

Maharashtra State Board Of Technical Education, Mumbai

Learning and Assessment Scheme for Post S.S.C Diploma Courses

Programme Name	: Diploma In Printing Technology		
Programme Code	: PN	With Effect From Academic Year	: 2023-24
Duration Of Programme	: 6 Semester	Duration	: 16 WEEKS
Semester	: Second	NCrF Entry Level : 3.0	Scheme : K

Sr No	Course Title	Abbreviation	Course Type	Course Code	Total IKS Hrs for Sem.	Learning Scheme					Credits	Paper Duration (hrs.)	Assessment Scheme										Total Marks
						Actual Contact Hrs./Week			Self Learning (Activity/Assignment /Micro Project)	Notional Learning Hrs /Week			Theory			Based on LL & TL				Based on Self Learning			
						CL	TL	LL					FA-TH	SA-TH	Total		FA-PR		SA-PR		SLA		
															Max	Min	Max	Min	Max	Min	Max	Min	

(All Compulsory)																							
1	PRINTING PROCESSES	PRP	DSC	322325	2	4	-	4	-	8	4	3	30	70	100	40	25	10	25@	10	-	-	150
2	GRAPHIC DESIGN	GFD	DSC	322324	2	3	-	4	1	8	4	3	30	70	100	40	25	10	25@	10	25	10	175
3	SCREEN PRINTING PROCESS	SRT	DSC	322326	2	3	-	4	1	8	4	3	30	70	100	40	25	10	25@	10	25	10	175
4	WEB PAGE DESIGNING USING HTML	WDH	SEC	322009	0	2	-	2	2	6	3	-	-	-	-	-	50	20	50@	20	25	10	125
5	ENGINEERING IN PRINTING MACHINES	EPM	DSC	322008	0	1	-	4	1	6	3	-	-	-	-	-	50	20	50@	20	25	10	125
6	PROFESSIONAL COMMUNICATION	PCO	SEC	312002	0	-	-	2	-	2	1	-	-	-	-	-	25	10	25@	10	-	-	50
7	SOCIAL AND LIFE SKILLS	SFS	VEC	312003		-	-	-	2	2	1	-	-	-	-	-	-	-	-	-	50	20	50
Total					6	13	0	20	7	40	20		90	210	300		200		200		150		850

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

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

- Note :**
1. FA-TH represents average of two class tests of 30 marks each conducted during the semester.
 2. If candidate is not securing minimum passing marks in FA-PR of any course then the candidate shall be declared as "Detained" in that semester.
 3. If candidate is not securing minimum passing marks in SLA of any course then the candidate shall be declared as fail and will have to repeat and resubmit SLA work.
 4. Notional Learning hours for the semester are (CL+LL+TL+SL)hrs.* 15 Weeks
 5. 1 credit is equivalent to 30 Notional hrs.
 6. * Self learning hours shall not be reflected in the Time Table.
 7. * Self learning includes micro project / assignment / other activities.

Course Category : Discipline Specific Course Core (DSC) : 4, Discipline Specific Elective (DSE) : 0, Value Education Course (VEC) : 1, Intern./Apprenti./Project./Community (INP) : 0, Ability Enhancement Course (AEC) : 0, Skill Enhancement Course (SEC) : 2, Generic Elective (GE) : 0

Programme Name/s : Printing Technology
Programme Code : PN
Semester : Second
Course Title : SCREEN PRINTING PROCESS
Course Code : 322326

I. RATIONALE

This course will provide an introduction to the screen-printing Process. It will cover technical aspects of the process. Students will explore copy preparation, mesh selection, frames, stencil systems, printing techniques, ink and substrate compatibility, reclamation of screens, and how screen printing affects the print finishing processes. A combination of technical laboratory applications and theory will provide the foundation for this course. Acquisition of technical skills through the actual production of screen-printed products is a major goal of this course.

II. INDUSTRY / EMPLOYER EXPECTED OUTCOME

- Prepare Screen and Print given job by Screen Printing Process.

III. COURSE LEVEL LEARNING OUTCOMES (COS)

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

- CO1 - Select the tools and material required for given product.
- CO2 - Prepare the stencil as per the job requirement.
- CO3 - Operate equipment and machines in screen printing department
- CO4 - Execute the job according to the requirement.
- CO5 - Identify the application area of screen-printing process.

IV. TEACHING-LEARNING & ASSESSMENT SCHEME

Course Code	Course Title	Abbr	Course Category/s	Learning Scheme						Credits	Paper Duration	Assessment Scheme										Total Marks
				Actual Contact Hrs./Week			SLH	NLH	Theory			Based on LL & TL				Based on SL						
				CL	TL	LL						Practical				SLA						
							FA-TH	SA-TH				Total		FA-PR		SA-PR		Max	Min			
Max	Max	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min											
322326	SCREEN PRINTING PROCESS	SRT	DSC	3	-	4	1	8	4	3	30	70	100	40	25	10	25@	10	25	10	175	

Total IKS Hrs for Sem. : 2 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

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Note :

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3. If candidate is not securing minimum passing marks in SLA of any course then the candidate shall be declared as fail and will have to repeat and resubmit SLA work.
4. Notional Learning hours for the semester are (CL+LL+TL+SL)hrs.* 15 Weeks
5. 1 credit is equivalent to 30 Notional hrs.
6. * Self learning hours shall not be reflected in the Time Table.
7. * Self learning includes micro project / assignment / other activities.

V. THEORY LEARNING OUTCOMES AND ALIGNED COURSE CONTENT

Sr.No	Theory Learning Outcomes (TLO's) aligned to CO's.	Learning content mapped with Theory Learning Outcomes (TLO's) and CO's.	Suggested Learning Pedagogies.
1	<p>TLO 1.1 Describe Basic principle of screen- printing process.</p> <p>TLO 1.2 Identify the stages of screen-printing process development.</p> <p>TLO 1.3 Compare screen printing process with other printing process.</p>	<p>Unit - I Screen Printing Process</p> <p>1.1 Basics of Screen Printing.</p> <p>1.2 History and development of screen-printing process.</p> <p>1.3 Comparison with other printing processes.</p> <p>1.4 Advantages, limitations & applications of screen printing.</p>	<p>Video</p> <p>Demonstrations</p> <p>Flipped Classroom</p> <p>Hands-on</p> <p>Site/Industry Visit</p>
2	<p>TLO 2.1 Identify the mesh according to product requirement.</p> <p>TLO 2.2 Select proper squeegee according to product requirement.</p> <p>TLO 2.3 Justify the necessity of flood coater.</p> <p>TLO 2.4 Compare liquid emulsion and dry emulsion.</p> <p>TLO 2.5 Suggest the substrate and ink according to product requirement.</p>	<p>Unit - II Materials for Screen Printing</p> <p>2.1 Screen Mesh: Composition, Physical fabric properties, Mesh count, Mesh opening.</p> <p>2.2 Frames: Materials used for frame, Frame Size, factors affecting selection of frame size.</p> <p>2.3 Squeegees: Materials, Blade profile, Durometer, Sharpening and Maintenance, Instrumentation & Tools: Shore a Hardness Tester.</p> <p>2.4 Flood coater: Stroke Speed, Angle.</p> <p>2.5 Photo Emulsion: liquid emulsions, and dry emulsion (Capillary films)</p> <p>2.6 Substrate and ink: Types of substrate- Paper, Textile, Metal, Glass and plastic Graphic Inks, Industrial Inks, Speciality inks.</p>	<p>Video</p> <p>Demonstrations</p> <p>Presentations</p> <p>Site/Industry Visit</p> <p>Flipped Classroom</p>
3	<p>TLO 3.1 Identify various types of Stretching techniques.</p> <p>TLO 3.2 Enlist requirement of film element for screen preparation.</p> <p>TLO 3.3 List stages in screen preparations.</p> <p>TLO 3.4 List types of stencil methods.</p>	<p>Unit - III Mesh stretching and screen preparation methods.</p> <p>3.1 Mesh stretching: Hand Stretching, Mechanical, Pneumatic, Need of mesh tension monitoring, Instrumentation and tools: Screen tension meters (Analog/Digital).</p> <p>3.2 Pre-press and Films: Evaluating Film Quality- Density & Image Quality (Resolution & Definition).</p> <p>3.3 Steps in screen Preparation: Mesh stretching, Degreasing, Drying, Emulsion coating, Drying coated mesh, Exposure, Development, Inspection of screen, computer to screen.</p> <p>3.4 Stencils: Hand cut, Direct, indirect method, Direct- indirect (direct film), Comparison of all.</p>	<p>Video</p> <p>Demonstrations</p> <p>Hands-on</p> <p>Site/Industry Visit</p> <p>Presentations</p>
4	<p>TLO 4.1 Compare manual and automatic screen- printing press.</p> <p>TLO 4.2 List advantage of rotary press.</p> <p>TLO 4.3 List press parameters.</p> <p>TLO 4.4 Explain the relation between ink deposit and press parameters.</p> <p>TLO 4.5 List cause and remedy for given job.</p>	<p>Unit - IV Screen Printing Machines & Press Setup</p> <p>4.1 Manual Tabletop: G-clamp, C- clamp, Sheet fed and web fed press: semi, fully-automatic, flatbed, rotary.</p> <p>4.2 Dryers: Racks, wicket-dryers, flatbed dryers curing.</p> <p>4.3 Press parameters: color sequence, Off Contact distance, Three-Point registration. Transparent- Flap-Overlay registration.</p> <p>4.4 Controlling Ink Deposit using Press Controls: Squeegee speed, angle, pressure. Press working condition: Dust free & Temperature controlled environment.</p> <p>4.5 Troubleshooting: cause and remedy.</p>	<p>Video</p> <p>Demonstrations</p> <p>Presentations</p> <p>Site/Industry Visit</p> <p>Hands-on</p>

Sr.No	Theory Learning Outcomes (TLO's) aligned to CO's.	Learning content mapped with Theory Learning Outcomes (TLO's) and CO's.	Suggested Learning Pedagogies.
5	TLO 5.1 Describe the role of screen printing for packaging. TLO 5.2 Justify screen printing is most recommended process for Printed electronics and industrial application.	Unit - V New Application area for screen printing Process 5.1 Graphics: Point of purchase, signage, display, wallpaper. 5.2 Packaging: Container, labels, Barcode and RFID. 5.3 Automotive: Decal, speedometerdials, instruction labels. 5.4 Printed Electronics- printed circuit boards, membrane switches, solar panel. 5.5 Textile Printing- Silk, Cotton, Wool and polyester.	Video Demonstrations Presentations Site/Industry Visit Hands-on

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

Practical / Tutorial / Laboratory Learning Outcome (LLO)	Sr No	Laboratory Experiment / Practical Titles / Tutorial Titles	Number of hrs.	Relevant COs
LLO 1.1 Identify the material, tools, equipment & machinery used for screen printing process.	1	Material, tools, equipment & machinery used for screen printing process.*	4	CO1
LLO 2.1 Identify the chemicals used in screen printing.	2	Print text matter on maplitho papers using a small offset press.*	4	CO1
LLO 3.1 Compute the Mesh requirements for the given type of frame.	3	Mesh requirements for the given type of frame.	4	CO2
LLO 4.1 Perform mesh stretching operation on given screen frame.	4	Mesh stretching operation on given screen frame.	4	CO2
LLO 5.1 Prepare screen by using hand cut method	5	Screen by using hand cut method.*	4	CO3
LLO 6.1 Prepare screen by direct emulsion coating method	6	Screen by direct emulsion coating method.*	4	CO3
LLO 7.1 Prepare screen by Indirect emulsion coating method	7	Screen by Indirect emulsion coating method.*	4	CO3
LLO 8.1 View the relevant video of auto Emulsion coater and report your observations	8	Auto Emulsion coater	4	CO4
LLO 9.1 Perform printing operation with screen prepared by hand cut method.	9	Printing operation with screen prepared by hand cut method.	4	CO4
LLO 10.1 Perform printing operation with screen prepared by direct method.	10	Printing operation with screen prepared by direct method.	4	CO4
LLO 11.1 Perform printing operation with screen prepared by Indirect method and your comments on Density, text & image sharpness.	11	Printing operation with screen prepared by Indirect method .*	4	CO4
LLO 12.1 View the job printed with hand cut, direct and indirect method & Submit your observation on Density, text & image sharpness.	12	Job printed with hand cut, direct and indirect method & observation on Density, text & image sharpness.	4	CO4
LLO 13.1 Perform screen printing operation with any four-specialty ink.	13	Screen printing operation with any four-specialty ink.	4	CO4
LLO 14.1 Perform screen printing operation with process color.	14	Screen printing operation with process color.	4	CO4
LLO 15.1 Prepare an invitation card using screen printing technique.	15	Invitation card printing using screen printing technique.	4	CO4
LLO 16.1 Print given job with squeegees having different hardness.	16	Printing with squeegees having different hardness.	4	CO4

Practical / Tutorial / Laboratory Learning Outcome (LLO)	Sr No	Laboratory Experiment / Practical Titles / Tutorial Titles	Number of hrs.	Relevant COs
LLO 17.1 Print a job on two substrates with given screen and compare color values.	17	Printing a job on two substrates with given screen and compare color values.*	4	CO4
LLO 18.1 Print multicolor invitation card using screen printing.	18	Print multicolor invitation card using screen printing.*	4	CO5
LLO 19.1 Identify the working condition requirement for screen printing and prepare a report by viewing the relevant video/industrial visit.	19	Working condition requirement for screen printing and prepare	4	CO5
LLO 20.1 Identify the attributes of a high-quality screen-printed product and prepare a report by viewing the relevant samples.	20	Attributes of a high-quality screen-printed product	4	CO5
Note : Out of above suggestive LLOs - <ul style="list-style-type: none"> *' Marked Practicals (LLOs) Are mandatory. Minimum 80% of above list of lab experiment are to be performed. Judicial mix of LLOs are to be performed to achieve desired outcomes. 				

