GOVERNMENT POLYTECHNIC, PUNE

'120 – NEP' SCHEME

PROGRAMME	**DIPLOMA IN CE/EE/ET/ME/MT/CM/IT**
PROGRAMME CODE	**01/02/03/04/05/06/07**
COURSE TITLE	**APPLIED MATHEMATICS**
COURSE CODE	**SC11207**
PREREQUISITE COURSE CODE & TITLE	**BASIC MATHEMATICS (SC11205/SC11206)**

I. LEARNING & ASSESSMENT SCHEME

Course Code	Course Title	Course Type	Learning Scheme					Credits	Assessment Scheme												
			Actual Contact Hrs./Week			SLH	NLH		Paper Duration	Theory				Based on LL &TSL				Based on SL		Total Marks
														Practical							
			CL	TL	LL					FA-TH	SA-TH	Total		FA-PR		SA-PR		SLA		
										Max	Max	Max	Min	Max	Min	Max	Min	Max	Min	
SC11207	APPLIED MATHEMATICS	AEC	3	1	-	-	4	2	3	30	70	100	40	-	-	-	-	-	-	100

Total IKS Hrs for Term: 6 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, **IKS** – Indian Knowledge System, **SLA**- Self Learning Assessment

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

Note:

FA-TH represents an average of two class tests of 30 marks each conducted during the semester.

1. If a candidate is not securing minimum passing marks in **FA-PR** (Formative Assessment - Practical) of any course, then the candidate shall be declared as **'Detained'** in that semester.
2. If a candidate does not secure minimum passing marks in SLA (Self Learning Assessment) of any course, then the candidate shall be declared as **'fail'** and will have to repeat and resubmit SLA work.
3. **Notional learning hours** for the semester are **(CL + LL + TL + SL) hrs. * 15 Weeks**
4. **1 credit** is equivalent to **30 Notional hours**.
5. * Self-learning hours shall not be reflected in the Timetable.
6. *Self-learning includes micro-projects/assignments/other activities.

II. RATIONALE:

An Applied Mathematics course, covering integration, definite integration, differential equations, numerical methods, and probability distribution, equips engineering students with essential problem-solving tools. It enables them to model and analyze complex systems, make informed decisions and address real-world engineering challenges effectively.

III. COURSE-LEVEL LEARNING OUTCOMES(CO'S)

Students will be able to achieve and demonstrate the following CO's on completion of course-based learning

CO1 - Apply Solve the broad-based engineering problems of integration using suitable methods.
CO2 - Use definite integration to solve given engineering-related problems.
CO3 - Apply the concept of differential equations to find the solutions of given engineering problems.
CO4 - Employ numerical methods to solve programme-specific problems.
CO5 - Use probability distributions to solve elementary engineering problems.

IV. THEORY LEARNING OUTCOMES AND ALIGNED COURSE CONTENT

Sr. No	Theory Learning Outcomes (TLO'S) aligned to CO's.	Learning content mapped with TLO's.	Suggested Learning Pedagogies	Relevant COs
UNIT-I Indefinite Integration (CL Hrs-15, Marks-20)				
1.	TLO1.1 Solve the given simple problem(s) based on rules of integration. TLO1.2 Evaluate the given simple integral(s) using the substitution method. TLO1.3 Integrate given simple functions using the integration by parts TLO1.4 Solve the given simple integral by partial fractions	**Unit - I Indefinite Integration** 1.1 Simple Integration: Rules of integration and integration of standard functions 1.2 Integration by substitution. 1.3 Integration by parts. 1.4 Integration by partial fractions (only linear non-repeated factors at the denominator of the proper fraction).	Improved Lecture Demonstration Chalk-Board Presentations Video Demonstrations	**CO1**
Unit - II Definite Integration (CL Hrs-08, Marks-12)				
2.	TLO2.1 Solve given examples based on Definite Integration. TLO2.2 Use properties of definite integration to solve given problems	Unit - II Definite Integration 2.1 Definite Integration: Definition, and rules of definite integration with simple examples. 2.2 Properties of definite integral (without proof) and simple examples	Video Simulation Chalk-Board Improved Lecture Presentations	**CO2**
Unit - III Differential Equation (CL Hrs-08, Marks-12)				
3.	TLO3.1 Find the order and degree of given differential equations. TLO3.2 Form simple differential equations for given elementary engineering problems. TLO3.3 Solve given differential equations using the methods of Variable separable and Exact Differential Equations (Introduce the concept of a partial differential equation). TLO3.4 Solve the given Linear Differential Equation.	**Unit - III Differential Equation** 3.1 Concept of Differential Equation. 3.2 Order, degree and formation of Differential equations **3.3** Methods of solving differential equations: Variable separable form, Exact Differential Equation, Linear Differential Equation.	Video Demonstrations Presentations Chalk-Board Improved Lecture Flipped Classroom	**CO3**

Sr. No	Theory Learning Outcomes (TLO'S) aligned to CO's.	Learning content mapped with TLO's.	Suggested Learning Pedagogies	Relevant COs
Unit - IV Numerical Methods (CL Hrs-06, Marks-14)				
4.	TLO4.1 Find roots of algebraic equations by using appropriate methods. TLO4.2 Solve the system of equations in three unknowns by iterative methods TLO4.3 Solve problems using the Bakhshali iterative method for finding approximate squareroots. (IKS)	**Unit - IV Numerical Methods** 4.1 Solution of algebraic equations: Bisection method, Regula falsi method and Newton–Raphson method. 4.2 Solution of simultaneous equations containing three Unknowns by iterative methods: Gauss-Seidel and Jacobi's method. 4.3 Bakhshali iterative method for finding the approximate square root. (IKS)		**CO4**
Unit - V Probability Distribution (CL Hrs-08, Marks-12)				
5.	TLO5.1 Solve given problems based on repeated trials using Binomial distribution TLO5.2 Solve given problems when the number oftrials is large and the probability is very small. TLO5.3 Utilize the concept of normal distribution to solve related engineering problems	**Unit - V Probability Distribution** 5.1 Binomial distribution. 5.2 Poisson's distribution. 5.3 Normal distribution.		**CO5**

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 1.1 Solve simple problems of Integration by substitution	*Integration by substitution	1	CO1
2	LLO 2.1 Solve integration using parts	*Integration by parts	1	CO1
3	LLO 3.1 Solve integration by partial fractions(only linear non-repeated factors at the denominator of the proper fraction).	Integration by partial fractions.	1	CO1
4	LLO 4.1 Solve examples on Definite Integral based on given methods.	Definite Integral based on given methods.	1	CO2
5	LLO 5.1 Solve problems on properties of definite integral.	*Properties of definite integral	1	CO2
6	LLO 6.1 Solve given problems for finding the area under the curve and volume of revolution.	* #Area under the curve and volume of revolution.(Only for Civil, Mechanical Metallurgical Engineering)	1	CO2

Sr. No	Practical/Tutorial/Laboratory Learning Outcome (LLO)	Laboratory Experiment / Practical Titles /Tutorial Titles	Number of hrs.	Relevant COs
7	LLO 7.1 Solve examples on meanvalue and root mean square value.	* #Mean value and root mean square value. (Only for Information Technology, Computer, Electrical and Electronics Engineering)	1	CO2
8	LLO 8.1 Solve examples on order, degree and formation of differential equations.	Order, degree and formation of the differentialequation.	1	CO3
9	LLO 9.1 Solve the first-order first-degree differential equation using the variable separable method.	Variable separable method.	1	CO3
10	LLO 10.1 Solve the first-order first-degree differential equation using exact differential equation and linear differential equation.	*Exact differential equation and linear differential equation.	1	CO3
11	LLO 11.1 Solve engineering application problems using differentialequations.	*Applications of differential equations.(Take programme specific problems)	1	CO3
12	LLO 12.1 Solve problems on the Bisection method and Regula falsi method.	*Bisection method and Regula falsi method.	1	CO4
13	LLO 13.1 Solve problems on the Newton-Raphson method.	Newton-Raphson method.	1	CO4
14	LLO 14.1 Solve problems on Jacobi's method and Gauss-Seidel Method.	Jacobi's method and Gauss-Seidel Method.	1	CO4
15	LLO 15.1 Use Bakhshali iterative methods for finding the approximate value of the square root. (IKS)	*Bakhshali iterative methods for findingthe approximate value of square root. (IKS)	1	CO4
16	LLO 16.1 Solve engineering problems using Binomial distribution.	*Binomial Distribution	1	CO5
17	LLO 17.1 Solve engineering problems using Poisson distribution.	*Poisson Distribution	1	CO5
18	LLO 18.1 Solve engineering problems using Normal distribution.	Normal Distribution	1	CO5
19	LLO 19.1 Solve problems on Laplace transform and properties of Laplace transform.	* # Laplace transform and properties of Laplacetransform.(Only for Electrical and Electronics Engineering)	1	CO2
20	LLO 20.1 Solve problems on Inverse Laplace transform and properties of Inverse Laplace transform.	* # Inverse Laplace transform and properties ofInverse Laplace transform.(Only for Electrical and Electronics Engineering)	1	CO2

Note: Out of the above suggestive LLOs –

1. '*' Marked Practicals (LLOs) Are mandatory.
2. A minimum of 80% of the above list of lab experiments are to be performed.
3. A judicial mix of LLOs is to be performed to achieve the desired outcomes

VI. SUGGESTED MICROPROJECT/ASSIGNMENT/ACTIVITIES FOR SPECIFIC LEARNING/SKILLS DEVELOPMENT (SELF-LEARNING)

Micro-project

NA

Assignment

NA

VII. LABORATORY EQUIPMENT/INSTRUMENTS/TOOLS/SOFTWARE REQUIRED

Sr. No	EquipmentNamewithBroadSpecifications	Relevant LLO Number
1	Open-source software like SageMaths, MATHS3D, GeoGebra, Graph, DPLOT and Graphing Calculator (GraphEq2.13), and ORANGE can be used for Algebra, Calculus, Trigonometry and Statistics respectively.	All

VIII. SUGGESTED FOR WEIGHTAGE TO LEARNING EFFORTS & ASSESSMENT PURPOSE (Specification Table)

Sr. No	Unit	Unit Title	Aligned COs	Learning Hours	R-Level	U-Level	A-Level	Total Marks
1	I	Indefinite Integration	CO1	15	2	6	12	20
2	II	Definite Integration	CO2	8	2	4	6	12
3	III	Differential Equation	CO3	8	2	4	6	12
4	IV	Numerical Methods	CO4	6	2	4	8	14
5	V	Probability Distribution	CO5	8	2	4	6	12
Grand Total				**45**	**10**	**22**	**38**	**70**

IX. ASSESSMENT METHODOLOGIES/TOOLS

Formative assessment (Assessment for Learning)	Summative Assessment (Assessment of Learning)
1. Tests	1. End Term Exam

X. SUGGESTED 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	1	-	-	1	-	1			
CO2	3	1	-	-	1	-	1			
CO3	3	2	1	1	1	1	1			
CO4	2	3	2	2	1	1	1			
CO5	2	2	1	1	2	1	2			

Legends:-High:03, **Medium:**02, **Low:**01, **No Mapping:**- *PSOs are to be formulated at the institute level.

XI.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 textbook 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	S. S. Sastry	Introductory Methods of Numerical Analysis	PHI Learning Private Limited, New Delhi. ISBN-978-81-203-4592-8
6	C. S. Seshadri	Studies in the History of Indian Mathematics	Hindustan Book Agency (India) P 19 Green Park Extension New Delhi. ISBN 978-93-80250-06-9
7	Marvin L. Bittinger DavidJ.Ellenbogen Scott A. Surgent	Calculus and Its Applications	Addison-Wesley 10th Edition ISBN-13: 978-0-321-69433-1
8	Gareth James, Daniela Witten,Trevor Hastie RobertandTibshirani	An Introduction to StatisticalLearning with Applications in R	Springer New York Heidelberg Dordrecht LondonISBN 978-1-4614-7137-0 ISBN 978-1-4614-7138-7 (eBook)

XIII. LEARNING WEBSITES & PORTALS

Sr. No	Link/Portal	Description
1	http://nptel.ac.in/courses/106102064/1	Online Learning Initiatives by IITs and IISc
2	https://www.khanacademy.org/math?gclid=CNqHuabCys4CFdOJaddHo Pig	Concept of Mathematics through video lectures andnotes
3	https://www.wolframalpha.com/	Solving mathematical problems, performing calculations, and visualizing mathematical concepts.
4	http://www.sosmath.com/	Free resources and tutorials
5	http://mathworld.wolfram.com/	Extensive math encyclopedia with detailed explanationsof mathematical concepts
6	https://www.mathsisfun.com/	Explanations and interactive lessons covering variousmath topics, from basic arithmetic to advanced
7	http://tutorial.math.lamar.edu/	The comprehensive set of notes and tutorials covers awide range of mathematics topics.
8	https://www.purplemath.com/	Purplemath is a great resource for students seeking helpwith algebra and other foundational mathematics to improve learning.
9	https://www.brilliant.org/	Interactive Learning in Mathematics

Sr. No	Link/Portal	Description
10	https://www.edx.org/	Offers a variety of courses
11	https://www.coursera.org/	Coursera offers online courses in applied mathematicsfrom universities and institutions around the globe.
12	https://ocw.mit.edu/index.htm	The Massachusetts Institute of Technology (MIT) offersfree access to course materials for a wide range of mathematical courses.

Name & Signature:

Shri. Vitthal B. Shinde
Lecturer in Mathematics

Shri. Sachin B. Yede
Lecturer in Mathematics

(Course Experts)

Name & Signature:	Name & Signature:
Dr. D. N. Rewadkar (Programme Head)	**Shri. S. B. Kulkarni** (CDC In-charge)

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GOVERNMENT POLYTECHNIC, PUNE

'120 – NEP' SCHEME

PROGRAMME	**DIPLOMA IN IT / CM**
PROGRAMME CODE	01/02/03/04/05/**06/07**/08
COURSE TITLE	**BASIC ELECTRICAL ENGINEERING**
COURSE CODE	**EE21204**
PREREQUISITE COURSE CODE & TITLE	**NA**

I. LEARNING & ASSESSMENT SCHEME

Course Code	Course Title	Course Type	Learning Scheme					Credits	Assessment Scheme											
			Actual Contact Hrs./Week			SLH	NLH		Paper Duration in Hrs.	Theory				Based on LL &TSL				Based onSL		Total Marks
														Practical						
			CL	TL	LL					FA-TH	SA-TH	Total		FA-PR		SA-PR		SLA		
										Max	Max	Max	Min	Max	Min	Max	Min	Max	Min	
EE21204	**BASIC ELECTRICAL ENGINEERING**	**AEC**	**2**	**-**	**2**	**2**	**6**	**3**	**1**	**15**	**35*#**	**50**	**20**	**25**	**10**	**25@**	**10**	**25**	**10**	**125**

Total IKS Hrs for Term: 0 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, **IKS** – Indian Knowledge System, **SLA**- Self Learning Assessment

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

Note:

FA-TH represents an average of two class tests of 30 marks each conducted during the semester.

1. If a candidate is not securing minimum passing marks in **FA-PR** (Formative Assessment - Practical) of any course, thenthe candidate shall be declared as **'Detained'** in that semester.
2. If a candidate does not secure minimum passing marks in SLA (Self Learning Assessment) of any course, then the candidate shallbe declared as **'fail'** and will have to repeat and resubmit SLA work.
3. **Notional learning hours** for the semester are **(CL + LL + TL + SL) hrs. * 15 Weeks**
4. **1 credit** is equivalent to **30 Notional hours**.
5. * Self-learning hours shall not be reflected in the Timetable.
6. * Self-learning includes micro-projects/assignments/other activities.

II. RATIONALE:

Diploma engineers have to deal with electrical systems. The course is designed with basic information to help students to apply basic concepts, rules, components and safety of electrical engineering and perform practical thereof. The basic concepts of electrical engineering in this course will be very useful to students in during field practicing in their technical areas.

COURSE-LEVEL LEARNING OUTCOMES (CO'S)

Students will be able to achieve & demonstrate the following CO's on completion of course-based learning

CO1: Measure various electrical quantities and parameters.

CO2: Use different electrical machines by making connections.

CO3: Use electrical safety devices in electrical circuits.

