Government Polytechnic, Pune

'180OB' – **Scheme**

Programme	Diploma in ET/CE/EE//ME/MT/**CM**/**IT**/DDGM
Programme code	01/02/03/04/05/**06/07**/08/16/17/21/22/23/24/**26**
Name of Course	**Programming in C**
Course Code	**CM2101**
Prerequisite course code and name	NA
Class Declaration	**NO**

1. TEACHING AND EXAMINATION SCHEME

Teaching Scheme (In Hours)			Total Credits (L+T+P)			Examination Scheme				Total Marks
						Theory		**Practical**		
L	**T**	**P**	**C**			**ESE**	**PA**	***ESE**	**PA**	175
				Marks		80	20	50	25	
03	02	02	07	**Exam Duration**		3 Hrs	1 Hr	2 Hr		

(*):PE- Practical Examination)

Legends: L- lecture,T-Tutorial/teacher guided theory practice,P-practical,ESE-End semester examination,PA- Progressive Assesment.

2. RATIONALE

It is necessary to program computers with the help of structured dynamic languages like 'C'. To study programming is useful in solving problems/tasks related to various domains. Now days almost every setup in software engineering domain chooses 'C' as a basic tool to develop software.

3. COMPETENCY

The aim of this course is to attend following industry identified competency through various teaching learning experiences:

- **Develop 'C' programs to solve industry based computer related problems.**

4. COURSE OUTCOMES (COs)

The theory, practical experiences and relevant soft skills associated with this course are to be taught and implemented, so that the student demonstrates the following industry oriented COs associated with the above mentioned competency:

1. Write procedural program with 'C' language tokens.
2. Execute programs using branching and looping.
3. Write programs using arrays, strings.
4. Develop a C program using functions.
5. Implement programs using structures.

6. Execute programs using pointers.

5.   SUGGESTED PRACTICALS/ EXERCISES

The practicals in this section are PrOs (i.e. sub-components of the COs) to be developed and assessed in the student for the attainment of the competency**:**

Sr. No.	Unit No.	Practical Exercises (Outcomes in Psychomotor Domain)	Relevant CO	Approximate Hours Required.
1.		Write/compile/execute simple 'C' program: Develop a program using Constants, Variables for different data types.		02
2.	1	Write 'C' programs based on different operators and expressions. (ex. relational, logical, arithmetic etc.) Write programs based on bitwise and special operators.	1	02
3.		Write simple program to take input from user at run time and display the output on the screen.		02
4.	2	Programs using following control statements: If statement, Switch statements,?:operator, go to statements. Programs using following loop controls, while loop, do.. while loop, for loop.	2	04
5.	3	Write programs based on arrays.	3	04
6.		Write programs using strings operations such as comparison, concatenation, copying etc.		04
7.	4	Write programs on Predefined Functions and User defined functions. Write programs based on recursion & nesting of functions.	4	04
8.	5	Write programs based on structure definition and initialization. Write programs based on structure within structure.	5	04
9.	6	Write programs based on pointers.	6	06
Total Hrs				**32**

S.No.	Performance Indicators	Weightage in %
a.	Correctness of algorithm	40
b.	Debugging ability	20
c.	Quality of input and output displayed (messaging and formatting)	10
d.	Preparing assignments (write-ups, program and output).	20
e.	Submit assignment on time.	10
	Total	**100**

6.   MAJOR EQUIPMENT/ INSTRUMENTSREQUIRED

The major equipment with broad specification mentioned here will usher in uniformity in conduct of practical, as well as aid to procure equipment by authorities concerned.

Sr.No.	Major Equipment/ Instruments Required	PrO. No.
1.	Computer system with Turbo C compiler to execute "C" programs	1 to 9

7.   THEORY COMPONENTS

The following topics/subtopics should be taught and assessed in order to develop UOs for achieving the COs to attain the identified competency.

Unit Outcomes (UOs) (in cognitive domain)	Topics and Sub-topics
UNIT 1. C Overview, tokens and expressions (Weightage-12 , Hrs- 10)	
1a. State importance of 'C'. Describe Basic structure of 'C' Programs. 1b. Demonstrate sample C program 1c. Describe Character set. 1d. Define keywords, identifiers, constants, variables, symbolic constants. 1e. List different data types. 1f. Describe different types of operators. 1g. Demonstrate input and output Operators. 1h. Initialise and evaluate expressions.	1.1 Introduction to 'C'. 1.2 Importance of C. 1.3 Basic structure of 'C' programs, programming style, sample 'C' programs execution of 'C' program. 1.4 Character set, C tokens, keywords & Identifiers, constants, variables. Data types, type conversion, declaration of variables, assigning values to variables. 1.5 **Operators**: Arithmetic operators and its precedence, relational, Logical, increment & decrement, conditional, bit-wise operator, special operator. 1.6 **Expressions**: Arithmetic expressions, evaluation of expressions.
UNIT 2 Decision Making and looping (Weightage- 15 , Hrs- 10)	
2a. Understand Branching and looping statements. 2b. Demonstrate if statement, if-else, else-if ladder. 2c. Use of switch statement and? : operator. 2d. Apply different types of loops.	2.1 **Branching**: decision making with if statement, if-else statement, else- if ladder. 2.2 **Looping**: switch statement, ?: operator, go-to statement, while loop, for loop, do-while loop, break and continue statement.
UNIT 3 Arrays and Strings (Weightage- 12, Hrs- 08)	
3a. List different types of Arrays. 3b. Distinguish between one-dimensional, two-dimensional and multidimensional arrays, 3c. Demonstrate initialization of arrays 3d. Declaring and initializing String variables. 3e. Describe String functions.	3.1 **Introduction to array**: array, Initialization of arrays, 3.2 **Types**: one- dimensional arrays, two-dimensional arrays, multidimensional arrays. 3.3 **Introduction to String**: declaration & initialization of string, string variables, reading string, writing string. 3.4 Concatenation & comparison of two strings, string handling functions.

Unit Outcomes (UOs) (in cognitive domain)	Topics and Sub-topics
UNIT 4 Functions (Weightage- 15 , Hrs-10)	
4a. Use the given Predefined function. 4b. Write User defined functions. 4c. Identify different categories of Functions. 4d. Understand nesting of functions. 4e. Implement Recursion. 4f. Demonstrate function with arrays.	4.1 Concept and need of functions 4.2 **Predefined Functions**: Library functions, Math function. 4.3 **User defined function**: Need, syntax, declaration, definition, return values and their types, calling a function. 4.4 **Category of functions**: No argument- No return value. 4.5 Nesting of functions, recursion and function with arrays.
UNIT 5 Structures and Unions (Weightage- 13 , Hrs- 04)	
5a. Define Structure. 5b. Use the structure for solving the given problem. 5c. Demonstrate arrays of structure. 5d. Execute arrays within structure. 5e. Identify use of structure in functions. 5f. Compare structure and Union.	5.1 **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 5.2 **Unions**: Introduction to union, definition, syntax.
UNIT 6. Pointers (Weightage- 13 , Hrs- 06)	
6a. Define pointer. 6b. Declaration of pointers. 6c. Initialization of pointers and pointer expressions. 6d. Demonstrate pointer as a function argument.	6.1 **Pointer:** Introduction to pointer Concept. Accessing the address of a variable**,** declaration of Pointers, Initialization of Pointers, Accessing a variable through its pointer, chain of pointer, pointer expressions. 6.2 **Pointer and Array:** Array of pointers, Pointer to array, pointers as a function argument. 6.3 Returning pointer and passing addresses to Functions.

8. SUGGESTED SPECIFICATION TABLE FORQUESTION PAPER DESIGN

Unit No.	Unit Title	Teaching Hours	Distribution of Theory Marks			
			R Level	U Level	A Level	Total Marks
I	C overview, tokens, expressions	10	04	02	06	12
II	Decision making and looping	10	04	03	08	15
III	Arrays, Strings	08	04	02	06	12
IV	Functions	10	04	03	08	15
V	Structures and Unions	04	04	04	05	13
VI	Pointers	06	04	04	05	13
Total		**48**	**24**	**18**	**38**	**80**

9. SUGGESTED STUDENT ACTIVITIES

Other than the classroom and laboratory learning, following are the suggested student-related *co-curricular* activities which can be undertaken to accelerate the attainment of the various outcomes in this course: Students should conduct following activities in group and prepare reports of about 5 pages for each activity, also collect/record physical evidences for their (student's) portfolio which will be useful for their placement interviews:

    a. Drawing flowchart and writing algorithms for the given problem statements.
    b. Prepare practical files with write-ups, programs and its outputs.

10. SUGGESTED SPECIAL INSTRUCTIONAL STRATEGIES (if any)

These are strategies, which can be used to accelerate the attainment of the various outcomes in this course:

Sr. No.	Topic	Instructional Strategy
1	C overview, tokens, expressions	Class room teaching
2	Decision making and looping	Laboratory demonstration
3	Arrays, Strings	Class room teaching, laboratory demonstration
4	Functions	Class room teaching, laboratory work
5	Structures and Unions	Class room teaching, laboratory work
6	Pointers	Class room teaching, laboratory work

11. SUGGESTED MICRO-PROJECTS

NA

12. SUGGESTED LEARNING RESOURCES

S. No.	Title of Book	Author	Publication
1	Programming in ANSI 'C'	E. Balaguruswamy	Mcgraw Hill
2	Let us 'C'	Yashwant Kanetkar	BPB Publication
3	C for Beginners	MadhusudhanMothe	Shroff Publishers and Distributions. Pvt. Ltd.

13. SOFTWARE/LEARNING WEBSITES

1. http://www.nptel.ac.in
2. https://www.tutorialspoint.com/cprogramming
3. https://onlinecourses.nptel.ac.in

14. PO - COMPETENCY- CO MAPPING

	PO1	PO2	PO3	PO4	PO5	PO6	PO7
Write procedural program with 'C' language tokens.	3	1	2	1	-	-	2
Execute programs using branching and looping.	2	1	2	2	-	-	2
Write programs using arrays, strings.	2	2	2	2	-	-	3
Develop a C program using functions.	3	2	2	2	-	-	3
Implement programs using structures.	3	2	2	2	-	-	3
Execute programs using pointers.	3	2	2	2	-	-	3

	PSO1	**PSO2**	**PSO3**
CO1	1	-	-
CO2	-	1	-
CO3	-	1	1
CO4	-	1	1
CO5	1	-	-
CO6	-	1	-

Sign:
 	
Name: (Smt.G. B. Garud)
        (Smt.K. S. Gaikwad)
 	
        (Course Expert /s)
	Sign:
	
	Name: (Shri. U.V. Kokate)
	
	        Head of the Department
	        (Computer Engineering)

Sign:
 	
Name: Shri. U. V. Kokate
 	
        (Programme Head)
    (Computer Engineering)
	Sign:
	
	Name: Shri A.S.Zanpure
	
	        (CDC)

Government Polytechnic, Pune

'180OB' – Scheme

Programme	**Diploma in CE/EE/ET/ME/MT/CM/IT/DDGM**
Programme code	**01/02/03/04/05/06/07/08/21/22/23/24/26**
Name of Course	**Fundamentals of ICT**
Course Code	**CM2102**
Prerequisite course code and name	**NA**

1.   TEACHING AND EXAMINATION SCHEME

Teaching Scheme (In Hours)			Total Credits (L+T+P)			Examination Scheme				Total Marks
						Theory		Practical		
						ESE	PA	*ESE	PA	
L	**T**	**P**	**C**		**Marks**	-	-	25	25	50
01	00	02	03		**Exam Duration**	-	-	2 Hr		

(*):PE (Practical Examination)
Legends: L- lecture,T-Tutorial/teacher guided theory practice,P-practical,ESE-End semester examination,PA- Progressive Assesment.

