# 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 | Paper Duration | Assessment Scheme | | | | | | | | | | | Total Marks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Actual Contact Hrs./Week | | | SLH | NLH | | | Theory | | | | Based on LL &TSL | | | | Based on SL | | | |
| | | | | | | | | | | | | | | 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. <br> TLO1.2 Evaluate the given simple integral(s) using the substitution method. <br> TLO1.3 Integrate given simple functions using the integration by parts <br> TLO1.4 Solve the given simple integral by partial fractions | **Unit - I Indefinite Integration** <br> 1.1 Simple Integration: Rules of integration and integration of standard functions <br> 1.2 Integration by substitution. <br> 1.3 Integration by parts. <br> 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 DefiniteIntegration. <br> TLO2.2 Use properties of definite integration to solve given problems | Unit - II Definite Integration <br> 2.1 Definite Integration: Definition, and rules of definite integration with simple examples. <br> 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 givendifferential equations. <br> TLO3.2 Form simple differential equations for given elementary engineering problems. <br> TLO3.3 Solve given differential equations using the methods of Variable separable and Exact Differential Equations (Introduce the concept of a partial differential equation). <br> TLO3.4 Solve the given Linear Differential Equation. | **Unit - III Differential Equation** <br> 3.1 Concept of Differential Equation. <br> 3.2 Order, degree and formation of Differential equations <br> **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. <br> TLO4.2 Solve the system of equations in three unknowns by iterative methods <br> TLO4.3 Solve problems using the Bakhshali iterative method for finding approximate squareroots. (IKS) | **Unit - IV Numerical Methods** <br> 4.1 Solution of algebraic equations: Bisection method, Regula falsi method and Newton–Raphson method. <br> 4.2 Solution of simultaneous equations containing three Unknowns by iterative methods: Gauss-Seidel and Jacobi's method. <br> 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 <br> TLO5.2 Solve given problems when the number oftrials is large and the probability is very small. <br> TLO5.3 Utilize the concept of normal distribution to solve related engineering problems | **Unit - V Probability Distribution** <br> 5.1 Binomial distribution. <br> 5.2 Poisson's distribution. <br> 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**

<div align="center">NA</div>

**Assignment**

<div align="center">NA</div>

## 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:

**Smt. J. R. Hange**
(Programme Head)

Name & Signature:

**Shri. S. B. Kulkarni**
(CDC In-charge)

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# GOVERNMENT POLYTECHNIC, PUNE
**'120 – NEP' SCHEME**

| PROGRAMME | DIPLOMA IN IT / CM |
|---|---|
| PROGRAMME CODE | IT/CM |
| COURSE TITLE | BASIC ELECTRICAL ENGINEERING |
| COURSE CODE | EE21204 |
| PREREQUISITE COURSE CODE & TITLE | NA |

## I. LEARNING & ASSESSMENT SCHEME

| Course Code | Course Title | Course Type | Actual Contact Hrs./Week | | | SLH | NLH | Credits | 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. <br><br> **TLO 1.2** Differentiate alternating current (AC) and direct current (DC) <br><br> **TLO 1.3** Explain parameters of single phase AC sinusoidal waveform <br><br> **TLO 1.4** Describe the silent features of period, frequency, angular frequency, RMS <br><br> **TLO 1.5** Calculate the power in three phase and single phase circuit. <br> . | **1.1** Electric and magnetic circuits. <br> **1.2** Series and parallel magnetic circuits. <br> **1.3** Faraday's laws of electromagnetic induction, Fleming's right hand rule, Lenz's law <br> **1.4** Dynamically and statically induced emf, self and mutual inductance <br> **1.5** AC and DC quantity, advantages of AC over DC supply. <br> **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. <br> **1.7** Power in single phase circuit- Active, Reactive and Apparent <br> **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. <br> **1.9** Power in three phase circuit <br> **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. <br> **TLO 2.2** Distinguish the construction of the given type of transformer. <br> **TLO 2.3** Explain working principle and operation of Capacitor star capacitor run single phase induction motor. <br> **TLO 2.4** Explain working principle and operation of Universal motor. <br> **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. <br> **2.2** Capacitor star capacitor run single phase induction motor- Working principle, Reversal of rotation and Applications <br> **2.3** Universal motor: Working principle, Reversal of rotation and Applications <br> **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<br><br>**TLO 3.2** Select the relevant protective device for the given application.<br><br>**TLO 3.3** Select the suitable switchgear for the given situation with justification.<br><br>**TLO 3.4** Select the I.E rule related to be applied for given type of earthing. | **3.1** Fuse: Operation, types and applications<br><br>**3.2** MCB and ELCB/RCB: Operation and general specifications<br><br>**3.3** Earthing: Types, Importance of earthing, factors affecting earthing resistance.<br><br>**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 EXPERIENCES. (Any 12)**

