GOVERNMENT OF ASSAM

DIRECTORATE OF TECHNICAL EDUCATION : ASSAM

FINAL DRAFT (2017-18)

CURRICULAR STRUCTURE & SYLLABI
OF
3-YEARS FULL TIME DIPLOMA COURSE
IN

PRINTING TECHNOLOGY

UNDER

STATE COUNCIL FOR TECHNICAL EDUCATION:
ASSAM KAHILIPARA: GUWAHATI-781019

3RD SEMESTER

COURSE STRUCTURE OF 3RD SEMESTER (PRINTING TECHNOLOGY)

Sl No	Code No	Subject	Contact hours /week			Evaluation scheme									
						Theory (Th)					Practical (Pr)			Total Marks (Th+Pr)	Credit
			L	T	P	ESE	Sessional (SS)			Pass (ESE+SS)	Practical Test(PT)	Practical Assessment (PA)	Pass (PT+ PA)		
							TA	HA	Total (TA+ HA)						
1	Co-301	Computer Application & Programming	3		3	70	10	20	30	33/100	25	25	17/ 50	150	4
2	Hu-302	Engineering Economics & Accountancy	3		-	70	10	20	30	33/100	-	-	-	100	3
3	El-304	Elements of Electrical Engineering	3	-	3	70	10	20	30	33/100	25	25	17/ 50	150	4
4	Et-304	Elements of Electronics Engineering	3	1	3	70	10	20	30	33/100	25	25	17/ 50	150	4
5	Pt-301	Printing Process	3		3	70	10	20	30	33/100	25	25	17/ 50	150	4
6	Pt-302	Prepress Reprotechnique	3			70	10	20	30	33/100	-	-	-	100	3
7	Pt-310	Professional Practice- I	1		2						25	25	17/ 50	50	2
			19	1	14								**Total**	**850**	**24**

1. Course title: Computer Application & Programming

2: Course Code –Co-301

3: Semester- 3rd

4: Aim of the Course :

- To give basic concepts related to organization of a computer
- To give fundamental terminologies in networking
- To develop simple programs in C.

5: Course Outcome:

On completion of the course students will be able to:

- Explain the basics of a computer hardware and software
- Solve problems related to number systems
- Define basics of Operating System
- Familiarize with networking components
- Write simple C programs

6: Prerequisites for the Course: Have basic idea about a computer and its functions.

7: Teaching Scheme (in hours):

Teaching Scheme			
L	T	P	Total hours per week
3	0	3	6

8: ExaminationScheme :

	Theory (T)	Sessional (TS)	Practical (P)	Practical Sessional (PS)
Full Marks	70	30	25	25
Pass Marks	33		17	

9: Detailed Course Content:

Unit	Topic/Sub-Topics	Intended Learning Outcome	Hours
1	**Computer Architecture:** Brief history, Charles Babbage Machine, Von Neumann Architecture, block diagram, memory &it's different types, I/O devices, Role of O.S., computer languages, translator software, editor. Data, different types of data, information and its characteristics	1. Define a computer and identify its parts. 2. Define computer memory & describe its different types. 3. Define computer languages & translators. 4. Describe the characteristics of information.	**8**
2	**Number System and codes:** Different number system- decimal, binary, octal, hexadecimal number system, their conversion, 1's and 2's Complement, subtraction using complements. Different codes- ASCII, BCD, Ex-3, Gray. Conversion from Gray to binary and vice-versa, BCD addition.	5. Define decimal, binary, octal & hexadecimal number systems. 6. Convert between different number systems. 7. Define 1's & 2's complements. 8. Subtract using 1's & 2's complements. 9. Describe some different codes.	**8**

Unit	Topic/Sub-Topics	Intended Learning Outcome	Hours
3	**Introduction to Operating System:** Definition, single user and multi-user OS, different function performs by OS, various popular OS like DOS, Windows, UNIX/LINUX. DOS and UNIX commands.	10. Define operating system. 11. Operate different commands of DOS, Windows & UNIX/LINUX.	**5**
4	**Computer Network and the Internet:** Definition, necessity of network, different types of network-LAN, MAN, WAN, network topology, transmission media, different network devices like NIC, hub, bridge, switch, gateway. Introduction to the internet, Internet services, browser, search engine.	12. Define network. 13. Describe different types of network. 14. Define network topology. 15. Describe different network devices. 16. Define internet & describe different internet services. 17. Explain use of different browsers & search engines.	**6**
5	**Introduction to C programming:** Fundamentals of programming-Algorithm & Flowchart, source code and object code,, Basic structure of C programs, Executing a C program, Constants, Variables, and data types. Operators and expression, Input Output function like printf, scanf, getchar, putchar, gets, puts, Decision making and branching using IF..Else, Switch, looping using for, while, and do-while, array.	18. Write algorithm and flow charts for simple programs 19. Define basic terminology of C language. 20. Write small programusing C language. 21. Write diversified solutions using C language. 22. Differentiate between IF..Else and Switch statement.	**15**
	Internal Assessment		**3**

10: Distribution of Marks:

Unit	Topic	Type of Question			Total Marks
		Objective	Short	Descriptive	
1	Computer Architecture	6	5	5	16
2	Number System and codes	4	2	8	14
3	Introduction to Operating System	4	2	4	10
4	Computer Network and the Internet	5	3	6	14
5	Introduction to C programming	6	3	7	16
		25	15	30	70

11: Table of specification :

Unit	Topics (a)	Time allotted in hours (b)	Percentage Weightage (c)	K	C	A	HA
1	Computer Architecture	8	19	✓			
2	Number Systems & Codes	8	19	✓		✓	
3	Introduction to Operating Systems	5	12	✓			
4	Computer Network & the Internet	6	15	✓		✓	
5	Introduction to C Programming	15	35	✓		✓	
Total		Σ b=42	100				

K = KnowledgeC =Comprehension A =ApplicationHA =Higher Than Application (Analysis, Synthesis, Evaluation)

$$c = \frac{b}{\Sigma b} * 100$$

Detailed Table of Specifications

Unit	Topics	Objective				Short					Descriptive				
		K	C	A	T	K	C	A	HA	T	K	C	A	HA	T
1	Computer Architecture	7			7	5				5	4				4
2	Number Systems & Codes	4			4	2				2	4		4		8
3	Introduction to Operating Systems	4			4	2				2	4				4
4	Computer Network & the Internet	5			5	3				3	3		4		7

5	**Introduction to C Programming**	5			5	3				3	3		4		7
Total		25			25	15				15	18		12		30

K = Knowledge C = Comprehension A = Application HA = Higher Than Application T = Total

10. Intellectual Skills :

- Logical reasoning
- Relating programming concepts in problem solving

11. Motor Skills :

- Learn to use and handle a computer and its peripherals.

List of Lab Exercises :

I. Basic commands for computer system maintenance.

II. Preparation of Documents

Introduction to Word processing, Opening a document, preparing documents, inserting diagrams and tables, Editing document- (a) Character, word and line editing, (b) Margin Setting, Paragraph alignment, (c) Block Operations, (d) Spell Checker, (e) Saving a document, (f) Mailmerge.

III. Information Presentation through Spread Sheet

Application of Spread Sheet, Structure of spreadsheets, preparing table for simple data and numeric operations, using formulae and functions in excel operations, Creation of graphs, Pie charts, bar charts.

IV. Preparation of presentation

Creation of electronic slides on any topic, Practice of animation effect, presentation of slides.

V. Programming in C

Editing a C program, defining variables and assigning values to variables Arithmetic and relational operators, arithmetic expressions and their evaluation Practice on in iput/output function like getchar, putchar, gets, puts, scanf, printf etc. Programming exercise on simple if statement, If..else statement, switch statement Programming exercise on looping with do-while, while, for loop and array.

1. Course Title : **ENGINEERING ECONOMICS AND ACCOUNTANCY**
2. Course Code: **Hu – 302**
3. Semester: **3rd**
4. Aim of the Course:

1. To introduce the students to some important economic and accounting terms.

2. To acquaint the students with some economic laws and with the functions of money, bank etc.

3. To make the students capable of recording business transaction under double entry system.

4. To introduce the students about financial statements.

5. Course Outcomes:

On completion of the course on EEA, students will be able to

- CO_1 = Define some important economic and accounting terms.
- CO_2 = explain some basic economic laws.
- CO_3 = Describe overall economic environment.
- CO_4 = explain double entry system of book keeping.
- CO_5 = record business transactions under double entry system of book keeping
- CO_6 = define financial statements.

1. **Teaching Scheme (in hours)**

Lecture	Tutorial	Practical	Total
42 hrs	**3 hrs**	**--**	**45 hrs**

2. **Examination Scheme:**

Theory				Practical				Total Marks
Examination Full Marks	Sessional Full Marks	Total Marks	Pass Marks	Examination		Sessional		
70	30	100	33	--	--	--	--	100

3. Detailed Course Content:

Chapter No.	Chapter Title	Content	Intended Learning Outcomes	Duration (in hours)
Part – A : Engineering Economics				**21 hrs**
1.0	**Introduction to Economics :**	i) Definition of Economics, its utility and scope of study ii) Definition of Engineering Economics ii) Meaning and concepts of Utility, Consumption, Value, Price, Goods and National Income, inflation iii) Wants – Definition and characteristics iv) Wealth & Welfare– Definition, meaning and types	i) explain core economic terms concepts and theories	5
2.0	**Demand and Supply :**	i) Meaning and types of Demand ii) The Law of Demand, its limitations iii) Preparation of Demand Schedule iv) Meaning of Supply ii) The Law of Supply, its limitations iii) Preparation of Supply Schedule	Define the Laws of Demand and Supply	4
3.0	**Production :**	i) Meaning and factors of production ii)Factors determining efficiency of labour iii) Savings, investment and capital formation iv)Meaning of production function	i) Define factors of production ii) Explain formation of capital	5
4.0	**Money:**	i) Meaning of money ii) Types of money iii) Functions of money	i) Understand meaning and functions of money	2

Chapter No.	**Chapter Title**	Content	Intended Learning Outcomes	Duration (in hours)
5.0	**Banking Organization :**	i) Central Bank – its functions ii) Commercial banks – its functions	i) Distinguish the functions of different banks	3
6.0	Pricing	i) Objectives of pricing policy ii) price determinants iii) Price discrimination	i) explain pricing policy	2
Part – B : Accountancy				**21 hrs**
7.0 (A)	**Introduction to Book-Keeping and Accounting:**	i) Definition & objectives of Book-keeping ii) Need and advantages of Book-keeping iii) Definition of Accounting iv) Difference between Book-keeping and Accounting v) Double Entry System – main features vi) Advantages and disadvantages of Double Entry System	i) Define Double Entry System of Book Keeping ii) State its objectives, features merits and demerits	3
(B)	**Introduction to Computerized Accounting System:**	i) Components of Computerized Accounting Software ii) Need for Computerized Accounting iii) Difference between Manual Accounting and Computerized Accounting	i) Identify components of computerized accounting software	2
8.0	**Transaction:**	i) Definition ii) Meaning of Account iii) Classification of Accounts: - Traditional Approach - Modern Approach iv) Meaning of Debit and Credit v) Rules of Debit and Credit	i) State the meaning and rules of Debit and Credit	2

Chapter No.	**Chapter Title**	Content	Intended Learning Outcomes	Duration (in hours)
9.0	**Journal and Ledger**	i) Meaning Journal ii) Recording of Transactions in Journal iii) Meaning of Ledger iv) Objectives and utility of Ledger v) Posting and balancing of Ledger vi) Distinction between Journal and Ledger vii) Names of different Books of Accounts	i) Record business transactions under double entry system in books of accounts	4
10.0	**Cash Book:**	i) Meaning and importance of Cash Book ii) Characteristics and advantages of Cash Book iii) Discount – Trade Discount and Cash Discount iv) Different types of Cash Book: - Single Column Cash Book - Double Column Cash Book - Triple Column Cash Book v) Bank Reconciliation Statement – Basic idea	i) Differentiate different types of Cash Book ii) Record transactions in Cash Book	4
11.0	**Trial Balance & Errors in Accounting:**	i) Meaning and objects of Trial Balance ii) Main features and advantages of Trial Balance iii) Preparation of Trial Balance iv) Types of errors in Accounting	i) Explain meaning and features of Trial balance	3

Chapter No.	**Chapter Title**	Content	Intended Learning Outcomes	Duration (in hours)
12.0	**Components of Final Accounts:**	i) Meaning and objectives of Trading Account ii) Contents of Trading Account iii) Meaning and objectives of Profit and Loss Account iv) Contents of Profit and Loss Account v) Meaning of depreciation, revenue expenditure and capital expenditure vi) Contents of Balance Sheet	i) Identify different components of Financial Statements	3
	Class Test			3 hrs
	Total			**45 hrs**

9 . TABLE OF SPECIFICATIONS for Engineering Economics & Accountancy

Sl. No	**Topic** (a)	**Time allotted in hours (b)**	**Percentage Weightage (c)**	Knowledge	Comprehension	**Application**	**HA**
1	Introduction to Economics	5	12	5	3	0	0
2	Demand & Supply	4	9	2	4	0	0
3	Production	5	12	6	2	0	0
4	Money	2	5	4	0	0	0
5	Banking Organization	3	7	3	2	0	0
6	Pricing	2	5	2	2	0	0

Sl. No	Topic (a)	Time allotted in hours (b)	Percentage Weightage (c)	Knowledge	Compre-hension	Application	HA
7	(A) Introduction to Book-Keeping	3	7	5	0	0	0
	(B) Introduction to Computerized Accounting System	2	5	3	0	0	0
8	Transaction	2	5	2	1	0	0
9	Journal & Ledger	4	9.5	2	2	3	0
10	Cash Book	4	9.5	0	5	2	0
11	Trial Balance & Errors in Accountancy	3	7	5	0	0	0
12	Components of Final Accounts	3	7	2	3	0	0
Total		**42 hrs**	**100**	**41**	**24**	**5**	**0**

K = Knowledge C = Comprehension A = Application

A = Higher than Application (Analysis, Synthesis, Evaluation)

$$\mathbf{C}=\frac{b}{\sum b}\times 100$$

10 Distribution of Marks:

DETAILED TABLE OF SPECIFICATIONS FOR EEA

Sl. No	Topic	OBJECTIVE TYPE				SHORT ANSWER TYPE					ESSAY TYPE					Grand
		K	C	A	T	K	C	A	HA	T	K	C	A	HA	T	Total
1	Introduction	3	1	0	4	2	2	0	0	4	0	0	0	0	0	8
2	Demand & Supply	0	0	0	0	0	0	0	0	0	2	4	0	0	6	6
3	Production	1	0	0	1	2	0	0	0	2	3	2	0	0	5	8
4	Money	2	0	0	2	2	0	0	0	2	0	0	0	0	0	4
5	Banking Organization	1	0	0	1	0	0	0	0	0	2	2	0	0	4	5
6	Pricing	2	2	0	4	0	0	0	0	0	0	0	0	0	0	4
7	Introdu to B K	2	0	0	2	3	0	0	0	3	0	0	0	0	0	5
	Introduc to Comput	3	0	0	3	0	0	0	0	0	0	0	0	0	0	3
8	Transact	2	0	0	2	0	1	0	0	1	0	0	0	0	0	3
9	Journal & Ledge	1	0	0	1	0	0	0	0	0	1	2	3	0	6	7
10	Cash Book	0	2	0	2	0	0	0	0	0	0	3	2	0	5	7
11	Trial Balance	3	0	0	3	2	0	0	0	2	0	0	0	0	0	5
12	Componts F/Ac	0	0	0	0	0	0	0	0	0	2	3	0	0	5	5
	Total	20	5	0	25	11	3	0	0	14	10	16	5	0	31	70

K = Knowledge C = Comprehension A = Application

HA = Higher Than Application**Higher than Application (Analysis, Synthesis, Evaluation)**

T = Total

11 Suggested implementation Strategies: Modified syllabus may be implemented with effect from July, 2018 (Starting with the present batch (2018) of 2nd Semester students)

12 **Suggested learning Resource**:

a. Book list

Sl. No.	Title of Book	Name of Author(s)	Publisher
1	Introductory Micro Economics	Sandeep Garg	Dhanpat Rai Publication Pvt. Ltd.
2	Introductory Macro Economics	Sandeep Garg	Dhanpat Rai Publication Pvt. Ltd.
3	Theory and Practice of Accountancy	B. B. Dam R. A. Sarda R. Barman B. Kalita	Capital Publishing Company, Guwahati – 5
4	Book-Keeping & Accountancy	Juneja, Chawla & Saksena	Kalyani Publisher, New Delhi - 110002
5	Tally. ERP 9 For Beginners	Tally Solutions Pvt. Ltd.	Sahaj Enterprises, Bangalore
6			
7			
8			

b. List of Journals

c. Manuals

d. Others

---

1. Course Title: Elements of Electrical Engineering

2. Course Code: El - 304

3. Semester: 3rd

4. Rationale of the Subject:

Technology integration is the main characteristic of present engineering development. Now a day, it is necessary to possess basic knowledge of various engineering discipline. The main objective of this subject is to enhance the knowledge and skill level in inter disciplinary area. This course is designed to impart basic knowledge of Electrical Engineering to the students of other disciplines like Civil, Mechanical etc.

5. Aim:

1. To impart basic knowledge of electrical engineering and preliminary idea of DC machine and transformer to the student of branches other than electrical.

2. To enhance the knowledge and skill level of electrical engineering in interdisciplinary area.

6. Objective:

The student will be able to

1. Know circuits with series and parallel resistances, power, energy.

2. Know AC wave form and its various quantities.

3. Interpret the response of R, L, C to AC supply.

4. Know calculation of various parameters of AC series circuit.

5. Know construction, working principle and use of DC machine, transformer.

6(a) COURSE OUTCOMES:-

On successful completion of the course the student will be able to –

CO 1: Define conductor, insulator, current, voltage. Understand Ohm's law, work, power, energy and solve numerical problem.

CO 2: Explain construction, working principle, application, starting and operation of DC generator and motor.

CO 3: Develop emf equation of single phase ac system, analyze R, L, C, R-L, R-C and R-L-C circuit and know the use of j operator.

CO 4: Understand the construction and working principle of transformer.

CO 5: Know construction, working principle and starting of induction motor.

7. Pre-Requisite:

1. Resistance, inductance, capacitance.

2. Simple differential calculus & integral calculus, matrix.

8. Teaching Scheme (in hours per week):

Lecture	Tutorial	Practical	Total
3hrs	1hrs	3hrs	7hrs/week

9. Examination Scheme:

Theory Theory			Pass marks (ESE+SS)	Practical		Pass marks(PT+PA)	Total marks (Th+Pr)	Credit
ESE	Sessional(SS)		33/100	PT	PA	17/50	150	4
	TA	HA		25	25			
70	10	20						

10. Detailed Course Content:

Chapter No	Chapter Title	Content	Duration (in hours)
1.0	Introduction	1.1 Conductor and Insulator --- Type, Properties and Uses 1.2 Definitions – Current, Voltage, Resistance	1
2.0	Work, Power, Energy and DC Circuit	2.1 Work, Power, Energy – definitions and units, relations, simple problems 2.2 Resistance and resistivity, Conductance and conductivity, Factors on which resistance depends, Effect of temperature on resistance 2.3 Ohm's law, resistance in series, Voltage division rule, Resistance in parallel, Current division rule, Simple problems 2.4 Network terminology – Circuit, parameter, Linear circuit, Non-linear circuit, Bilateral circuit, Unilateral circuit, Electric network, Active and passive element, Active and passive network, Node, Junction, Branch, Loop, Mesh. 2.5 Kirchhoff's point law, Voltage law and problems	9
3.0	D. C. Generator	3.1 Faraday's laws of electromagnetic induction 3.2 Fleming's right hand rule 3.2 Principle of D. C. Generator, Construction, types, Emf equation, Uses and simple problems	5

4.0	D. C. Motor	4.1 Lenz's law 4.2 Fleming's left hand rule 4.2 Principle of D. C. motor, Construction, types, Back Emf, Uses and simple problems	5
5.0	A.C. Fundamentals	5.1 Definitions, Equations, Cycle, Time period, Frequency, Amplitude, Phase, Phase difference, RMS value, Average value, Maximum values, form factor, Crest factor, Simple problem	3
6.0	A.C. Series Circuit	6.1 Definitions – Inductance, Inductive reactance, Capacitance, Capacitive reactance, impedance 6.2 A. C. through pure resistance, pure inductance and pure capacitance 6.3 A. C. through R—L, R—C and R—L – C seriescircuit and their problems 6.4 Resonance and problems	8
7.0	Phasor Algebra	7.1 J operator 7.2 Rectangular, polar and trigonometrical form of phasor. 7.3 Addition, subtraction, multiplication and division of phasor	2
8.0	Transformer	8.1 Working principle, Construction, types, Emf equation, Transformation ratio, Ideal transformer, their problems 8.2 Losses of transformer, Rating of transformer 8.3 C. T. and P.T., Auto transformer,	5
9.0	Induction Motor	9.1 3 phase induction motor – Principle, Construction, Uses, Synchronous speed, full load speed, Slip, Percentage of speed	4
CLASS TEST			3

11. TABLE OF SPECIFICATION FOR THEORY

Sl no	Topics (a)	Time allotted in Hrs (b)	Percentage Weightage (c)	Modified % Weightage (d)	K	C	A	HA
1	Introduction	1	3	3	5		0	
2	Work ,Power , Energy and DC circuit	9	21	21	6	1	4	
3	D.C generator	5	12	12	3	1	5	
4	D.C motor	5	12	12	3	0	7	
5	A.C fundamentals	3	6	6	5	1	4	
6	A.C Series circuit	8	20	20	7	2	4	
7	Phasor Algebra	2	4	4	3		0	
8	Transformer	5	12	12	2		4	

9	Induction motor	4	10	10	1		2	
	Total	42	100	100	35	5	30	

12. DETAILED TABLE OF SPECIFICATIONS FOR THEORY EXAM

Sl no.	Topics	Objective type				Short answer type					Essay type				
		K	C	A	T	K	C	A	HA	T	K	C	A	HA	T
1	Introduction	1			1	1					3				3
2	Work, Power, Energy and D.C circuit	2	1	2	5			2		2	4				4
3	D.C generator	1	1		2	2		2		2			3		3
4	D.C motor	1		1	2	2		2		2			4		4
5	A.C fundamental	2	1		3			2		2	3		2		5
6	A.C Series circuit	1	2		3	2		2		2	4		2		6
7	Phasor algebra	1			1						2				2
8	Transformer	2			2								4		4
9	Induction motor	1			1								2		2

13. Suggested Implementation Strategies:

This is a fundamental subject. It is necessary to handle the subject carefully so that students can develop clear understanding of principles and concepts and develop skill in their application in solving related problems. Teacher may give emphasis on laboratory experiments and give lot of home assignments.

14. Suggested Learning Resources:

Book List: 1.Fundamentals of Electrical Engineering by Tarlok Singh, S. K. Kataria& Sons,

2. Electrical Technology Vol.-I & Vol.-II by B. L. Thereja& A. K. Thereja, S. Chand & Co.

3. Basic Electrical Engineering by V. K. Mehta &Rohit Mehta, S. Chand & Co.

4. Fundamentals of Electrical & Electronics Engineering by S. Ghosh,PHI

5. Electrical Technology Vol.-I by J. B. Gupta, S. K. Kataria& Sons

****

Course Title :- Element of Electrical Engineering (Practical)

3rd Semester

CODE No. El – 304P

Practical: Full Marks: 50, Test/viva =25 Sessional (TA+HA) Marks: 25,

Pass Marks: 17/50

Skills to be developed

a)Intellectual Skills:-

1. Skill of analyzing results.
2. Skill of identification of instruments.

b) Motor Skill:-

1. Skill of connecting the instruments/machines properly.
2. Skill of taking the reading of the instrument properly.
3. Skill of drawing phasor diagram and graph.

List of Practical

1. To find the following for a filament lamp
   a) Variation of resistance with voltage
   b) Variation of power with voltage
2. Verification of Ohm's law.
3. Verification of Kirchhoff's laws.
4. Testing of fuse and find out the fusing constant.
5. To find out the voltage-current relationship in an R-L series AC circuit to determine power factor of the circuit.
6. To find out the voltage-current relationship in an R-C series AC circuit to determine power factor of the circuit.
7. To find out the voltage-current relationship in an R-L-C series AC circuit to determine power factor of the circuit.
8. Study of two point starter and DC series motor & starting of DC series motor.
9. Study of three point starter and DC shunt motor & starting of DC shunt motor.
10. Find the transformation ratio of single phase transformer.

Reference Book:

Lab manual on basic Electrical Engineering and Electrical MeasurementBy S K Bhattacharjee, K M Rastogy

Lab Course in Electrical Engineering by S G Tarnekar, P K Kharbandha

A Text Book of Practical in Electrical Engineering by Dr. N. K. Jain

1. COURSE TITLE : ELEMENTS OF ELECTTRONICS ENGINEERING

2. COURSE CODE : ET-304

3. Semester : 3rd Semester

4. Contact hours : 45

5. Rationale: The Aim of the course is to develop the student to excel in over all skill, ability, innovation and team work. The course also aims to involve students in challenging meaningful activities by proving a strong base in electronics thereby they will be able to understand concepts and processes of electronic parts used in automobile engineering.