2.   RATIONALE

In any typical business setup, in order to carry out routine tasks related to create business documents, perform data analysis and its graphical representations and making electronic slide show presentations, the student need to learn various softwares as office automation tools like word processing applications, spreadsheets and presentation tools. They also need to use these tools for making their project reports and presentations. The objective of Information and Communication Technology course is to develop the basic competency in students for using these office automation tools to accomplish the job.

3.   COMPETENCY

The aim of this course is to help the student to attain the following industry identified competency through various teaching learning experiences:
* **Use Computers for electronic documentation, data analysis, slide presentations and use of various internet services.**

4.   COURSE OUTCOMES (COs)
The theory, practical experiences and relevant soft skills associated with this course are to be taught and implemented, so that the student demonstrates the following industry oriented COs associated with the above mentioned competency**:**

1. Connect Computer System and its peripherals.
2. Prepare document using word processing tool.
3. Create and design spreadsheets and data tables.
4. Prepare professional presentations.
5. Use various web services.

5. **SUGGESTED PRACTICALS/ EXERCISES**
The practicals in this section are PrOs (i.e. sub-components of the COs) to be developed and assessed in the student for the attainment of the competency:

Sr. No.	Unit No.	Practical Exercises (Learning Outcomes in Psychomotor Domain)	Relevant CO	Approximate Hours Required.
1		i) Identify various Input/output devices, connections and peripherals of computer system ii) Demonstration of Front Panel View ,Rear Panel View, I/O Serial and Parallel Ports iii)Demonstration of opening and closing of the Computer	CO1	1
2		i) Connections inside CPU and its demonstration ii) Setting up the Cabinet. iii) Identification and Demonstration of different slots on motherboard. Mounting and Un mounting of RAM, Graphics card and Network card	CO1	1
3	1	i) Connecting various I/O Devices such as Mouse, Keyboards, Monitors, Printers, Web Cameras, Speakers, Scanners and External Hard disks etc. ii)Demonstration of RJ45 connector and its use and Bluetooth as an external interface	CO1	2
4		Functions and working of Secondary Storage devices i) Study of various types of Secondary Storage devices. ii) BIOS Settings for Primary and secondary Memory. iii) Installation, Configuration and Setting of Hard Disks and working of CD-ROM/DVD-ROM/ DVD-Combo/ DVD-Writer (Internal and External).	CO1	1
5		Execution of basic commands in command window: Ex: dir, md, copy, cd, move, rmdir, rd etc.	CO1	1
6		Various operations on Window based operating system part I: i) Windows Operations: Minimizing, Maximizing, Resizing. ii) Managing files and folders: Create, copy, rename, delete, move file and folder, Creating shortcuts.	CO1	1
7		Various operations on Window based operating system part II:	CO1	2

		i) Creating and Removing/Deleting User Accounts. ii) Using Add /Remove Programs and Hardware Utility. iii)Adding Fonts and Viewing Computer Configuration iv)Desktop settings: Display properties, Time and Date setting, Screen Saver , Appearance		
8		i) Create, edit and save document : apply formatting features on the text - line, paragraph ii) Use bullets, numbering, page formatting iii) Insert and edit images and shapes, sizing, cropping, color, background, group/ungroup	CO2	3
9	2	i) Insert and apply various table formatting features on it. ii) Use mail merge with options.	CO2	2
10		Apply page layout features i)Themes, page background, paragraph, page setup ii)Create multicolumn page iii)Use different options to print the documents	CO2	2
11		Create, open and edit worksheet i)Enter data and format it, adjust row height and column width ii)Insert and delete cells, rows and columns iii) Apply wrap text, orientation feature on cell.	CO3	2
12		i) Insert formulas, "IF" conditions, functions and named ranges in worksheet. ii) Apply data Sort Filter and Data Validation features.	CO3	2
13		Create charts to apply various chart options.	CO3	2
14	3	Apply Page setup and print options for worksheet to print the worksheet.	CO3	1
15		Perform following in GUI based database software using GUI like MS-Access i) Create Database ii) Create tables and assign primary key. iii) Modify the table structure-add column, change the data type of column, delete the column from table. iv) Insert, update and delete the record from table. v) Retrieve data from the table according to condition given.	CO3	2
16	4	i)Create slide presentation ii)Apply design themes to the given presentation iii)Add new slides and insert pictures/images, shapes iv)Add tables and charts in the slides. v)Run slide presentation in different modes vi)Print slide presentation as handouts	CO4	2
17		i)Apply animation effects to the text and slides. ii)Add audio and video files in the given	CO4	1

		presentation		
18		Configure Internet connection	CO5	1
19	5	Use internet for different web services.	CO5	2
20		Configure browser settings and use browsers.	CO5	1
		Total		**32**

Sr.No.	Performance Indicators	Weightage in %
a.	Use of Appropriate tool to solve the problem (Process)	40
b.	Quality of output achieved (Product)	30
c.	Complete the practical in stipulated time	10
d.	Observations and Recording	10
e.	Answer to sample questions	10
	Total	**100**

6. MAJOR EQUIPMENT/ INSTRUMENTSREQUIRED

The major equipment with broad specification mentioned here will usher in uniformity in conduct of practicals, as well as aid to procure equipment by authorities concerned**.**

Sr. No.	Major Equipment/ Instruments Required	PrO. No.
1	Computer system with all necessary components like; motherboard, random access memory (RAM), read-only memory (ROM), Graphics cards, sound cards, internal hard disk drives, DVD drive, Network interface card, Mouse, Keyboard, Monitors, Printers, Web Cameras, Speakers, Scanners and External Hard disks etc.	1 to 7
2	Laser printer	1,14,16
3	Hard Disks, CD-ROM/DVD-ROM/ DVD-Combo/ DVD-Writer (Internal and External).	3,4
4	Hubs, Switches, Modems.	18,19
5	Any operating system.	5 to 20
6	Any Office Software.	,9,10, 11, 12, 13, 15,16,17
7	Any browser.	18,19,20

7. THEORY COMPONENTS

The following topics/subtopics should be taught and assessed in order to develop UOs for achieving the COs to attain the identified competency**.**

Unit Outcomes (UOs) (in cognitive domain)	Topics and Sub-topics
UNIT 1. INTRODUCTION TO COMPUTER SYSTEM (Hrs- 04)	

1a.Explain the given block diagram of computer system.
 	
1b. Classify the given types of software.
	1.1 Basics of Computer System:
	   Overview of Hardware and Software ,block diagram of Computer System, Input /Output unit, CPU, Control unit, Arithmetic logic unit(ALU), Memory Unit
	
	1.2 Internal Components:
	   Processor, Motherboards, random access memory(RAM),

Unit Outcomes (UOs) (in cognitive domain)	Topics and Sub-topics
1c. Explain characteristics of the specified type of network. **1d.**Describe Procedure to manage file/folders. **1e.**Describe application of the specified type of network connecting device.	read-only memory(ROM), Video cards, Sound cards and internal hard disk drives **1.3 External Devices:** Types of Input/ Output Devices, Types of monitors, Keyboards, Mouse, Printers: Dot Matrix, Inkjet and LaserJet, Plotter and scanner, external storage devices CD/DVD , Hard disk and pen drive **1.4 Basic Commands in command window**: Ex: dir, md, copy, cd, move, rmdir, rd etc. **1.5 Application Software:** Word processing , Spreadsheet, database management systems, Control software, measuring software, photo editing software , video editing software, graphics manipulation software system software compilers, linkers, device drivers, operating systems and utilities **1.6 Network environments:** Network interface cards, hubs, switches, routers and modems, concept of LAN, MAN, WAN, WLAN, Wi-Fi and Bluetooth **1.7 Working With Operating Systems:** Create and manage file and folders, Copy a file, renaming and deleting files and folders, searching files and folders, application installation , creating shortcut of application on the desktop
UNIT 2. WORD PROCESSING (Hrs- 03)
2a. Write steps to create the given text document. **2b.**Explain the specified feature for document editing. **2c.**Explain the given page setup features of a document. **2d.**Write the specified table formatting feature..	**2.1 Word Processing:** Overview of Word processor, Basics of Font type, size, color, Effects like Bold, italic, underline, subscript and superscript, Case changing options, Previewing a document, Saving a document, Closing a document and exiting application. **2.2 Editing a Document:** Navigate through a document, Scroll through text, Insert and delete text, Select text, Undo and redo commands, Use drag and drop to move text, Copy, cut and paste, Use the clipboard, Clear formatting, Format and align text, Formatting Paragraphs, Line and paragraph spacing, using FIND and REPLACE, Setting line spacing ,add bullet and numbers in lists, add borders and shading, document views, Page settings and margins, Spelling and Grammatical checks **2.3 Changing the Layout of a Document:**

Unit Outcomes (UOs) (in cognitive domain)	Topics and Sub-topics

	Adjust page margins, Change page orientation, Create headers and footers, Set and change indentations, Insert and clear tabs
	2.4 Inserting Elements to Word Documents:
	    Insert and delete a page break, Insert page numbers, Insert the date and time, Insert special characters(symbols),Insert a picture from a file, Resize and reposition a picture
	2.5 Working with Tables:
	    Insert a table, Convert a table to text, Navigate and select text in a table, Resize table cells, Align text in a table, Format a table, Insert and delete columns and rows, Borders and shading, Repeat table headings on subsequent pages, Merge and split cells.
	2.6 Working with Columned Layouts and Section Breaks:
	    Add Columns, Section breaks, Creating columns, Newsletter style columns, Changing part of a document layout or formatting, Remove section break, Add columns to remainder of a document, Column widths, Adjust column spacing, Insert manual column breaks

UNIT 3.SPREADSHEETS AND DATABASE(Hrs- 04)	
3a. Write steps to create the given spreadsheet. **3b.**Explain the specified formatting feature of a worksheet. **3c.**Write steps to insert formula and functions in the given worksheet. **3d.**Write steps to create charts for the specified data set. **3e.**Explain steps to perform advance operation on the given dataset	**3.1 Working with Spreadsheets:** Overview of workbook and worksheet, Create Worksheet Entering sample data, Save, Copy Worksheet, Delete Worksheet, and Open & Close Workbook. **3.2 Editing Worksheet:** Insert and select data, adjust row height and column width, delete, move data, insert rows and columns, Copy and Paste, Find and Replace, Spell Check, Zoom In-Out, Special Symbols, Insert Comments, Add Text Box, Undo Changes,- Freeze Panes, hiding/un hiding rows and columns. **3.3 Formatting Cells and sheet:** Setting Cell Type, Setting Fonts, Text options, Rotate Cells, Setting Colors, Text Alignments, Merge and Wrap, apply Borders and Shades, Sheet Options, Adjust Margins, Page Orientation, Header and Footer, Insert Page Breaks, Set Background. **3.4 Working with Formula:** Creating Formulas, Copying Formulas, Common spreadsheet Functions such as sum, average, min, max, date, In, And, or, mathematical functions such as sqrt, power, applying conditions using IF.