| Sr. No | Practical/Tutorial/Laboratory Learning Outcome (LLO) | Laboratory Experiment / Practical Titles /Tutorial Titles | Number of 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** |
| 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** |

| Sr. No | Practical/Tutorial/Laboratory Learning Outcome (LLO) | Laboratory Experiment / Practical Titles /Tutorial Titles | Number of hrs. | Relevant COs |
|--------|------------------------------------------------------|-----------------------------------------------------------|----------------|--------------|
| 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** |

**Note: Out of the above suggestive LLOs –**
1. '*' Marked Practicals (LLOs) Are mandatory.
2. Attempt any 11 from remaining 12 experiments

## 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.
a. Prepare models in the form of mini-projects.
b. Prepare power point presentation related to basics of electrical engineering.
c. 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 <br> 2. Rubrics for COs <br> 3. Assignment <br> 4. Midterm Exam <br> 5. Self-Learning <br> 6. Term Work <br> 7. Seminar/Presentation | 1. End Term Exam <br><br> 2. Micro-project <br><br> 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/ 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 |
| 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 |

## 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
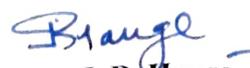
(Course Experts)

Name & Signature:

**Smt. J. R. Hange**
(Programme Head)

Name & Signature:

**Shri.S.B.Kulkarni**
(CDC In-charge)

GOVT. POLYTECHNIC, PUNE.

# GOVERNMENT POLYTECHNIC, PUNE
## '120 – NEP' SCHEME

| PROGRAMME | DIPLOMA IN COMPUTER/IT |
|---|---|
| PROGRAMME CODE | 01/02/03/04/05 |
| 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 | Paper Duration | Assessment Scheme | | | | | | | | | | Total Marks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Actual Contact Hrs./Week | | | SLH | NLH | | | Theory | | | | Based on LL &TSL | | | | Based on SL | | |
| | | | | | | | | | | | | | | | | 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** |

| Sr. No | Theory Learning Outcomes (TLO'S) aligned to CO's. | Learning content mapped with TLO's. | Suggested Learning Pedagogies | Relevant Cos |
|---|---|---|---|---|
| **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 $\alpha$ and $\beta$, 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<br>2. Rubrics for COs<br>3. Assignment<br>4. Midterm Exam<br>5. Self-Learning<br>6. Term Work<br>7. Seminar/Presentation | 1. End Term Exam<br>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 Managem ent | PO-7 Life Long Learning | PSO-1 | PSO-2 | PSO-3 |
| CO1 | 3 | 2 | 2 | 3 | - | 1 | 1 | - | - | - |
| CO2 | 3 | 2 | 3 | 3 | - | 1 | 1 | - | - | - |
| CO3 | 3 | 2 | 3 | 3 | 2 | 1 | 1 | - | - | - |
| **Legends:- High**:03, **Medium:**02, **Low:**01, **No Mapping:** - <br> *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: |
|---|---|
| **Smt. J. R. Hange**<br>(Programme Head) | **Shri. S.B. Kulkarni**<br>(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** | **INTRODUCTION TO OPEN SOURCE TECHNOLOGY** |
| **COURSE CODE** | **CM21206** |
| **PREREQUISITE COURSE CODE & TITLE** | **NA** |