III. THEORY LEARNING OUTCOMES AND ALIGNED COURSE CONTENT

Sr. No	Theory Learning Outcomes (TLO'S) aligned to CO's.	Learning content mapped with TLO's.	Suggested Learning Pedagogies	Relevant COs
UNIT-I BASIC ELECTRICAL FUNDAMENTALS (CL Hrs-12, Marks-15)				
1.	**TLO 1.1** Apply Faraday's law of electromagnetic induction and Fleming's right hand rule, Lenz's law for induced emf to find its magnitude and direction. **TLO 1.2** Differentiate alternating current (AC) and direct current (DC) **TLO 1.3** Explain parameters of single phase AC sinusoidal waveform **TLO 1.4** Describe the silent features of period, frequency, angular frequency, RMS **TLO 1.5** Calculate the power in three phase and single phase circuit. .	**1.1** Electric and magnetic circuits. **1.2** Series and parallel magnetic circuits. **1.3** Faraday's laws of electromagnetic induction, Fleming's right hand rule, Lenz's law **1.4** Dynamically and statically induced emf, self and mutual inductance **1.5** AC and DC quantity, advantages of AC over DC supply. **1.6** Single phase AC, sinusoidal AC wave: instantaneous value, cycle, amplitude, time period, frequency, angular frequency, RMS value, Average value for sinusoidal waveform, form factor, peak factor. **1.7** Power in single phase circuit- Active, Reactive and Apparent **1.8** Types of three phase supply system, Advantages of three phase supply system over single three phase supply system, Relationship between line and phase values for star and delta connected system. **1.9** Power in three phase circuit **2.0** Numerical on above topic	Chalk-Board Presentations Model Demonstrations Video	**CO1**
UNIT-II ELECTRICAL MACHINES (CL Hrs-12, Marks-12)				
2	**TLO 2.1** Explain the working principle of the given type of transformer. **TLO 2.2** Distinguish the construction of the given type of transformer. **TLO 2.3** Explain working principle and operation of Capacitor star capacitor run single phase induction motor. **TLO 2.4** Explain working principle and operation of Universal motor. **TLO 2.5** Describe the procedure to connect stepper motor for the given application with sketches.	**2.1** Transformer: Types of transformers, Difference between core type and shell type transformer, Working principle, construction, emf equation, Voltage ratio, current ratio and transformation ratio, efficiency and regulation. **2.2** Capacitor star capacitor run single phase induction motor- Working principle, Reversal of rotation and Applications **2.3** Universal motor: Working principle, Reversal of rotation and Applications **2.4** Stepper motor: Working principle, Types and Applications	Chalk-Board Presentations Model Demonstrations Video	**CO2**

UNIT-III ELECTRICAL SAFETY AND PROTECTIVE DEVICES (CL Hrs-06, Marks- 08)				
	TLO 3.1 Describe the characteristics and features of different protective devices **TLO 3.2** Select the relevant protective device for the given application. **TLO 3.3** Select the suitable switchgear for the given situation with justification. **TLO 3.4** Select the I.E rule related to be applied for given type of earthing.	**3.1** Fuse: Operation, types and applications **3.2** MCB and ELCB/RCB: Operation and general specifications **3.3** Earthing: Types, Importance of earthing, factors affecting earthing resistance. **3.4** Measures for reducing earth resistance, I.E rules relevant to earthing.	Chalk-Board Presentations Model Demonstrations Video	**CO3**

IV. LABORATORY LEARNING OUTCOME AND ALIGNED PRACTICAL/TUTORIAL EXPERIMENTS.

Sr. No	Practical/Tutorial/Laboratory Learning Outcome (LLO)	Laboratory Experiment / Practical Titles /Tutorial Titles	Numberof hrs.	Relevant COs
1	**LLO 1** Use electrical meters for measurement of electrical parameters	Measure the parameters of simple electrical circuit. (e.g. current, voltage, power,).	**2**	**CO1***
Any 11 of the following				
2	**LLO 2** Check the AC waveform parameters	Measure frequency, time period, rms value, peak value of sinusoidal AC waveform for resistive and inductive circuit using CRO.	**2**	**CO1**
3	**LLO 3** Find the phase voltage and line current relation in star connected load.	Measure the line voltage, phase voltage and phase current and line current in three phase star connected balanced load.	**2**	**CO1**
4	**LLO 4** Find the phase voltage and line current relation in delta connected load.	Measure the line voltage, phase voltage and phase current and line current in three phase delta connected balanced load	**2**	**CO1**
5	**LLO 5** Determine the transformation ratio	Determination of the voltage and current ratio of single phase transformer.	**2**	**CO2**
6	**LLO 6** Study of universal motor / single phase induction motor.	Study the reversal of rotation of universal motor / single phase induction motor.	**2**	**CO2**
7	**LLO 7** Study of stepper motor operation.	Study the operation of stepper motor for various speed rotation.	**2**	**CO2**
8	**LLO 8** Use multimeter for measurement of AC / DC quantities	Use of multimeter for measurement of voltage, current (AC, DC), resistance and continuity of the given electrical circuit	**2**	**CO3**

9	**LLO 9** Connection of fuses in electrical circuit.	Connect fuse in electrical circuit and check its operation at normal and abnormal conditions	**2**	**CO3**
10	**LLO 10** Connection of MCB in electrical circuit	Connect MCB in electrical circuit and check its operation at normal and abnormal conditions.	**2**	**CO3**
11	**LLO 11** Connection of ELCB in electrical circuit.	Connect ELCB in electrical circuit and check its operation at normal and abnormal conditions.	**2**	**CO3**
12	**LLO 12** Measurement of earth resistance.	Use of earth tester for measurement of earthing resistance of a installed earthing of laboratory.	**2**	**CO3**
13	**LLO 13** Determine efficiency and regulation of single phase transformer by direct loading.	Determine the efficiency and regulation of single phase transformer by direct loading.	**2**	**CO2**

V. SUGGESTED MICRO PROJECT/ASSIGNMENT/ACTIVITIES FOR SPECIFIC LEARNING/SKILLS DEVELOPMENT (SELF-LEARNING)

A suggested list is given here. A similar micro-project/ Assignment could be added by the concerned faculty

Assignment

a. Numerical based on calculation of various parameters of given magnetic circuit.
b. Numerical based on calculation of self-inductance.
c. Numerical based on calculation of mutual inductance
d. Numerical on AC fundamental to calculate various parameters.
e. Numerical on 3 ph star delta circuits.
f. Working principle & construction of transformer & various motors.
g. Selection of relevant safety devices for relevant applications.
h. Few other similar to above as per the need .

Suggested Student Activity

a. Illustrate situations wherein electrical energy is required.
b. Prepare models in the form of mini-projects.
c. Prepare power point presentation related to basics of electrical engineering.
d. Prepare a chart of electric circuit elements and relevant industrial application.

Micro project

a. Types of Electrical equipment: Prepare chart showing real-life examples indicating various types of electrical equipment.
b. Prepare chart /model of magnetic circuit & electromagnetic induction.
c. Prepare a chart for transformer various types of motors showing construction and applications.

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Note :

"These are the just suggestive topics. Faculty must design Microproject/Activities/ Assignments based on Course Outcome requirements".

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VI. LABORATORY EQUIPMENT/INSTRUMENTS/TOOLS/SOFTWARE REQUIRED

Sr.No	Equipment Name with Broad Specifications	Relevant LLO Number
1	Single Phase Transformer: 1kVA. single-phase. 230/150 V, air cooled -	5,13
2	Single phase auto transformer (Dimmer stat) 0-230 volt 2/5Amp	5,13
3	CRO-20 MHz Dual channel	2
4	Three phase Auto Transformer-10/5 kVA. Input 415 V ,3 phase. 50 Hz. Output (0-415 V, 10/20 A	3 & 4
5	Rheostat (0-500 Ohm, 1.2A), Nichrome wire wound rheostat on epoxy resin or class F insulating tube with two fixed and one sliding contact.	1
6	Rheostat (0 to 100Ω, 5A), Nichrome wire wound rheostat on epoxy resin or class F insulating tube with two fixed and one sliding contact.	8
7	Dc Ammeter range (0-5-10A). Portable analog PMMC type as per relevant BIS	1 & 8
8	D. C. Supply. A 230 V dc supply (with inbuilt rectifier to convert ac to dc)	1 & 8
9	DC Voltmeter Range (0-150- 300V). 1, Portable analog PMMC type as per relevant BIS	1 & 8
10	AC Voltmeter Range (0-150- 300 -600 V). Portable analog MI tyre as per relevant BIS	2, 3, 4, 5, 6, 7, 8, 9 & 10, 11
11	Lamp Bank load (0-230 V , 0-10A)	1,3,4,5,8,9& 10, 11
12	Single phase Universal motor- 1	6
13	Earth tester analog /digital type	12
14	Variable DC power supply 0-30V, 2.A SC protection, display for voltage and current.	1
15	Digital Multimeter – 3 ½ digit	1, 2, 3, 4, 5, 8, 9, 10 & 11

VII. SUGGESTED FOR WEIGHTAGE TO LEARNING EFFORTS & ASSESSMENT PURPOSE (Specification Table)

Sr. No	Unit	Unit Title	Aligned COs	Learning Hours	R-Level	U-Level	A-Level	Total Marks
1	I	BASIC ELECTRICAL FUNDAMENTALS	CO1	12	4	5	6	15
2	II	ELECTRICAL MACHINES	CO2	12	4	4	4	12
3	III	ELECTRICAL SAFETY AND PROTECTIVE DEVICES	CO3	06	2	2	4	08
		Grand Total		**30**	**10**	**11**	**14**	**35**

VIII. ASSESSMENT METHODOLOGIES/TOOLS

Formative assessment (Assessment for Learning)	Summative Assessment (Assessment of Learning)
1. Tests 2. Rubrics for COs 3. Assignment 4. Midterm Exam 5. Self-Learning 6. Term Work 7. Seminar/Presentation	1. End Term Exam 2. Micro-project 3. Tutorial Performance

IX. SUGGESTED 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/ Developmentof 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	-	-
CO2	2	1	-	1	-	-	1	1	-	-
CO3	2	-	-	3		-	3	1	-	-

X. SUGGESTED LEARNING MATERIALS/BOOKS

Sr.No	Author	Title	Publisher
1	B.L. Theraja	Electrical Technology Vol. I	S. Chand Publication, Delhi ISBN-9788121924405
2	V.N. Mittle	Basic Electrical Engineering	Tata McGraw Hill Publishing Company Ltd., New Delhi. ISBN- 0074516329, 9780074516324
3	Edward Hughes	Electrical Technology	Low Price Edition ISBN-9780582405196
4	H. Cotton	Electrical Technology	CBS Publishers & Distributors ISBN-8123909284, 9788123909288
5	S. B. Lal Saksena and Kaustuv Dasgupta	Fundamentals of Electrical Engineering Part-1	Cambridge University Press, New Delhi ISBN : 9781107464353

XI. LEARNING WEBSITES & PORTALS

Sr.No	Link/Portal	Description
1.	https://www.electrical4u.com/electrical-engineering-articles/basic-electrical/	Basic Electrical Parameters
2.	https://www.slideshare.net/ChetanPatil396/basic-electrical-parameters-basic-electrical-engineering	Basic Electrical Parameters
3.	https://www.britannica.com/science	Magnetic Circuits
4.	https://en.wikipedia.org/wiki/Magnetic_circuit	Magnetic Circuits
5.	https://en.wikipedia.org/wiki/Electromagnetic_induction	Electromagnetic Induction
6.	https://youtu.be/XT-UmPviH64?si=MLIZBB5BgOA2SWBk	Electromagnetic Induction
7.	https://youtu.be/M-QfX2fvpp4?si=xpZDAiX3-_7xrnnr	Basics Magnetic Circuits
8.	https://archive.nptel.ac.in/courses/117/106/117106108/	Basic Electrical Circuits

Name & Signature:

Smt. S.P. Phadnaik
Lecturer in Electrical Engineering

Smt. M. H. Bilgi
Lecturer in Electrical Engineering

(Course Experts)

Name & Signature:	Name & Signature:
Dr.D N Rewadkar (Programme Head)	**Shri.S.B.Kulkarni** (CDC In-charge)

GOVERNMENT POLYTECHNIC, PUNE

'120 – NEP' SCHEME

PROGRAMME	**DIPLOMA IN COMPUTER/IT**
PROGRAMME CODE	01/02/03/04/05/**06/07**/08
COURSE TITLE	**BASIC ELECTRONICS ENGINEERING**
COURSE CODE	**ET21203**
PREREQUISITE COURSE CODE & TITLE	**NA**

I. LEARNING & ASSESSMENT SCHEME

Course Code	Course Title	Course Type	Learning Scheme					Credits	Assessment Scheme											
			Actual Contact Hrs./Week			SLH	NLH		Paper Duration	Theory				Based on LL &TSL				Based on SL		Total Marks
														Practical						
			CL	TL	LL					FA-TH	SA-TH	Total		FA-PR		SA-PR		SLA		
										Max	Max	Max	Min	Max	Min	Max	Min	Max	Min	
ET21203	BASIC ELECTRONICS ENGINEERING	AEC	2	-	2	2	6	3	2	15	35*#	50	20	25	10	25@	10	25	10	125

Total IKS Hrs for Term: 0 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, **IKS** – Indian Knowledge System, **SLA**- Self Learning Assessment

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

Note:

FA-TH represents an average of two class tests of 15 marks each conducted during the semester.

1. If a candidate is not securing minimum passing marks in **FA-PR** (Formative Assessment - Practical) of any course, then the candidate shall be declared as **'Detained'** in that semester.
2. If a candidate does not secure minimum passing marks in SLA (Self Learning Assessment) of any course, then the candidate shall be declared as **'fail'** and will have to repeat and resubmit SLA work.
3. **Notional learning hours** for the semester are **(CL + LL + TL + SL) hrs. * 15 Weeks**
4. **1 credit** is equivalent to **30 Notional hours**.
5. * Self-learning hours shall not be reflected in the Timetable.
6. *Self-learning includes micro-projects/assignments/other activities.

I. RATIONALE:

Diploma engineers have to deal with electronic system. The course is designed with basic information to help student to apply basic concepts, rules, components and safety of electronic engineering and perform practical's thereof. The basic concepts of electronics engineering in this course will be very useful to students in during field practicing in their technical area.

II. COURSE -LEVEL LEARNING OUTCOMES (CO'S)

Students will be able to achieve & demonstrate the following CO**s** on completion of course-based learning

CO1: Use relevant diode in different electronic circuits.
CO2: Use BJT and FET in various electronic circuits.
CO3: Use various types of sensors and transducers.

III. THEORY LEARNING OUTCOMES AND ALIGNED COURSE CONTENT

Sr. No	Theory Learning Outcomes (TLO'S) aligned to CO's.	Learning content mapped with TLO's.	Suggested Learning Pedagogies	Relevant Cos
UNIT I: DIODES AND THEIR APPLICATIONS (CL Hrs-10, Marks-12)				
1.	**TLO1.1:** Draw VI Characteristics of PN junction Diode. TLO1.2: Measure Zener voltage on VI Characteristics of Zener diode. **TLO1.2:** Explain the Working Principle of LED. **TLO1.3:** Describe Working of given type of Rectifier. **TLO1.4:** Explain the Working Principle of Regulated Power Supply. **TLO1.5:** Explain the Block diagram of ONLINE and OFFLINE UPS	**1.1**P-N Junction Diode: Construction, Working, Symbol, Applications **1.2** Zener Diode: Construction, Working, Symbol, Applications **1.3** LED: Working, Symbol, Applications **1.4** Rectifiers: Circuit Diagram, Working and Waveforms of Half Wave, Centre tapped, Bridge rectifiers. Ripple factor, Efficiency **1.5** Filters: Need of Filters, Circuit diagram, Working of C,L,CLC filters. **1.6** Block diagram of Regulated Power Supply. **1.7** UPS: Block diagram of ONLINE and OFFLINE UPS	Chalk-Board Demonstration Assignment.	**CO1**

UNIT-II: TRANSISTOR (CL Hrs-12, Marks-13)				
2	**TLO2.1:** Explain Working Principle of NPN transistor **TLO2.2:** Draw Input and Output Characteristics in CE configuration **TLO2.3:** Explain Transistor as an Amplifier. **TLO2.4:** Describe Working of n-channel JFET **TLO2.5:** Draw and Explain Drain and Transfer characteristic of n-channel JFET	**2.1** BJT: Types, Symbol, Construction, Working Principle of NPN transistor. **2.2** Transistor Configurations: CB, CE, CC **2.3** Transistor Characteristics in CE configuration. **2.4** Transistor Parameters α and β, Relation between them. **2.5** Circuit Diagram, Working of CE as an Amplifier. **2.6** Transistor as a Switch. **2.7** Types, Symbol of FET, Construction, Working Principle of n-channel JFET **2.8** Drain and Transfer characteristics of n-channel JFET	Chalk-Board Demonstration Assignment.	**CO2**

