SYLLABUS

DIPLOMA IN PRINTING TECHNOLOGY

Course Code; 1202

M - SCHEME

2015-2016 onwards

DIRECTORATE OF TECHNICAL EDUCATION
GOVERNMENT OF TAMILNADU

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Diploma in Printing Technology

M – Scheme syllabus

Technology is developing at a rapid pace and changing many established methods of accomplishing tasks and completing projects. The print and design industries are excellent examples of areas seeing these changes and innovations. To remain competitive and profitable, the Diploma Engineers are encouraged to update themselves on the latest developments in printing technology, particularly in software and machine features. Some recent print technology innovations worth noting include high-speed digital printing viz., Print on demand, 3 D printing, hybrid print processes and the increased efficiency of digital print workflows. In order to produce printing diploma engineers to cater to the needs of the printing industry, students must adapt equally to existing and continually developing new technologies and opportunities in today's information society. In keeping this in mind, we have framed the M scheme syllabus by considering the following aspects.

- Suggestions from Alumnus of printing students
- Latest technological developments in print and media industry
- Suggestions from leading industrial personnel and academicians
- Print media industry requirements
- Inclusion of new topics on latest trends in all subjects
- Entry level and knowledge of diploma students

Towards framing the M scheme syllabus lot of suggestions were received from leading industrialists and academicians including alumnus. Among them we found the above mentioned aspects worth considering for framing the M scheme syllabus. While framing new topics covering latest technological developments, we carefully framed the contents of the subjects to suit the needs and levels of the diploma students. We hope the new syllabus will prepare the students as job ready candidates. Taking into consideration the areas where the existing syllabus was modified with few changes to meet the latest developments in the field of printing technology.

DIPLOMA COURSES IN ENGINEERING/TECHNOLOGY

(SEMESTER SYSTEM)

(Implemented from 2015- 2016)

M – SCHEME

R E G U L A T I O N S*

***** *Applicable to the Diploma Courses other than Diploma in Hotel Management & Catering Technology and the Diploma Courses offered through MGR Film Institute, Chennai.*

1. Description of the Course:

a. Full Time (3 years)

The Course for the full Time Diploma in Engineering shall extend over a period of three academic years, consisting of 6 semesters* and the First Year is common to all Engineering Branches.

b. Sandwich (3½ years)

The Course for the Diploma in Engineering (sandwich) shall extend over a period of three and half academic years, consisting of 7 semesters* and the First Year is common to all Engineering Branches. The subjects of three years full time diploma course being regrouped for academic convenience.

During 4^{th} and/or during 7^{th} semester the students undergo industrial training for six months/ one year. Industrial training examination will be conducted after completion of every 6 months of industrial training

c. Part Time (4 years)

The course for the diploma in Engineering shall extend over a period of 4 academic years containing of 8 semesters*, the subjects of 3 year full time diploma courses being regrouped for academic convenience.

* Each Semester will have 15 weeks duration of study with 35 hrs. /Week for Regular Diploma Programme and 18hrs/ week (21 hrs. / Week I year) for Part-Time Diploma Programmes.

The Curriculum for all the 6 Semesters of Diploma courses (Engineering & Special Diploma Courses viz. Textile Technology, Leather Technology, Printing Technology, Chemical Technology etc.) have been revised and revised curriculum is applicable for the candidates admitted from 2015 – 2016 academic year onwards.

2. Condition for Admission:

Condition for admission to the diploma courses shall be required to have passed in

The S.S.L.C Examination of the Board of Secondary Education, TamilNadu.

(Or)

The Anglo Indian High School Examination with eligibility for Higher Secondary Course in TamilNadu.

(Or)

The Matriculation Examination of Tamil Nadu.

(Or)

Any other Examination recognized as equivalent to the above by the Board of Secondary Education, TamilNadu.

Note: In addition, at the time of admission the candidate will have to satisfy certain minimum requirements, which may be prescribed from time to time.

3. Admission to Second year (Lateral Entry):

A pass in HSC (Academic) or (Vocational) courses mentioned in the Higher Secondary Schools in TamilNadu affiliated to the TamilNadu Higher Secondary Board with eligibility for university Courses of study or equivalent examination, & Should have studied the following subjects.

Sl. No	Courses	H.Sc Academic	H.Sc Vocational	
		Subjects Studied	Subjects Studied	
			Related subjects	Vocational subjects
1.	All the Regular and Sandwich Diploma Courses	Maths, Physics & Chemistry	Maths / Physics / Chemistry	Related Vocational Subjects Theory & Practical
2.	Diploma course in Modern Office Practice	English & Accountancy English & Elements of Economics English & Elements of Commerce	English & Accountancy, English & Elements of Economics, English & Management Principles & Techniques, English & Typewriting	Accountancy & Auditing, Banking, Business Management, Co-operative Management, International Trade, Marketing & Salesmanship, Insurance & Material Management, Office Secretaryship.

- For the diploma Courses related with Engineering/Technology, the related / equivalent subjects prescribed along with Practical may also be taken for arriving the eligibility.

- Branch will be allotted according to merit through counseling by the respective Principal as per communal reservation.

- For admission to the Textile Technology, Leather Technology, Printing Technology, Chemical Technology and Modern Office Practice Diploma courses the candidates studied the related subjects will be given first preference.

- *Candidates who have studied Commerce Subjects are not eligible for Engineering Diploma Courses.*

4. Age Limit: No Age limit.

5. Medium of Instruction: English

6. Eligibility for the Award of Diploma:

No candidate shall be eligible for the Diploma unless he/she has undergone the prescribed course of study for a period of not less than 3 academic years in any institution affiliated to the State Board of Technical Education and Training, TamilNadu, when joined in First Year and two years if joined under Lateral Entry scheme in the second year and passed the prescribed examination.

The minimum and maximum period for completion of Diploma Courses are as given below:

Diploma Course	Minimum Period	Maximum Period
Full Time	3 Years	6 Years
Full Time(Lateral Entry)	2 Years	5 Years
Sandwich	3½ Years	6½ Years
Part Time	4 Years	7 Years

7. Subjects of Study and Curriculum outline:

The subjects of study shall be in accordance with the syllabus prescribed from time to time, both in theory and practical. The curriculum outline is given in Annexure **- I**

8. Examinations:

Board Examinations in all subjects of all the semesters under the scheme of examinations will be conducted at the end of each semester.

The Internal assessment marks for all the subjects will be awarded on the basis of continuous internal assessment earned during the semester concerned. For each subject 25 marks are allotted for internal assessment and 75 marks are allotted for Board Examination.

9. Continuous Internal Assessment:

A . For Theory Subjects:

The Internal Assessment marks for a total of 25 marks, which are to be distributed as follows:

i. Subject Attendance **5 Marks**

(Award of marks for subject attendance to each subject theory/practical will as per the range given below)

80%	- 83%		1 Mark
84%	- 87%		2 Marks
88%	- 91%		3 Marks
92%	- 95%		4 Marks
96%	- 100%		5 Marks

ii) Test # **10 Marks**

2 Tests each of 2 hours duration for a total of 50 marks are to be conducted. Out of which the best one will be taken and the marks to be reduced to: 05 marks

The Test – III is to be the Model test covering all the five units and the marks so obtained will be reduced to : 05 marks

Total **10 marks**

TEST	UNITS	WHEN TO CONDUCT	MARKS	DURATION
Test I	Unit – I & II	End of 6th week	50	2 Hrs
Test II	Unit – III & IV	End of 12th week	50	2 Hrs
Test III	**Model Examination** - **Compulsory** Covering all the 5 Units. (Board Examination-question paper-pattern).	End of 15th week	75	3 Hrs

 # - From the Academic year 2015-2016 onwards.

Question Paper Pattern for the Periodical Test :(Test - I & Test- II)

With no choice:

PART A type questions:	4 Questions X 2 mark	… … 8 marks
PART B type questions:	4 Questions X 3 marks	… … 12 marks
PART C type questions:	3 Questions X 10 marks	… … 30 marks

	Total	50 marks
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iii) Assignment **10 Marks**

For each subject Three Assignments are to be given each for 20 marks and the average marks scored should be reduced for 10 marks

All Test Papers and assignment notebooks after getting the signature with date from the students must be kept in the safe custody in the Department for verification and audit. It should be preserved for 2 Semesters and produced to the flying squad and the inspection team at the time of inspection/verification.

B. For Practical Subjects:

The internal assessment mark for a total of 25 marks which are to be distributed as follows:-

a)	Attendance	:	**5 Marks**
	(Award of marks as same as Theory subjects)		
b)	Procedure/ observation and tabulation/ Other Practical related Work	:	**10 Marks**
c)	Record writing	:	**10 Marks**

	TOTAL	:	**25 Marks**

- *All the Experiments/exercises indicated in the syllabus should be completed and the same to be given for final board examinations.*
- The Record for every completed exercise should be submitted in the subsequent Practical classes and marks should be awarded for 20 for each exercise as per the above allocation.
- At the end of the Semester, the average marks of all the exercises should be calculated for 20 marks and the marks awarded for attendance is to be added to arrive at the internal assessment mark for Practical. (20+5=25 marks)
- The students have to submit the duly signed bonafide record note book/file during the Practical Board Examinations.

- *All the marks awarded for assignment, Test and attendance should be entered in the Personal Log Book of the staff, who is handling the subject. This is applicable to both Theory and Practical subjects.*

10. Life and Employability Skill Practical:

The Life and Employability Skill Practical with more emphasis is being introduced in IV Semester for Circuit Branches and in V Semester for other branches of Engineering.
Much Stress is given to increase the employability of the students:

Internal assessment Mark **….. 25 Marks**

11. Project Work:

The students of all the Diploma Programmes **(except Diploma in Modern Office Practice)** have to do a Project Work as part of the Curriculum and in partial fulfillment for the award of Diploma by the State Board of Technical Education and Training, Tamilnadu. In order to encourage students to do worthwhile and innovative projects, every year prizes are awarded for the best three projects i.e. institution wise, region wise and state wise. **The Project work must be reviewed twice in the same semester.**

a) Internal assessment mark for Project Work & Viva Voce:

Project Review I	…	**10 marks**
Project Review II	…	**10 marks**
Attendance	…	**05 marks** (award of marks same as theory subjects pattern)
Total	…	**25 marks**

Proper record to be maintained for the two Project Reviews, and It should be preserved for 2 Semesters and produced to the flying squad and the inspection team at the time of inspection/verification.

b) Allocation of Mark for Project Work & Viva Voce in Board Examination:

Viva Voce	…	**30 marks**
Marks for Report Preparation, Demo	…	**35 marks**
Total		**65 marks**

c) Written Test Mark (from 2 topics for 30 minutes duration): $

i) Environment Management	2 questions X 2 ½ marks	= **5 marks**
iI) Disaster Management	2 questions X 2 ½ marks	= **5 marks**
		10marks

$ **-** Selection of Questions should be from Question Bank, by the External Examiner. No choice need be given to the candidates.