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

Assignment

- Give seminar on relevant topic of screen-printing process.
- Observe the safe work procedures on screen printing press.
- Collect the technical brochures of the different specialty ink used for screen printing from the local market/internet to present in report form.
- Collect the technical brochures of the different screen-printing machines from the local market/internet to present in report form.
- Visit the screen-printing press nearby your institute and study the material management for prepress, press and post press activity and write a report.
- Visit the screen-printing press and study the workflow of it.
- Observe waste management approaches used by screen printers in nearby town or city.
- Prepare list of newer industrial applications of screen printing.
- Carry out survey of foundation techniques used for installation of medium to heavy screen-printing machines.
- Collect the technical paper on any one area of screen-printing process and write a report.

Micro project

- Collect the information of Mesh used for screen printing.
- Collect the information of automatic equipment used in actual practice.
- Collect the information of squeegee rubber manufacturer and write a report.
- Collect the information about dry emulsion film and write its technical specification.
- Prepare sample book of substrate used for screen printing.
- Prepare report on technical specification for equipment and machine used for screen printing process
- Visit the press and identify the quality parameter inspected during screen printing.
- Visit the screen-printing press and record minimum 20 process variables for screen printing process.
- Identify the print defects relevant to screen printing process and write a report.
- Identify the process control tools used for screen printing and write a report.
- Enlist the hazardous chemicals used in screen printing industry.
- Enlist the drying equipment used for screen printing process.

Note :

A suggestive list is provided, this may vary according to need of the course curriculum.

VIII. LABORATORY EQUIPMENT / INSTRUMENTS / TOOLS / SOFTWARE REQUIRED

Sr.No	Equipment Name with Broad Specifications	Relevant LLO Number
1	Screen processing Tools and equipment	All
2	Mesh stretching tools	4
3	Exposing table	5,6,7
4	Screen Printing machine (table top, semiautomatic)	17,18,19
5	Dryer	9,10,11,12
6	Densitometer	9,10,12,17

IX. SUGGESTED 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	Screen Printing Process	CO1	4	6	4	0	10
2	II	Materials for Screen Printing	CO2	10	4	4	6	14
3	III	Mesh stretching and screen preparation methods.	CO3	10	6	4	4	14
4	IV	Screen Printing Machines & Press Setup	CO4	15	4	8	6	18
5	V	New Application area for screen printing Process	CO5	6	4	6	4	14
Grand Total				45	24	26	20	70

X. ASSESSMENT METHODOLOGIES/TOOLS

Formative assessment (Assessment for Learning)

- Two unit tests of 30 marks each and average of two unit tests out of 30 marks.
- Each practical will be assessed considering 60% weightage to process and 40% weightage to output.

Summative Assessment (Assessment of Learning)

- End semester assessment of 70 marks through offline examination.
- Actual performance in internal practical examination of 25 marks.

XI. SUGGESTED COS - POS MATRIX FORM

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

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

XII. SUGGESTED LEARNING MATERIALS / BOOKS

Sr.No	Author	Title	Publisher with ISBN Number
1	Sean Smyth	The Print and Production Manual	Pira International Ltd, Randalls Road, Leatherhead, Surrey KT22 7RU, UK, 9th edition, ISBN: 185802 9
2	NIIR Board	Screen Printing Technology Hand Book	Asia Pacific business press Inc. ISBN: 8178330539
3	Kipphan, Helmut	Handbook of print media	Heidelberger Druckmaschinen AG, Heidelberg, April 2000 ISBN-13: 978-3540335702
4	J. I. Biegeleisen	The Complete Book of Silk Screen Printing Production	Dover Publications, Inc. New York ISBN13 9780486211008

XIII . LEARNING WEBSITES & PORTALS

Sr.No	Link / Portal	Description
1	https://www.youtube.com/watch?v=HaMBk3uDZUs	Screen Printing: Choosing the proper mesh count
2	https://www.youtube.com/watch?v=wcO_EkxAeGI	Understanding Off-Contact Screen Printing
3	https://www.youtube.com/watch?v=6pdRE_Q2BYs	Auto Screen Stretching Machine
4	https://www.youtube.com/watch?v=UdIYTk1intE	Squeegees for screen printing
5	https://www.youtube.com/watch?v=WPgXGRuETv0	Flatbed screen printing machine

Programme Name/s : Printing Technology

Programme Code : PN

Semester : Second

Course Title : PRINTING PROCESSES

Course Code : 322325

I. RATIONALE

This course is required to introduce the students about communication media, print media and its applications. It deals with different printing processes, their principles, advantages, limitations and applications. After completion of this course, a student will develop skills required to sequence any printing job, its important raw materials as well as the merits of the processes of any particular job.

II. INDUSTRY / EMPLOYER EXPECTED OUTCOME

This course is to be taught and implemented with the aim to develop in the student, the course outcomes (COs) leading to the attainment of following industry identified outcome expected from this course: Prepare sequential operations for printing jobs.

III. COURSE LEVEL LEARNING OUTCOMES (COS)

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

- CO1 - Suggest different printing processes for particular jobs.
- CO2 - Identify prepress requirements of graphic originals.
- CO3 - Suggest image carriers used in printing processes for different print jobs..
- CO4 - Select printing machine for a given product.
- CO5 - Plan post press operations for printed products.

IV. TEACHING-LEARNING & ASSESSMENT SCHEME

Course Code	Course Title	Abbr	Course Category/s	Learning Scheme						Credits	Paper Duration	Assessment Scheme										Total Marks
				Actual Contact Hrs./Week			SLH	NLH	Theory			Based on LL & TL				Based on SL						
				CL	TL	LL			FA-TH			SA-TH	Total	Practical		SLA						
				Max	Max	Max	Min	Max	Min			Max	Min	Max	Min	Max	Min					
322325	PRINTING PROCESSES	PRP	DSC	4	-	4	-	8	4	3	30	70	100	40	25	10	25@	10	-	-	150	

Total IKS Hrs for Sem. : 2 Hrs

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5. 1 credit is equivalent to 30 Notional hrs.
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V. THEORY LEARNING OUTCOMES AND ALIGNED COURSE CONTENT

Sr.No	Theory Learning Outcomes (TLO's) aligned to CO's.	Learning content mapped with Theory Learning Outcomes (TLO's) and CO's.	Suggested Learning Pedagogies.
1	<p>TLO 1.1 List communication technologies with examples.</p> <p>TLO 1.2 State the conventional and digital printing processes.</p> <p>TLO 1.3 Identify printing processes used in printed products.</p>	<p>Unit - I Printing Media</p> <p>1.1 Characteristics, applications, advantages and limitations of print media and non-print media. Media for different segments available in communication technology. Introduction to additive and subtractive color reproduction theories. Leading segment wise printing organizations.</p> <p>1.2 Basic stages of digital and conventional printing in prepress, press and post-press processes and their purposes.</p> <p>1.3 Classification of Printing Processes - Conventional (Impact) and Digital (Non-impact), Methods of Impression-Plane to Plane, Plane to Round, Round to Round, Nip/Area of contact and Non-contact impression (inkjet)</p>	<p>Chalk-Board Presentations</p> <p>Video Demonstrations</p>
2	<p>TLO 2.1 Define basic terms related to the prepress.</p> <p>TLO 2.2 List equipments used in image carrier making.</p> <p>TLO 2.3 Explain the stages in prepress operations.</p>	<p>Unit - II Prepress Techniques</p> <p>2.1 Operations in prepress according to graphic originals, Layout and Imposition schemes.</p> <p>2.2 Equipment's used in image carrier making e.g. computer-to-plate, imagesetter</p> <p>2.3 Prepress stages - scanning, color correction, separation, RIP, output, resolution.</p>	<p>Chalk-Board Presentations</p> <p>Demonstration</p>
3	<p>TLO 3.1 Classify the image carriers used in different printing processes.</p> <p>TLO 3.2 Differentiate between different types of image carriers.</p> <p>TLO 3.3 List consumables used in image carrier making.</p>	<p>Unit - III Image Carriers</p> <p>3.1 Concept of image carrier, types of image carrier based on physical shape and photosensitivity (eg. rotary, flat, visible and thermal).</p> <p>3.2 Basic characteristics of image carrier required for different printing processes, stages involved in image carrier making of conventional printing processes - Lithographic Offset, Letterpress, Flexography, Gravure, Screen.</p> <p>3.3 List consumables used in image carrier making for printing processes.</p>	<p>Demonstration</p> <p>Chalk-Board Presentations</p>
4	<p>TLO 4.1 Explain the configurations of printing machines.</p> <p>TLO 4.2 State the working principle of units of different printing machines.</p> <p>TLO 4.3 Enlist applications of different printing machine configurations.</p>	<p>Unit - IV Printing Machines</p> <p>4.1 Basic working principles and application area of printing processes such as- Lithographic Offset, Letterpress, Flexography, Gravure, Screen and Digital.</p> <p>4.2 Difference between sheet fed & web fed printing machines, basic units in machines for each process and their functions.</p> <p>4.3 Different configurations of offset, screen, flexographic and gravure printing machine and their applications.</p>	<p>Chalk-Board Demonstration</p> <p>Hands-on</p>

Sr.No	Theory Learning Outcomes (TLO's) aligned to CO's.	Learning content mapped with Theory Learning Outcomes (TLO's) and CO's.	Suggested Learning Pedagogies.
5	<p>TLO 5.1 Explain the need of binding with examples.</p> <p>TLO 5.2 Classify different types of substrate and inks.</p> <p>TLO 5.3 List the printing machine and raw material manufacturing organizations.</p>	<p>Unit - V Binding, finishing and raw materials</p> <p>5.1 Binding styles and machines - side/center sewing/stitching, adhesive/perfect binding, operations and their purpose, machines - cutting, folding, perfect binding, gathering.</p> <p>5.2 (a) Substrates- Absorbent, Non- Absorbent, Paper and boards - ISO paper sizes, paper quantity measurements- Ream, Quire, Gross, Basic properties - GSM, Whiteness, Opacity, Grain direction, Caliper (b) Ink- ingredients with purpose, Ink drying methods. (c) Binding materials - Thread, Paste, Adhesive, Cloth, Board.</p> <p>5.3 Manufacturing companies (Indian and International) of Digital camera, Graphic software, Plates & chemicals, Digital Printers, Printing machines, Binding machines, Paper, Ink</p>	<p>Chalk-Board Demonstration</p> <p>Hands-on</p>

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

Practical / Tutorial / Laboratory Learning Outcome (LLO)	Sr No	Laboratory Experiment / Practical Titles / Tutorial Titles	Number of hrs.	Relevant COs
LLO 1.1 Use of unprocessed plate and estimate the chemicals	1	Prepare PS (Pre-sensitized) Plate using plate making equipment.*	4	CO1
LLO 2.1 Fix the image carrier and identify substrate	2	Print text matter on maplitho papers using a small offset press.*	4	CO1
LLO 3.1 Make the offset machine ready for printing	3	Print text matter on newsprint papers using a small offset press.	4	CO1
LLO 4.1 Control the ink flow in offset press.	4	Print 1-color halftone image on 2 different papers using a small offset press.*	4	CO2
LLO 5.1 Control the ink flow on different substrates	5	Print full color halftone image on maplitho and coated papers using a small size sheet fed offset printing machine.	4	CO2
LLO 6.1 Print on flexographic machine.	6	Print single color image on two papers using flexographic press.*	4	CO2
LLO 7.1 Screen print the given job.	7	Prepare a screen by any direct method .*	4	CO3
LLO 8.1 Screen print the given job.	8	Prepare a screen by any direct method	4	CO3
LLO 9.1 Prepare a screen (indirect)	9	Prepare a screen by indirect method.	4	CO3
LLO 10.1 Operate non-impact printing machine (Inkjet).	10	Interpret effect of different substrates on print quality using inkjet printer.	4	CO4
LLO 11.1 Operate wire stitching machine.	11	Prepare a wire stitched book.	4	CO4
LLO 12.1 Prepare gravure machine for printing.	12	Mount, demount rolls at winder and unwinder of gravure press and observe the working of gravure machine.*	4	CO4
LLO 13.1 Operate cutting and binding machine.	13	Make 4 equal parts of a pile of paper and bind them.	4	CO5
LLO 14.1 Use of different folding styles.	14	Prepare bound stationery products with two different folding styles.*	4	CO5

Practical / Tutorial / Laboratory Learning Outcome (LLO)	Sr No	Laboratory Experiment / Practical Titles / Tutorial Titles	Number of hrs.	Relevant COs
LLO 15.1 Use of camera for graphic reproduction	15	Demonstrate use of digital camera to prepare a film for reproduction.*	4	CO5
Note : Out of above suggestive LLOs - <ul style="list-style-type: none"> *' Marked Practicals (LLOs) Are mandatory. Minimum 80% of above list of lab experiment are to be performed. Judicial mix of LLOs are to be performed to achieve desired outcomes. 				

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

Micro project

- Collect ten offset printed paper products.
- Collect ten materials used in book binding processes.
- Collect ten products printed on different substrates using ink jet process.
- Survey a local market and analyse use of digital printing processes.
- Visit three offset printers & tabulate their products.
- Survey a local market and analyse use of inks and papers.
- List latest environmental-friendly packaging recommendations.