6. Objectives:

After the completion of the course the students will be able to

- Demonstrate the functioning of electronic components and devices (resistors capacitors inductors valves diodes transistors)
- Fabricate basic rectifiers and amplifier circuits.
- Develop the skill to handle sophisticated electronic instruments (CRO, DMM)
- Simplify and design digital logic circuits.
- Understand introduces appraisal use of microprocessor in Automobile engineering field.

7. Teaching Scheme:

Lecture	Tutorial	Practical	Total
3	-	3	6

8. Examination Scheme:

Theory				Practical				Total
Examination		Sessional		Practical Viva		Sessional		
Full Marks	Pass Marks	Full Marks	Pass Marks	Full Marks	Pass Marks	Full Marks	Pass Marks	
70	28	30	15	25	12	25	13	150

9. Details of Contents:

Chapter No.	Content /area of focus	Duration (In Hours)
1.0	INTRODUCTION: 1.1 Introduction to Electronics: Its scope. 1.2 Electronic Components- Active and Passive Components. 1.3 Passive Components- Resistors, Inductor, Capacitors, Colour Coding.	5

2.0	**VALVES:** 2.1 Types of electron emission, vacuum diode- physical construction onward and reversed biasing, characteristics, space charge. 2.2 Vacuum Triode- Physical Construction, characteristics, and parameters: Triode as an amplifier. 2.3 Triode & Pentode- limitations of Triode and hence realization of Triode and pentode.	7
3.0	**SEMICONDUCTOR** 3.1 Review of atomic theory, electron pair, bonds, energy, levels conduction band, and valance band, difference between insulation, conduction and semiconductors: impurities, intrinsic and extrinsic semiconductors, P- type and N- type semiconductors. 3.2 Semiconductors Diode P-N junction, forward and reverse biased diode, characteristics curve, half wave and full wave rectification circuits 3.3 Transistors- Physical construction of P-N-P & N-P-N transistors, their biasing, circuit configurations (CB, CE & CC), their input and output characteristics.	9
4.0	**TRANSISTOR AMPLIFIER** 4.1 Transistor as amplifier- principles of transistor as an amplifier: Different classes of amplifier- class A, B, C and Class AB amplifier, push pull amplifier. 4.2 Multistage amplifier- Need for multistage amplification: different coupling methods- DC, RC & transformer coupling, their merits, demerits and applications.	6
5.0	**Oscillators** 5.1 Types of feedback- positive and negative feedback and their comparison 5.2 Oscillators- condition for oscillations: types of oscillators (using transistors only) – Hartley, Colpitt's, Clapp's, crystal etc, their advantages disadvantages and application.	5
6.0	**Electronic instruments** 6.1 Cathode Ray oscilloscope- basic idea, construction, working & uses 6.2 Multimeter –working & uses	5
7.0	**Digital electronics** 7.1 Boolean algebra and logic gates; AND, OR, NOT, NAND, NOR, XOR operation	2

8.0	**Microprocessor:** 8.1 Basics of 8085 microprocessor, pin diagram and architecture, application and use of microprocessor chip in automobiles.	3
9.0	Class Test	3

10. Distribution of Marks :

Ch. No	Chapter Title	Hours	Marks			Total
			Objective Types (Compulsory)	Descriptive Type	Short Questions	
1	Introduction	5	1	2	2	05
2	Valve	7	2	7	3	12
3	semiconductors	9	2	10	3	15
4	Transistor amplifier	6	2	7	3	12
5	Oscillators	5	1	7	2	10
6	Electronic instruments	5	1	5	2	08
7	Digital electronics	2	-	3	-	03
8	Microprocessor	3	1	4	-	05
11	Class Test	3	-	-	-	-
	Total	45	10	45	15	70

****

5.Course Title– Elements of Electronic Engineering Laboratory

ELEMENTS OF ELECTRONICS ENGINEERING- LAB

CODE No. ET– 304P

Practical: Full Marks: 25, **Pass Marks: 12**

Sessional: Full Marks: 25, **Pass Marks: 13**

Skills to be developed

Intellectual Skills:- a. Skill of analyzing results.

b. Skill of identification of instruments.

Motor Skill:- a. Skill of connecting the instruments/machines properly.

b. Skill of taking the reading of the instrument properly.

c. Skill of drawing phasor diagram and graph.

List of Practical: 1. To find the following for a filament lamp

a. Variation of resistance with voltage

b. Variation of power with voltage

2. Verification of Ohm's law.

3. Verification of Kirchhoff's laws.

4. Testing of fuse and find out the fusing constant.

5. To find out the voltage-current relationship in an R-L series AC circuit to determine power factor of the circuit.

6. To find out the voltage-current relationship in an R-C series AC circuit to determine power factor of the circuit.

7. To find out the voltage-current relationship in an R-L-C series AC circuit to determine power factor of the circuit.

8. Study of two point starter and DC series motor & starting of DC series motor.

9. Study of three point starter and DC shunt motor & starting of DC shunt motor.

10. Open circuit and short circuit test of a single phase transformer.

11. Polarity test of a single phase transformer.

12. Parallel operation of single phase transformer.

Reference Book:

i. Lab manual on basic Electrical Engineering and Electrical Measurement

By S K Bhattacharjee, K M Rastogy

ii. Lab Course in Electrical Engineering by S G Tarnekar, P K Kharbandha

iii. A Text Book of Practical in Electrical Engineering by Dr. N. K. Jain

****

1. **Course Title : PRINTING PROCESS**
2. **Course Code : Pt – 301**
3. **Semester : 3rd Semester**

4. **Aim** : The aim of teaching the paper life basic printing is to acquaint the student with various methods of processing and printing use in industry and to equip the students with the basic principle of technological changes taking place in different aspect connected to printing and graphic Arts field .

Objective: The students will be able to Understand different principles of printing, processing techniques & graphic Arts technology.

Pre-Requisite: Elementary knowledge of Basic Printing & Production

Course Outcomes (CO's)	
CO-1	Knowledge of history and evolution of printing, understand different processes of printing industry, different printing processes.
CO-2	Understand the basic principles of different printing processes, knowledge of advantages and limitations of different printing processes.
CO-3	Understand the classification of Offset printing machines, configuration of sheetfed offset machine, knowledge of different type of colour sheetfeds, classification of web offset machines.
CO-4	Understand the configuration of flexography machine, knowledge of different types of flexography machine.
CO-5	Knowledge of different types of Gravure and Screen printing machines, understanding of different types of screen printing machines.

Programme Outcomes (PO's)	
PO-1	Apply the knowledge of mathematics and science to understand engineering fundamentals and to solve Printing Technology problems
PO-2	Design and conduct experiments of Printing Technology as well as analyse and interpret data.
PO-3	Identify, formulate and solve Printing Technology problems.
PO-4	Use the techniques, skills and modern engineering tools necessary for engineering practices.
PO-5	Understand professional ethics and responsibility to extend the benefit of the Printing Technology projects to the society.
PO-6	Communicate effectively both verbally and in writing within the engineering community and with people in the society.
PO-7	Recognize the need for, and an ability to engage in life long learning to incorporate technological innovations.

5. Teaching Scheme (In Hrs):

Lecturer	Tutorial	Practical	Total
3		3	6

6. Examination scheme:

Theory					Practical			
ESE	Sessional (SS)			Pass (ESE+SS)	Practical Test(PT)#	Practical Assessment (PA)@	Pass (PT+PA)	Total Marks (Theory +Practical)
	TA	HA	Total (TA+HA)					
70	10	20	30	33/100	25	25	17/50	100

7. Detailed course content:

Chapter	Contents	Intended Learning Outcome (ILO)	Hours
1	Introduction to printing process 1.1 Evolution of Printing - Invention of movable wooden and metal type printing.- Lithography- Offset Printing-Intaglio- Gravure-Flexography- Screen Printing- Digital Printing 1.2 Structure of Printing Industry- Pre-media, Prepress - Film reproduction, Image assembly, Plate making and Digital prepress, Press and Post Press Sections- Flow chart. 1.3 Applications of Printing Process – Offset, Intaglio, Gravure, Flexography, Screen Printing and Digital printing.	• State the history and evolution of Printing • Familiarise with different processes of printing industry • Use the different printing process.	**10**
2	Principles of Printing Processes 2.1 Basic Principles of Letterpress, Offset, Flexography, Gravure, Screen Printing and Digital Printing 2.2 Advantages and Limitations of Printing process- Letterpress, Offset, Flexography, Gravure and Screen Printing.	• Explain basic principle of printing processes • Distinguish the merits and demerits of printing processes	**8**
3	Classification of Offset Printing Machines 3.1 Classification of Offset Machines- Sheet fed and Web fed Offset machines, Basic configuration of sheet fed offset machine. 3.2 Single colour sheet-fed offset press, Multi colour sheet-fed press, Offset perfecting press and small offset press. 3.3 Classification of web offset Machines- In-line web offset press, Blanket- to blanket web offset press and Satellite type web offset press.	• Classify the offset machines • Disguise the different types of colour sheet feds • Classify the web offset machines	**7**
4	Classifications of Flexography Printing 4.1 Basic configuration of flexography machine. 4.2 Types of flexography machine - In-line-type flexography press, Stack type flexography press and Satellite of flexography in Food packaging.	• Know the basics configuration of flexography machine • Know the different types of flexography machine	**8**
5	Classifications of Gravure & Screen	• Classify the different types of	**9**

	5.1 Classification and types of Gravure machine- Gravure printing unit, printing cylinder, Doctor Blade and Impression cylinder. 5.2 Screen printing machine – parts of screen printing press 5.3 Types of screen printing machines – Flat –bed hinged frame machines, Flat-bed vertical lift machines, Cylinder-bed machines, Container printing machines and Rotary screen machines.	Gravure Machines • Know the different parts of screen printing press • Identify the different types of screen printing press	
	Internal Assessment		**3**

8. TABLE OF SPECIFICATIONS FOR THOERY

Sr no	Topic (a)	Time allotted in hrs (b)	Percentage weightage (c)	Modified % weightage (d)	K	C	A	HA
1	Introduction to printing prosess	10	24	24	10	5	5	4
2	Principles of Printing Processes	8	19	19	8	4	3	4
3	Classification of Offset Printing Machines	7	17	17	8	4	2	3
4	Classifications of Flexography Printing	8	19	19	8	4	3	4
5	Classifications of Gravure & Screen Printing	9	21	21	10	4	3	4
	Total	42	100	100				

9. DETAILED TABLE OF SPECIFICATION FOR THEORY EXAM:-

Sl no.	Topics	Objective type				Short answer type					Essay type				
		K	C	A	T	K	C	A	HA	T	K	C	A	HA	T
1	Introduction to printing process	5	1		6		1	1	2	4					
2	Principles of Printing Processes	3	1		4			1	1	2		5			5
3	Classification of Offset Printing Machines		3	2	5		1	2		3		5			5
4	Classifications of Flexography Printing		3	2	5		2	1		3		5	5		10
5	Classifications of Gravure & Screen Printing		3	2	5		2	1		3		5	5		10
	Total				25					15					30

K = Knowledge C = Comprehension
A = Application HA = Higher Than Application (Analysis Synthesis, Evaluation)

10. . Suggested Implementation Strategies: This subject will develop the foundation of the Printing technology diploma students. Therefore more tutorial assignments are to be given the students. Experiments performed in the laboratory will help the students in developing the skill.

11. List of books:-

Sl.No.	Title of book	Author	Publication
1	Modern Lithography	Lan Faux	SITA Limited
2	Printing Materials- Science and Technology	Thompson, Bob	PIRA Publication
3	The Print Production Manual	J. Peacock, C Berril and M Barnard	PIRA
4	The Printing Lnk Manual	R.H. Leach and	
5	Flexography Primer-	J. Page Cronnch	GATF Press
6	Gravure Primer	Cheryk L Kasunich	GATF Press.

PRINTING PROCESS LAB

Code: Pt-301

Total Marks: - 50
Practical : - 25 **Pass Marks: - 8**
Sessional :- 25 **Pass Marks :- 9**
Skills to be developed –

a) Intellectual skills –

i. Knowledge of basic processes related to Printing Process
ii. Identify & selection of various tools, equipment & software.

b) Machine skills --

i. Operate, control different machines & equipment
ii. Inspect/ produce the job for specified dimensions
iii. safety practices/ Care & maintenance of the tools & machines.

List of the Experiments

Unit : 1 Practice on Offset Printing Machine

1. Installation of Plate and Blanket
2. Setting of Feeder, Impression & Delivery according to the thickness and size of the stock.
3. Applying ink, damping solution – make ready, printing with registration

Unit : 2 Practice on Flexography & Gravuare Printing Machine

1. Installation of Stereo or Image Cylinder, Fitting the Web path, maintaining proper tension.
2. Choosing the right Anilox/ adjusting the Doctor Blade, Adjusting the ink viscosity by Flow cup
3. Maintaining the proper drying temperature – make ready, printing with registration.

Unit : 3 Practice on Screen Printing Machine

1. Study of various type of screen materials
2. Screen stretching techniques
3. Screen preparation - Direct
4. Stencil preparation - Indirect, Direct/ Indirect
5. Screen printing of various routine documents
6. Printing on various substances
7. Screen Reclamation

8. 2 Colour Screen Printing
9. 4 Colour Screen Printing
10. Study of automatic Screen Printing

Reference Book

1. Modern lithography – Ian Faux – SITA Ltd.
2. Printing Materials Science and Technology – Thompson, Bob – PIRA Publication
3. The Printing Production Manual – J. Peacock, C.Berrel and Barnard – PIRA Publication

1. **Course Title : PREPRESS REPROTECHNIQUE**
2. **Course Code : Pt – 302**
3. **Semester : 3rd Semester**

4. **Aim** : Getting the output through a printing machine is the most important operation for completing the print production. This subject known as Presswork - I is one of the key subject to make a clear and sound knowledge in some of the major print production systems and supplies. This will enable the students to make judgement about the aspect of printing, particularly the selection of a particular process to choose for a specific print production.

Objective: The students will be able to

(i) understand the basic and clear classification of all kinds of printing processes;

(ii) understand the details divisions and subdivisions of letterpress printing machines, their applications and uses, characteristics and identifications of their products- merits and demerits of various letterpress machines;

(iii) understand the principal mechanism of various letterpress and sheet-fed machines, their constructional differences in the printing unit and operational features;

(iv) understanding the various feeding and delivery mechanism in printing machines;

(v) appreciate the relational aspects of various materials used in presswork.

Pre-Requisite: Elementary knowledge of Basic Printing & Production

Course Outcomes (CO's)	
CO-1	Knowledge of silver/ non-silver based emulsions, chemicals and their functions, manual and automatic film production, different chemical processes, densitometer
CO-2	Understand half tone reproduction - necessity of screen, different types of halftone screen, negatives and positives, different types of scanners
CO-3	Understand the basics of light, electromagnetic sprectum, perception, properties, temperature of colour, measurement of colour- spectrophotometer, different colour synthesis
CO-4	Understand colour reproduction- basic principles, colour separation - methods, electronic separation technique, colour correction- manual and photographic.
CO-5	Understand reproduction photography, conventional camera, flat colour and process colour, gray balance, UCR & GCR
CO-6	Knowledge of proofing - photographic, electrostatic, thermal, inkjet.

Programme Outcomes (PO's)	
PO-1	Apply the knowledge of mathematics and science to understand engineering fundamentals and to solve Printing Technology problems
PO-2	Design and conduct experiments of Printing Technology as well as analyse and interpret data.
PO-3	Identify, formulate and solve Printing Technology problems.
PO-4	Use the techniques, skills and modern engineering tools necessary for engineering practices.
PO-5	Understand professional ethics and responsibility to extend the benefit of the Printing Technology projects to the society.
PO-6	Communicate effectively both verbally and in writing within the engineering community and with people in the society.
PO-7	Recognize the need for, and an ability to engage in life long learning to incorporate technological innovations.

5. Teaching Scheme (In Hrs):

Lecturer	Tutorial	Practical	Total
3			3

6. Examination scheme:

Theory					Practical			
ESE	Sessional (SS)			Pass (ESE+SS)	Practical Test(PT)#	Practical Assessment(PA)@	Pass (PT+PA)	Total Marks (Theory+Practical)
	TA	HA	Total (TA+HA)					
70	10	20	30	33/100				100

7. Detailed course content:

Chapter No.	Chapter Title	Contents	Duration (in Hrs)
1	**LIGHT SENSITIVE EMULSION & PROCESSING**	1.1 Study of silver based photographic emulsions 1.2 Studies of non-silver based emulsion viz., Diazo, Polymer 1.3 Study of development, stop bath, fixation, chemicals and their functions. 1.4 Study of manual and automatic film processing techniques 1.5 Study of Reproduction, Intensification & Chemical Reversal Process.	6

		1.6 Study of basic densitometry, characteristic curve, gamma, & Densitometer.	
2	**HALF-TONE REPRODUCTION**	2.1 Introduction and necessity of screen in reproduction processes. 2.2 Different type of halftone screens viz., Glass ruled and vignette contact screen, screens for special effects 2.3 Study of halftone screen theories 2.4 Study of Moiré pattern & Rosette pattern 2.5 Halftone negatives & Positives. 2.6 Study of high light dropout, duotones, Line-tone combination 2.7 Different types of Scanner i.e., PMT based and CCD based scanners and their functions.	7
3	**LIGHT & COLOUR**	3.1 Nature of light, Electromagnetic spectrum, illumination & ideal illuminants for Repro-photo work. 3.2 Perception of colour, properties of colour, colour temperature. 3.3 Fundamental characteristics of colour, Hue, Saturation, Brightness, Colour space, Measurement of colour, Spectrophotometer. 3.4 Study of different colour synthesis viz., Additive synthesis, Subtractive synthesis, Colour Triangle, Complementary colours, Colour printing principle.	7
4	**COLOUR REPRODUCTION — SEPARATION & CORRECTION**	4.1 Basic principles of colour separation, filters & filter factors, its absorption & transmission qualities. 4.2 Methods of colour separation. 4.3 Electronic colour separation technique. 4.4 Necessity of colour correction, Principles of colour & tonal correction. 4.5 Study of manual correction procedure through dye retouching, staging & dot etching 4.6 Study of Photographic correction procedure i.e. Photographic Masking.	6
5	**REPRODUCTION PHOTOGRAPHY**	5.1 Conventional Horizontal & Vertical Process camera 5.2 Flat Colour & Process Colour 5.3 Gray balance, UCR & GCR	8
6	**PROOFING**	6.1 Photographic Proofing 6.2 Electrostatic- Laser Proofing 6.3 Thermal Proofing 6.4 Inkjet Proofing	8
7	Class test	Three test of 1hrs.	2 hrs.

8. TABLE OF SPECIFICATIONS FOR THOERY

Sr no	Topic (a)	Time allotted in hrs (b)	Percentage weightage (c)	Modified % weightage (d)	K	C	A	HA
1	Relief Printing	6	15	15	8	3	2	2
2	Letterpress Machines	7	16	16	8	2	2	4
3	Letterpress Sheet-Fed Cylinder Machines	7	16	16	8	2	2	4
4	Automatic Feeders & Delivery System	6	15	15	8	3	2	2
5	Flexography Press Work	8	19	19	9	4	3	3
6	Web-Fed Machine	8	19	19	9	4	3	3
	Total	42	100	100				

9. DETAILED TABLE OF SPECIFICATION FOR THEORY EXAM:-

Sl no.	Topics	Objective type				Short answer type					Essay type				
		K	C	A	T	K	C	A	HA	T	K	C	A	HA	T
1	Relief Printing	5	1		6		1		1	2					5
2	Letterpress Machines	3	1		4			1	2	3					5
3	Letterpress Sheet-Fed Cylinder Machines	2	2		4			1	1	2					5
4	Automatic Feeders & Delivery System	1	2		3		2	1		3					5
5	Flexography Press Work	2	2		4		2			2					5
6	Web-Fed Machine	2	1		3		1		2	3					5
	Total				25					15					30

K = Knowledge C = Comprehension
A = Application HA = Higher Than Application (Analysis Synthesis, Evaluation)

10. Suggested Implementation Strategies: This subject will develop the foundation of the Printing technology diploma students. Therefore more tutorial assignments are to be given the students. Experiments performed in the laboratory will help the students in developing the skill.

11. List of books:-

Sl.No.	Title of book	Author	Publication
1	LETTERPRESS PRINTING (VOL – I & II)	C.S.MISRA	
2	FLEXOGRAPHY PRIMER	J.PAGE CROUCH	

3	PAPER IN PRINTING PROCESS	BANKS	
4	CYLINDER PRESSES	GANDERTON	
5	MACHINE PROBLEMS	GANDERTON	
6	FLEXOGRAPHY PRIMER	DONNAC. MULVIHILL	

PROFESSIONAL PRACTICE –I

3rd SEMESTER, PRINTING TECHNOLOGY

CODE: PT-310

THEORY SCHEME:	PRACTICAL SCHEME:
Theory: 1hr/week	Practical assessment: 25 marks
Practical: 2hrs/week	Practical test: 25 marks
Credit: 2	

A) RATIONAL:-

To develop general confidence, ability to communicate and attitude, in addition to basic technological concepts through industrial visits, guest lectures on technical topics and conducting group discussions.

B) AIMS AND OBJECTIVES:-

The student will be able to:

- Preparing report on industrial visits, expert lectures.
- Interacting with peers to share thoughts.
- Prepare notes for given topic.
- Presentation in seminar, group discussion on improvement of communication skills.
- Acquire information from different sources.

C) PRE- REQUISITE:-

1. Desire to gain comparable knowledge and skills of various activities in various areas of importance.
2. Eagerness to participate in group work and to share thoughts with group members.
3. Knowledge of basic electrical engineering.

Activities:

1. INDUSTRIAL/FIELD VISIT: - - 10 HRS.

Structured field visits be arranged and report of the same should be submitted by the individual student, to form part of the team work.

Visits to following companies:

a. Nearby Yark Print Pvt.Ltd. at BaihataChariali and observe equipment and operating procedure
b. Abdos India Pvt. Ltd.

2. GUEST LECTURES: (Any three) Lectures by professional /industrial expert/ student

Seminars on the following areas. -10 HRS

a. Latest method for printing
b. Modern printing devices
c. Modern concept for CTP plate making

Individual report of the above lecture should be submitted by the students.

3. GROUP DISCUSSION: (Any TWO among a group of four to five students). Topic and time duration of the group discussion to be decided by concerned teacher. –10 HRS.

a. Current topics related to Printing Technology.
b. Concept on graphic design

4. STUDENTS ACTIVITY: The students in a group of 4 to 5 will perform any one of the following activities. –10 HRS.

a) Identify the various printing tools and equipments and write their functions.
b) Tree plantation inside or outside of the institute campus.
c) Help in flood relief camp (by all students)
d) Other co- curricular and extracurricular activity.

EXAMINATION SCHEME (on Practical assessment)

Continuous internal assessment of 25 marks is to be carried out by the teachers.

Distribution of marks: -

Activities =10,

Group discussion = 5,

Field visits=5 and

Guest lecturer attendance and

Report=5.

4TH SEMESTER

COURSE STRUCTURE OF 4TH SEMESTER (PRINTING TECHNOLOGY)

Sl no	Code no	Subject	Contact hours /week			Evaluation scheme									
						Theory (Th)					Practical (Pr)			Total Marks (Th+Pr)	Credit
			L	T	P	ESE	Sessional(SS)			Pass (ESE+SS)	Practical Test(PT)	Practical Assessment (PA)	Pass (PT+ PA)		
							TA	HA	Total (TA+ HA)						
1	**Pt-401**	Visual Design & DTP	3		3	70	10	20	30	33/100	25	25	17/50	150	4
2	**Pt-402**	Image Processing	3	-	3	70	10	20	30	33/100	25	25	17/50	150	4
3	**Pt-403**	Printers Material Science-I	4		-	70	10	20	30	33/100	-	-	-	100	4
4	**Pt-404**	Gravure Flexoghaphe & Screen Printing	3	-		70	10	20	30	33/100				100	3
5	**Pt-405**	Typesetting & Composition	3		3	70	10	20	30	33/100	25	25	33/100	150	4
6	**Me-404**	Theory of Machines	3		3	70	10	20	30	33/100	25	25	17/50	150	4
7	**Pt-410**	Professional Practice- II	1		2						25	25	17/50	50	2
			20	0	14									850	24

1. **Course Title : Visual Design and DTP**
2. **Course Code : Pt – 401**
3. **Semester : 4th Semester**

4. **Aim** : Graphic design is working with type, image , symbol to establich representation of ideas or products to simply communicate.

Objective: ..

To work with clients to identify business, objectives, create strategies and implement then with a range of design, advertising, branding and marketing projects.