Unit Outcomes (UOs) (in cognitive domain)	Topics and Sub-topics
	3.5 Working with Charts: Introduction to charts, overview of different types of charts, Bar, Pie, Line charts, creating and editing charts. Using chart options: chart title, axis title, legend, data labels, Axes, grid lines, moving chart in a separate sheet. **3.6 Advanced Operations:** Conditional Formatting, Data Filtering, Data Sorting, Using Ranges, Data Validation, Adding Graphics, Printing Worksheets, print area, margins, header, footer and other page setup options **3.7 Introduction to Database Management System:** Meaning of Data, Database, DBMS, GUI based database software Creating tables and assign primary key, Modifying the table structure-add column, change the data type of column, and delete the column from table. And Insert, update and delete the record from table.
UNIT 4. PRESENTATION TOOL (Hrs- 03)	
4a. Write the steps to create the specified slide presentation. **4b.** Write the steps to insert multiple media in the given presentation. **4c.** Write steps to apply table features in the given presentation **4d.** Write steps to manage charts in the given presentation	**4.1 Creating a Presentation:** Outline of an effective presentation, Identify the elements of the User Interface, Starting a New Presentation Files, Creating a Basic Presentation, Working with text boxes, Apply Character Formats, Format Paragraphs, View a Presentation, Saving work, creating new Slides, Changing a slide Layout, Applying a theme, Changing Colors, fonts and effects, apply custom Color and font theme, changing the background, Arrange Slide sequence, **4.2 Inserting Media elements:** Adding and Modifying Graphical Objects to a Presentation - Insert Images into a Presentation, insert audio clips, video/animation, Add Shapes, Add Visual Styles to Text in a Presentation, Edit Graphical Objects on a Slide, Format Graphical Objects on a Slide, Group Graphical Objects on a Slide, Apply an Animation Effect to a Graphical Object, Add Transitions, Add Speaker Notes, Print a Presentation. **4.3 Working with Tables:** Insert a Table in a Slide, Format Tables, and Import Tables from Other Office Applications. **4.4 Working with Charts:** Insert Charts in a Slide, Modify a Chart, Import Charts from Other Office Applications

Unit Outcomes (UOs) (in cognitive domain)	Topics and Sub-topics
UNIT 5. BASICS OF INTERNET (Hrs- 02)	
5a. Explain use of the given setting option in browsers. **5b.** Explain features of the specified web service. **5c.** Describe the given characteristic of cloud. **5d.** Explain the specified option used for effective searching in search engine	**5.1 World Wide Web**: Introduction, Internet, Intranet, Cloud, Web Sites, Web Pages, URL, web servers, basic settings of web browsers-history, extension, default page, default search engine, creating and retrieving bookmarks, use search engines effectively for searching the content. **5.2 Web Services**: e-Mail, Chat, Video Conferencing, e-learning, e-shopping, e-Reservation, e-Groups, Social Networking.

8.   SUGGESTED SPECIFICATION TABLE FORQUESTION PAPER DESIGN

Unit No.	Unit Title	Teaching Hours	Distribution of Theory Marks			
			R Level	U Level	A Level	Total Marks
I	Introduction to Computer System	4	--	--	--	--
II	Word Processing	3	--	--	--	--
III	Spreadsheets and Database	4	--	--	--	--
IV	Presentation Tool	3	--	--	--	--
V	Basics of Internet	2	--	--	--	--
Total		16	--	--	--	--

9.   SUGGESTED STUDENT ACTIVITIES
Other than the classroom and laboratory learning, following are the suggested student-related *co-curricular* activities which can be undertaken to accelerate the attainment of the various outcomes in this course: Students should conduct following activities in group and prepare reports of about 5 pages for each activity, also collect/record physical evidences for their (student's) portfolio which will be useful for their placement interviews:
   a. Prepare journal of practicals.
   b. Prepare a sample document with all word processing features.(Course teacher shall allot appropriate document type to each students)
   c. Prepare PowerPoint Presentation with all the presentation features.(Course teacher shall allot various topics to the groups of students)
   d. Prepare Database/spreadsheets in groups, related to various Fields/Organizations
   e. Undertake micro projects

10.   SUGGESTED SPECIAL INSTRUCTIONAL STRATEGIES (if any)
These are sample strategies, which the teacher can use to accelerate the attainment of the various outcomes in this course:
   a. Massive open online courses (*MOOCs*) may be used to teach various topics/sub topics.

b. About *15-20% of the topics/sub-topics* which is relatively simpler or descriptive in nature is to be given to the students for *self-directed learning* and assess the development of the COs through classroom presentations (see implementation guideline for details).
c. With respect to item No.8, teachers need to ensure to create opportunities and provisions for *co-curricular activities*.
d. Guide student(s) in undertaking micro-projects.
e. Correlate subtopics with power plant system and equipments.
f. Use proper equivalent analogy to explain different concepts.
g. Use Flash/Animations to explain various components, operation and
h. Teacher should ask the students to go through instruction and Technical manuals

11.   SUGGESTED MICRO-PROJECTS
    NA

12.   SUGGESTED LEARNING RESOURCES

S.N.	Title	Author, Publisher, Edition and Year of publication	ISBN Number
1	Computer Fundamentals	Goel, Anita, Pearson Education, New Delhi, 2014,	ISBN-13: 978-8131733097
2	Computer Basics Absolute Beginner's Guide, Windows 10	Miller, Michael, QUE Publishing; 8th edition August 2015	ISBN: 978-0789754516
3	Microsoft Office 2010 for Windows: Visual Quick Start	Schwartz, Steve, Pearson Education, New Delhi India, 2012	ISBN:9788131766613
4	OpenOffice.org for Dummies	Leete, Gurdy, Finkelstein Ellen, Mary Leete, Wiley Publishing, New Delhi 2003	ISBN : 978-0764542220
5	Microsoft Office 2010: On Demand	Johnson, Steve, Pearson Education, New Delhi India, 2010.	ISBN : 9788131770641

13.   SOFTWARE/LEARNING WEBSITES

a. http://www.nptel.ac.in
b.   https://www.microsoft.com/en-in/learning/office-training.aspx
c. http://www.tutorialsforopenoffice.org
d. https://s3-ap-southeast-1.amazonaws.com/r4ltue295xy0d

14. **PO - COMPETENCY- CO MAPPING**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	1	-	-	-	-	-	-
CO2	1	-	-	-	1	-	-
CO3	2	1	1	-	1	-	-
CO4	1	-	-	-	1	-	-
CO5	1	-	-	-	1	-	1

	PSO1	PSO2
CO1	1	-
CO2	-	1
CO3	-	1
CO4	-	1
CO5	1	1

Sign: Name: 1. Smt.A. D. Kshirsagar (Lecturer,Information Technology) 2. Smt.K.S.Sathawane (Lecturer,Computer Engineering) (Course Expert /s)	Sign: Name: Shri.U.V.Kokate (Head of Department) (Computer Engineering Dept.)
Sign: Name: Shri .U. V. Kokate (Programme Head)	Sign: Name: Shri A.S.Zanpure (CDC)

Government Polytechnic, Pune
'180OB' – Scheme

Programme	Diploma in ET/CE/EE//ME/MT/**CM/IT**/DDGM
Programme code	01/02/03/04/05/**06/07**/08/16/17/21/22/23/24/**26**
Name of Course	**Linux Basics**
Course Code	**CM2103**
Prerequisite course code and name	**NO**

1. TEACHING AND EXAMINATION SCHEME

Teaching Scheme (In Hours)			Total Credits (L+T+P)		Examination Scheme				Total Marks
					Theory		Practical		
L	T	P	C		ESE	PA	*ESE	PA	
				Marks	--	--	25	25	50
01	-	02	03	**Exam Duration**	--	--	2 Hr		

(*):POE (Practical Examination)

Legends: L- lecture, T-Tutorial/teacher guided theory practice, P-practical, ESE-End semester examination, PA- Progressive Assessment.

2. RATIONALE

Linux Operating System is Open source and freely distributed O.S. Apart from the fact that it's freely distributed, Linux's functionality, adaptability and robustness makes it highly suitable for server platform. The course aims at providing knowledge of shell and command line essentials.

3. COMPETENCY

The aim of this course is to attend following industry identified competency through various teaching learning experiences:

- **Practice basic Linux commands.**

4. COURSE OUTCOMES (COs)

The theory, practical experiences and relevant soft skills associated with this course are to be taught and implemented, so that the student demonstrates the following industry oriented COs associated with the above mentioned competency**:**

1. Install and Configure Linux O.S.
2. Execute various commands of Linux Operating System.
3. Compress and archive files in Linux OS.
4. Use vi editor to handle files.
5. Write and execute programs using shell scripting.

5. SUGGESTED PRACTICALS/ EXERCISES

The practicals in this section are PrOs (i.e. sub-components of the COs) to be developed and assessed in the student for the attainment of the competency:

Sr. No.	Unit No	Practical Exercises (Learning Outcomes in Psychomotor Domain)	Relevant CO	Approximate Hours Required.
1	1	i) Installing Linux: Hardware, Software , Requirements, Opening Disk space for Linux partitions ii) Virtual Consoles iii) Configuring GRUB / LILO Boot Loader.	CO1	4
2	2	i) Executing commands related to Login into user accounts, start up and shutdown commands, command line editing commands, man, who, who am i ,info , pwd.	CO2	2
3	2	i) Executing Commands I/O redirection and pipes. ii) Practicing File Name Arguments: *, ?, [ ].	CO2	4
4	3	i) Executing various file Related commands –cat, more,ls, cd, cp, mv, rm, touch, mkdir, rmdir, find.	CO2	2
5	3	i) Practicing Absolute and Relative Pathnames. ii) Setting/Changing file and directory related permissions chmod. iii) Link command.	CO2	6
6	4	i) Executing commands related to archive and file compression	CO3	2
7	4	i) Executing various commands related to vi Editor. ii) Practicing editing with vi editor. iii) Practicing vi editing commands.	CO4	4
8	5	i) Executing various Shell commands: cat, tee, head and tail. ii) Creating shell variables	CO5	2
9	5	i) Configuring Login Shell with Special Shell Variables. ii) Practicing filter output :wc, spell and sort.	CO5	2
10	5	i) BASH Shell Programming (any 4 basic programs without looping)	CO5	4
		Total		32

S.No.	Performance Indicators	Weightage in %
a.	Debugging ability.	20
b.	Quality of output achieved.	40
c.	Complete the practical in stipulated time.	10
d.	Answer to sample questions.	20
e.	Submission of assignment in time.	10
	Total	**100**

6.   MAJOR EQUIPMENT/ INSTRUMENTSREQUIRED

The major equipment with broad specification mentioned here will usher in uniformity in conduct of practical, as well as aid to procure equipment by authorities concerned**.**

S. No.	Equipment Name with Broad Specifications	Experiment Sr.No.
1	Computer system with all necessary components like; motherboard, random access memory (RAM), read-only memory (ROM), internal hard disk drives, Mouse, Keyboard , open source operating System. (RedHat, Ubuntu etc).	All Experiments

7.   THEORY COMPONENTS

The following topics/subtopics should be taught and assessed in order to develop UOs for achieving the COs to attain the identified competency**.**