Project Work & Viva Voce in Board Examination	--	**65 Marks**
Written Test Mark (from 2 topics for 30 minutes duration)	--	**10 Marks**
TOTAL	--	**75 Marks**

A neatly prepared PROJECT REPORT as per the format has to be submitted by individual during the Project Work & Viva Voce Board examination.

12. Scheme of Examinations:

The Scheme of examinations for subjects is given in **Annexure - II.**

13. Criteria for Pass:

1. No candidate shall be eligible for the award of Diploma unless he/she has undergone the prescribed course of study successfully in an institution approved by AICTE and affiliated to the State Board of Technical Education & Training, Tamil Nadu and pass all the subjects prescribed in the curriculum.

2. A candidate shall be declared to have passed the examination in a subject if he/she secures not less than *40% in theory subjects* and *50% in practical subject* out of the total prescribed maximum marks including both the internal assessment and the Board Examination marks put together, subject to the condition that he/she secures at least a minimum of *30 marks out of 75 marks in the Board's Theory examinations and a minimum of 35 marks out of 75 marks in the Board Practical Examinations.*

14. Classification of successful candidates:

Classification of candidates who will pass out the final examinations from April 2018 onwards (Joined in first year in 2015-2016) will be done as specified below.

First Class with Superlative Distinction:
A candidate will be declared to have passed in **First Class with Superlative Distinction** if he/she secures not less than 75% of the marks in all the subjects and passes all the semesters in the first appearance itself and passes all subjects within the stipulated period of study 3/ 3½/ 4 years (Full Time/Sandwich/Part Time) without any break in study.

First Class with Distinction:
A candidate will be declared to have passed in **First Class with Distinction** if he/she secures not less than 75% of the aggregate of marks in all the semesters put together and passes all the semesters except the I and II semesters in the first appearance itself and passes all the subjects within the stipulated period of study 3/ 3½/ 4 years (Full Time/Sandwich/Part Time) without any break in study.

First Class:

A candidate will be declared to have passed in **First Class** if he/she secures not less than 60% of the aggregate marks in all semesters put together and passes all the subjects within the stipulated period of study 3/ 3½ / 4 years (Full Time/Sandwich/Part Time) without any break in study.

Second Class:

All other successful candidates will be declared to have passed in **Second Class.**

The above mentioned classifications are also applicable for the Sandwich / Part-Time students who pass out Final Examination from October 2018 /April 2019 onwards (both joined in First Year in 2015-2016)

15. Duration of a period in the Class Time Table:

The duration of each period of instruction is 1 hour and the total period of instruction hours excluding interval and Lunch break in a day should be uniformly maintained as 7 hours corresponding to 7 periods of instruction (Theory & Practical).

16. Seminar:

For seminar the total seminar 15 hours(15 weeks x 1hour) should be distributed equally to total theory subject per semester(i.e 15 hours divided by 3/4 subject). A topic from subject or current scenario is given to students. During the seminar hour students have to present the paper and submit seminar material to the respective staff member, who is handling the subject. It should be preserved for 2 Semesters and produced to the flying squad and the inspection team at the time of inspection/verification.

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DIPLOMA IN PRINTING TECHNOLOGY

The following are the alternative subjects for the 'K' SCHEME (Subject), 'L' SCHEME (subject) to the 'M' scheme (subject).

III SEMESTER – W. E.F OCT '16

Code No.	'K' SCHEME	Code No.	'L' SCHEME	Code No.	'M' SCHEME
18231	Printing Processes and Materials	28231	Printing Processes	38231	Printing Processes
18232	Visual Design and DTP	28232	Visual Design and DTP	38232	Visual Design and DTP
18233	Image Processing	28233	Image Processing	38233	Image Processing
18234	Design Studio Lab.	28234	Design Studio Practical.	38234	Design Studio Practical.
18235	Image Processing Lab.	28235	Image Processing Practical.	38235	Image Processing Practical.
18236	Printing Primer Lab.	28236	Printing Primer Practical.	38236	Printing Primer Practical.
-	-	20001	Computer Application Practical**.	30001	Computer Application Practical**.

IV SEMESTER - W. E.F APR '17

Code No.	'K' SCHEME	Code No.	'L' SCHEME	Code No.	'M' SCHEME
18241	Offset Printing Technology	28241	Offset Printing Technology	38241	Offset Printing Technology
18242	Gravure, Flexography and Screen Printing	28242	Gravure, Flexography and Screen Printing	38242	Gravure, Flexography and Screen Printing
18243	Print Finishing and Converting	28243	Print Finishing and Converting	38243	Print Finishing and Converting
		28244	Printing Materials	38244	Printing Materials
18244	Desk Top Publishing for Print Production Lab.	28245	Desk Top Publishing for Print Production Practical.	38245	Desk Top Publishing for Print Production Practical.
18245	Offset Machines Lab.	28246	Offset Machines Practical.	38246	Offset Machines Practical.
18246	Print Finishing Lab.	28247	Print Finishing Practical.	38247	Print Finishing Practical.

V SEMESTER - W. E.F OCT '17

Code No.	'K' SCHEME	Code No.	'L' SCHEME	Code No.	'M' SCHEME
18251	Digital Prepress	28251	Digital Prepress	38251	Digital Prepress
18252	Advanced Printing Technologies	28253	Advanced Printing Technologies	38253	Advanced Printing Technologies
18271	Elective: I – E – Publishing	28252	E-Publishing	38252	E-Publishing
18272	Elective: I – Packaging Technology	28254	Packaging Technology	38254	Packaging Technology
11011	English Communication Practical	20002	Communication and Life Skills Practical**	30002	Life and Employability Skill Practical**
18255	Digital Pre-Press Lab.	28255	Digital Pre-Press Practical	38255	Digital Pre-Press Practical.
18256	Packaging Lab.	28256	Packaging Practical	38256	Packaging Practical

VI SEMESTER - W. E.F APR '18

Code No.	'K' SCHEME	Code No.	'L' SCHEME	Code No.	'M' SCHEME
18261	Total Quality Management	28261	Total Quality Management	38261	Total Quality Management
18262	Printing Press Management	28262	Printing Press Management	38262	Printing Press Management
18281	Elective – II: Printing Machinery Maintenance	28263	Printing Machinery Maintenance	38263	Printing Machinery Maintenance
18282	Elective – II: Advertising in Print Media	28264	Print Quality Assurance Practical.	38264	Print Quality Assurance Practical.
18264	Print Quality Control Lab	28265	Machinery Maintenance Practical.	38265	Machinery Maintenance Practical.
18265	Industrial Exposure and Report	28266	Industrial Exposure and Report	38266	Industrial Exposure and Report
18266	Project Work	28267	Project Work	38267	Project Work

***common subject for all Diploma in Engineering and Technology courses*

ANNEXURE - I

CURRICULUM OUTLINE

THIRD SEMESTER

Subject Code	SUBJECT	HOURS PER WEEK			
		Theory Hours	Tutorial / Drawing	Practical hours	Total Hours
38231	Printing Processes	6	--	--	6
38232	Visual Design and DTP	5	--	--	5
38233	Image Processing	6	--	--	6
38234	Design Studio Practical	--	--	4	4
38235	Image Processing Practical	--	--	4	4
38236	Printing Primer Practical	--	--	5	5
30001	Computer Application Practical**	--	--	4	4
Seminar		1	--	--	1
TOTAL		18	--	17	**35**

FOURTH SEMESTER

Subject Code	SUBJECT	HOURS PER WEEK			
		Theory Hours	Tutorial / Drawing	Practical hours	Total Hours
38241	Offset Printing Technology	5	--	--	5
38242	Gravure, Flexography and Screen Printing	6	--	--	6
38243	Print Finishing and Converting	5	--	--	5
38244	Printing Materials	5	--	--	5
38245	Desk Top Publishing for Print Production Practical	--	--	5	5
38246	Offset Machines Practical	--	--	4	4
38247	Print Finishing Practical	--	--	4	4
Seminar		1	--	--	1
TOTAL		22	--	13	**35**

CURRICULUM OUTLINE

FIFTH SEMESTER

Subject Code	SUBJECT	HOURS PER WEEK			
		Theory Hours	Tutorial / Drawing	Practical hours	Total Hours
38251	Digital Pre-press	5	--	--	5
38252	E-Publishing	5	--	--	5
38253	Advanced Printing Technologies	6	--	--	6
38254	Packaging Technology	6	--	--	6
38255	Digital Pre-press Practical	--	--	4	4
38256	Packaging Practical	--	--	4	4
30002	Life and Employability Skill Practical**	--	--	4	4
Seminar		1	--	--	1
TOTAL		23	--	12	**35**

SIXTH SEMESTER

Subject Code	SUBJECT	HOURS PER WEEK			
		Theory Hours	Tutorial / Drawing	Practical hours	Total Hours
38261	Total Quality Management	6	--	--	6
38262	Printing Press Management	5	--	--	5
38263	Printing Machinery Maintenance	6	--	--	6
38264	Print Quality Assurance Practical	--	--	5	5
38265	Machinery Maintenance Practical	--	--	5	5
38266	Industrial Exposure and Report	--	--	3	3
38267	Project Work	--	--	4	4
Seminar		1	--	--	1
TOTAL		18	--	17	**35**

***common subject for all Diploma in Engineering and Technology courses*

ANNEXURE - II
SCHEME OF THE EXAMINATION

THIRD SEMESTER

Subject Code	SUBJECT	Examination Marks			Minimum for pass	Duration of Exam Hours
		Internal assess-ment Marks	Board Exam. Marks	Total Mark		
38231	Printing Processes	25	75	100	40	3
38232	Visual Design and DTP	25	75	100	40	3
38233	Image Processing	25	75	100	40	3
38234	Design Studio Practical	25	75	100	50	3
38235	Image Processing Practical	25	75	100	50	3
38236	Printing Primer Practical	25	75	100	50	3
30001	Computer Application Practical**	25	75	100	50	3
TOTAL		**175**	**525**	**700**		

FOURTH SEMESTER

Subject Code	SUBJECT	Examination Marks			Minimum for pass	Duration of Exam Hours
		Internal assess-ment Marks	Board Exam Marks	Total Mark		
38241	Offset Printing Technology	25	75	100	40	3
38242	Gravure, Flexography and Screen Printing	25	75	100	40	3
38243	Print Finishing and Converting	25	75	100	40	3
38244	Printing Materials	25	75	100	40	3
38245	Desk Top Publishing for Print Production Practical	25	75	100	50	3
38246	Offset Machines Practical	25	75	100	50	3
38247	Print Finishing Practical	25	75	100	50	3
TOTAL		**175**	**525**	**700**		

SCHEME OF THE EXAMINATION

FIFTH SEMESTER

Subject Code	SUBJECT	Examination Marks			Minimum for pass	Duration of Exam Hours
		Internal assess-ment Marks	Board Exam. Marks	Total Mark		
38251	Digital Pre-press	25	75	100	40	3
38252	E-Publishing	25	75	100	40	3
38253	Advanced Printing Technologies	25	75	100	40	3
38254	Packaging Technology	25	75	100	40	3
38255	Digital Pre-press Practical	25	75	100	50	3
38256	Packaging Practical	25	75	100	50	3
30002	Life and Employability Skill Practical**	25	75	100	50	3
TOTAL		**175**	**525**	**700**		