## I.   LEARNING & ASSESSMENT SCHEME

| Course Code | Course Title | Course Type | Learning Scheme | | | | | Credits | Assessment Scheme | | | | | | | | | | | Total Marks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Actual Contact Hrs./Week | | | SLH | NLH | | Paper Duration | Theory | | | | Based on LL & TSL | | | | Based on SL | | |
| | | | | | | | | | | | | | | Practical | | | | | | |
| | | | CL | TL | LL | | | | | FA-TH | SA-TH | Total | | FA-PR | | SA-PR | | SLA | | |
| | | | | | | | | | | Max | Max | Max | Min | Max | Min | Max | Min | Max | Min | |
| CM21206 | INTRODUCTION TO  OPEN SOURCE TECHNOLOGY | DSC | 2 | - | 2 | - | 4 | 2 | -- | -- | -- | -- | -- | 50 | 20 | 25@ | 10 | - | - | 75 |

**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:

Open Source has acquired a prominent place in software industry. Open Source includes set of principles and values that promote collaboration, transparency, and community-driven development. Having knowledge of Open Source and its related technologies is an essential for Computer engineering students.

## 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 Open Source system, its use, impact and importance.
 CO2: Identify the different types of licenses used in open source.
 CO3: Recognize different Open Source technologies.
 CO4: Use VS Code as a primary code editor.
 CO5: Use Git for version control.
 CO6: Describe Open Source Ethics.

**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 OPEN SOURCE  (CL Hrs-6, Marks-NIL )** | | | | |
| 1. | **TLO1.1** Define open source. **TLO1.2** Explain principles of open source. **TLO1.3** Specify advantages and applications of open source. **TLO1.4** Differentiate between Open source vs. Free software. **TLO1.5** Explain Licensing and Legal Aspects in Open Source. | **1.1** Open source:  Definition of open source, Historical background, Principles of open source, Advantages and Applications of open source, Free software, Open source vs. Free software, Examples of open source and free software. **1.2** Licensing and Legal Aspects–: Overview of open-source licenses, Legal considerations in open source development. | Hands-on Demonstration Presentations | CO1, CO2 |
| **UNIT-II OPEN SOURCE –TECHNOLOGIES (CL Hrs-6, Marks-NIL )** | | | | |
| 2 | **TLO2.1** Explore Open source browser Mozilla Firefox. **TLO2.2** Explore various Open source applications. **TLO2.1** Explore Apache web server. **TLO2.1** Explore various Open source OS. **TLO2.1** Explore Open source database MySQL. | **2.1** Open source browser: Mozilla Firefox **2.2**  Open source Applications: OpenOffice, Wikipedia, VLC Media Player, GNU CC, GIMP, Wikipedia. **2.3** Open source Web Server: Apache **2.4** Open source OS: Linux, Android **2.5** Open source Database: MySQL | Hands-on Demonstration Presentations | CO3 |
| **UNIT-III INTRODUCTION TO DEVELOPMENT TOOL (CL Hrs-08, Marks-NIL)** | | | | |
| 3 | **TLO3.1** Describe working of VS Code. **TLO3.2** Illustrate use of Git. | **3.1** Integrated Development Environment (IDE) –VS Code: Installation, User Interface, Extensions, Editing. | Hands-on Demonstration Presentations | CO4 |
| **UNIT- IV INTRODUCTION TO GIT(CL Hrs-06, Marks-NIL)** | | | | |
| 4 | **TLO4.1:** Describe importance of Version control. **TLO 4.2:** Demonstrate use of Git. | **4.1** Introduction to Version Control:  Importance of Version control. **4.2** Git Basics: Creating Repository, Committing changes, branching and merging. | Hands-on Demonstration Presentations | CO5 |

| | UNIT –V OPEN SOURCE ETHICS (CL Hrs-04, Marks-NIL) | | | |
|---|---|---|---|---|
| **5** | **TLO 5.1** Explain Open Source Ethics. <br> **TLO 5.2** Differentiate Open Vs Closed Source Ethics. <br> **TLO 5.3** Describe impact of Open source Technology. | **5.1** Open Source Ethics: Principles and practices <br> **5.2** Open Vs Closed Source Ethics <br> **5.3** Impact of Open source Technology | Hands-on Demonstration Presentations | **CO6** |