Unit Outcomes (UOs) (in cognitive domain)	Topics and Sub-topics
Unit 1. Introduction to Linux Operating System(Hrs-03)	
1a.Describe History of Linux. 1b. Identify different types of shells. 1c.Compare Linux file systems.	1.1. Operating system and Linux 1.2. History, Overview of Linux 1.3. Shell: Bourne, Korn, Cshell. 1.4.Linux releases, Linux File Systems(ext) and versions.
Unit 2. The Shell(Hrs- 04)	
2a. Use History command. 2b. Use filename arguments. 2c. Execute file related commands. 2d. Execute commands using pipes and I/O redirection	2.1. The Command Line. 2.2. Command Line Editing. 2.3. Command and Filename Completion. 2.4. History: History Events, History command, History Event Editing. 2.5. Configuring History: HISTFILE and HISTSAVE. 2.6. Filename Expansion: *, ?, [ ]: Matching Multiple Characters, Matching Single Characters, Matching a Range of Characters, Matching Shell Symbols, Generating Patterns. 2.7. Standard Input/Output and Redirection: Redirecting the Standard Output: > and >>, The Standard Input. 2.8. Pipes: |, Redirecting the Standard Error:2>, >>.
Unit 3. Linux Files and Directories(Hrs-02)	
3a. Describe linux file structure 3b. Use absolute and relative pathnames. 3c. Execute file and Directory commands. 3d. Change file and directory permissions 3e. Use link command.	3.1. Linux Files, The File Structure- Home Directories, Pathnames, System Directories. 3.2. Listing, Displaying, and Printing Files(ls, cat, more, less, and lpr). 3.3. Displaying Files: cat, less, and more, Printing Files: lpr, lpq, and lprm. 3.4. Managing Directories(mkdir, rmdir, ls, cd, and pwd): Creating and Deleting Directories, Displaying Directory

Unit Outcomes (UOs) (in cognitive domain)	Topics and Sub-topics
	Contents, Moving Through Directories, Referencing the Parent Directory. 3.5. File and Directory Operations(find, cp, mv, rm, and ln): Searching Directories: find, Searching the Working Directory, Locating Directories, Copying Files, Moving Files, Copying and Moving Directories, Erasing Files and Directories: The rm Command. 3.6. Links: The ln Command, Symbolic Links, Hard Links. 3.7. File and Directory Permissions: chmod.
Unit 4.Archive,Editors and Utilities(Hrs- 03)	
4a. Compress and archive files. 4b. Create and modify files using vi editor. 4c. line editing command.	4.1. Archive Files and Devices: tar Displaying Archive Contents, Creating Archives, Extracting Archives, Updating Archives, Compressing Archives. 4.2. File Compression: gzip, bzip2, and zip: Compression with gzip, Compressing with bzip2, Using Zip. 4.3. The vi Editor: vi Command, Input, and Line Editing Modes. 4.4. Creating, Saving and Quitting a File in vi, Managing Editing Modes in vi. 4.5. vi Editing Commands: Common Operations.
Unit 5. Filters, Regular Expressions and Shell programming(Hrs- 04)	
5a. Execute Linux filters. 5b. Execute commands using regular expressions. 5c. Execute shell script programs	5.1. Filters and Regular Expressions: Using Redirection and Pipes with Filters: cat, tee, head and tail. 5.2. Types of Filter Output :wc, spell and sort. 5.3. Configuring Your Login Shell with Special Shell Variables. 5.4. Introduction to BASH Shell Programming, Variables and Scripts.

8. SUGGESTED SPECIFICATION TABLE

Unit No	Unit Title	Teaching Hrs	Distribution of Theory Marks			
			R Level	U Level	A and above Levels	Total Marks
1	Introduction to Linux Operating System	3	-	-	-	-
2	The Shell	4	-	-	-	-
3	Linux Files and Directories	2	-	-	-	-
4	Archive,Editors and Utilities	3	-	-	-	-
5	Filters, Regular Expressions and Shell programming	4	-	-	-	-
	Total	16				

9. **SUGGESTED STUDENT ACTIVITIES**
Other than the classroom and laboratory learning, following are the suggested student-related *co-curricular* activities which can be undertaken to accelerate the attainment of the various outcomes in this course: Students should conduct following activities in group and prepare reports of about 5 pages for each activity, also collect/record physical evidences for their (student's) portfolio which will be useful for their placement interviews:

a. Prepare journal based on practical.
b. Practice more commands and their options other than practical list.
c. Undertake Micro projects in group of students.

10. **SUGGESTED SPECIAL INSTRUCTIONAL STRATEGIES (if any)**
These are sample strategies, which the teacher can use to accelerate the attainment of the various outcomes in this course:

a. Massive open online courses (*MOOCs*) may be used to teach various topics/sub topics.

11. **SUGGESTED MICRO-PROJECTS**

   NA

12. **SUGGESTED LEARNING RESOURCES**

S. No.	Title of Book	Author	Publication
1	Linux The Complete Reference 6th Edition	Richard Petersen	McGraw Hill
2	Linux command line and shell scripting	Richard Blum	Willey India
3	Prof. DayanandAmbawade and Prof. Prof. DevenN.Shah	Linux Lab: Hands on Linux	Dreamtech publications

13. **SOFTWARE/LEARNING WEBSITES**
   - https://maker.pro/linux/tutorial/basic-linux-commands-for-beginners
   - https://www.tecmint.com/linux-commands-cheat-sheet/
   - https://www.guru99.com/must-know-linux-commands.html
   - https://www.shellscript.sh/
   - https://www.tutorialspoint.com/unix/shell_scripting.htm
   - https://spoken-tutorial.org/tutorial

14.   **PO - COMPETENCY- CO MAPPING**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	1	-	-	1	-	-	-
CO2	3	-	1	2	-	-	2
CO3	3	-	-	2	-	-	2
CO4	1	-	-	1	-	-	-
CO5	2	1	2	2	-	-	2

	PSO1	PSO2
CO1	2	-
CO2	-	2
CO3	-	1
CO4	-	2
CO5	-	2

Sign:
 	
Name: Smt.H S Pawar
Name: Smt. H F Khan
          (Course Expert /s)
	Sign:
	
	Name: Shri. U V Koakte
	   (Head of Department)
	   (Computer Enguneering)

Sign:
 	
Name: Shri. U V Koakte
   (Program Head)
(Computer Enguneering)
	Sign:
	
	Name: Shri A.S.Zanpure
	
	          (CDC)

Government Polytechnic, Pune
'180 OB' – Scheme

Programme	Diploma in ET/CE/EE/ME/MT/**CM/IT**/DDGM
Programme code	01/02/03/04/05/**06/07**/08/16/17/21/22/23/24/**26**
Name of Course	Web Designing using HTML
Course Code	CM2104
Prerequisite course code and name	-
Class Declaration	No

1. TEACHING AND EXAMINATION SCHEME

Teaching Scheme (In Hours)			Total Credits (L+T+P)	Examination Scheme				Total Marks
				Theory Marks		Practical Marks		
L	T	P	C	ESE	PA	*ESE	PA	75
1	-	2	3			25	50	

(*): PE (Practical Examination)
Legends: L- lecture, T-Tutorial/teacher guided theory practice, P-practical, ESE-End semester examination, PA- Progressive Assessment.

2. RATIONALE
In the Era of Web Technology it is essential for every Diploma Engineering students to understand the various steps for designing a creative and dynamic Web site and finally create good effective and customized websites. This course covers Web designing using HTML, Web site publishing, Internet related technologies and systematic way of developing a website.

3. COMPETENCY
The aim of this course is to attend following industry identified competency through various teaching learning experiences:
- **Develop static interactive web sites.**

4. COURSE OUTCOMES (COs)
The theory, practical experiences and relevant soft skills associated with this course are to be taught and implemented, so that the student demonstrates the following industry oriented COs associated with the above mentioned competency:

1. Use HTML tags for information representation on webpage.
2. Create webpage using images, colors and backgrounds.
3. Design HTML forms.
4. Format web pages using CSS.
5. Host static web sites.

5. **PRACTICALS/ EXERCISES**

The practicals in this section are PrOs (i.e. sub-components of the COs) to be developed and assessed in the student for the attainment of the competency:

Sr. No.	Unit No.	Practical Exercises (Outcomes in Psychomotor Domain)	Relevent CO	Approx. Hrs. Required
1	1	a) Create lists of at least 10 available browsers and search engines. Use internet for acquiring this information. b) Take a string example "Government Polytechnic, Pune" and display it in all <h1> to <h6> header tags. State the output.	CO1	2
2	1	a) 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, horizontal lines, span tag, pre tag etc.	CO1	2
3	1	a) Write an HTML script that gives information about G.P. Pune and displays the names of various Departments as unordered list. b) Design and implement a webpage displaying list of grocery items as ordered list	CO1	2
4	1	a) Design a webpage for implementing – • Ordered list within unordered list. • Unordered list within ordered list. • Ordered list within ordered list (implement different list numbering style) • Unordered list within unordered list (Implement different bullet styles) b) Write an HTML script that displays definitions of minimum 10 terms related to a context. Use definition lists for the same.	CO1	2
5	2	a) Adding Hyperlinks and Images: Create a webpage containing two images and add a hyperlink to another webpage. Apply width and height property to one image. Align one image to center and the other one to left. Assign the second image as hyperlink to another webpage. b) Create a webpage containing an image and some paragraph. Apply following- • Create the map of image with sections of image linking to different webpage's in the same HTML where it is to be applied. • Apply this map on the image.	CO2	2
6	2	a) Applying background properties - Create a webpage with paragraphs, headers and information of your choice. Apply and practice following effects on webpage: • Set the background color of the page to linen. • Set border to h1 tag. • Set background image to a page. • Set background image to any paragraph. • Repeat the image vertically only.	CO2	2

Sr. No.	Unit No.	Practical Exercises (Outcomes in Psychomotor Domain)	Relevent CO	Approx. Hrs. Required
		• Repeat the image horizontally only. • Show the background image at top right position.		
7	2	a) Applying Border properties: Create a webpage with paragraphs, headers and information of your choice. Apply and practice following effects on webpage: • Set all top border properties of a paragraph in one declaration. • Set style of bottom border for a paragraph. • Set the width of left border. • Assign different colors to four borders. Use hexadecimal color assignment. • Set rounded border for some paragraph • Apply border to the page. • Set border width to the header.	CO2	2
8	3	a) Create a webpage that displays first year timetable. Make effective use of rowspan and colspan attributes. Make use of <th> tag too.	CO3	2
9	3	a) Use the webpage from earlier assignments with tables. Use borders, margins and padding properties on table/table rows/table cells. b) Use <div> tag to mark various divisions of webpages. Apply background, border, margin properties to different divisions	CO3	2
10	3	a) Create a webpage for creating any layout in frameset with atleast two frames. b) Design the layout first and then write appropriate scripts for defining frameset and individual frames.	CO3	2
11	3	a) Create a webpage that provides a form for filling information. The webpage must contain following elements : • Textbox • Radio buttons • Checkboxes • Buttons (Submit/REST) • Text area • Textbox for passwords Design the form properly for some task: Example- Login creation/Registration etc. Provide appropriate Labels to all form elements to guide user into filling the form.	CO3	2
12	4	a) Apply background and border style on paragraph/page/header using inline and internal cascaded styles. b) Apply different styles to various selectors i.e. elements, names, ids, class, groups. Use any web page created earlier.	CO4	2
13		a) Applying CSS text properties: Create a web page with number of paragraphs and headers. Apply following text properties:	CO4	2