UNIT-III :TRANSDUCERS AND SENSORS (CL Hrs-08, Marks-10)				
3	**TLO3.1:** Select relevant Transducer for given application. **TLO3.2:** Compare and Classify Sensors and transducers with example. **TLO3.2:** Explain Working principle of given Sensor. **TLO3.3:** Explain Working principle of given Transducer	**3.1** Basic Definition, Difference, Classification of Transducers and Sensors **3.2** Working Principle of Thermistor, RTD, Phototransistor sensors. **3.3** Transducers: Need of Transducer, Types of Transducers, Active, Passive, Analog, Digital **3.4** Working Principle of LVDT, LDR, Thermocouple. **3.5** Selection Criteria for Transducer.	Chalk-Board Demonstration Assignment.	**CO3**

a. 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	**LLO1.1** Check the Forword and Reverse Bias V-I characteristics of PN junction diode.	*Connect PN Junction in circuit and test its operation in Forward and Reverse bias mode	2	CO1
2	**LLO1.2**Check the Forword and Reverse Bias V-I characteristics of Zener diode.	*Connect Zener diode in circuit and test its operation in Forward and Reverse bias mode	2	CO1
3	**LLO1.3** Check waveforms of Half wave, FWR, Bridge Rectifier	*Observe Waveforms of Half wave, FWR, Bridge Rectifier with and without filter.	2	CO1
4	**LLO1.4** Check the operation of UPS under ONLINE and OFFLINE mode.	Make the input output connections and measure output voltage of UPS under ONLINE and OFFLINE mode.	2	CO1
5	**LLO2.1**Check the operation of NPN transistor under CE configuration.	*Test Input and Output Characteristics of CE configuration.	2	CO2
6	**LLO2.1**Check the operation of transistor as a Switch.	*Test the operation of Transistor as switch	2	CO2
7	**LLO2.2** Check the operation of transistor as an amplifier.	*Test the operation of Transistor as an amplifier.	2	CO2
8	**LLO2.3**Check the operation of NPN transistor under CB configuration.	Test Input and Output Characteristics of CB configuration	2	CO2
9	**LLO2.4** Use BFW10 FET for drain and Transfer characteristics.	*Test the operation of FET	2	CO2
10	**LLO3.1** Use RTD(PT100) for measurement of Temperature	*Measure Temperature of Liquid using RTD	2	CO3
11	**LLO3.2**Use Active Transducer for measurement of Temperature	*Measure Temperature of water using Thermocouple	2	CO3

12	**LLO3.3**Use of photoelectric sensor to sense motion	*Check motion of given object using photoelectric sensor	2	CO3
13	**LLO3.3**Use passive transducer for measurement of resistance	*Measure resistance of LDR in varying intensity of light.	2	CO3
14	**LLO3.3**Use passive transducer for measurement of displacement	Measure displacement using LVDT	2	CO3
15	**LLO3.3**Use passive transducer for measurement of displacement	*Measure displacement using potentiometer.	2	CO3

Minimum 12 for 2 LL Hrs./Week or 24 for 4 LL hrs./Week are to be Performed.
'*' Marked Practical (LLOs) Are mandatory
Judicial mix of LLOs are to be performed to complete minimum requirement of 12 / 24 as applicable

VI.SUGGESTED MICRO PROJECT/ASSIGNMENT/ACTIVITIES FOR SPECIFIC LEARNING/SKILLS DEVELOPMENT (SELF-LEARNING)

Micro project

Only one micro-project is planned to be undertaken by a student that needs to be assigned to him/her. In special situations where groups have to be formed for microprojects, the number of students in the group should not exceed three. The micro-project could be industry application based, internet-based, workshop based, laboratory-based or field-based. Each micro-project should encompass two or more COs which are in fact, an integration of PrOs, UOs and ADOs.(Affective Domain Outcomes) .

Each student will have to maintain activity chart consisting of individual contribution in the project work and give a seminar presentation of it before submission.

The student ought to submit micro-project by the end of the semester to develop the industry oriented COs.

A suggestive list of micro-projects is given here.

Similar micro-projects could be added by the concerned faculty:

a. Prepare a chart of different types of diodes showing their specifications and applications
b. Prepare chart of transistors showing their specifications and Applications
c. Prepare a chart of different types of Rectifiers showing their specifications and applications
d. Diode: Build a circuit on general purpose PCB to clip a positive half cycle at 1.5V of a waveform with input signal 5Vpp and prepare the report.
e. Rectifier : Build a half wave rectifier for 6V,500mA output current on general purpose PCB.
f. Rectifier :Build a full wave rectifier with capacitor filter for 6V,500mA output current on general purpose PCB.
g. BJT : Build a circuit to switch on and off the LED by using BJT as a switching component.
h. Passive Transducer: Build temperature controller using RTD.
i. Active Transducer: Build temperature controller using Thermocouple.

- SUGGESTED ASSIGNMENT:

a. Analyze Data sheets of BJT, FET and MOSFET
b. Make chart of Symbol, constructional diagram, characteristics of diodes, Transistor, MOSFET.
c. Differentiate active and Passive Transducers
d. Collect information of Active Transducers and prepare charts of the same.
e. Give seminar on any relevant topic.
f. Collect information of passive Transducers and prepare charts of the same.

VII .LABORATORY EQUIPMENT/INSTRUMENTS/TOOLS/SOFTWARE REQUIRED

Sr.No	Equipment Name with Broad Specifications	Relevant LLO Number
1	Variable DC power supply 0-30V ,2 Amp, SC protection, display for voltage and current	All
2	Cathode Ray Oscilloscope Dual trace 20 MHz ,1MΩ, Input Impedance	All
3	Function Generator 0-2MHz with Sine, square, and triangular output	All
4	Digital Multimeter:3/1/2-digit display ,9999 counts digital	All

VIII. SUGGESTED FOR WEIGHTAGE TO LEARNING EFFORTS & ASSESSMENT PURPOSE (Specification Table)

Sr. No	Unit	Unit Title	Aligned COs	Learning Hours	R-Level	U-Level	A-Level	Total Marks
1	I	Diodes and Their Applications	CO1	10	4	6	2	12
2	II	Transistor	CO2	12	4	6	3	13
3	III	Transducers and Sensors	CO3	08	4	2	4	10
Grand Total				**30**	**12**	**14**	**09**	**35**

IX.ASSESSMENT METHODOLOGIES/TOOLS

Formative assessment (Assessment for Learning)	Summative Assessment (Assessment of Learning)
1. Tests 2. Rubrics for COs 3. Assignment 4. Midterm Exam 5. Self-Learning 6. Term Work 7. Seminar/Presentation	1. End Term Exam 2. Micro-project

IX. SUGGESTED 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	2	3	-	1	1	1	-	-
CO2	3	2	3	3	-	1	1	1	-	-
CO3	3	2	3	3	2	1	1	1	-	-
Legends:- High:03, **Medium:**02, **Low:**01, **No Mapping:** - *PSOs are to be formulated at the institute level										

X. SUGGESTED LEARNING MATERIALS/BOOKS

Sr.No	Author	Title	Publisher
1.	Albert Malvino	Basic Electronics.	8th Edition, Tata McGraw Hill ,2015ISBN10:1259200116 ISBN13:9781259200113
2.	B.L. Theraja	Basic Electronics.	2007, ISBN10:8121925568ISBN 13: 9788121925563
3.	R.S.Sedha	Applied Electronics	S. Chand&company Ltd., New Delhi,ISBN:8121927833 4 P.
4.	Ramesh Babu	Electronics Devices and Circuits	Scitech PublicationPvt.Ltd 2009, ISBN:8183711723 5
5.	H S Kalsi	Electronic Instrumentation	3 rd Edition, Tata McGraw Hill ISBN 978-0-07-070206-6

XI. LEARNING WEBSITES & PORTALS

Sr.No	Link/Portal	Description
1.	www.youtube.com/watch?v=anCnrtjNLQM	LVDT
2.	www.tutorialspoints.com/difference-between-bjt-and-fet	BJT,FET
3.	www.tutorialspoints.com/difference-between-sensors-and-transducers	Sensors and Transducer
4.	www.nptel.com	Online Learning Initiativesby IITs
5.	http://www.electronics-tutorials	Basic Electronics Tutorials and Revision
6.	https://en.wikipedia.org/wiki/P%E2%80%93n_junction	Semiconductor diodedescription

Name & Signature:

Smt. C. D. Pophale
Lecturer in Electronics

(Course Experts)

Name & Signature:	Name & Signature:
Dr.D N Rewadkar (Programme Head)	**Shri. S.B. Kulkarni** (CDC In-charge)

GOVERNMENT POLYTECHNIC, PUNE
'120-NEP'SCHEME

PROGRAMME	**DIPLOMA IN INFORMATION TECHNOLOGY**
PROGRAMME CODE	01/02/03/04/05/06/**07**/08
COURSE TITLE	**MULTIMEDIA AND ANIMATION**
COURSE CODE	**IT31201**
PREREQUISITE COURSE CODE & TITLE	**NA**

I. LEARNING AND ASSESSMENT SCHEME:

Course Code	CourseTitle	Course Type	Learning Scheme					Credits	Assessment Scheme											
			Actual Contact Hrs./Week						Paper Duration (hrs.)	Theory				Based on LL & TL				Based on Self Learning		Total Marks
														Practical						
			CL	TL	LL	SLH	NLH			FA-TH	SA-TH	Total		FA-PR		SA-PR		SLA		
										Max	Max	Max	Min	Max	Min	Max	Min	Max	Min	
IT31201	MULTIMEDIA AND ANIMATION	DSC	2	0	2	0	4	2	0	0	0	0	0	50	20	25@	10	00	00	75

Total IKS Hrs. for Semester : 00 Hrs.

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, **IKS** – Indian Knowledge System, **SLA**-Self Learning Assessment

Legends: @InternalAssessment,**#**ExternalAssessment,***#**OnLineExamination,**@$-**InternalOnlineExamination.

Note:

1. FA-TH represents average of two class tests of 30 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.*15Weeks
5. 1 credit is equivalent to **30 Notional hrs.**
6. *Self learning hours shall not be reflected in the Timetable.
7. *Self learning includes microproject / assignment / other activities.

II. RATIONALE:

Multimedia techniques and animation make connections between verbal and visual representations of content. Multimedia applications use text, graphics, animation, images and audio. These applications can be used in entertainment, business and education which can enhance communication and learning.

III. COURSE LEVEL LEARNING OUTCOMES (COS)

CO1: Describe the Multimedia components and color models.
CO2: Create images using Graphics processing tools.
CO3: Design web pages with multimedia components.
CO4: Develop 2D animation.
CO5: Use action script and authoring tools.

IV. THEORY LEARNING OUTCOMES AND ALIGNED COURSE CONTENT

Sr. No.	Theory Learning Outcomes (TLO's) aligned to CO's.	Learning content mapped with TLO's	Suggested Learning Pedagogies	Relevant COs
UNIT 1– Introduction to Multimedia (CL Hrs.- 06)				
1	**TLO1.1:** Describe characteristics of the given color model supported in graphics. **TLO1.2:** Describe the working of CRT display. **TLO1.3:** Describe the multimedia system architecture. **TLO1.4:** Explain concept of virtual reality with example.	1.1 Definitions -Where to use Multimedia, Multimedia in Business, Multimedia in Schools, Multimedia in Home, Multimedia in Public Places. 1.2 Multimedia System Architecture, Framework for Multimedia System, CRT display System, Flat Panel Display. 1.3 Color models- RGB, CMY, HSB, HUE, saturation and brightness. 1.4 Fundamentals of virtual reality.	Hands-on Demonstration Presentation	CO1
UNIT 2– Image editing and compression (CL Hrs.- 08)				
	TLO2.1: Describe various image file formats. **TLO2.2:** Describe image editing operations on an image. **TLO2.3:** Compare Lossy and Lossless image compression techniques. **TLO2.4:** Explain various Fonts and types.	2.1 Image types: Raster Format, Bitmap (BMP), Graphics Interchange Format(GIF), Joint Photographic Experts Group (JPEG),Tagged Image File Format (TIFF), Portable Network Graphics (PNG) and their differences. 2.2 Basic operations on image: crop, resize. 2.3 Image compression techniques lossy and lossless. 2.4 Fonts and its types, OCR Software. 2.5 2D Vs 3D images	Hands-on Demonstration Presentation	CO2
UNIT 3–Webpage development using multimedia (CL Hrs.- 06)				
	TLO3.1: Write steps to develop a webpage comprising of hypermedia. **TLO3.2:** Describe features of given audio file format. **TLO3.3:** Compare different types of audio.	3.1 Design Web Pages using Hypertext and hypermedia. 3.2 Different audio file formats. 3.3 Uncompressed audio format, lossless compressed audio format, Lossy compressed audio format, mp3,wav,mpeg-4, wma, pcm. 3.4 MIDI Vs Digital audio.	Hands-on Demonstration Presentation	CO3
UNIT 4– Video and Animation (CL Hrs.- 06)				

	TLO4.1: Explain digital video and standards. **TLO4.2:** Describe features of given video file format. **TLO4.3:** Describe Video Streaming process. **TLO4.4:** Explain Story Boarding. **TLO4.5:** Explain Principles of Animation.	4.1 Digital Video. 4.2 How video works, Broadcast video standards. 4.3 Video file formats: MPEG, MPEG1, MPEG2, MPEG4, AVI. 4.4 Video Streaming: Introduction to Streaming, Difference between streaming and downloading, how streaming works, buffering, factors affecting streaming. 4.5 Study of story board. 4.6 The Power of motion, Principles of Animation.	Hands-on Demonstration Presentation	CO4
UNIT 5– Action Script and Authoring tools (CL Hrs.- 06)				
	TLO5.1: Use action script to create animation. **TLO5.2:** Describe different types of Authoring tools.	5.1 Programming Concepts with respect to Action Script – Variables, Data types, conditionals, loops, arrays, Functions 5.2 Multimedia Authoring tools : Features. 5.3 Types of Authoring Tools: Card- and Page-Based Authoring tools, Icon-and Object Based Authoring tools, Time Based Authoring tools.	Hands-on Demonstration Presentation	CO5

VI. LABORATORY LEARNING OUTCOME AND ALIGNED PRACTICAL / TUTORIAL EXPERIENCES.

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Sr. No.	Practical/Tutorial/Laboratory Learning Outcome (LLO)	Laboratory Experiment/Practical Titles/Tutorial Titles	No. Of Hrs.	Relevant COs
1	LLO1: Use Image Editing Tools and Color Models.	a. Convert given image into different image formats and observe the changes in image quality and file size. b. Create different types of still images using various graphical processing tools and RGB/ CMY/ HSB color models.	02	CO1
2	LLO2: Design banners using multimedia components.	Design banner using graphics processing tool.	04	CO2
3	LLO3: Apply Effects to Text.	Apply drop shadow and reflection effects to Text.	02	CO2
4	LLO4: Apply Effects to Image.	Apply broken mirror effect to Image.	02	CO2
5	LLO5: Edit/Modify Images and apply effects.	Modify existing image by adding rainy season effect on any 2D image processing software.	02	CO2
6	LLO5: Edit/Modify Images and apply effects.	Design wallpaper showing water drop effect in image.	02	CO2
7	LLO6: Design web pages and embed audio and video.	Develop a webpage which show animation with sound effect / embed video using any professional HTML editor.	02	CO3
8	LLO7: Create 2D animation.	a. Develop a 2D animation using shape twinning and motion twinning. b. Develop different types of symbols (button symbol, graphic, movie clip symbol and similar types of icons).	04	CO4
9	LLO7: Create 2D animation.	Create 2D animation for bouncing and rolling ball down.	02	CO4
10	LLO7: Create 2D animation.	Create 2D animation using motion guide layer and masking.	02	CO4
11	LLO8: Create simple animation using action script.	a. Create animation using action script. (eg. Rotating object). b. Create a variable for different Data Types using Action Script.	04	CO5
12	ALL LLOs	Create animation using all components and action script.	04	All

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VII. SUGGESTED MICRO PROJECT / ASSIGNMENT/ ACTIVITIES FOR SPECIFIC LEARNING/SKILLS DEVELOPMENT(SELF LEARNING)

-NA-

VIII. LABORATORY EQUIPMENT/INSTRUMENTS/TOOLS/SOFTWARE REQUIRED

Sr. No.	Equipment Name with broad specifications	Relevant LLO
1	Hardware: Personal computer Pentium IV,2 GHz minimum (i3-i5 preferable), RAM minimum 2 GB.	ALL LLOs
2	Graphics and animation development tools (Like Gif animation tool, Pencil, Synfig studios, Stykz, Blender, Scilab, Macromedia Flash, Corel Draw or any other tool)	

IX. SUGGESTED FOR WEIGHTAGE TO LEARNING EFFORTS & ASSESSMENT PURPOSE

-NA-

X. ASSESSMENT METHODOLOGIES / TOOLS

Formative Assessment (Assessment for Learning)	Summative Assessment (Assessment of Learning)
Lab performance, Assignment and Seminar/Presentation	Lab. Performance, viva voce

Xl. SUGGESTED COs-POs–PSOs MATRIX FORM

CO / PO	PO1 Basic and Discipline Specific knowledge	PO2 Problem Analysis	PO3 Design/Development of Solutions	PO4 Engineering Tools, Experimentations and Testing	PO5 Engineering Practices for Society ,Sustainability and	PO6 Project Management	PO7 Life Long Learning
Describe the Multimedia components and color models.	3	-	2	-	-	2	2
Create images using Graphics processing tools.	2	2	1	3	1	1	3
Design web pages with multimedia components.	2	1	2	2	2	2	2
Develop 2D animation.	3	2	2	3	2	2	3

Use action script and authoring tools.	**3**	**1**	**2**	**2**	**1**	**2**	**3**

PSO - CO MAPPING

CO /PSO	**Hardware and Networking**	**Database Technologies**	**Software Development**
Describe the Multimedia components and color models.	**-**	**-**	**2**
Create images using Graphics processing tools.	**-**	**-**	**3**
Design web pages with multimedia components.	**1**	**-**	**3**
Develop 2D animation.	**-**	**-**	**2**
Use action script and authoring tools.	**-**	**-**	**2**
Summary	**1**	**-**	**2**