## IV.  LABORATORY LEARNING OUTCOME AND ALIGNED PRACTICAL/ TUTORIAL EXPERIENCES.

| Sr. No | Practical/Tutorial/Laboratory Learning Outcome (LLO) | Laboratory Experiment/ Practical Titles /Tutorial Titles | Number of hrs. | Relevant COs |
|---|---|---|---|---|
| 1 | **LLO 1.1:** Understand Open Source Principles. <br> **LLO1.2:** Understand the collaborative nature of open-source development. | *Search different open source software or tools. | 2 | CO1,CO3 |
| 2 | **LLO 2.1:** Download, install, and set up open-source software on your local machine. <br> **LLO 2.2:** Understand any prerequisites and system requirements. <br> **LLO 2.3:** Develop skills in configuring the open-source software according to your specific needs. | *Install and configure any one open source OS as suggested by course in charge. | 4 | CO3 |
| 3 | **LLO 3.1**: Understand of the concept of open-source licensing. <br> **LLO 3.2:** Recognize the key principles and objectives behind open-source licenses. <br> **LLO 3.3**: Identify and understand common open-source licenses such as MIT, Apache, GNU GPL, BSD, and others. | *Identify the different types of licenses in Open Source software. | 2 | CO2 |
| 4 | **LLO 4.1:** Create and manage Word document. <br> **LLO 4.2**: Apply formatting features on text at line, paragraph and page level. <br> **LLO 4.3**: Insert and edit images, and shapes in a document file. <br> **LLO 4.4:** Insert table and apply various table formatting features on it. | *Create a word document using Open office. | 2 | CO3 |
| 5 | **LLO 5.1:** Enter and format data in a worksheet. <br> **LLO 5.2:** Insert and delete cells, rows and columns <br> **LLO 5.3**: Apply various functions and named ranges in the spreadsheet. | *Create a spreadsheet using Open office. | 2 | CO3 |
| 6 | **LLO 6.1:** Apply design themes to the given presentation. <br> **LLO 6.2:** Insert pictures text/images/shapes in slide <br> **LLO 6.3:** Use pictures text/images/shapes editing options. <br> **LLO 6.4:** Add tables and charts in the slides. | *Create a power point presentation using Open office. | 2 | CO3 |

| | | | | |
|---|---|---|---|---|
| | **LLO 6.5:** Run slide presentation in different modes | | | |
| 7 | **LLO 7.1:** Understand Online Registration Processes<br>**LLO 7.2:** Explore User Interface and Navigation.<br>**LLO 7.3**: Practice Account Security. | *Create account on Wikipedia. | 2 | CO3 |
| 8 | **LLO 8.1:** Understanding Development Environments<br>**LLO 8.2:** Navigate Software Installation<br>**LLO 8.3:** Explore User Interface and Features.<br>**LLO 8.4:** Add the Extensions required. | *Install and Configure VS Code. | 4 | CO4 |
| 9 | **LLO 9.1:** Write, Evaluate and Edit code.<br>**LLO 9.2:** Extend VS Code functionality and customize the development environment. | *Demonstrate collaborative coding environment using VS Code. | 4 | CO4 |
| 10 | **LLO 10.1:** Recognize the importance of version control in managing and tracking changes in software development.<br>**LLO 10.2:** create an account on an online platform.<br>**LLO 10.3:** Understand the features and services offered by platforms. | *Create Account on Git. | 2 | CO5 |
| 11 | **LLO 11.1:** initialize a new Git repository.<br>**LLO 11.2:** Add files to the repository.<br>**LLO 11.3:** Add various file types to a Git repository | *Create a new Git repository and add a file to a created Git repository. | 4 | CO5 |
| 12 | **ALL** | *Micro-project (Refer section **V** for micro project list) | 2 | ALL |

**Note: Out of the above suggestive LLOs –**
  1. '*' Marked Practicals (LLOs) Are mandatory.
  2. A judicial mix of LLOs is to be performed to achieve the desired outcomes

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

**Self-Learning**    NA

**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) Identify a small, beginner-friendly bug in an open source project's issue tracker and submit a fix.
  2) Choose a project and contribute by adding tests for existing code.
  3) Improve the ReadMe file of a project. Provide clear instructions on how to install, configure, and use the software. Add badges, examples, and any missing information.
  4) Create a personal blog and host it on GitHub.
  5) Create a small script that automates a repetitive task.