Sr. No.	Unit No.	Practical Exercises (Outcomes in Psychomotor Domain)	Relevent CO	Approx. Hrs. Required
	4	• Set the text color of page to "RED" and text color of <h1> to "BLUE". • Align <h1> to center. • Style text in <h1> to uppercase. • Style test in some <p> to capitalize. • Indent the first line of the paragraph to 20 px. • Set letter spacing for the paragraph • Set word-spacing in another paragraph • Set text direction from right to left • Create text-shadow effect on certain heading. • Set no wrap property for some paragraph. State the output.		
14	4	a) Applying CSS font properties: Create a web page with number of paragraphs and headers. Apply following font properties: • Set the font of page to "COURIER" and the font of <h1> tag to "VERDANA". • Set the font size of page to "20px" and the font size of a paragraph to "3em" • Show some <p> elements as Italic text. • Set some part of <p> element to small caps • Set font style through CSS to oblique. • Set font-weight of some part of paragraph to bold.	CO4	2
15	4	a) Applying CSS link properties: Create a web page with number of paragraphs and number of links. Apply different styles to hyperlinks: • Link changing colors when visited. • Link changing color on Mouse over • Link changing font-size on mouse over. • Link changing background color on mouse-over • Link changing font-family when visited. • Set color of some link to green. • Remove underline from the links. • Set the background color of link to TOMATO for visited and unvisited link	CO4	2
16	5	Micro project:	CO5	2
		Total Hrs		32

S.No.	Performance Indicators	Weightage in %
a.	Debugging ability	20
b.	Quality of output achieved	40
c.	Complete the practical in stipulated time	10
d.	Answer to sample questions	20
e.	Submission of assignment in time	10
Total		**100**

6.   MAJOR EQUIPMENTS/ INSTRUMENTS REQUIRED
The major equipment with broad specification mentioned here will usher in uniformity in conduct of practicals, as well as aid to procure equipment by authorities concerned**.**

S. No.	Equipment Name with Broad Specifications	Experiment Sr.No.
1	Computer with a text editor and browser	All
2	Computer system with Internet connection	16
3	Web server	16

6. THEORY COMPONENTS
The following topics/subtopics should be taught and assessed in order to develop UOs for achieving the COs to attain the identified competency**.**

Unit Outcomes (UOs) (in cognitive domain)	Topics and Sub-topics
UNIT 1. INTRODUCTION TO COMMON HTML,LINKS AND ADDRESSING (Hrs-04)	
1a. Define HTML. 1b. State the Terminologies used in Web Design. 1c. Describe Block Level Elements. 1d. Define Components of HTML Tags. 1e. Enlist Text Level Elements. 1f. Create the different List. 1g. Write a program for Linking HTML Documents.	**1.1 Introduction to HTML** **1.2 Terminologies used in Web Design:** Web, Web site, Web page, Web server,Web Browser, Search Engine **1.3 Components of HTML:** Tags – closed tags and open tags, Attributes, Elements **1.4 Structure Tags:** !DOCTYPE, HTML, HEAD, TITLE, BODY tags. **1.5 Block Level Elements:** Headings, Paragraphs, Breaks, Divisions, Centered Text, Block Quotes, Preformatted text,Address. **1.6 Text Level Elements:** Bold, Italic, Teletype, Underline, Strikethrough, Superscript, subscript. **1.7** Horizontal Rules, Special characters, Adding comments, The Meta tag. **1.8 Creating Lists:** Ordered Lists, Unordered Lists, Definition Lists, Nested Lists. **1.9 Linking HTML Documents URL**: Types of URLs, Absolute URLs, Relative URLs, The Anchor Tag. Linking: To document in the same folder, to document in the different folder, to document on the web, to specific section within the document, Inserting E-mail link.

UNIT 2. IMAGES, COLORS AND BACKGROUND (Hrs-04)

2a. Find Image Formats 2b. Describe HSPACE & VSPACE. 2c. Differentiate between Server-side image maps & Client-side image maps. 2d. Describe Text Color. 2e. Write a program for setting text color & background Color. 2f. Write a program for setting background images. 2g. Describe attribute of BODY tag	**2.1 Image:** • **Image formats:** gif, jpeg, png • **The inline image:** an IMG tag, alternate text, image alignment, buffer space – HSPACE, VSPACE, wrapping text,height and width of images, Image as a link. • **Image maps:** Server-side image maps, Client-side image map **2.2 Colors and Backgrounds:** • **The text color:** color attribute of FONT tag, text attribute of BODY tag. • **Background color:** bgcolor attribute of BODY tag • **BackgroundImages:** Background attribute of BODY tag. • **Changing link colors:**link, alink, vlink attributes of BODY tag.

UNIT 3. TABLES, FRAMES AND FORMS (Hrs-04)

3a. State Basic Tables Tags. 3b. Describe how to add Captions. 3c. Define Frames. 3d. Enlist Advantages & Disadvantages of Frames. 3e. Write a program to Create Frame using Frame Tag. 3f. Define Forms. 3g. Write a program to Create basic form using different form fields. 3h. Describe Button tag.	**3.1 Tables:** • **Creating basic tables:** TABLE, TR, TH, TD tags. • **Formatting tables:** border, cellspacing, cellpadding, width, align, bgcolor attributes. Adding captions: CAPTION tag. • **Formatting contents in the table cells:** align, valign, bgcolor, height, width, nowrap attributes. Spanning rows and columns: rowspan and colspan attributes. **3.2 Frames:** • **Introduction to frames:** What is frame? Advantages and disadvantages of using frames. • **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. **3.3 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.

UNIT 4. STYLE SHEETS(Hrs-02)

4a.Define CSS. 4b. Write a program for adding different Style to the Document. 4c. Describe Selectors. 4d. Describe Style Sheet Properties. 4e. Write a Program displaying Style Sheet Properties.	**4.1 Adding style to the document**: Linking to style sheets, embedding style sheets, using inline style. **4.2 Element Selectors**: CLASS rules, ID rules. **4.3 Style sheet properties**: font, text, box, color and background properties.

UNIT 5. WEB SITE HOSTING (Hrs-02)

5a. Describe the procedure to configure a web server 5b. Differentiate hosting requirement on Internet and Intranet. 5c. Describe the procedure for hosting the given web site. 5d. Explain process of uploading given files on a web site.	**5.1** Concept of Internet and Intranet **5.2** Publishing web site on Intranet **5.3** Installing and configuring web server **5.4** Uploading files on Intranet site, Access intranet base web page **5.5** Publishing web site on Internet. **5.6** Access Internet based web site.

7. SPECIFICATION TABLE

Unit No	Unit Title	Teaching Hrs	Distribution of Theory Marks			
			R Level	U Level	A and above Levels	Total Marks
1	Introduction to common HTML, Links and addressing.	4	-	-	-	-
2	Image colors and background	4	-	-	-	-
3	Tables, frames and forms	4	-	-	-	-
4	Style Sheets	2	-	-	-	-
5	Website Hosting	2	-	-	-	-

8. STUDENT ACTIVITIES
      1. Prepare journal of practical.
      2. Browse and Observe features of different types of website.
      3. Undertake micro projects.

9. LEARNING RESOURCES

Sr.No.	Title of Book	Author	Publication
1	The Complete Reference: HTML	Thomas A.Powell	Tata McGraw Hill,5th Edition
2	Mastering HTML 4.0	Deborah S. Ray , Eric J. Ray	BPB

10. SOFTWARE/LEARNING WEBSITES
- https://www.w3.org/TR/2018/SPSD-html401-20180327/struct/links.html

- http://www.html.net/
- http://webdesign.about.com
- https://www.html.am/templates/simple-website-templates/
- https://www.w3schools.com/html/
-

11. PO - COMPETENCY- CO MAPPING

	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	-	-	2	2	-	-	2
CO2	-	-	1	-	2	-	2
CO3	1	-	2	2	2	-	2
CO4	1	-	2	2	1	-	2
CO5	2	-	2	2	2	2	1

12. PSO - COMPETENCY- CO MAPPING

CO /PSO	PSO1	PSO2
CO1	-	2
CO2	-	2
CO3	-	2
CO4	-	2
CO5	-	3

(Smt. S. P. Ambavane) (Smt. A. B. Bhusagare) Signature of Course Experts	(Mr. M. U. Kokate) Signature of Head of the Department (Computer Engineering)
(Mr. U. V. Kokate) Signature of Programme Head, Computer Engineering	(Mr.A.S. Zanpure) Signature of CDC In-charge

Government Polytechnic, Pune

'180OB' – **Scheme**

Programme	Diploma in ET/CE/EE//ME/MT/**CM/IT**/DDGM CM/IT
Programme code	01/02/03/04/05/06/07/08/21/22/23/24/26
Name of Course	**Electrical Engineering**
Course Code	**EE2107**
Prerequisite course code and name	--

1. TEACHING AND EXAMINATION SCHEME

Teaching Scheme (In Hours)			Total Credits (L+T+P)		Examination Scheme				Total Marks
					Theory		Practical		
L	**T**	**P**	**C**		**ESE**	**PA**	***ESE**	**PA**	
03	00	02	05	**Marks**	80	20	25	25	150
				Exam Duration	3Hrs	1Hrs	2 Hrs		

(*):OE(Oral Examination)
Legends: L- lecture, T-Tutorial/teacher guided theory practice, P-practical, ESE-End semester examination, PA- Progressive Assessment.

2. RATIONALE

The basic concepts of electrical engineering in this course will be very useful for understanding the utilization of electrical circuits, equipment, and machines. Hence, it is necessary to able to grasp the basic electric and magnetic circuits, AC fundamentals, polyphase circuits, different types of AC and DC motors , their principles, working characteristics and application. It is also useful for trouble shooting of basic electrical wiring and knows the electrical safety; this course will be very useful for understanding of higher level courses.
.