XII. SUGGESTED LEARNING MATERIALS / BOOKS

Sr. No.	AUTHOR	TITLE	PUBLISHER
1	Vaughan Tay	Multimedia: Making it work,9e	McGraw Hill Education, New Delhi 2015, ISBN:9780071832885
2	Parekh Ranjan	Principles of Multimedia 2e	McGraw Hill Education, New Delhi.2015, ISBN-13: 978-1-2-90650-0
3	Roger Brounstein	Action Script 3.0 Bible	Wiley Publishing, Inc ISBN: 978-0-470-52523-4
4	Colin Moock	Essential Action Script 3.0	O'Reilly Media, Inc. ISBN: 0596526946
5	Andleigh, Prabhat K. Thakrar, Kiran	Multimedia Systems and Design	PHI Learning, New Delhi 2013 ISBN: 81-203-2177-4
6	Li, Ze-Nian	Fundamentals of Multimedia	PHI Learning, New Delhi 2013 ISBN:13-978-8120328174

XIII. LEARNING WEBSITES & PORTALS

Sr. No.	Link/Portal	Description
1	https://www.tutorialspoint.com/multimedia/ (As on 16/01/2024)	Introduction to Multimedia.
2	https://www.adobe.com/devnet/actionscript/articles/actionscript3_overview.html (As on 16/01/2024)	Introduction to action script. Installing Adobe flash ,writing and executing action script.
3	http://edutechwiki.unige.ch/en/AS3_Tutorials_Beginner (As on 16/01/2024)	Action script Tutorial
4	https://www.cloudflare.com/learning/performance/what-is-streaming/ (As on 16/01/2024)	Video Streaming

Name & Signature: 1) Smt. H.F. Khan 2) Smt. P.L. Sonawane (Course Experts)	
Name & Signature: Dr. D.N. Rewadkar (Program Head) (Information Technology)	**Name & Signature:** (Shri. S.B. Kulkarni) (CDC In-charge)

GOVERNMENT POLYTECHNIC, PUNE

'120 – NEP' SCHEME

PROGRAMME	**DIPLOMA IN CE/EE/ET/ME/MT/CM/IT/DDGM**
PROGRAMME CODE	**01/02/03/04/05/06/07/08**
COURSE TITLE	**PROFESSIONAL COMMUNICATION**
COURSE CODE	**HU11202**
PREREQUISITE COURSE CODE & TITLE	**NA**

I. LEARNING & ASSESSMENT SCHEME

Course Code	Course Title	Course Type	Learning Scheme					Credits	Assessment Scheme											
			Actual Contact Hrs./Week			SLH	NLH		Paper Duration	Theory				Based on LL & TSL				Based on SL		Total Marks
														Practical						
			CL	TL	LL					FA-TH	SA-TH	Total		FA-PR		SA-PR		SLA		
										Max	Max	Max	Min	Max	Min	Max	Min	Max	Min	
HU11202	PROFESSIONAL COMMUNICATION SKILLS	SEC	-	-	2	-	2	1		-	-	-	-	25	10	25@	10	-	-	50

Total IKS Hrs for Sem. : 0 Hrs

Abbreviations: CL- Classroom Learning, TL- Tu tutorial Learning, LL-Laboratory Learning, SL H-Self Learning Hours, NLH-Notional Learning Hours, FA - Formative Assessment, SA -Summative assessment, IKS – Indian Knowledge System, SLA - Self Learning Assessment.

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

Note :

1. FA-TH represents the average of two class tests of 30 marks each conducted during the semester.
2. If the candidate does not secure minimum passing marks in FA-PR of any course then the candidate shall be declared as "Detained" in that semester.
3. If the 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 timetable.
7. * Self-learning includes micro-projects/assignments / other activities.

II. RATIONALE:

Communication is key to the smooth and efficient functioning of any industry or business. Professional communication is the need of every organization to maintain ethics, quality and standards. The efficacy of business communication skills is essential for engineering professionals to instruct, guide and motivate peers/ subordinates to achieve desired goals at the workplace. Thus, this course has been designed to enhance professional communication skills for effective presentation both in written and oral forms at the workplace.

III. COURSE-LEVEL LEARNING OUTCOMES (CO'S):

Students will be able to achieve and demonstrate the following COs on completion of course-based learning

- CO1 - Communicate effectively (oral and written) in various formal and informal situations minimizing the barriers.
- CO2 - Develop listening skills through active listening and note-taking.
- CO3 - Write the circulars, notices and minutes of the meeting.
- CO4 - Draft enquiry letter, complaint letter, and Job application with resume / CV, Compose effective Emails.
- CO5 - Write Industrial reports.

IV. THEORY LEARNING OUTCOMES AND ALIGNED COURSE CONTENT:

Sr. No	Theory Learning Outcomes (TLO'S) aligned to CO's.	Learning content mapped with TLO's.	Suggested Learning Pedagogies	Relevant COs
	UNIT-I PROFESSIONAL COMMUNICATION: AN OVERVIEW			
1	TLO 1.1 Describe the importance of professional communication in given situations. TLO 1.2 Identify the types of communication barriers in given situations and suggest remedies. TLO 1.3 Use different types of verbal and non–verbal communication for the given situation.	1.1 Definition of professional communication- Importance, relevance, Elements and process of communication,7 C's of Professional Communication (Clarity, Conciseness, correctness, coherent, concrete, courteous & Complete). 1.2 Communication barriers, Types of barriers (Linguistic, Psychological, Technological). 1.3 Types of Communication– Verbal (Oral-Written), Formal, Informal (Grapevine) and Vertical Comm.	Language lab, Role plays, Chalkboard, Reference books, Case studies.	**CO1**
	UNIT - II LISTENING & NOTE-TAKING			
2	TLO 2.1 Identify the difference between listening and hearing. TLO 2.2 Differentiate the types of listening in various situations. TLO 2.3 Take notes during lectures and seminars. Make use of types of note-taking and note-making for different subjects/topics.	2.1 Difference between listening & Hearing. 2.2 Types of listening a)Active listening b)Passive listening c)Selective listening. 2.3 Techniques of Note-taking, Types of note taking (Outline notes, Mind Mapping, Flowcharts).	Language Lab, Classroom learning, NPTEL, Role Play.	**CO2**
	UNIT - III OFFICE DRAFTING			
3	TLO 3.1 Prepare notices/agenda for the given type of meeting/information. TLO 3.2 Prepare minutes of meeting/s. TLO 3.3 Draft a circular for a particular information/event.	3.1 Format of Notice, Drafting Agenda. 3.2 Preparing Minutes of the meeting. 3.3 Format of Circular.	Whiteboard, Language Lab, Reference books, Classroom learning.	**CO3**
	UNIT - IV WRITING SKILLS FOR PROFESSIONAL COMMUNICATION			
4	TLO 4.1 Compose cover letter and CV / Resume for jobs. TLO 4.2 Apply E-mail Etiquettes for professional purposes. TLO 4.3 Compose Emails for different official purposes.	4.1 Job Application with Resume / CV. 4.2 E-Mail Etiquettes. 4.3 Writing official E-Mails to communicate intended purposes.	Language lab, Classroom learning NPTEL, Reference books.	**CO4**

Sr. No	Theory Learning Outcomes (TLO'S) aligned to CO's.	Learning content mapped with TLO's.	Suggested Learning Pedagogies	Relevant COs
UNIT - V REPORT WRITING				
5	TLO 5.1 Compose technical reports. TLO5.2 Draft accident and Investigation.	5.1 Introduction to report writing 5.2 Accident Report and Investigation Report.	Chalk and talk, Language Lab, Collaborative learning, Classroom learning.	**CO5**

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 1.1 Draw the communication cycle using real-life examples and explain the process of communication.	Communication Process and Cycle	2	CO1
2	LLO 2.1 Undertake the Roleplay / Group discussion to illustrate types/barriers to communication.	Role plays and Group Discussion	2	CO1
3	*LLO 3.1 Listen to audio in the language lab and make notes of it.	Active Listening	2	CO2
4	*LLO 4.1 Give a presentation / Seminar using the 7 C's of Communication.	Presentations / Seminars	2	CO1
5	*LLO 5.1 Explain the types of note-taking with examples and make notes on any one topic related to your curriculum.	Note taking & Note Making	2	CO2
6	*LLO 6.1 Prepare agenda for meeting and draft minutes of the meeting.	Agenda and Minutes of the Meeting	2	CO3
7	*LLO 7.1 Draft circulars for the given situation.	Office Drafting	2	CO3
8	*LLO 8.1 Respond to job advertisements referring to newspapers, and LinkedIn. Write a cover letter with a resume /CV.	Job Application with Resume / CV	2	CO4
9	*LLO 9.1: Write Four (formal) E-mails using ethics and etiquette.	E-Mail writing.	2	CO4
10	*LLO 10.1: Write a detailed report on the Accident/ Investigation.	Technical Report writing	2	CO5
11	*LLO 11.1: Prepare a case study related to linguistic barriers: language pronunciation, punctuation, and technical jargon and suggest remedies for the same.	Barriers to Communication	2	CO1

Sr. No	Practical/Tutorial/Laboratory Learning Outcome (LLO)	Laboratory Experiment / Practical Titles /Tutorial Titles	Number of hrs.	Relevant COs
12	LLO 12.1: draft complaint/enquiry letter for various situations.	Complaint and Enquiry letter	2	CO4
13	LLO 13.1: List psychological barriers to communication. LLO 13.2 Prepare case studies on any two psychological barriers and suggest remedies to overcome the barriers.	Psychological barriers to Communication.	2	CO1
14	*LLO 14.1 - Draw a flow chart and mind mapping for any topic related to the curriculum.	Listening Skills.	2	CO2
15	*LLO 15.1 - Face mock interview arranged by your teacher.	Job Application, Resume / CV & Interview.	2	CO4

Note:

- "*" marked practicals are compulsory for coverage of all course outcomes.
- The remaining practicals are recommended to provide enhanced skills/abilities.
- Any **12** assignments out of **15** are compulsory

Note:

Only one micro-project is planned to be undertaken by a student that needs to be assigned to him/her at the beginning of the semester. She/he ought to submit it by the end of the semester to develop the industry-oriented COs. Each micro-project should encompass two or more COs. The micro-project could be industry application-based, internet-based, workshop-based, laboratory-based or field-based. Each student will have to maintain a dated work diary consisting of individual contributions to the project work and give a seminar presentation of it before submission. The total duration of the micro-project should not be less than 15 (fifteen) student engagement hours during the course. In the first four semesters, the micro-project could be group-based. However, in higher semesters, it should be individually undertaken to build up the skill and confidence in every student to become a problem solver so that s/he contributes to the projects of the industry. A suggestive list is given here. Similar micro-projects could be added by the concerned faculty.

VI. SUGGESTED MICRO PROJECT/ASSIGNMENT/ACTIVITIES FOR SPECIFIC LEARNING/SKILLS DEVELOPMENT (SELF-LEARNING)

Micro project

- Conduct an interview of any person and follow the procedure (interview questions, photo with the interviewee etc.)
- Listening and Speaking are lifelong learnings. Explain with appropriate examples and real-life case studies.
- Collect (four to five) emails with technical jargon, and barriers, make required corrections and keep a record of both the emails (original and Corrected one)
- Prepare a case study on Technological barriers to communication
- Complete any one certification course of (Two Weeks duration) from (MOOC/ NPTEL/ Coursera/ any other source)related to Communication Skills / Personality Development.
- Prepare a report on aspects of body language.

VII. LABORATORY EQUIPMENT/INSTRUMENTS/TOOLS/SOFTWARE REQUIRED:

Sr.No	Equipment Name with Broad Specifications	Relevant LLO Number
1	Language Lab with software with internet facility.	**All**
2	LCD Projector	**All**
3	Smart Board with networking.	**All**
4	Printer.	**All**

VIII. SUGGESTED FOR WEIGHTAGE TO LEARNING EFFORTS & ASSESSMENT PURPOSE

(Specification Table):

N.A.

IX. ASSESSMENT METHODOLOGIES/TOOLS:

Formative assessment (Assessment for Learning)	Summative Assessment (Assessment of Learning)
1. Term Work (**FA-PR**) 2. Micro-project.	1. Practical Exam of **25** marks using language lab**.** **(SA-PR)**

X. SUGGESTED COs- POs MATRIX FORM:

Course Outcomes (COs)	Programme Outcomes(POs)							ProgrammeSpecific 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	-	-	-
CO2	-	-	-	-	-	-	1	-	-	-
CO3	-	-	-	-	-	-	1	-	-	-
CO4	-	-	-	-	-	-	1	-	-	-
CO5	-	-	-	-	-	-	1	-	-	-

Legends:- High:03, **Medium:**02, **Low:**01, **No Mapping:** -
*PSOs are to be formulated at the institute level.

XI.SUGGESTED LEARNING MATERIALS/BOOKS

Sr.No	Author	Title	Publisher with ISBN Number
1	M Ashraf Rizvi	Effective Communication Skills	Tata McGraw-Hill Publication-ISBN 0070599521, 9780070599529
2	Sanjay Kumar and Pushp Lata	Communication Skills	Oxford University Press ISBN 9780199457069
3	MSBTE Textbook	Communication Skills	MSBTE
4	Robert King	Effective communication Skills	Audio Book -ISBN 978181667009742
5	N P Sudharshana, C Savitha	English for Technical Communication	Cambridge-ISBN 978-13-16640-08-1
6	C. Murlikrishna, Sunita Mishra	Communication Skills for Engineers	Pearson - ISBN 978-81-317-3384-4
7	Meenakshi Raman, Sangeeta Sharma	Technical Communication, Principles and Practice	Oxford University Press -ISBN 978-1316640-08-1
8	K. K. Sinha	Business Communication	Galgotiya Publishing company, New Delhi ISBN 9789356227064
9	Rajendra Pal, J.S. Korlahalli	Essentials of Business Communication	Sultan Chand & Sons, New Delhi ISBN 9788180547294

XIII. LEARNING WEBSITES & PORTALS

Sr.No	Link / Portal	Description
1	https://www.britishcouncil.in	conversations
2	https://www.coursera.org	certification courses
3	https://www.udemy.com	Communication skills training courses
4	http://www.makeuseof.com	Dale Carnegie's free resources

Name & Signature:

Mr. V.V. Kulkarni
Lecturer in English

Dr. S.P. Palve
Lecturer in English

(Course Experts)

Name & Signature:	Name & Signature:
Dr.D.N Rewadkar (Programme Head)	**Shri. S.B. Kulkarni** (CDC In-charge)

GOVERNMENT POLYTECHNIC, PUNE

'120 – NEP' SCHEME

PROGRAMME	**DIPLOMA IN** CE/EE/ET/ME/MT/**CM/IT**/DDGM
PROGRAMME CODE	01/02/03/04/05/**06/07**/08
COURSE TITLE	**PROGRAMMING IN C**
COURSE CODE	**CM21204**
PREREQUISITE COURSE CODE & TITLE	**NA**

I. LEARNING & ASSESSMENT SCHEME

Course Code	Course Title	Course Type	Learning Scheme					Credits	Assessment Scheme										
			Actual Contact Hrs./Week			SLH	NLH		Paper Duration	Theory				Based on LL & TSL				Based on SL		Total Marks
														Practical						
			CL	TL	LL					FA-TH	SA-TH	Total		FA-PR		SA-PR		SLA		
										Max	Max	Max	Min	Max	Min	Max	Min	Max	Min	
CM21204	PROGRAMMING IN C	DSC	4	-	4	-	8	4	--	30	70	100	40	50	20	25@	10	-	-	175

Total IKS Hrs for Term: 0 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, **IKS** – Indian Knowledge System, **SLA**- Self Learning Assessment

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

Note:

FA-TH represents an average of two class tests of 30 marks each conducted during the semester.

1. If a candidate is not securing minimum passing marks in **FA-PR** (Formative Assessment - Practical) of any course, then the candidate shall be declared as **'Detained'** in that semester.
2. If a candidate does not secure minimum passing marks in SLA (Self Learning Assessment) of any course, then the candidate shall be declared as **'fail'** and will have to repeat and resubmit SLA work.
3. **Notional learning hours** for the semester are **(CL + LL + TL + SL) hrs. * 15 Weeks**
4. **1 credit** is equivalent to **30 Notional hours**.
5. * Self-learning hours shall not be reflected in the Timetable.

6.* Self-learning includes micro-projects/assignments/other activities.

II. RATIONALE:

The C programming language is a general-purpose, operating system-agnostic, and procedural language that supports structured programming. Numerous companies use C as a programming language for embedded systems development, application development, and socket programming. C programming acts as a foundation for higher level programming which includes problem solving, building logic, developing algorithms and flowcharts. All the concepts learned will assist the student to grasp advanced languages at ease.