**Assignment**

Prepare a journal of practical performed in the laboratory.

## VI.     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 Open Office Software c) Any Browser (Any General Purpose Computer available in the Institute ) | ALL |

## 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 | Introduction to Open Source | CO1,CO2 | 6 | -- | -- | -- | -- |
| 2 | II | Open Source Technologies | CO3 | 6 | -- | -- | -- | -- |
| 3 | III | Introduction to Development Tool | CO4 | 8 | -- | -- | -- | -- |
| 4 | IV | Introduction to Git | CO5 | 6 | -- | -- | -- | -- |
| 5 | V | Open Source Ethics | CO6 | 4 | -- | -- | -- | -- |
| | | Grand Total | | 30 | -- | -- | -- | -- |

## VIII.   ASSESSMENT METHODOLOGIES/TOOLS

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

## 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 |
| CO1 | 3 | - | - | - | 2 | - | 2 | - | 1 |
| CO2 | 3 | 2 | - | 3 | 1 | - | 1 | - | 3 |
| CO3 | 3 | 2 | 2 | 3 | 2 | 3 | 3 | - | 3 |
| CO4 | 1 | 2 | 3 | 3 | 1 | 3 | 3 | - | 3 |
| CO5 | 2 | 2 | 3 | 3 | 2 | 3 | 3 | - | 3 |
| CO6 | 2 | - | - | - | 3 | - | 2 | - | 2 |
| **Legends:- High**:03, **Medium:**02, **Low:**01, **No Mapping:** - <br>*PSOs are to be formulated at the institute level | | | | | | | | | |

## X.    SUGGESTED LEARNING MATERIALS/BOOKS

| Sr.No | Author | Title | Publisher |
|---|---|---|---|
| 1 | Kailash Vadera, Bhavyesh Gandhi | Open Source Technology | Laxmi Publications Pvt Ltd 2012, 1st Edition. |
| 2 | Fadi P. Deek and James A. M. McHugh | Open Source: Technology and Policy | Cambridge Universities Press 2007. |

## XIII. LEARNING WEBSITES & PORTALS

1.  https://opensource.com/
2.  https://code.visualstudio.com/docs/introvideos/basics
3.  https://www.w3schools.com/git/
4.  https://opensource.org/

| Name & Signature: | |
|---|---|
| **Mrs. Swati S. Sant** Lecturer in Computer Engineering | **Mrs. Sonali B. Gosavi** Lecturer in Computer Engineering |

**(Course Experts)**

| Name & Signature: | Name & Signature: |
|---|---|
| **Smt.J.R.Hange** (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 | PROFESSIONAL COMMUNICATION |
| COURSE CODE | HU11202 |
| PREREQUISITE COURSE CODE & TITLE | NA |

## I. LEARNING & ASSESSMENT SCHEME

| Course Code | Course Title | Course Type | CL | TL | LL | SLH | NLH | Credits | Paper Duration | FA-TH Max | SA-TH Max | Total Max | Total Min | FA-PR Max | FA-PR Min | SA-PR Max | SA-PR Min | SLA Max | SLA Min | Total Marks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 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.<br> 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)**<br>2. Micro-project. | 1. Practical Exam of **25** marks using language lab.<br>**(SA-PR)** |

## X.  SUGGESTED COs- POs MATRIX FORM:

| Course Outcomes (COs) | 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.