Assignment

- Prepare a report on applications of printed stationery.
- Visit two newspaper presses and prepare report on infrastructure.
- Prepare a list of companies covering different sectors of the printing industry.
- List developmental stages and applications of 3D printing technology.
- Summarize any one research paper discussing future of printing.
- Tabulate the information about companies manufacturing sustainable packages.
- Prepare a showcase of different carton styles and flexible pouches.

Note :

A suggestive list is provided, this may vary according to need of the course curriculum.

VIII. LABORATORY EQUIPMENT / INSTRUMENTS / TOOLS / SOFTWARE REQUIRED

Sr.No	Equipment Name with Broad Specifications	Relevant LLO Number
1	A4 size Color Laser Printer	10
2	Digital Camera	15
3	Single Color Offset Printing Machine	3,4,5
4	Gravure Printing Machine	12
5	Flexographic Printing Machine	6
6	Printing Down Frame, Pasting Table	1,2
7	Cutting, Wire Stitching Machine	11,13
8	A4 size Color Ink Jet Printer	10
9	Folding and Binding Machine	14
10	Direct and Direct-Indirect Screen Making Unit	9
11	Single Color Screen Printing Machine	7,8

IX. SUGGESTED 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
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Sr.No	Unit	Unit Title	Aligned COs	Learning Hours	R-Level	U-Level	A-Level	Total Marks
1	I	Printing Media	CO1	14	4	4	6	14
2	II	Prepress Techniques	CO2	10	4	4	6	14
3	III	Image Carriers	CO3	10	4	4	6	14
4	IV	Printing Machines	CO4	10	4	4	6	14
5	V	Binding, finishing and raw materials	CO5	16	4	4	6	14
Grand Total				60	20	20	30	70

X. ASSESSMENT METHODOLOGIES/TOOLS

Formative assessment (Assessment for Learning)

- Two unit tests of 30 marks each and average of two unit tests out of 30 marks.
- Each practical will be assessed considering 60% weightage to process and 40% weightage to output.

Summative Assessment (Assessment of Learning)

- End semester assessment of 70 marks through offline examination.
- Actual performance in internal practical examination of 25 marks.

XI. SUGGESTED COS - POS MATRIX FORM

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

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

XII. SUGGESTED LEARNING MATERIALS / BOOKS

Sr.No	Author	Title	Publisher with ISBN Number
1	Herbert Simonn	Introduction To Printing	Fiber & Fiber Limited ISBN 9780571084081
2	Sean Smith	The Print and Production Manual	Pira International Limited, Randalls Road, Leatherhead, Surrey KT22 7RU, UK, 9th Edition, ISBN 81783
3	Ian Faux	Modern Lithography	Macdonad & Evans Plynonnt ISBN 10;0712113622

XIII. LEARNING WEBSITES & PORTALS

Sr.No	Link / Portal	Description
1	youtube.com/watch?v=5LMU-zB8Sro	Offset printing process introduction

Sr.No	Link / Portal	Description
2	https://www.youtube.com/watch?v=c4S51how-y4	Gravure printing process
3	https://www.youtube.com/watch?v=dC7Yl-IV_	Web offset process
4	https://www.youtube.com/watch?v=IDGJkAKFnGI	Plate making for offset
5	youtube.com/watch?v=9pocAG01M5s	Flexographic printing process
6	youtube.com/watch?v=ME4LvA5WCEg	Digital printing
7	youtube.com/watch?v=ME4LvA5WCEg	Inkjet printing
8	youtube.com/watch?v=ME4LvA5WCEg	Printing workflow

Programme Name/s : Printing Technology
Programme Code : PN
Semester : Second
Course Title : GRAPHIC DESIGN
Course Code : 322324

I. RATIONALE

This course covers graphic design concepts in order to improve diploma students' printing design skills. This course will teach students how to develop layouts manually and utilizing publishing and design software, as well as design principles, layout planning, color terminology concepts, and technique.

II. INDUSTRY / EMPLOYER EXPECTED OUTCOME

Use the basic concepts of design in the prepress department.

III. COURSE LEVEL LEARNING OUTCOMES (COS)

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

- CO1 - Apply principles of graphic design in layout and artwork making.
- CO2 - Use the effect of color element in graphic design.
- CO3 - Suggest layout type for different graphic products.
- CO4 - Apply various typographic and imposition methods used in printing.
- CO5 - Create a layout and artwork for given printing requirement.

IV. TEACHING-LEARNING & ASSESSMENT SCHEME

Course Code	Course Title	Abbr	Course Category/s	Learning Scheme						Credits	Paper Duration	Assessment Scheme										Total Marks
				Actual Contact Hrs./Week			SLH	NLH	Theory			Based on LL & TL				Based on SL						
				CL	TL	LL			Practical			FA-PR		SA-PR		SLA						
				Max	Max	Max	Min	Max	Min			Max	Min	Max	Min	Max	Min					
				FA-TH	SA-TH	Total	FA-PR	SA-PR	SLA													
322324	GRAPHIC DESIGN	GFD	DSC	3	-	4	1	8	4	3	30	70	100	40	25	10	25@	10	25	10	175	

Total IKS Hrs for Sem. : 2 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, *# On Line Examination , @\$ Internal Online Examination

Note :

1. FA-TH represents average of two class tests of 30 marks each conducted during the semester.
2. If candidate is not securing minimum passing marks in FA-PR of any course then the candidate shall be declared as "Detained" in that semester.
3. If candidate is not securing minimum passing marks in SLA of any course then the candidate shall be declared as fail and will have to repeat and resubmit SLA work.
4. Notional Learning hours for the semester are (CL+LL+TL+SL)hrs.* 15 Weeks
5. 1 credit is equivalent to 30 Notional hrs.
6. * Self learning hours shall not be reflected in the Time Table.
7. * Self learning includes micro project / assignment / other activities.

V. THEORY LEARNING OUTCOMES AND ALIGNED COURSE CONTENT

Sr.No	Theory Learning Outcomes (TLO's) aligned to CO's.	Learning content mapped with Theory Learning Outcomes (TLO's) and CO's.	Suggested Learning Pedagogies.
1	<p>TLO 1.1 Identify relation of printing process to Printer's Design.</p> <p>TLO 1.2 Enlist principles of graphic design.</p> <p>TLO 1.3 Choose fundamentals of graphic design.</p> <p>TLO 1.4 Apply principles of graphic design for preparation of various layout.</p>	<p>Unit - I Principles and elements of Graphic Design</p> <p>1.1 Introduction to printer's design: Printer's design and its importance.</p> <p>1.2 Relation: Printing process relation to Printer's design.</p> <p>1.3 Fundamentals of Graphic Design: Line, space, size, tone, texture, color and its use and purposes.</p> <p>1.4 Principles of Graphic Design: Design Balance, symmetric and asymmetric, contrast, proportion, unity, rhythm and its use, advantages and limitations.</p>	<p>Chalk-Board Video Demonstrations</p>
2	<p>TLO 2.1 Apply color terminology used for graphic design.</p> <p>TLO 2.2 Select appropriate color according to different types of substrate.</p>	<p>Unit - II Colors in Graphic Design</p> <p>2.1 Color Terminology: Color Terminology, Color Wheel, Hue, Value, Chroma, Brightness, Shades, Tint, Color Symbolism.</p> <p>2.2 Color Relationship: Cool, Warm, Contrast, Complementary Colors and Color Schemes.</p> <p>2.3 Color Selection: Selection of color according to different types of substrate and end use.</p>	<p>Chalk-Board Video Demonstrations Presentations</p>
3	<p>TLO 3.1 Prepare final layout using attributes for given graphic product.</p> <p>TLO 3.2 Use of House style for given printed product.</p> <p>TLO 3.3 Identify impact of design on target audience.</p>	<p>Unit - III Layout Planning</p> <p>3.1 Definition of layout and stages: Definition of layout and attributes of a good layout, stages involved in preparing a good layout such as visualization, thumbnail and rough layout and final layout.</p> <p>3.2 Geometry: Basic geometric shapes, space, use of geometric and optical centre.</p> <p>3.3 House Style: Definition, types, rules, applications, advantages and limitations of House style and Dummy.</p> <p>3.4 Impact: Impact of design on various target audience. Relationship between design and sale of a product. Graphic designer and his role.</p>	<p>Chalk-Board Video Demonstrations Presentations</p>
4	<p>TLO 4.1 Use the terminology of type, typeface and font in printing applications.</p> <p>TLO 4.2 Describe stages in proof reading on a given copy.</p> <p>TLO 4.3 Compare different types of imposition schemes used in printing.</p> <p>TLO 4.4 State the sequence of making imposition for different printing jobs.</p>	<p>Unit - IV Typography and Imposition</p> <p>4.1 Typographic Elements: Type and typeface, types of strokes and serifs, termination. Font styles and size of type, text and display faces. Dimensional attributes of a type- x-height, ascender and descender line.</p> <p>4.2 Legibility and readability: Definition of legibility and readability. Factors governing legibility and readability. Different types of proof-reading marks and qualification of proof reader.</p> <p>4.3 Concept of imposition: Concept and need of imposition. Concept of oblong and upright pages. Elements of a standard imposition schemes and their applications. Comparison of different types of imposition schemes in layout.</p> <p>4.4 Graphic marks: Different types of graphic marks incorporated in an imposition scheme.</p>	<p>Chalk-Board Video Demonstrations Presentations</p>

Sr.No	Theory Learning Outcomes (TLO's) aligned to CO's.	Learning content mapped with Theory Learning Outcomes (TLO's) and CO's.	Suggested Learning Pedagogies.
5	TLO 5.1 List design consideration for commercial printing jobs. TLO 5.2 List design consideration for packaging jobs. TLO 5.3 Create layout using designing software.	Unit - V Design of different printing products 5.1 Design for commercial Product: Design considerations for books, magazines, newspapers, leaflet, letterhead, visiting card and envelopes. 5.2 Design for packaging product: Design considerations for cartons, labels, pouches and metal can. 5.3 Graphic design software: Study of CorelDraw, Photoshop, InDesign etc softwares	Chalk-Board Video Demonstrations Presentations

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

Practical / Tutorial / Laboratory Learning Outcome (LLO)	Sr No	Laboratory Experiment / Practical Titles / Tutorial Titles	Number of hrs.	Relevant COs
LLO 1.1 Identify relation of printing process to printer's design.	1	Identification of designing principles according to printing processes.*	4	CO1
LLO 2.1 Enlist principles of graphic design.	2	Identification of designing principles in packaging product.	4	CO1
LLO 3.1 Choose fundamentals of graphic design.	3	Identification of designing principles in publication design.	4	CO1
LLO 4.1 List color attributes	4	List color attributes included in given graphic design.	4	CO2
LLO 5.1 Prepare different types of color wheel.	5	Prepare colour wheel*	4	CO2
LLO 6.1 Prepare color scheme.	6	Prepare color schemes according to the substrates.	4	CO2
LLO 7.1 Prepare rough layout.	7	Prepare a rough layout, house style specimen, and dummy for a given publication product.	4	CO3
LLO 8.1 Prepare rough layout.	8	Prepare a rough layout, house-style specimen, and dummy for a given packaging product.*	4	CO3
LLO 9.1 Implement design elements.	9	Implementation of designing elements for layout-Thumbnail, comprehensive, rough layout and final layout.	4	CO3
LLO 10.1 Implement of text setting.	10	Implementation of text setting, alignment, paragraph setting using CorelDraw or suitable software.*	4	CO3
LLO 11.1 Implement Typesetting.	11	Typeset bookwork in InDesign or suitable software.	4	CO4
LLO 12.1 Prepare newspaper design.	12	Prepare newspaper design showing indentation & multi-column work setting.*	4	CO4
LLO 13.1 Prepare multi-element artwork design.	13	Prepare artwork design for large display font and image-based advertisement.*	4	CO4
LLO 14.1 Design two-page layout	14	Design a two-page layout using graphic designing software indicating Verso & Recto, Bleed work for the cover page.*	4	CO4
LLO 15.1 Prepare full sheet work Imposition scheme.	15	Prepare a full sheet work Imposition scheme for 8 and 16 pages of a given size.	4	CO4
LLO 16.1 Prepare Imposition scheme.	16	Preparation of Imposition scheme for 8 and 16 pages of a given size and form in a half sheet work (work and tumble) style.	4	CO4
LLO 17.1 Create visiting and wedding card layout using CorelDraw.	17	Create visiting, invitation and wedding card and letterhead layout using CorelDraw.*	4	CO5
LLO 18.1 Use of InDesign tools	18	Use of InDesign tools in page layout designing.	4	CO5

Practical / Tutorial / Laboratory Learning Outcome (LLO)	Sr No	Laboratory Experiment / Practical Titles / Tutorial Titles	Number of hrs.	Relevant COs
LLO 19.1 Use of Photoshop tools	19	Use of Photoshop tools in photographic editing.	4	CO5
LLO 20.1 Create line art images/ logo/ design using CorelDraw software.	20	Create logo designs using CorelDraw software.	4	CO5

Note : Out of above suggestive LLOs -

- '*1' Marked Practicals (LLOs) Are mandatory.
- Minimum 80% of above list of lab experiment are to be performed.
- Judicial mix of LLOs are to be performed to achieve desired outcomes.