SIXTH SEMESTER

Subject Code	SUBJECT	Examination Marks			Minimum for pass	Duration of Exam Hours
		Internal assess-ment Marks	Board Exam Marks	Total Mark		
38261	Total Quality Management	25	75	100	40	3
38262	Printing Press Management	25	75	100	40	3
38263	Printing Machinery Maintenance	25	75	100	40	3
38264	Print Quality Assurance Practical	25	75	100	50	3
38265	Machinery Maintenance Practical	25	75	100	50	3
38266	Industrial Exposure and Report	25	75	100	50	3
38267	Project Work	25	75	100	50	3
TOTAL		**175**	**525**	**700**		

***common subject for all Diploma in Engineering and Technology courses*

Board Examination - Question paper pattern

Common for all theory subjects

PART A ***- (1 to 8) 5 Questions are to be answered out of 8 questions for 2 marks each.*****(Question No. 8 will be the compulsory question and *can be asked from any one of the units)(From each unit maximum of two 2 marks questions alone can be asked)***

PART B ***- (9 to 16)5 Questions are to be answered out of 8 questions for 3 marks each.*** **(Question No. 16 will be the compulsory question and *can be asked from any one of the units) (From each unit maximum of two 3 marks questions alone can be asked)***

PART C ***- (17 to 21) Five Questions will be in the Either OR Pattern. Students have to answer these five questions. Each question carries 10 marks. (Based on the discretion of the question setter, he/she can ask two five mark questions (with sub division A & sub division B) instead of one ten marks question if required)***

III SEMESTER

DIRECTORATE OF TECHNICAL EDUCATION

DIPLOMA IN PRINTING TECHNOLOGY

II YEAR

M SCHEME

III SEMESTER

2015-2016 onwards

PRINTING PROCESSES

CURRICULAM DEVELOPMENT CENTRE

STATE BOARD OF TECHNICAL EDUCATION & TRAINING, TAMIL NADU
DIPLOMA IN PRINTING TECHNOLOGY

M-SCHEME
(to be implemented for the student Admitted from the Year 2015-2016 onwards)

Course Name : DIPLOMA IN PRINTING TECHNOLOGY
Subject Code : **38231**
Semester : III Semester
Subject Title : PRINTING PROCESSES

TEACHING AND SCHEME OF EXAMINATION:

No. of weeks per semester: 15 weeks

Subject Title	Instructions		Examination			
	Hours/ Week	Hours/ Semester	Marks			Duration
			Internal Assessment	Board Examination	Total	
PRINTING PROCESSES	6 Hrs	90 Hrs	25	75	100	3 Hrs

Topics and Allocation of Hours:

Unit No.	Topic	Time(Hrs)
I	Introduction to Printing Processes	18
II	Principles of Printing Processes	16
III	Classifications of Offset Printing Machines	18
IV	Classifications of Flexography Printing	13
V	Classifications of Gravure & Screen Printing	15
	Revision and Test	10
	Total	90

Rationale:

This subject informs about all the printing processes like letterpress, offset, gravure, flexography and screen printing. The students can able to know the inventions of all the processes and how printing was developed. They can also able to know the job suitably of each printing processes. This subject tells the types, structures and configurations and working of all the printing machines used in each printing processes. This subject is the base for all the printing processes.

Objective:

At the end of the study of III Semester the student will be able to:

- Know the Historical background and evolution.
- Study the Structure of Printing Industry.
- Understand the Principles of Printing Processes.
- Learn the Applications of Printing Processes.
- Know the Classifications of Offset Printing Machines.
- Know the Classifications of Gravure Printing Machines.
- Know the Classifications of Flexography Printing Machines.
- Know the Classifications of Screen Printing Machines.
- Study the type of Printing Machines.

PRINTING PROCESSES

DETAILED SYLLABUS

Contents: Theory

Unit	Name of the Topic	Hours
I	**Introduction to Printing Processes** 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 Processes – Offset, Intaglio, Gravure, Flexography, Screen printing and Digital printing.	**18 Hrs**
II	**Principles of Printing Processes** 2.1 - Basic Principles of Letterpress, Offset, Flexography, Gravure, Screen Printing and Digital Printing. 2.2 - Print recognition of Printing Processes – Letterpress, Offset, Flexography, Gravure and Screen Printing. 2.3 - Advantages and Limitations of Printing Processes – Letterpress, Offset, Flexography, Gravure and Screen Printing.	**16 Hrs**
III	**Classifications 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 color sheet-fed offset press, Multi color 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.	**18 Hrs.**
IV	**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 type flexography press. 4.3 - Special application of flexography in Food Packaging.	**13 Hrs**
V	**Classifications of Gravure & Screen Printing** 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.	**15 Hrs**

Text Book / Reference Book:

1. Modern Lithography – Ian 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 Ink Manual – R.H. Leach and R.J. Pierce.
5. Flexography Primer – J. Page Cronnch – GATF Press.
6. Gravure Primer – Cheryk L Kasunich – GATF Press.
7. Hand Book of Print Media – Helmut Kipphan – Springer.
8. Introduction to Printing and Finishing – Hugh M Speirs – PIRA.
9. Screen Printing Primer – GATF Press.
10. Sheetfed Offset Press Operating – Lloyd P Dejidas and Thomas M Destree – GATF Press.

DIRECTORATE OF TECHNICAL EDUCATION

DIPLOMA IN PRINTING TECHNOLOGY

II YEAR

M SCHEME

III SEMESTER

2015-2016 onwards

VISUAL DESIGN & DTP

CURRICULAM DEVELOPMENT CENTRE

+STATE BOARD OF TECHNICAL EDUCATION & TRAINING, TAMIL NADU
DIPLOMA IN PRINTING TECHNOLOGY

M-SCHEME
(to be implemented for the student Admitted from the Year 2015-2016 onwards)

Course Name : DIPLOMA IN PRINTING TECHNOLOGY
Subject Code : **38232**
Semester : III Semester
Subject Title : VISUAL DESIGN & DTP

TEACHING AND SCHEME OF EXAMINATION:

No. of weeks per semester: 15 weeks

Subject Title	Instructions		Examination			
	Hours/ Week	Hours/ Semester	Marks			Duration
			Internal Assessment	Board Examination	Total	
VISUAL DESIGN & DTP	5 Hrs	75 Hrs	25	75	100	3 Hrs

Topics and Allocation of Hours:

Unit No.	Topic	Time(Hrs)
I	Introduction to Design and Layout	13
II	Typography	13
III	Colour Dynamics	13
IV	Page Layout	13
V	Print Publishing	13
	Revision and Test	10
	Total	75

Rationale:

Visual design focuses on the aesthetics of a site and its related materials by strategically implementing images, colours, fonts, and other elements. A successful visual design does not take away from the content on the page or function. Instead, it enhances it by engaging users and helping to build trust and interest in the brand. Graphic design helps clarify meaning and ease communication from one person (persons) to another, and it does so in a few ways.

Objective:

At the end of the study of III Semester the student will be able to:

- Introduce the Visual Design and DTP.
- Know the history of Visual Communications.
- Acquire basic graphic skills in visual communication.
- Learn basics of Design and Layout.
- Understand Typography.
- Learn to organize content as per hierarchy.
- Use the types effectively with emphasis on readability and legibility.
- Understand the world of colour and its impact on readers.
- Learn layout principles for various printed products.
- Understand software used in the Graphic Arts industry.

VISUAL DESIGN AND DTP

DETAILED SYLLABUS

Contents: Theory

Unit	Name of the Topic	Hours
I	**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 and asymmetrical - Optical Centre, Unity, Emphasis, Contrast, rhythm, proportion and harmony. 1.4 - Layout, definition, stages of layout - Visualization, Thumbnails, Rough layout and Comprehensive/final layout.	**13 Hrs**
II	**Typography** 2.1 - Measurements followed in typography – Point and Pica. Anatomy of types –- X height, Ascender and descender, base line and body width. Parts of type 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, type face, type font, type family, type style, modern typefaces, display types, true type and open type. Initials – raised and dropped. 2.3 - Importance of Legibility and Readability, Vector fonts and bitmapped fonts, Logos and trademarks.	**13 Hrs**
III	**Colour Dynamics** 3.1 - Fundamentals of Colour, visible spectrum, primary, secondary and tertiary colours, subtractive colour and additive colour theory, process colour, spot colour/pantone, tint, shade and tones. 3.2 - Colour wheel - purpose and diagram, monochromatic, analogue, complimentary, split complementary and triad colors. 3.3 - Psychological effects of colours – warm and cool colours. 3.4 - Setting the environment for Colour works - Color Temperature.	**13 Hrs.**

Unit	Name of the Topic	Hours
IV	**Page Layout** 4.1 - Style of house, style of work, grids, guides and columns, templates, master page, style sheet, caption, quotes, headers and footers, folio, headlines, sub headlines and margins. 4.2 - Handling originals/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.	**13 Hrs**
V	**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 let, 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.	**13 Hrs**

Text Book / Reference Book:

1. Fundamentals of copy and layout (third edition): National text book company, Illinois, USA
2. Exploring Publication design: by Poppy Evans – Publisher: Thomson – Delmar learning; UK
3. Exploring Typography: by Tova Rabinowitz – Publisher: Thomson – Delmar learning; UK
4. Making digital type look good-Bob Gordon-Thames and Hudson
5. Typography and typesetting- van Nostrand Reinhold,Newyork
6. Magazine Design-Stacey king-Rockport Publishers.

DIRECTORATE OF TECHNICAL EDUCATION

DIPLOMA IN PRINTING TECHNOLOGY

II YEAR

M SCHEME

III SEMESTER

2015-2016 onwards

IMAGE PROCESSING

CURRICULAM DEVELOPMENT CENTRE

STATE BOARD OF TECHNICAL EDUCATION & TRAINING, TAMIL NADU
DIPLOMA IN PRINTING TECHNOLOGY

M-SCHEME
(to be implemented for the student Admitted from the Year 2015-2016 onwards)

Course Name : DIPLOMA IN PRINTING TECHNOLOGY
Subject Code : **38233**
Semester : III Semester
Subject Title : IMAGE PROCESSING

TEACHING AND SCHEME OF EXAMINATION:

No. of weeks per semester: 15 weeks

Subject Title	Instructions		Examination			
	Hours/ Week	Hours/ Semester	Marks			Duration
			Internal Assessment	Board Examination	Total	
IMAGE PROCESSING	6 Hrs	90 Hrs	25	75	100	3 Hrs

Topics and Allocation of Hours:

Unit No.	Topic	Time(Hrs)
I	Originals and Colour	17
II	Digital Reproduction Techniques	15
III	Line and Halftone Photography	16
IV	Film Processing	17
V	Offset Plate Processing	15
	Revision and Test	10
	Total	90

Rationale:

Image processing is a method to convert an image into digital form and perform some operations on it, in order to get an enhanced image or to extract some useful information from it. It is a type of signal dispensation in which input is image, like video frame or photograph and output may be image or characteristics associated with that image. Usually Image Processing system includes treating images as two dimensional signals while applying already set signal processing methods to them.