3. COMPETENCY

The aim of this course is to help the student to attain the following competency through various teaching learning experience

a. **Use electrical equipment in computer.**

b. **Do trouble shooting and rectification of basic electrical wiring.**

c. **Understand the electrical safety.**

4. COURSE OUTCOMES (COs)

The theory, practical experiences and relevant soft skills associated with this course are to be taught and implemented, so the student are able to demonstrates the following COs associated with the above mentioned competency.

    a. **CO1- Appreciate the basic principles of electric and magnetic circuits**

    b. **CO2- Use single phase and three phase AC supply.**

    c. **CO3- Utilization of transformer and AC , DC and special purpose motors for specific applications**

    d. **CO4- Use electrical protective switchgear for electrical wiring and system as per requirement**

    e. **CO5- Recognize the electrical safety**

5.   SUGGESTED PRACTICALS/ EXERCISES

The practicals in this section are PrOs (i.e. sub-components of the COs) to be developed and assessed in the student for the attainment of the competency:

Pro1:- Verify the basic laws of electric and magnetic circuits.
Pro2:- Analyze the single and three phase circuits.
Pro3:- Understand the operation of transformer, DC and AC motors
Pro3:- Perform the simple electrical wiring and testing by lamps or multimeters

Sr. No.	Unit No.	Practical Exercises (Outcomes in Psychomotor Domain)	Relevant CO	Approximate Hours Required
1	1	To verify properties of series and parallel connection of resistances	CO1	2
2	1	Verification of Kirchhoff"s Voltage Law and Kirchhoff"s Current Law	CO1	2
3	1	Verification of Faradays laws of Electromagnetic Induction.	CO1	2
4	1	To perform statically and dynamically induced EMF	CO1	2
5	2	To determine frequency, time period, peak value, rms value, peak factor and form factor of a sinusoidal A. C. waveform on C. R. O.	CO2	2
6	2	Find the phase difference between voltage and current on C. R. O. for resistive, inductive and capacitive circuits.	CO2	2
7	2	To verify the relation between line & phase values of current and voltage in a balanced star & delta connected circuit	CO2	2
8	2	Measurement of power by two wattmeter method	CO2	2
9	3	To determine voltage & current ratio of single-phase transformer and determine efficiency and voltage regulation of single phase transformer	CO3	2
10	3	Reversal the direction of following motors 1 Three phase Induction motor 2. Single phase induction	CO3	4

		motor			
11	4	Reversal the direction of any one of the following motor 1. D.C. motor 2. Stepper Motor 3. Servo motor 4. BLDC motor	CO3		2
12	5	To connect and perform two lamps control by two switches with MCB.	CO4		2
13	5	To prepare switch board of one lamp and one socket control by using two switches.	CO4		2
14	5	Test circuit using series lamp and multimeter	CO4		2
15	5	Prepare chart of procedure for rescuing a person who has received an electrical shock.	CO5		2
		Total Hrs			32

S.No.	Performance Indicators	Weightage in %
1	Arrangement of available equipment / test rig or model	20
2	Setting and operation	20
3	Safety measures	10
4	Observations and Recording	10
5	Interpretation of result and Conclusion	20
6	Answer to sample questions	10
7	Submission of report in time	10
Total		**100**

6. MAJOR EQUIPMENT/ INSTRUMENTSREQUIRED

The major equipment with broad specification mentioned here will user in uniformity in conduct of practical, as well as aid to procure equipment by authorities concerned.

Sr.No.	Major Equipment/ Instruments Required	PrO. No.
1	Voltage /Current/Power measuring meter AC & DC	Pro1, Pro2, Pro3
2	Single phase transformer	Pro3
3	DC Motor	Pro3
4	Three phase induction motor	Pro3
5	Single phase motor	Pro3
6	Tachometer	Pro3
7	Passive electrical elements ,Rheostat, Capacitor and inductor	Pro1 to Pro4
8	Three phase lamp load	Pro2

7. THEORY COMPONENTS

The following topics/subtopic should be taught and assessed in order to develop UOs for achieving the COs to attain the identified competency.

Unit Outcomes (UOs) (in cognitive domain)	Topics and Sub-topics
UNIT 1. Electrical Circuit and Electromagnetism (Marks-12, Hrs-07)	
1a.Define Ohms Law and Kirchhoff's Laws 1b. Analyze series and parallel circuits 1c. Define Power and Energy. 1d. Define laws and rules of electromagnetism. 1e. Explain Statically and dynamically induced EMF.. 1f. Explain concepts of self-inductance, mutual inductance and coefficient of coupling. 1g. Explain Energy stored in magnetic fields.	1.1 Ohms Law and Kirchhoff's laws 1.2 Analysis of series, parallel and series –parallel circuits excited by independent voltage sources. Power and Energy. 1.3 Faradays Laws, Lenz's Law, Fleming's Rules. Statically and dynamically induced EMF. Concepts of self-inductance, mutual inductance and coefficient of coupling. Energy stored in magnetic fields
Unit 2 Single Phase and Three phase A.C. Circuits (Marks-22, Hrs-13)	
2a. Describe the method of generation of single phase voltage by an elementary alternator, define basic terms of sinusoidal waveform 2b. Represent the given AC quantities by phasors, waveform and mathematical equations. 2c. With the help of waveforms and phasor diagrams, show the phase relationship between voltage and current in R, L, C, RL, RC, and RLC ac circuit. 2d. Calculate the parameters of the given circuit, and also calculate current, power factor and power of the given AC circuit 2e Explain the concept of symmetrical system and phase sequence of the given AC supply. 2f Calculate the current and power of the given three phase star / delta connection.	2.1 Generation of sinusoidal voltage. Definition of average value, root mean square value, form factor and peak factor of sinusoidal voltage and current and phasor representation of alternating quantities. 2.2 Analysis with phasor diagrams of R, L, C, RL, RC and RLC circuits. Real power, reactive power, apparent power and power factor, series, parallel and series -parallel circuits. Series and parallel resonance. 2.3 Necessity and Advantages of three phase systems. 2.4 Generation of three phase power, definition of Phase sequence. 2.5 Relationship between line and phase values of balanced star and delta connections. Power in balanced three phase circuits. 2.6 Measurement of power by two wattmeter method
UNIT 3 Induction motor and Transformer (Marks- 16 , Hrs- 10)	

Unit Outcomes (UOs) (in cognitive domain)	Topics and Sub-topics
.3a. Explain the construction & working principal of induction motor 3b.Select relevant induction motor for given application with justification. 3c. Describe the construction and working of transformer. 3d. Derive emf equation and explain losses, efficiency and voltage regulation.	3.1 Concept of rotating magnetic field; Principle of operation, types and constructional features of induction motor.; Slip and its significance. 3.2 Necessity of a starter, star-delta starter: 3.3 Applications of squirrel cage and slip ring motors. 3.4 Single Phase Induction Motors- Working principle, construction and applications of following Motors. I) Split phase a)Resistance b)Capacitance II) Capacitor start capacitor run III) Shaded pole. Reversal of rotation of above motors. 3.5 Principle of operation and construction of single phase transformers (Core and shell types). 3.6 EMF equation, losses, efficiency and voltage regulation
UNIT 4 Special Purpose Electrical Motors (Marks-16 , Hrs-10)	
4a. Explain the construction and working principle of DC motor and its applications. 4b. Explain the construction and working principle of stepper motor, servo motor and BLDC motor and its applications	4.1 DC Motor: DC motor working principle; Back EMF and its significance, torque equation; Types of D.C. motors, characteristics and applications; Necessity of a starter for DC motor. 4.2. Stepper Motor: Working principal and construction of stepper motor and application. 4.3 Servo motor: Servo motor working principal, construction and application. 4.5 BLDC Motor: Brush less D. C. Motor construction, working principal and application
UNIT 5 Electrical wiring ,Protective Devices and Electrical safety (Marks-14, Hrs-08)	
5a. Select the relevant protective device and suitable switchgear for the given application with justification. 5b Describe the features of the given type of protective device. 5c State the I.E. rule related to be applied for the safety with justification. 5d. Explain how to take the precautions against shocks and understand the procedure for rescuing a person, who has received an electrical shock.	5.1 Introduction to domestic wiring, service mains, meter board and distribution board; 5.2 Introduction to circuit protective devices: Concept of overload, O.C., S.C., leakage current, H.R.C. Fuses, MCB, use of ELCB. Necessity of Earthling 5.3. One lamp control by one switch. Two lamp control by two switches. Electrical wiring diagram of 5 PC labs. 5.4 I.E. rules for safety of person & equipment followed when working with electrical installation. Electrical shocks and precautions against shocks. Procedure for rescuing a person who has received an electrical shock.

8. SUGGESTED SPECIFICATION TABLE FORQUESTION PAPER DESIGN

Unit No.	Unit Title	Teaching Hours	Distribution of Practical Marks			
			R Level	U Level	A Level	Total Marks
I	Electrical Circuit and Electromagnetism	07	02	06	04	12
II	Single Phase and Three phase A.C. Circuits	13	06	10	06	22
III	Induction motor and Transformer	10	04	06	06	16
IV	Special Purpose Electrical Motors	10	04	06	06	16
V	Electrical wiring ,Protective Devices and Electrical safety	08	04	06	04	14
VI						
VII						
	Total	48	20	34	26	80

9. SUGGESTED STUDENT ACTIVITIES

Other than the classroom and laboratory learning, following are the suggested student-related *co-curricular* activities which can be undertaken to accelerate the attainment of the various outcomes in this course: Students should conduct following activities in group and prepare reports of about 5 pages for each activity, also collect/record physical evidences for their (student's) portfolio which will be useful for their placement interviews:

 a. Prepare journals based on practical performed in laboratory.
 b. Market survey regarding commonly used electrical equipment which are not covered in the curriculum.
 c. Prepare charts of different electrical wiring diagram
 d. Search information about Ratings and specifications of AC, DC and special purpose electrical motors.
 e. Prepare power point presentation or animation for showing working of DC or AC or special purpose electrical motors.
 f. Prepare posters to illustrate the use of procedure for rescuing a person who has received an electrical shock.

10. SUGGESTED SPECIAL INSTRUCTIONAL STRATEGIES (if any)

These are sample strategies, which the teacher can use to accelerate the attainment of the various outcomes in this course:

 a. Massive open online courses (*MOOCs*) may be used to teach various topics/sub topics.
 b. About *15-20% of the topics/sub-topics* which is relatively simpler or descriptive in nature is to be given to the students for *self-directed learning* and assess the development of the COs through practically implementation.
 c. With respect to item No.8, teachers need to ensure to create opportunities and provisions for *co-curricular activities*.
 d. Guide student(s) in undertaking micro-projects.
 e. Teacher should ask the students to go through instruction and Technical manuals

11.   SUGGESTED MICRO-PROJECTS
        NA

12.   SUGGESTED LEARNING RESOURCES

S.N.	Title	Author, Publisher, Edition and Year of publication	ISBN Number
1	Electrical Technology – Vol-I	B. L. Theraja, A. K. Theraja , S. Chand & Company Pvt. Ltd. New Delhi	ISBN: 978-81-219-2440-5
2	Electrical Technology- Vol-II	B. L. Theraja, A. K. Theraja , Revised by S. G. Tarnekar , S. Chand & Company Pvt. Ltd., New Delhi	ISBN: 978-81-219-2437-5
3	A Textbook of Electrical Machines	K. R. Siddhapura, D. B. Raval, Vikas Publishing House Pvt. Ltd.	ISBN: 978-93259-7562-0

13.   SOFTWARE/LEARNING WEBSITES
    1. www.nptel.com
    2. www.electrical-technologies.com
    3. www.youtube.com/electrical

14.   PO - COMPETENCY- CO MAPPING

	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	3	2	-	-	1	-	1
CO2	3	1	1	-	1	-	2
CO3	3	1	-	-	-	-	-
CO4	-	2	1	-	1	-	2
CO5	-	1	-	-	3	-	2

	PSO1	PSO2
CO1	1	-
CO2	3	-
CO3	2	-
CO4	2	-
CO5	2	-

Sign:
 	
Name: Dr. Vijaykumar Kishanrao Jadhav
            (Course Expert /s)
	Sign:
	
	Name:
	                (Head of Department)

Sign:
 	
Name:
            (Program Head)
	Sign:
	
	Name: Shri A.S.Zanpure
	
	                (CDC)

Government Polytechnic, Pune

'180OB' – Scheme

Programme	Diploma in ET/CE/EE//ME/MT/CM/IT/DDGM
Programme code	01/02/03/04/05/**06**/07/08/16/17/21/22/23/24/26
Name of Course	**Fundamental of Electronics**
Course Code	**ET2107**
Prerequisite course code and name	

1. TEACHING AND EXAMINATION SCHEME

Teaching Scheme (In Hours)			Total Credits (L+T+P)		Examination Scheme				Total Marks
					Theory		Practical		
L	T	P	C		ESE	PA	*ESE	PA	
				Marks	80	20	25	25	150
03	--	02	05	**Exam Duration**	3 Hrs	1 Hr	2 Hr	--	

(*):OE (Oral Examination)

Legends: L- lecture, T-Tutorial/teacher guided theory practice, P-practical, ESE-End semester examination, PA- Progressive Assessment.