III. COURSE-LEVEL LEARNING OUTCOMES (CO'S)

Students will be able to achieve & demonstrate the following CO's on completion of course-based learning

CO1: Establish Strong foundation in building procedural programs with 'C' language tokens.
CO2: Develop C program involving branching and looping statements.
CO3: Implement programs using Arrays and Strings.
CO4: Write C program using predefined and user-defined functions.
CO5: Execute programs using pointers.
CO6: Create and Implement user -defined data types such as Structures.

IV. THEORY LEARNING OUTCOMES AND ALIGNED COURSE CONTENT

Sr. No	Theory Learning Outcomes (TLO'S) aligned to CO's.	Learning content mapped with TLO's.	Suggested Learning Pedagogies	Relevant COs
UNIT-I INTRODUCTION TO COMPUTER PROGRAMMING (CL Hrs-08, Marks-10)				
1.	**TLO 1.1** Introduction to Programming. **TLO 1.2** To know the history and basic structure of C. **TLO 1.3** Identify the given building blocks of a C Program. **TLO 1.4** Use basic constructs like constants, variables , data types for developing C programs. **TLO 1.5** Managing Input and Output Operations. **TLO 1.6** Develop C programs using Operators and Expressions.	**1.1** Introduction to Computing: Introduction, Art of Programming through Algorithms and Flowcharts. **1.2** Overview of C: History and importance of C, Basic structure of C program, executing a C program. **1.3** Constants, Variable and Data Types: Introduction, Character Set, C Tokens, Keywords and Identifiers, Constants, Variables, Data Types, Declaration of Variables, Assigning Values to Variables, Defining Symbolic Constants,Type def. **1.4** Managing Input and Output Operations: Reading a Character, Writing a Character, Formatted Input, Formatted Output. **1.5** Operators and Expressions: Introduction, Arithmetic Operators, Relational Operators, Logical Operators, Assignment Operators, Increment and Decrement Operators, Conditional Operator, Bitwise Operators, Special Operators, Arithmetic Expressions, Evaluation of Expressions, Type Conversions in Expressions, Operator Precedence and Associativity, sizeof operator.	Hands-on Demonstration Presentations	**CO1**
UNIT-II CONTROL STRUCTURES (CL Hrs-08, Marks-10)				
2	**TLO 2.1** Write a 'C' program using decision making statements **TLO 2.2** Use loop statements in C program to solve iterative problems. **TLO 2.3** Use appropriate statement to alter the program flow in the loop.	**2.1** Decision Making and Branching: Introduction, Decision Making with IF Statement, Simple IF Statement, the IF-ELSE Statement, Nesting of IF-ELSE Statements, The ELSE IF Ladder, The Switch statement, The ? : Operator, **2.2** Jump Statements: break, continue, goto, return. **2.3** Decision Making and Looping: While loop, for loop, do-while loop.	Hands-on Demonstration Presentations	**CO2**
UNIT-III ARRAYS AND STRINGS (CL Hrs-12, Marks-14)				
3	**TLO 3.1** Explain the characteristics of an Array. **TLO 3.2** Enlist the types of Arrays. **TLO 3.3** Write C Program to perform operations on one dimensional array. **TLO 3.4** Declare, initialize and access elements of two dimensional array. **TLO 3.5** Declare, initialize and access functions using String.	**3.1** Arrays: Introduction to array: Array Definition, Initialization of arrays, Types: one- dimensional arrays, two-dimensional arrays, multidimensional arrays. Searching Sorting, Matrix Addition, Multiplication, Transpose of a matrix. **3.2** Strings: Introduction to String: declaration & initialization of string, string variables, reading string, writing string. Concatenation & comparison of two strings, string handling functions**.**	Hands-on Demonstration Presentations	**CO3**

UNIT- IV FUNCTIONS IN C (CL Hrs-12, Marks-14)				
4	**TLO 4.1** Explain need of Functions in C program. **TLO 4.2** Write C Program involving C library functions. **TLO 4.3** Write user defined functions for given problem in C program **TLO 4.4** Write C Program for calling function by 'value and calling function by 'reference' **TLO 4.5** Implement recursive functions in C Program	**4.1** Concept and need of functions, Predefined Functions: Library functions, Math function, **4.2** User defined function: Need, syntax, declaration, definition, return values and their types, calling a function.Scope of a variable. **4**.3 Category of functions: a)Function with no arguments and no return value, b)Function with no arguments and a return value, c)Function with arguments and no return value, d)Function with arguments and with return value. **4.4** Nesting of functions, recursion and function with arrays. **4.5** Dynamic Memory Allocation in C : malloc(), calloc(), realloc() , free()	Hands-on Demonstration Presentations	**CO4**
UNIT- V POINTERS IN C (CL Hrs-10, Marks-10)				
5	**TLO 5.1** Declare and Define Pointer Variable. **TLO 5.2** Initialization of pointers and pointer expressions. **TLO 5.3** Write C program to print the address and values of pointer variables. **TLO 5.4** Write C program to perform arithmetic operations using pointers. **TLO 5.5** Write C Program to perform operations on Arrays using Pointers. **TLO 5. 6** Demonstrate pointer as a function argument.	**5.1** Pointer**:** Introduction to pointer Concept. Accessing the address of a variable, declaration of Pointers, Initialization and Accessing of Pointers, chain of pointer, pointer expressions. **5.2** Pointer and Array: Array of pointers, Pointer to array, pointers as a function argument. Returning pointer **5.3** Returning pointer and passing addresses to Functions.	Hands-on Demonstration Presentations	**CO5**
UNIT- VI STRUCTURES (CL Hrs-10, Marks-12)				
6	**TLO 6.1** Define Structure. **TLO 6.2** Use the structure for solving the given problem. **TLO 6.3** Demonstrate arrays of structure. **TLO 6.4 U**nderstand and Implement Concept of Enumerated Data type	**6.1 Structure :** definition, declaring and accessing, structure initialization, copying and comparing structure variables, operations on structure members, array of structures, array within the structure, structure within structures ,structure and functions, size of structures **6.2** Enumerated Data Type: Create and Implement Enum in C Program.	Hands-on Demonstration Presentations	**CO6**

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 1.1** Write logical steps for given program flow **LLO 1.2** Write the standard English like statements for programming flow of given Problem statement **LLO 1.3** Write Simple C program using constant and variables.	Write/compile/execute simple 'C' program: Develop a program using Constants, Variables for different data types.	2	CO1
2	**LLO 2.1** Use the Relational, Logical, Assignment, Increment and Decrement operators for developing C Program. **LLO 2.2** Use the various expressions in the C Program.	*Implementation of a 'C' program based on different operators and expressions. (ex. Arithmetic, Relational, Logical, Assignment, Increment and Decrement, etc.)	4	CO1
3	**LLO 3.1** Use the Conditional, bitwise operators for developing C Program	*Implementation of a C program based on Conditional, bitwise and special operators.	2	CO1
4	**LLO 4.1** Write code for access modifiers.	*Implementation of a simple C program to take input from the user at run time and display the output on the screen.	2	CO1
5	**LLO 5.1** Write the syntax for various if statements. **LLO 5.2** Write C program for any problem using If statements.	Implementation of minimum two C programs using simple If statement and if..else statement.	**2**	CO2
6	**LLO 6.1** Write syntax of if... else and if.. else if ladder statements.	*Implementation of minimum two C programs using nested If ...else statement and if.. else if ladder.	**2**	CO2
7	**LLO 7.1** Write C program using Switch statement.	*Develop a C program using Switch statements.	**2**	CO2
8	**LLO 8.1** Implement iterative solution to problem using for loop, while and do - - while loop	*Implementation of minimum two C programs using 'for loop', 'while' loop and 'do...while' loop control statements.	2	CO2
9	**LLO 9.**1Write the syntax -for statement. **LLO 9.2** Write C code for solving a given problem using For-loop with the help of break and continue keyword.	*Implementation of a C program to Print various patterns using for loop with break and continue statements.	**4**	CO2

10	**LLO 10.1** Declare and initialize the Array. **LLO 10.2** Write C program for implementation of one Dimensional array.	Write C programs based Operations on 1D arrays: i)Declaration of different data types of array. ii)Initialization of array elements. iii)Accessing array elements without loop and with loop.	**2**	**CO3**
11	**LLO 11.1** Develop Logic for Searching an element from an array. **LLO 11.2** Develop logic for sorting an array in ascending/descending order. **LLO 11.3** Write C programs to perform Searching and Sorting	*Implementation of a C programs based Operations on 1D arrays: Search an element, sorting array etc.	**2**	**CO3**
12	**LLO 12.1** Write a C program for operations on 2D Arrays	*Implementation of a C programs based Operations on 2D arrays: i)Declaration of different data types of array. ii)Initialization of array elements. iii)Accessing array elements without loop and with loop.	**2**	**CO3**
13	**LLO 13.1**Write C program for implementation of two Dimensional arrays. **LLO 13.2** Develop logic for performing operations on 2D arrays	Implementation of a C programs based Operations on 2D arrays : Addition , Multiplication etc.	**2**	**CO3**
14	**LLO 14.1** Write C programs for print string operations using string handling Functions	*Implementation of a C program using predefined string functions for string comparison, concatenation, copying etc.	2	**CO3**
15	**LLO 15.1** Write C programs for print string operations without using string handling Functions	*Implementation of a C program without using predefined string functions for string comparison, concatenation, copying etc.	2	**CO3**
16	**LLO 16.1** Use built-in library functions in C programs	Implementation of a C programs on Predefined Functions	2	CO4
17	**LLO 17.1** Write C programs using user defined functions	*Implementation of a programs on User defined functions for following a)Function with no arguments and no return value, b)Function with no arguments and a return value, c) Function with arguments and no return value, d) Function with arguments and with return value.	4	CO4
18	**LLO 18.1**Write Recursive functions in C. **LLO 18.2** Write nested functions in C.	*Implementation of a C programs based on i) Recursion ii) Nesting of functions.	2	CO4
19	**LLO 19.1** Write user defined functions in C.	*Develop a C programs on User defined functions for following i)Call by value. ii)Call by reference.	2	CO4

20	**LLO 20.1** Write a C program C program based on Pointers	Implementation of a C program based on declaration of Pointers, Initialization and Accessing pointers to pointers.	2	CO5
21	**LLO 21.1** Perform operations using pointers.	*Develop a C program based on i) Pointer Expressions ii) Array of Pointers	2	CO5
22	**LLO 22.1** Write a C program based on structure .	*Implementation of a C program based on structure definition and initialization.	2	CO6
23	**LLO 23.1** Write a C program using Structure within Structure.	Implementation of a C program based on structure within structure.	2	CO6
24	**LLO 24.1** Write a C program using an array of Structure.	Development of a C program based on an array of structure.	2	CO6
25	**LLO 25.1** Write a C program using Concept of Enumerated Data type.	Implementation of a C programs based on Enumerated Data Types	2	CO6
26	**LLO 26.1** Develop a micro project using concepts learned from C programming.	*Micro-project/SpringBoard certification for PIC. (Refer point 11 for micro project list)	4	ALL

*Write algorithm and draw flowchart for given problem statement in each practical .
* SpringBoard certification for PIC Example:Learn and Master C Programming For Absolute Beginners!
Free Certification : 14hrs 50 m:
Link:https://infyspringboard.onwingspan.com/web/en/app/toc/lex_auth_013094424590991360222 8_shared/overview

Note : Out of above suggestive LLOs -
'*' Marked Practicals (LLOs) Are mandatory.
Minimum 80% of the above list of lab experiments are to be performed.
Judicial mix of LLOs are to be performed to achieve desired outcomes.

VI. SUGGESTED MICRO PROJECT/ASSIGNMENT/ACTIVITIES FOR SPECIFIC LEARNING/SKILLS DEVELOPMENT (SELF-LEARNING)

Micro project

The micro project has to be Industry Application Based, Internet-based, Workshop-based, Laboratory-based or Field-based as suggested by Teacher.

1. Prepare a simple calculator to perform mathematical operations. Accept values and operations to be performed from the user. Allow only numeric values and otherwise show appropriate messages to users.

2. Prepare menu driven program for Bank management system.The functionality of the Bank Management System Application is mentioned below:Transfer Money to the Account,Creation of Account,Check Amount, Login Functionality.

3.Develop food menu cards for restaurant. Display food items. Accept food menu, quantity and generate bill for the same.

4. Develop a menu-driven program to perform Number System ConversionThe functionality of the Number System Conversion is mentioned below: Decimal to Binary, Binary to Decimal, Decimal to Octal, Octal to, Decimal,Hexadecimal to Binary,Binary to Hexadecimal.

5.Develop a menu-driven program to performQuiz Game:The Functionality of the Quiz Game is mentioned below: Insert questions,Check answer,Get Score.

6. Calendar:Create an application to check date, day, etc using an application that can be created with C using basic knowledge like arithmetic operations, strings, etc. The Functionality of the Calendar are mentioned below: Find Out the Day, Print all the days of the month, Add Note.

VII.

VIII. LABORATORY EQUIPMENT/INSTRUMENTS/TOOLS/SOFTWARE REQUIRED

Sr. No	Equipment Name with Broad Specifications	Relevant LLO Number
1	a) Computer System with all necessary Peripherals and Internet connectivity. b) Any Office Software c) Any Browser (Any General Purpose Computer available in the Institute) d) C language IDE- Turbo/Borland / Dev C etc	ALL

IX. SUGGESTED FOR WEIGHTAGE TO LEARNING EFFORTS & ASSESSMENT PURPOSE

(Specification Table)

Sr. No	Unit	Unit Title	Aligned COs	Learning Hours	R-Level	U-Level	A-Level	Total Marks
1	I	INTRODUCTION TO COMPUTER PROGRAMMING	CO1	08	**4**	**2**	**4**	**10**
2	II	CONTROL STRUCTURES	CO2	08	**2**	**2**	**6**	**10**
3	III	ARRAYS AND STRINGS	CO3	12	**4**	**4**	**6**	**14**
4	IV	FUNCTIONS IN C	CO4	12	**4**	**4**	**6**	**14**
5	V	POINTERS IN C	CO5	10	**2**	**4**	**4**	**10**
6	VI	STRUCTURES	CO6	10	**2**	**4**	**6**	**12**
Grand Total				**60**	**18**	**20**	**32**	**70**

X. ASSESSMENT METHODOLOGIES/TOOLS

Formative assessment (Assessment for Learning)	Summative Assessment (Assessment of Learning)
Continuous assessment based on process and product related performance indicators Each practical will be assessed considering, Lab performance, Assignment, Self-learning and Seminar/Presentation	End semester examination ,Lab Performance, viva voce

XI. SUGGESTED 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	2	2	2	1	-	-	2	2	-	3
CO2	2	2	3	2	-	1	2	-	-	3
CO3	2	3	2	3	1	1	2	-	-	3
CO4	3	3	2	3	1	1	3	-	-	3
CO5	3	3	3	3	1	1	3	2	-	3
CO6	3	3	2	3	1	2	3	-	-	3
Legends:- High:03, **Medium:**02, **Low:**01, **No Mapping:** - *PSOs are to be formulated at the institute level										

XII. SUGGESTED LEARNING MATERIALS/BOOKS

Sr. No	Author	Title	Publisher
1	E. Balaguruswamy	Programming in ANSI 'C'	Mcgraw Hill Publications ISBN 0070534772
2	Yashwant Kanetkar	Let us 'C'	BPB Publication ISBN 9788183331630
3	David Griffiths, Dawn Griffiths	Head First C	O'Reilly Media, Inc. ISBN: 9781449345013

XIII. LEARNING WEBSITES & PORTALS

Sr.No	Link/Portal	Description
1	https://nptel.ac.in/courses/106104128	C Programming
2	https://jsommers.github.io/cbook/control.html	Control structures, flow control statements in C
3	https://www.learn-c.org/en/Functions	Functions
4	https://www.simplilearn.com/tutorials/c-tutorial/pointers-in-c	Pointers
5	https://www.w3schools.com/c/	C Programming
6	https://www.javatpoint.com/c-programming-language- tutorial	C Programming tutorial
7	https://www.programiz.com/c-programming	C Programming
8	https://www.programiz.com/c-programming/online- compiler/	Online C compiler

Name & Signature:

Mrs. Khushboo S. Sathawane

Mrs. Snehal S. Ingavale

Lecturer in Computer Engineering.

Mrs. K. S. Gaikwad

Lecturer in Information Technology.

(Course Experts)

Name & Signature:	Name & Signature:
Dr.D N Rewadkar (Programme Head)	**Shri. S.B. Kulkarni** (CDC In-charge)

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GOVERNMENT POLYTECHNIC, PUNE

'120 – NEP' SCHEME

PROGRAMME	**DIPLOMA IN** CE/EE/ET/ME/MT/**CM/IT**/DDGM
PROGRAMME CODE	01/02/03/04/05/**06/07**/08
COURSE TITLE	**WEB PAGE DESIGNING USING HTML**
COURSE CODE	**CM21205**
PREREQUISITE COURSE CODE & TITLE	**NA**

I.LEARNING & ASSESSMENT SCHEME

Course Code	Course Title	Course Type	Learning Scheme					Credits	Assessment Scheme											
			Actual Contact Hrs./Week			SLH	NLH		Paper Duration	Theory				Based on LL & TSL				Based on SL		Total Marks
														Practical						
			CL	TL	LL					FA-TH	SA-TH	Total		FA-PR		SA-PR		SLA		
										Max	Max	Max	Min	Max	Min	Max	Min	Max	Min	
CM21205	Web Page Designing Using HTML	SEC	2	-	4	2	8	4	--	--	--	--	--	50	20	50@	20	50	20	150

Total IKS Hrs for Term: 0 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, **IKS** – Indian Knowledge System, **SLA**-Self Learning Assessment

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

Note:

FA-TH represents an average of two class tests of 30 marks each conducted during the semester.