It is among rapidly growing technologies today, with its applications in various aspects of a business. Image Processing forms core area within engineering and computer science disciplines too.

Objective:

At the end of the study of III Semester the student will be able to:

- Know the Types of Originals used for Reproduction.
- Understand the Basics of Light and Colour and its importance in Printing.
- Learn the Concepts of Reproduction Photography.
- Understand the Scanners and Digital Photography.
- Learn Line and Halftone Photography.
- Understand the Reproduction Process of Line and Halftone Negatives and Positives.
- Study the Types and Characteristics of Films.
- Learn the Film Processing and Computer to Film Technology.
- Study the Various Types of Plates used in Offset Image Carrier Preparation.
- Understand Plate Processing and quality control procedures in plates preparation.

IMAGE PROCESSING

DETAILED SYLLABUS

Contents: Theory

Unit	Name of the Topic	Hours
I	**Originals and Colour** 1.1 - Originals: Definition, Types of original – reflection 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.	**17 Hrs**
II	**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 connections 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 tonal adjustments.	**15 Hrs**
III	**Line and Halftone Photography** 3.1 - Line Reproduction: Steps involved in Line Negative Reproduction. 3.2 - Halftone Reproduction - Highlight, Middle tone and Shadow areas. Halftone Screens, Screen Ruling, Screen angle and Screen Resolution. 3.3 - Working Principles of Scanners and their types – Working principles of Flat bed scanners and Drum Scanners. 3.4 - Steps in Halftone Reproduction using Scanner.	**16 Hrs.**

Unit	Name of the Topic	Hours
IV	**Film Processing** 4.1 - Photographic Films: Types of films – orthochromatic film, panchromatic films, blue sensitive films. Film contrast and film speed. 4.2 - Structure of photographic films. 4.3 - Film processing chemicals: The photographic emulsion, developer solutions, stop bath solutions, fixer solutions, reducers, intensifiers and washing solutions. 4.4 - Film processing: Manual film processing and Automatic film processing. Automatic film processor. Processing accessories – processing trays and processing tanks. 4.5 - Computer to film technology: Workflow, advantages of CTF technology. Film imagesetter: Types, working principles of different types of film imagesetters.	**17 Hrs**
V	**Offset Plate Processing** 5.1 - Type of Plates – 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 GATF dot 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.	**15 Hrs**

Text Book / Reference Book:

1. Colour and its Reproduction - Gary field.
2. Graphic Reproduction Photography - James Walter Burden.
3. Introduction to Prepress – Hugh M. Speirs.
4. Line Photography - Karl Davis Robinson.
5. Principles of Colour Technology - Roy S. Berns.
6. Scanning Primer - Richard M. Adams II.
7. Understanding Digital Colour - Phil Green.
8. Chemistry for the Graphic Arts - Nelson R. Eldred.
9. Colour Science - Style.
10. The Lithographers - Manual GATF Publication, USA.
11. Hand Book of Print Media by Helmut Kipphan - Springer Publications, Germany.
12. Introduction to Prepress by Hugh Speirs, PIRA – BOIF Publishing, United Kingdom.

DIRECTORATE OF TECHNICAL EDUCATION

DIPLOMA IN PRINTING TECHNOLOGY

II YEAR

M SCHEME

III SEMESTER

2015-2016 onwards

DESIGN STUDIO PRACTICAL

CURRICULAM DEVELOPMENT CENTRE

STATE BOARD OF TECHNICAL EDUCATION & TRAINING, TAMIL NADU
DIPLOMA IN PRINTING TECHNOLOGY

M-SCHEME
(to be implemented for the student Admitted from the Year 2015-2016 onwards)

Course Name : DIPLOMA IN PRINTING TECHNOLOGY
Subject Code : **38234**
Semester : III Semester
Subject Title : DESIGN STUDIO PRACTICAL

TEACHING AND SCHEME OF EXAMINATION:

No. of weeks per semester: 15 weeks

Subject Title	Instructions		Examination			
	Hours/ Week	Hours/ Semester	Marks			Duration
			Internal Assessment	Board Examination	Total	
DESIGN STUDIO PRACTICAL	4 Hrs	60 Hrs	25	75	100	3 Hrs

RATIONALE:

Within the printing technology, it's important to have a good understanding of graphics and what types are acceptable for different printing methods. This practical provides the students with a general background in the types of graphics programs, files, fonts and color formats that may be used within the printing industry. Students may cover everything from CMYK and RGB color graphics to setting print margins and transferring font files.

OBJECTIVES:

At the end of the study of III Semester the student will be able to:

1. Design 2D/3D shapes: Table / chair / cupboard / speaker box / gift box using lines, shapes.
2. Create and apply texture to the given 2D/3D object.
3. Create initials like dropped, raised.
4. Design parts of type face (serif, apex, bowl, etc.) with ascender & descender
5. Modify typefaces for display types by using options like type style, skew, rotate, distort, fill and stroke.
6. Create illusion using lines/colors.
7. Creating a logo for an organization using words, symbols, initials, combinations.
8. Design additive and subtractive color wheels.
9. Create duotone image and monochrome image from a color original.
10. Design a visiting card using design elements.

ALLOCATION OF MARKS

Internal Assessment	25 marks
Viva Voce	15 marks
Procedure	10 marks
Practical Exercise	50 marks
Total	100 Marks

DESIGN STUDIO PRACTICAL

List of Exercises

1. Design 2D/3D shapes: Table / chair / cupboard / speaker box / gift box using lines, shapes.
2. Create and apply texture to the given 2D/3D object.
3. Creating initials like dropped, raised.
4. Design parts of type face (serif, apex, bowl, etc.) with ascender & descender
5. Modify type faces for display types by using options like type style, skew, rotate, distort, fill and stroke.
6. Create illusion using lines/colors.
7. Creating a logo for an organization using words, symbols, initials, combinations.
8. Design additive and subtractive color wheels.
9. Create duotone image and monochrome image from a color original.
10. Design a visiting card using design elements.

Systems Requirements

Hardware: minimum 1 GB RAM, 80 GB HDD

Operating System: Linux/Windows XP and Above

Software: Free Open Source Software (FOSS) or Proprietary Software.

Free Open Source Software (FOSS):

For Vector Drawing – Inkscape

For Image Editing – Gimpshop/Photo Plus6.

Proprietary Software:

For Vector Drawing - Corel Draw/Adobe Illustrator

For Image Editing - Adobe Photoshop/Indesign.

III SEMESTER

DESIGN STUDIO PRACTICAL

MODEL QUESTION PAPER

1. Create and apply texture to the given 2D/3D object and write the procedure for same.
2. Create initials like dropped, raised and write the procedure for same.
3. Design parts of type face (serif, apex, bowl, etc.) with ascender & descender and write the procedure for same.
4. Modify typefaces for display types by using options like type style, skew, rotate, distort, fill and stroke and write the procedure for same.
5. Create illusion using lines/colors and write the procedure for same.

The college authority should ensure the safety to all the students during the workshop and the lab practical.

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DIRECTORATE OF TECHNICAL EDUCATION

DIPLOMA IN PRINTING TECHNOLOGY

II YEAR

M SCHEME

III SEMESTER

2015-2016 onwards

IMAGE PROCESSING PRACTICAL

CURRICULAM DEVELOPMENT CENTRE

STATE BOARD OF TECHNICAL EDUCATION & TRAINING, TAMIL NADU
DIPLOMA IN PRINTING TECHNOLOGY

M-SCHEME
(to be implemented for the student Admitted from the Year 2015-2016 onwards)

Course Name : DIPLOMA IN PRINTING TECHNOLOGY
Subject Code : **38235**
Semester : III Semester
Subject Title : IMAGE PROCESSING PRACTICAL

TEACHING AND SCHEME OF EXAMINATION:

No. of weeks per semester: 15 weeks

Subject Title	Instructions		Examination			
	Hours/ Week	Hours/ Semester	Marks			Duration
			Internal Assessment	Board Examination	Total	
IMAGE PROCESSING PRACTICAL	4 Hrs	60 Hrs	25	75	100	3 Hrs

RATIONALE:

In Diploma level engineering education skill development plays a vital role. The skill development in image processing can be achieved by on hand experience in handling various instruments, apparatus and equipment in the image processing laboratory. This is accomplished by doing all the image processing related works in this laboratory.

OBJECTIVES:

At the end of the study of III Semester the student will be able to:

1. Image capturing by digital camera for graphic reproduction.
2. Scanning a line original/continuous tone original using flatbed scanner.
3. Scanning text matter using Optical Character Recognition (OCR).
4. Color Correction of scanned image.
5. Image manipulation of scanned image.
6. Convert Black and white photograph to colour photograph
7. Enhancement of low key originals.
8. Convert the given graphics to a safe colour gamut CMYK to RGB / RGB to CMYK and Perform channel separation.
9. Preparation of imposition scheme for sheet work and half sheet work.
10. Preparation of pre-sensitized plates/wipe-on plates.

ALLOCATION OF MARKS

Internal Assessment	25 marks
Viva Voce	15 marks
Procedure	10 marks
Practical Exercise	50 marks
Total	100 Marks

IMAGE PROCESSING PRACTICAL

List of Exercises

1. Image capturing by digital camera for graphic reproduction.
2. Scanning a line original/continuous tone original using flatbed scanner.
3. Scanning text matter using Optical Character Recognition (OCR).
4. Colour Correction of scanned image.
5. Image manipulation of scanned image.
6. Convert Black and white photograph to color photograph
7. Enhancement of low key originals.
8. Convert the given graphics to a safe color gamut CMYK to RGB / RGB to CMYK and Perform channel separation.
9. Preparation of imposition scheme for sheet work and half sheet work.
10. Preparation of pre-sensitized plates/wipe-on plates.

Systems Requirements

Hardware: minimum 1 GB RAM, 80 GB HDD

Operating System: Linux/Windows XP and Above

Software: Free Open Source Software (FOSS) or Proprietary Software.

Free Open Source Software (FOSS):
For Vector Drawing – Inkscape

For Image Editing – Gimpshop/Photo Plus6.

Proprietary Software:

For Vector Drawing - Corel Draw/Adobe Illustrator

For Image Editing - Adobe Photoshop/Indesign.

List of Equipments

- Digital Camera - 1 No.
- Exposing Frame - 1 No.
- Flatbed Scanner - 1 No.

Materials required:

- PS plates
- Wipe on plates
- Developing chemicals
- Gum
- Cleaning agents and cloth
- Various printed samples

III SEMESTER

IMAGE PROCESSING PRACTICAL

MODEL QUESTION PAPER

1. Scan a line original/continuous tone original using flatbed scanner and write the procedure for same.
2. Make a colour Correction of scanned image and write the procedure for same.
3. Convert Black and white photograph to colour photograph and write the procedure for same.
4. Prepare of imposition scheme for sheet work and half sheet work and write the procedure for same.
5. Prepare of pre-sensitized plates/wipe-on plates and write the procedure for same.