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

Micro project

- Prepare a text layout by using at least four typefaces.
- Draw a thumbnail of the already-printed layout.
- Collect and analyze samples with different layouts.
- Enlist the house style attributes of a publication house.
- Collect layout samples for different age groups.
- Visit and study the proof-reading method in newspaper presses.
- Visit nearby publications and list the imposition schemes used.
- Classify collected samples according to the principles of graphic design.
- Visit any two design houses / presses and write a visit report containing the facilities.
- Collect samples with cool, warm, contrast and complementary color schemes.
- Collect and identify the effects of color on different printed products.
- Collect printed samples from various printing processes.
- Collect samples for designs of commercial products like leaflets, letterheads, visiting cards, envelopes, and newspapers.
- Collect samples for designs of packaging products like cartons, labels, pouches, and metal cans.

Assignment

- Collect printed specimens for relevant design principles
- Visit locations like hospitals, schools etc. for study of color symbolism.
- Undertake micro-projects.
- Give a seminar on relevant topic.
- Enlist different techniques used in market for designing.
- Survey a market for innovative design ideas.
- Prepare a journal based on practicals performed in laboratory.
- Survey a market for display advertisements.
- Visit any pre-press house near by your institute to learn commercial job designing.
- Visit any pre-press house near your institute to learn about packaging job design.

Note :

A suggestive list is provided, this may vary according to need of the course curriculum.

VIII. LABORATORY EQUIPMENT / INSTRUMENTS / TOOLS / SOFTWARE REQUIRED

Sr.No	Equipment Name with Broad Specifications	Relevant LLO Number
1	Computer (Windows 10 Pro, Intel® Core™i5, RAM 8GB, 64-bit operating system)	All
2	Printer (LaserJet color / Black and white, Print Resolution: 600x600 DPI, Print Speed Black: 18 PPM, Paper Size: A3, A4)	All
3	A4 Size Flat Bed Color Scanner	All

IX. SUGGESTED 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	Principles and elements of Graphic Design	CO1	8	4	4	6	14
2	II	Colors in Graphic Design	CO2	10	4	4	6	14
3	III	Layout Planning	CO3	8	4	4	6	14
4	IV	Typography and Imposition	CO4	12	4	4	8	16
5	V	Design of different printing products	CO5	7	4	4	4	12
Grand Total				45	20	20	30	70

X. ASSESSMENT METHODOLOGIES/TOOLS

Formative assessment (Assessment for Learning)

- Two unit tests of 30 marks each and average of two unit tests out of 30 marks.
- Each practical will be assessed considering 60% weightage to process and 40% weightage to output.

Summative Assessment (Assessment of Learning)

- Actual performance in Internal Practical Examination of 25 marks.
- End semester assessment of 70 marks through offline examination.

XI. SUGGESTED COS - POS MATRIX FORM

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

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

XII. SUGGESTED LEARNING MATERIALS / BOOKS

Sr.No	Author	Title	Publisher with ISBN Number
1	Hollis, Richard	Graphic Design: A Concise History	New York: Thames and Hudson, 1994. Print ISBN:9780500202708
2	Eskilson, Stephen	Graphic Design: A New History	New Haven: Yale UP, 2007. Print ISBN:9780300172607
3	O'Connor	Elements and principles of design: Tools for digital imagery, art and design	Z (2014) ISBN:9780992426309

XIII . LEARNING WEBSITES & PORTALS

Sr.No	Link / Portal	Description
1	https://blog.entheosweb.com/tutorials/website-layout-design-in-coreldraw	How to design a fun and colorful designer web layout with Corel Draw.
2	https://design.tutsplus.com/categories/adobe-illustrator	Design and illustration tutorials
3	https://blog.hubspot.com/marketing/how-to-use-photoshop	Use photoshop to enhance image.

Programme Name/s : Printing Technology
Programme Code : PN
Semester : Second
Course Title : WEB PAGE DESIGNING USING HTML
Course Code : 322009

I. RATIONALE

The Webpage Design Using HTML course provides students with a comprehensive and relevant skillset in web development. By learning HTML, students will be well-equipped to create, manage, and maintain web content, making them valuable assets in the digital age. This course not only caters to professional development but also personal growth and creative expression, making it a well-rounded and essential offering in the realm of web design and development education.

II. INDUSTRY / EMPLOYER EXPECTED OUTCOME

This course shall enable students to gain a comprehensive understanding of HTML syntax, tags, and elements, enabling them to construct the structural framework of websites and the best practices for optimizing content accessibility and search engine visibility.

III. COURSE LEVEL LEARNING OUTCOMES (COS)

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

- CO1 - Use HTML formatting tags to present content on web page.
- CO2 - Develop web page using List and hyperlinks, Images, Colors and Backgrounds.
- CO3 - Design HTML forms using table and frames.
- CO4 - Apply presentation schemes on content using CSS
- CO5 - Publish websites on Internet or Intranet.

IV. TEACHING-LEARNING & ASSESSMENT SCHEME

Course Code	Course Title	Abbr	Course Category/s	Learning Scheme					Credits	Paper Duration	Assessment Scheme										Total Marks
				Actual Contact Hrs./Week			SL	LH			NLH	Theory			Based on LL & TL				Based on SL		
				CL	TL	LL						FA-TH	SA-TH	Total	Practical		SLA				
				Max	Max	Max	Min	Max			Min				Max	Min	Max	Min			
322009	WEB PAGE DESIGNING USING HTML	WDH	SEC	2	-	2	2	6	3	-	-	-	-	-	50	20	50@	20	25	10	125

Total IKS Hrs for Sem. : 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, *# On Line Examination , @\$ Internal Online Examination

Note :

1. FA-TH represents average of two class tests of 30 marks each conducted during the semester.
2. If candidate is not securing minimum passing marks in FA-PR of any course then the candidate shall be declared as "Detained" in that semester.
3. If candidate is not securing minimum passing marks in SLA of any course then the candidate shall be declared as fail and will have to repeat and resubmit SLA work.
4. Notional Learning hours for the semester are (CL+LL+TL+SL)hrs.* 15 Weeks
5. 1 credit is equivalent to 30 Notional hrs.
6. * Self learning hours shall not be reflected in the Time Table.
7. * Self learning includes micro project / assignment / other activities.

V. THEORY LEARNING OUTCOMES AND ALIGNED COURSE CONTENT

Sr.No	Theory Learning Outcomes (TLO's)aligned to CO's.	Learning content mapped with Theory Learning Outcomes (TLO's) and CO's.	Suggested Learning Pedagogies.
1	TLO 1.1 Understand the basic terminologies and types of websites. TLO 1.2 Describe the procedure of creating sample web page using block level HTML tags. TLO 1.3 Describe the procedure of using the given Text level tag and use of special characters in web page.	Unit - I Introduction to HTML 1.1 Introduction of HTML, Terminologies used in Web Design: World Wide Web (www), Web Pages, Web Site, Web Browsers, Web Servers and Types of sites. Static vs. Dynamic web sites, Search Engine. 1.2 Web page structure: DOCTYPE, HTML, TITLE, HEAD, BODY and other meta tags with attributes. 1.3 Block Level Elements: Headings, Paragraphs, Breaks, Divisions, Cantered Text, Block Quotes, Preformatted text	Chalk-Board Demonstration Hands-on
2	TLO 2.1 Use the given type of list in Web Pages. TLO 2.2 Use the given type of hyperlink in Web Pages. TLO 2.3 Design web page using given colors/images as page background.	Unit - II HTML page Development 2.1 Lists: Ordered Lists, Unordered Lists, Definition Lists, Nested Lists. Hyperlinks: Absolute, Relative and Inline links, Linking various elements on the website. 2.2 Image: Types image format, jpg, bmp, png gif etc. IMG tag, alternate text, image alignment, HSPACE, VSPACE, Working and editing Images. 2.3 Working with Colors and Backgrounds.	Presentations Demonstration Hands-on
3	TLO 3.1 Use table attributes to organize data on a web page. TLO 3.2 Design frames using its various tags and attributes TLO 3.3 Create basic form using different form fields and Button tags.	Unit - III Table and Form Development Using HTML tags. 3.1 Table: Table tag with attributes, Border, cell spacing, cell padding, width, align, bgcolor attributes. Adding captions: CAPTION tag, Formatting contents in the table cells, Spanning rows and columns: rowspan and colspan attributes. 3.2 Frames: Types of Frames with their attributes, Creating frames: FRAMESET tag, FRAME tag and its attributes, Frame targeting. 3.3 Forms: Creating basic form: FORM tag, action and method attributes, Form fields, Pull down menus, Buttons, Formatting technique: Using table to layout form.	Demonstration Presentations Hands-on

Sr.No	Theory Learning Outcomes (TLO's) aligned to CO's.	Learning content mapped with Theory Learning Outcomes (TLO's) and CO's.	Suggested Learning Pedagogies.
4	TLO 4.1 Format CSS code on a web page with different CSS properties. TLO 4.2 Create CSS for applying the given presentation scheme on a web page	Unit - IV Cascading Style sheets 4.1 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 4.2 Style sheet properties: Font, text, box, 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.	Presentations Demonstration Hands-on
5	TLO 5.1 Configure a web server TLO 5.2 Hosting the static website.	Unit - V Website Hosting 5.1 configuring web server, uploading files on intranet site, access intranet based website; Publishing website on Internet, hiring Web space, uploading files using FTP, Virtual Hosting, access internet based website 5.2 Website Hosting: Concept of Internet and Intranet. Publishing website on Intranet.	Demonstration Presentations Hands-on

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

Practical / Tutorial / Laboratory Learning Outcome (LLO)	Sr No	Laboratory Experiment / Practical Titles / Tutorial Titles	Number of hrs.	Relevant COs
LLO 1.1 Create a Simple Web Page.	1	Create web page using structure tags to display sample message.*	2	CO1
LLO 2.1 Use all heading tags in web page.	2	Create a web page which display a string "Maharashtra State Board Technical Education, Mumbai" in all header tags.*	2	CO1
LLO 3.1 Use block level tags in web page	3	Create a web page for displaying a paragraph using block level tags, HR tags.*	2	CO1
LLO 4.1 Use text level tags, border and special characters for web page design.	4	Create webpage to display paragraph with different text level tag, border and special characters.*	2	CO1
LLO 5.1 Use ordered and unordered list.	5	Design a web page for implementing ordered list items and unordered list.	2	CO2
LLO 6.1 Use ordered and unordered List for webpage to display data in pattern.	6	Design a web page using Nested list* 1. Ordered list within unordered list 2. Unordered list within ordered list 3. Ordered list within ordered list 4. Unordered list within unordered list	2	CO2
LLO 7.1 Use hyperlink tag to link different web pages	7	Create a web page to link* 1. A different web page of same site 2. A different location on the same web page 3. A Specific location on different web page of same site 4. Use Image as a link	2	CO2

Practical / Tutorial / Laboratory Learning Outcome (LLO)	Sr No	Laboratory Experiment / Practical Titles / Tutorial Titles	Number of hrs.	Relevant COs
LLO 8.1 Insert image on web page foreground and background with various attributes.	8	Create a webpage containing any image and add a hyperlink to another webpage. Use width and height property for an image. Insert images on web page using various attributes and set image as background.	2	CO2
LLO 9.1 Create web page with table and frames with different attributes	9	Create table within table and also insert an image within the data elements of the table.*	2	CO3
LLO 10.1 Create web page with table and frames using rowspan and colspan attributes.	10	Create a webpage that displays first year timetable. Make effective use of rowspan and colspan attributes.*	2	CO3
LLO 11.1 Create web page for filling information using form with its attributes	11	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.	2	CO3
LLO 12.1 Assign CSS in Web page with different styles	12	Create a web page for demonstration of CSS by applying Internal style.	2	CO4
LLO 13.1 Assign CSS in Web page with different styles	13	Create a web page for demonstration of CSS by applying External style.	2	CO4
LLO 14.1 Assign CSS in Web page with different styles	14	Create a web page for demonstration of CSS by applying inline style.	2	CO4
LLO 15.1 Host web pages on open source platform	15	Create a website and host on open source.	2	CO5
Note : Out of above suggestive LLOs - <ul style="list-style-type: none"> *1 Marked Practicals (LLOs) Are mandatory. Minimum 80% of above list of lab experiment are to be performed. Judicial mix of LLOs are to be performed to achieve desired outcomes. 				

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

Micro project

- Personal Resume Page: create a personal resume webpage that includes their name, contact information, a brief bio, education, work experience, and skills.
- Simple Game Interface: create a simple web-based game interface using HTML. This can include buttons, score displays, and game instructions.
- FAQ Page: Create a Frequently Asked Questions (FAQ) page for a fictional product or service, including questions and answers.
- Personal Blog Post: write a short blog post on a topic of their choice and format it as a blog entry with text, images, and headings.
- Travel Blog Entry: create a travel blog entry that includes text, images, and links to external resources.
- Event Invitation: Create an HTML invitation for an event. Include details like the event name, date, time, location, and RSVP functionality.
- News Article: Design a webpage that mimics the structure of a news article, complete with a headline, byline, article text, and an image.

Assignment

- Insert Video in an HTML page.
- Create an E-mail Newsletter.
- Create an animation using various HTML tags.

Note :
A suggestive list is provided, this may vary according to need of the course curriculum.

VIII. LABORATORY EQUIPMENT / INSTRUMENTS / TOOLS / SOFTWARE REQUIRED

Sr.No	Equipment Name with Broad Specifications	Relevant LLO Number
1	Desired Desktop configuration - Processor: A modern quad-core processor, such as an Intel Core i5 or AMD Ryzen 5, should be sufficient for web design tasks. Memory (RAM): 8GB of RAM is a minimum, but 16GB or more will provide smoother performance when working with multiple design applications and browser tabs. Storage: A Solid-State Drive (SSD) is highly recommended for faster boot times and application loading. A 256GB SSD should suffice for your operating system and software, and you can	All
2	Dreamweaver software	All

IX. SUGGESTED 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	0	0	0	0
2	II	HTML page Development	CO2	6	0	0	0	0
3	III	Table and Form Development Using HTML tags.	CO3	8	0	0	0	0
4	IV	Cascading Style sheets	CO4	6	0	0	0	0
5	V	Website Hosting	CO5	6	0	0	0	0
Grand Total				30	0	0	0	0

X. ASSESSMENT METHODOLOGIES/TOOLS

Formative assessment (Assessment for Learning)

- Each practical will be assessed considering 60% weightage to process and 40% weightage to output.