1.If a candidate is not securing minimum passing marks in **FA-PR** (Formative Assessment - Practical) of any course, then the candidate shall be declared as **'Detained'** in that semester.

2.If a candidate does not secure minimum passing marks in SLA (Self Learning Assessment) of any course, then the candidate shall be declared as **'fail'** and will have to repeat and resubmit SLA work.

3.**Notional learning hours** for the semester are **(CL + LL + TL + SL) hrs. * 15 Weeks**

4. C**redit** is equivalent to **30 Notional hours**.

5.* Self-learning hours shall not be reflected in the Timetable.

6.* Self-learning includes micro-projects/assignments/other activities.

II.RATIONALE:

Web Page Design is used to develop online applications for various organizations such as Organizational and Educational websites, Virtual Learning environments, Business Applications in various fields such as products, sales, banking railways reservation, services etc. Web pages are categorized into two namely: static and dynamic web page. This course introduces web page design using HTML5 and also give emphasis on learning Cascading Style Sheets (CSS) which is a style sheet language used for describing the presentation of a document written in a markup language for formatting and styling of content.

III.COURSE-LEVEL LEARNING OUTCOMES (CO'S)

Students will be able to achieve & demonstrate the following Cos on completion of course based learning

CO1:Use HTML formatting tags to develop a web page.

CO2:Develop web page using List and hyperlinks.

CO3:Create Web pages using Images, Colors and Backgrounds.

CO4:Design HTML forms.

CO5:Format web pages using CSS.

CO6:Host static websites.

IV.THEORY LEARNING OUTCOMES AND ALIGNED COURSE CONTENT

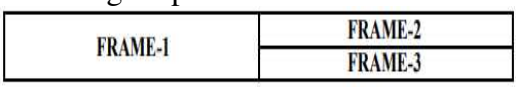
Sr. No	Theory Learning Outcomes (TLO'S) aligned to CO's.	Learning content mapped with TLO's.	Suggested Learning Pedagogies	Relevant COs
UNIT-I INTRODUCTION TO HTML (CL Hrs-04, Marks-NIL)				
1.	**TLO 1.1** Differentiate characteristics of the given type of web sites. **TLO 1.2** Describe structure of the given HTML page. **TLO 1.3** Explain use of Head tag and body tag in the given web page. **TLO 1.4**Describe the procedure of using the given block level tag on a web page. **TLO 1.5** Describe the procedure of using the given Text level tag and use of special characters in web page.	**1.1** Introduction of HTML **1.2** Terminologies used in Web Design: World Wide Web (www), Web Pages and it'sypes, Web Site, Web Browsers, Web Servers and types of sites. Static vs. dynamic web sites, Search Engine. **1.3** Web page structure: DOCTYPE, HTML, TITLE, HEAD, BODY and other meta tags with attributes. **1.4** Block Level Elements: Headings, Paragraphs, Breaks, Divisions, Centered Text, Block Quotes, Preformatted text, types of Address, HR tag. Horizontal Rule,Block level tag. **1.5** Text Level Elements: Bold, Italic, Teletype, Underline, Strikethrough, Superscript, Subscript, displaying special characters, Comments.	Hands-on Demonstration Presentation	**CO1**
UNIT-II ELEMENTS OF HTML (CL Hrs-04, Marks-NIL)				
2	**TLO 2.1** Explain use of the given type of list in Web Pages. **TLO 2.2**Describe different types of Links.	**2.1**Lists: Ordered Lists, Unordered Lists, Definition Lists, Nested Lists. **2.2** Links: Absolute, Relative and Inline links, Use image as link, Link to an email address, Button as link, Types of Links, Linking various documents for Internal and external links, To link different web page of same site, link different location on the same web page, Specific location on different web page of same site. to specific section within the Document, Inserting E-mail link.	Hands-on Demonstration Presentation	**CO2**
UNIT-III IMAGES,COLORS AND BACKGROUND(CL Hrs-06, Marks-NIL)				
3	**TLO 3.1** Describe the given image attribute on a web page and describe HSPACE & VSPACE **TLO 3.2**. Explain process of using the given colors/images as page background on a Web Page.	**3.1** Image: Types of image format, jpg, bmp, png gif etc. IMG tag, alternate text, image alignment, HSPACE, VSPACE, wrapping text, height and width of images, Image as a link, Inserting Images, formatting image for sizing, alignment. Border and using other attributes with IMG tag. **3.2** Colors and Backgrounds: The text color, color attribute of FONT tag, text attribute of BODY tag. bgcolor attribute of BODY tag,	Hands-on Demonstration Presentation	**CO3**

		Changing link colors: link, alink, vlink, attributes of BODY tag, Backgrounds: Inserting image as page background, Background attributes of BODY tag, Creating solid color page background		
UNIT- IV TABLE,FRAMES AND FORMS (CL Hrs-06, Marks-NIL)				
4	**TLO 4.1:** Explain the given table attributes to organize data on a web page and table setting. **TLO 4.2:** Describe the table formatting in web pages. **TLO 4.3:** Describe the given type of 'frame' with examples and procedure to organize display as per given screen layout using frames. **TLO 4.4:** Create basic form using different form fields and Button tags.	**4.1** Table: Table tag with attributes. TABLE,<tr>,<th>,<td> tags. Border, cell spacing, cell padding, width, align, bgcolor attributes. Adding captions: CAPTION tag **4.2** Formatting contents in the table cells: align, valign, bgcolor, height, width, nowrap attributes. Spanning rows and columns: rowspan and colspan attributes. **4.3** Frames: 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 NOFRAMES tag, Frame targeting. **4.4** Forms: 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.Formatting technique: Using table to layout form.	Hands-on Demonstration Presentation	**CO4**
UNIT –V INTRODUCTION TO CASCADING STYLE SHEETS(CL Hrs-06, Marks-NIL)				
5	**TLO 5.1** Describe CSS code for the given type of formatting on a web page with different CSS properties. **TLO 5.2** Describe the procedure to create CSS for applying the given presentation scheme on a web page **TLO 5.3** Describe CSS advanced properties. And Enlist different types of CSS responsive attributes.	**5.1** Cascading Style Sheets: Different types of Style Sheets, Benefits of using CSS. Adding style to the document: Linking to style sheets, Embedding style sheets, Using inline style, Selectors: CLASS rules, ID rules. **5.2** Style sheet properties: Font, textbox, color and background properties; Creating and Using a simple external CSS file; Using the internal and inline CSS; background and color gradients in CSS Setting font and text in style sheet using table layout. **5.3.**CSS responsive attributes**:**CSS HYPERLINK Rounded Corners ,CSS Border Images, CSS Shadows, CSS Text Effects,CSS 2D Transforms, CSS 3D Transforms, CSS Transitions, CSS Animations, CSS Tooltips, CSS Style Images, CSS Image Reflection.	Hands-on Demonstration Presentation	**CO5**

UNIT –VI WEBSITE HOSTING (CL Hrs-04, Marks-NIL)				
6	**TLO 6.1** Describe the procedure to configure a web server and hosting the given website.	**6.1** Website Hosting: Concept of Internet and Intranet. Publishing website on Intranet, Installing and configuring web server, uploading files on intranet site, access intranet based website; Publishing website site on Internet, hiring Web space, uploading files using FTP, Virtual Hosting, access internet based website.	Hands-on Demonstration Presentation	**CO6**

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 1.1** Working with basic HTML tags.	Create a web page using structure tags to display sample message	2	CO1*
2	**LLO2.1** Working with Font tags	Create a web page to provide an introduction to "Government Polytechnic, Pune"with the help of different font tags.	2	CO 1*
3	**LLO 3.1** Use of heading tags in web page	Display all branches of Government polytechnic Pune in <h1> to <h6> header tags.	2	CO 1*
4	**LLO 4.1** Working with text level tags	Design a web page with two paragraphs each of 8-10 lines. Assign title to web page. Practice formatting tags for bold, italics, underline, center, break, space,	4	CO 1*
5	**LLO 5.1** Working with block level tags	Create a web page for displaying a paragraph using block level tags and HR tags, pre tag, DIV tag ,span tag etc.	2	CO 1
6	**LLO 6.1**Implement the border properties in web page	Create a web page to insert a border property in html statements.i.e. ©, ®, ←	2	CO 1*
7	**LLO 7.1** Use of special character in webpage	Create a web page using special symols	2	CO 1
8	**LLO 8.1** Use of different character formatting in Web page.	Create a page to show different character formatting (SUB, SUP) tags: for eg: $log_b m^p = p\ log_b m$	2	CO 1*
9	**LLO 9.1** Working with ordered and unordered List.	Design a web page for implementing Ordered list and Unordered list.	2	CO 2*

10	**LLO 10.1** Use of different types or ordered and unordered list in web page	Design a web page for implementing • Ordered list within unordered list • Unordered list within ordered list • Ordered list within ordered list • Unordered list within unordered list	4	CO 2*
11	**LLO11.1** Create a web page link	Create a web page to link: • A different web page of same site • A different location on the same web page • A Specific location on different web page of same site	4	CO 2*
12	**LLO12.1** Use of links with images in web page.	Create a web page with an appropriate image towards the left hand side of the page, when user clicks on the image another web page should open.	4	CO 2*
13	**LLO13.1** Use of colors for links in web page	Demonstrate to change colors of links on web page.	2	CO 2*
14	**LLO14.1** Insert image on web page foreground and background with various attributes.	Create a web page with pink color background and display moving message in red color.	2	CO 3*
15	**LLO15.1** Insert images with hyperlink and set image width and height property of image	Create a webpage containing any image and add a hyperlink to another webpage. Use width and height property for an image.	2	CO 3*
16	**LLO16.1** Create table in web page	Create a webpage that displays first year timetable. Make effective use of row span and cols pan attributes. Make use of tag too.	2	CO 3*
17	**LLO17.1** Create table and use table properties in web page	Create a webpage that displays first year timetable. A) Make use of borders, margins and padding properties on table/table rows/table cells. B) Use tag to mark various divisions of webpages. Apply background, border, margin properties to different divisions.	4	CO 3*
18	**LLO18.1** Create table within table and Insert images in tables	Create table within table and also insert an image within the data elements of the table.	2	CO 4*
19	**LLO19.1** Create a frames in web pages	Create a web page which should generate following output: 	2	CO 4*
20	**LLO20.1** Create different elements in web pages.	Create a “registration form “with the following fields: 1)Name 2) Password 3)Email id 4)Phone no 5) Gender	2	CO 4*

		6)Language Known		
21	**LLO21.1** Create CSS by applying style sheets.	Design a webpage using CSS which includes the following: 1)Use different fonts and styles: In the style definition you define how each selector should work(font,color,etc).	4	CO 5*
22	**LLO22.1** Create CSS by applying animation	Create a web page for demonstration of CSS animation.	4	CO 5*
23	**LLO23.1** Hosting of website on open source platform.	Create a website and host on open source.	4	CO 6*
24	**LLO24.1** Create a website to represent portfolio	Create a website to represent personal portfolio.	2	CO 6
25	ALL	Micro-project	04	All COs*

VI. SUGGESTED MICRO PROJECT/ASSIGNMENT/ACTIVITIES FOR SPECIFIC LEARNING/SKILLS DEVELOPMENT (SELF-LEARNING)

Self-Learning

1. 1)"HTML & CSS For Beginners with HTML5" certification course of Infosys Springboard(TOC -HTML & CSS For Beginners with HTML5 | Infosys Springboard (onwingspan.com))
2. "Introduction to HTML: A Complete Beginner to Expert Course "certification course of Infosys Springboard(TOC - Introduction to HTML: A Complete Beginner to Expert Course | Infosys Springboard (onwingspan.com))
3. Completion Certification course of SWAYAM/NPTEL/MOOCS/OTHER LEARNING PLATFORM
4. Prepare a report on good design and bad design.
5. Prepare a report on best practices of web programming.

Suggested Micro project

The micro project has to be industry application-based, internet-based, workshop-based, laboratory-based or field-based as suggested by the Teacher.

1) To perform a survey on various websites available like IRCTC, Amazon and prepare report on different HTML controls used in it.
2) Prepare a Registration form for cultural event. (The course teacher shall assign a document to be prepared by each student)
3) To study and prepare a report on advanced HTML Tags (The subject teacher shall assign a presentation to be prepared by each student).

Assignment

Prepare a journal of practical performed in the laboratory.

VII. LABORATORY EQUIPMENT/INSTRUMENTS/TOOLS/SOFTWARE REQUIRED

Sr.No	Equipment Name with Broad Specifications	Relevant LLO Number
1	a) Computer System with all necessary Peripherals and Internet connectivity. b) Any Office Software c) Any Browser (Any General Purpose Computer available in the Institute)	ALL

VIII. SUGGESTED FOR WEIGHTAGE TO LEARNING EFFORTS & ASSESSMENT PURPOSE (Specification Table)

Sr. No	Unit	Unit Title	Aligned COs	Learning Hours	R-Level	U-Level	A-Level	Total Marks
1	I	INTRODUCTION TO HTML	CO1	4	--	--	--	--
2	II	ELEMENTS OF HTML	CO2	4	--	--	--	--
3	III	IMAGES,COLORS AND BACKGROUND	CO3	6	--	--	--	--
4	IV	TABLE,FRAMES AND FORMS	CO4	6	--	--	--	--
5	V	INTRODUCTION TO CASCADING STYLE SHEETS	CO5	6	--	--	--	--
6	VI	WEBSITE HOSTING	CO6	4				
		Grand Total		**30**	--	--	--	--

IX.ASSESSMENTMETHODOLOGIES/ TOOLS

Formative assessment (Assessment for Learning)	Summative Assessment (Assessment of Learning)
Lab performance, Assignment, Self-learning and Seminar/Presentation	Lab. Performance, viva voce

X.SUGGESTED 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	1	-	-	-	-	-	1	2	-	3
CO2	-	-	-	3	-	-	1	-	-	3
CO3	-	2	1	3	-	-	1	-	-	3
CO4	-	-	-	3	-	-	1	-	-	3
CO5	1	-	-	3	-	-	3	2	-	3
CO6	1	2	3	2	-	-	2	-	-	3
Legends:-High:03, **Medium:**02, **Low:**01, **No Mapping:** - *PSOs are to be formulated at the institute level										

XI.SUGGESTED LEARNING MATERIALS/BOOKS

Sr No	Author	Title	Publisher
1	HTML and CSS Complete Reference	Thomos Powell	Tata McGraw Hill
2	Web Publishing with HTML and CSS	Lemay Colburn	Pearson
3	HTML and CSS 3	Ivan Bayross	BPB
4	Learning Web Design	Robbins	O'Reilly
5	Teach Yourself HTML & CSS in 24 Hours	SAMS	Pearson

XII. LEARNING WEBSITES & PORTALS

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

Name & Signature:

Mrs. Sheetal J. Siraskar

Mrs. Priya K. Zade

Lecturer in Computer Engineering

Miss. Poonam C. Fafat

Lecturer in Information Technology

(Course Experts)

Name & Signature:	Name & Signature:
Dr.D N Rewadkar (Programme Head)	**Shri. S.B. Kulkarni** (CDC In-charge)

GOVERNMENT POLYTECHNIC, PUNE

'120 – NEP' SCHEME

PROGRAMME	**DIPLOMA IN CE/EE/ET/ME/MT/CM/IT/DDGM**
PROGRAMME CODE	**01/02/04/05/05/06/07/08**
COURSE TITLE	**YOUTH LEADERSHIP FOR CLIMATE ACTION**
COURSE CODE	**HU21202**
PREREQUISITE COURSE CODE AND TITLE	**NA**

I. LEARNING &ASSESSMENT SCHEME:

Course Code	Course Title	Course Type	Learning Scheme					Credits	Assessment Scheme											
			Actual Contact Hrs./Week			SLH	NLH		Paper Duration Hrs.	Theory				Based on LL &TSL				Based on SL		Total Marks
														Practical						
			CL	TL	LL					FA-TH	SA-TH	Total		FA-PR		SA-PR		SLA		
										Max	Max	Max	Min	Max	Min	Max	Min	Max	Min	
HU21202	YOUTH LEADERSHIP FOR CLIMATE ACTION	VEC	-	-	-	2	2	1	-	-	-	-	-	-	-	-	-	50	20	50

Total IKS Hrs for Term: 0 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, **IKS** – Indian Knowledge System, **SLA**- Self Learning Assessment

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 semester.
2. If a candidate is not securing minimum passing marks in **FA-PR** (Formative Assessment - Practical) of any course, then the candidate shall be declared as **'Detained'** in that semester.
3. If a candidate does not secure minimum passing marks in SLA (Self Learning Assessment) 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 hours**.
6. * Self-learning hours shall not be reflected in the Timetable.