The college authority should ensure the safety to all the students during the workshop and the lab practical.

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DIRECTORATE OF TECHNICAL EDUCATION

DIPLOMA IN PRINTING TECHNOLOGY

II YEAR

M SCHEME

III SEMESTER

2015-2016 onwards

PRINTING PRIMER PRACTICAL

CURRICULAM DEVELOPMENT CENTRE

STATE BOARD OF TECHNICAL EDUCATION & TRAINING, TAMIL NADU
DIPLOMA IN PRINTING TECHNOLOGY

M-SCHEME
(to be implemented for the student Admitted from the Year 2015-2016 onwards)

Course Name : DIPLOMA IN PRINTING TECHNOLOGY
Subject Code : **38236**
Semester : III Semester
Subject Title : PRINTING PRIMER PRACTICAL

TEACHING AND SCHEME OF EXAMINATION:

No. of weeks per semester: 15 weeks

Subject Title	Instructions		Examination			
	Hours/ Week	Hours/ Semester	Marks			Duration
			Internal Assessment	Board Examination	Total	
PRINTING PRIMER PRACTICAL	5 Hrs	75 Hrs	25	75	100	3 Hrs

RATIONALE:

In this laboratory the students get practical knowledge in sheet-fed offset machines, flexography machines, gravure machines and screen printing machines. They will do practical exercises in all these machines from which they can know how to run a job in each machines. They can also know the types of inks, substrates to be used for each printing processes. From the lab they know the basic practical knowledge and how to run printing processes.

OBJECTIVES:

At the end of the study of III Semester the student will be able to:

1. Perform plate & blanket mounting operations in sheet-fed offset machine.
2. Perform make ready operations and perform single colour printing in sheet-fed offset machine.
3. Perform plate mounting in flexography printing machine.
4. Perform make ready operations and perform single colour printing in flexography machine.
5. Perform setting & changing of doctor blade in gravure printing machine.
6. Perform plate cylinder mounting & impression setting in gravure printing machine.
7. Print single colour in gravure printing machine.
8. Prepare screen stencil by direct method.
9. Prepare screen stencil by direct / indirect method.
10. Print on various substrates using screen printing.

ALLOCATION OF MARKS

Internal Assessment	25 marks
Viva Voce	15 marks
Procedure	10 marks
Practical Exercise	50 marks
Total	100 Marks

PRINTING PRIMER PRACTICAL

List of Exercises

1. Plate & Blanket mounting in sheet-fed offset machine.
2. Preparation of Dampening unit
3. Make ready operations and single color printing in sheet-fed offset machine.
4. Plate mounting in flexography printing machine.
5. Make ready operations in flexography machine.
6. Plate cylinder mounting in gravure printing machine.
7. Direct method of stencil preparation for screen printing.
8. Direct / Indirect method of stencil preparation for screen printing.
9. Printing on various substrates in screen printing.
10. Substrates/print recognition of various printing processes.

List of Equipments

- Single color sheet-fed offset / Mini offset printing machine - 1No.
- Flexography printing machine - 1 No.
- Gravure printing machine / Gravure Cylinder - 1 No.
- Screen-printing table (Manual) - 1 No.
- Exposing Frame - 1 No.

Materials required:

- Paper, board & various substrates.
- Various printed samples.
- Photo polymer plates.
- Double sided adhesive tapes.
- Doctor blade.
- Offset, flexography, gravure & screen printing inks.
- Offset blanket.
- Plastic films / Paper (Roll to Roll).
- Screen mesh.
- Thinner.
- Screen frame, squeegee.
- Stencil and preparation materials.
- Cleaning agents and cloth.

III SEMESTER

PRINTING PRIMER PRACTICAL

MODEL QUESTION PAPER

1. Prepare Dampening unit in single colour offset machine and write the procedure for same.
2. Make ready operations and single colour printing in sheet-fed offset machine and write the procedure for same.
3. Make a plate cylinder mounting in gravure printing machine and write the procedure for same.
4. Make a Print on various substrates in screen printing and write the procedure for same.
5. Determine the substrates/print recognition of various printing processes and write the procedure for same.

The college authority should ensure the safety to all the students during the workshop and the lab practical.

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DIRECTORATE OF TECHNICAL EDUCATION

DIPLOMA IN PRINTING TECHNOLOGY

II YEAR

M SCHEME

III SEMESTER

2015-2016 onwards

COMPUTER APPLICATIONS PRACTICAL

CURRICULAM DEVELOPMENT CENTRE

STATE BOARD OF TECHNICAL EDUCATION & TRAINING, TAMILNADU.

DIPLOMA IN COMPUTER ENGINEERING

M- SCHEME

(to be implemented for the student Admitted from the Year 2015-2016 on wards)

Course Name : For All Branches

Subject Code : 30001

Semester : III

Subject title : COMPUTER APPLICATIONS PRACTICAL

TEACHING & SCHEME OF EXAMINATION:

No. of weeks per Semester: 15 Weeks

Course	Instruction		Examination			
			Max.			Duration
	Hours/ week	Hours/ Semester	Internal Assessment	Board Examination	Total	
COMPUTER APPLICATIONS PRACTICAL	4Hrs	60 Hrs	25	75	100	3Hrs

RATIONALE:

The application of Computer knowledge is essential the students of all disciplines of Engineering in addition to their respective branch of study. The Computer Application Practical course facilitates the necessary knowledge and skills regarding creating, working and maintaining the documents and presentation of documents with audio visual effects ina computer and produces necessary skills in E- Learning and Chatting tools..

OBJECTIVES:

On completion of the following exercises, the students will be able to

- Use the GUI operating systems
- Familiarize and customize the desktop
- Use the different facilities available in the word processor
- Prepare Power Point presentation with different formats
- Expose E-learning tools and chatting tools
- Analyze the datasheet
- Create and manipulate the database
- Create different types of charts
- Prepare PowerPoint presentation

- Understand Internet concepts and usage of e-mail

GUIDELINES:

- All the experiments given in the list of experiments should be completed and all the experiments should include for the end semester practical examination.
- The computer systems should be 1:1ratioforpracticalclasses

SYLLABUS
LAB EXERCISES
SECTION – A

GRAPHICAL OPEARTING SYSTEM

Introduction to GUI OS; Features and various versions of GUI OS & its use; Working with GUI OS; My Computer & Recycle bin ; Desktop, Icons and Explorer; Screen description & working styles of GUI OS; Dialog Boxes & Toolbars; Working with Files & Folders; simple operations like copy, delete, moving of files and folders from one drive to another, Shortcuts &Autostart; Accessories and Windows Settings using Control Panel- setting common devices using control panel, modem, printers, audio, network, fonts, creating users, internet settings, Start button & Program lists; Installing and Uninstalling new Hard ware & Software program on your computer - Copying in CD/DVD settings – Recording Audio files.

Exercises

1. a. Installing screen saver and change the monitor resolution by 1280X960
   b. Setting wall papers
   c. Creating, moving, deleting and renaming a folder
   d. Copy, paste and cut a folder/file
   e. Displaying the properties for a file or folder
2. a. Restoring files and folders from Recycle bin
   b. Creating short cuts for folder/file
   c. Finding a file or folder by name
   d. Selecting and moving two or more files/folders using mouse
   e. Sorting folders/files.

WORD PROCESSING

Introduction to Word Processing – Examples- Creation of new documents, opening document, insert a document into another document. Page setup, margins, gutters, font properties, Alignment, page breaks, header footer deleting, moving, replace, editing text in document. Saving a document, spell checker.

Printing a document. Creating a table, entering and editing, Text in tables. Changing format of table, height width of row or column. Editing, deleting Rows, columns in table. Borders, shading, Templates, wizards, drawing objects, mail merge.

Exercises

3. Create the following table and perform the operations given below

DAYS	1	2	3	4	5	6	7	8
MON	← TEST →		**A**: JPP **B**:RDBMS			CA	RDBMS	TUT
TUE	CA	OOP	CN	RDBMS	**A**: RDBMS **B**: JPP			
WED	CN	RDBMS	OOP	RDBMS	COMMUNICATIO N		CN	CA
THU	OOP	**A**: JPP **B**: RDBMS			CA	RDBMS	CN	OOP
FRI	COMMUNICATI ON		**A**: RDBMS **B**: JPP		OOP	CN	RDBMS	CA
SAT	OOPS	RDBMS	CN	CA	---------			

4. Create a standard covering letter and use mail merge to generate the customized letters for applying to a job in various organizations. Also, create a database and generate labels for the applying organizations.
5. Create a news letter of three pages with two columns text. The first page contains some formatting bullets and numbers. Set the document background colour and add 'confidential' as the watermark. Give the document a title which should be displayed in the header. The header/ footer of the first page should be different from other two pages. Also, add author name and date/ time in the header. The footer should have the page number.

SPREADSHEET

Introduction to Analysis Package – Examples - Concepts of Workbook & Worksheets; Using Wizards; Various Data Types; Using different features with Data, Cell and Texts; Inserting, Removing & Resizing of Columns & Rows; Working with Data & Ranges; Different Views of Worksheets; Column Freezing, Labels, Hiding, Splitting etc.; Using different features with Data and Text; Use of Formulas, Calculations & Functions; Cell Formatting including Borders & Shading; Working with Different Chart Types; Printing of Workbook & Worksheets with various options.

Exercises

6. Create a result sheet containing Candidate's Register No., Name, Marks for six subjects. Calculate the total and result. The result must be calculated as below and failed candidates should be turned to red.

   Result is Distinction if Total >= 70 %

   First Class if Total > = 60 % and < 70 %

   Second Class if Total >= 50 % and < 60 %

   Pass if Total >= 35 % and < 50 %

   Fail otherwise

Create a separate table based on class by using auto filter feature.

7. Create a table of records with columns as Name and Donation Amount. Donation amount should be formatted with two decimal places. There should be at least twenty records in the table. Create a conditional format to highlight the highest donation with blue color and lowest donation with red colour. The table should have a heading.

8. Create line and bar chart to highlight the sales of the company for three different periods for the following data.

SALES BAR CHART

Period	Product1	Product2	Product3	Total
JAN	35	40	50	125
FEB	46	56	40	142
MAR	70	50	40	160

SECTION – B

DATABASE

Introduction – Menus – Tool bar – Create – Edit – Save – Data types – Insert – Delete – Update – View – Sorting and filtering – Queries – Report – Page setup – Print.

Exercises

9. Create Database to maintain at least 10 addresses of your class mates with the following constraints

- Roll no. should be the primary key.
- Name should be not null

10. create a students table with the following fields: Sr.No, Reg. No, Name, Marks in 5 subjects. Calculate total and percentage of 10 students. Perform the following queries.