Summative Assessment (Assessment of Learning)

- Actual performance in internal practical examination of 50 marks.

XI. SUGGESTED COS - POS MATRIX FORM

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

CO2	1	1	3	-	-	1	1			
CO3	1	1	3	-	-	1	1			
CO4	1	1	2	-	-	1	1			
CO5	1	1	2	-	-	1	1			

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

XII. SUGGESTED LEARNING MATERIALS / BOOKS

Sr.No	Author	Title	Publisher with ISBN Number
1	Jon Duckett	"HTML and CSS: Design and Build Websites"	Wiley ISBN-13: 978-1118008188
2	Jennifer Niederst Robbins	"Learning Web Design: A Beginner's Guide to HTML, CSS, JavaScript, and Web Graphics"	O'Reilly Media ISBN-13: 978-1449319274
3	Jon Duckett	"Web Design with HTML, CSS, JavaScript and jQuery Set"	Wiley ISBN-13: 978-1119038634
4	Steve Krug	"Don't Make Me Think, Revisited: A Common Sense Approach to Web Usability"	New Riders ISBN-13: 978-0321965516
5	Terry Felke-Morris	"Web Development and Design Foundations with HTML5"	Pearson ISBN-13: 978-0134801148

XIII. LEARNING WEBSITES & PORTALS

Sr.No	Link / Portal	Description
1	https://www.w3schools.com/	W3Schools is a popular online resource that offers tutorials, examples, and exercises for learning HTML, CSS, JavaScript, and other web development technologies. It's a great starting point for beginners.
2	https://developer.mozilla.org/	MDN provides extensive documentation, guides, and interactive examples for web development, including HTML, CSS, and JavaScript. It's a trusted resource with up-to-date information.
3	https://www.codecademy.com/learn/learn-html	Codecademy offers interactive coding lessons and projects, including web design and development courses. It's a great platform for hands-on learning.
4	https://css-tricks.com/	CSS-Tricks is a website dedicated to CSS and web design. It offers tutorials, articles, and code examples that cover a wide range of web design topics.
5	https://www.smashingmagazine.com/	Smashing Magazine is an online publication that provides articles and resources on web design, development, and UX/UI design. It's a valuable source of inspiration and knowledge.
6	https://www.webdesignerdepot.com/	Web Designer Depot offers articles, tutorials, and resources related to web design, user experience, and web development.
7	https://webdesign.tutsplus.com/	Tuts+ offers a wide range of tutorials and courses on web design, including HTML, CSS, and web development topics.
8	https://www.udemy.com/	Udemy offers a wide range of web design courses, both free and paid, on topics such as HTML, CSS, JavaScript, responsive design, and more. It's a popular platform with a variety of courses suitable for students of different skill levels.
9	https://www.coursera.org/	Coursera partners with universities and organizations to provide online courses in web design and development. Students can enroll in courses, many of which are available for free, and learn from experts in the field.

Sr.No	Link / Portal	Description
10	https://www.edx.org/	edX offers courses from top universities and institutions. Students can explore web design and development courses, some of which are available for free.
11	https://www.codecademy.com/	Codecademy focuses on interactive coding lessons and projects, including web design and development courses. It's a great platform for hands-on learning.
12	https://www.freecodecamp.org/	FreeCodeCamp is a nonprofit organization that offers a free, self-paced curriculum covering web development, including HTML, CSS, JavaScript, and more.

Programme Name/s : Printing Technology
Programme Code : PN
Semester : Second
Course Title : ENGINEERING IN PRINTING MACHINES
Course Code : 322008

I. RATIONALE

Nowadays, printing technology includes several electrical and electronically powered tools and machinery. This course aims to provide knowledge of the terminology and technologies used in printing technology tools and machines. This course develops skills of students in electrical/electronic engineering principles as well as aspects of manufacturing, production, and fabrication.

II. INDUSTRY / EMPLOYER EXPECTED OUTCOME

Operate printing machines securely when using electrical and electronic equipment.

III. COURSE LEVEL LEARNING OUTCOMES (COS)

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

- CO1 - Identify different electrical/electronic products and machinery.
- CO2 - Connect electric motors for specific requirements.
- CO3 - Identify and understand principles of electronic components.
- CO4 - Use simple PLC programming tools.
- CO5 - Use relevant electric/electronic components safely.

IV. TEACHING-LEARNING & ASSESSMENT SCHEME

Course Code	Course Title	Abbr	Course Category/s	Learning Scheme						Credits	Paper Duration	Assessment Scheme										Total Marks
				Actual Contact Hrs./Week			SLH	NLH	Theory			Based on LL & TL				Based on SL						
				CL	TL	LL			FA-TH			SA-TH	Total	Practical		SLA						
							FA-PR	SA-PR						Max	Min	Max	Min					
				Max	Max	Max	Min	Max	Min			Max	Min	Max	Min							
322008	ENGINEERING IN PRINTING MACHINES	EPM	DSC	1	-	4	1	6	3	-	-	-	-	-	50	20	50@	20	25	10	125	

Total IKS Hrs for Sem. : 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, *# On Line Examination , @\$ Internal Online Examination

Note :

1. FA-TH represents average of two class tests of 30 marks each conducted during the semester.
2. If candidate is not securing minimum passing marks in FA-PR of any course then the candidate shall be declared as "Detained" in that semester.
3. If candidate is not securing minimum passing marks in SLA of any course then the candidate shall be declared as fail and will have to repeat and resubmit SLA work.
4. Notional Learning hours for the semester are (CL+LL+TL+SL)hrs.* 15 Weeks
5. 1 credit is equivalent to 30 Notional hrs.
6. * Self learning hours shall not be reflected in the Time Table.
7. * Self learning includes micro project / assignment / other activities.

V. THEORY LEARNING OUTCOMES AND ALIGNED COURSE CONTENT

Sr.No	Theory Learning Outcomes (TLO's) aligned to CO's.	Learning content mapped with Theory Learning Outcomes (TLO's) and CO's.	Suggested Learning Pedagogies.
1	TLO 1.1 Explain given electric and magnetic circuits term. TLO 1.2 Differentiate between the behaviour of component under AC and DC.	Unit - I Electrical Circuits 1.1 Definition and Units : EMF, M.M.F, Current, Potential Difference, Power and Energy. 1.2 AC and DC in resistor, induction, capacitors. Introduction to 3-phase signal.	Chalk-Board Demonstration Hands-on
2	TLO 2.1 Explain the construction, working principle and types of AC motors. TLO 2.2 Explain the construction, working principle and types of DC motors. TLO 2.3 Interpret the construction working principle and application of servo motors.	Unit - II Electrical Motors 2.1 Construction and Working principle of single phase A.C. motor, types of single-phase motors, applications of single-phase motors. 2.2 Construction, Working and applications of D.C. motor. 2.3 Construction, Working and applications of Servo motor.	Chalk-Board Demonstration Hands-on
3	TLO 3.1 Differentiate between the given active and passive electronic components. TLO 3.2 Calculate value of the given resistor and capacitor using color code. TLO 3.3 Interpret the operation of given Digital component	Unit - III Electronic Components 3.1 Active and passive components; Resistor, capacitor, inductor, symbols, color codes, specifications. 3.2 Voltage and current sources, signals: waveform (sinusoidal, triangular and square), time and frequency domain representation, amplitude, frequency, phase, wavelength 3.3 Introduction to digital electronics, gates, combinational and sequential circuits.	Demonstration Chalk-Board Hands-on
4	TLO 4.1 Interpret block diagram of PLC TLO 4.2 Select suitable PLC for given application. TLO 4.3 Write and Interpret simple PLC programs	Unit - IV Programmable Logic Controllers 4.1 Introduction to PLC, Block diagram, Types of PLC – Modular and fixed, 4.2 Basics of Input / Output Modules, Applications of PLC 4.3 Introduction to Ladder Programming and Simple Ladder Programs	Chalk-Board Demonstration Hands-on
5	TLO 5.1 Explain working of diode using V-I characteristics. TLO 5.2 Explain working and waveforms of given Rectifier. TLO 5.3 Select power supply and LEDs for given circuit.	Unit - V Electronic components and Applications 5.1 P-N junction diode: symbol. construction, working and application. Zener diode: working, symbol, voltage regulator. 5.2 Rectifiers: Half wave, Full wave and Bridge Rectifier. 5.3 Light Emitting Diodes: symbol, working principle and applications, photodiode: symbol, working principle and applications.	Chalk-Board Demonstration Hands-on

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

Practical / Tutorial / Laboratory Learning Outcome (LLO)	Sr No	Laboratory Experiment / Practical Titles / Tutorial Titles	Number of hrs.	Relevant COs
LLO 1.1 Measure electrical parameters such as AC/DC voltage, current, resistance, continuity, in given application using digital multimeter.	1	Use digital multimeter to measure voltage, current, resistance, continuity in circuit and test diode.*	4	CO1

Practical / Tutorial / Laboratory Learning Outcome (LLO)	Sr No	Laboratory Experiment / Practical Titles / Tutorial Titles	Number of hrs.	Relevant COs
LLO 2.1 Perform basic electrical connection for given application.	2	Perform basic electrical wiring connections, switches, MCBs, Sockets, for given application.*	4	CO2
LLO 3.1 Measure electrical parameters in single phase circuit.	3	Measure, voltage, current and power in 1-phase circuit with resistive load.	4	CO1
LLO 4.1 Measure electrical parameters in star/delta connections.	4	Make Star and Delta connection in induction motor starters and measure the line and phase values.	4	CO2
LLO 5.1 Troubleshoot the servomotor.	5	Verify the working and troubleshooting of servo motor.*	4	CO2
LLO 6.1 Verify the series and parallel combination behavior of resistor.	6	Connect resistors in series and parallel combination on bread board and measure resistance, current and voltage using digital multimeter.*	4	CO3
LLO 7.1 Verify the series and parallel combination of capacitor.	7	Connect capacitors in series and parallel combination on bread board and measure its value using multimeter.	4	CO3
LLO 8.1 Code and simulate a simple PLC program for given problem.	8	Calculate the value of given resistor using color code method and verify using digital multimeter.*	4	CO4
LLO 9.1 Code and simulate a simple PLC program for given problem.	9	Simulate simple ladder program using PLC.	4	CO4
LLO 10.1 Execute a basic relay program using PLC.	10	Simulate simple relay program using PLC.	4	CO4
LLO 11.1 Verify the operation of photosensor (any one).	11	Test and verify the operation of photodiode or any photosensor.*	4	CO3
LLO 12.1 Verify the operation of proximity sensor (any one).	12	Test and verify the operation of any one proximity sensor.	4	CO3
LLO 13.1 Verify the operation and waveforms of full wave rectifier.	13	Test and verify the operation of full wave rectifier.*	4	CO5
LLO 14.1 Test the operation and characteristics of photodiode.	14	Verify the operation and characteristics of photodiode.*	4	CO3
LLO 15.1 Verify the operation of basic gates using IC.	15	Test and verify the operation of basic gates using IC	4	CO5
Note : Out of above suggestive LLOs - <ul style="list-style-type: none"> * Marked Practicals (LLOs) Are mandatory. Minimum 80% of above list of lab experiment are to be performed. Judicial mix of LLOs are to be performed to achieve desired outcomes. 				

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

Micro project

- Electric and magnetic circuit: Each batch will prepare a coil without core. Students will note the deflection of galvanometer connected across the coil for: movement of the North Pole of permanent magnet towards and away from the coil (slow and fast movement), movement of the South Pole of permanent magnet towards and away from the coil (slow and fast movement). Students will demonstrate and prepare a report based on their observations.

- Single phase induction motor: Each batch will select a three-phase squirrel cage type induction motor for a particular application (assume suitable rating). They will visit local electrical market (if the market is not nearby you may use the Internet) and prepare a report based on the following points: i. Manufactures, ii. Technical specifications iii. Features offered by different manufacturers iv. Price range
- Transistor as a switch: Each batch (3-4 students) will search and study datasheet of transistor and relevant component and will build / test transistor switch circuit on breadboard/General purpose PCB for various input signal.
- Prepare display boards consisting of electronic components: Each batch (3-4 students) will prepare display boards/ models/ charts/ Posters to visualize the appearance of electronic active and passive components.
- Diode: Build a circuit on general purpose PCB to clamp a waveform at 3.0V using diode and passive components.

Assignment

- Make star delta connections of motor
- Connect the various meters to measure the current and voltage of induction motor.
- Conduct a market survey, interpret the name plate ratings, and identify the parts of an induction motor.
- Search for the commonly used PLCs in Industry and prepare a report which includes specifications, features, cost, etc.

Note :

A suggestive list is provided, this may vary according to need of the course curriculum.

