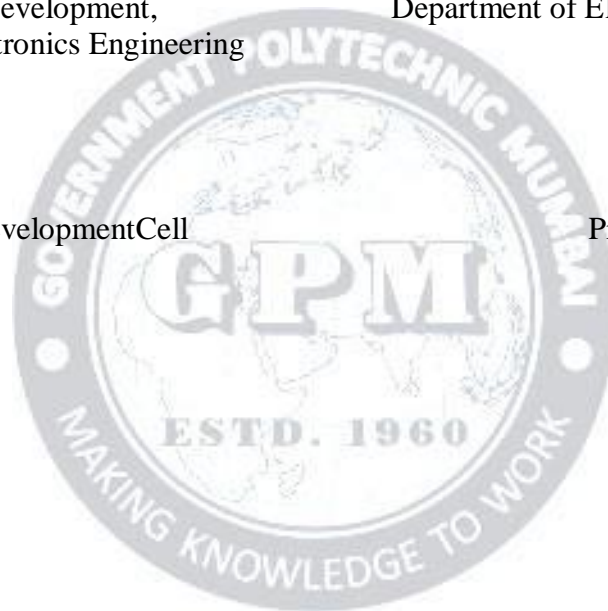
Sr. No	Name	Designation	Institute/Organisation
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3	Mrs. S. N. Nagargoje	Lecturer in Electronics	Govt. Polytechnic Thane
4	Dr. R. A. Patil	Sel. Gr. Lecturer in Electronics,	Govt. Polytechnic Mumbai
5	Dr. P. N. Padghan	Sel. Gr. Lecturer in Electronics,	Govt. Polytechnic Mumbai

Coordinator
Curriculum Development,
Department of Electronics Engineering

Head of Department
Department of Electronics Engineering

I/C, Curriculum Development Cell

Principal



Programme: Diploma in Information Technology (Sandwich Pattern)										
Course Code: IT192R01				Course Title: Web Technology						
Compulsory/ Optional: Compulsory										
Teaching Scheme and Credits				Examination Scheme						
L	P	TU	Total	TH (2Hrs 30 min)	TS1(1Hr)	TS2(1Hr)	PR	OR	TW	Total
2	4	---	6	--	--	--	50*	--	50	100

Abbreviations: L-Theory Lecture, P-Practical, TU-Tutorial, TH-Theory Paper TS1 & TS2-Term Tests, PR-Practical, OR-Oral, TW: Term Work (progressive assessment), * Indicates assessment by External Examiner else internal practical skill test, # indicates Self, on-line learning Mode, @ indicates on line examination **Note:** For Minimum passing marks under various heads, refer, examination rule AR26. Two practical skill tests are to be conducted. First skill test at mid term and second skill test at the end of the term

Rationale: Diploma holders of Information Technology often work to develop professional looking static and dynamic websites using different Web Technologies. Some common

Web technologies which are used to develop websites are HTML, JavaScript, CSS, XML, XHTML, AJAX, ASP.NET, PHP.

This is a Hands-on course in designing and developing Static World Wide Web pages using HTML (Hypertext Markup Language) and CSS (Cascading Style Sheets) which will develop abilities in students to create and deploy Static Web pages.

Course Outcomes: Student should be able to

CO1	Visualize the basic concept of HTML.
CO2	Recognize the elements of HTML.
CO3	Develop CSS code for HTML file
CO4	Create a fully functioning static website.
CO5	Develop the concept of web publishing.

Course Content Details:

Unit No	Topics/Sub-topics
1	<p>INTRODUCTION TO WEB TECHNOLOGY-</p> <p>1.1 Careers in Web Technologies and Job Profile</p> <p>1.2 Web Site Design Principles – How the Website Works?, Five Golden rules of web designing, Analyze your Audience, Build a Web Site Development Team, Filenames and URLs, Directory Structure, Diagram the Site.</p> <p>1.3 Planning Site Navigation – Creating Usable Navigation, Using Text Based Navigation, Using Graphics- Based Navigation.</p> <p>1.4 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</p>