- To find the details of distinction student
- To find the details of first class students
- To find the details of second class students

11. Design a report for the above exercise to print the consolidated result sheet and mark card for the student.

PRESENTATION

Introduction - Opening new presentation, Parts of PowerPoint window – Opening -Saving and closing presentations - Features of PowerPoint, Background design, Word art, Clip art, Drawings,3D settings - Animations, Sound, Views, types of views - Inserting and deleting slides, arranging slides, slides show, rehearsal, setup show, custom show - Creating custom presentations, action setting, auto content wizard, working with auto content wizard

Exercises

12. Make a marketing presentation of any consumer product with at least 10 slides. Use different customized animation effects on pictures and clip art on any four of the ten slides.
13. Create a Presentation about our institution or any subject with different slide transition with sound effect.

INTERNET

Introduction – Getting acquainted with Internet Connection - Browsers – Website URL - Open a website – Net Browsing - Email: Creating E-mail id – Sending , receiving and deleting E-mail - Email with Attachments – CC and BCC - Chatting – Creating Group mail - Google docs – Search Engines – Searching topics .

Most Popular Social Networking Sites : History – Features – Services – Usage of Face book , Twitter and Linkdln.

Transferring data through wifi / bluetooth among different devices.

Introduction to cybercrime – Software Piracy – Viruses – Antivirus Software

Exercises

14. Create an e-mail id and perform the following
    - Write an e-mail inviting your friends to your Birthday Party.
    - Make your own signature and add it to the e-mail message.
    - Add a word attachment of the venue route
    - Send the e-mail to at least 5 of your friends.

15. Create a presentation on Google docs. Ask your friend to review it and comment onit. Use "Discussion" option for your discussions on the presentation.

Hardware and Software Requirements

Hardware Requirements:

- Computers – 36Nos
    - Intel Core i3 Processor
    - 500 GB Hard Disk, 2 MB RAM
    - 14" Monitor
- Projector – 1 Nos
- Laser Printer – 1 No
- Internet Connection – Minimum of 512 KB

Software Requirement

- Any GUI Operating System
- Open Source Software / MS- Office

1. SemesterEndExamination–75 Marks

Content	Max.Marks
Writing Procedure – One Question from Section A	15
Demonstration	15
Results with Printout	5
Writing Procedure – One Question from Section B	15
Demonstration	15
Results with Printout	5
Viva voce	5
Total	**75MARK**

IV SEMESTER

DIRECTORATE OF TECHNICAL EDUCATION

DIPLOMA IN PRINTING TECHNOLOGY

II YEAR

M SCHEME

IV SEMESTER

2015-2016 onwards

OFFSET PRINTING TECHNOLOGY

CURRICULAM DEVELOPMENT CENTRE

STATE BOARD OF TECHNICAL EDUCATION & TRAINING, TAMIL NADU
DIPLOMA IN PRINTING TECHNOLOGY

M-SCHEME
(to be implemented for the student Admitted from the Year 2015-2016 onwards)

Course Name : DIPLOMA IN PRINTING TECHNOLOGY
Subject Code : **38241**
Semester : IV Semester
Subject Title : OFFSET PRINTING TECHNOLOGY

TEACHING AND SCHEME OF EXAMINATION:

No. of weeks per semester: 15 weeks

Subject Title	Instructions		Examination			
	Hours/ Week	Hours/ Semester	Marks			Duration
			Internal Assessment	Board Examination	Total	
OFFSET PRINTING TECHNOLOGY	5 Hrs	75 Hrs	25	75	100	3 Hrs

Topics and Allocation of Hours:

Unit No.	Topic	Time(Hrs)
I	Introduction to Sheetfed Offset Presses	12
II	Sheet Control and Delivery in Offset Press	13
III	Printing Unit in Offset Press	14
IV	Webfed Offset Press – Infeed and Web Guiding Devices	13
V	Webfed Offset Press – Delivery Unit	13
	Revision and Test	10
	Total	75

Rationale:

This subject gives the detailed notes about the types of offset printing. Nowadays offset printing is most commonly used in the printing industry. This subject tells about the sheet-fed and web-fed offset printing techniques. This subject helps to know about all the units, working principles and auxiliary operations performed in sheet-fed and web-fed machines. The thorough knowledge in offset machines helps the students to have easy employment opportunities in India or in Abroad.

Objective:

At the end of the study of IV Semester the student will be aware of:

- Basic principles of offset printing process.
- Structure and type of offset printing presses.
- Various cylinders in offset printing unit.
- Inking and dampening systems of offset press.
- Feeding unit of offset press.
- Delivery unit of offset press.
- In feed unit of a web fed offset press
- Web control in web offset press.
- Types of dryers, chill rollers and folders in web offset presses.
- Auxiliary equipments used in web offset press.

OFFSET PRINTING TECHNOLOGY

DETAILED SYLLABUS

Contents: Theory

Unit	Name of the Topic	Hours
I	**Introduction to Sheetfed Offset Presses** 1.1 - Principles 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 color, Multi color and convertible presses. 1.4 - Type of Presses: Inline Press, Stack Press, Blanket-to-Blanket Press and Common Impression cylinder Press.	**12 Hrs**
II	**Sheet Control and Delivery in Offset Press** 3.1 - Types of Feeders – Friction feeders and Suction feeders, Types of Suction Feeders – Single sheet feeder and Stream Feeder. 3.2 - Feeder Head Components – Feeder Head, Air blast Nozzle, Rear Pickup Suckers, Forwarding Pickup Suckers, Sheet Steadiers, Separator Brushes and fingers. 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 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 Slow down Rollers, Blow downs, Wedges, Skeleton Wheels, Star Wheels and Anti set-off devices. 3.6 - Make ready operations in offset printing machines and Safety precautions in press room.	**13 Hrs**
III	**Printing Unit in Offset Press** 2.1 - Construction and functions of Plate Cylinder, Blanket Cylinder, Impression Cylinder, Transfer Cylinder and Delivery Cylinder. 2.2 - Types of Blankets: Conventional blanket and Compressible blanket. 2.3 - Inking System – Construction, Roller setting methods: Form Roller to Oscillator and Form Roller to Plate. 2.4 - Inking System Problems - Roller Streaks and Glazed Rollers. 2.5 - Dampening System – Construction, Composition of Dampening Solution - pH, Conductivity and Dampening system Roller setting. Types of Dampening System: Conventional or Intermittent, Continuous dampening system and Dahlgren dampening system.	**14 Hrs.**

Unit	Name of the Topic	Hours
IV	**Webfed Offset Press – Infeed and Web Guiding Devices** 4.1 - Historical development of webfed offset presses. 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 Festoon. Flying Paster – Working Principle and function of Flying paster. 4.3 - Web Control – Dancer Roller, Metering Roller, Box Tilt, Web break detectors and Bustle Wheel.	**13 Hrs**
V	**Webfed Offset Press – Delivery Unit** 5.1 - Types of Dryers – Open flame, High Velocity Hot Air and Combination Dryer, Chill Rollers – Early stage Chill rolls, Baffle plate Chill rolls and Jacketed Chill rolls. 5.2 - Types of Folders – Former folder, Double Former Folder, Jaw Folder, Chopper Folder, Combination Folder and Ribbon Folder. 5.3 - Auxiliary Equipments – Stackers, Bundlers, Sheeters, Perforators and Imprinters.	**13 Hrs**

Text Book / Reference Book:

1. A Manual for Lithographic Press Operations – A.S. Porter
2. Handbook of Print Media – Dr. Helmut Kipphan.
3. Sheetfed Offset Press Operating – Lloyd P. Dejidas and Thomas M. Destree, GATF.
4. Offset Lithography – S. Jaganathan, K.T. Chary.
5. Web Offset Press Operating – Danial G Wilson, GATF.
6. Modern Lithography Printing – Ian Faux

DIRECTORATE OF TECHNICAL EDUCATION

DIPLOMA IN PRINTING TECHNOLOGY

II YEAR

M SCHEME

IV SEMESTER

2015-2016 onwards

GRAVURE FLEXOGRAPHY AND SCREEN PRINTING

CURRICULAM DEVELOPMENT CENTRE

STATE BOARD OF TECHNICAL EDUCATION & TRAINING, TAMIL NADU
DIPLOMA IN PRINTING TECHNOLOGY

M-SCHEME
(to be implemented for the student Admitted from the Year 2015-2016 onwards)

Course Name : DIPLOMA IN PRINTING TECHNOLOGY
Subject Code : **38242**
Semester : IV Semester
Subject Title : GRAVURE FLEXOGRAPHY AND SCREEN PRINTING

TEACHING AND SCHEME OF EXAMINATION:

No. of weeks per semester: 15 weeks

Subject Title	Instructions		Examination			
	Hours/ Week	Hours/ Semester	Marks			Duration
			Internal Assessment	Board Examination	Total	
GRAVURE FLEXOGRAPHY AND SCREEN PRINTING	6 Hrs	90 Hrs	25	75	100	3 Hrs

Topics and Allocation of Hours:

Unit No.	Topic	Time(Hrs)
I	Basic Principles	16
II	Image Carrier Preparation	17
III	Flexography Printing	16
IV	Gravure Printing	16
V	Screen Printing	15
	Revision and Test	10
	Total	90

Rationale:

The industry is dominated by three separate and distinct processes - flexography, gravure, and screen printing. The five major printing processes are distinguished by the method of image transfer and by the general type of image carrier employed. Depending upon the process, the printed image is transferred to the substrate either directly or indirectly. In direct printing the image is transferred directly from the image carrier to the substrate, examples of direct printing are gravure, flexography, screen printing.

Each of the printing processes has particular properties, characteristics and associated costs which make it more suitable for certain classes of work than others.

It has to be acknowledged, however, that there is a considerable amount of common ground where two or more printing processes may regularly be used to produce a certain printed product - eg - books printed by offset litho, flexography and letterpress, newspapers by offset litho (cold-set) and flexography, reel-fed labels by flexography and letterpress, periodicals printed by sheet-fed, heat-and cold-set web offset, also web-fed gravure.

Objective:

At the end of the study of IV Semester the student will be able to:

- Learn the Basic Principles of Gravure, Flexography and Screen Printing Process.
- Understand the Main Sections of Gravure, Flexography and Screen Printing Process.
- Know the Image Carrier Preparation Methods of Gravure, Flexography and Screen Printing Process.
- Understand the best applicable Method of Image Carrier Preparation.
- Study the Flexography Press Operations in detail.
- Understand the substrates used for Flexography Printing.
- Learn in detail about the Gravure Press Operations.
- Know about the inks used for Gravure Printing.
- Understand the Screen Printing Operations.
- Learn the Screen Printing Press, their types and applications.