Pre-Requisite: Elementary knowledge of Basic Printing & Production

Course Outcomes (CO's)	
CO-1	Knowledge of Graphic design and its elements like line shape etc., design prinsiples, definitions, details of layout, defination
CO-2	understand the measurements followed in typography- x height, ascender, descender etc., knowledge of different type groups- sanserif, serif, display types, trutypes, legibility and readability of fronts, vector fronts, bitmapped fronts etc.,
CO-3	Understand the fundamentles of colour dynamics and its type, spectrum, knowledge of colour whell, psycological effect of colours, environment setting for colour
CO-4	Understand different styles of page layout, grids, columns, templates etc., photo editing, imposition scheme, different format for magazine, newspaper and bookwork.
CO-5	Knowledge of different processes of print publishing like dummy preparation, proof reading etc., design of printed products, feasibility of various printing / drafting software, understanding of different drawing file formats.

Programme Outcomes (PO's)	
PO-1	Apply the knowledge of mathematics and science to understand engineering fundamentals and to solve Printing Technology problems
PO-2	Design and conduct experiments of Printing Technology as well as analyse and interpret data.
PO-3	Identify, formulate and solve Printing Technology problems.
PO-4	Use the techniques, skills and modern engineering tools necessary for engineering practices.
PO-5	Understand professional ethics and responsibility to extend the benefit of the Printing Technology projects to the society.
PO-6	Communicate effectively both verbally and in writing within the engineering community and with people in the society.
PO-7	Recognize the need for, and an ability to engage in life long learning to incorporate technological innovations.

5. Teaching Scheme (In Hrs):

Lecturer	Tutorial	Practical	Total
3		3	6

6. Examination scheme:

Theory					Practical			
ESE	Sessional (SS)			Pass (ESE+SS)	Practical Test(PT)#	Practical Assessment (PA)@	Pass (PT+PA)	Total Marks (Theory+Practical)
	TA	HA	Total (TA+HA)					
70	10	20	30	33/100	25	25	17/50	100

7. Detailed course content:

Chapter No.	Chapter Title	Contents	Duration (in Hrs)
1	Introduction to Design and Layout	1.1-Design, Introduction to graphic design-goal, audience, venue and budget. 1.2-Design elements- line, shape, value, format, texture-visual and tactile, type, color, and space-negative and positive. 1.3-Design principles, Balance- Symmetrical- Optical Centre, Unity, Emphasis, Contrast, rhythm, proportion and harmony. 1.4- Layout, definition, stages of layout-Visualization, Thumbnails, Rough layout and Comprehensive/final layout.	9
2	Typig raphy	2.1- Measurements followed in typography- point and pica. Anatomy of types- x height, Ascender and descender, base line and body width. Parts of face-arm, stroke,bracket, bowl, terminal, serif, hairline, count, stem and spine. 2.2-Type groups- sanserif, serif, novelty/decorative, black letter and roman old style, typeface, type front, type family, type style, modern typefaces, display types, true type and open type.Initial and dropped. 2.3- Importance of Legibility and Readability, Vector fronts and bitmapped fronts, Logos and trademarks.	10

3	Colour Dynamics	3.1-Fudamentls of Colour, visible spectrum, primary, secondary and tertiary colours, subtractive colour and additive colour theory, process, spot colour/pantone, tint,shade and tones. 3.2- Colour whell- purpose and diagram, monochromatic, analogue, complimentaery, split complementary and trials colors. 3.3- psychological effects of colours- warm and cool colours. 3.4- Setting the environment for Colour works- Color Temperature.	8
4	Page layout	4.1- Style of house, style of work, grids, and columns, templates, master page, style sheet, caption, quotes, headers and footers, folio, headlings, sub headlines and margines. 4.2- Handling orginals/photo- cropping, scaling and skewing. 4.3- Imposition scheme- half sheet work, sheet work/work and turn, work and tumble and work and twist. 4.4- Layout format for Magazine, Newspaper, and Bookwork.	8
5	Print publishing	5.1- Dummy preparation, proof reading, proof reading marks, printers mark- crop, trim, bleed slug and registration, considerations for print production. 5.2- Designing of other printed products- brochure, leaf, visiting card, invitation, booklet and folders. 5.3- Feasibility of various graphic designing and pagination software (Photoshop, Illustrator, CorelDraw, Adobe In-design, Quark Xpress or FOSS) 5.4- Understanding file formats- TIFF, JPEG, PDF, GIF, EPS and PNG	7
7	Class test	Three test of 1hrs.	3 hrs.

8. TABLE OF SPECIFICATIONS FOR THOERY

Sr no	Topic (a)	Time allotted in hrs (b)	Percentage weightage (c)	Modified % weightage (d)	K	C	A	HA
1	Introduction to Design and Layout	9	21	21	10	5	2	3
2	Typig raphy	10	24	24	8	6	3	7
3	Colour Dynamics	8	19	19	8	3	3	5
4	Page layout	8	19	19	8	3	3	5
5	Print publishing	7	17	17	7	4	3	3
	Total	42	100	100				

K = Knowledge C = Comprehension
A = Application HA = Higher Than Application (Analysis Synthesis, Evaluation)

10. Suggested Implementation Strategies: This subject will develop the foundation of the Printing technology diploma students. Therefore more tutorial assignments are to be given the students. Experiments performed in the laboratory will help the students in developing the skill.

9. DETAILED TABLE OF SPECIFICATION FOR THEORY EXAM:-

Sl no.	Topics	Objective type				Short answer type					Essay type				
		K	C	A	T	K	C	A	HA	T	K	C	A	HA	T
1	Introduction to Design and Layout	5	1		6		1		1	2					5
2	Typig raphy	3	1		4			1	2	3					5
3	Colour Dynamics	2	2		4			1	1	2					5
4	Page layout	1	2		3		2	1		3					5
5	Print publishing	2	2		4		2			2					5
	Total				25					15					30

10. Suggested learning resources =

List of books:-

Sl.No.	Title of book	Author	Publication

Visual Design and DTP–(Lab)
Code–Pt-401 (P)

Total Marks: - 50
Practical : - 25 **Pass Marks: - 8**
Sessional :- 25 **Pass Marks :- 9**

Skills to be developed –

a) Intellectual skills –

i. Knowledge of basic processes related to Visual Design and DTP
ii. Identify & selection of various tools, equipment & software.

b) Operating skills --

i. Operate, control different machines & equipment
ii. Inspect/ produce the job for specified dimensions
iii. safety practices/ Care & maintenance of the tools & machines.

List of the practical

1. Practicing the techniques of lettering by tracing of different typeface characters — Study of different typefaces & family.
2. Layout for letterheads, visiting cards, greeting cards, invitation, certificates.
3. Designing of logo, caption, monograms and trademarks enlargement & reduction geometrically.
4. Study of colour and mixing of colours, two/three-colour combinations, colour circle, Complementary colour, Double-split Complementary colour, Analogous colour & its harmony.
5. Layout for typographical design of book cover, title pages, half title page & book jacket, Page layout with margin.
6. Tools of the layout man: Care & handling.
7. Layout for folders, calendars posters and advertisement.
8. Study of layout and artwork. Understanding fully the concept of making printing design.
9. Study of layout for designing computer stationery/continuous stationery including MICR Cheques.
10. Practice on scanning & computer assisted composition.
11. Collection and study of printed materials.

Reference books:-

1. Fundamentals of Copy and Layout – National Textbook Company, Illinois, USA
2. Exploring Publication Design – Poppy Evans

1. **Course Title : Image Processing**
2. **Course Code : Pt – 402**
3. **Semester : 4th Semester**

4. **Aim** : To give the students a general understanding of the fundamentals of digital image processing and to introduce then to analytical tools which are currently used in digital image processing.

Objective: Understand the basic of the human visual system as they relate to image processing including spatial fiequancy resolution and brightness adaption.

Pre-Requisite: Elementary knowledge of Basic Printing & Production

Course Outcomes (CO's)	
CO-1	Knowledge of originals and its type and classification, understand the types of colour, properties, and the spectrum
CO-2	Knowledge of digital reproduction with digital camera and its basic theories, image capturing, editing and manipulation techniques.
CO-3	Understand line reproduction, halftone reproduction, knowledge of scanners and its principles, use of scanner in halftone reproduction
CO-4	Understand film processing, knowledge of photographic films and its structures, different film processing chemicals, computer to film technology, types of film imagesetters.
CO-5	Understand offset plate processing, types of plates, plate making equipments, facilities, control variables for plate making, steps involved and trouble shooting.

Programme Outcomes (PO's)	
PO-1	Apply the knowledge of mathematics and science to understand engineering fundamentals and to solve Printing Technology problems
PO-2	Design and conduct experiments of Printing Technology as well as analyse and interpret data.
PO-3	Identify, formulate and solve Printing Technology problems.
PO-4	Use the techniques, skills and modern engineering tools necessary for engineering practices.
PO-5	Understand professional ethics and responsibility to extend the benefit of the Printing Technology projects to the society.
PO-6	Communicate effectively both verbally and in writing within the engineering community and with people in the society.
PO-7	Recognize the need for, and an ability to engage in life long learning to incorporate technological innovations.

5. Teaching Scheme (In Hrs):

Lecturer	Tutorial	Practical	Total
3		3	6

6. Examination scheme:

Theory					Practical			
ESE	Sessional (SS)			Pass (ESE+SS)	Practical Test(PT)#	Practical Assessment (PA)@	Pass (PT+PA)	Total Marks (Theory+Practical)
	TA	HA	Total (TA+HA)					
70	10	20	30	33/100	25	25	17/50	100

7. Detailed course content:

Chapter No.	Chapter Title	Contents	Duration (in Hrs)
1	Originals and Colour	1.1- Originals : Defination, Types of originals- and transmission originals. 1.2- Classification of originals: Line originals, Continuous tone originals, Colour originals, Halftone originals and Merchandise(product) samples-Handling of Originals. 1.3- Light and Color: Seeing and measuring colors- Principles of color- Color as a wave length- The human perception of color. 1.4- The properties of colour: hue, saturation and brightness. 1.5- The electromagnetic spectrum and the visible spectrum, Color reproduction principles: Additive color theory and Subtractive color theory.	9
2	Digital Reproduction Techniques	2.1- Digital camera-Basics elements/parts of digital camera: The camera body, optics, image recording sensors, view finder, image storage, batteries, buttons and controls, flash ,accessory and computer transfer interface. 2.2- image capturing techniques using Digital camera, Scanner and photo CD. 2.3- Image editing and manipulations: Image correction and enhancement, sharpening and total adjustments.	8
3	Line and Haltone photography	3.1- Line Reproduction: Steps involved in line Negative Reproduction . 3.2- Halftone Reproduction- Highlight, Middle tone	7

		and shadow areas. Haltone Screens, Screen Ruling, Screen angle and Screen Resolution. 3.3- Working Principles of Scanners and their types- Working principles of Flat bed scanner and Drum Scanners. 3.4- Steps in Halftone Reproduction using Scanner.	
4	Film Processing	4.1- Photographic Films: Types of Films- orthochromatic film, panchromatic films, blue sensitive films. Fixed contrast and film speed. 4.2- Structures of photographic films. 4.3-Film processing chemicals: The photographic emulsion , developer solutions, stop bath solutions, fixer solutions, accessories- processing trays and processing tanks. 4.5- Computer to film technology: Workflow, advantages of CTF technology. Film imagesetters Types, working principles of different types of film imagesetters.	8
5	Offset Plate Processing	5.1- Types of plantes- Wipe-on Plates and Pre-sensitized plates. 5.2- Facilities and Equipments used in plate Making department- Printing Down Frame, Automatic plate processor and plate processing steps. 5.3- Control of plate making variables- Quality control aids: Plate sensitivity guide, GATF star target, UGRA plate control wedge and GAFT do gain scale. 5.4- Processing steps involved in preparation of PS plates and Wipe-on Plates. 5.5- Plate making troubles: Wipe-on plates troubles and PS plates troubles.	10
	Class test	Three test of 1hrs.	3 hrs.

8. TABLE OF SPECIFICATIONS FOR THOERY

Sr no	Topic (a)	Time allotted in hrs (b)	Percentage weightage (c)	Modified % weightage (d)	K	C	A	HA
1	Originals and Colour	9	21	21	10	5	2	4
2	Digital Reproduction Techniques	8	19	19	8	6	3	4
3	Line and Haltone photography	7	17	17	7	3	2	5
4	Film Processing	8	19	19	8	6	3	4
5	Offset Plate Processing	10	24	24	10	6	3	5
	Total	42	100	100				

9. DETAILED TABLE OF SPECIFICATION FOR THEORY EXAM:-

Sl no.	Topics	Objective type				Short answer type					Essay type				
		K	C	A	T	K	C	A	HA	T	K	C	A	HA	T
1	Originals and Colour	5	1		6		1		1	2					5
2	Digital Reproduction Techniques	3	1		4			1	2	3					5
3	Line and Haltone photography	2	2		4			1	1	2					5
4	Film Processing	1	2		3		2	1		3					5
5	Offset Plate Processing	2	2		4		2			2					5
	Total				25					15					30

K = Knowledge C = Comprehension
A = Application HA = Higher Than Application (Analysis Synthesis, Evaluation)

10. . Suggested Implementation Strategies: This subject will develop the foundation of the Printing technology diploma students. Therefore more tutorial assignments are to be given the students. Experiments performed in the laboratory will help the students in developing the skill.

11. List of books:-

Sl.No.	Title of book	Author	Publication
	Colour and its Reproduction	Gary field	
	Graphic Reproduction Photography	James Walter Burden	

	Introduction to prepress	Hugh M. Speirs	
	Line Photography	Karl Davis Robinson	

]

Image Processing–(Lab)
Code–Pt-402 (P)

Total Marks: - 50
Practical : - 25 **Pass Marks: - 8**
Sessional :- 25 **Pass Marks :- 9**
Skills to be developed –

a) Intellectual skills –

i. Knowledge of basic processes related to Image Processing
ii. Identify & selection of various tools, equipment & software.

b) Operating skills --

i. Operate, control different machines & equipment
ii. Inspect/ produce the job for specified dimensions
iii. safety practices/ Care & maintenance of the tools & machines.

List of the practical

1. Comparative study of various materials and equipment used in image generation Department.
2. Assembling positive for four colour jobs.
3. Layout preparation
4. Study of wipe-on plate
5. Study of albumin plates and deep-etch plate.
6. Preparation of pre-sensitized plate
7. Study of gripper margin and registration processes.
8. Study of Flexographic plate and gravure cylinder
9. Study of digital plates
10. Surface preparation for screen printing processes

Reference books:-

1. Colour and its reproduction – Gary Field

2. Graphics Reproduction Photography – James Walter Burden

3. Introduction to Prepress – Hugh M. Speirs

1. **Course Title : Printer's Material Science-I**
2. **Course Code : Pt – 403**
3. **Semester : 4th Semester**

4. **Aim:** To make students acquainted with all the physicochemical processes that require monitoring and close control in different printing processes for good quality printing.

Objective: The students will be able to

1. Differentiate between lyophobic and lyophilic colloids used in different printing processes.
2. Identify the different polymeric substrates used for printing.
3. Select inks and adhesives for suitable printing and printed substrates respectively.
4. Prepare Fountain solution with fountain concentrate by correct dosage to avoid press problems.
5. Measure total hardness and conductivity of water to determine whether the water available is suitable for the printing process and take proper steps to make it suitable for the process.
6. Identify printing problems that arise from the use of inks with higher or lower viscosity than that required for the particular printing process.
7. Determine the pH of fountain solution, ink, adhesive or paper if need arises.
8. Take necessary precautions to safeguard himself and the environment from adverse effects of chemicals and wastes generated in the workplace.

Pre-Requisite: 1. Elementary knowledge of Atomic structure, Chemical Bonding, Polymer, pH,Hardness of Water and Surface Tension (taught in first semester).

Course Outcomes (CO's)	
CO-1	Understand Colloids- its definition, classification, properties, stability, different types and differences of colloids and gels, suitability of colloids and gels.
CO-2	Knowledge of natural and synthetic polymer and its properties, properties of vulcanized rubber and its uses, materials used in inking and dampeing rollers, photopolymers- its properties and applications.
CO-3	Understand metals as image carriers, choices of matels, materials used for graining.
CO-4	Knowledge of lubricants, definition, types, constituents, additives, characteristics and uses.
CO-5	understand surface tension and surface energy, angle of contact, surfactant and wetting agents, details of wetting process used in printing.
CO-6	Understand viscosity- units and measurements, range of viscosity in printing process, troubleshooting, viscosity of adhesive in laminated printed materials

Programme Outcomes (PO's)	
PO-1	Apply the knowledge of mathematics and science to understand engineering fundamentals and to solve Printing Technology problems
PO-2	Design and conduct experiments of Printing Technology as well as analyse and interpret data.

PO-3	Identify, formulate and solve Printing Technology problems.
PO-4	Use the techniques, skills and modern engineering tools necessary for engineering practices.
PO-5	Understand professional ethics and responsibility to extend the benefit of the Printing Technology projects to the society.
PO-6	Communicate effectively both verbally and in writing within the engineering community and with people in the society.
PO-7	Recognize the need for, and an ability to engage in life long learning to incorporate technological innovations.

5. Teaching Scheme (In Hrs):

Lecturer	Tutorial	Practical	Total
4			4

6. Examination scheme:

Theory					Practical			
ESE	Sessional (SS)			Pass (ESE+SS)	Practical Test(PT)#	Practical Assessment (PA)@	Pass (PT+PA)	Total Marks (Theory+Practical)
	TA	HA	Total (TA+HA)					
70	10	20	30	33/100				100

7. Detailed course content:

Chapter No.	Chapter Title	Contents	Duration (in Hrs)
1	Colloids	1.1 Definition 1.2 Classification 1.3 Properties 1.4 Stability 1.5 Differences between the two classes of colloids 1.6 Differences between sol, emulsion and gel 1.7 Different types of emulsion and their applications in printing processes 1.8 Thixotropic gel- characteristics and use in offset printing 1.9 Suitability of colloids as sensitised plate and film coatings, desensitizing materials, printing inks and adhesives	6

2	Polymer	2.1 Properties and uses of natural polymers used in the printing industry 2.2 Properties and uses of synthetic polymers used in the printing industry 2.3 Surface treatment of polymeric materials for subsequent printing 2.4 Properties of vulcanized rubber 2.5 Synthetic rubbers used in flexographic plate making 2.6 Properties of rubber blankets used in offset presses 2.7 Properties of materials used to make inking and dampening rollers –desirable hardness, problems arising from incorrect hardness 2.8 Introduction to photopolymers – their properties 2.9 Application of photopolymers in image carriers	7
3	Metals	3.1 Choice of metals for surface preparation of image carriers 3.2 Characteristics of aluminium, copper, chromium, zinc 3.3 Choice of metals in bimetal and multimetal plates 3.4 Materials used for graining and their characteristics	7
4	Lubricants	4.1 Definition 4.2 Types of lubricants 4.3 Constituents and additives 4.4 Characteristics – adhesion, wettability 4.5 Uses	5
5	Surface Tension	5.1 Cohesive and adhesive forces 5.2 Surface tension and surface energy 5.3 Angle of contact 5.4 Surface tension and angle of contact 5.5 Surface tension and wetting 5.6 Surfactant and Wetting agents 5.6 Wetting of ink pigments by ink vehicle 5.7 Wetting of non-image area of lithographic plate by fountain solution 5.8 Wetting of printing substrates by printing inks 5.9 Wetting of adherends by adhesives during lamination of printed products	8
6	Viscosity	6.1 Definition, unit and instruments used to measure viscosity of different printing inks 6.2 Desirable viscosity ranges of printing inks	9

		for different printing processes 6.3 Relation between viscosity and temperature 6.4 Problems encountered on using very high viscosity inks in sheet fed and offset printing process 6.5 Problems encountered on using very low viscosity inks in web fed offset printing process 6.6 Viscosity of adhesives used in laminating printed materials	
7	Class test	Three test of 1hrs.	3 hrs.

8. TABLE OF SPECIFICATIONS FOR THOERY

Sr no	Topic (a)	Time allotted in hrs (b)	Percentage weightage (c)	Modified % weightage (d)	K	C	A	HA
1	Colloids	6	15	15	5	4	2	4
2	Polymer	7	16	16	6	5	2	3
3	Metals	7	16	16	6	5	2	3
4	Lubricants	5	19	19	7	5	3	4
5	Surface Tension	8	13	13	5	4	1	3
6	Viscosity	9	21	21				
	Total	42	100	100				

9. DETAILED TABLE OF SPECIFICATION FOR THEORY EXAM:-

Sl no.	Topics	Objective type				Short answer type					Essay type				
		K	C	A	T	K	C	A	HA	T	K	C	A	HA	T
1	Colloids	5	1		6		1		1	2					5
2	Polymer	3	1		4			1	2	3					5
3	Metals	2	2		4			1	1	2					5

4	Lubricants	1	2		3		2	1		3					5
5	Surface Tension	2	2		4		2			2					5
6	Viscosity	2	1		3		1		2	3					5
	Total				25					15					30

K = Knowledge C = Comprehension
A = Application HA = Higher Than Application (Analysis Synthesis, Evaluation)

10. Suggested Implementation Strategies: This subject will develop the foundation of the Printing technology diploma students. Therefore more tutorial assignments are to be given the students. Experiments performed in the laboratory will help the students in developing the skill.

11. List of books:-

Sl.No.	Title of book	Author	Publication
1	Chemistry in Printing, 2nd Edition	Tulika Das	Barnana Prakashani, 2011
2	Chemistry in Printing, 2nd Edition	N.R.Elred & T. Scarlet	GATF, 1992
3	The Lithographer's Manual	R. Blair, Editor-in-Chief, M.D. Thomas Ed	GATF, Inc., 1988
4	An Introduction to Science for Printers	G.R. Marshall	William Heinmann Ltd., 1963
5	Printing Science	F. Pateman and L.C. Young	Sir Isaac Pitman and Sons Ltd., 1963
6	Chemistry of Lithography	P.J. Hartsuch	Lithographic Technical Foundation Inc., 1961

1. **Course Title : Gravure, Flexography and Screen printing.**
2. **Course Code : Pt – 404**
3. **Semester : 4th Semester**

4. **Aim** : To make the students understand about the technical aspects of gravure flexo and screen printing.

Objective: The students will be able to

- To keep the up to date about all the change in this cutting edge technologies.

Pre-Requisite: Elementary knowledge of Basic Printing & Production

Course Outcomes (CO's)	
CO-1	Understand basic principles of Gravure, Flexography and Screen printing processes- its advanctages, limitations and characteristics.
CO-2	Knowledge of image carrier,details of image carrier preparation of flexography, Gravure and Screen printing
CO-3	Knowledge of Flexography Printing, inking systems, types and specifications of Anilox Cells and cleaning systems, roller selection, flexography plates, sleeve technology, flexo substrates, corona treatment, flexo substrates.
CO-4	Knowledge of Gravure printing, gravure cylinder, drying system, doctor blades, impression roller, gravure presses- solvents and inks.
CO-5	Knowledge of screen printing, mesh n squeegee selection, Screen pretreatment, tensioning/ stretching, types of screen printing machines, inks, applications.

Programme Outcomes (PO's)	
PO-1	Apply the knowledge of mathematics and science to understand engineering fundamentals and to solve Printing Technology problems
PO-2	Design and conduct experiments of Printing Technology as well as analyse and interpret data.
PO-3	Identify, formulate and solve Printing Technology problems.
PO-4	Use the techniques, skills and modern engineering tools necessary for engineering practices.
PO-5	Understand professional ethics and responsibility to extend the benefit of the Printing Technology projects to the society.
PO-6	Communicate effectively both verbally and in writing within the engineering community and with people in the society.
PO-7	Recognize the need for, and an ability to engage in life long learning to incorporate technological innovations.