COURSE TITLE: PROFESSIONAL COMMUNICATION

## 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: | Name & Signature: |
|---|---|
| **Mr. V.V. Kulkarni**<br>Lecturer in English | **Dr. S.P. Palve**<br>Lecturer in English |
| (Course Experts) ||
| Name & Signature: | Name & Signature: |
| **Smt . J. R. Hange**<br>(Programme Head) | **Shri. S.B. Kulkarni**<br>(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 | | | | | | | | | | Total Marks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Actual Contact Hrs./Week | | | SLH | NLH | | Paper Duration | Theory | | | | Based on LL & TSL | | | | Based on SL | | |
| | | | | | | | | | | | | | | 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. <br> **TLO 1.2** To know the history and basic structure of C. <br> **TLO 1.3** Identify the given building blocks of a C Program. <br> **TLO 1.4** Use basic constructs like constants, variables , data types for developing C programs. <br> **TLO 1.5** Managing Input and Output Operations. <br> **TLO 1.6** Develop C programs using Operators and Expressions. | **1.1** Introduction to Computing: Introduction, Art of Programming through Algorithms and Flowcharts. <br> **1.2** Overview of C: History and importance of C, Basic structure of C program, executing a C program. <br> **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. <br> **1.4** Managing Input and Output Operations: Reading a Character, Writing a Character, Formatted Input, Formatted Output. <br> **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 <br> **TLO 2.2** Use loop statements in C program to solve iterative problems. <br> **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, <br> **2.2** Jump Statements: break, continue, goto, return. <br> **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. <br> **TLO 3.2** Enlist the types of Arrays. <br> **TLO 3.3** Write C Program to perform operations on one dimensional array. <br> **TLO 3.4** Declare, initialize and access elements of two dimensional array. <br> **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. <br> **3.2** Strings: <br> 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** Understand 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 <br> **LLO 1.2** Write the standard English like statements for programming flow of given Problem statement <br> **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. <br> **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. <br> **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. <br> **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. <br> **LLO 10.2** Write C program for implementation of one Dimensional array. | *Write C programs based Operations on 1D arrays: <br> i)Declaration of different data types of array. <br> ii)Initialization of array elements. <br> iii)Accessing array elements without loop and with loop. | **2** | **CO3** |
|---|---|---|---|---|
| 11 | **LLO 11.1** Develop Logic for Searching an element from an array. <br> **LLO 11.2** Develop logic for sorting an array in ascending/descending order. <br> **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: <br> i)Declaration of different data types of array. <br> ii)Initialization of array elements. <br> iii)Accessing array elements without loop and with loop. | **2** | **CO3** |
| 13 | **LLO 13.1**Write C program for implementation of two Dimensional arrays. <br> **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, <br> b)Function with no arguments and a return value, <br> c) Function with arguments and no return value, <br> d) Function with arguments and with return value. | 4 | CO4 |
| 18 | **LLO 18.1**Write Recursive functions in C. <br> **LLO 18.2** Write nested functions in C. | *Implementation of a C programs based on <br> i) Recursion <br> 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 <br> i)Call by value. | 2 | CO4 |

| | | ii)Call by reference. | | |
|---|---|---|---|---|
| 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<br>i) Pointer Expressions<br>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 |

**Note: Out of the above suggestive LLOs –**
1. '*' Marked Practicals (LLOs) Are mandatory.
2. A judicial mix of LLOs is to be performed to achieve the desired outcomes

*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_0130944245909913602228_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.    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. <br> b) Any Office Software <br> c) Any Browser (Any General Purpose Computer available in the Institute ) <br> d) C language IDE- Turbo/Borland / Dev C etc | 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 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 |

## IX. 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 |

## 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 |
| CO1 | 2 | 2 | 2 | 1 | - | - | 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 | - | 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

## XI. 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: |
|---|---|
| **Smt . J. R. Hange** (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**/08/15/16/17/18/19/21/22/23/24 |
| **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 | | | | | | | | | | | Total Marks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Actual Contact Hrs./Week | | | SLH | NLH | | Paper Duration | Theory | | | | Based on LL & TSL | | | | Based on SL | | |
| | | | | | | | | | | | | | | | | 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 | Hands-on Demonstration  Presentation | **CO3** |

| | | BODY tag. bgcolor attribute of BODY tag, 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<br>• Ordered list within unordered list<br>• Unordered list within ordered list<br>• Ordered list within ordered list<br>• Unordered list within unordered list | 4 | CO 2 |
|----|---|---|---|---|
| 11 | **LLO11.1** Create a web page link | *Create a web page to link:<br>• A different web page of same site<br>• A different location on the same web page<br>• 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.<br> A) Make use of borders, margins and padding properties on table/table rows/table cells.<br>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:<br> | 2 | CO 4 |
| 20 | **LLO20.1** Create different elements in web pages. | *Create a "registration form "with the following fields:<br>1)Name<br>2) Password<br>3)Email  id<br>4)Phone no<br>5) Gender | 2 | CO 4 |

| 21 | **LLO21.1** Create CSS by applying style sheets. | *Design a webpage using CSS which includes the following:<br>1)Use different fonts and styles: In the style definition you define how each selector should work(font,color,etc). | 4 | CO 5 |
|---|---|---|---|---|
| | | 6)Language Known | | |
| 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 |