6.*Self-learning includes micro-projects/assignments/other activities.

II. RATIONALE:

Climate change is a global phenomenon that transcends borders. Climate change poses significant threats to biodiversity, ecosystems, and natural resources. Its impacts, such as rising temperatures, extreme weather events, and sea-level rise, affect communities worldwide. Addressing climate change is a collective responsibility to safeguard the planet and its ecosystems for current and future generations. Climate change exacerbates social and economic inequalities, affecting vulnerable communities disproportionately. With increasing climate risks, and exposure to hazards, citizens need to improve clean and green skills.

Mitigating climate change and taking climate action is essential for preserving the Earth's biodiversity, maintaining ecosystem services, and ensuring the sustainability of vital resources upon which human societies depend. By taking climate action, societies can enhance resilience, reduce vulnerability, and promote social and economic stability. Sustainable practices help protect, preserve, and sustain the environment, as well as stimulate economic growth in sectors such as renewable energy and energy efficiency.

Climate action involves transitioning to more sustainable and resource-efficient practices. This includes adopting clean energy sources, improving energy efficiency, and promoting circular economies. Imparting skills to the human resources in the clean and green sectors is also a climate action. Such measures not only mitigate climate change but also contribute to the efficient use of resources and the reduction of environmental degradation.

The national, state, and multilateral efforts, such as the Mission Life, State Climate Action Planning, Paris Agreement, etc. provide a framework for countries to work together in reducing greenhouse gas emissions, adapting to climate impacts, and fostering technology transfer for sustainable development.

III. COURSE-LEVEL LEARNING OUTCOMES (CO's)

Students will be able to achieve & and demonstrate the following COs on completion of course-based learning

CO1: Demonstrate a comprehensive understanding of the science behind climate change, its causes, and its impacts on the environment, economy and society.
CO2: Understand the principles of water resource management (WRM), water conservation and its application in the context of climate change.
CO3: Understand the relationship between climate change and waste management, including the issues and impacts of waste management practices on greenhouse gas emissions.
CO4: Demonstrate a comprehensive understanding of energy systems, including sources, distribution, and consumption patterns
CO5: Advocate for and implement energy conservation practices at individual, community, and organizational levels to reduce overall energy demand.
CO6: Develop a comprehensive understanding of the intricate interconnections between biodiversity and climate, and recognize the reciprocal impacts each has on the other.

IV. THEORY LEARNING OUTCOMES AND ALIGNED COURSE CONTENT:

Sr. No	Theory Learning Outcomes(TLO'S) aligned to COs.	Learning content mapped with TLOs.	Suggested Learning Pedagogies	Relevant COs
	UNIT-I LIVING WITH CLIMATE CHANGE			
	SUBUNIT 1: CLIMATE CHANGE PHENOMENON AND SCIENCE			
1.1	**TLO 1.1.1** Able to articulate the fundamental differences between weather and climate **TLO 1.1.2** Understanding of the basic principles of climate change, including the greenhouse effect, human-induced factors, and the consequences of a warming planet. **TLO 1.1.3** Able to define the concept of a carbon footprint, understanding it as the total amount of greenhouse gases.	1.1.1 Understanding Climate: Weather versus Climate 1.1.2 Climate and the Greenhouse Effect 1.1.3 Natural and Human-induced Climate Change 1.1.4 Carbon footprint	Video Lectures (Online Mode: Link https://www.mahayouthnet.in/)	1
	SUB UNIT 2: CLIMATE CHANGE IMPACTS			
1.2	**TLO 1.2.1** Grasp the foundational science behind climate change, including the greenhouse effect, human-induced emissions, and the role of feedback mechanisms in global warming. **TLO 1.2.2** Identify and analyze key indicators of climate change, such as rising global temperatures, changing precipitation patterns, sea level rise, and the frequency of extreme weather events. **TLO 1.2.3** Understand the diverse climate patterns across India's biogeographic regions, including the Himalayas, Indo-Gangetic Plains, Western Ghats, Eastern Ghats, Deccan Plateau, and coastal regions.	1.2.1Global impacts and uncertainties 1.2.2 Effects on India and its various biogeographic regions 1.2.3Impacts on livelihoods and economy: Agriculture and Horticulture 1.2.4Impacts on Vulnerable Communities: Fishing Communities	Video Lectures (Online Mode: Link https://www.mahayouthnet.in/)	1

SUB UNIT 3: CLIMATE ACTION				
1.3	**TLO1.3.1** Understand the concept of climate change mitigation and adaptation and its role in preparing for and responding to the impacts of climate change. **TLO1.3.2** Understand the concept of sustainable development and its three dimensions: economic, social, and environmental. **TLO1.3.3** Identify and articulate the connections between climate change impacts and existing social, economic, and environmental inequalities. **TLO1.3.4** Understand the importance of community-based climate action and initiatives led by local communities in India. **TLO 1.3.5** Understand the concepts of green skills and green work, emphasizing their role in promoting sustainability and environmentally conscious practices in various industries.	1.3.1 Mitigation and Adaptation 1.3.2 Intergovernmental processes 1.3.3 Sustainable Development Goals 1.3.4 Climate Justice 1.3.5 India's journey towards Climate Action 1.3.6 Majhi Vasundhara and Other Initiatives 1.3.7 Role of Individuals 1.3.8 Green Skills and Green Work	Video Lectures (Online Mode: Link https://www.mahayouthnet.in/)	2
UNIT-II WATER MANAGEMENT FOR CLIMATE CHANGE				
SUB UNIT 1: THE NEED OF WATER MANAGEMENT AND CONSERVATION				
2.1	**TLO 2.1.1** Understand the concept of water management and its significance in addressing water-related challenges. **TLO 2.1.2** Describe the water cycle and its role in the distribution and availability of water. **TLO 2.1.3** Identify regions facing water scarcity and understand the factors contributing to water shortages. **TLO 2.1.4** Analyze patterns of human water consumption and its impact on local and global water resources. **TLO 2.1.5**Examine water quality issues, including pollution sources, contaminants, and their effects on ecosystems and human health. **TLO 2.1.6** Recognize the role of community engagement in water conservation efforts and sustainable water management practices. **TLO 2.1.7** Understand the	2.1.1 Water - the basis of life. 2.1.2 The water cycle and freshwater availability. 2.1.3 Water use in India and the importance of groundwater. 2.1.4 Water Resources in Maharashtra. 2.1.5 Use of water in our lives. 2.1.6 Virtual Water. 2.1.7 Traditions of water use and management. 2.1.8 Water Quality - an important dimension. 2.1.9 Wastewater: a problem and a potential resource.	Video Lectures (Online Mode: Link https://www.mahayouthnet.in/)	2

	concept of wastewater and Identify and analyze the sources of pollutants in wastewater, including industrial discharges, agricultural runoff, and urban sewage.			
SUB UNIT 2: ISSUES AND CHALLENGES IN WATER MANAGEMENT				
2.2	**TLO 2.2.1** Understand the concept of water stress and its implications for a region's ability to meet water demand for various purposes. **TLO 2.2.2** Explore the role of agriculture in water stress, including irrigation practices, cropping patterns, and the impact of changing agricultural practices. **TLO 2.2.3** Understand the concept of water pollution and differentiate between various types of pollutants affecting water bodies. **TLO 2.2.4** Understand the environmental, ecological, and public health impacts of different pollutants in water, such as nutrients, heavy metals, pathogens, and synthetic chemicals. **TLO 2.2.5** Identify common waterborne diseases, such as cholera, typhoid, dysentery, and gastroenteritis, and understand their causative agents. **TLO 2.2.6** Define the challenges associated with inadequate sanitation, including issues related to open defecation, lack of access to sanitary facilities, and the impact on public health.	2.2.1 Water Stress in India. 2.2.2 Water resources limitation and increasing use. 2.2.3 Water stress in agriculture. 2.2.4 Water pollution and contamination. 2.2.5 Health impacts of poor water quality. 2.2.6 Water management and climate change. 2.2.7 The global challenge of water and sanitation. 2.2.8 Summary - causes of water stress.	Video Lectures (Online Mode: Link https://www.mahayouthnet.in/)	2
SUB UNIT 3:TOWARDS SUSTAINABLE WATER MANAGEMENT				
2.3	**TLO 2.3.1** Understand and define the concept of sustainable water management, considering its ecological, social, and economic dimensions. **TLO 2.3.2** Understand the significant initiatives launched by the Government of India/State government which focuses on water resources and management.	2.3.1 Towards sustainable water management 2.3.2 Swachh Bharat - The Mission for a Clean India 2.3.3 Jal Jeevan Mission - Water for All 2.3.4 Atal Bhujal Yojana - Replenish Groundwater 2.3.5 Mission Amrit Sarovar - Rejuvenate Water bodies 2.3.6 Jalyukt Shivar Abhiyan – Waterscapes.	Video Lectures (Online Mode: Link https://www.mahayouthnet.in/)	2

SUB UNIT 4: INDIVIDUAL AND COMMUNITY ACTIONS FOR WATER AND WASTEWATER MANAGEMENT				
2.4	**TLO 2.4.1** Understand the concept of a water audit and its significance in assessing water use, efficiency, and conservation. **TLO 2.4.2** Analyze water use patterns in common household activities, including bathing, washing dishes, laundry, and gardening. **TLO 2.4.3** Understand the definition of greywater and Recognize common sources of greywater in households, including bathroom sinks, showers, bathtubs, and washing machines. **TLO 2.4.4** promote awareness within communities about the benefits of greywater management and its potential impact on water conservation. **TLO 2.4.5** Understand the concept of rainwater harvesting and its significance in sustainable water management. **TLO 2.4.6** Learn different methods used to calculate rainwater harvesting potential	2.4.1 Conduct water audits 2.4.2 Save water at home 2.4.3 Promote greywater management at home and in the community 2.4.4 Spread the word on sustainable water management 2.4.5 Calculate Rainwater Harvesting Potential.		2
UNIT III: WASTE MANAGEMENT AND CLIMATE ACTION				
SUBUNIT 1: WHAT IS WASTE?				
3.1	**TLO 3.1.1** Understand the term "domestic waste" and distinguish it from other types of waste generated in different contexts. **TLO 3.1.2** Classify domestic waste into different categories such as organic waste, recyclables, hazardous waste, and non-recyclables. **TLO 3.1.3** Learn various methods used to quantify household waste, including direct measurement, sampling, and estimation techniques. **TLO 3.1.4** Identify specific waste patterns associated with different generations and lifestyles **TLO 3.1.5** Understand the Sustainable Development Goals (SDGs)	3.1.1 Define and enlist types of waste 3.1.2 List the components of domestic waste 3.1.3 Differentiate between biodegradable and non-biodegradable waste 3.1.4 Assess the quantum of waste generated at home 3.1.5 Changes in Waste generation over human generations 3.1.6 Review lifestyle choices 3.1.7 SDGs and Link of Waste with SDGs	Video Lectures (Online Mode: Link https://www.mahayouthnet.in/)	3

	TLO 3.1.6 Analyze the critical role of waste management in achieving multiple SDGs			
SUBUNIT 2: ISSUES IN WASTE MANAGEMENT				
3.2	**TLO 3.2.1 E**mphasizing waste impact on the environment, human health, and overall sustainability. **TLO 3.2.2** Identify health risks associated with improper waste disposal, such as the spread of diseases and exposure to hazardous materials. **TLO 3.2.3** Analyze how waste, particularly organic waste in landfills, contributes to greenhouse gas emissions and climate change.	3.2.1 Why is waste an issue? 3.2.2 Health impacts from mismanagement of waste 3.2.3 Work conditions of waste workers 3.2.4 Waste of natural resources and increased greenhouse gas emissions	Video Lectures (Online Mode: Link https://www.mahayouthnet.in/)	3
SUBUNIT 3: APPROACHES TO WASTE MANAGEMENT				
3.3	**TLO 3.3.1** Clearly define the waste management hierarchy **TLO 3.3.2 W**aste management hierarchy role in guiding sustainable waste management practices such as source reduction, reuse, recycling, energy recovery, and disposal.	3.3.1 Hierarchy of waste management 3.3.2 Waste segregation at source 3.3.3 Reduce, Reuse, Recycle and Recover 3.3.4 Recycling of waste materials 3.3.5 Principle of circular economy 3.3.6 Avoiding waste by design 3.3.7 Composting	Video Lectures (Online Mode: Link https://www.mahayouthnet.in/)	3
SUBUNIT 4: LEGISLATIONS RELATED TO WASTE MANAGEMENT				
3.4	**TLO 3.4.1** Familiarize yourself with major national and international legislation related to waste management. **TLO 3.4.2** Define Extended Producer Responsibility (EPR) and explain its concept in the context of environmental management. **TLO 3.4.3** Define biomedical waste and distinguish it from other types of waste. Identify the various sources and types of biomedical waste generated in healthcare facilities.	4.1 Municipal Solid Waste Management Rules 2016 4.2 Plastic Waste Management Rules 4.3 Extended Producer Responsibility (EPR) 4.4 Biomedical Waste Management 4.5 Preventive Measures for Manual Scavenging	Video Lectures (Online Mode: Link https://www.mahayouthnet.in/)	3
SUBUNIT 5: ACTION FOR IMPROVING WASTE MANAGEMENT				
3.5	**TLO 3.5.1** Develop skills in data collection methods for waste assessment, such as waste audits, surveys, and interviews.	5.1 Waste assessment in your community or town 5.2 Setting up a compost unit	Video Lectures (Online Mode: Link https://www.mahayouthnet.in/)	3

	TLO 3.5.2 Analyze collected data to identify patterns, trends, and areas for improvement in waste management practices. **TLO 3.5.3** Define composting and explain the biological processes involved in the decomposition of organic matter. **TLO 3.5.4** Explore different composting methods, such as aerobic and anaerobic composting, and choose the most suitable technique for the compost unit. **TLO 3.5.5** Explore different biogas production technologies, such as continuous stirred tank reactors (CSTR) and anaerobic digesters.	5.3 Biogas: Is it a possibility?		
UNIT IV: ENERGY MANAGEMENT AND CLIMATE ACTION				
SUBUNIT 1: ENERGY IN OUR LIVES				
4.1	**TLO 4.1.1** Identify the key principles of efficient energy use and conservation. **TLO 4.1.2** Familiarize yourself with different energy sources, including renewable and non-renewable options. **TLO 4.1.3** Understand the connection between energy production, consumption, and climate change. **TLO 4.1.4** Understand India's commitments to sustainable energy at the national and international levels, including agreements	4.1.1 Energy and quality of life 4.1.2 Sources of energy 4.1.3 Energy and C Change 4.1.4 Judicious use of non-renewable energy resources 4.1.5 A Just Transition 4.1.7 India's commitment to sustainable energy 4.1.8 Policies and Programs for Energy Management 4.1.9 Clean Energy for Cooking	Video Lectures (Online Mode: Link https://www.mahayouthnet.in/)	4