	<p>Web Services: e-Mail, Chat, Video Conferencing, e-learning, e-shopping, e-Reservation, e-Groups, Social Networking</p> <p>Course Outcome-CO1 Teaching Hours-04 Marks -NA</p>
2	<p>HTML4.01: INTRODUCTION TO ELEMENTS OF HTML</p> <p>2.1 Basic structure tags: !DOCTYPE, HTML, HEAD, TITLE, BODY with attributes</p> <p>2.2 Block level tags and horizontal rules: Headings, Paragraphs, Breaks, Divisions, Centered Text, Block Quotes, Preformatted text, Address, HR tag.</p> <p>2.3 Text level tags and special characters: Bold, Italic, Teletype, Underline, Strikethrough, Superscript, Subscript, DIV tag</p> <p>2.4 Working with lists: Ordered Lists, Unordered Lists, Definition Lists, Nested Lists.</p> <p>2.5 URL and Anchor tag: URL: Types of URLs, Absolute URLs, Relative URLs. Anchor Tag: Linking various documents for internal and external links. Marquee Tag.</p> <p>2.6 IMAGES, COLORS AND BACKGROUNDS: IMG tag and different Image formats, colors and backgrounds.</p> <p>Course Outcome-CO1 Teaching Hours – 06 Marks –NA</p>
3	<p>TABLE, FRAME AND FORMS</p> <p>3.1 Working with table: TABLE tag with attributes. TABLE, TR, TH, TD tags, border, cell spacing, cell padding, width, align, bgcolor attributes.</p> <p>3.2 Working with frame: Types of Frames with their attributes. Creating frames: FRAMESET tag – rows, cols attributes, FRAME tag – name, frame border, margin height, margin width, src, resize, scrolling attributes. Use of NOFRAME tag, Frame targeting.</p> <p>3.3 Working 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. Buttons: submit, reset and generalized buttons</p> <p>3.4 Introduction To IFRAME</p> <p>Course Outcome-CO2 Teaching Hours-06 Marks-NA</p>
4	<p>HTML5</p> <p>4.1 Introduction to HTML5</p> <p>4.2 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 Doc Type</p> <p>Course Outcome-CO2 Teaching Hours- 04 Marks-NA</p>
5	<p>INTRODUCTION TO XHTML 1.1</p> <p>5.1 What is XHTML (Extensible HyperText Markup Language)</p> <p>5.2 Difference between HTML & XHTML</p> <p>5.3 Introduction to Doc Types (Strict, Transitional and Mobile)</p> <p>Course Outcome-CO3 Teaching Hours- 02 Marks-NA</p>
6	<p>CASCADING STYLE SHEETS 2.0</p> <p>6.1 Introduction to CSS</p> <p>6.2 Types of Style Sheets (Inline, Internal and External)</p> <p>6.3 Creating Style Sheet</p> <p>6.4 CSS Properties</p> <p>6.5 CSS Styling (Background, Text Format, Controlling Fonts)</p> <p>6.6 Working with block elements and objects</p> <p>6.7 Working with Lists and Tables</p> <p>6.8 CSS Id and Class</p> <p>6.9 Box Model (Introduction, Border properties, Padding Properties, Margin properties)</p>

	6.10 CSS Color 6.11 Creating page Layout and Site Designs. Course Outcome-CO3	Teaching Hours- 04	Marks-NA
7	CASCADING STYLE SHEETS (CSS3.0) 7.1 Introduction to CSS3 7.2 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- 02	Marks-NA
8	PUBLISHING AND MAINTAINING YOUR WEBSITE 8.1 Publishing Your Web Site 8.2 Testing Your Web Site 8.3 Refining and Updating Your Content 8.4 Attracting Notice to Your Web Site 8.5 Create Web Sites and Publishing on free web servers (Zoomla, Yola) Course Outcome-CO4,5	Teaching Hours- 02	Marks-NA

List of experiments: First 7 Experiments are compulsory and any 3 experiments out of 8 to 14. Mini project is compulsory

Sr. No.	Unit No	CO	List of Experiments	Hours
1	1	CO1	1. Study of internal and external devices 2. Formatting word documents and excel sheets, table 3.A accessing internet and study of web pages	4
2	1	CO1	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.) 5. Any other suggested topic by subject teacher.	4
3	2	CO2	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.	4
4	2	CO2	1. Create a web page for implementing different types of Lists 2. Create a web page to link 2.1 A different web page of same site 2.2 A different location on same web page. 2.3 A specific location on different web page in the same site	4
5	3	CO3	Create a web page for applying Background, Text Format, and Controlling Fonts using CSS	4
6	3	CO3	Create a static web page for students Registration form using FORM tag, css	4
7	3	CO5	1. install web server and publish a website on internet 2. Publish a website on internet by acquiring space on free hosting site	4
8	4	CO2	Create a web page for changing colors of links using BODY tag attributes	4

9	4	CO3	create a webpage using IMG tag implementing various attributes, implementing image as a button and setting image as background.	4
10	2	CO2	1. Create a web page link to: 1. An external page of different website 2. To an Email ID 2. Write a tag to change color of links	4
11	6	CO3	Create a web page for demonstration of CSS Applying Internal/External/Inline style	4
12	5	CO3	Create a web page using HTML5 tags (Structure Tags, Form Tags)	4
13	6	CO3	Working with List, HTML elements box, Positioning and Block properties in CSS3.0	4
14	6,7	CO3	Creating one page Layout using CSS.	4
15	8	CO1 CO5	Mini project Creation and Publishing Finalizing Mini Project containing minimum Ten web pages from above practical and Publishing it.	4
Total				60