5. Teaching Scheme (In Hrs):

Lecturer	Tutorial	Practical	Total
3			3

6. Examination scheme:

Theory					Practical			
ESE	Sessional (SS)			Pass (ESE+SS)	Practical Test(PT)#	Practical Assessment (PA)@	Pass (PT+PA)	Total Marks (Theory+Practical)
	TA	HA	Total (TA+HA)					
70	10	20	30	33/100				100

7. Detailed course content:

Chapter No.	Chapter Title	Contents	Duration (in Hrs)
1	Basic Principles	1.1- Principle of Flexography Printing Process- Main Sections of Flexography Printing machine: Unwinnd section, Printing section, Drying section and Rewind section. 1.2- Principle of Gravure printing Process: Advantages, Limitations and Characteristics of Gravure process, Main Sections of Gravure Printing Machine: Unwind section, Printing section, Drying section and Rewind section. 1.3- Principles of Screen Printing Process: Advantages of Screen Printing Process, main Sections of Flat Bed Screen Printing Machine: Frame Base,Screen Fabric and Squeegee.	9
2	Image Carrier Preparation	2.1- Flexography Image Carrier Preparation: Structure of Flexography Plate, Plate Preparation Methods- Rubber Plates Preparation, sheet photopolymer plates preparation and Liquide Photopolymer plates Preparation. 2.2- Gravure Image Carrier Preparation: Gravure Cylinder manufacture, Copper plating method, Gravure cylinder Preparation Methods-Conventional Method/Carbon Tissue Method of Gravure cylinder Preparation , Electromechanical Engraving method of Gravure cylinder preparation and Laser Engraving method of Grvure cylinder preparation. 2.3- Screen Printing Image Carrier Praparation: Screen Fabrics, Screen preparation by Direct Method,	8

		Screen preparation by Indirect /Transfer method and Screen preparation by Direct /indirect method.	
3	Flexography Printing	3.1- Flexography Inking systems: Ink Metering, Anilox Roller, Types of Flexography linking systems 3.2- Types of Anilox Cells and Cleaning systems, The Anilox Roll, Anilox Roll specifications- Cell count, Cell depth, Cell volume,Types of Anilox roll besed on cell shapes- Inverted Pyramid shape cells, Quadrangular shapes cell and Trihelical shape cells.- Types of Anilox Rolls based on roller surfaces- Laser engraved ceramic anilox rolls and Conventional or mechanically engraved chrome anilox rolls,Different types of Anilox Roll Cleaning Systems 3.3- Selection of Suitable Anilox Roller: Factor to be considered in selection of anilox roller. 3.4- Flexography plates- Structure and Mounting Techniques, Flexography plates: Metal backed plates, Magnetic plates, Flexographic plate Mounting: Plate mounting Fundamentals, Sticaky back Plate mounting ,Types of Flexography plates cylinders 3.5- Sleeve Technology, Direct laser engraving-Laser engraving on Rubber Rollers. 3.6- Corona Treatment, Flexo Substrates- Paper and Paperboard stocks, Corrugated stocks, Plastic Films,Foils and Laminates.	10
4	Gravure Printing	4.1- Structure of Gravure Cylinder: Gravure cylinder parts-Axis, shaft, Diameter, Circumference and Face length. 4.2- Gravure Drying System- Drying Chamber- Solvent Recovery Sysyetms- Environmetal Friendly Solvent Removal Systems. 4.3-Doctor Blade – Structure, Types and Mechanisms of doctor blade. 4.4- Impression Roller- Structure,Types and Mechanisms of Impression Roller 4.5- Gravure Presses- Gravure Packaging Presses, Gravure Label Presses and Gravure publication Presses. 4.6- Gravure Solvent based inks, Gravure Water based inks, Gravure UV and Gravure EB inks.	6
5	Screen Printing	5.1- Mesh, Squeegee Selection, Mesh/Woven screen Printing Fabric:Materials used for Screen printing Fabrics, Squeegee hardness and Squeegee materials. 5.2-Screen Pretreament, Screen Tensioning/Stretching: Basic steps in Screen	9

		Tensioning, Stretching the Screen Printing Fabric- Manual Stretching and Machine Stretching. 5.3- Types of Screen Printing Machines- Container Screen Printing Mechine, Flat bed Hinged frame (Automatic) Screen Press, Rotary Screen Printing Press and Carousal Printing Machines. 5.4- Screen Printing Inks- Types, Properties, Types of Screen Printing Inks for specific Application 5.5- Screen Printing Applications: Screen Printing on Curved Surfaces.	
	Class test	Three test of 1hrs.	3 hrs.

8. TABLE OF SPECIFICATIONS FOR THOERY

Sr no	Topic (a)	Time allotted in hrs (b)	Percentage weightage (c)	Modified % weightage (d)	K	C	A	HA
1	Basic Principles	9	21	21	10	5	2	4
2	Image Carrier Preparation	8	19	19	8	6	3	4
3	Flexography Printing	10	17	17	7	3	2	5
4	Gravure Printing	6	19	19	8	6	3	4
5	Screen Printing	9	24	24	10	6	3	5
	Total	42	100	100				

9. DETAILED TABLE OF SPECIFICATION FOR THEORY EXAM:-

Sl no.	Topics	Objective type				Short answer type					Essay type				
		K	C	A	T	K	C	A	HA	T	K	C	A	HA	T
1	Originals and Colour	5	1		6		1		1	2		5			5
2	Digital Reproduction Techniques	3	1		4			1	2	3			5		5
3	Line and Haltone photography	2	2		4			1	1	2			5		5
4	Film Processing	1	2		3		2	1		3		5			5
5	Offset Plate Processing	2	2		4		2			2			5		5
	Total				25					15					30

K = Knowledge C = Comprehension
A = Application HA = Higher Than Application (Analysis Synthesis, Evaluation)

10 . Suggested Implementation Strategies: This subject will develop the foundation of the Printing technology diploma students. Therefore more tutorial assignments are to be given the

students. Experiments performed in the laboratory will help the students in developing the skill.

10. List of books:-

Sl.No.	Title of book	Author	Publication
	Flexography Primer	GAFT	GAFT
	Hand book of Printmedia	by Helmut Kipphan	GAFT
	flexography	by Donna C. Muvihil,	GAFT
	Gravure Primer	by Cheryl L. Kasumich,	GAFT

1. Course Title : **Typesetting & Composition**
2. Course Code : **Pt – 405**
3. Semester : **4th Semester**

4. **Aim:**

Every printed product consists of Text portion and illustrations, with the former occupying a predominant portion. Knowledge of text setting methods and equipment used for setting text that is broadly termed "Typesetting & Composition" therefore very essential. The aim of this subject is to study Typesetting & Composition as an important part of Print production techniques, to enable the students to make judgement about the aspect of printing, particularly in relation to the requirements of designing the printed products. This will cover development of typesetting methods, preparation for typesetting, typesetting inputs and outputs, planning and proofing.
On successful completion of the course, the students will be in a position to**:** —

Objective: The students will be able to
(i) Understand the basic factors for Typesetting;
(ii) Understanding the Methods of Composition;
(iii) Understand the role of Computer assisted composition;
(iv) Understand the proof reading marks and techniques;
(v) Appreciate the role of page make-up and assembly in print production;
(vi) Understand the role of Proofing;
(vii) Appreciate the role of Planning & Production.

Pre-Requisite:
Elementary knowledge of Basic Printing & Production

Course Outcomes (CO's)	
CO-1	Understand the essential factors of typesetting and suitability
CO-2	understand the mechanical methods of composition - principles and overview.
CO-3	Understand computer ssisted composition- working principles and overview, different fonts, software
CO-4	undrestand proof reading, qualities and rules, proof reading marks
CO-5	Knowledge of page maku up and assembly and its kinds, parts of a book.
CO-6	Understand the role of proofing, different methods- reflex, transfer, thermographic, photographic, electrostatic, diazo, laser and inkjet.
CO-7	Understand planning and production, progression of work, factors, scheduling and progress.

Programme Outcomes (PO's)	
PO-1	Apply the knowledge of mathematics and science to understand engineering fundamentals and to solve Printing Technology problems
PO-2	Design and conduct experiments of Printing Technology as well as analyse and interpret data.
PO-3	Identify, formulate and solve Printing Technology problems.
PO-4	Use the techniques, skills and modern engineering tools necessary for engineering practices.

PO-5	Understand professional ethics and responsibility to extend the benefit of the Printing Technology projects to the society.
PO-6	Communicate effectively both verbally and in writing within the engineering community and with people in the society.
PO-7	Recognize the need for, and an ability to engage in life long learning to incorporate technological innovations.

5. Teaching Scheme (In Hrs):

Lecturer	Tutorial	Practical	Total
3		3	6

6. Examination scheme:

Theory					Practical			
ESE	Sessional (SS)			Pass (ESE+SS)	Practical Test(PT)#	Practical Assessment (PA)@	Pass (PT+PA)	Total Marks (Theory+Practical)
	TA	HA	Total (TA+HA)					
70	10	20	30	33/100	25	25	17/50	100

7. Detailed course content:

Chapter No.	Chapter Title	Contents	Duration (in Hrs)
1	ESSENTIAL FACTORS FOR TYPE SETTING	1.1 Factors to be considered before composing 1.2 How to select typefaces for text composing 1.3 Style of the house 1.4 Handling of Manuscript 1.5 Terminology, Composing room equipment & materials 1.6 Copy fitting 1.7 Typographic Measurement & different type faces 1.8 Thixotropic gel- characteristics and use in offset printing 1.9 Suitability of colloids as sensitised plate and film coatings,	6
2	MECHANICAL COMPOSITION (LINOTYPE & MONOTYPE)	2.1 Working principles & Overview 2.2 Keyboard (Linotype), Matrix releasing and distributing mechanism 2.3 Keyboard (Monotype) and caster.	5
3	COMPUTER ASSISTED COMPOSITION	3.1 Working Principles & Overview of Phototypesetting Composition 3.2 Introduction to Desk top Publishing system	7

		3.3 Components of a Desk top Publishing system – Computers,Monitors, Mouse, and Laser Printers. 3.4 Fonts – How Computers handle Fonts, Bitmapped & Outlined Fonts & its management. 3.5 Application-Style, justification, Left Alignment, Right Alignment, Centre setting, Tabs, Pagination, Graphics rendering etc. 3.6 Word Processing software 3.7 Page Layout software	
4	PROOF READING	4.1 Qualities of Proof readers 4.2 Standard proof reading marks 4.3 General rules for Proof- reading	5
5	PAGE MAKE-UP & ASSEMBLY	5.1 Essential know-how for page make up 5.2 Kinds of make up 5.3 Different parts of a book	6
6	PROOFING	6.1 Reflex method 6.2 Transfer method 6.3 Thermo graphic method 6.4 Photographic Contact Printing 6.5 Electrostatic method 6.6 Diazo method 6.7 Laser & Inkjet method	7
7	PLANNING & PRODUCTION	7.1 Progression of work in Letter Assembly dept. 7.2 Factors affecting work flow 7.3 Scheduling and Progress	6
8	Class test	Three test of 1hrs.	3 hrs.

8. TABLE OF SPECIFICATIONS FOR THOERY

Sr no	Topic (a)	Time allotted in hrs (b)	Percentage weightage (c)	Modified % weightage (d)	K	C	A	HA
1	ESSENTIAL FACTORS FOR TYPE SETTING	6	14	14	5	3	2	4
2	MECHANICAL COMPOSITION (LINOTYPE & MONOTYPE)	5	12	12	4	3	2	3
3	COMPUTER ASSISTED COMPOSITION	7	16	16	6	5	2	3
4	PROOF READING	5	12	12	4	2	2	4
5	PAGE MAKE-UP & ASSEMBLY	6	14	14	5	4	1	3
6	PROOFING	7	16	16	5	4	3	4
7	PLANNING & PRODUCTION	6	16	16	5	4	3	4
	Total	42	100	100				

9. DETAILED TABLE OF SPECIFICATION FOR THEORY EXAM:-

Sl no.	Topics	Objective type				Short answer type					Essay type				
		K	C	A	T	K	C	A	HA	T	K	C	A	HA	T
1	ESSENTIAL FACTORS FOR TYPE SETTING	5	1		6		1		1	2		5			5
2	MECHANICAL COMPOSITION (LINOTYPE & MONOTYPE)	3	1		4			1	2	3			5		5
3	COMPUTER ASSISTED COMPOSITION	2	2		4			1	1	2		5			5
4	PROOF READING	1	2		3		2	1		3			5		5
5	PAGE MAKE-UP & ASSEMBLY	2	2		4		2			2			5		5
6	PROOFING	2	1		3		1		2	3			5		5
7	PLANNING & PRODUCTION														
	Total				25					15					30

K = Knowledge C = Comprehension
A = Application HA = Higher Than Application (Analysis Synthesis, Evaluation)

10. Suggested Implementation Strategies: This subject will develop the foundation of the Printing technology diploma students. Therefore more tutorial assignments are to be given the students. Experiments performed in the laboratory will help the students in developing the skill.

11. List of books:-

Sl.No.	Title of book	Author	Publication
1	Letter Assembly in Printing	D. Wooldridge	Focal Press
2	Composing &Typography Today	B. D. Menderatta	Printek Publications New Delhi – 110055
3	Desktop Publishing Skills	James Felci & Ted Nace	Focal Press
4	Printing Office Procedure	BPIF	BPIF
5	Handbook of Print Media	BPIF P. Kipphan	Springer, 2002

Typesetting & Composition–(Lab)
Code–Pt-405 (P)

Total Marks: - 50
Practical : - 25 **Pass Marks: - 8**
Sessional :- 25 **Pass Marks :- 9**

Skills to be developed –

a) Intellectual skills –

i. Knowledge of basic processes related to typesetting & composition
ii. Identify & selection of various tools, equipment & software.

b) Operating skills --

i. Operate, control different machines & equipment
ii. Inspect/ produce the job for specified dimensions
iii. safety practices/ Care & maintenance of the tools & machines.

List of the practical

1. **Practice on Hand Composing**

   Study of different fonts / quoins / quads and other composing materials
   Composing a block/passage, tabular matter, more than one point in a line
   Proofing and correction
2. **Demonstration on Mechanical Composing Machines**

   Monotype Keyboard & Caster
3. **Demonstration on Line Casting Machines**

   Linotype Casting mechanism
   Releasing and assembling of matrices and space bands
   Distributing mechanism
4. **Appreciating Electronic Composition for Printing Purposes**

Introducing page making Software – The utilities – Understanding page maker

windows – Using the tool book and control box – Creating a new file – Page dimensions – Orientation – Start page number – Number of page and master page formulation – Option – double side publication – Opening a file/publication – Directories/driver/open/close/saving a file – Import/export – Using different filters – Correcting unknown words – Text and paragraph formatting – Using fonts – Selecting sizes – Changing the leading – Changing the width of characters – Changing the tracking characters – Tab setting – Apply styles – Selecting paragraphs to format – Proving a background for reverse – Sending an object to the back – Bringing an object to the front – Rounding corners/rules/boxes – Bullets and numbering – Drop caps and other utilities – Running header and footer – Printing a publication – Print to copies / collate / reverse / proof / all (pages) / ranges / Both / even / odd / size / orientation / tile / manual / auto / scale / reduce to fit.

Reference books:-

1. Letter Assembly in Printing – D. Wooldridge
2. Composing and Typography Today – B. D. Menderatta

PROFESSIONAL PRACTICE –II

4th SEMESTER, PRINTING TECHNOLOGY

CODE: Pt-410

THEORY SCHEME:	PRACTICAL SCHEME:
Theory: 1hr/week	Practical assessment: 25 marks
Practical: 2hrs/week	Practical test: 25 marks
Credit: 2	

A) RATIONAL:-

To develop general confidence, ability to communicate and attitude, in addition to basic technological concepts through industrial visits, guest lectures on technical topics and conducting group discussions.

B) AIMS AND OBJECTIVES:-

The student will be able to:

- Preparing report on industrial visits, expert lectures.
- Interacting with peers to share thoughts.
- Prepare notes for given topic.
- Presentation in seminar, group discussion on improvement of communication skills.
- Acquire information from different sources.

C) PRE- REQUISITE:-

1. Desire to gain comparable knowledge and skills of various activities in various areas of importance.
2. Eagerness to participate in group work and to share thoughts with group members.

Activities:

1. INDUSTRIAL/FIELD VISIT: - - 10 HRS.

Structured field visits be arranged and report of the same should be submitted by the individual student, to form part of the team work.

Visits to following companies:

c. Bhavani Printers Pvt. Ltd.
d. Polymer Pvt. Ltd.

2. GUEST LECTURES: (Any three) Lectures by professional /industrial expert/ student

Seminars on the following areas. -10 HRS

a) Online Printing
b) Pre-Print Technology

Individual report of the above lecture should be submitted by the students.

3. GROUP DISCUSSION: (Any TWO among a group of four to five students). Topic and time duration of the group discussion to be decided by concerned teacher. –10 HRS.

c. Current topics related to Printing Technology.
d. Latest trends on Digital Printing

4. STUDENTS ACTIVITY: The students in a group of 4 to 5 will perform any one of the following activities. –10 HRS.

a. Identify the various printing tools and equipments and write their functions.
b. Tree plantation inside or outside of the institute campus.
c. Help in flood relief camp (by all students)
d. Other co- curricular and extracurricular activity.

EXAMINATION SCHEME (on Practical assessment)

Continuous internal assessment of 25 marks is to be carried out by the teachers.

Distribution of marks: -

Activities =10,

Group discussion = 5,

Field visits=5 and

Guest lecturer attendance and

Report=5.

5TH SEMESTER

COURSE STRUCTURE OF 5TH SEMESTER (PRINTING TECHNOLOGY)

Sl no	Code no	Subject	Contact hours /week			Evaluation scheme									
						Theory (Th)					Practical (Pr)			Total Marks (Th+ Pr)	Credit
			L	T	P	ESE	Sessional(SS)			Pass (ESE+SS)	Practical Test(PT)	Practical Assessment (PA)	Pass (PT+ PA)		
							TA	HA	Total (TA+ HA)						
1	**Pt-501**	Digital Prepress	3	-	3	70	10	20	30	33/100	25	25	17/50	150	4
2	**Pt-502**	Offset Printing Technology	3	-	3	70	10	20	30	33/100	25	25	17/50	150	4
3	**Pt-503**	Printers Material Science-I I	4	-		70	10	20	30	33/100				100	4
4	**Pt-504**	Plano graphic Painting Technique -I	3	-	3	70	10	20	30	33/100	25	25	17/50	150	3
5	**Pt-505**	Press Work	3	-	3	70	10	20	30	33/100	25	25	17/50	150	3
6	**Pt-506**	Printing Machine Maintenance	4	1		70	10	20	30	33/100				100	5
7	**Pt-510**	Professional Practice- III	1	0	2						25	25	17/50	50	2
			19	1	14									850	25

1. **Course Title : Digital Prepress**
2. **Course Code : Pt – 501**
3. **Semester : 5th Semester**

4. **Aim** : Visual information taken in an electronic form in order to output film for pointing.

Objective: In graphic arts world, 75 percent of all prepress work is now done digitally. Prepress, using traditional methods or digital prepress, emcopasses the entire idea of document making to the final product.

Pre-Requisite: Elementary knowledge of Basic Printing & Production

Course Outcomes (CO's)	
CO-1	Understand digital printed page, dot shape, AM and FM screening, type of resolutions, knowledge of UCR, GCR & USM - its advantages and differences.
CO-2	Understand the specifications of a digital camera, definition and differences of CCD & CMOS, functions and advantages of scanner, techniques of digitizing and redigitizing.
CO-3	Understand CTF & CTP, Full sheet output, imposition workflows, knowledge of raster image processor, file formats- TIFF, JPEG, GIF, LJW etc., different data formats.
CO-4	understand colour management- definitions, needs, targets, measurement of colour, profiles for monitor, scanner and printer, ICC profiles
CO-5	Understand computer to plate system - its types, advantages, configuration, workflows- pdf & jdf, types of lasers, different types of plates in CTP.

Programme Outcomes (PO's)	
PO-1	Apply the knowledge of mathematics and science to understand engineering fundamentals and to solve Printing Technology problems
PO-2	Design and conduct experiments of Printing Technology as well as analyse and interpret data.
PO-3	Identify, formulate and solve Printing Technology problems.
PO-4	Use the techniques, skills and modern engineering tools necessary for engineering practices.
PO-5	Understand professional ethics and responsibility to extend the benefit of the Printing Technology projects to the society.
PO-6	Communicate effectively both verbally and in writing within the engineering community and with people in the society.
PO-7	Recognize the need for, and an ability to engage in life long learning to incorporate technological innovations.

5. Teaching Scheme (In Hrs):

Lecturer	Tutorial	Practical	Total
3		3	6

6. Examination scheme:

Theory					Practical			
ESE	Sessional (SS)			Pass (ESE+SS)	Practical Test(PT)#	Practical Assessment (PA)@	Pass (PT+PA)	Total Marks (Theory+Practical)
	TA	HA	Total (TA+HA)					
70	10	20	30	33/100	25	25	17/50	150

7. Detailed course content:

Chapter No.	Chapter Title	Contents	Duration (in Hrs)
1	Digital Prepress-Introduction	1.1-Digital Description of the Printed page-Elements of Digital page-Integration of Text, Images, Graphics Layout and prepress checklist. 1.2-dot Shape- Round, square, elliptical and composite shapes, Amplitude Modulation/frequency Modulation Screening- Difference between AM and FM screening and Benefits of FM screening. 1.3-Input and Output Resolution-Scanning Frequency, Picture element and Scanning frequency formula. Image- dependent Effects and Corrections-Spreads and Chokes, Trapping, Moire and interference of dot pattern. 1.4-Under Colour Removal, Gray Component Replacement, and Unsharp Masking Techniques-Advantages of UCR, GCR & USM. Difference between UCR and GCR. Chromatic composition and achromatic composition.	9
2	Digital Photography & Digital Proofing	2.1- Image capturing with Digital camera- Special features of Digital Camera- Tone Value Quantization, Focal length of lens and Aspect ratio Link up to a Computer. 2.2- Charge Coupled Device and Complementary Metal Oxide Semiconductor- Definition and difference between CCD and CMOS. 2.3- Scanner design and models, Flat bed Scanners-Diagram, functions of scanners and advantages of flatbed scanner. 2.4- Digitizing and Redigitzing- Various Redigitizing Tecniques- Copy dot, Descreening and mixed mode. Digital Proofs and Press Proofs.	8
3	Digital Image Assembly and	3.1-Page Assembly and Imposition- Digital assembly	10

	Data Formats	techniques of CTF and CTP. Imposition – Image register and alignment, Imposition plans- sheet wise, Work and turn and Work and tumble 3.2- Full Sheet Output , Full sheet production in the workflow, Imposition through Software and Full sheet production workflow. 3.3- Imposition Workflows- Types of Imposition programs, Imposition sheet, demand on imposition programs and Imposition workflows and considerations for impositions. 3.4-Raster Image Processor(RIP)- Workflow diagram- Interpreter, Renderer, demands on Imposition programs and Imposition workflows and considerations for impositions. And Bitmap. File Formats – Postscript, TIFF, JPEG, GIF, LZW, EPS, PDF, PPF,1 bit TIFF and JDF. 3.5- Data Formats – Bitmap & Vector, Applications of storage media- Data distribution, Archiving and Backup or transport.	
4	Colour Management	4.1- Definition of Colour, Colour Management and Needs- Targets of Print Colour Management,CIE Chromaticity Diagram- CIE Lab Values- Spectrophotometry description of color. 4.2- Colour measuring instruments, Colorimetry and Densitometry- Densitometer, Spectrophotometer diagrams and functions. 4.3- Pfofiles for Monitor, Scanner and Printer- International Colour Consortium- ICC Profiles, generating ICC profiles for monitor, Scanner and Printer, Device- independent CIE LAB colour space, rendering intents- perceptual, Relative, Absolute and saturation.	8
5	Computer to Plates system	5.1- Types of Computer to plate System – Image register and Alignment, Types of CTPs, Advantage of CTP, Components of Computer to Plate system, Different Configuration of CTPs- Flatbed, Internal Drum and External Drum 5.2- Workflows- PDF and JDF- portable Document Format, Job Defination Format and their advantages. Preflighting- Preflighting techniques, the process and preflighting checks. 5.3- Computer to plate workflow, Types of Lasers- UV, Violet, Thermal and Computer to plate technology for flexography, gravure and screen printing processes. 5.4- Printing plates for Digital Imaging- Types of plates used in CTP- Silver halide plates, photopolymer plates, Thermal plates, Inkjet plates- Automatic plate processor diagram and its functions.	7
	Class test	Three test of 1hrs.	3 hrs.

8. TABLE OF SPECIFICATIONS FOR THOERY

Sr no	Topic (a)	Time allotted in hrs (b)	Percentage weightage (c)	Modified % weightage (d)	K	C	A	HA
1	Digital Prepress-Introduction	9	21	21	10	5	2	4
2	Digital Photography & Digital Proofing	8	19	19	8	4	3	4
3	Digital Image Assembly and Data Formats	10	24	24	9	6	4	5
4	Colour Management	8	19	19	8	4	3	4
5	Computer to Plates system	7	17	17	6	5	2	3
	Total	42	100	100				

9. DETAILED TABLE OF SPECIFICATION FOR THEORY EXAM:-

Sl no.	Topics	Objective type				Short answer type					Essay type				
		K	C	A	T	K	C	A	HA	T	K	C	A	HA	T
1	Digital Prepress-Introduction	5	1		6		1		1	2					5
2	Digital Photography & Digital Proofing	3	1		4			1	2	3					5
3	Digital Image Assembly and Data Formats	2	2		4			1	1	2					5
4	Colour Management	1	2		3		2	1		3					5
5	Computer to Plates system	2	2		4		2			2					5
	Total				25					15					30

K = Knowledge C = Comprehension
A = Application HA = Higher Than Application (Analysis Synthesis, Evaluation)

10. Suggested Implementation Strategies: This subject will develop the foundation of the Printing technology diploma students. Therefore more tutorial assignments are to be given the students. Experiments performed in the laboratory will help the students in developing the skill.

11 List of books:-

Sl.No.	Title of book	Author	Publication
1	The Art of Colour	Johannes Item	

2	Colour and Quality	Heidelberg	
3	Colour and its Reproduction	Gray and Field	
4	Understanding Digital Imppsition	Hal Hiderliter.	