2. RATIONALE

In today's world most of the consumer appliances are based on electronic circuits and devices. The foundation for working of computer or any of its peripherals are based on electronics. This course has been designed to develop skills to understand and test simple electronic components and circuits. After studying this course students will develop an insight to identify, build and troubleshoot simple electronic circuits.

3. COMPETENCY

The aim of this course is to attend following industry identified competency through various teaching learning experiences:

- **Maintain electronic circuits comprising of discrete electronic components**.

4. COURSE OUTCOMES (COs)

The theory, practical experiences and relevant soft skills associated with this course are to be taught and implemented, so that the student demonstrates the following industry oriented COs associated with the above mentioned competency:

1. Plot the characteristics of semiconductor devices.
2. Interpret working of oscillators.
3. Use OP-AMP IC in circuits.
4. Operate CRO and Function generator.
5. Select appropriate transducers for relevant applications

5.   SUGGESTED PRACTICALS/ EXERCISES

The practicals in this section are PrOs (i.e. sub-components of the COs) to be developed and assessed in the student for the attainment of the competency:

Sr. No.	Unit No.	Practical Exercises (Outcomes in Psychomotor Domain)	Relevant CO	Approximate Hours Required.
1.	1	Plot V-I characteristics of P-N junction diode.	CO1	02
2.		Plot V-I characteristics of the given Zener diode.	CO1	02
3.		Test performance of diode as Half wave and Full wave rectifier with and without filter.	CO1	04
4.		Plot the input and output characteristics of NPN transistor in CE configuration.	CO1	04
5.	2	Plot the characteristics of n-channel JFET.	CO1	02
6.	3	Calculate frequency of oscillations for Crystal Oscillator.	CO2	02
7.		Observe input-output waveforms of Inverting Amplifier.	CO3	02
8.		Observe input-output waveforms of Non Inverting Amplifier.	CO3	02
9.		Observe input/output waveforms of Integrator.	CO3	02
10.		Observe input/output waveforms of Differentiator	CO3	02
11.	4	Study of front panel of C.R.O.	CO4	02
12.		Study of front panel of Function generator.	CO4	02
13.		Measure amplitude, Time period of sine, triangular and square wave with the help of CRO.	CO4	02
14.	5	Test performance of inductive transducer LVDT.	CO5	02
		Total Hrs		**32**

S.No.	Performance Indicators	Weightage in %
a.	Arrangement of available equipment / test rig or model	20
b.	Setting and operation	20
c.	Safety measures	10
d.	Observations and Recording	10
e.	Interpretation of result and Conclusion	20
f.	Answer to sample questions	10
g.	Submission of report in time	10
	Total	**100**

6.   MAJOR EQUIPMENT/ INSTRUMENTSREQUIRED

The major equipment with broad specification mentioned here will usher in uniformity in conduct of practical, as well as aid to procure equipment by authorities concerned.

Sr.No.	Major Equipment/ Instruments Required	PrO. No.
1	Variable DC Power supply 0-30V with display for voltage and current	3,4
2	Digital Multimeter	7,8

3	CRO	1,2,3,4,5,6,7,8,9,10,11,12,13
4	Function Generator	12,13
5	Different types of cables and connectors	All

7. THEORY COMPONENTS

The following topics/subtopics should be taught and assessed in order to develop UOs for achieving the COs to attain the identified competency.

Unit Outcomes (UOs) (in cognitive domain)	Topics and Sub-topics
UNIT 1. SEMICONDUCTOR DEVICES (Weightage-22 , Hrs- 14)
1a. Plot V-I characteristics of PN Diode 1b. Define and Measure parameters of diode 1c. Implement Zener diode as voltage regulator. 1d. Compare salient features of the given type of rectifiers. 1e. Explain with sketches the working principle of the given transistor configuration. 1f. Analyze and differentiate between CE, CB, CC configurations 1g. Derive relation between alpha and beta.	**1.1 Rectifying diode:** Review of P - type and N - type semiconductor, PN junction, Barrier voltage, depletion region, Junction Capacitance, Forward biased & reversed biased junction. Diode symbol , forward & reversed Characteristics of PN junction diode Specifications : Forward voltage drop , Reverse saturation current, maximum forward current , power dissipation ,Package view of diodes of different power ratings (to be shown during practical hours) **1.2 Zener diode :** Construction ,Symbol ,characteristics (forward & reversed) Avalanche &Zener breakdown **Specifications :** Zener voltage , power dissipation , break over current, dynamic resistance & maximum reverse current (to be shown during practical hours) **1.3 Rectifier :** Half wave, Full wave and Bridge Rectifier, working principle, circuit diagram, performance parameters PIV, ripple factor, efficiency Need for filters: circuit diagram and working of 'L', 'C' and 'π'' filter. **1.4** Working principle and block diagram of regulated power supply. **1.5** Symbol, construction and working principle of LED **1.6 Transistor :** construction, symbol, operating principle, characteristics, applications, rating and specifications, configurations, comparison between CB, CE, CC. Transistor as a switch and amplifier. Transistor parameters – alpha, Beta , input and output resistance and relation between alpha and beta

Unit Outcomes (UOs) (in cognitive domain)	Topics and Sub-topics
UNIT 2 FIELD EFFECT TRANSISTORS(Weightage- 14 , Hrs- 08)	
2a. Explain with sketches the working principle of the given transistor configuration. 2b. Determine the FET parameters from the given FET characteristics curve. 2c. Describe the specified JFET parameter. 2d. Describe the specified MOSFET parameter.	2.1 FET-Types: JFET and MOSFET 2.2 Classification of JFET 2.3 Symbol, construction and working principle of N-channel and P channel JFET, Drain and transfer characteristics of JFET 2.4 JFET parameters: DC and AC drain resistance, Transconductance, amplification factor 2.5 Symbol, construction and working principle of MOSFET.
UNIT 3 OSCILLATORS & LINEAR ICS (Weightage- 16 , Hrs- 10)	
Part A: 3a. State Barkhausen criteria for oscillator. 3b.Classify oscillators. 3c. Describe how oscillations are produced in LC tank circuit. 3d. Explain with circuit diagram working of LC oscillators. 3e. Draw circuit and explain working of Crystal oscillator. **PartB**: 3f. Draw symbol and pin diagram of IC 741. 3g. Define various parameters related to OP-AMP. 3h. Derive expression for various mathematical operation of OP-AMP.	**Part A :** 3.1 Block diagram, Barkhausen Criteria for sustained oscillations, classification of oscillator. Oscillations in LC tank circuit, Working of - Hartley, Colpitts, Clapp Oscillators Crystal oscillator : Diagram, Working principle **Part B:** 3.2 OP AMP. IC 741, symbol, pin diagram, ideal and typical characteristics, Applications such as Inverting , Non Inverting amplifier, Difference amplifier, adder , substractor , Integrator, differentiator.
UNIT 4 INSTRUMENTATION(Weightage- 12 , Hrs- 06)	
4a. Draw and explain blocks of CRT, CRO and Function generator. 4b. State applications & specifications of CRO and Function generator.	4.1 CRO: Cathode Ray Tube, Oscilloscope Block diagram, operation, oscilloscope specifications, Applications. 4.2 Function generator: Block diagram, operation, specifications, applications
UNIT 5 SENSORS & TRANSDUCERS(Weightage- 16 , Hrs- 10)	

Unit Outcomes (UOs) (in cognitive domain)	Topics and Sub-topics
5a. Differentiate between sensor and transducer. 5b. Define and classify transducers. 5c. State selection criteria of transducer. 5d. Differentiate between Active- Passive, Primary-Secondary, and Analog- Digital transducers. 5e. Interpret working principle and application of Resistive, Capacitive, Inductive, Transducers (LVDT), photodiode, phototransistor, Piezoelectric Transducers, proximity sensor transducers.	5.1 Definition, classification: Active, Passive, Primary, Secondary, Analog, Digital 5.2 Selection criteria for transducer 5.3 Construction, Operation, One example of -Resistive, Capacitive, Inductive, Transducers(LVDT), photodiode and phototransistor , Piezoelectric Transducers 5.4 Thermocouple, proximity sensor and its applications

8.   SUGGESTED SPECIFICATION TABLE FORQUESTION PAPER DESIGN

Unit No.	Unit Title	Teaching Hours	Distribution of Theory Marks			
			R Level	U Level	A Level	Total Marks
I	Semiconductor Devices	14	08	08	06	22
II	Field Effect Transistors	08	04	06	04	14
III	Oscillators & Linear ICs	10	04	08	04	16
IV	Instrumentation	06	04	04	04	12
V	Sensors & Transducers	10	04	06	06	16
	Total	48	**24**	**32**	**24**	**80**

9.   SUGGESTED STUDENT ACTIVITIES

Other than the classroom and laboratory learning, following are the suggested student-related *co-curricular* activities which can be undertaken to accelerate the attainment of the various outcomes in this course: Students should conduct following activities in group and prepare reports of about 5 pages for each activity, also collect/record physical evidences for their (student's) portfolio which will be useful for their placement interviews:

   a. Prepare journals based on practical performed in laboratory.
   b. Study of datasheet of electronic components.
   c. Prepare charts of symbols of Electronic components.
   d. Search information about Ratings and specifications of Regulator, diodes, transistors, CRO, function generator.
   e. Collect information of passive transducers and prepare charts of the same.
   f. Prepare posters to illustrate the use of photoelectric sensors in remote controls.