References/Books:

Sr. No.	Title	Author, Publisher, Edition and Year of publication	ISBN
1	HTML and XHTML – The complete reference	Thomas Powell Tata McGraw Hill, New Delhi	9780070582811
2	Html5 Black Book	Kogent Learning Solutions Inc Dream Tech	978-9351199076
3	Murach's HTML5 and CSS3	Zak Ruvalcaba and Anne Boehm Murach	9781943872268
4	Learning Web Design	Robbins, O'Reilly	9781449337551
5	HTML, XHTML and CSS	Anne Boehm Murach's Publication	9788183335157

E-References:

- 1 <https://www.w3schools.com/html>
- 2 <https://www.tutorialspoint.com/html/index.htm>
- 3 <https://www.programiz.com>
- 4 <https://www.udemy.com>
- 5 <https://www.w3.org/standards/webdesign>
- 6 <https://coder-coder.com/learn-web-development>

CO Vs PO and CO Vs PSO Mapping

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	1	1	3			1	1	2	1	1
CO2	1		1					2	2	1
CO3	2	2			1		1	3	2	1
CO4	1		2					1	2	1
CO5	1	2			2	3	1	2	2	1

Industry Consultation Committee:

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Head of Department
Department of Information Technology

I/C, Curriculum Development Cell

Principal

Programme: Diploma in Information Technology and Computer Engineering (sandwich Pattern)										
Course Code: IT19R202				Course Title: Logic Development using C Programming						
Compulsory/Optional: Compulsory										
Teaching Scheme and Credits				Examination Scheme						
L	P	TU	Total	TH (2 Hrs 30 min)	TS1(1Hr)	TS2(1Hr)	PR	OR	TW	Total
3	4	--	7	60	20	20	50*		25	175

Abbreviations: L-Theory Lecture, P-Practical, TU-Tutorial, TH-Theory Paper, TS1 & TS2-Term Tests, PR-Practical, OR-Oral, TW: Term Work (progressive assessment), * Indicates assessment by External Examiner else internal practical skill test, # indicates Self, on-line learning Mode, @ indicates on line examination. **Note:** For Minimum passing marks under various heads, refer, examination rule AR26. Two practical skill tests are to be conducted. First skill test at mid term and second skill test at the end of the term

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 subject covers 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, OOAD, etc.

Course Outcomes: Students should be able to

CO1	Illustrate the Flowchart and describe an algorithm for a given program.
CO2	Use Conditional and iterative statements in C programs.
CO3	Demonstrate the use of user defined functions to solve real time problems
CO4	Describe C Programs using pointers and to allocate memory using dynamic memory Management functions
CO5	Develop programs using input and output operations
CO6	Use of constants, variables, data types and operators and arrays in programs.

Course Content Details:

Unit No	Topics/Sub-topics
1	<p>Program Logic development</p> <p>1.1 Fundamentals of algorithms: Notion of an algorithm. Pseudo-code conventions like assignment statements and basic control structures.</p> <p>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</p>

	<p>prime numbers.</p> <p>1.3 Flowchart: Draw flowcharts for all algorithms developed</p> <p>Course Outcome-CO1 Teaching Hours – 05 Marks:08(R-02U-02A-04)</p>
2	<p>Basic of C programming</p> <p>2.1 Different approaches in programming: Procedural approach, Object Oriented approach, Event Driven approach.</p> <p>2.2 Structure of C: Header and body, Use of comments, Compilation of a program.</p> <p>2.3 Data 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.</p> <p>2.4 Operators in C: Logical, Arithmetic, Bitwise, Relational, Assignment</p> <p>2.5 Basic Input output: C program structure, Input and output using printf() and scanf(), character I/O. (Programs based on I/O)</p> <p>Course Outcome-CO2, CO5 Teaching Hours – 08 Marks:10(R-02U-03A-05)</p>
3	<p>Control Structures</p> <p>3.1 Decision making: If statement, If else statement, Nesting of if-else</p> <p>3.2 branching: The switch statement</p> <p>3.3 Looping: While loop, Do-while loop, For loop</p> <p>3.4 Ternary operator</p> <p>3.5 Go to statement</p> <p>3.6 Use of break and continue statements</p> <p>Course Outcome-CO6 Teaching Hours – 08 Marks:08(R-02U-02A-04)</p>
4	<p>Arrays and Strings</p> <p>4.1 One dimension, two dimension and multidimensional arrays</p> <p>4.2 Array declaration</p> <p>4.3 Array initialization</p> <p>4.4 calculating the length of an array</p> <p>4.5 Operation on array</p> <p>4.6 String input/output</p> <p>4.7 String operations</p> <p>4.8 Array of strings</p> <p>Course Outcome-CO2, CO5 Teaching Hours – 08 Marks:10(R-02U-04A-04)</p>
5	<p>Functions</p> <p>5.1 Concept of library functions</p> <p>5.2 String functions (comparison, concatenation, length)</p> <p>5.3 User-defined functions</p> <p>5.4 Local & global variables</p> <p>5.5 Parameter passing</p> <p>5.6 Storage classes</p> <p>Course Outcome-CO3 Teaching Hours – 05 Marks:08(R-02U-02A-04)</p>
6	<p>Structure and Union</p> <p>6.1 Basic Concept</p> <p>6.2 Structure declaration, initialization</p> <p>6.3 Structure within structure</p> <p>6.4 Nested Structures</p> <p>6.5 Array of Structure</p>