Digital Prepress–(Lab)
Code–Pt-501 (P)

Total Marks: - 50
Practical : - 25 **Pass Marks: - 8**
Sessional :- 25 **Pass Marks :- 9**

Skills to be developed –

a) Intellectual skills –

i. Knowledge of basic processes related to Digital Prepress
ii. Identify & selection of various tools, equipment & software.

b) Operating skills --

i. Operate, control different machines & equipment
ii. Inspect/ produce the job for specified dimensions
iii. safety practices/ Care & maintenance of the tools & machines.

List of the practical

1. WINDOWS – ASSIGNMENT

1.1 Acquaintance with the Basic elements of Windows – Parts of Window, Types of Window, Types of Icons.
1.2 Basic Mouse Technique – Basic Keyboard Technique, Choosing & Selecting items, Choosing Commands from Menus, Using the Control Menu Commands.

2.0 SCANNING – ASSIGNMENT

2.1 Capturing image from Reflection copy, Negative & Transparency.
2.2 Adjusting the scanning factors.
2.3 Changing of Mode and colour correction.
2.4 Use of filters.
2.5 Saving the file under specific file format.
2.6 Importing different files to the Page Layout Graphic Software.

3.0 PIXEL BASED GRAPHIC SOFTWARE – ASSIGNMENT

3.1 Create a new file, manipulate using different filters, and save it under specific file format.
3.2 Export/Import files through different filters, close & exit.

4.0 VECTOR BASED ILLUSTRATING SOFTWARE – ASSIGNMENT

4.1 Creating a new drawing, using options save it under specific file format.
4.2 Export/Import files through different filters, close & exit.

5.0 PAGE LAYOUT GRAPHIC SOFTWARE – ASSIGNMENT

5.1 Practice cursor movement, create file, composing text, and manipulate file (save, cut, copy, paste, delete & print).
5.2 Document set up, page size, margin, select, draw lines / boxes etc., merging text & graphics.
5.3 Justification, alignment, changes of type font/size/style etc.

6.0 IMAGE SETTER/PLATESETTER & AUTO FILM PROCESSOR – ASSIGNMENT

6.1 Study of Image setter/Platesetter, RIP, Calibration of IS Software.
6.2 Study of Image recording, processing & their functions.

Reference books:-

1. The Art of Colour – Johannes Ittem
2. Digital Colour Printing Technology – Biswanath Chakkarvarthy

1. **Course Title : Offset Printing Technology**
2. **Course Code : Pt – 502**
3. **Semester :5th Semester**

4. **Aim**: The most common printing technique that transfer the inked image from a plate to the printing surface through a robber blanket.

Objective: The students will be able to Explain the offset printing techniques and their applications, the preparation process and comparison with each other to provide the necessary information.

Pre-Requisite: Elementary knowledge of Basic Printing & Digital Pre-Press Technique

Course Outcomes (CO's)	
CO-1	Understand lithography and offset printing, structure of offset machine, sheetfed presses, different types of presses.
CO-2	Understand the structure of an offset press - different cylinders, types of blankets, inking system, dampening system and troubleshooting.
CO-3	Understand sheet control and delivery in offset press - types of feeders, feeder head components, sheet registering devices, sheet insertion devices, delivery section.
CO-4	understand the history of webbed offset press, types of reel stands, automatic splicer, web control of rollers.
CO-5	Understand the delivery unit of webbed offset press, types of dryers, folders, different auxiliary equipments.

Programme Outcomes (PO's)	
PO-1	Apply the knowledge of mathematics and science to understand engineering fundamentals and to solve Printing Technology problems
PO-2	Design and conduct experiments of Printing Technology as well as analyse and interpret data.
PO-3	Identify, formulate and solve Printing Technology problems.
PO-4	Use the techniques, skills and modern engineering tools necessary for engineering practices.
PO-5	Understand professional ethics and responsibility to extend the benefit of the Printing Technology projects to the society.
PO-6	Communicate effectively both verbally and in writing within the engineering community and with people in the society.
PO-7	Recognize the need for, and an ability to engage in life long learning to incorporate technological innovations.

5. Teaching Scheme (In Hrs):

Lecturer	Tutorial	Practical	Total
3		3	6

6. Examination scheme:

Theory					Practical			
ESE	Sessional (SS)			Pass (ESE+SS)	Practical Test(PT)#	Practical Assessment (PA)@	Pass (PT+PA)	Total Marks (Theory+Practical)
	TA	HA	Total (TA+HA)					
70	10	20	30	33/100	25	25	17/50	150

7. Detailed course content:

Chapter No.	Chapter Title	Contents	Duration (in Hrs)
1	Introduction to Sheetfed Offset Press	1.1. Principl4es of Lithography and offset printing 1.2. Units of Offset machine- Feeding unit, Printing Unit and Delivery unit. 1.3. Configuration and Structure of Sheetfed Presses: Single Colour, Multi colour and convertible presses. 1.4. Type of Presses: Inline Press, Stack Press, Blanket-to Blanket Press and Common Impression cylinder Press.	8
2	Printing Unit in Offset Press	1.1 Construction and functions of place Cylinder, Blanket Cylinder, Impression Cyliner, Transfer Cylinder and Delivery Cylinder 1.2 Types of Blankets : Conventional blanket and compressible blanket. 1.3 Inking Syestem- Construction, Roller Streak and Glazed Rollers. 1.4 Inking System Problems- Roller Streaks and Glazed Rollers. 1.5 Dampening System- Construction, of Dampening Solution- PH Conductivity and Sampenning system Roller setting. Types of Dmpending System. Conventional or Intermittent, Continous dampending system and Dahlgren dampening system.	10
3	Sheet Control and Delivery in Ofset Press	3.1 Types of Feeders- Friction and Suction , Types of Suction Feeders- Single sheet feeder and Stream Feeder. 3.2 Feeder Head Components- Feeder Head, Air blast Nozle, Rear Pickup Suckers, Forwarding Pickup Suckers, Sheet Steadiers, Separator Brushes and finders. Feed board elements- metal wheel, rubber tyred wheel, brush wheels, tapes and ball smoothener. 3.3 Sheet Registering Devices- Front lay and Sidelay , Types of Front lay and Side lay. Sheet	8

		detectors- double sheet, no sheet and cross sheet detectors 3.4 Sheet Insertions Devices – Swing arm, Rotary, Tumbler and Overfeed Grippers. 3.5 Delivery Section- Delivery Assist Devices, Suction slows down Rollers , Blow downs, Wedges ,Skeleton, Wheels, Star Wheels and Anti Precautions in press room.	
4	Webfed Offset Press – Infeed and Web Guiding Devices	4.1 Historical development of webfed offset preses. Types of Reel Stands- Single reel stands, Double reel stands and three reel stands. 4.2 Automatic Splicers- Zero Speed Paster , Working Principle and function of Zero Speed paster, Purpose of Festoom. Flying Paster- working Principle and fundction of Flying paster. 4.3 Web Control – Dancer Roller, Metering Roller, Box Tilt , Web breb deterctors and Bustle Wheel.	7
5	Webfed Offset Press – Delivery Unit	5.1 Types of Dryers- Open flame, High Velocity Air and Combination Dryer, Chill Rollers- Early stage chill rolls, Baffle plate chil roll and Jacketed chill rools. 5.2- Types of Folders- Former folder , Double Former Folder, Jaw Folder, Chopper Folder, Combinnation Folder and Riboon Foler 5.3. Auxiliary Equipments – Stackers, Bundiles, Sheeters, Perfofactors and Imprinters.	9
	Class test	Three test of 1hrs.	3 hrs.

8. TABLE OF SPECIFICATIONS FOR THOERY

Sr no	Topic (a)	Time allotted in hrs (b)	Percentage weightage (c)	Modified % weightage (d)	K	C	A	HA
1	Introduction to Sheetfed Offset Press	8	19	19	10	3	2	4
2	Printing Unit in Offset Press	10	24	24	10	6	3	5
3	Sheet Control and Delivery in Ofset Press	8	19	19	10	3	2	4
4	Webfed Offset Press – Infeed and Web Guiding Devices	7	17	17	8	4	1	4
5	Webfed Offset Press – Delivery Unit	9	21	21	10	5	2	4
	Total	42	100	100				

9. DETAILED TABLE OF SPECIFICATION FOR THEORY EXAM:-

Sl no.	Topics	Objective type				Short answer type					Essay type				
		K	C	A	T	K	C	A	HA	T	K	C	A	HA	T
1	Introduction to Sheetfed Offset Press	5	1		6		1		1	2		5			5
2	Printing Unit in Offset Press	3	1		4			1	2	3		5			5
3	Sheet Control and Delivery in Ofset Press	2	2		4			1	1	2			5		5
4	Webfed Offset Press – Infeed and Web Guiding Devices	1	2		3		2	1		3			5		5
5	Webfed Offset Press – Delivery Unit	2	2		4		2			2		5			5
	Total				25					15					30

K = Knowledge C = Comprehension
A = Application HA = Higher Than Application (Analysis Synthesis, Evaluation)

10. Suggested Implementation Strategies: This subject will develop the foundation of the Printing technology diploma students. Therefore more tutorial assignments are to be given the students. Experiments performed in the laboratory will help the students in developing the skill.

11 List of books:-

Sl.No.	Title of book	Author	Publication
1	A Manual for Lithographic Press Operations	A.S Porter	
2	Handbook of Print Media	Dr. Helmut Kipphan	
3	Sheetfed Offset Press Operation	Lioyd P. Dejidas and Thomas M. Destree, Gate	
4	Offset Lithography	S. Jaganathan , K.T. Chary	
5	Web Offset Press Operation	Danial G Wilson, AGTE	
6	Modern Lithography Printing	Lan Faux	

Offset Printing Technology –(Lab)
Code–Pt-502 (P)

Total Marks: - 50
Practical : - 25 **Pass Marks: - 8**
Sessional :- 25 **Pass Marks :- 9**

Skills to be developed –

a) Intellectual skills –

i. Knowledge of basic processes related to Offset Printing Technology
ii. Identify & selection of various tools, equipment & software.

b) Machine skills --

i. Operate, control different machines & equipment
ii. Inspect/ produce the job for specified dimensions
iii. safety practices/ Care & maintenance of the tools & machines.

List of the practical

1. Setting of Feeder Pneumatic Control, Setting Feeder Ramp, Setting Side Lay, Adjusting Detectors, and Front Lay alignment – Problems & Solution.
2. Cylinder Parallelism, Thumb test, and Filler Gauge Test.
3. Roller Setting – Form roller with plate (ink – band test), Form roller with oscillating (Filler gauge test) – setting of Ductor roller, Connection with toggle mechanism, drive cam, wobble gear.
4. Roller setting – dampening rollers, motorised dampening.
5. Pile Lifting System – problems & remedies.
6. Impression on/off systems, problem & remedies.
7. Pneumatic insertion device and transfer point.
8. Delivery gripper setting and transfer point.
9. Jogger problems and remedies, delivery pile lowering mechanism.
10. Lubrication system.
11. Machine timing.

Reference books:-

1. A Manual for Lithographic Press Operations – A. S. Porter
2. Offset Lithography – S. Jaganathan, K. T. Chary.

1. **Course Title : Printer's Material Science-II**
2. **Course Code : Pt – 503**
3. **Semester : 5th Semester**

4. **Aim** : To make students acquainted with all the chemical aspects of printing so that they may be able to solveall chemistry related problems that may arise during printing..

Objective: The students will be able to
1. Produce a perfect negative or positive film whenever required.
2. Prepare suitable image carrier for any printing process.
3. Make proper selection of ink compatible with printing substrate, printing process and end-use of the substrate.
4. Understand the necessity for colour management.
5. Make correct requisition of paper for any printing process.

Pre-Requisite: Elementary knowledge of organic chemistry (taught in second semester).

Course Outcomes (CO's)	
CO-1	Understand photogrphic materials and chemistry of photography, knowledge of photographic emulsion and film base, film exposure, development bath and fixing bath, chemistry of washing
CO-2	Understand the image carriers - offset plate making, gravure cylinder making, flexographic plate making, screen printing process, use of computer.
CO-3	knowledge of printing inks and toners, its nature, raw materials used in ink, classification and differences of ink, physical properties, rheological properties, problems encountered in ink, toners.
CO-4	understand colour science - basic concept, perception, types of colours, attributes of colour, colour differences and management.
CO-5	Understand the basics of paper, constituent raw materials, properties of paper-structural, physical,strength, optical, resistance, required characteristics of paper for news paper, package printing, troubleshooting and waste management.
CO-6	Understand the packaging materials - definition, materials used, properties, material selection, lamination and testing.

Programme Outcomes (PO's)	
PO-1	Apply the knowledge of mathematics and science to understand engineering fundamentals and to solve Printing Technology problems
PO-2	Design and conduct experiments of Printing Technology as well as analyse and interpret data.
PO-3	Identify, formulate and solve Printing Technology problems.
PO-4	Use the techniques, skills and modern engineering tools necessary for engineering practices.
PO-5	Understand professional ethics and responsibility to extend the benefit of the Printing Technology projects to the society.
PO-6	Communicate effectively both verbally and in writing within the engineering community and with people in the society.
PO-7	Recognize the need for, and an ability to engage in life long learning to incorporate technological innovations.

5. Teaching Scheme (In Hrs):

Lecturer	Tutorial	Practical	Total
4			4

6. Examination scheme:

Theory					Practical			
ESE	Sessional (SS)			Pass (ESE+SS)	Practical Test(PT)#	Practical Assessment (PA)@	Pass (PT+PA)	Total Marks (Theory+Practical)
	TA	HA	Total (TA+HA)					
70	10	20	30	33/100				100

7. Detailed course content:

Chapter No.	Chapter Title	Contents	Duration (in Hrs)
1	Photographic Materials and Chemistry of Photography	1.1 Constituents of photographic emulsion and uses of each constituent 1.2 Characteristics of photographic film base 1.3 Effect of film exposure-formation of latent image 1.4 Steps for film processing- Development, Fixing, Washing, Drying 1.5 Development bath and fixing bath constituents 1.6 Use of all constituents in development bath and fixing bath 1.6 Effect of developer and fixing bath chemicals on film emulsion 1.7 Chemistry of washing 1.8 Use of Hypo Clearing Agent 1.9 Sensitometry and Densitometry	8
2	Image Carriers	2.1 Offset plate making- deep etch process, wipe-on process, P.S. plate processing, waterless plate making 2.2 Gravure cylinder making process –chemical, electrochemical, electromechanical and electronic engraving 2.3 Flexographic plate making – rubber and photopolymer plates 2.4 Screen printing process – direct, direct-indirect, indirect and capillary 2.5. Introduction to Computer to Plate/Print/Press Technology	8

3	Printing Inks and Toners	3.1 Nature of printing ink – visual characteristics, drying characteristics, adhesive nature, resistance properties 3.2 Raw materials of printing inks – pigments and dyestuffs, oils, solvents, resins, plasticisers, driers, waxes, surfactants, antioxidants and other additives 3.3 Classification of printing inks based on fluidity 3.4 Differences between the two classes of ink 3.5 Lithographic inks, Flexographic inks, Gravure inks, Screen inks – general characteristics, ink formulation, ink drying mechanism 3.6 Inks for specific end-use application - paper, plastics, packaging, tin printing and metal decorating inks 3.7 Inks for Non-Impact Printing Technologies- electrophotography, inkjet, xerography, thermal 3.8 Physical properties of printing inks – length, tack, viscosity, pH 3.9 Use of press inkometer 3.10 Problems encountered with using ink of wrong length and tack 3.11 Rheological properties of printing inks – plastic, pseudoplastic, dilatants and thixotropic substances, visco-elastic fluids and viscoelasticity of printing inks, flow of non-newtonian inks 3.12 Ink related problems in offset, flexographic and gravure printing and their remedies 3.13 Toners for nonimpact printing	9
4	Colour Science	4.1 Basic concept of light 4.2 Colour perception 4.3 Additive and subtractive colours 4.4 Elementary principles of colour reproduction 4.5 Attributes of colour – Hue, Saturation, Lightness 4.6 Tristimulus values 4.7 CIE Colour spaces – CIE XYZ, CIE L*a*b*, CIE LCH 4.8 Colour difference 4.9 Colour management- Calibration, Characterization, Conversion	5

5	Paper	5.1 Raw materials for paper manufacture – Structures of Cellulose,Hemicellulose and Lignin 5.2 Paper manufacture - Wood Pulping (mechanical and chemical),Bleaching, Refining, Internal Sizing, Effect of fillers to improve printability of paper, Colouring, Fourdrinier paper machine, Pressing, Drying, External Sizing, Coating, Calendering, Supercalendering, Surface treatment of paper (paper reinforcement by polymer addition), Finishing (gloss and matte) 5.4 Structural properties of paper - Grain, Two-sidedness, Smoothness, Dimensional stability 5.5 Paper grain direction and its importance in folding and binding 5.6 Physical properties of paper - Basis weight, Paper caliper, Water absorbency, Ink receptivity, Surface smoothness, pH 5.7 Strength properties of paper - Surface strength, Tensile strength,Bursting strength 5.8 Optical properties of paper - Brightness, Whiteness, Opacity, Gloss,Metamerism 5.9 Resistance properties of paper – Pick resistance, Tear resistance,Resistance to water, acid and alkali 5.10 Paper runnability and Paper printability 5.11 Paper characteristics required for news paper printing 5.12 Paper characteristics required for package printing 5.13 Printing problems related to paper 5.14 Waste paper recycling	8
6	Packaging Materials	6.1 Definition of packaging 6.2 Materials used for packaging- paper and paper boards, metals (tin and aluminium), films, foils, polymers (LDPE, HDPE, PP, PS, PVC) 6.3 Properties of packaging materials and their application 6.3 Selection of packing materials 6.4 Importance and role of waxing, varnishing, laminating, foiling 6.5 Laminates- double, triple 6.6 Testing methods for different packages	4
	Class test	Three test of 1hrs.	3 hrs.

8. TABLE OF SPECIFICATIONS FOR THOERY

Sr no	Topic (a)	Time allotted in hrs (b)	Percentage weightage (c)	Modified % weightage (d)	K	C	A	HA
1	Photographic Materials and Chemistry of Photography	8	19	19	10	4	2	3
2	Image Carriers	8	19	19	10	4	2	3
3	Printing Inks and Toners	9	21	21	10	6	2	3
4	Colour Science	5	12	12	4	4	1	3
5	Paper	8	19	19	10	4	2	3
6	Packaging Materials	4	10	10	3	2	2	3
	Total	42	100	100				

9. DETAILED TABLE OF SPECIFICATION FOR THEORY EXAM:-

Sl no.	Topics	Objective type				Short answer type					Essay type				
		K	C	A	T	K	C	A	HA	T	K	C	A	HA	T
1	Photographic Materials and Chemistry of Photography	5	1		6		1		1	2					5
2	Image Carriers	3	1		4			1	2	3					5
3	Printing Inks and Toners	2	2		4			1	1	2					5
4	Colour Science	1	2		3		2	1		3					5
5	Paper	2	2		4		2			2					5
6	Packaging Materials	2	1		3		1		2	3					5
	Total				25					15					30

K = Knowledge C = Comprehension
A = Application HA = Higher Than Application (Analysis Synthesis, Evaluation)

10. Suggested Implementation Strategies: This subject will develop the foundation of the Printing technology diploma students. Therefore more tutorial assignments are to be given the students. Experiments performed in the laboratory will help the students in developing the skill.

11. List of books:-

Sl.No.	Title of book	Author	Publication
1	Hand Book Of Lithography -	David Cumming	GATF
2	David Cumming	Cavuto and Beale	GATF
3	Solving Sheet Fed Offset	GATF	GATF
4	Press Problems - Cavuto And	GATF	GATF
5	Beale(Gatf)	Ian Faux	GATF
6	Sheetfed Offset Press	GATF	GATF
7	Operatig - Gatf	GATF	GATF
8	The Printing Industry	GATF	GATF
9	Modern Lithography – Ian	GATF	GATF
10	Faux – Macdonald And Evans	GATF	GATF
11	Single Colour Lithographing	David Cumming	GATF

1. **Course Title : Plano graphic Printing Technique I**
2. **Course Code : Pt – 504**
3. **Semester : 5th Semester**

4. **Aim** : Among the wide spectrum of different printing processes the most versatile and popular process is Plano graphic process. A wide range of substrates can be printed by Plano graphic process. Continuous R and D are going on in this process into different printing machines manufacturing companies and allied trades. There are tremendous job opportunities for the printing students in this field. The rapid changes and development in the field of Plano graphic technology obviate certain very old methodology and claim inclusion of up to date concept. The present syllabus reflects this rationale.

Objective: The students will be able to

1) Understand the four units that make up any printing press.
2) Understanding the development of press design from platen presses to rotary presses.
3) Understanding the principle of offset printing
4) Understanding the feeding unit, registration unit, printing unit, inking unit, dampening unit and delivery unit operation of an offset lithographic press.
5) Understanding the basic steps in setting up and operating an offset lithographic press
6) Understanding the several quality control devices commonly used in offset printing.
7) Understanding the concept of offset blanket
8) Understanding the feeding, dampening and inking systems of offset presses.
9) Understanding the common press problems.
10) Understanding the different imposition schemes, precautionary measures in machine room.

Pre-Requisite: Elementary knowledge of Basic Printing & Pre-Press Repro Technique

Course Outcomes (CO's)	
CO-1	Understand the history and basics of planographic printing, its classification, different processes, and visual characteristics.
CO-2	Understand the web offset printing, different units of web offset machine, knowledge of web delivery
CO-3	Understand the principles of lithography and offset printing, different materials and chemicals used.
CO-4	Understand the offet press, driography, digital printing - introduction, substrate used, limitations.
CO-5	Understand the different types of dampening system, dampener cleaningproblems related to dampening.
CO-6	Understand the basics of imposition and planning, kinds of imposition.
Programme Outcomes (PO's)	
PO-1	Apply the knowledge of mathematics and science to understand engineering fundamentals and to solve Printing Technology problems
PO-2	Design and conduct experiments of Printing Technology as well as analyse and interpret data.
PO-3	Identify, formulate and solve Printing Technology problems.
PO-4	Use the techniques, skills and modern engineering tools necessary for engineering practices.

PO-5	Understand professional ethics and responsibility to extend the benefit of the Printing Technology projects to the society.
PO-6	Communicate effectively both verbally and in writing within the engineering community and with people in the society.
PO-7	Recognize the need for, and an ability to engage in life long learning to incorporate technological innovations.

5. Teaching Scheme (In Hrs):

Lecturer	Tutorial	Practical	Total
3		3	6

6. Examination scheme:

Theory					Practical			
ESE	Sessional (SS)			Pass (ESE+SS)	Practical Test(PT)#	Practical Assessment (PA)@	Pass (PT+PA)	Total Marks (Theory+Practical)
	TA	HA	Total (TA+HA)					
70	10	20	30	33/100	25	25	17/50	150

7. Detailed course content:

Chapter No.	Chapter Title	Contents	Duration (in Hrs)
1	**Introduction to Plano graphic Printing**	1. Introduction to Plano graphic Printing – Classification of Printing (Impact and Non-impact – Different Printing processes – Visual Characteristics. (Identification) of different printing processes. 2. Plano graphic Printing – Discovery, Application and Development.	7
2	**Introduction to Web Offset Printing**	3. Elements of In feed section of Web Offset including Splicer, Unwinding unit, Web Tension Control, Guide Rollers 4. Web Delivery – Roll to Roll, Roll to Fold, Roll to Sheet	7
3	**Principles of Lithography & Offset Printing**	3.1 Principles of Lithography and Offset printing. 3.2 Different Chemicals and materials used in Lithography.	6
4	**Offset & Driography**	4.1 What Offset press means – Details about printing unit. 4.2 Driography with personalization programme 4.3 Introduction to Digital Printing 4.4 Substrate used in Digital Printing 4.5 Limitation of Digital Printing	8

5	**Dampening System**	5.1 Dampening system – Conventional, Continuous, Brush,Blast, Delta, Motorized Dampening system - Setting of form rollers – 5.2 Dampener cleaning – Dampening (Fountain) solution – Contact angle , Surface Tension, pH, Conductivity,TDS. 5.3. Problems related to Dampening Unit	9
6	**Imposition & Planning**	6.1 Imposition–Basic information–Arrangements of pages– 6.2 Kinds of binding–Kinds of imposition.	5
7	Class test	Three test of 1hrs.	3 hrs.