GRAVURE FLEXOGRAPHY AND SCREEN PRINTING

DETAILED SYLLABUS

Contents: Theory

Unit	Name of the Topic	Hours
I	**Basic Principles** 1.1 - Principles of Flexography Printing Process - Main Sections of Flexography Printing Machine: Unwind section, Printing section, Drying section and Rewind section. 1.2 - Principles 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.	**16 Hrs**
II	**Image Carrier Preparation** 2.1 - Flexography Image Carrier Preparation: Structure of Flexographic Plate, Plate Preparation Methods – Rubber Plates preparation, Sheet Photopolymer Plates preparation and Liquid 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 Gravure cylinder preparation. 2.3 - Screen Printing Image Carrier Preparation: Screen Fabrics, Screen preparation by Direct Method, Screen preparation by Indirect / Transfer method and Screen preparation by Direct / Indirect method.	**17 Hrs**
III	**Flexography Printing** 3.1 - Flexography Inking Systems: Ink Metering, Anilox Roller, Types of Flexography Inking 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 based 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: Factors 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, Sticky back plate mounting, Types of Flexography Plate cylinders. 3.5 - Sleeve Technology, Direct laser engraving – Laser engraving on	**16 Hrs.**

	Rubber Rollers. 3.6 - Corona Treatment, Flexo Substrates – Paper and Paperboard stocks, Corrugated stocks, Plastic Films, Foils and Laminates.	
IV	**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 Systems – Environmental 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.	**16 Hrs**
V	**Screen Printing** 5.1 - Mesh, Squeegee Selection, Mesh / Woven Screen Printing Fabric: Materials used for Screen Printing Fabrics, Squeegee selection: The squeegee, Squeegee selection – Shapes of squeegee blades, Squeegee hardness and Squeegee materials. 5.2 - Screen Pretreatment, Screen Tensioning / Stretching: Basic steps in Screen Tensioning, Stretching the Screen Printing Fabric – Manual Stretching and Machine Stretching. 5.3 - Types of Screen Printing Machines - Container Screen Printing machine, Flat bed Hinged frame (Automatic) Screen Press, Rotary Screen Printing Press and Carousal Screen 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 Flat surfaces and Screen Printing on Curved Surfaces.	**15 Hrs**

Text Book / Reference Book:

1. Flexographic Principles and Practice - by Flexographic Technical Associations, Inc. New York, 1980.
2. Rotogravure and Flexographic Printing Presses - by Herbert L. Weiss,
3. Modern Gravure Technology - by Harry B Smith, Pira International, U. K.
4. Screen Process Printing - by John Stephens, Blue Print, An Imprint of hapman and Hall, London.
5. Flexography Primer - by GATF.
6. Hand book of Printmedia - by Helmut kipphan
7. Flexography Primer - by Donna C. Muvihill, GATF
8. Gravure Primer - by Cheryl L. Kasumich, GATF
9. Screen Printing Primer - by Samuel Ingram, GATF

DIRECTORATE OF TECHNICAL EDUCATION

DIPLOMA IN PRINTING TECHNOLOGY

II YEAR

M SCHEME

IV SEMESTER

2015-2016 onwards

PRINT FINISHING AND CONVERTING

CURRICULAM DEVELOPMENT CENTRE

STATE BOARD OF TECHNICAL EDUCATION & TRAINING, TAMIL NADU
DIPLOMA IN PRINTING TECHNOLOGY

M-SCHEME
(to be implemented for the student Admitted from the Year 2015-2016 onwards)

Course Name : DIPLOMA IN PRINTING TECHNOLOGY
Subject Code : **38243**
Semester : IV Semester
Subject Title : PRINT FINISHING AND CONVERTING

TEACHING AND SCHEME OF EXAMINATION:

No. of weeks per semester: 15 weeks

Subject Title	Instructions		Examination			
	Hours/ Week	Hours/ Semester	Marks			Duration
			Internal Assessment	Board Examination	Total	
PRINT FINISHING AND CONVERTING	4 Hrs	60 Hrs	25	75	100	3 Hrs

Topics and Allocation of Hours:

Unit No.	Topic	Time(Hrs)
I	Binding, Finishing and Enhancement– Introduction	10
II	Materials used in Binding	10
III	Forwarding Operations	10
IV	Binding Operations	10
V	Automation in Binding	10
	Revision and Test	10
	Total	60

Rationale:

Binding and finishing are those activities performed on printed material after printing. Binding involves the fastening of individual sheets together, while finishing involves additional decorative actions, such as die-stamping, embossing, etc. This subject gives a comprehensive knowledge to the students and offers placement opportunities to work in print finishing houses.

Objective:

At the end of the study of IV Semester the student will be aware of:

- The various printed products and binding materials used for binding.
- The various end papers and securing methods.
- The various binding and finishing machines.
- The various binding and finishing tools and their uses.
- The various binding operations.
- The various binding styles.
- The sewing methods and edge decoration.
- The various finishing operations.
- The various automation processes in binding.

PRINT FINISHING AND CONVERTING

DETAILED SYLLABUS

Contents: Theory

Unit	Name of the Topic	Hours
I	**Binding, Finishing and Enhancement– Introduction** 1.1 - Brief Introduction to Print Finishing. Classification of Book Binding – Quarter bound book, Half bound book – old style and new style and Full bound book. 1.2 - End Paper – Types and its uses - Single End Paper, Made End Paper, Reinforced End Paper, Cloth Joint End Paper and Zig Zag End Paper. 1.3 - Binding and Finishing Tools - Folder, Glue Brush, Paste Brush, Spring Divider, Needle, Tennon Saw, Hammer, Foot Rule, Knife, Bodkin, Piercer/Awl, Eyelet punch, Scissors, Carpenter's L – Square, Center Tool, Round Roll, Fillet and Type Holder. 1.4 - Lamination Machine - Different types of lamination machines - Dry Lamination, Wet lamination, Thermal Lamination, Strip lamination and Window Lamination. 1.5 - Varnishing, Full varnishing and Spot Varnishing. Types of varnish - matt and gloss varnishing - water (Aqua) based, solvent based - UV and special effect varnish.	**10 Hrs**
II	**Materials used in Binding** 2.1 - Ware House, Types of Ware House – White paper Ware House and Printed paper Ware House. 2.2 - Covering Materials – Binding cloth, Buckram cloth, Rexene, Leather, Paper fabric and PVC. 2.2 - Reinforcing Materials – Mull Cloth, Calico Cloth, Tapes and Cords. 2.3 - Securing Materials – Thread, Wire, Metal and Plastic Units. 2.4 - Adhesives – Paste, Glue, Synthetic Adhesive, Hot-melt and Gum. 2.5 - Book Finishing Materials – Gold leaf and Blocking foil.	**10 Hrs**
III	**Forwarding Operations** 3.1 - Cutting, Trimming, Difference between Cutting and Trimming, Folding – Types of Folding – Folding-to-paper, Folding-to-Print and Lump Folding. 3.2 - Creasing, Gathering, Collating, Binder's/Collating mark, Inserting and Attaching of Plates and Maps. 3.3 - Perforating – Types of Perforation, Punching and Drilling, Numbering – Horizontal Numbering and Vertical Numbering.	**10 Hrs.**

Unit	Name of the Topic	Hours
	3.4 - Die cutting and Slitting Operations. 3.5 - Headbands, Edge Decoration, Types of Edge Decoration – Colouring the edge, Marbling and Edge Guilding.	
IV	**Binding Operations** 4.1 - Stitching – Side Stitching and Saddle Stitching. 4.2 - Sewing, Types of Sewing – French Sewing, Tape Sewing or Sewing on Tapes, Raised Cord Sewing or Flexible Sewing, Recessed Card Sewing or Sawn-in Sewing, Two on & All along Sewing and Overcast Sewing. 4.3 - Loose Leaf Binding – Spiral Binding and Comb Binding. 4.4 - Perfect Binding – clamping station, milling station, gluing station, nipping station and delivery station. 4.5 - Case Binding – preparation of case and casing-in.	**10 Hrs**
V	**Automation in Binding** 5.1 - Programmable Cutting Machine and its operations – machine bed, clamp, back gauge, knife and safety mechanisms. 5.2 - Folding Machine and its operations – buckle folding, knife folding and combination folding stations. 5.3 - Wire Stitching Machine and its operations – wire unwind, wire straightener, cutter block, saddle and wire clenchers. 5.4 - Rounding and Backing Machine and its operations – hopper, rounding station, backing station and delivery station. 5.5 - Gathering Machine and its operations.	**10 Hrs**

Text Book / Reference Book:

1. Folding in Practice - by Alfred Furler.
2. Modern Book Binding - by Alex J. Vaughan.
3. Printing and Die Cutting - by Vanessa Bailey
4. Hand Book of Print Media - by Helmut Kippan Ed., Heidelberg.
5. Introduction to Printing and Finishing - by Hugh M. Spiers.
6. What the Printer should know about Paper - by Lawrence A. Wilson.
7. Printing Technology - by Michael Adams J. and Penny Ann Dohn.

DIRECTORATE OF TECHNICAL EDUCATION

DIPLOMA IN PRINTING TECHNOLOGY

II YEAR

M SCHEME

IV SEMESTER

2015-2016 onwards

PRINTING MATERIALS

CURRICULAM DEVELOPMENT CENTRE

STATE BOARD OF TECHNICAL EDUCATION & TRAINING, TAMIL NADU
DIPLOMA IN PRINTING TECHNOLOGY

M-SCHEME
(to be implemented for the student Admitted from the Year 2015-2016 onwards)

Course Name : DIPLOMA IN PRINTING TECHNOLOGY
Subject Code : **38244**
Semester : IV Semester
Subject Title : PRINTING MATERIALS

TEACHING AND SCHEME OF EXAMINATION:

No. of weeks per semester: 15 weeks

Subject Title	Instructions		Examination			
	Hours/ Week	Hours/ Semester	Marks			Duration
			Internal Assessment	Board Examination	Total	
PRINTING MATERIALS	5 Hrs	75 Hrs	25	75	100	3 Hrs

Topics and Allocation of Hours:

Unit No.	Topic	Time(Hrs)
I	Composition of Paper and Pulping Process	14
II	Manufacturing of Paper and Board	13
III	Paper, Board - Types, Sizes and Properties	13
IV	Printing Inks - Composition and Manufacturing	13
V	Ink Drying and Ink Problems	12
	Revision and Test	10
	Total	75

Rationale:

Paper plays an important role in the modern world. For many years, it has been the chief medium for the communication of knowledge and ideas in a permanent form, so essential to the development of commerce, industry and education. There has been an increasing demand as a medium for protection and display of goods in the packaging industry. Without paper it is hard to imagine a printing industry for its present stage of development. Although, there is a growing amount of printing being carried out on plastic and metal substrates, paper is likely to be the printer most important basic material.

Objective:

At the end of the study of IV Semester the student will be able to:

- Study the composition of paper.
- Learn manufacturing process of paper.
- Study the operations in paper making machine.
- Study quality of paper for different printing process.
- Understand the paper and board sizes.
- Study the properties of paper and board.
- Understand the raw materials of printing inks.
- Learn the properties of inks.
- Know about the various ink drying methods.
- Study about the various ink problems.