	6.6 Union Course Outcome-CO5,CO2	Teaching Hours:05	Marks:08(R-02U-02A-04)
7	Pointers 7.1 Basic concept 7.2 Pointer & arrays 7.3 Pointer & func tions 7.4 Pointer arithmetic Course Outcome-CO4	Teaching Hours:06	Marks:08(R-02U-02A-04)

Suggested Specifications Table with Hours and Marks(Theory):

Unit No	Topic Title	Distribution of Theory Marks			
		R Level	U Level	A Level	Total Marks
1	Program Logic development	02	02	04	8
2	Basics of C programming	02	03	05	10
3	Control Structures	02	02	04	8
4	Arrays and Strings	02	04	04	10
5	Functions	02	02	04	8
6	Structure and Union	02	02	04	8
7	Pointers	02	02	04	8
Total		14	17	29	60

Legends: R-Remember; U-Understand; A-Apply and above levels (Bloom's revised Taxonomy).

Notes: This specification table shall be treated as a general guideline and actual distribution of marks may slightly vary from table. But the questions from each topic should be asked as per marks weightage. Numerical questions are to be asked only if specified.

List of experiments: First 7 Experiments are compulsory and any 3 experiments out of 8 to 14. Mini project is compulsory.

Sr. No.	Unit No	CO	List of Experiments	Hours
1	1	CO1	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
2	1,2	CO5	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

3	3	CO2	Program using control structures: Branching a) To find the greatest number among three numbers using nest ed if b) Program that asks user an arithmetic operator („+“, „-“, „*“, or „/“) and two operands and perform the corresponding calculation on the operands using switch case	4
4	3	CO2	Program using control structures: Looping (using loops) a) To find the sum of first n natural numbers where n is entered 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
5	4	CO6	Program to accept values in 2-Dimensional 3 by 3 arrays and display the sum of all the elements.	4
6	5	CO3	Program using function (call by value) a) to swap two numbers b) to find square of a given number	4
7	7	CO4	Program using pointer.	4
8	4	CO6 CO3	Program using array of strings.	4
9	1.2.3	CO2	Program using control structures: Decision making a) To find whether the input number is even or odd. b) To find whether the number entered is positive or negative.	4
10	5	CO6 CO3	Program to perform different operations on string.	4
11	5	CO3	Program using function (call by value) a) to swap two numbers b) to find square of a given number	4
12	6	CO4 CO6	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
13	7	CO6	Program to compute the sum of all elements stored in an array using pointers	4
14	7	CO4	Program using pointer Arithmetic.	4
15	All	CO3	Mini Project	4
Total				60

E-References:

- 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>

References/Books:

Sr. No.	Title	Author, Publisher, Edition and Year of publication	ISBN
1	The C Programming language	Brian W. Kernighan, Dennis Ritchie Prentice Hall	978-0131103627
2	Programming in ANSIC	E. Balgurusamy The Mc-Graw Hill	978-9339219666
3	Let us C	Yashawant Kanetkar BPB Publications	978-9387284494

COVsPOandCOVsPSOMapping(Information Technology)

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	1	1	3			1	1	3	1	1
CO2	1		1	2				3	2	1
CO3	2	2			1		1	3	3	
CO4	1		2	2		2		3	2	1
CO5		2		3	2	3	1	2	2	
CO6	1	3	1			2		3		1

COVsPOandCOVsPSOMapping(Computer Engineering)

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	1	1	3			1	1	3	2	
CO2	1		1	2				3	2	
CO3	2	2			1		1	3	3	2
CO4	1		2	2		2		3	2	1
CO5		2		3	2	3	1	3	2	3
CO6	1	3	1			2		3	1	1

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