SUBUNIT 2: YOUTH ACTION TO IMPROVE ENERGY MANAGEMENT				
4.2	**TLO 4.2.1** Recognize the role of youth in driving positive change in energy management. **TLO 4.2.2** Understand how youth-led initiatives can influence energy policies, behaviours, and practices. **TLO 4.2.3** Identify and promote energy-efficient practices in daily life, schools, and communities.	4.1.1 Avoid energy wastage 4.2.2 Energy-efficient appliances 4.2.3 Renewable Energy-Specific Policies and Schemes 4.2.4 Low Carbon Lifestyles book	Video Lectures (Online Mode: Link https://www.mahayouthnet.in/)	4
SUBUNIT 3: PROMOTE SUSTAINABLE ENERGY AT HOME, INSTITUTION AND IN THE COMMUNITY				
4.3	TLO 4.3.1 Identify and calculate energy requirements at the household level and enlist ways of efficient energy usage TLO 4.3.2 Identify opportunities for improving public energy use in their village or town TLO 4.3.3 Design surveys that effectively capture data on energy-efficient appliance availability and usage patterns. TLO 4.3.4 Identify and analyze emerging technologies within the energy sector that require specialized skills. TLO 4.3.5 Demonstrate the ability to map existing skills within the energy sector workforce. TLO 4.3.6 Analyze skill gaps and their implications for the industry.	4.3.1 Energy audit at home or institution 4.3.2 Energy saving opportunities 4.3.3 Energy access survey 4.3.4 Surveys of energy-efficient appliance availability and use 4.3.5 Survey of renewable energy use 4.3.6 Survey energy sector skilling opportunities 4.3.7 Share study findings with policymakers	Video Lectures (Online Mode: Link https://www.mahayouthnet.in/)	5
UNIT V: BIODIVERSITY CONSERVATION AND CLIMATE ACTION				
SUBUNIT 1: BIODIVERSITY IN OUR LIVES				
5.1	**TLO 5.1.**1 Understand the concept of biodiversity and its components **TLO 5.1.2** Clearly define the concept of biocultural diversity, explaining the interconnectedness of biological diversity (biodiversity) and cultural diversity. **TLO 5.1.3** Clearly define the concept of human dependence on biodiversity, outlining the various ways in which humans rely on	**5.1.1** What is biodiversity? **5.1.2** What is Biocultural diversity? **5.1.3** Nature of Human Dependence on Biodiversity **5.1.4** Biodiversity resources in your landscape	Video Lectures (Online Mode: Link https://www.mahayouthnet.in/)	6

	diverse ecosystems for survival and well-being. **TLO 5.1.4** Develop the ability to identify and categorize the various forms of biodiversity present in the specific landscape, including plants, animals, microorganisms, and their interactions.			
SUBUNIT 2: THREATS TO BIODIVERSITY				
5.2	**TLO 5.2.1** Categorize and differentiate between natural and anthropogenic threats to biodiversity, including habitat loss, pollution, climate change, invasive species, and overexploitation. **TLO 5.2.2** Clearly define the concepts of biocultural diversity and climate change, highlighting the interconnectedness between biological diversity, cultural diversity, and changing climatic conditions.	**5.2.1 Threats to biodiversity** **2.2.2 Biocultural diversity and climate change**	Video Lectures (Online Mode: Link https://www.mahayouthnet.in/)	6
SUBUNIT 3: CONSERVING BIODIVERSITY				
5.3	**TLO 5.3.1** Clearly define the concept of biodiversity conservation, emphasizing its importance in maintaining ecological balance and supporting human well-being. **TLO 5.3.2** Explore the historical background that led to the development of forest acts, considering factors such as colonial influences, resource extraction, and changing societal attitudes towards forests. **TLO 5.3.3** Clearly define the concept of biodiversity conservation actions, emphasizing the multifaceted approaches and strategies employed to protect and sustain biodiversity.	**5.3.1** Approaches to conservation of biodiversity. **5.3.** Key legislations for biodiversity conservation **5.3.3** Actions for biodiversity conservation at various levels, including awareness raising and advocacy in the community	Video Lectures (Online Mode: Link https://www.mahayouthnet.in/)	6

Note: All above Units are Mandatory units. (In Online mode, only Units nos 1 and 2 are Mandatory and units nos 3,4, and 5 are Elective/optional)

V. LABORATORY LEARNING OUTCOME AND ALIGNED PRACTICAL/TUTORIAL EXPERIENCES.

NOT APPLICABLE

VI. SUGGESTED MICROPROJECT/ASSIGNMENT/ACTIVITIES FOR SPECIFIC LEARNING/SKILLS DEVELOPMENT (SELF-LEARNING)

Table 01: Individual Activities

Sr. No	Unit Name	Activity	Activity Details
1	Living with Climate Change	Calculation of your carbon footprint online	To Calculate your carbon footprint online at https://www.unfccc.int/ https://www.carbonfootprint.com/ Use two carbon footprint calculators available online to Prepare your report for Carbon footprint. Compare the calculators used and suggest which is the better calculator with the reasons.
2	Water Management and Climate Action	Conducting water audits	To conduct a Personal-level water audit. 1. Track your overall water usage: a) Read your water meter, b) Estimate usage without a meter 2. Measure individual fixture flow rates: a) Faucet and showerhead flow b) Toilet flush: 3. Monitor your water habits: a) Keep a water use log b) Observe your routines 4. Analyze your findings: a) Compare your usage to benchmarks, b) Identify potential leaks c) Prioritize areas for improvement 5. Implement water-saving strategies: a) Install water-efficient fixtures b) Shorten showers and bath times c) Run appliances only when full d) Fix leaky faucets promptly e)Utilize alternative water sources
3	Waste Management and Climate Action	Surveying Home waste	To find out How much waste is generated in your home every day conduct a home survey for a weekAnalyze as per the following: a) What makes up the maximum part of the waste? b) How much of what was thrown out could have been reused or recycled? c) Could the amount of garbage be reduced? List the ways to reduce waste at home. Calculate: a) Waste generated over a week (in grams) divided by 7= waste (gms)/ day, b) Waste (gms)/ day divided by the number of persons in your house= Waste (gms)/ day/capita Using your survey results, you can calculate the approximate waste generated by the entire population of a block of flats, township, village, town, city, etc.
4	Energy Management and Climate Action	Preparation of Survey report on energy-efficient appliances.	To prepare a Survey report on energy-efficient appliances, their availability and use. 1. Availability of Energy-Efficient Appliances: 2. Use of Energy-Efficient Appliances 3. Government Policies and Incentives 4. Technological Advancements 5. Environmental Impact and Consumer Trends
5	Biodiversity Conservation and Climate Action	Preparation of a Survey report on Biodiversity resources in your landscape	To prepare a Survey report on Biodiversity resources in your landscape based on any one point among the list given below. 1. List of trees, plants, and shrubs in the village/ town outskirts, their classification, occurrence, and usage study. 2. Draw a biocultural map of the landscape of the village/ town, the diversity of trees (mother trees) and those who maintain it 3. A village called Tree: Understand a tree as an ecosystem and the biodiversity associated with the tree. 4. Ranmeva special study 5. Dietary diversity across three generations, a ‘change over time’ study.

Table 2: Group Activity

Sr. No.	Unit Name	Community Project Name	Activity Details
1.	Living with Climate Change	Conduction of Feasibility Study of Renewable Energy	Conduct a feasibility study on implementing renewable energy sources (such as solar, wind, or hydroelectric power) for a specific area or institution. Analyze costs, benefits, environmental impacts, and logistics involved in transitioning to renewable energy**.**
2.	Water Management and Climate Action	Preparation of water audit for the college campus.	To prepare a water audit for the college campus based on the following points 1. Gather Information: 2. Identify Water Use Areas: 3. Assess Indoor Water Usage: 4. Evaluate Outdoor Water Usage: 5. Measurements and Inspections: 6. Data Analysis: 7. Recommendations for Conservation: 8. Cost-Benefit Analysis: 9. Create an Action Plan: 10. Implementation and Monitoring: 11. Educational Outreach: 12. Documentation and Reporting:
3.	Waste Management and Climate Action	Conduction of survey on Waste assessment in your locality.	1. Conduct a survey of waste management systems in your town/ locality. Observe all the stages of waste management, and note who is involved at each stage viz. Waste collection Transport Processing in different ways Disposal etc. 2. Analysis of waste management in your /locality. 3. Assessment of Waste Segregation in your /locality.
4	Energy Management and Climate Action	Conduction of energy audit at home or Institute	To conduct an energy audit at home or Institute based on the following points. Analyze your findings based on the energy audit and suggest necessary actions to minimize energy consumption. 1. Gather information and Create a checklist about the following. **1. Lighting:** • Turn off lights in unoccupied rooms. • Replace incandescent bulbs with LEDs • Utilize natural light whenever possible **2. Heating and Cooling:** • Set your thermostat to energy-efficient temperatures (25°C in summer, 20°C in winter) • Seal air leaks around windows and doors. • Clean or replace air filters regularly. **3. Appliances:** • Unplug electronics and chargers when not in use. • Wash clothes and dishes in cold water whenever possible. • Use energy-efficient appliances when purchasing new ones **4. Insulation:** • Check your attic and basement for proper insulation. • Seal any gaps or cracks around pipes and vents. **5.** Suggest corrective actions.

Sr. No.	Unit Name	Community Project Name	Activity Details
5.	Biodiversity Conservation and Climate Action	Preparation of report on Bio-Cultural Diversity Conservation	Prepare a report on Bio-Cultural Diversity Conservation. The report should include : **a) Introduction** i) What is biodiversity? ii)What is its importance in our life? iii) Connections of human beings with their nonliving surrounding and with living forms. **b) Biodiversity resources in your landscape -:** List of trees, plants, and shrubs in the village/ town outskirts, their classification, occurrence, and usage study. **c) Understand a tree as an ecosystem and the biodiversity associated with the tree.**

Note: (1) Individual activities:

The student should complete **any Three activities** among the list given in Table No. 01. above. **(Total Marks: 30 i.e. 10 Marks for each activity)**

(2) Group activity:

Students should complete **any One Community Project** among the list given in Table No. 02 above. **(Total Marks: 20)**

VII. LABORATORY EQUIPMENT/INSTRUMENTS/TOOLS/SOFTWARE REQUIRED

Sr.No	Equipment Name with Broad Specifications	Relevant LLO Number
1	NIL (SLA Course)	NIL

VIII. SUGGESTED FOR WEIGHTAGE TO LEARNING EFFORTS & AND ASSESSMENT PURPOSE

(Specification Table)

NOT APPLICABLE

IX. ASSESSMENT METHODOLOGIES/TOOLS

Formative assessment (Assessment for Learning)	Summative Assessment (Assessment of Learning)
Individual activities and group activities. (50 marks)	Online Examination and issue of online certificate. (Total 4 Certificates)

Note: Student will be awarded 1 credit only upon submission of certificates

i) **One Certificate on combined completion of Units 1 and 2 and**

ii) **One Certificate each on completion of Units nos. 3,4, and 5.**

A total of 4 Certificates are needed to be submitted which will be issued online along with the submission of Individual activities and Group activities.

X. SUGGESTED COs- POs MATRIX FORM

NOT APPLICABLE

XI. SUGGESTED LEARNING MATERIALS/BOOKS

Sr.No	Description	Mode	Remarks
1	Learning material.	Learning material is available in PDF form	Learning material is available for all units in PDF form at the institute website.

XII. LEARNING WEBSITES & PORTALS

Sr.No	Web Link /Portal	Description
1	(Online Mode: Link https://www.mahayouthnet.in/)	Learning material is available online in the course menu after registration for this online course for all units.

XIII. ROLE OF STUDENT AND FACULTY:

(a) ROLE OF STUDENT.

1. **i)Course Registration:** Students should register for this course by adopting the normal procedure for registration as applicable for other courses, as per the schedule declared in the academic calendar through his/her MIS login.

ii) Online Registration: Online registration for this **Self-paced course** "**YOUTH LEADERSHIP FOR CLIMATE ACTION" in online mode by using the URL as under.**

" URL for online registration: https://www.mahayouthnet.in/

Students may join the course by scanning the QR Code as mentioned below.

(Important Note: Students must complete both actions "a" and "b" as mentioned above. Merely completing the registration process in the Institute MIS will not get the student registered for this course.)

2. Students should complete the **Module No. 01 and 02** of this course in online mode and complete the online assignments as available in the online module. Upon completion of these activities, the student will receive a certificate of completion for Units No. 1 and 2. (Will be generated Online from The portal)

3. Students should take up online **Module Nos. 03, 04 and 05** (**which are available as "Elective Modules" in the same online module, No separate registration is needed for these modules**) and complete all unit-wise assignments as available in the online module. Upon completion of these activities, students will receive a separate certificate of completion for each unit i.e. **Units 03,04 and 05**) i.e. **three certificates**. (Will be generated Online from The portal)

4. Student must submit all 4 certificates (first certificate upon completing units nos. 1 and 2 and individual certificates upon completing units nos 3,4 and 5. A Total 4 certificates are needed to be submitted to the concerned faculty assigned for this course by the Concerned Head of the Department)

5. **Most Important Note regarding the award of 1 credit for this course: student must complete any 3 individual activities among the list of activities mentioned in table no 1 above AND must complete any 1 group activity AND submit all 4 certificates (generated in online mode upon completion of all 5 units in online study mode). Upon satisfying these conditions, the student will be awarded 1 credit for this course (SLA).**

6. **Detention/ Fail:** If a candidate does not secure minimum passing marks in SLA (Self Learning Assessment) of any course, then the candidate shall be declared as a **'fail'** and will have to repeat and resubmit SLA work.

(b) ROLE OF FACULTY:

1. i) Regarding confirmation of Course Registration: Faculty should confirm that the course registration has been confirmed by the concerned registration in charge and HOD from their MIS login.

ii) Online Registration for the course: Faculty should confirm that the student has registered for the course in online mode by scanning the QR code OR through the link provided by the portal for registering for the **Self-paced course** "**YOUTH LEADERSHIP FOR CLIMATE ACTION"** in online mode. Faculty should collect screenshots from the students and maintain a record of such screenshots for the concerned semester/term.

2. Regarding submissions to be accepted: The faculty should ensure that the student has completed all 5 modules as mentioned above. The faculty should get the 4 certificates (per student) submitted as submission against completion of the online self-paced course "**YOUTH LEADERSHIP FOR CLIMATE ACTION"** during the term/semester for which, the student have registered. Also, the Faculty should accept the submissions from each student regarding the completion of the group activities as well as individual activities as mentioned above. This activity of submission must be completed before the last date of submission for other courses. ie before the provisional detention schedule as per the academic calendar for that term.

3. **Regarding SLA assessment and allocation of Marks:** Faculty should assess the submission with following guidelines.

   i) Upon submission of online generated all 4 certificates (upon completion of online modules from the portal), the student should be considered eligible for the award of 1 credit along with satisfying the following conditions. (Faculty must not assess the individual activities and group activities if the student fails to submit all 4 certificates as proof of completion of the online course)

   ii) Upon accepting the submission concerning individual activities and group activities, the assessment of these activities should be done by the faculty as per the assessment norms mentioned above in **"VI"** titled "**SUGGESTED MICROPROJECT/ASSIGNMENT/ACTIVITIES FOR SPECIFIC LEARNING/SKILLS DEVELOPMENT (SELF-LEARNING)"**

   iii) Faculty should preserve the record of student-wise allotted marks in the rubrics provided for SLA assessment.

   iv) FACULTY should fill UP the marks of the student in the MIS mark sheet, only if the student has completed the online course (submitted all 4 certificates) and assessment of the group activities along with individual activities has been completed within the term schedule.

   v) In case the student fails to complete " iv" above, the faculty should fill up the marks obtained by the student for the part-submission and fill up those marks in the MIS mark sheet.

Name & Signature:		
(Shri. Nitin D. Toradmal) Lecturer in Electronics Govt. Polytechnic, Pune	**(Shri. Balaji Vharkat)** UNICEF, Maharashtra	**(Shri. Girish W. Sonone)** Lecturer in Electronics Govt. Polytechnic, Mumbai
Name & Signature: **Dr.D N Rewadkar** (Programme Head)	Name & Signature: **Shri. S.B. Kulkarni** (CDC In-charge)	

GOVERNMENT POLYTECHNIC, PUNE

'120 – NEP' SCHEME

PROGRAMME	DIPLOMA IN CM/IT
PROGRAMME CODE	06/07
COURSE TITLE	OBJECT ORIENTED PROGRAMMING
COURSE CODE	CM31203
PREREQUISITE COURSE CODE & TITLE	NA
CLASS DECLARATION COURSE	NO

I. LEARNING & ASSESSMENT SCHEME

Course Code	Course Title	Course Type	Learning Scheme					Credits	Assessment Scheme										
			Actual Contact Hrs./Week			SLH	NLH		Paper Duration	Theory				Based on LL & TSL				Based on SL		Total Marks
														Practical						
			CL	TL	LL					FA-TH	SA-TH	Total		FA-PR		SA-PR		SLA		
										Max	Max	Max	Min	Max	Min	Max	Min	Max	Min	
CM31203	OBJECT ORIENTED PROGRAMMING	SEC	3	--	4	1	8	4	3	30	70	100	40	25	10	25@	10	25	10	175

Total IKS Hrs for Term: 0 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, **IKS** – Indian Knowledge System, SLA- Self Learning Assessment

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

Note:

FA-TH represents an average of two class tests of 30 marks each conducted during the semester.

1. If a candidate is not securing minimum passing marks in **FA-PR** (Formative Assessment - Practical) of any course, then the candidate shall be declared as **'Detained'** in that course.
2. If a candidate does not secure minimum passing marks in SLA (Self Learning Assessment) of any course, then the candidate shall be declared as **'fail'** and will have to repeat and resubmit SLA work.
3. **Notional learning hours** for the semester are **(CL + LL + TL + SL) hrs. * 15 Weeks**
4. **1 credit** is equivalent to **30 Notional hours.**
5. * Self-learning hours shall not be reflected in the Timetable.
6. * Self-learning includes micro-projects/assignments/other activities.

II. RATIONALE:

This course provides students with an introduction to entry-level fundamentals of Object Oriented Programming. The goals of the course are to develop the programming ability of students and to improve their proficiency in applying the fundamentals of Object Oriented Programming. To achieve this goal high-level programming language used is C++. The topics include different programming paradigms in computer programming, limitations of procedural approaches and solutions given by object-oriented programming.

III. COURSE-LEVEL LEARNING OUTCOMES (CO's)

Students will be able to achieve & demonstrate the following CO's on completion of course-based learning

- CO1 Understand procedural and object-oriented paradigms.
- CO2 Implement different functions in OOP.
- CO3 Develop programs using classes and objects.
- CO4 Implement programs on inheritance.
- CO5 Apply concepts of polymorphism and type conversion.
- CO6 Develop applications for file handling.