**Note: Out of the above suggestive LLOs –**
1. '*' Marked Practicals (LLOs) Are mandatory.
2. A judicial mix of LLOs is to be performed to achieve the desired outcomes

**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. ASSESSMENT METHODOLOGIES/ 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 |
| CO1 | 1 | - | - | - | - | - | 1 | 2 | - |
| CO2 | - | - | - | 3 | - | - | 1 | - | - |
| CO3 | - | 2 | 1 | 3 | - | - | 1 | - | 3 |
| CO4 | - | - | - | 3 | - | - | 1 | - | - |
| CO5 | 1 | - | - | 3 | - | - | 3 | 2 | - |
| CO6 | 1 | 2 | 3 | 2 | - | - | 2 | - | 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 | 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:

**Smt . J. R. Hange**
(Programme Head)

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 | 01/02/04/05/05/06/07/08 |
| 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 | | | | | | | | | | | Total Marks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Actual Contact Hrs./Week | | | SLH | NLH | | Paper Duration Hrs. | Theory | | | | Based on LL &TSL | | | | Based on SL | | |
| | | | | | | | | | | | | | | 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.<br>**TLO 2.2.2** Explore the role of agriculture in water stress, including irrigation practices, cropping patterns, and the impact of changing agricultural practices.<br>**TLO 2.2.3** Understand the concept of water pollution and differentiate between various types of pollutants affecting water bodies.<br>**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.<br>**TLO 2.2.5** Identify common waterborne diseases, such as cholera, typhoid, dysentery, and gastroenteritis, and understand their causative agents.<br>**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.<br>2.2.2 Water resources limitation and increasing use.<br>2.2.3 Water stress in agriculture.<br>2.2.4 Water pollution and contamination.<br>2.2.5 Health impacts of poor water quality.<br>2.2.6 Water management and climate change.<br>2.2.7 The global challenge of water and sanitation.<br>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.<br><br>**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<br>2.3.2 Swachh Bharat - The Mission for a Clean India<br>2.3.3 Jal Jeevan Mission - Water for All<br>2.3.4 Atal Bhujal Yojana - Replenish Groundwater<br>2.3.5 Mission Amrit Sarovar - Rejuvenate Water bodies<br>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** Emphasizing waste impact on the environment, human health, and overall sustainability. <br> **TLO 3.2.2** Identify health risks associated with improper waste disposal, such as the spread of diseases and exposure to hazardous materials. <br> **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? <br><br> 3.2.2 Health impacts from mismanagement of waste <br><br> 3.2.3 Work conditions of waste workers <br><br> 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 <br> **TLO 3.3.2** Waste 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 <br><br> 3.3.2 Waste segregation at source <br><br> 3.3.3 Reduce, Reuse, Recycle and Recover <br> 3.3.4 Recycling of waste materials <br><br> 3.3.5 Principle of circular economy <br><br> 3.3.6 Avoiding waste by design <br><br> 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. <br><br> **TLO 3.4.2** Define Extended Producer Responsibility (EPR) and explain its concept in the context of environmental management. <br><br> **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 <br><br> 4.2 Plastic Waste Management Rules <br><br> 4.3 Extended Producer Responsibility (EPR) <br><br> 4.4 Biomedical Waste Management <br><br> 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 <br><br> 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.<br><br>**TLO 3.5.3** Define composting and explain the biological processes involved in the decomposition of organic matter.<br><br>**TLO 3.5.4** Explore different composting methods, such as aerobic and anaerobic composting, and choose the most suitable technique for the compost unit.<br><br>**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.<br><br>**TLO 4.1.2** Familiarize yourself with different energy sources, including renewable and non-renewable options.<br><br>**TLO 4.1.3** Understand the connection between energy production, consumption, and climate change.<br><br>**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<br>4.1.2 Sources of energy<br>4.1.3 Energy and C Change<br>4.1.4 Judicious use of non-renewable energy resources<br>4.1.5 A Just Transition<br>4.1.7 India's commitment to sustainable energy<br>4.1.8 Policies and Programs for Energy Management<br>4.1.9 Clean Energy for Cooking | Video Lectures (Online Mode: Link https://www.mahayouthnet.in/) | 4 |