VIII. LABORATORY EQUIPMENT / INSTRUMENTS / TOOLS / SOFTWARE REQUIRED

Sr.No	Equipment Name with Broad Specifications	Relevant LLO Number
1	Discrete components : Switches, MCBs, Sockets,etc	2
2	Single phase Servo motor	5
3	Different types of starters - Star Delta	4
4	Digital multi meter, 3 and ½ digit, separate range for resistances and capacitance, component tester, AC and DC measurement.	All
5	Function generator, 0-2MHz. for generation of sin, square, pulse and triangular wave shapes	13,15
6	Digital IC Trainer	15
7	Rectifier Trainer Kit	13
8	Cathode Ray Oscilloscope	13,14
9	Discrete Components: Resistors, Capacitors, Diodes, Photodiode, Sensors	6,7,11,14

IX. SUGGESTED 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	Electrical Circuits	CO1	3	0	0	0	0
2	II	Electrical Motors	CO2	3	0	0	0	0
3	III	Electronic Components	CO3	3	0	0	0	0
4	IV	Programmable Logic Controllers	CO4	3	0	0	0	0
5	V	Electronic components and Applications	CO5	3	0	0	0	0
Grand Total				15	0	0	0	0

X. ASSESSMENT METHODOLOGIES/TOOLS**Formative assessment (Assessment for Learning)**

- Each practical will be assessed considering 60% weightage to process and 40% weightage to output.

Summative Assessment (Assessment of Learning)

- Actual performance in internal practical examination of 50 marks.

XI. SUGGESTED COS - POS MATRIX FORM

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

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

XII. SUGGESTED LEARNING MATERIALS / BOOKS

Sr.No	Author	Title	Publisher with ISBN Number
1	Mittie and Mittal	Basic Electrical Engineering	McGraw Education, New Delhi, 2015, ISBN: 978-0-07-0088572-5
2	Saxena S. B. Lal	Fundamentals of Electrical Engineering	Cambridge University Press, latest edition ISBN: 9781107464353
3	Theraja B. L.	Electrical Technology Vol - I and Vol - ii	S. Chand publications, New Delhi, 2015, ISBN: 9788121924405, ISBN-13: 978-8121927833
4	Malvina, Albert Paul, David	Electronics Principles	McGraw Hill Education, New Delhi, 2015, ISBN-13: 978-0070634244
5	Prof. V. R. Jadhav	Programmable Logic Controller	Khanna Publication 2012 9788174092281
6	Theraja B.L., Sedha R.S.	Principles of Electronic Devices and Circuits	S Chand & Company ISBN-8121921996

XIII. LEARNING WEBSITES & PORTALS

Sr.No	Link / Portal	Description
1	http://www.electronicclub.info/	This website provides simple and clear explanations of electronics and electrical concepts.
2	https://www.allaboutcircuits.com/	This website provides comprehensive information and tutorials on various electrical and electronics
3	http://www.electronics-tutorials.ws/	Electronics Tutorials offers a variety of tutorials and articles covering fundamental electrical con
4	https://www.learnelectronics.org/	This site provides practical electronics tutorials with a focus on hands-on learning, making it a gr
5	https://learn.sparkfun.com/tutorials	SparkFun offers a variety of tutorials on electronics, sensors, and microcontrollers.
6	https://www.electronicshub.org/	Electronics Hub is a resource for electronics enthusiasts. It offers articles, tutorials, and projec

Sr.No	Link / Portal	Description
7	https://ocw.mit.edu/courses/electrical-engineering-and-computer-science/6-002-circuits-and-electron	MIT's OpenCourseWare provides free access to their course materials. This link is specifically for a
8	LTspice	LTspice is a powerful, free electronic circuit simulator that allows students to design, test, and s
9	Multisim	Multisim, part of the National Instruments suite, is a popular electronics simulation software that
10	Electronics Toolkit (Mobile App)	This mobile app, available for both Android and iOS, provides a collection of calculators and tools
11	LabVIEW	LabVIEW, also from National Instruments, is used for teaching control and measurement systems. It ca
12	QUCS (Quite Universal Circuit Simulator)	QUCS is an open-source electronics circuit simulator that can be used to design and simulate various

Programme Name/s	: Architecture Assistantship/ Automobile Engineering./ Artificial Intelligence/ Agricultural Engineering/ Artificial Intelligence and Machine Learning/ Automation and Robotics/ Architecture/ Cloud Computing and Big Data Analytics/ Civil Engineering/ Chemical Engineering/ Computer Technology/ Computer Engineering/ Civil & Rural Engineering/ Construction Technology/ Computer Science & Engineering/ Fashion & Clothing Technology/ Dress Designing & Garment Manufacturing/ Digital Electronics/ Data Sciences/ Electrical Engineering/ Electronics & Tele-communication Engg./ Electrical Power System/ Electronics & Communication Engg./ Electrical Engineering/ Food Technology/ Computer Hardware & Maintenance/ Hotel Management & Catering Technology/ Instrumentation/ Industrial Electronics/ Information Technology/ Computer Science & Information Technology/ Instrumentation/ Interior Design & Decoration/ Interior Design/ Civil & Environmental Engineering/ Mechanical Engineering/ Mechatronics/ Medical Laboratory Technology/ Medical Electronics/ Production Engineering/ Printing Technology/ Polymer Technology/ Surface Coating Technology/ Textile Technology/ Electronics & Computer Engg./ Travel and Tourism/ Textile Manufactures
Programme Code	: AA/ AE/ AI/ AL/ AN/ AO/ AT/ BD/ CE/ CH/ CM/ CO/ CR/ CS/ CW/ DC/ DD/ DE/ DS/ EE/ EJ/ EP/ ET/ EX/ FC/ HA/ HM/ IC/ IE/ IF/ IH/ IS/ IX/ IZ/ LE/ ME/ MK/ ML/ MU/ PG/ PN/ PO/ SC/ TC/ TE/ TR/ TX
Semester	: Second
Course Title	: SOCIAL AND LIFE SKILLS
Course Code	: 312003

I. RATIONALE

Rationale : Life skills can be defined as abilities that enable humans to deal effectively with the demands and challenges of life. Social skills are a set of skills that are needed for successful, healthy relationships to easily adapt when moving from one social situation to the next. They help regulate our emotions effectively and develop enduring, supportive relationships, we're happier and healthier. This is why developing life skills and eventually social skills is key to being successful in life, it's key for our health and well-being. Thus, Teaching of Social and life skills provide students with essentials of knowing , understanding attitudes, values, morals ,social skills and better equip them to handle stress and build their self efficacy, self esteem and self confidence.

Note : The course offers five different alternatives(modules) for achieving above outcomes . Students must complete any one module from the following options.

- MODULE-I : Unnat Maharashtra Abhiyan (UMA)
- MODULE-II : National Service Scheme (NSS)
- MODULE-III : Universal Human Values
- MODULE-IV : Value Education (Unnati Foundation)
- MODULE-V : Financial Literacy (NABARD)

The institute can choose to offer any one MODULE to the groups of the students by taking into consideration the resources required and resources available at the institute . Different group of students maybe offered different MODULE based on their choices .

II. INDUSTRY / EMPLOYER EXPECTED OUTCOME

Demonstrate critical social and life skills ethics, resilience, positive attitude , integrity and self-confidence at workplace and society at large.

III. COURSE LEVEL LEARNING OUTCOMES (COS)

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

- CO1 - Enhance the ability to be fully self-aware and take challenges by overcoming all fears and insecurities and grow fully.
- CO2 - Increase self-knowledge and awareness of emotional skills and emotional intelligence at the place of study/work.
- CO3 - Provide the opportunity to realizing self-potential through practical experience while working individually or in group.
- CO4 - Develop interpersonal skills and adopt good leadership behaviour for self-empowerment and empowerment of others.
- CO5 - Set appropriate life goals with managing stress and time effectively.

IV. TEACHING-LEARNING & ASSESSMENT SCHEME

Course Code	Course Title	Abbr	Course Category/s	Learning Scheme						Credits	Paper Duration	Assessment Scheme							
				Actual Contact Hrs./Week			SLH	NLH	Theory			Based on LL & TL		Bas					
				CL	TL	LL			FA-TH			SA-TH	Total		Practical				
															FA-PR	SA-PR	Sl		
Max	Max	Max/Min	Max/Min	Max/Min	Max/Min	Max/Min	Max/Min	Max/Min											
312003	SOCIAL AND LIFE SKILLS	SFS	VEC	-	-	-	2	2	1	-	-	-	-	-	-	-	-	-	50

Total IKS Hrs for Sem. : Hrs

Abbreviations: CL- Classroom Learning, TL- Tutorial Learning, LL-Laboratory Learning, SLH-Self Learning Hours, NLH-Notional Learning Hours, I Formative Assessment, SA -Summative assessment, IKS - Indian Knowledge System, SLA - Self Learning Assessment

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

Note :

1. FA-TH represents average of two class tests of 30 marks each conducted during the semester.
2. If candidate is not securing minimum passing marks in FA-PR of any course then the candidate shall be declared as "Detained" in that semester.
3. If candidate is not securing minimum passing marks in SLA of any course then the candidate shall be declared as fail and will have to repeat and re-appear in SLA work.
4. Notional Learning hours for the semester are (CL+LL+TL+SL)hrs.* 15 Weeks
5. 1 credit is equivalent to 30 Notional hrs.
6. * Self learning hours shall not be reflected in the Time Table.
7. * Self learning includes micro project / assignment / other activities.

V. THEORY LEARNING OUTCOMES AND ALIGNED COURSE CONTENT

Sr.No	Theory Learning Outcomes (TLO's) aligned to CO's.	Learning content mapped with Theory Learning Outcomes (TLO's) and CO's.	Suggested Learning Pedagogies
1	<p>TLO 1.1 Explain developmental needs and connection of various stakeholders</p> <p>TLO 1.2 Enlist the local problems</p> <p>TLO 1.3 Design a methodology for fieldwork</p> <p>TLO 1.4 Select the attributes of engineering and social system for measurement, quantification, and documentation</p> <p>TLO 1.5 Measure & quantify the quantities / systems parameters</p> <p>TLO 1.6 Write a report using information collected tStudy the data collected from fieldwork and conclude the observations</p>	<p>MODULE I : Activities Under Unnat Maharashtra Abhiyan (UMA)</p> <p>1.1 Introduction to Societal Needs and respective stakeholders : Regional societal issues that need engineering intervention</p> <p>1.2 Multidisciplinary approach-linkages of academia, society and technology</p> <p>1.3 Stakeholders' involvement</p> <p>1.4 Introduction to Important secondary data sets available such as census, district economic surveys, cropping pattern, rainfall data, road network data etc</p> <p>1.5 Problem Outline and stakeholders : Importance of activity and connection with Mapping of system components and stakeholders (engineering / societal)</p> <p>1.6 Key attributes of measurement</p> <p>1.7 Various instruments used for data collection - survey templates, simple measuring equipments</p> <p>1.8 Format for measurement of identified attributes/ survey form and piloting of the same</p> <p>1.9 Fieldwork : Measurement and quantifications of local systems such as agriculture produce, rainfall, Road network, production in local industries, Produce /service which moves from A to B</p> <p>1.10 Analysis and Report writing</p> <p>Report writing containing-</p> <ol style="list-style-type: none"> 1. Introduction of the topic 2. Data collected in various formats such as table, pie chart, bar graph etc 3. Observations of field visits and data collected. 	<p>i) Group discussion</p> <p>ii) Role play</p> <p>iii) Case study</p> <p>iv) Seminar and presentation</p> <p>Implementation guidelines suggest</p> <p>The course will be implemented in sessions and fieldwork:</p> <ol style="list-style-type: none"> a) Session I - Introduction to develop paradigm, fieldwork and case study pedagogy b) Session II - VII - Society, stakeholder value creation, measurements, rudimentary analysis and reporting c) Session VIII - Final closure session feedback and assessment d) Field work - <ol style="list-style-type: none"> 1. Pilot Visit - Pilot of survey instrument 2. Survey Visit 1 - Data gathering / Information Collection 3. Survey Visit 2 - Data gathering 4. Summary Visit - Closure after an <p>Methodology:</p> <p>Considering the nature of the course designed, following points shall be considered while implementing the course-</p> <ol style="list-style-type: none"> i) Regroup in the batches of 5-6 students conducting the fieldwork from the beginning. ii) Assign a few batches of the students to this course to all the faculty members iii) A group of course teachers will constitute governance bodies such as Municipal Corporations, Village Panchayats, Zilla Parishads, Panchayat Samitis to assist in their area of work. iv) The group of course teachers will conduct initial field visits to evaluate the possibilities of field visits / various places where in students can conduct fieldwork to measure / quantify the parameters /