8. TABLE OF SPECIFICATIONS FOR THOERY

Sr no	Topic (a)	Time allotted in hrs (b)	Percentage weightage (c)	Modified % weightage (d)	K	C	A	HA
1	**Introduction to Plano graphic Printing**	7	17	17	8	4	2	3
2	**Introduction to Web Offset Printing**	7	17	17	8	4	2	3
3	**Principles of Lithography & Offset Printing**	6	14	14	6	4	1	3
4	**Offset & Driography**	8	19	19	8	5	2	4
5	**Dampening System**	9	21	21	10	6	2	3
6	**Imposition & Planning**	5	12	12	4	2	2	4
	Total	42	100	100				

9. DETAILED TABLE OF SPECIFICATION FOR THEORY EXAM:-

Sl no.	Topics	Objective type				Short answer type					Essay type				
		K	C	A	T	K	C	A	HA	T	K	C	A	HA	T
1	**Introduction to Plano graphic Printing**	5	1		6		1		1	2		5			5
2	**Introduction to Web Offset Printing**	3	1		4			1	2	3		5			5
3	**Principles of Lithography & Offset Printing**	2	2		4			1	1	2			5		5
4	**Offset & Driography**	1	2		3		2	1		3		5			5
5	**Dampening System**	2	2		4		2			2					5
6	**Imposition & Planning**	2	1		3		1		2	3		5			5
	Total				25					15					30

K = Knowledge C = Comprehension
A = Application HA = Higher Than Application (Analysis Synthesis, Evaluation)

10. Suggested Implementation Strategies: This subject will develop the foundation of the Printing technology diploma students. Therefore more tutorial assignments are to be given the students. Experiments performed in the laboratory will help the students in developing the skill.

11 List of books:-

Sl.No.	Title of book	Author	Publication
1	Hand Book Off Lithography -- David Cumming	David Cumming	
2	Solving Sheet Fed Offset Press Problems -- Cavuto And Beale (Gatf)	Cavuto and Beale	
3	Sheetfed Offset Press Operating – Gatf	GATF	GATF
4	The Printing Industry	GATF	GATF
5	Modern Lithography – Ian Faux – Macdonald And Evans	Ian Faux	GATF
6	Single Colour Lithographing Machine Operating	GATF	GATF
7	The Lithographers Mannuall	GATF	GATF
8	Small Offset : Preparation And Press	GATF	GATF
9	Web Offset Press Operating	GATF	GATF
10	Hand Book Off Printing Processes	GATF	GATF

Plano graphic Painting Technique –I (Lab)
Code–Pt-504 (P)

Total Marks: - 50
Practical : - 25 **Pass Marks: - 8**
Sessional :- 25 **Pass Marks :- 9**

Skills to be developed –

a) Intellectual skills –

i. Knowledge of basic processes related to Plano graphic Painting Technique –I
ii. Identify & selection of various tools, equipment & software.

b) Machine skills --

i. Operate, control different machines & equipment
ii. Inspect/ produce the job for specified dimensions
iii. safety practices/ Care & maintenance of the tools & machines.

List of the practical

1. Demonstration of Single colour sheet-fed offset press arrangement
2. Functions of different units of a sheet-fed offset machine
3. Application of different chemicals used in offset press
4. Preparation of fountain solution
5. Mounting plate on plate cylinder with properly adjusted packing
6. Fitting of offset blanket - checking the levelness of the blanket – preparing it for blanket
7. Setting of dampening rollers
8. Setting of ink form rollers

Reference books:-

1. Handbook of Lithography – David Cumming – GATF
2. Solving Sheet Fed Offset Press Problems – Cavuto and Beale – GATF
3. Web Offset Press Operating - GATF

1. **Course Title : PRESS WORK**
2. **Course Code : Pt – 505**
3. **Semester : 5th Semester**

4. **Aim** : Getting the output through a printing machine is the most important operation for completing the print production. This subject known as Presswork - I is one of the key subject to make a clear and sound knowledge in some of the major print production systems and supplies. This will enable the students to make judgement about the aspect of printing, particularly the selection of a particular process to choose for a specific print production.

Objective: The students will be able to

(i) understand the basic and clear classification of all kinds of printing processes;

(ii) understand the details divisions and subdivisions of letterpress printing machines, their applications and uses, characteristics and identifications of their products- merits and demerits of various letterpress machines;

(iii) understand the principal mechanism of various letterpress and sheet-fed machines, their constructional differences in the printing unit and operational features;

(iv) understanding the various feeding and delivery mechanism in printing machines;

(v) appreciate the relational aspects of various materials used in presswork.

Pre-Requisite: Elementary knowledge of Basic Printing & Production

Course Outcomes (CO's)	
CO-1	Knowledge of different relief printing machines- their characteristics and applications, understand the divisions and subdivisions of letterpress printing machines- their characteristics, applications, merits, demerits, unitwise divisions.
CO-2	Understand the working principle of letter press platen machine and its different units and different job related operations, knowledge of various methods used in letterpress printing and its applications.
CO-3	Understand the principles and operational features of Stop cylinder machines, Single revolution machines and Two revolution machines and their comparitions.
CO-4	Understand the different units of feeder and their roles, advantages and disadvantages, activities related to delivery system
CO-5	Understand the features and classification of different presses, knowledge of unwinding, rewinding units, inking arrangement, anilox roller, inks and substrates.
CO-6	Knowledge of web tension control, splicer, compensator.

Programme Outcomes (PO's)	
PO-1	Apply the knowledge of mathematics and science to understand engineering fundamentals and to solve Printing Technology problems
PO-2	Design and conduct experiments of Printing Technology as well as analyse and interpret data.

PO-3	Identify, formulate and solve Printing Technology problems.
PO-4	Use the techniques, skills and modern engineering tools necessary for engineering practices.
PO-5	Understand professional ethics and responsibility to extend the benefit of the Printing Technology projects to the society.
PO-6	Communicate effectively both verbally and in writing within the engineering community and with people in the society.
PO-7	Recognize the need for, and an ability to engage in life long learning to incorporate technological innovations.

5. Teaching Scheme (In Hrs):

Lecturer	Tutorial	Practical	Total
3		3	6

6. Examination scheme:

Theory					Practical			
ESE	Sessional (SS)			Pass (ESE+SS)	Practical Test(PT)#	Practical Assessment (PA)@	Pass (PT+PA)	Total Marks (Theory+Practical)
	TA	HA	Total (TA+HA)					
70	10	20	30	33/100	25	25	17/50	150

7. Detailed course content:

Chapter No.	Chapter Title	Contents	Duration (in Hrs)
1	Relief Printing	1.1 Classifications of various relief printing machines, their applications and uses, characteristics of the products. 1.2 Details of divisions and subdivisions of letterpress printing machines, their applications and uses, characteristics and identifications of their products- merits and demerits of various letterpress machines General unit wise division of a printing machine.	6
2	Letterpress Machines	2.1 Letterpress platen m/c-kinds-purposes-working principal of printing unit construction- construction of inking unit-different operation to run a job like packing, positioning, feeding etc. 2.2 Various packing and make ready methods used in letterpress printing – overlay, interlay, underlay, hard soft and medium packing- use and applications	7
3	Letterpress Sheet-Fed Cylinder Machines	3.1 Stop cylinder machines – principles, operational features. 3.2 Single revolution machines - principles, operational features.	7

		3.3 Two revolution machines - principles, operational features. 3.4 Comparison of Stop, Single and Two revolution machines.	
4	Automatic Feeders & Delivery System	4.1 Feeders- advantage and disadvantage-friction, suction and combination-front and back separation-various detectors and paper control on ramps- front and side lay, ionised air blower bar. 4.2 Delivery – kinds-fly, carriage and chain delivery-joggers control of printed delivered sheets	6
5	Flexography Press Work	5.1 Features, classification of various presses. 5.2 Various unwinding and rewinding units, printing units. 5.3 Inking arrangements, anilox roller. 5.4 Characteristics of ink and substrates.	8
6	Web-Fed Machine	6.1 Web tension control. 6.2 Splicer. 6.3 Compensator.	8
	Class test	Three test of 1hrs.	4 hrs.

8. TABLE OF SPECIFICATIONS FOR THOERY

Sr no	Topic (a)	Time allotted in hrs (b)	Percentage weightage (c)	Modified % weightage(d)	K	C	A	HA
1	Relief Printing	6	14	14	6	2	2	4
2	Letterpress Machines	7	17	17	8	4	2	3
3	Letterpress Sheet-Fed Cylinder Machines	7	17	17	8	4	2	3
4	Automatic Feeders & Delivery System	6	14	14	6	2	2	4
5	Flexography Press Work	8	19	19	8	6	2	3
6	Web-Fed Machine	8	19	19	8	6	2	3
	Total	42	100	100				

9. DETAILED TABLE OF SPECIFICATION FOR THEORY EXAM:-

Sl no.	Topics	Objective type				Short answer type					Essay type				
		K	C	A	T	K	C	A	HA	T	K	C	A	HA	T
1	Relief Printing	5	1		6		1		1	2		5			5
2	Letterpress Machines	3	1		4			1	2	3			5		5
3	Letterpress Sheet-Fed Cylinder Machines	2	2		4			1	1	2		5			5
4	Automatic Feeders &	1	2		3		2	1		3			5		5

	Delivery System														
5	Flexography Press Work	2	2		4		2			2		5			5
6	Web-Fed Machine	2	1		3		1		2	3		5			5
	Total				25					15					30

K = Knowledge C = Comprehension
A = Application HA = Higher Than Application (Analysis Synthesis, Evaluation)

10. Suggested Implementation Strategies: This subject will develop the foundation of the Printing technology diploma students. Therefore more tutorial assignments are to be given the students. Experiments performed in the laboratory will help the students in developing the skill.

11 List of books:-

Sl.No.	Title of book	Author	Publication
1	LETTERPRESS PRINTING (VOL – I & II)	C.S.MISRA	
2	FLEXOGRAPHY PRIMER	J.PAGE CROUCH	
3	PAPER IN PRINTING PROCESS	BANKS	
4	CYLINDER PRESSES	GANDERTON	
5	MACHINE PROBLEMS	GANDERTON	
6	FLEXOGRAPHY PRIMER	DONNAC. MULVIHILL	

Presswork–(Lab)
Code–Pt-505 (P)

Total Marks: - 50
Practical : - 25 **Pass Marks: - 8**
Sessional :- 25 **Pass Marks :- 9**

Skills to be developed –

a) Intellectual skills –

i. Knowledge of basic processes related to Press Work
ii. Identify & selection of various tools, equipment & software.

b) Operating skills --

i. Operate, control different machines & equipment
ii. Inspect/ produce the job for specified dimensions
iii. safety practices/ Care & maintenance of the tools & machines.

List of the practical

1. Shop talk & Familiarisation with various machines -
   Letterpress, Flexography, Gravure & Small Offset workshop
   Making charts and layouts of the machine department.
2. Working on Automatic stop cylinder machine –
   familiarisation with different units – setting of feeders with pawl and ratchet system for various types and thickness of paper, setting of inking system with
   control measure, examining and changing of rollers, ink flow adjustment, setting of rollers, fixing the under lay Practice on Letterpress sheet fed machines.
3. Air Compressor and accessories – Demonstration & Shop talk.
4. Static Electricity, Progressive Proof, Process Inks, Qualities of Papers by the help of AV Systems.

Reference books:-

1. Letterpress Printing – Vol I & II – C.S. Misra
2. Flexoghaphic Primer – J. Page Crouch
3. Paper in Printing Process – Banks
4. Cylinder Presses - Ganderton

1. **Course Title : Printing Machine Maintenance**
2. **Course Code : Pt – 506**
3. **Semester : 5th Semester**

4. **Aim:**

Maintenance of printing machines is important for many reasons. The delay in production for a equipment failure can create serious problem because printing is a service industry. Today's newspaper if supplied tomorrow is no longer news but history. Like other technological fields, new concepts and applications are developing continuously in maintenance also. This proposed syllabus is based on latest changes.

Objective: The students will be able to
1) Choose the right piece of printing equipment considering the end product requirement.
2) Understand the different lubricants and the importance of correct lubrication
3) Use different compressor in printing machines and do maintenance job.
4) Differentiate the various mechanical drives in the printing machines and work with them.
5) Select and maintain bearings in the printing machines.

Pre-Requisite:
Elementary knowledge of Basic Printing & Pre-Press Repro Technique

Course Outcomes (CO's)	
CO-1	Understand the factors effecting printing machine purchasing, guiding factors like cost, required desing considerations etc.
CO-2	Understand theimportance of lubrication, its types, purposes and characteristics, maintenance failure.
CO-3	Understand the use of pneumatic machines in printing, reciprocating and rotary compressor, aompressor maintenance.
CO-4	Understand the role of bearing in printing machine, definition, type and selection of bearing, advantages, maintenance and failure of bearings.
CO-5	Understand the mevhanical drives in printing machines, types and application of chains and sprocket, different types of belts and pullies, parts of machines like cam, follower, knowledge of gear terminology and types of gears.

Programme Outcomes (PO's)	
PO-1	Apply the knowledge of mathematics and science to understand engineering fundamentals and to solve Printing Technology problems
PO-2	Design and conduct experiments of Printing Technology as well as analyse and interpret data.
PO-3	Identify, formulate and solve Printing Technology problems.
PO-4	Use the techniques, skills and modern engineering tools necessary for engineering practices.
PO-5	Understand professional ethics and responsibility to extend the benefit of the Printing Technology projects to the society.
PO-6	Communicate effectively both verbally and in writing within the engineering community and with people in the society.
PO-7	Recognize the need for, and an ability to engage in life long learning to incorporate technological innovations.

5. Teaching Scheme (In Hrs):

Lecturer	Tutorial	Practical	Total
4	1		5

6. Examination scheme:

Theory					Practical			
ESE	Sessional (SS)			Pass (ESE+SS)	Practical Test(PT)#	Practical Assessment (PA)@	Pass (PT+PA)	Total Marks (Theory+Practical)
	TA	HA	Total (TA+HA)					
70	10	20	30	33/100				100

7. Detailed course content:

Chapter No.	Chapter Title	Contents	Duration (in Hrs)
1	**Printing Equipment Purchasing**	1.1 Initial cost, installation of printing machines 1.2 Printing equipment design consideration. 1.3 Critical questions regarding printing equipment purchasing.	8
2	**Lubrication**	2.1 Types of lubricants – Petroleum, animal and vegetable oils, grease, graphite (over-view only) 2.2 Purpose of lubrication – control of friction, control of wear, control of temperature, removal of contaminants, shock absorption. 2.3 Characteristic – wetting ability, surface tension, viscosity, adhesion. 2.4 Lubrication maintenance failure.	10
3	**Pneumatics in Printing**	3.1 Reciprocating compressor in front separation feeder. 3.2 Rotary compressor (vanes-type) in back separation feeder. 3.3 Compressor maintenance.	8
4	**Bearing used to printing machines**	4.1 Selection of bearing, different types of bearings used in printing machine, definition. 4.2 Bearing failure 4.3 Advantages and maintenance.	6
5	**Mechanical drives in printing machines**	5.1 Chain – Roller chain and its application areas in printing, Sprocket-with hub and without hub and its application in printing. Maintenance of chains and sprocket. 5.2 Belt and pulleys – Definition, classification, maintenance. Definition, application areas in printing.	10

		5.3 Cam, follower, an overview of theoretical curve, working curve, base circle stroke and dwell. 5.4 Gear terminology, material, different types of gears used in printing machines. (No mathematical calculations included anywhere).	
6	Class test	Three test of 1hrs.	3 hrs.

8. TABLE OF SPECIFICATIONS FOR THOERY

Sr no	Topic (a)	Time allotted in hrs (b)	Percentage weightage (c)	Modified % weightage (d)	K	C	A	HA
1	**Printing Equipment Purchasing**	8	19	19	10	3	2	4
2	**Lubrication**	10	24	24	10	6	3	5
3	**Pneumatics in Printing**	8	19	19	10	3	2	4
4	**Bearing used to printing machines**	6	14	14	6	4	1	3
5	**Mechanical drives in printing machines**	10	24	24	10	6	3	5
	Total	42	100	100				

9. DETAILED TABLE OF SPECIFICATION FOR THEORY EXAM:-

Sl no.	Topics	Objective type				Short answer type					Essay type				
		K	C	A	T	K	C	A	HA	T	K	C	A	HA	T
1	**Printing Equipment Purchasing**	5	1		6		1		1	2					5
2	**Lubrication**	3	1		4			1	2	3					5
3	**Pneumatics in Printing**	2	2		4			1	1	2					5
4	**Bearing used to printing machines**	1	2		3		2	1		3					5
5	**Mechanical drives in printing machines**	2	2		4		2			2					5
	Total				25					15					30

K = Knowledge C = Comprehension
A = Application HA = Higher Than Application (Analysis Synthesis, Evaluation)

10. Suggested Implementation Strategies: This subject will develop the foundation of the Printing technology diploma students. Therefore more tutorial assignments are to be given

the students. Experiments performed in the laboratory will help the students in developing the skill.

11 List of books:-

Sl.No.	Title of book	Author	Publication
1	Advanced Pressmanship – C. W. Latham	C. W. Latham	Focal Press
2	Modern Lithography – Ian Faux	Ian Faux	Printek Publications New Delhi – 110055
3	Web Offset Press Troubles – G.A.T.F.	G.A.T.F.	Focal Press
4	Solving Sheet-fed Press Troubles – G.A.T.F.	G.A.T.F.	BPIF
5	Method Of Conditioning Paper for Multicolour Offset Printing – Weber & Geib	Weber & Geib	Springer, 2002
6	Prevention of Occupational Dermatitis in Lithography – L.T.F. Inc.	L.T.F. Inc.	

PROFESSIONAL PRACTICE –III

5th SEMESTER, PRINTING TECHNOLOGY

CODE: PT-510

THEORY SCHEME:	PRACTICAL SCHEME:
Theory: 1hr/week	Practical assessment: 25 marks
Practical: 2hrs/week	Practical test: 25 marks
Credit: 2	

A) RATIONAL:-

To develop general confidence, ability to communicate and attitude, in addition to basic technological concepts through industrial visits, guest lectures on technical topics and conducting group discussions.

B) AIMS AND OBJECTIVES:-

The student will be able to:

- Preparing report on industrial visits, expert lectures.
- Interacting with peers to share thoughts.
- Prepare notes for given topic.
- Presentation in seminar, group discussion on improvement of communication skills.
- Acquire information from different sources.

C) PRE- REQUISITE:-

1. Desire to gain comparable knowledge and skills of various activities in various areas of importance.
2. Eagerness to participate in group work and to share thoughts with group members.

Activities:

1. INDUSTRIAL/FIELD VISIT: - - 10 HRS.

Structured field visits be arranged and report of the same should be submitted by the individual student, to form part of the team work.

Visits to following companies:

e. Genesys Press nearby Kahilipara, Guwhati
f. Parkson's Ltd nearby Biahata Chariali, Guwahati

2. GUEST LECTURES: (Any three) Lectures by professional /industrial expert/ student

Seminars on the following areas. -10 HRS

c) Planographic Printing
d) Printers Material Science

Individual report of the above lecture should be submitted by the students.

3. GROUP DISCUSSION: (Any TWO among a group of four to five students). Topic and time duration of the group discussion to be decided by concerned teacher. –10 HRS.

e. Offset Lithography.
f. Intaglio Printing
g. Relief Printing

4. STUDENTS ACTIVITY: The students in a group of 4 to 5 will perform any one of the following activities. –10 HRS.

e. Identify the various printing tools and equipments and write their functions.
f. Tree plantation inside or outside of the institute campus.
g. Help in flood relief camp (by all students)
h. Other co- curricular and extracurricular activity.

EXAMINATION SCHEME (on Practical assessment)

Continuous internal assessment of 25 marks is to be carried out by the teachers.

Distribution of marks: -

Activities =10,

Group discussion = 5,

Field visits=5 and

Guest lecturer attendance and

Report=5.

6TH SEMESTER

COURSE STRUCTURE OF 6TH SEMESTER (PRINTING TECHNOLOGY)

Sl no	Code no	Subject	Contact hours /week			Evaluation scheme									
						Theory (Th)					Practical (Pr)			Total Marks (Th+Pr)	Credit
			L	T	P	ESE	Sessional(SS)			Pass (ESE+SS)	Practical Test (PT)	Practical Assessment (PA)	Pass (PT+PA)		
							TA	HA	Total (TA + HA)						
1	**Hu-601**	Industrial Management and Entrepreneurship	3	-	-	70	10	20	30	33/100				100	3
2	**Pt-601**	Binding and Finishing	3		3	70	10	20	30	33/100	25	25	17/50	150	4
3	**Pt-602**	Estimating and Costing	3	1		70	10	20	30	33/100				100	3
4	**Pt-603**	Plano graphic Painting Technique -II	3	-		70	10	20	30	33/100				100	3
5	**Pt-611**	Project & Seminar	-	1	6						100	50	66/100	150	3
6	**Pt-612**	General Viva		2							50			50	2
7	**Pt-610**	Professional Practice- IV	1	0	2						25	25	17/50	50	2
			13	4	11									700	
			Elective (Any One)												
8	**Pt-604**	Machine	3	-	3	70	10	20	30	33/100	25	25	17/50	150	4
9	**Pt-605**	Surface Preparation	3	-	3	70	10	20	30	33/100	25	25	17/50	150	4
10	**Pt-606**	Graphic Design	3	-	3	70	10	20	30	33/100	25	25	17/50	150	4
													Total	850	24

1: Course Title : Industrial Management and Entrepreneurship (All Branches)

Course Code: **Hu – 601**

Semester: **VI**

Aim of the Course:

1. To acquaint the students with managerial activities
2. To provide introductory knowledge of Cost Accounting
3. To introduce students with industrial legislation
4. To explain the scope for self-employment
5. To compare and contrast different forms of business organization
6. To identify the opportunities to start a small scale industry

Course Outcomes:

On completion of the course on IME, students will be able to

- CO_1 = explain managerial activities.
- CO_2 = describe leadership qualities and decision making process.
- CO_3 = state the elements of costs.
- CO_4 = explain important industrial laws.
- CO_5 = define different forms of business organisations
- CO_6 = identify entrepreneurial abilities for self employment through small scale industries.