| | | | | |
|---|---|---|---|---|
| colspan="5" | **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<br><br>TLO 4.3.2 Identify opportunities for improving public energy use in their village or town<br><br>TLO 4.3.3 Design surveys that effectively capture data on energy-efficient appliance availability and usage patterns.<br><br>TLO 4.3.4 Identify and analyze emerging technologies within the energy sector that require specialized skills.<br><br>TLO 4.3.5 Demonstrate the ability to map existing skills within the energy sector workforce.<br><br>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.<br><br>**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.<br><br>**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**<br>**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.<br><br>**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.<br><br>**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.<br>**5.3.** Key legislations for biodiversity conservation<br>**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/ <br> 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. <br> 1. Track your overall water usage: <br> a) Read your water meter, b) Estimate usage without a meter <br> 2. Measure individual fixture flow rates: <br> a) Faucet and showerhead flow b) Toilet flush: <br> 3. Monitor your water habits: <br> a) Keep a water use log b) Observe your routines <br> 4. Analyze your findings: <br> a) Compare your usage to benchmarks, b) Identify potential leaks <br> c) Prioritize areas for improvement <br> 5. Implement water-saving strategies: <br> a) Install water-efficient fixtures b) Shorten showers and bath times <br> c) Run appliances only when full d) Fix leaky faucets promptly <br> 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: <br> a) What makes up the maximum part of the waste? <br> b) How much of what was thrown out could have been reused or recycled? <br> c) Could the amount of garbage be reduced? List the ways to reduce waste at home. <br> Calculate: <br> a) Waste generated over a week (in grams) divided by 7= waste (gms)/ day, <br> b) Waste (gms)/ day divided by the number of persons in your house= Waste (gms)/ day/capita <br> 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. <br> 1. Availability of Energy-Efficient Appliances: <br> 2. Use of Energy-Efficient Appliances <br> 3. Government Policies and Incentives <br> 4. Technological Advancements <br> 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. <br> 1. List of trees, plants, and shrubs in the village/ town outskirts, their classification, occurrence, and usage study. <br> 2. Draw a biocultural map of the landscape of the village/ town, the diversity of trees (mother trees) and those who maintain it <br> 3. A village called Tree: Understand a tree as an ecosystem and the biodiversity associated with the tree. <br> 4. Ranmeva special study <br> 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<br>1. Gather Information:<br>2. Identify Water Use Areas:<br>3. Assess Indoor Water Usage:<br>4. Evaluate Outdoor Water Usage:<br>5. Measurements and Inspections:<br>6. Data Analysis:<br>7. Recommendations for Conservation:<br>8. Cost-Benefit Analysis:<br>9. Create an Action Plan:<br>10. Implementation and Monitoring:<br>11. Educational Outreach:<br>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.<br>Observe all the stages of waste management, and note who is involved at each stage viz.<br>Waste collection<br>Transport<br>Processing in different ways<br>Disposal etc.<br>2. Analysis of waste management in your /locality.<br>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.<br>1. Gather information and Create a checklist about the following.<br>**1. Lighting:**<br>• Turn off lights in unoccupied rooms.<br>• Replace incandescent bulbs with LEDs<br>• Utilize natural light whenever possible<br>**2. Heating and Cooling:**<br>• Set your thermostat to energy-efficient temperatures (25°C in summer, 20°C in winter)<br>• Seal air leaks around windows and doors.<br>• Clean or replace air filters regularly.<br>**3. Appliances:**<br>• Unplug electronics and chargers when not in use.<br>• Wash clothes and dishes in cold water whenever possible.<br>• Use energy-efficient appliances when purchasing new ones<br>**4. Insulation:**<br>• Check your attic and basement for proper insulation.<br>• Seal any gaps or cracks around pipes and vents.<br>**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)**

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