Sr.No	Theory Learning Outcomes (TLO's) aligned to CO's.	Learning content mapped with Theory Learning Outcomes (TLO's) and CO's.	Suggested Learning Pedagog
2	<p>TLO 2.1 Adopt a Village or Slum for providing needed services to the community</p> <p>TLO 2.2 Carry out Survey to identify the problems of village community</p> <p>TLO 2.3 Undertake Special camping about developmental programs</p> <p>TLO 2.4 Establish the liaisons between government and other developmental agencies for the implementations of various development schemes of Government</p>	<p>MODULE II : National Service Scheme (NSS)</p> <p>2.1 Contacting Village/Area Leaders</p> <p>2.2 Primary socio economic survey of few villages in the vicinity of the institute.</p> <p>2.3 Selection of the village for adoption - conduct of activities</p> <p>2.4 Comprehensive Socio Economic Survey of the Village/Area</p> <p>2.5 Identification of Problem(s)</p> <p>2.6 Dissemination of information about the latest developments in agriculture, watershed management, wastelands development, non-conventional energy, low cost housing, sanitation, nutrition and personal hygiene, schemes for skill development, income generation, government schemes, legal aid, consumer protection and allied fields.</p> <p>2.7 A liaison between government and other development agencies for the implementation of various development schemes in the selected village / slum.</p>	<p>(i) The teachers should visit the village before adopting it for NSS activities</p> <p>(ii) The selected area should be convenient</p> <p>(iii) The community people should be receptive to the ideas of improving living standard. They should also be coordinate and involve in the projects undertaken by the NSS for their uplift.</p> <p>(iv) The areas where political conflicts are likely to arise should be avoided by units.</p> <p>(v) The area should be easily accessible to NSS volunteers to undertake frequent visits to slums.</p>
3	<p>TLO 3.1 Demonstrate Love and Compassion (Prem and Karuna) in the society</p> <p>TLO 3.2 Follow the path of Truth (Satya)</p> <p>TLO 3.3 Practice Non-Violence (Ahimsa)</p> <p>TLO 3.4 Follow the Righteousness (Dharma)</p> <p>TLO 3.5 Attain Peace (Shanti) in Life</p> <p>TLO 3.6 Provide Service (Seva) to the needy person/community.</p> <p>TLO 3.7 Demonstrate Renunciation (Sacrifice) Tyaga</p> <p>TLO 3.8 Practice Gender Equality and Sensitivity</p>	<p>MODULE-III : Universal Human Values</p> <p>3.1 Love and Compassion (Prem and Karuna): Introduction, Practicing Love and Compassion (Prem and Karuna)</p> <p>3.2 Truth (Satya) : Introduction, Practicing Truth (Satya)</p> <p>3.3 Non-Violence (Ahimsa) : Introduction, Practicing Non-Violence (Ahimsa)</p> <p>3.4 Righteousness (Dharma) : Introduction, Practicing Righteousness (Dharma)</p> <p>3.5 Peace (Shanti) : Introduction, Practicing Peace (Shanti)</p> <p>3.6 Service (Seva) : Introduction, Practicing Service (Seva)</p> <p>3.7 Renunciation (Sacrifice) Tyaga : Introduction, Practicing Renunciation (Sacrifice) Tyaga</p> <p>3.8 Gender Equality and Sensitivity: Introduction, Practicing Gender Equality and Sensitivity</p>	<p>i) Lectures</p> <p>ii) Demonstration</p> <p>iii) Case Study</p> <p>iv) Role Play</p> <p>v) Observations</p> <p>vi) Portfolio Writing</p> <p>vii) Simulation</p> <p>viii) Motivational talks by Practitioners</p> <p>ix) Site/Industry Visit</p>

Sr.No	Theory Learning Outcomes (TLO's) aligned to CO's.	Learning content mapped with Theory Learning Outcomes (TLO's) and CO's.	Suggested Learning Pedagog
4	<p>TLO 4.1 Demonstrate Punctuality appropriately</p> <p>TLO 4.2 Practice Cleanliness, Hygiene and Orderliness for self and others</p> <p>TLO 4.3 Take Responsibility and Calculated Risks</p> <p>TLO 4.4 Demonstrate Gratitude and Appreciations</p> <p>TLO 4.5 Show Determination & Persistence about work</p> <p>TLO 4.6 Give Respect as per the social norms and practice</p> <p>TLO 4.7 Respect Team Spirit to the acceptable level</p> <p>TLO 4.8 Practice Caring & Sharing among fellow citizens/community</p> <p>TLO 4.9 Demonstrate Honesty</p> <p>TLO 4.10 Practice for Forgive and Forget</p>	<p>MODULE-IV: Value Education (Unnati Foundation)</p> <p>4.1 Punctuality, Icebreaker and Simple Greeting, Understanding & Managing Emotions, Introducing Self, The power of a Positive Attitude, Talking about one's Family, Talking about one's Family, Making a Positive Impression, Give word list for a Word based</p> <p>4.2 Cleanliness , Hygiene and Orderliness , Likes and Dislikes, Developing Confidence in Self and Others, Strengths and Weaknesses, Listening Skills , Greeting gestures, Gender Equality and Sensitivity</p> <p>4.3 Responsibility, OCSEM- Visual Comprehension and Word Based Learning, Goal Setting – Make it happen, Follow, Like & Share Unnati Social Media - Facebook / Instagram/ Twitter Introducing Others, Time Management, Talking about the daily routine, Money Management</p> <p>4.4 Gratitude and Appreciation , Asking Simple Questions & Asking for the price , Stress Management, Student Referral process ,Comprehending & Paraphrasing Information, A Plate of Rice and Dignity of Labour, Topics for Public Speaking, Placement Process , OCSEM-E-Newspaper, Critical Thinking to overcome challenges</p> <p>4.5 Determination and Persistence, Guiding and Giving Directions, Language Etiquette & Mannerism, . Unnati Philosophy , b. Unnati Branding - Follow, Like & Share Unnati Social Media - Facebook / Instagram/ Twitter, Simple instructions to follow procedures, Assertiveness, Give topics for Debate, Describing a person/Objects, Refusal Skills, Word List for Word based Learning</p> <p>4.6 Respect, Comparing , OCSEM - Public Speaking, Student referral process, Attending a phone call, Being a Good Team Player , Placement Process, At a Restaurant, Workplace ethics</p> <p>4.7 Team Spirit, Inviting someone, OCSEM - Picture Reading & Word, a. Unnati Philosophy & b. Unnati Branding - Follow, Like & Share Unnati Social Media - Facebook / Instagram/ Twitter, Apologizing, Apologizing, Dealing effectively with Criticism, Introduce Importance of Self Learning and upskilling</p> <p>4.8 Caring and Sharing , Handling Customer queries, Flexibility & Adaptability, Student referral process, Writing a Resume, OCSEM-Public Speaking, Placement Process, Meditation/ Affirmation & OCSEM-Debate, Introduce Certif-ID, how to create Certif-ID Project ,</p> <p>4.9 Honesty, Email etiquette & Official Email communication, Alcohol & Substance use & abuse, Describing a known place , Leadership Skills, Describing an event, OSCEM-Picture Reading & Visual Comprehension</p> <p>4.10 Forgive and Forget, Facing and Interview, OSCEM-Public Speaking , Attending a telephonic/Video interview & Mock Interview , Affirmation , Pat-a-Back & Closure (Valediction , Unnati Branding, Student Testimonials), Meditation/ Affirmation & Sponsor connect (Speak to UNXT HO)</p>	<p>i) Video Demonstrations</p> <p>ii) Flipped Classroom</p> <p>iii) Case Study</p> <p>iv) Role Play</p> <p>v) Collaborative learning</p> <p>vi) Cooperative Learning</p> <p>vii) Chalk-Board</p>
5	<p>TLO 5.1 Develop Literacy About Savings and Investments in the community</p> <p>TLO 5.2 Attain Literacy About Financial Planning</p> <p>TLO 5.3 Demonstrate skills about Financial Transactions</p> <p>TLO 5.4 Use Literacy skills About Income, expenditure and budgeting</p> <p>TLO 5.5 Use measures about Inflation in the market.</p> <p>TLO 5.6 Use Literacy/Knowledge About Loans</p> <p>TLO 5.7 Explain the Importance of Insurance</p> <p>TLO 5.8 Follow Dos and Donts about finances</p>	<p>MODULE-V : Financial Literacy</p> <p>5.1 Introduction - Life Goals and financial goals</p> <p>5.2 Savings and Investments - Three pillars of investments, Popular asset classes, Government schemes, Mutual Funds, Securities markets (Shares and bonds), Gold, Real Estate, Do's and Don'ts of investments</p> <p>5.3 Retirement planning</p> <p>5.4 Cashless transactions</p> <p>5.5 Income, expenditure and budgeting – Concepts and Importance</p> <p>5.6 Inflation- Concept, effect on financial planning of an individual</p> <p>5.7 Loans – Types, Management of loans, Tax benefits</p> <p>5.8 Insurance – Types, Advantages, selection</p> <p>5.9 Dos and Donts in Financial planning and Transactions</p>	<p>i) Online/Offline Mode of Instruction</p> <p>ii) Video Demonstrations</p> <p>iii) Presentations</p> <p>iv) Case Study</p> <p>v) Chalk-Board</p> <p>vi) Collaborative learning</p>

VI. LABORATORY LEARNING OUTCOME AND ALIGNED PRACTICAL / TUTORIAL EXPERIENCES : NOT APPLICABLE.

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

Suggestive list of activities during Regular as well as Special Camping (NSS Activities)

- Following list is only an illustrative list of the type of activities that can be undertaken. Under the programme it would be open to each NSS Unit to un of these programmes or any other activity which may seem desirable to them according to local needs. The NSS Unit should aim at the integrated develop

area selected for its operation which could be a village or a slum. It has also to be ensured that at least a part of the programme does involve manual work

(a) Environment Enrichment and Conservation:

The activities under this sub-theme would inter-alia, include:

- (i) plantation of trees, their preservation and upkeep
- (ii) Construction & maintenance of village streets, drains
- (iii) Cleaning of village ponds and wells;
- (iv) Popularization and construction of Gobar Gas Plants, use of non-conventional energy;
- (v) Disposal of garbage & composting;
- (vi) Prevention of soil erosion and work for soil conservation,
- (vii) Watershed management and wasteland development
- (viii) Preservation and upkeep of monuments, and creation of consciousness about the preservation of cultural heritage among the community.

(b) Health, Family Welfare and Nutrition Programme:

- (i) Programme of mass immunization;
- (ii) Working with people in nutrition programmes with the help of Home Science and medical college students;
- (iii) Provision of safe and clean drinking water;
- (iv) Integrated child development programmes;
- (v) Health education, AIDS Awareness and preliminary health care.
- (vi) Population education and family welfare programme;
- (vii) Lifestyle education centres and counselling centres.

© Programmes aimed at creating an awareness for improvement of the status of women: (i) programmes of educating people and making them aware of rights both constitutional and legal;

- (ii) creating consciousness among women that they too contributed to economic and social well-being of the community;
- (iii) creating awareness among women that there is no occupation or vocation which is not open to them provided they acquire the requisite skills; and
- (iv) imparting training to women in sewing, embroidery, knitting and other skills wherever possible.

(d) Social Service Programmes:

- (i) work in hospitals, for example, serving as ward visitors to cheer the patients, help the patients, arranging occupational or hobby activities for long term guidance service for out-door-patients including guiding visitors about hospital's procedures, letter writing and reading for the patients admitted in the hospital, up of patients discharged from the hospital by making home visits and places of work, assistance in running dispensaries etc.
- (ii) work with the organisations of child welfare;
- (iii) work in institutions meant for physically and mentally handicapped;
- (iv) organising blood donation, eye pledge programmes;
- (v) work in Cheshire homes, orphanages, homes for the aged etc.;
- (vi) work in welfare organisations of women;
- (vii) prevention of slums through social education and community action;

(e) Production Oriented Programmes:

- (i) working with people and explaining and teaching improved agricultural practices;
- (ii) rodent control land pest control practices;
- (iii) weed control;
- (iv) soil-testing, soil health care and soil conservation;
- (v) assistance in repair of agriculture machinery;
- (vi) work for the promotion and strengthening of cooperative societies in villages;
- (vii) assistance and guidance in poultry farming, animal husbandry, care of animal health etc.;
- (viii) popularisation of small savings and assistance in procuring bank loans

(f) Relief & Rehabilitation work during Natural Calamities:

- (i) assisting the authorities in distribution of rations, medicine, clothes etc.;
- (ii) assisting the health authorities in inoculation and immunisation, supply of medicine etc.;
- (iii) working with the local people in reconstruction of their huts, cleaning of wells, building roads etc.;
- (iv) assisting and working with local authorities in relief and rescue operation;
- (v) collection of clothes and other materials, and sending the same to the affected areas;

(g) Education and Recreations: Activities in this field could include:

- (i) adult education (short-duration programmes);
- (ii) pre-school education programmes;
- (iii) programmes of continuing education of school drop outs, remedial coaching of students from weaker sections;
- (iv) work in crèches;
- (v) participatory cultural and recreation programmes for the community including the use of mass media for instruction and recreation, programmes of cooking, singing, dancing etc.;
- (vi) organisation of youth clubs, rural land indigenous sports in collaboration with Nehru Yuva Kendras;
- (vii) programmes including discussions on eradications of social evils like communalism, castism, regionalism, untouchability, drug abuse etc.;
- (viii) non- formal education for rural youth and
- (ix) legal literacy, consumer awareness.