Teaching Scheme (in hours)

Lecture	Tutorial	Practical	Total
42 hrs	**3 hrs**	**--**	**45 hrs**

Examination Scheme:

Theory				Practical				Total Marks
Examination Full Marks	Sessional Full Marks	Total Marks	Pass Marks	Examination		Sessional		
70	30	100	33	--	--	--	--	100

Detailed Course Content:

Chapter No.	Chapter Title	Content	Intended Learning Outcomes	Duration (in hours)
				42 hrs
1.0	**Introduction to Management :**	i) Meaning and Concept ii) Functions of Management iii) Principles of Management	i) Explain functions and principles of management	3
2.0	**Leadership Decision Making & Communication :**	i) Definition of Leader ii) Functions of a leader iii) Decision making – Definition iv) Decision making process v) Communication – definition, importance & types	i) Develop leadership qualities ii) Demonstrate decision making abilities	4
3.0	**Introduction to Cost :**	i) Definition and classification of Cost ii) Elements of Cost iii) Break Even Analysis	i) State elements of costs ii) Explain Break Even Analysis	3
4.0	**Human Resource Management:**	i) Meaning of manpower planning ii) Recruitment and Selection procedure iii) Payment of wages – factors determining the wage iv) Methods of payment of wages – Time rate and Piece rate v) Labour Turnover – definition, its causes, impact and remedy	i) State selection procedure of employees ii) Distinguish Time rate and Piece rate system of wage payments iii) Explain causes and impact of labour turnover	5

5.0	**Industrial Legislation :**	i) Need of Industrial legislation ii) Indian Factories Act – 1948 – Definition of Factory, main provisions regarding health, Safety and Welfare of Workers iii) Industrial Dispute Act – 1947 – Definition of Industrial dispute, Machineries for settlement of Industrial dispute in India	i) Identify the needs and importance of industrial laws	5
6.0	**Production Management :**	i) Meaning of Production ii) Production Management – definition, objectives, functions and scope iii) Inventory Management, Basic idea	i) State the objectives and functions of Production management	3
7.0	**Marketing Management:**	i) Meaning and functions of marketing ii) e- Commerce iii) Channels of distribution iv) Wholesale and retail trade	i) state the functions of wholesalers and retailers	2
8.0	**Entrepreneur and Entrepreneurship:**	i) Definition of Entrepreneur and Entrepreneurship ii) Qualities required by an entrepreneur iii) Functions of an entrepreneur iv) Entrepreneurial motivation	i) State the qualities and functions of an entrepreneur	3
9.0	**Forms of Business**	i) Sole Trader – meaning,	i) Differentiate	5

	Organisation:	main features, merits and demerits ii) Partnership – definition, features, merits and demerits iii) Joint Stock Company – Definition, types, features, merits and demerits	different forms of Business organization ii) compare and contrast features, merits and demerits of different business organizations.	
10.0	**Micro and Small Enterprises:**	i) Definition of Micro & Small enterprises ii) Meaning and characteristics of Micro and Small enterprise iii) Scope of SSI with reference to self-employment iv) Procedure to start SSI – idea generation, SWOT analysis v) Selection of site for factories	i) Define micro and small enterprises ii) Explain the procedure to start a small enterprise	4
11.0	**Support to Entrepreneurs**	a) Institutional support: i) Introduction ii) Sources of information and required application forms to set up SSIs iii) Institutional support of various National & State level organizations – DICC, NSIC, IIE, MSME - DI, Industrial Estates	i) identify the supporting agencies to entrepreneurs ii) Explain the role of financial support organisations	5

		b) Financial support: i) Role of Commercial banks, RRB, IDBI, ICICI, SIDBI, NEDFi, and State Financial Corporations ii) Special incentives and subsidies for Entrepreneurship Development in the North East		
	Class Test			3 hrs
	Total			**45 hrs**

(9) TABLE OF SPECIFICATIONS for Industrial Management & Entrepreneurship

Sl. No	**Topic** (a)	**Time allotted in hours (b)**	**Percentage Weightage (c)**	**Knowledge**	*Compre-hension*	**Application**	**HA**
1	Introduction to Management	3	7	2	3	0	0
2	Leadership & Decision Making	4	9.5	3	4	0	0
3	Introduction to Cost	3	7	3	2	0	0
4	Human Resource Management	5	12	6	2	0	0
5	Industrial Legislation	5	12	4	4	0	0

6	Production Management	3	7	3	2	0	0
7	Marketing Management	2	5	4	0	0	0
8	Entrepreneur & Entrepreneurship	3	7	3	2	0	0
9	Forms of Business Organisation	5	12	3	5	0	0
10	Micro & Small Enterprises	4	9.5	4	3	0	0
11	Support to Entrepreneurs	5	12	4	4	0	0
Total		**42**	**100**	**39**	**31**	**0**	**70**

K = Knowledge C = Comprehension A = Application HA = Higher Than Application (Analysis, Synthesis, Evaluation)

C= $\frac{b}{\sum b} \times 100$

10. Distribution of Marks:

DETAILED TABLE OF SPECIFICATIONS FOR IME

Sl. No	**Topic**	**OBJECTIVE TYPE**				**SHORT ANSWER TYPE**					**ESSAY TYPE**					**Grand**
		K	**C**	**A**	**T**	**K**	**C**	**A**	**HA**	**T**	**K**	**C**	**A**	**HA**	**T**	**Total**
1	Management	**1**	**0**	**0**	**1**	**1**	**0**	**0**	**0**	**1**	**0**	**3**	**0**	**0**	**3**	5
2	Leader & Decisi	**1**	**0**	**0**	**1**	**2**	**1**	**0**	**0**	**3**	**0**	**3**	**0**	**0**	**3**	7

3	Cost	**1**	**1**	**0**	**2**	**2**	**1**	**0**	**0**	**3**	**0**	**0**	**0**	**0**	**0**	5
4	HRM	**2**	**1**	**0**	**3**	**1**	**1**	**0**	**0**	**2**	**3**	**0**	**0**	**0**	**3**	8
5	Laws	**3**	**0**	**0**	**3**	**0**	**0**	**0**	**0**	**0**	**1**	**4**	**0**	**0**	**5**	8
6	Product Manage	**2**	**1**	**0**	**3**	**1**	**1**	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**0**	5
7	Market	**2**	**0**	**0**	**2**	**2**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**0**	4
8	Entrepreneurship	**1**	**1**	**0**	**2**	**2**	**1**	**0**	**0**	**3**	**0**	**0**	**0**	**0**	**0**	5
9	Forms of BO	**2**	**1**	**0**	**3**	**0**	**0**	**0**	**0**	**0**	**1**	**4**	**0**	**0**	**5**	8
10	MSME	**2**	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**2**	**3**	**0**	**0**	**5**	7
11	Support to Entp.	**3**	**0**	**0**	**3**	**1**	**0**	**0**	**0**	**1**	**0**	**4**	**0**	**0**	**4**	8
	Total	**20**	**5**	**0**	**25**	**12**	**5**	**0**	**0**	**17**	**7**	**21**	**0**	**0**	**28**	**70**

K = Knowledge C = Comprehension A = Application

HA = Higher Than ApplicationT = Total

Higher than Application (Analysis, Synthesis, Evaluation)

11. **Suggested implementation Strategies**: Modified syllabus may be implemented with effect from January, 2020 (Starting with the present batch (2018) of 2nd Semester students)

12. **Suggested learning Resource**:

a. **Book list** :

Sl. No.	**Title of Book**	**Name of Author(s)**	**Publisher**
1	Industrial Management	S.C. Jain H.S. Bawa	Dhanpat Rai & Co. (P) Ltd. New Delhi-110006
2	Business Organisation and	S.S. Sarkar	Kalyani Publishers,

	Entrepreneurship Development	R.K. Sharma Sashi K. Gupta	New Delhi-110002
3	Entrepreneurial Development	S. S. Khanka	S. Chand & Co. Ltd. New Delhi-110055
4	Business Methods	R.K. Sharma Shashi K Gupta	Kalyani Publishers, New Delhi
5	Entrepreneurship Development and Management	Dr. R.K. Singhal	S.K. Kataria & Sons, New Delhi-110002
6	Business Administration & Management	Dr. S. C. Saksena	Sahitya Bhawan, Agra
7			
8			

*****

b. List of Journals
c. Manuals
d. Others

Xxxxxxxxxxxxxxxxxx

1. **Course Title : BINDING & FINISHING**
2. **Course Code : Pt – 601**
3. **Semester : 6th Semester**

4. **Aim** : Getting the output through Print Finishing Processes are the most important operations for completing the print production. This will enable the students to make judgement about the aspect of Binding & Print Finishing, particularly the selection of a particular process chosen for a specific print production.

Objective: The students will be able to

1. Understand various Paper and Board sizes & Estimates, warehouse management & adhesive & other related materials, different finishing tools.
2. Appreciate styles of binding, layout of binding & finishing department.
3. Understand various types of binding, the detailed steps to be taken in each binding type.
4. Understand various cutting machines and other allied equipment.
5. Get an idea about various automation-taking places in binding & finishing.
6. Understand various Paper and Board sizes & Estimates, warehouse management & adhesive & other related materials, different finishing tools.
7. Appreciate styles of binding, layout of binding department.
8. Understand various types of binding, the detailed steps to be taken in each binding type.
9. Understand various cutting machines and other allied equipment.
10. Get an idea about various automation-taking places in binding.

Pre-Requisite: Elementary knowledge of Basic Printing & Pre-Press Repro Technique

Course Outcomes (CO's)	
CO-1	Understand book binding - its definition and classification, different papers used and its sizes, binding styles and uses of adhesives
CO-2	understand uses of cutting machine and binding and finishing tools.
CO-3	Understand various terms of binding, the detail steps to be taken in each binding and finishing.
CO-4	undrestand different steps in folding, assembly of folded material for binding
CO-5	understand proper binding by stitching, sewing, adhesive binding, case book binding etc.
CO-6	Understand operational sequences of binding, rebinding, preventation of deterioration

Programme Outcomes (PO's)	
PO-1	Apply the knowledge of mathematics and science to understand engineering fundamentals and to solve Printing Technology problems
PO-2	Design and conduct experiments of Printing Technology as well as analyse and interpret data.
PO-3	Identify, formulate and solve Printing Technology problems.
PO-4	Use the techniques, skills and modern engineering tools necessary for engineering practices.

PO-5	Understand professional ethics and responsibility to extend the benefit of the Printing Technology projects to the society.
PO-6	Communicate effectively both verbally and in writing within the engineering community and with people in the society.
PO-7	Recognize the need for, and an ability to engage in life long learning to incorporate technological innovations.

5. Teaching Scheme (In Hrs):

Lecturer	Tutorial	Practical	Total
3		3	6

6. Examination scheme:

Theory					Practical			
ESE	Sessional (SS)			Pass (ESE+SS)	Practical Test(PT)#	Practical Assessment (PA)@	Pass (PT+PA)	Total Marks (Theory+Practical)
	TA	HA	Total (TA+HA)					
70	10	20	30	33/100	25	25	17/50	150

7. Detailed course content:

Chapter No.	Chapter Title	Contents	Duration (in Hrs)
1	**Book Binding in Print Finishing**	1.0 Definition, General description of a book, classification of bookbinding & its operational divisions, main stages of Binding. 2.0 Paper and its sizes – GSM, relation between GSM and weight of a ream, Estimation for paper, board, cloth calculations. Paper consideration – Size, Grain, Weight, Squaring & Singling. 3.0 Styles of binding and covering materials. 4.0 Use of different boards and adhesives.	10
2	**Binding equipment & tools**.	5.0 Cutting Machine – Single knife, three knives & five knives trimmer– Application of Air cushion table. 6.0 Binding & Finishing tools and equipment.	6
3	**Binding & Finishing terms & Terminology**	7.0 Binding & Finishing terms and terminology. 8.0 End papers – definition, classification and its purpose. 9.0 General layout of a Binding & Finishing Department	7
4	**Folding & Assembling the folded material for**	10.0 Folding – Manual & Mechanical, Folding to print – Folding to paper, Right angle folding and parallel folding, knife folder, buckle folder, Former folder (for newspaper), Spiral folder (continuous	8

	binding	stationery/business forms) 12.0 Assembling the folded material for binding – Gathering, Collating, Inserting, – Manual and mechanical version.	
5	**Binding Proper**	1.0 Binding Proper – Stitching, Methods of using staplers or wire stitching machine, Sewing (Hand and Machine version), and classification of sewing, Adhesive/perfect binding loose leaf and mechanical binding. 2.0 Case book binding work (Manual and Mechanical).	6
6	**Operational Sequences** -	Flush cut binding, Edition Binding, Library Binding, Account Book Binding, Re-binding – Prevention of Deterioration.	5
	Class test	Three test of 1hrs.	3 hrs.

8. TABLE OF SPECIFICATIONS FOR THOERY

Sr no	Topic (a)	Time allotted in hrs (b)	Percentage weightage (c)	Modified % weightage (d)	K	C	A	HA
1	**Book Binding in Print Finishing**	10	23	23	10	7	2	4
2	**Binding equipment & tools**.	6	14	14	6	3	2	3
3	**Binding & Finishing terms & Terminology**	7	17	17	7	4	2	4
4	**Folding & Assembling the folded material for binding**	8	19	19	6	7	2	4
5	**Binding Proper**	6	15	15	7	3	2	3
6	**Operational Sequences** -	5	12	12	3	4	2	3
	Total	42	100	100				

9. DETAILED TABLE OF SPECIFICATION FOR THEORY EXAM:-

Sl no.	Topics	Objective type				Short answer type					Essay type				
		K	C	A	T	K	C	A	HA	T	K	C	A	HA	T
1	**Book Binding in Print Finishing**	5	1		6		1		1	2					5
2	**Binding equipment & tools**.	3	1		4			1	2	3					5
3	**Binding & Finishing terms & Terminology**	2	2		4			1	1	2					5
4	**Folding & Assembling the folded material for binding**	1	2		3		2	1		3					5

5	**Binding Proper**	2	2		4		2			2					5
6	**Operational Sequences** -	2	1		3		1		2	3					5
	Total				25					15					30

K = Knowledge C = Comprehension
A = Application HA = Higher Than Application (Analysis Synthesis, Evaluation)

10. Suggested Implementation Strategies: This subject will develop the foundation of the Printing technology diploma students. Therefore more tutorial assignments are to be given the students. Experiments performed in the laboratory will help the students in developing the skill.

11 List of books:-

Sl.No.	Title of book	Author	Publication
1	Book Binding For Studenits - M.P.Kini	M P Kini	GATF
2	Modern Book Binding – Alen. J. Vaugha	Alen J Vaugha	GATF
3	Book Binding By Hand - Lorence Thom	Lorence Thom	GATF
4	Book Binding – John Masa	John Massa	GATF
5	Book Binding For Begiiners – J.Key	J Key	GATF
6	Practtical Elementary Book Craftt – E.V.Whicher	E V Whicher	GATF
7	The Artt Off Book Binding – J.W.Zachensden	J W Zachensden	GATF
8	Finishing Process In Printting – A.G.Martin	A G Martin	GATF
9	The Pinting Industry – Victor Strauss	Victor Strauss	GATF

Binding & Finishing -Lab

Code–Pt-601 (P)

Total Marks: - 50
Practical : - 25 **Pass Marks: - 8**
Sessional :- 25 **Pass Marks :- 9**

Skills to be developed –

a) Intellectual skills –

i. Knowledge of basic processes related to Binding & Finishing
ii. Identify & selection of various tools, equipment & software.

b) Machine skills --

i. Operate, control different machines & equipment
ii. Inspect/ produce the job for specified dimensions
iii. safety practices/ Care & maintenance of the tools & machines.

List of the practical

Unit: 1

1. Acquaintance with the tools and equipment and their uses
2. Performing operations like Counting, Jogging
3. Folding by hand
4. Acquaintance with the plan of Sewing machine
5. Sewing by hand
6. Wire Stitching

Unit: 2

7. Acquaintance with different styles of Binding
8. Preparing a quarter bound book cut flush
9. Demo on different kind of end papers
10. Case Binding
11. Document Binding

Unit: 3

12. Preparing a Writing Pad
13. Exercise on stitching and cutting machine
14. Demo on various Finishing operations such as Ruling, Numbering, Laminating (dry table top) -Miscellaneous operations such as Perforation, Eye-letting, Numbering.
15. Demo on Account Book Binding

Unit: 4

16. Demo on the Folding machine
17. Acquaintance with Die – cutting, Scoring, Rotary board cutter.
18. Demo on Adhesive/Perfect binding
19. Demo on Saddle stitcher cum three knife trimmer – complete Binding & Finishing m/c for magazine work

Reference Book

1. M P Kini Boook Binding for Students
2. Alen J. Vaugha Modern Book of Binding

1. **Course Title :PRINTERS' COSTING & ESTIMATING**
2. **Course Code : Pt – 602**
3. **Semester : 6th Semester**

4. **Aim**: Printing supervisors, owners of printing presses have to study costing for the purpose of cost recovery and cost control. The study of a scientific system of costing will give them proper guidance as to how the maximum utilization of the resources of the factory can be achieved and do away with waste of time and money. In an extremely competitive market, scientific estimating can guarantee the meaningful survival of a printing organization by enabling it to forecast correctly and judiciously the estimated cost of jobs, the overhead expenditure of a business, and the amount of profit to be made from each job.

Objective: The students will be able to

1. Understand various Paper and Board sizes & Estimates, warehouse management & adhesive & other related materials, different finishing tools.
2. Appreciate styles of binding, layout of binding & finishing department.
3. Understand various types of binding, the detailed steps to be taken in each binding type.
4. Understand various cutting machines and other allied equipment.
5. Get an idea about various automation-taking places in binding & finishing.

Pre-Requisite: Elementary knowledge of Basic Printing , Pre-Press Repro Technique & Binding Finishing

Course Outcomes (CO's)	
CO-1	Understand the structure of costing, variable cost, semi-variable cost, indirect cost, fixed cost.
CO-2	Understand definition of pricing, factors, bin card, job ticket, purchase requisition.
CO-3	Understand requisition and depriciation, definition and representation of Break-Even point
CO-4	Understand good estimation, good copy and bad copy, SPANKS method.
CO-5	Understand the use of En method, knowledge of estimation and determination of fixed cost of machine.

Programme Outcomes (PO's)	
PO-1	Apply the knowledge of mathematics and science to understand engineering fundamentals and to solve Printing Technology problems
PO-2	Design and conduct experiments of Printing Technology as well as analyse and interpret data.
PO-3	Identify, formulate and solve Printing Technology problems.
PO-4	Use the techniques, skills and modern engineering tools necessary for engineering practices.
PO-5	Understand professional ethics and responsibility to extend the benefit of the Printing Technology projects to the society.
PO-6	Communicate effectively both verbally and in writing within the engineering community and with people in the society.
PO-7	Recognize the need for, and an ability to engage in life long learning to incorporate technological innovations.

5. Teaching Scheme (In Hrs):

Lecturer	Tutorial	Practical	Total
3	1		4

6. Examination scheme:

Theory					Practical			
ESE	Sessional (SS)			Pass (ESE+SS)	Practical Test(PT)#	Practical Assessment (PA)@	Pass (PT+PA)	Total Marks (Theory+Practical)
	TA	HA	Total (TA+HA)					
70	10	20	30	33/100				100

7. Detailed course content:

Chapter No.	Chapter Title	Contents	Duration (in Hrs)
1	COSTING	Variable Cost Names of Variable materials & services used in Printing Industries Semi – Variable Cost Name of the things included in Semi – Variable Costs in Printing Indirect Cost Names of the things included in Fixed Costs in Printing Industries	10
2	Definition of Pricing	Definition of Pricing Different factors of Pricing Brief overview on Bin Card, Job Ticket, Purchase Requisition	8
3	Requisition and Depreciation	Definition of Break – Even Point Algebrical & Graphical representation of Break – Even Point	8
4	ESTIMATING	Quality of a good Estimator Good Copy & Bad copy in Printing SPANKS method to find out ink coverage in Printing	6
5	Casting Off calculation by En method	Casting Off calculation by En method Calculation of Kg of a Ream for a known GSM and size of a stock and to estimate cost from it To find out the fixed cost of a machine for a known initial cost, interest%, depreciation%, insurance% etc.	10
	Class test	Three test of 1hrs.	4 hrs.

8. TABLE OF SPECIFICATIONS FOR THOERY

Sr no	Topic (a)	Time allotted in hrs (b)	Percentage weightage (c)	Modified % weightage (d)	K	C	A	HA
1	COSTING	10	24	24	10	8	2	4
2	Definition of Pricing	8	19	19	8	5	2	4
3	Requisition and Depreciation	8	19	19	8	5	2	4
4	ESTIMATING	6	14	14	5	3	2	4
5	Casting Off calculation by En method	10	24	24	10	8	2	4
	Total	42	100	100				

9. DETAILED TABLE OF SPECIFICATION FOR THEORY EXAM:-

Sl no.	Topics	Objective type				Short answer type					Essay type				
		K	C	A	T	K	C	A	HA	T	K	C	A	HA	T
1	COSTING	5	1		6		1		1	2					5
2	Definition of Pricing	3	1		4			1	2	3					5
3	Requisition and Depreciation	2	2		4			1	1	2					5
4	ESTIMATING	1	2		3		2	1		3					5
5	Casting Off calculation by En method	2	2		4		2			2					5
	Total				25					15					30

K = Knowledge C = Comprehension
A = Application HA = Higher Than Application (Analysis Synthesis, Evaluation)

10. Suggested Implementation Strategies: This subject will develop the foundation of the Printing technology diploma students. Therefore more tutorial assignments are to be given the students. Experiments performed in the laboratory will help the students in developing the skill.

11 List of books:-

Sl.No.	Title of book	Author	Publication
1	Estimating Methods & Cost Analysis for Printers	K S Venkataraman & K S Balaraman	
2	Printers' Production Management	Gary G Field	
3	The Printers Estimator	Harold Mills	
4	A Primary Course in Printers' Costing	F C Avis	

1. **Course Title : Plano graphic Printing Technique II**
2. **Course Code : Pt – 603**
3. **Semester : 6th Semester**

4. **Aim** : Among the wide spectrum of different printing processes the most versatile and popular process is Plano graphic process. A wide range of substrates can be printed by Plano graphic process. Continuous R and D are going on in this process into different printing machines manufacturing companies and allied trades. There are tremendous job opportunities for the printing students in this field. The rapid changes and development in the field of Plano graphic technology obviate certain very old methodology and claim inclusion of up to date concept. The present syllabus reflects this rationale.

Objective: The students will be able to
1) Understand the four units that make up any printing press.
2) Understanding the development of press design from platen presses to rotary presses.
3) Understanding the principle of offset printing
4) Understanding the feeding unit, registration unit, printing unit, inking unit, dampening unit and delivery unit operation of an offset lithographic press.
5) Understanding the basic steps in setting up and operating an offset lithographic press
6) Understanding the several quality control devices commonly used in offset printing.
7) Understanding the concept of offset blanket
8) Understanding the feeding, dampening and inking systems of offset presses.
9) Understanding the common press problems.
10) Understanding the different imposition schemes, precautionary measures in machine room.

Pre-Requisite: Elementary knowledge of Basic Printing & Pre-Press Repro Technique

Course Outcomes (CO's)	
CO-1	Understand the procedure to make a printing machine ready for other printing
CO-2	Understand offset blanket and its usefulness, classification, qualities, repair of damages.
CO-3	Understand sheet feeding and pile feeding and its different steps.
CO-4	Understand inking system and setting of rollers.
CO-5	Understand fundamentals of web offset press
CO-6	Understand web theory, roll to roll, roll to fold, roll to sheet.

Programme Outcomes (PO's)	
PO-1	Apply the knowledge of mathematics and science to understand engineering fundamentals and to solve Printing Technology problems
PO-2	Design and conduct experiments of Printing Technology as well as analyse and interpret data.
PO-3	Identify, formulate and solve Printing Technology problems.
PO-4	Use the techniques, skills and modern engineering tools necessary for engineering practices.

PO-5	Understand professional ethics and responsibility to extend the benefit of the Printing Technology projects to the society.
PO-6	Communicate effectively both verbally and in writing within the engineering community and with people in the society.
PO-7	Recognize the need for, and an ability to engage in life long learning to incorporate technological innovations.

5. Teaching Scheme (In Hrs):

Lecturer	Tutorial	Practical	Total
3			3

6. Examination scheme:

Theory					Practical			
ESE	Sessional (SS)			Pass (ESE+SS)	Practical Test(PT)#	Practical Assessment (PA)@	Pass (PT+PA)	Total Marks (Theory+Practical)
	TA	HA	Total (TA+HA)					
70	10	20	30	33/100				100

7. Detailed course content:

Chapter No.	Chapter Title	Contents	Duration (in Hrs)
1		1.0 Make – Ready.	4
2		2.0 Offset Blanket – Usefulness – Construction – Classification – Required qualities – Treatment – Leveling – Restoring – Cleaning – Reasons for damaging – Repairing Dented Blanket–Compressible Blanket.	8
3		3.0 Sheet Feeder – Successive sheet feeding – Stream feeding – Pile feeding – Continuous feeding – Basic requirements to be made by a Feeder.	8
4		4.0 Inking system including setting of rollers.	8
5		5.0 Fundamentals of Web – Offset press.	8
6		6.0 Web Delivery – Roll to Roll, Roll to Fold, Roll to Sheet	6
	Class test	Three test of 1hrs.	3 hrs.

8. TABLE OF SPECIFICATIONS FOR THOERY

Sr no	Topic (a)	Time allotted in hrs (b)	Percentage weightage (c)	Modified % weightage (d)	K	C	A	HA
1	1.0 Make – Ready.	4	10	10	3	2	2	3

2	2.0 Offset Blanket – Usefulness – Construction – Classification –	8	19	19	8	4	3	4
3	3.0 Sheet Feeder – Successive sheet feeding – Stream feeding –	8	19	19	8	4	3	4
4	4.0 Inking system including setting of rollers.	8	19	19	8	4	3	4
5	5.0 Fundamentals of Web – Offset press.	8	19	19	8	4	3	4
6	6.0 Web Delivery – Roll to Roll, Roll to Fold, Roll to Sheet	6	14	14	5	4	2	3
	Total	42	100	100				

9. DETAILED TABLE OF SPECIFICATION FOR THEORY EXAM:-

Sl no.	Topics	Objective type				Short answer type					Essay type				
		K	C	A	T	K	C	A	HA	T	K	C	A	HA	T
1	1.0 Make – Ready.	5	1		6		1		1	2					5
2	2.0 Offset Blanket – Usefulness – Construction – Classification –	3	1		4			1	2	3					5
3	3.0 Sheet Feeder – Successive sheet feeding – Stream feeding –	2	2		4			1	1	2					5
4	4.0 Inking system including setting of rollers.	1	2		3		2	1		3					5
5	5.0 Fundamentals of Web – Offset press.	2	2		4		2			2					5
6	6.0 Web Delivery – Roll to Roll, Roll to Fold, Roll to Sheet	2	1		3		1		2	3					5
	Total				25					15					30

K = Knowledge C = Comprehension
A = Application HA = Higher Than Application (Analysis Synthesis, Evaluation)

10. Suggested Implementation Strategies: This subject will develop the foundation of the Printing technology diploma students. Therefore more tutorial assignments are to be given the students. Experiments performed in the laboratory will help the students in developing the skill.

11 List of books:-

Sl.No.	Title of book	Author	Publication
1	Hand Book Of Lithography - David Cumming	David Cumming	GATF
2	Solving Sheet Fed Offset Press Problems - Cavuto And Beale(Gatf)	Cavuto and Beale	GATF
3	Sheetfed Offset Press Operatig – Gatf	GATF	GATF
4	The Printing Industry	GATF	GATF
5	Modern Lithography – Ian Faux – Macdonald And Evans	Ian Faux	GATF
6	Single Colour Lithographing Machine Operating	GATF	GATF

1. **Course Title : Printing Machine**
2. **Course Code : Pt – 604**
3. **Semester : 6th Semester**

4. **Aim** : In respect to the advancement of modern digital Printing Technology along with its analog counterpart, the Elective subject will groom the students more efficiently to face the challenges and to adapt the new technology.