10. SUGGESTED SPECIAL INSTRUCTIONAL STRATEGIES (if any)

These are sample strategies, which the teacher can use to accelerate the attainment of the various outcomes in this course:

a. Massive open online courses (*MOOCs*) may be used to teach various topics/sub topics.

b. About *15-20% of the topics/sub-topics* which is relatively simpler or descriptive in nature is to be given to the students for *self-directed learning* and assess the development of the COs through classroom presentations (see implementation guideline for details).

c. With respect to item No.8, teachers need to ensure to create opportunities and provisions for *co-curricular activities*.

d. Guide student(s) in undertaking micro-projects.

e. Correlate subtopics with power plant system and equipments.

f. Use proper equivalent analogy to explain different concepts.

g. Use Flash/Animations to explain various components, operation and

h. Teacher should ask the students to go through instruction and Technical manuals

11. SUGGESTED MICRO-PROJECTS
   NA

12. SUGGESTED LEARNING RESOURCES

S.N.	Title	Author, Publisher, Edition and Year of publication	ISBN Number
1	Basic Electronics.	Albert Malvino, 8th Edition,Tata McGraw Hill,2015	ISBN10:1259200116ISBN13:9781259200113
2	Basic Electronics.	J.S.Katre. Edition 2017, Techmax Publishers	ISBN-10: 9350779641 ISBN-13: 978-9350779644
3	Basic Electronics.	B.L.Theraja, S Chand Publishing, 2007	ISBN 10: 8121925568 ISBN 13: 9788121925563
4	Linear Integrated Circuits	RamakantGaikwad,4TH EDITION, PHI Publication,	ISBN 10: 8120320581 ISBN 13: 9788120320581
5	Modern Digital Electronics	R P Jain, McGraw Hill Education Pvt. Ltd, 4th Edition,2012	ISBN 10: 0070669112 ISBN 13: 9780070669116
6	Instrumentation	A K Sawheny, Nineteenth edition, 2017, DhanpatRai publication	ISBN : 8177001006

13. SOFTWARE/LEARNING WEBSITES

1. www.nptel.com
2. http://www.electronics-tutorials
3. https://en.wikipedia.org/wiki/P%E2%80%93n_junction
4. https://learn.sparkfun.com/tutorials/transistors
5. http://www.pitt.edu/~qiw4/Academic/ME2082/Transistor%20Basics.pdf
6. http://faculty.cord.edu/luther/physics225/Handouts/transistors_handout.pdf
7. http://www.technologystudent.com/elec1
8. www.slideshare.net/manash234/classification-of-transducers
9. http://www.electrical4u.com/linear-variable-differential-transformer/

14. **PO - COMPETENCY- CO MAPPING**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	3	-	2	2	-	-	2
CO2	3	-	2	2	-	-	2
CO3	3	3	2	2	-	-	2
CO4	1	-	-	3	-	-	2
CO5	3	2	2	2	1	-	3

	PSO1	PSO2
CO1	3	-
CO2	3	-
CO3	3	-
CO4	3	-
CO5	3	-

Sign: Name: Smt.V.S.Sabnis (Course Expert /s)	Sign: Name: Shri. R.N. Shikari (Head of Department) Electronics and Telecommunication)
Sign: Name: Shri. U. V. Kokate (Program Head) (Computer Engineering)	Sign: Name: Shri A.S.Zanpure (CDC)

Government Polytechnic, Pune
'180 OB' – **Scheme**

Programme	Diploma in CM/IT
Programme code	06/07/26
Name of Course	**ENGINEERING MAHEMATICS**
Course Code	SC2102
Prerequisite	SC1102
Class Declaration	**NO**

1.TEACHING AND EXAMINATION SCHEME

Teaching Scheme (In Hours)			Total Credits (L+T+P)			Examination Scheme				Total Marks
						Theory		Tutorials		
L	T	P	C			ESE	PA	ESE	PA	
					Marks	80	20	--	25	125
03	02	00	05		Exam Duration	3 Hrs	1 Hr	--	--	—

*Legends: L- lecture,T-Tutorial/teacher guided theory practice,P-practical,**ESE-End semester examination,PA- Progressive Assesment***

2. **RATIONALE**

   The student shall learn various techniques in integration and differential equations and use these techniques to their related Engineering problems.

3. **COMPETENCY**

   The aim of this course is to help the student to attain the following industry identified competency through various teaching learning experiences:

   Solve various engineering related problems using the principles of engineering mathematics

4. **COURSE OUTCOMES (COs)**

   The theory, practical experiences and relevant soft skills associated with this course are to be taught and implemented, so that the student demonstrates the following industry oriented COs associated with the above mentioned competency**:**

   1. Solve the given problems of integration using suitable methods.
   2. Apply the concept of integration to find mean and RMS value.
   3. Solve the differential equation of first order and first degree using suitable methods.
   4. Utilize basic concepts of probability distribution to solve elementary engineering problems.
   5. Use statistical measures to solve engineering related problems

5. SUGGESTED PRACTICALS/ EXERCISES

The practicals in this section are PrOs (i.e. sub-components of the COs) to be developed and assessed in the student for the attainment of the competency:

S. No.	Practical Exercises (Learning Outcomes in Psychomotor Domain)	Unit No.	Approx. Hrs. required
1	Integration by substitution method	1	3
2	Integration on the type $1/ax^2+bx+c$, $1/\sqrt{ax^2+bx+c}$,$1/a\sin x+b\cos x+c$, $1/a\sin^2 x +b\cos^2 x +c$.	1	2
3	Integration using By Part Rule and integration by partial fraction method.	1	2
4	Integration by partial fraction method.	1	2
5	Examples on Definite integral and it's properties	2	2
6	Examples on Mean and R.M.S. value	2	2
7	Examples on order, degree and formation of differential equation.	3	2
8	Solution of first order first degree D.E. using various methods.	3	3
9	Solve problems based on Binomial Distribution related to engineering problems.	4	2
10	Solve problems based on Poisson Distribution related to engineering problems.	4	2
11	Solve problems based on Normal Distribution related to engineering problems.	4	2
12	Solve problems on moments.	5	2
13	Solve problems on skewness.	5	2
14	Solve problems on Kurtosis.	5	2
15	Solve problems on correlation.	5	2
	Total		16

S.No.	Performance Indicators	Weightage in %
a.	Prepare experimental set up	-
b.	Handling of instruments during performing practical.	-
c.	Follow Safety measures	-
d.	Accuracy in calculation	20
e.	Answers to questions related with performed practices.	40
f.	Submit journal report on time	20
g.	Follow Housekeeping	10
h.	Attendance and punctuality	10
	Total	**100**

6. MAJOR EQUIPMENT/ INSTRUMENTS REQUIRED

The major equipment with broad specification mentioned here will usher in uniformity in conduct of practical's, as well as aid to procure equipment by authorities concerned.

S. No.	Equipment Name with Broad Specifications	PrO. No.
1	LCD Projector	1-15
2	Interactive Classroom	1-15

7.   THEORY COMPONENTS

The following topics/subtopics should be taught and assessed in order to develop UOs for achieving the COs to attain the identified competency.

Unit Outcomes (UOs) (in cognitive domain)	Topics and Sub-topics
Units 1 : Integration	
1.1. Obtain the given simple integral(s) using substitution method. 1.2. Integrate given simple functions using the integration by parts. 1.3. Evaluate the given simple integral by partial fractions.	Methods of Integration: a) Integration by substitution. b) Integration by parts c) Integration by partial fractions.
Unit 2: Definite integrals	
2 .1. Solve given simple problems based on properties of definite **integration**. 2.2. Utilize the concept of definite integration to find mean value of the function. 2.3. Invoke the concept of definite integration to find root mean square value of function.	2.1 Definite Integration: a) Simple examples b) Properties of definite integral (without proof) and simple examples. 2.2 Applications of integration : a) Mean value. b) Root Mean Square Value.
Unit 3: Differential Equations	
3.1. Find the order and degree of given differential equations 3.2. Form simple differential equation for given simple engineering problems. 3.3. Solve given differential equations using the method of variable separable 3.4 Solve the given differential equations using linear differential equations.	3.1Concept of differential equation. 3.2 Order, degree and formation of Differential equations 3. 3 Solution of differential equation Equations a. Variable separable form. b. Linear differential equation. 3.4 Application of differential equations and related engineering problem(s).
Unit 4: Probability Distribution	

4.1. Make use of probability distribution to identify discrete
and continuous probability distribution
4.2. Solve given problems based on repeated trials using Binomial
distribution
4.3. Solve given problems when number of trials are large and probability is very small.
4.4. Utilize the concept of normal distribution to solve related engineering problems.
	4.1 Probability distribution Probability
	  a. Discrete Probability distribution
	  b. Continuous Probability distribution
	4. 2 Binomial distribution.
	4. 3 Poisson's distribution.
	4. 4 Normal distribution.

Unit 5: Statistical Measures	
5.1. Calculate Moments about the mean of the given frequency distribution. 5.2 Calculate the coefficient of Skewness of given distribution. 5.3 Calculate the coefficient of Kurtosis of given distribution. 5.4 Calculate the coefficient of correlation of given simple data.	5.1. Moments of given frequency distribution. 5.2 Skewness and coefficient of skewness of the given frequency distribution. 5.3 Kurtosis, coefficient of Kurtosis and type of Kurtosis. 5.4 Karl Pearson's coefficient of Correlation of simple data.

8. SUGGESTED SPECIFICATION TABLE FOR QUESTION PAPER DESIGN

Unit No.	Unit Title	Teaching Hours	Distribution of Theory Marks			
			R Level	U Level	A Level	Total Marks
I	Integration	09	04	08	08	20
II	Definite integration	09	--	08	08	16
III	Differential equation	12	04	08	08	20
IV	Probability Distribution	09	04	04	04	12
V	Statistical Measures	09	04	04	04	12
Total		**48**	**16**	**32**	**32**	**80**

9. SUGGESTED STUDENT ACTIVITIES

Other than the classroom and laboratory learning, following are the suggested student-related *co-curricular* activities which can be undertaken to accelerate the attainment of the various outcomes in this course:

a. Identify engineering problems based on real world problems and solve with the use of free tutorials available on internet.
b. Use graphical software's:EXCEL,DPLOT and GRAPH for related topics.
c. Use MathCAD as Mathematical Tool and solve the problems on Calculus.
d. Indentify problems based on applications of differential equations and solve these problems.

10. SUGGESTED SPECIAL INSTRUCTIONAL STRATEGIES (if any)

These are sample strategies, which the teacher can use to accelerate the attainment of the various outcomes in this course:

a. Massive open online courses (*MOOCs*) may be used to teach various topics/sub topics.
b. About *15-20% of the topics/sub-topics* which is relatively simpler or descriptive in nature is to be given to the students for *self-directed learning* and assess the development of the COs through classroom presentations (see implementation guideline for details).
c. Use Flash/Animations to explain various components, operation.
d. Teacher should ask the students to go through instruction and Technical manuals

11. SUGGESTED MICRO-PROJECTS
(Only for Class Declaration Courses)
N.A.

12. SUGGESTED LEARNING RESOURCES

S. No.	Title of Book	Author	Publication
1	Higher Engineering Mathematics	Grewal B.S	Khanna Publishers, New Delhi
2	Engineering Mathematics Vol.II	Vishwanath	Satya Prakashan, New Delhi
3	Mathematics for Polytechnic students	S.P. Deshpande	Pune Vidyarthi Griha Prakashan

S. No.	Title of Book	Author	Publication
4	Engineering Mathematics Part II	H.K. Dass	S. Chand & Co. Ltd. Delhi

13. SOFTWARE/LEARNING WEBSITES

   a. *www.scilab.org/ -SCI Lab*
   b. *www.mathworks.com/product/matlab/ -MATLAB*
   c. *Spreadsheet Applications*
   d. *www.dplot.com*
   e. *https://www.khanacademy.org/math?gclid=CNqHuabCys4CFdOJaddHoPig*

14 PO - COMPETENCY- CO MAPPING

CO-PO Matrices of course

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
1	2	2	1	-	-	-	1
2	3	3	1	-	-	1	2
3	3	3	-	-	-	-	1
4	3	3	1	1	-	-	1
5	3	3	1	1	-	-	1
AVERAGE	3	3	1	1	-	1	2

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

CO-PSO Matrices of course

CO	CM		IT		
	PSO1	PSO2	PSO1	PSO2	PSO3
1	-	1	-	1	1
2	-	1	-	1	1
3	-	2	-	2	1
4	-	2	-	2	-
5	-	2	-	2	-
Average	-	2	-	2	1

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

PREPARED BY:

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