VIII. LABORATORY EQUIPMENT / INSTRUMENTS / TOOLS / SOFTWARE REQUIRED

Sr.No	Equipment Name with Broad Specifications	Relevant LLO Number
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Sr.No	Equipment Name with Broad Specifications	Relevant LLO Number
1	Simple engineering measurement devices GPS data collection tools GIS open source softwares- Google Earth and QGIS MS office suite	All

IX. SUGGESTED WEIGHTAGE TO LEARNING EFFORTS & ASSESSMENT PURPOSE (Specification Table) : NOT APPLICABLE

X. ASSESSMENT METHODOLOGIES/TOOLS

Formative assessment (Assessment for Learning)

- Formative assessment (Assessment for Learning) Report and presentation of fieldwork activities, Self-Learning (Assignment)

Summative Assessment (Assessment of Learning)

XI. SUGGESTED COS - POS MATRIX FORM

Course Outcomes (COs)	Programme Outcomes (POs)							Program Outcomes	
	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					03	03	03		
CO2					02	02	03		
CO3	01	01	01		03	03	03		
CO4		01	01	01	03	03	03		
CO5		02		01	03	03	03		

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

XII. SUGGESTED LEARNING MATERIALS / BOOKS

Sr.No	Author	Title
1	IRAP, Hyderabad, CTARA, IIT Bombay and UNICEF, Mumbai	Compendium of Training Materials for the Capacity Building of the Faculty and Students of Engineering Colleges on 'IMPROVING THE PERFORMANCE OF RURAL WATER SUPPLY AND SANITATION SECTOR IN MAHARASHTRA' Districts Economic survey reports
2	Central Public Health and Environmental Engineering Organisation	Manual on Water Supply and Treatment
3	Specifications And Standards Committee	Indian Standards (IS) Codes and Indian Roads Congress (IRC) Codes
4	Prepared by each district administration	Districts Economic survey reports
5	Local college students, UMA staffs	Sample Case Studies on UMA website
6	RBI	https://www.rbi.org.in/FinancialEducation/content/GUIDE310113_F.pdf
7	RBI	https://www.rbi.org.in/FinancialEducation/content/Financing%20needs%20of%20Micro%20and%20small%20Enterprises%20-%20A%20guide.pdf
8	RBI	https://www.rbi.org.in/FinancialEducation/content/I%20Can%20Do_RBI.pdf

XIII. LEARNING WEBSITES & PORTALS

Sr.No	Link / Portal	Description
1	https://gr.maharashtra.gov.in/Site/Upload/Government%20Resolutions/English/201601131501523808.pdf	Government Resolution of Government of Maharashtra regarding Unna Maharashtra Abhiyan
2	https://gr.maharashtra.gov.in/Site/Upload/Government%20Resolutions/English/201606151454073708.pdf	Government Resolution of Government of Maharashtra regarding Unna Maharashtra Abhiyan Guidelines
3	https://censusindia.gov.in/census.website/	A Website of Census of India

Sr.No	Link / Portal	Description
4	https://gsda.maharashtra.gov.in/english/	A Website of Groundwater Survey and Development Agency, GoM
5	https://mrsac.gov.in/MRSAC/map/map	A Website where district-wise maps showcasing different attributes dev Maharashtra Remote Sensing Applications Centre.
6	https://ejalshakti.gov.in/jjmreport/JJMIndia.aspx	A Website of Jal Jivan Mission, Government of India
7	https://cpcb.nic.in/	A Website of Central Pollution Control Board, Government of India
8	http://www.mahapwd.com/#	A Website of Public Works Department, GoM
9	http://tutorial.communitygis.net/	A Website for GIS data sets developed by Unnat Maharashtra Abhiyan
10	https://youtu.be/G71maumVZ1A?si=TzDTxKUpLYaRos7U	A video record of lecture by Prof. Milind Sohoni, IIT Bombay, on Engir Development and Society
11	https://youtu.be/TUcPNwtdKyE?si=wnSWrhGc9dJTC-ac	A keynote talk by Prof. Milind Sohoni, IIT Bombay, on Interdisciplinary Engineering: The Road Ahead
12	https://youtu.be/mKJj6j_1gWg?si=ajE8s4lfB2OM63Ng	A TED talk by Prof. Milind Sohoni, IIT Bombay, on Vernacular Science Science of Delivery
13	https://www.ugc.gov.in/pdfnews/4371304_LifeSkill_JeevanKaushal_2023.pdf	UHV: UGC Course on life skills. Unit 4 i.e. Course 4 is to be referred
14	https://nss.gov.in/	NSS : Know about the NSS Scheme and details
15	https://www.rbi.org.in/FinancialEducation/FinancialEntrepreneur.aspx	Reference for Module V
16	https://www.rbi.org.in/FinancialEducation/content/I%20Can%20Do_RBI.pdf	Reference for Module V
17	https://www.rbi.org.in/FinancialEducation/content/Financing%20needs%20of%20Micro%20and%20small%20Enterprises%20-%20A%20guide.pdf	Reference for Module V
18	https://www.rbi.org.in/FinancialEducation/content/GUIDE310113_F.pdf	Reference for Module V

Programme Name/s	: Architecture Assistantship/ Automobile Engineering./ Artificial Intelligence/ Agricultural Engineering/ Artificial Intelligence and Machine Learning/ Automation and Robotics/ Architecture/ Cloud Computing and Big Data/ Civil Engineering/ Chemical Engineering/ Computer Technology/ Computer Engineering/ Civil & Rural Engineering/ Construction Technology/ Computer Science & Engineering/ Fashion & Clothing Technology/ Dress Designing & Garment Manufacturing/ Digital Electronics/ Data Sciences/ Electrical Engineering/ Electronics & Tele-communication Engg./ Electrical Power System/ Electronics & Communication Engg./ Electronics Engineering/ Food Technology/ Computer Hardware & Maintenance/ Instrumentation & Control/ Industrial Electronics/ Information Technology/ Computer Science & Information Technology/ Instrumentation/ Interior Design & Decoration/ Interior Design/ Civil & Environmental Engineering/ Mechanical Engineering/ Mechatronics/ Medical Laboratory Technology/ Medical Electronics/ Production Engineering/ Printing Technology/ Polymer Technology/ Surface Coating Technology/ Textile Technology/ Electronics & Computer Engg./ Travel and Tourism/ Textile Manufactures
Programme Code	: AA/ AE/ AI/ AL/ AN/ AO/ AT/ BD/ CE/ CH/ CM/ CO/ CR/ CS/ CW/ DC/ DD/ DE/ DS/ EE/ EJ/ EP/ ET/ EX/ FC/ HA/ IC/ IE/ IF/ IH/ IS/ IX/ IZ/ LE/ ME/ MK/ ML/ MU/ PG/ PN/ PO/ SC/ TC/ TE/ TR/ TX
Semester	: Second
Course Title	: PROFESSIONAL COMMUNICATION
Course Code	: 312002

I. RATIONALE

Communication is key to 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 are essential for engineering professionals to instruct, guide and motivate peers/ subordinates to achieve desired goals at work place. Strong Communication skills are highly valued in the professional world and contribute to career growth and opportunities. Thus, this course has been designed to enhance the professional communication skills for effective presentation both in written and oral forms at workplace.

II. INDUSTRY / EMPLOYER EXPECTED OUTCOME

1. Communicate effectively at workplace. 2. Issues can be identified and resolved by brainstorming solutions 3. Effective communication ensures strong decision making

III. COURSE LEVEL LEARNING OUTCOMES (COS)

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

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

IV. TEACHING-LEARNING & ASSESSMENT SCHEME

Course Code	Course Title	Abbr	Course Category/s	Learning Scheme					Credits	Paper Duration	Assessment Scheme										Total Marks
				Actual Contact Hrs./Week			SLH	NLH			Theory			Based on LL & TL				Based on SL			
				CL	TL	LL					FA-TH	SA-TH	Total	Practical		SLA					
														FA-PR	SA-PR	Max	Min	Max	Min		
312002	PROFESSIONAL COMMUNICATION	PCO	SEC	-	-	2	-	2	1	-	-	-	-	-	25	10	25@	10	-	-	50

Total IKS Hrs for Sem. : 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, *# On Line Examination , @\$ Internal Online Examination Note :

1. FA-TH represents average of two class tests of 30 marks each conducted during the semester.
2. If candidate is not securing minimum passing marks in FA-PR of any course then the candidate shall be declared as "Detained" in that semester.
3. If candidate is not securing minimum passing marks in SLA of any course then the candidate shall be declared as fail and will have to repeat and resubmit SLA work.
4. Notional Learning hours for the semester are (CL+LL+TL+SL)hrs.* 15 Weeks
5. 1 credit is equivalent to 30 Notional hrs.
6. * Self learning hours shall not be reflected in the Time Table.
7. * Self learning includes micro project / assignment / other activities.

V. THEORY LEARNING OUTCOMES AND ALIGNED COURSE CONTENT

Sr.No	Theory Learning Outcomes (TLO's)aligned to CO's.	Learning content mapped with Theory Learning Outcomes (TLO's) and CO's.	Suggested Learning Pedagogies.
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 suggestive remedies TLO 1.3 Use different types of verbal and non-verbal communication for the given situation	Unit - I Professional Communication : An Overview 1.1 Definition of professional communication- Importance, relevance, Elements and process of communication 1.2 7 C's of Professional Communication (Clarity, Conciseness, correctness, Coherent, concrete, courteous and Complete) 1.3 Types –Verbal (Oral-Written),Formal, Informal (Grapevine), Vertical 1.4 Barriers to communication,Types of barriers (Linguistic, Psychological, Technological)	Language lab Role plays Chalk board Reference books Case studies
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, seminars . Make use of types of note taking and note making for different subjects / topics	Unit - II Listening & Note Taking 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

Sr.No	Theory Learning Outcomes (TLO's) aligned to CO's.	Learning content mapped with Theory Learning Outcomes (TLO's) and CO's.	Suggested Learning Pedagogies.
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	Unit - III Office Drafting 3.1 Format of Notice and Circular 3.2 Drafting Agenda 3.3 Preparing Minutes of meeting	white board Language Lab Reference books Classroom learning
4	TLO 4.1 Compose cover letter and CV / Resume for jobs TLO 4.2 Apply E- mail Etiquette for professional purposes TLO 4.3 Compose E- mails for different official purposes	Unit - IV Writing Skills for Professional Communication 4.1 Job Application with Resume / CV 4.2 E-Mail Etiquettes 4.3 Writing official E- Mails to communicate intended purposes 4.4 Drafting Enquiry letter and Complaint letter	Language lab Classroom learning NPTEL Reference books
5	TLO 5.1 Compose technical reports TLO 5.2 Draft accident / Investigation/ Daily reports	Unit - V Report Writing 5.1 Introduction to report writing 5.2 Accident Report 5.3 Investigation Report 5.4 Daily Report	Chalk and talk Language Lab Collaborative learning Classroom learning

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

Practical / Tutorial / Laboratory Learning Outcome (LLO)	Sr No	Laboratory Experiment / Practical Titles / Tutorial Titles	Number of hrs.	Relevant COs
LLO 1.1 Draw communication cycle using real life examples and explain process of communication.	1	*Communication Process and Cycle	2	CO1
LLO 2.1 Undertake the Role play / Group discussion to illustrate types / barriers to communication	2	Role plays and Group Discussion	2	CO1
LLO 3.1 Listen to audios in the language lab and make notes of it.	3	*Active Listening	2	CO2
LLO 4.1 Give a presentation / Seminar using 7 C's of Communication.	4	*Presentations / Seminars	2	CO1
LLO 5.1 Explain the types of note taking with examples and make notes on any one topic related to your curriculum.	5	*Note taking and Note Making	2	CO2
LLO 6.1 Prepare agenda for meeting and draft minutes of the meeting.	6	*Agenda and Minutes of the meeting	2	CO3
LLO 7.1 Draft circulars for the given situation .	7	*Office Drafting	2	CO3
LLO 8.1 Respond to job advertisements referring newspapers, LinkedIn. Write cover letter with resume /CV.	8	*Type Job Application with Resume / CV	2	CO4
LLO 9.1 Type Four (formal) E-mails using ethics and etiquette.	9	* E- Mail writing	2	CO4
LLO 10.1 Write a detailed report on Accident/ Investigation .	10	*Technical Report writing	2	CO5
LLO 11.1 Prepare a case study related to linguistic barriers : language ,pronunciation, punctuation, technical jargon and suggest remedies for the same.	11	*Barriers to Communication	2	CO1
LLO 12.1 Draft complaint / enquiry letter for various situations	12	Complaint and Enquiry letter	2	CO4

Practical / Tutorial / Laboratory Learning Outcome (LLO)	Sr No	Laboratory Experiment / Practical Titles / Tutorial Titles	Number of hrs.	Relevant COs
LLO 13.1 List psychological barriers to communication LLO 13.2 Prepare case studies on any two psychological barriers and suggest remedies to overcome the barriers	13	Psychological barriers to Communication	2	CO1
LLO 14.1 Draw flow chart and mind mapping for any topic related to the curriculum.	14	*Listening Skills	2	CO2
LLO 15.1 Face mock interview arranged by your teacher.	15	* Typed Job Application , Resume / CV/ formal dressing and Interview	2	CO4
Note : Out of above suggestive LLOs - <ul style="list-style-type: none"> *Marked Practicals (LLOs) Are mandatory. Minimum 80% of above list of lab experiment are to be performed. Judicial mix of LLOs are to be performed to achieve desired outcomes. 				

VII. 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 life long learnings . Explain with appropriate examples and real life case studies.
- Collect (four to five) emails with technical jargons, barriers, make required corrections and keep a record of both the mails (original and Corrected one)
- 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
- Prepare a case study on Technological /Psychological barriers to communication

Reading for vocabulary and sentence structure

- Read any motivational book and present a review of the book

Note :

Only one micro-project is planned to be undertaken by a student that needs to be assigned to him/her in the beginning of the semester. S/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 dated work diary consisting of individual contribution in 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 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.

VIII. LABORATORY EQUIPMENT / INSTRUMENTS / TOOLS / SOFTWARE REQUIRED

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

IX. SUGGESTED WEIGHTAGE TO LEARNING EFFORTS & ASSESSMENT PURPOSE (Specification Table) : NOT APPLICABLE

X. ASSESSMENT METHODOLOGIES/TOOLS**Formative assessment (Assessment for Learning)**

- Term Work, Micro Project

Summative Assessment (Assessment of Learning)

- Practical Exam of 25 marks using language lab

XI. SUGGESTED COS - POS MATRIX FORM

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

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

XII. 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 978-13-16640-08-1
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

Sr.No	Link / Portal	Description
3	https://www.udemy.com	Communication skills training courses
4	http://www.makeuseof.com	Dale Carnegie's free resources