Objective: The students will be able to

1. Understand the run ability factors.
2. Understand the delivery system.
3. Understand the different parameters of Flexography printing.
4. Understand the different parameters of Gravure printing.
5. Acquire knowledge about the importance of grippers.
6. Acquire knowledge about the trip throw mechanism.
7. Understand the use and importance of proper tools and equipment in offset.
8. Understand the detail concepts of offset printing.
9. Understand the detail concepts of different dampening systems.
10. Understand the printing unit including the adjustments of inking and dampening unit
11. Achieving proper ink and water balance
12. Understand the sequence of colours.
13. Understand Moisture content and dimensional stability of Paper – Paper Conditioning
14. Understand various blanket related problem.
15. Understand printed image size – changing print length.
16. Understand preparing different printing plates for storage.
17. Understand the printability of paper.

Pre-Requisite: Elementary Elementary knowledge of Basic Printing & Pre-Press Repro Technique

Course Outcomes (CO's)	
CO-1	Understand automatic feeder - successive and stream feeding, knowledge of suction, lifting and forwarding and delivery mechanism.
CO-2	Understand structure of flexography machine, fixing stereo, anilox roller, cell structure, cell angle, web path
CO-3	Understand roto gravure machine, splicer, web tension control, impression, slitter, dryer, web path
CO-4	Understand gripper settings, general rules, precautions to be taken, ill effects.
CO-5	Understand impression mechanism, cylinder parallelism, ill effects.
CO-6	Understand history of offset printing, printing units, its configuration, comparison between single colour and multi colour offset machines.

Programme Outcomes (PO's)	
PO-1	Apply the knowledge of mathematics and science to understand engineering fundamentals and to solve Printing Technology problems
PO-2	Design and conduct experiments of Printing Technology as well as analyse and interpret data.
PO-3	Identify, formulate and solve Printing Technology problems.
PO-4	Use the techniques, skills and modern engineering tools necessary for engineering practices.

PO-5	Understand professional ethics and responsibility to extend the benefit of the Printing Technology projects to the society.
PO-6	Communicate effectively both verbally and in writing within the engineering community and with people in the society.
PO-7	Recognize the need for, and an ability to engage in life long learning to incorporate technological innovations.

5. Teaching Scheme (In Hrs):

Lecturer	Tutorial	Practical	Total
3		3	6

6. Examination scheme:

Theory					Practical			
ESE	Sessional (SS)			Pass (ESE+SS)	Practical Test(PT)#	Practical Assessment (PA)@	Pass (PT+PA)	Total Marks (Theory+Practical)
	TA	HA	Total (TA+HA)					
70	10	20	30	33/100	25	25	17/50	150

7. Detailed course content:

Chapter No.	Chapter Title	Contents	Duration (in Hrs)
1	Automatic Feeder – Successive and Stream feeding	1. Automatic Feeder – Successive and Stream feeding a. Air Blast b. Suction c. Lifting and Forwarding mechanism d. Pre-timed rotary valve e. Pile lifting mechanism and pressure foot f. Pull-in-wheels g. Endless belts and trimmings h. Timing 2. Delivery mechanism – a. Chute delivery b. Chain delivery	8
2	Flexography –	a. Fixing stereos b. Anilox roller c. Cell structure d. Cell angle e. Web path	5
3	Roto Gravure –	a. Splicer b. Web tension control c. Impression d. Slitter e. Dryer f. Web path	5
4	Gripper Setting	a. General rules for gripper setting b. Precautions to be taken while gripper setting c. Ill effects of wrongly set grippers.	6

5	Method of obtaining impression	a. Impression on/off mechanism (Toggle mechanism) b. Cylinder parallelism, thumb test, feeler gauge test. c. Ill effects of non-parallel cylinders on printing.	10
6	Offset printing	a. Development and latest trend b. Printing unit c. Configuration of bi-colour machine. d. Comparison between single colour and multi colour offset machines	8
	Class test	Three test of 1hrs.	5 hrs.

8. TABLE OF SPECIFICATIONS FOR THOERY

Sr no	Topic (a)	Time allotted in hrs (b)	Percentage weightage (c)	Modified % weightage (d)	K	C	A	HA
1	Automatic Feeder – Successive and Stream feeding	8	19	19	8	6	2	3
2	Flexography –	5	12	12	4	2	2	4
3	Roto Gravure –	5	12	12	4	2	2	4
4	Gripper Setting	6	14	14	6	3	2	3
5	Method of obtaining impression	10	24	24	8	6	4	6
6	Offset printing	8	19	19	8	6	2	3
	Total	42	100	100				

9. DETAILED TABLE OF SPECIFICATION FOR THEORY EXAM:-

Sl no.	Topics	Objective type				Short answer type					Essay type				
		K	C	A	T	K	C	A	HA	T	K	C	A	HA	T
1	Automatic Feeder – Successive and Stream feeding	5	1		6		1		1	2					5
2	Flexography –	3	1		4			1	2	3					5
3	Roto Gravure –	2	2		4			1	1	2					5
4	Gripper Setting	1	2		3		2	1		3					5
5	Method of obtaining impression	2	2		4		2			2					5

6	Offset printing	2	1		3		1		2	3					5
	Total				25					15					30

K = Knowledge C = Comprehension
A = Application HA = Higher Than Application (Analysis Synthesis, Evaluation)

10. Suggested Implementation Strategies: This subject will develop the foundation of the Printing technology diploma students. Therefore more tutorial assignments are to be given the students. Experiments performed in the laboratory will help the students in developing the skill.

11 List of books:-

Sl.No.	Title of book	Author	Publication
1	The Pinting Industry – Victor	Victor Strauss	
2	Strauss	G.A.T.F.	
3	The Lithographers Mannual –	Ian Faux	
4	G.A.T.F.	Latham	
5	Modern Lithography – Ian Faux	J Page Crouch	
6	Advanced Pressmanship – Latham	Web Offset Press	
7	Flexography Primer	Operating	
8	Web Offset Press Operating	A.S.Porter	

Machine Lab
Code: Pt-604

Total Marks: - 50
Practical : - 25 **Pass Marks: - 8**
Sessional :- 25 **Pass Marks :- 9**
Skills to be developed –

a) Intellectual skills –

i. Knowledge of basic processes related to Machine
ii. Identify & selection of various tools, equipment & software.

b) Machine skills --

i. Operate, control different machines & equipment
ii. Inspect/ produce the job for specified dimensions
iii. safety practices/ Care & maintenance of the tools & machines.

List of the Experiments

Unit : 1 Practice on Offset Printing Machine

1. Installation of Plate and Blanket
2. Setting of Feeder, Impression & Delivery according to the thickness and size of the stock.
3. Applying ink, damping solution – make ready, printing with registration

Unit : 2 Practice on Flexography

1. Introduction and familiarization about Flexographic machine and other related elements.
2. Preparation of rubber plates.
3. Preparation of photo polymer plates.
4. Plate mounting in flexographic printing machine.
5. Make ready procedures and single, two and four colour printing in flexomachine.
6. Study of 6 colour and 8 colour flexography machine.
7. Printing on various substrates in flexographic printing.

Unit : 3 Practice on Screen Printing

1. To be acquainted with the fundamentals of Screen Printing Techniques.
2. To study the materials for screen printing
3. To prepare a screen
4. To prepare photographic stencil by direct method
5. To expose the direct coated screen in sunlight and to develop it with cold water
6. To be acquainted with transfer method or five star film method
7. To study screen printing ink and its qualities.

Reference Book

1. **Course Title : Surfaces Preparation**
2. **Course Code : Pt – 605**
3. **Semester : 6th Semester**

4. **Aim** : In respect to the advancement of modern digital Printing Technology along with its analog counterpart,the Elective subject will groom the students more efficiently to face the challenges and to adapt the new technology.

Objective: The students will be able to

- Appreciate the Surface Imaging concept.
- Understand the Various Image Transfer Machineries for Litho-offset Plates.
- Understand the Various Materials & Chemical used in surface developments.
- Understand the Processing of various types of positive & negatives preparation through Image Setter.
- Understand the Film processing technique on auto processor & Film assembly basics.
- Understand the Various quality control measures on Surface Imaging.
- Understand the Various trouble shooting on Surface Imaging.
- Understand the Safety Measures and Health support.
- Understand the Plant Layout for Surface Imaging unit/Department.
- Understand Production responsibilities of related departments

Pre-Requisite: Elementary knowledge of Basic Printing & Pre-Press Repro Technique

Course Outcomes (CO's)	
CO-1	Understand the surface imaging concepts, materials in surface preparation, chemicals used in surface imaging
CO-2	Understand film preparation through image setter, its calibration, conversion of images, processing of positive and negatives, film processing.
CO-3	Understand imposition, film image assembly - aspects, materials required, preparation of negative and positive film flats.
CO-4	Understand plate making processes, electrostatic process, laser exposed process, diffusion transfer process, reflex plate making, projection speed plate making.
CO-5	Understand modern techniques of screen printing, screen direct, indirect, direct-indirect, capillary, exposing techniques
CO-6	Understand gravure cylinder making, raw cylinder, image transfer, electronic processes, proofing and correction, finishing.

Programme Outcomes (PO's)	
PO-1	Apply the knowledge of mathematics and science to understand engineering fundamentals and to solve Printing Technology problems
PO-2	Design and conduct experiments of Printing Technology as well as analyse and interpret data.
PO-3	Identify, formulate and solve Printing Technology problems.
PO-4	Use the techniques, skills and modern engineering tools necessary for engineering practices.
PO-5	Understand professional ethics and responsibility to extend the benefit of the Printing Technology projects to the society.
PO-6	Communicate effectively both verbally and in writing within the engineering community and with people in the society.
PO-7	Recognize the need for, and an ability to engage in life long learning to incorporate technological innovations.

5. Teaching Scheme (In Hrs):

Lecturer	Tutorial	Practical	Total
3		3	6

6. Examination scheme:

Theory					Practical			
ESE	Sessional (SS)			Pass (ESE+SS)	Practical Test(PT)#	Practical Assessment (PA)@	Pass (PT+PA)	Total Marks (Theory+Practical)
	TA	HA	Total (TA+HA)					
70	10	20	30	33/100	25	25	17/50	150

7. Detailed course content:

Chapter No.	Chapter Title	Contents	Duration (in Hrs)
1	Various Materials used in surface preparation.	**2.0 Appreciate the Surface Imaging concepts.** 2.1 Different types of material used in surface preparation. 2.2 Different types of chemical used in surface imaging 3.0 department	8
2	Film preparation through Image Setter	3.1 Calibrating Image Setter 3.2 Converting Image for films output through Image Setter 3.3 Processing of various types of positive & negatives. 3.4 Film processing technique on auto processor	8
3	Imposition	4.1 Aspects of Film image assembly 4.2 Preparation of Negative and Positive film flat 4.3 Materials required for film image assembly	6
4		**1.0 Electrostatic Plate Making** **2.0 Laser Exposed plate** **3.0 Diffusion Transfer Process** **3.1** Reflex Plate Making 3.2 Projection Speed Plate Making	8
5	Modern techniques of screen printing	5.1 Preparing a Screen Direct, Indirect, Direct-Indirect, Capillary 5.2 Exposing Technique	6
6	Gravure Cylinder Making	6.1 Making a Raw Cylinder 6.2 Elaborate Image transfer on Cylinder surface under conventional process 6.3 Electronic and Other processes (overview) 6.4 Proofing and correction 6.5 Finishing	6
	Class test	Three test of 1hrs.	3 hrs.

8. TABLE OF SPECIFICATIONS FOR THOERY

Sr no	Topic (a)	Time allotted in hrs (b)	Percentage weightage (c)	Modified % weightage (d)	K	C	A	HA
1	Various Materials used in surface preparation.	8	19	19	9	5	2	3
2	Film preparation through Image Setter	8	19	19	9	5	2	3
3	Imposition	6	14	14	6	2	2	4
4		8	19	19	9	5	2	3
5	Modern techniques of screen printing	6	14	14	6	2	2	4
6	Gravure Cylinder Making	6	15	15	5	4	2	4
	Total	42	100	100				

9. DETAILED TABLE OF SPECIFICATION FOR THEORY EXAM:-

Sl no.	Topics	Objective type				Short answer type					Essay type				
		K	C	A	T	K	C	A	HA	T	K	C	A	HA	T
1	Various Materials used in surface preparation.	5	1		6		1		1	2					5
2	Film preparation through Image Setter	3	1		4			1	2	3					5
3	Imposition	2	2		4			1	1	2					5
4		1	2		3		2	1		3					5
5	Modern techniques of screen printing	2	2		4		2			2					5
6	Gravure Cylinder Making	2	1		3		1		2	3					5
	Total				25					15					30

K = Knowledge C = Comprehension
A = Application HA = Higher Than Application (Analysis Synthesis, Evaluation)

10. Suggested Implementation Strategies: This subject will develop the foundation of the Printing technology diploma students. Therefore more tutorial assignments are to be given the students. Experiments performed in the laboratory will help the students in developing the skill.

11 **List of books:-**

Sl.No.	Title of book	Author	Publication
1	Platemaking Department — M.H. Bruno	M. H. Bruno	
2	Flexography Primer II Edin. — J. P. Crouch	J. P. Crouch	
3	Ceramic Screen Printing — Albert Kosloft	Albert Kosloft	
4	Lithographers' Manual — GATF	GATF	
5	Photoengraving — C. C. Ammonds	C. C. Ammonds	
6	The Deep-Etch Process —	Robert F. Reed	
7	Chemistry for the Graphic Arts — P. J. Hartsuch	P. J. Hartsuch	

Surface Preparation -LAB

Code–Pt-605 (P)

Total Marks: - 50
Practical : - 25 **Pass Marks: - 8**
Sessional :- 25 **Pass Marks :- 9**

Skills to be developed –

a) Intellectual skills –

i. Knowledge of basic processes related to Surface Preparation
ii. Identify & selection of various tools, equipment & software.

b) Machine skills --

i. Operate, control different machines & equipment
ii. Inspect/ produce the job for specified dimensions
iii. safety practices/ Care & maintenance of the tools & machines.

List of the practical

Unit: 1

1. Line Etching

   1.1 Metal Printing and burning in

   1.2 Make – ready and retouching

   1.3 First etching and powdering

2. Finishing and Mounting for the production of Line Block

Unit: 2

1. Finishing and Mounting for the production of Line Block
2. Making Half-tone print on metal and Half-tone etching

Unit: 3

1. Finishing and Mounting for the production of Half-tone Block
2. Production of Combination Block (Line and Half-tone)

Unit: 4

1. Production of colour line block (two colour)
2. Preparation of key drawing and chart making
3. Photo – polymer plate making by using Photo Polymer Process

Reference Book

1. Plate Making Department – M.H.Bruno - GATF
2. Flexography Premier – I & II - J.P. Crouch – GATF

3. Ceramic Screen Printing – Alburt Kosloft - GATF
4. The Deep-etch Process – Robert f. Reed - GAFT

1. **Course Title : Graphic Design**
2. **Course Code : Pt – 606**
3. **Semester :6th Semester**

4. **Aim** : In respect to the advancement of modern digital Printing Technology along with its analog counterpart, the Elective s

Objective: The students will be able to

1. Understand the Digital Prepress & Printing Technology
2. Understand the Color Management
3. Understand the Font Management
4. Understand the Workflow Management

Pre-Requisite: Elementary knowledge of Basic Printing & Digital Pre-Press Technique

Course Outcomes (CO's)	
CO-1	Understand the configuration of a computer, the hardware, perepheral devices, different graphic software
CO-2	Understand the concept of phototypesetting, principles of phototypesetting and processing method, conversion from photomechanical to electromechanical & finaally to digital method.
CO-3	Understand the basics of different printing methods- laser , dot-matrix, ink-jet, thermal, image setter. Their components and functions.
CO-4	Understand scanner technology, type of scanner, processing methods, image processing, optical/ magnetic character reader
CO-5	Understand concept of image resolution, gray scale, colour resolution, pixels, device resolution.
CO-6	Understand image acquisation, scanning lines and resolutions, image size, editing images, unsharp mask.

Programme Outcomes (PO's)	
PO-1	Apply the knowledge of mathematics and science to understand engineering fundamentals and to solve Printing Technology problems
PO-2	Design and conduct experiments of Printing Technology as well as analyse and interpret data.
PO-3	Identify, formulate and solve Printing Technology problems.
PO-4	Use the techniques, skills and modern engineering tools necessary for engineering practices.
PO-5	Understand professional ethics and responsibility to extend the benefit of the Printing Technology projects to the society.
PO-6	Communicate effectively both verbally and in writing within the engineering community and with people in the society.
PO-7	Recognize the need for, and an ability to engage in life long learning to incorporate technological innovations.

5. Teaching Scheme (In Hrs):

Lecturer	Tutorial	Practical	Total
3		3	6

6. Examination scheme:

Theory					Practical			
ESE	Sessional (SS)			Pass (ESE+SS)	Practical Test(PT)#	Practical Assessment (PA)@	Pass (PT+PA)	Total Marks (Theory+Practical)
	TA	HA	Total (TA+HA)					
70	10	20	30	33/100	25	25	17/50	150

7. Detailed course content:

Chapter No.	Chapter Title	Contents	Duration (in Hrs)
1	System Configuration	1.1 The Hardware we need – CD drive, Processor, RAM, ROM, HDD, FDD, Cache Memory, Expansion – Bays, Slots, Ports, SCSI, Monitor, Keyboard, Mouse, Track Balls, Touch Pads, Pressure sensitive Tablets and other peripheral devices. 1.2 The Soft ware we need – Operating system, Word processing, Software, Vector based, Illustration software, Pixel based graphics software, Page layout software, Font management utilities, System Maintenance Utilities.	8
2	Phototypesetting	2.1 Concept of cold composition, Generation/Original name/Output of character of photo-type setter, Principles of PTS and processing method. 2.2 Concept of Photomechanical to Electro mechanical and finally digital method.	6
3	Impact and Non-Impact printing output devices	3.1 Laser printing technology, Basic components of a laser printer, Function of a laser printer, Different aspects of laser printing resolution. 3.2 Daisy wheel printer, Dot-matrix printers, Method of printing and its resolution 3.3 Ink Jet Printer – Method of printing and its resolution 3.4 Thermal Printer, Dye-sublimation printers. 3.5 Image setter – types, parts, print mechanism and output, RIP technology	8
4	Scanner Technology	4.1 Introduction, Types of a scanner, product group. 4.2 Processing method, Limitations of a Scanner, Image Processing(Line Art, Continuous Art, Halftoning),Resolution, Optical Character Reader, Magnetic Ink Character Reader	6
5	Proper resolution and grayscale adjustments of digital images for print media.	5.1 Concept of Image Resolution – Line Art, Grey scale, Color Resolution, Pixels, lpi, dpi, ppi, epi & their relation, Device resolution	6
6	Image Acquisition	6.1 Scanning Line & Halftone Image 6.2 Scanning Resolution- Input & Output 6.3 Dynamic Range	8

		6.4 Determining File Size 6.5 Resampling Images 6.6 Printing Separation approaches 6.7 Unsharp Mask	
	Class test	Three test of 1hrs.	3 hrs.

8. TABLE OF SPECIFICATIONS FOR THOERY

Sr no	Topic (a)	Time allotted in hrs (b)	Percentage weightage (c)	Modified % weightage (d)	K	C	A	HA
1	System Configuration	8	19	19	9	5	2	3
2	Phototypesetting	6	14	14	6	2	2	4
3	Impact and Non-Impact printing output devices	8	19	19	9	5	2	3
4	Scanner Technology	6	14	14	6	2	2	4
5	Proper resolution and grayscale adjustments of digital images for print media.	6	14	14	6	2	2	4
6	Image Acquisition	8	19	19	9	5	2	3
	Total	42	100	100				

9. DETAILED TABLE OF SPECIFICATION FOR THEORY EXAM:-

Sl no.	Topics	Objective type				Short answer type					Essay type				
		K	C	A	T	K	C	A	HA	T	K	C	A	HA	T
1	System Configuration	5	1		6		1		1	2					5
2	Phototypesetting	3	1		4			1	2	3					5
3	Impact and Non-Impact printing output devices	2	2		4			1	1	2					5
4	Scanner Technology	1	2		3		2	1		3					5
5	Proper resolution and grayscale adjustments of digital images for print media.	2	2		4		2			2					5
6	Image Acquisition	2	1		3		1		2	3					5
	Total				25					15					30

K = Knowledge C = Comprehension
A = Application HA = Higher Than Application (Analysis Synthesis, Evaluation)

10. Suggested Implementation Strategies: This subject will develop the foundation of the Printing technology diploma students. Therefore more tutorial assignments are to be given the students. Experiments performed in the laboratory will help the students in developing the skill.

11 List of books:-

Sl.No.	Title of book	Author	Publication
1	Understanding Digital Colour -- Phil Green GATF	Phil Green GATF	
2	Handbook of Printing Processes -- Deborah L. Stevenson GATF	Deborah L. Stevenson GATF	
3	On – Demand Printing -- Howard M. Fenton GATF	Howard M. Fenton GATF	
4	Electronic Pre-press Essentials – GATF	GATF	
5	Computer – to- plate : Automating the Printing Industry -- Dr. Richard M. Adams II & Frank Romano GATF	Dr. Richard M. Adams II & Frank Romano GATF	
6	Hand Book of Print Media -- Helmut Kipphan	Helmut Kipphan	
7	Scanning & Printing -- Auton and Peter Kammermeier, The Bath Press,Avon	Auton and Peter Kammermeier, The Bath Press,Avon	
8	Pocket Guide to Digital Prepress -- Frank J. Romano	Frank J. Romano	
9	Digital Pre-press Complete -- Donnie O' Quinn & Matt Leclair, Hayden Books	Donnie O' Quinn & Matt Leclair, Hayden Books	

Graphic Design LAB

Code: Pt-606

Total Marks: - 50
Practical : - 25 **Pass Marks: - 8**
Sessional :- 25 **Pass Marks :- 9**
Skills to be developed –

a) Intellectual skills –

i. Knowledge of basic processes related to Graphic Design
ii. Identify & selection of various tools, equipment & software.

b) Operating skills --

i. Operate, control different machines & equipment
ii. Inspect/ produce the job for specified dimensions
iii. safety practices/ Care & maintenance of the tools & machines.

List of the Experiments

1. Direct Mail
2. Folders – Single fold & Double fold
3. Stickers – Two colours
4. Level designing – 2 and 4 colours
5. Introduction to computers, various software's used for designing purpose – Demonstration (Manipulation of series design)
6. Logo designing
7. Knowledge of different computer commands
8. Colour wheel
9. Designing of visiting card, Letterhead, Envelop, Bill Form, Receipt.
10. Designing of invitation card, Posters, Tittle page of a Book, Magazine Cover page.

Reference Book

1. Chemistry for the graphic Arts – Nelson R.Eldred
2. Colour Science - Styl
3. Principles of Colour Technology - Roy S. Berns.

PROFESSIONAL PRACTICE –IV

6th SEMESTER, PRINTING TECHNOLOGY

CODE: PT-610

THEORY SCHEME:	PRACTICAL SCHEME:
Theory: 1hr/week	Practical assessment: 25 marks
Practical: 2hrs/week	Practical test: 25 marks
Credit: 2	

A) RATIONAL:-

To develop general confidence, ability to communicate and attitude, in addition to basic technological concepts through industrial visits, guest lectures on technical topics and conducting group discussions.

B) AIMS AND OBJECTIVES:-

The student will be able to:

- Preparing report on industrial visits, expert lectures.
- Interacting with peers to share thoughts.
- Prepare notes for given topic.
- Presentation in seminar, group discussion on improvement of communication skills.
- Acquire information from different sources.

C) PRE- REQUISITE:-

1. Desire to gain comparable knowledge and skills of various activities in various areas of importance.
2. Eagerness to participate in group work and to share thoughts with group members.

Activities:

1. INDUSTRIAL/FIELD VISIT: - - 10 HRS.

Structured field visits be arranged and report of the same should be submitted by the individual student, to form part of the team work.

Visits to following companies:

g. TCPL 21st Century Packaging, near Chaygaon
h. Huttamukhi Group (PPL) Packaging near Amingaon

2. GUEST LECTURES: (Any three) Lectures by professional /industrial expert/ student

Seminars on the following areas. -10 HRS

e) Printing Machine
f) Printing Machine Maintenance

Individual report of the above lecture should be submitted by the students.

3. GROUP DISCUSSION: (Any TWO among a group of four to five students). Topic and time duration of the group discussion to be decided by concerned teacher. –10 HRS.

h. Offset Machines
i. Gravure Machines
j. Flexography Machines

4. STUDENTS ACTIVITY: The students in a group of 4 to 5 will perform any one of the following activities. –10 HRS.

i. Identify the various printing tools and equipments and write their functions.
j. Tree plantation inside or outside of the institute campus.
k. Help in flood relief camp (by all students)
l. Other co- curricular and extracurricular activity.

EXAMINATION SCHEME (on Practical assessment)

Continuous internal assessment of 25 marks is to be carried out by the teachers.

Distribution of marks: -

Activities =10,

Group discussion = 5,

Field visits=5 and

Guest lecturer attendance and

Report=5.