PRINTING MATERIALS

DETAILED SYLLABUS

Contents: Theory

Unit	Name of the Topic	Hours
I	**Composition of Paper and Pulping Process** 1.1 - Paper: Description, Composition of paper: Raw materials for manufacturing of paper. 1.2 - Fibrous materials: Common paper making fibres - categories of fibres: characteristics of softwood pulps and hardwood pulps. 1.3 - Manufacture of paper: Pulping Process – Three basic methods of pulping process: Mechanical pulping, Mechanical / Chemical pulping and chemical pulping process. 1.4 - Bleaching process, Stock preparation - Description - Breaking: Sizing agents, Loadings, Fillers, coloring materials and Chemical additives. Refining - Description.	**14 Hrs**
II	**Manufacturing of Paper and Board** 2.1 - Operations in paper making machine: Wet end, Head box, Slice, Dandy roll, Press section and Drying section. 2.2 - Paper finishing: Super calendaring, Coating: Types of coating methods. 2.3 - Packing and Delivery - Precautions taken during packing and delivery. 2.4 - Board making: Raw materials for manufacturing of Board.	**13 Hrs**
III	**Paper, Board - Types, Sizes and Properties** 3.1 - Classifications of paper for printing - printing paper, writing paper, wrapping paper and specialty papers. Different types of Board - Pulp board, Straw board, Carton board, Art board, Chromo board and Corrugated board. 3.2 - Choice of appropriate quality of paper for different printing processes - Letter press, offset, gravure, Screen, Flexography printing and Digital printing. 3.3 - Paper and Board sizes: - ISO paper size (A, B, C Series), British paper sizes - Crown, Double Crown, Demy, Double Demy, Royal and Imperial. 3.4 - Runnability Properties - Tear Resistance, Tensile Strength,	**13 Hrs.**

Unit	Name of the Topic	Hours
	Bursting Strength, Folding Endurance, Stiffness, Basis weight and grammage, Caliper and Bulk, Wire and Felt side, Moisture Content and Relative Humidity, Dimensional Stability and Grain Direction. 3.5 - Printability properties - Brightness and Whiteness, Colour, Gloss, Opacity, Ink Absorbency and Pick Resistance. 3.6 - Paper problems - Powdering and Pilling Problem, Linting, Dusting, and Picking problem.	
IV	**Printing Inks - Composition and Manufacturing** 4.1 - Raw materials used for manufacturing of printing inks - Pigments, Dyes, Vehicles, Driers Solvents, Ink and Additives. Manufacturing of printing inks by three roll dispersion mill. 4.2 - General characteristics and requirements of printing inks. 4.3 - Inks for different printing processes - Letter press inks, Flexo inks, Gravure inks, Offset inks and Screen inks. 4.4 - Ink properties - Color properties – opaque and transparent ink, Flow properties and working properties of inks. 4.5 - Ink types – based on substrate, based on drying and based on chemistry.	**13 Hrs**
V	**Ink Drying and Ink Problems** 5.1 - Drying methods - Drying by Penetration/Absorption, Oxidation, Polymerization, Evaporation, Gellation, Solidification and Precipitation. 5.2 - Ink problems - Mottle, Chalking, Chemical ghosting, mechanical ghosting problems, trapping, hickeys, picking, piling, set-off, tinting, scumming, stripping and, strike through and show through. 5.3 - Causes and remedies for the above Ink problems.	**12 Hrs**

Text Book / Reference Book:

1. Printing Materials - Science and Technology - Thompson, Bob - PIRA Publication.
2. Printing Paper and Ink - Charles Finley.
3. The Print Production Manual - J. Peacock, C. Berril and M. Barnard - PIRA.
4. The Printing Ink Manual - R.H. Leach and R.J. Pierce.
5. What the Printer should know about Ink - Dr. Nelson Ra Eldred - GATF Press.

6. What the Printer should know about Paper - Lawrence A Wilson - GATF Press.
7. Flexography Primer - J. Page Cronnch - GATF Press.
8. Gravure Primer - Cheryk L Kasunich - GATF Press.
9. Hand Book of Print Media - Helmut Kipphan - Springer.
10. Introduction to Printing and Finishing - Hugh M Speirs - PIRA.
11. Screen Printing Primer - GATF Press.
12. Sheetfed Offset Press Operating - Lloyd P Dejidas and Thomas M Destree - GATF Press.
13. Web Offset Press Operating - Daniel G Wilson and PIA / GATF staff.

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DIRECTORATE OF TECHNICAL EDUCATION

DIPLOMA IN PRINTING TECHNOLOGY

II YEAR

M SCHEME

IV SEMESTER

2015-2016 onwards

DESKTOP PUBLISHING FOR PRINT PRODUCTION PRACTICAL

CURRICULAM DEVELOPMENT CENTRE

STATE BOARD OF TECHNICAL EDUCATION & TRAINING, TAMIL NADU
DIPLOMA IN PRINTING TECHNOLOGY

M-SCHEME
(to be implemented for the student Admitted from the Year 2015-2016 onwards)

Course Name **:** DIPLOMA IN PRINTING TECHNOLOGY
Subject Code **: 38245**
Semester **:** IV Semester
Subject Title **:** DESKTOP PUBLISHING FOR PRINT PRODUCTION PRACTICAL

TEACHING AND SCHEME OF EXAMINATION:

No. of weeks per semester: 15 weeks

Subject Title	Instructions		Examination			
	Hours/ Week	Hours/ Semester	Marks			Duration
			Internal Assessment	Board Examination	Total	
DESKTOP PUBLISHING FOR PRINT PRODUCTION PRACTICAL	5 Hrs	75 Hrs	25	75	100	3 Hrs

RATIONALE:

This subject is aimed at providing basic understanding of the fundamentals of practical sections; mainly designing a posters, flyers, brochures, Letter head, Bills / Vouchers and Invitation card / greeting card.

The topics covered are based on the syllabus for Diploma in Printing Technology. The subject is planned to include sufficient practices which would help the student to understand the principles of desktop publishing for print production.

OBJECTIVES:

At the end of the study of IV Semester the student will be able to:

1. Creating master page for the given layout (setting grid, margin and columns)
2. Print, proof and correct the saved page.
3. Creating Cover and Title page
4. Creating style sheets and Table of Content
5. Designing Letter head
6. Designing Pamphlet
7. Designing Envelop & greeting card
8. Designing Bills / Vouchers
9. Designing an Advertisement
10. Designing Labels in multiple steps

ALLOCATION OF MARKS

Internal Assessment	25 marks
Viva Voce	15 marks
Procedure	10 marks
Practical Exercise	50 marks
Total	100 Marks

DESKTOP PUBLISHING FOR PRINT PRODUCTION PRACTICAL

List of Exercises

1. Creating master page for the given layout (setting grid, margin and columns)
2. Print, proof and correct the saved page.
3. Creating Cover and Title page
4. Creating style sheets and Table of Content
5. Designing Letter head
6. Designing Pamphlet
7. Designing Envelop & greeting card
8. Designing Bills / Vouchers
9. Designing an Advertisement
10. Designing Labels in multiple steps

Systems Requirements

Hardware: Minimum 2 GB RAM, 500 GB HDD

Operating System: Windows XP and Above

Software: FOSS or Proprietary

FOSS: Scribus

Proprietary: Adobe Indesign, QuarkXpress

IV SEMESTER

DESKTOP PUBLISHING FOR PRINT PRODUCTION PRACTICAL

MODEL QUESTION PAPER

1. Create style sheets and Table of Content and write the procedure for same.
2. Design a Letter head and write the procedure for same.
3. Design a Pamphlet and write the procedure for same.
4. Design an Envelop & greeting card and write the procedure for same.
5. Design a Bills / Vouchers and write the procedure for same.

The college authority should ensure the safety to all the students during the workshop and the lab practical.

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DIRECTORATE OF TECHNICAL EDUCATION

DIPLOMA IN PRINTING TECHNOLOGY

II YEAR

M SCHEME

IV SEMESTER

2015-2016 onwards

OFFSET MACHINES PRACTICAL

CURRICULAM DEVELOPMENT CENTRE

STATE BOARD OF TECHNICAL EDUCATION & TRAINING, TAMIL NADU
DIPLOMA IN PRINTING TECHNOLOGY

M-SCHEME
(to be implemented for the student Admitted from the Year 2015-2016 onwards)

Course Name : DIPLOMA IN PRINTING TECHNOLOGY
Subject Code : **38246**
Semester : IV Semester
Subject Title : OFFSET MACHINES PRACTICAL

TEACHING AND SCHEME OF EXAMINATION:

No. of weeks per semester: 15 weeks

Subject Title	Instructions		Examination			
	Hours/ Week	Hours/ Semester	Marks			Duration
			Internal Assessment	Board Examination	Total	
OFFSET MACHINES PRACTICAL	4 Hrs	60 Hrs	25	75	100	3 Hrs

RATIONALE:

In this lab the students can have the detailed knowledge about the sheet-fed offset printing. They can know the how to set the sheet handling, forwarding, insertion devices of the offset machines. They can able to set the feeder mechanisms, delivery mechanisms, inking units rollers and dampening unit rollers. This lab ensures the students about how to print single colour offset machines. From this lab the students could how the dampening solution preparation ink mixing, trapping printing ink problems, etc. This laboratory for working in latest technology offset machines later.

OBJECTIVES:

At the end of the study of IV Semester the student will be able to:

1. Perform feeder setting in single colour sheet-fed offset printing machines.
2. Perform delivery setting in single colour sheet-fed offset printing machines.
3. Set of sheet registering devices.
4. Perform roller setting in dampening system.
5. Perform roller setting in inking system.
6. Prepare fountain solution and dampening system.
7. Prepare the inking system.
8. Perform make ready procedures for single colour printing.
9. Perform two colour printing in single colour sheet-fed offset printing machine.
10. Learn cleaning of dampening and inking systems.

ALLOCATION OF MARKS

Internal Assessment	25 marks
Viva Voce	15 marks
Procedure	10 marks
Practical Exercise	50 marks
Total	100 Marks

OFFSET MACHINES PRACTICAL

List of Exercises

1. Feeder setting in single color sheet-fed offset printing machines.
2. Delivery setting in single color sheet-fed offset printing machines.
3. Setting sheet registering devices.
4. Roller setting in dampening system.
5. Roller setting in inking system.
6. Preparation of fountain solution and dampening system.
7. Preparation of inking system.
8. Make ready procedures for single color printing.
9. Two color printing in single color sheet-fed offset printing machine.
10. Cleaning of dampening and inking systems.

List of Equipment

Single color sheet-fed offset printing machine - 1 No.

List of Instrument

Micrometer	- 1 No.
Durometer	- 1 No.
pH Meter	- 1 No.
Densitometer	- 1 No.
Conductivity Meter	- 1 No.
Packing Gauge	- 1 No.
Magnifier	- 1 No.

List of Materials

Offset Plates.
Inks.
Papers.
Press work chemicals.
Molleton cloth.
Waste cloth.
Packing sheets.
Blanket.
Anti-setoff powder.
Ink knife.

IV SEMESTER

OFFSET MACHINES PRACTICAL

MODEL QUESTION PAPER

1. Make a Roller setting in dampening system and write the procedure for same.
2. Make a Roller setting in inking system and write the procedure for same.
3. Prepare of fountain solution and dampening system and write the procedure for same.
4. Prepare of inking system and write the procedure for same.
5. Make ready procedures for single colour printing and write the procedure for same.

The college authority should ensure the safety to all the students during the workshop and the lab practical.

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DIRECTORATE OF TECHNICAL EDUCATION

DIPLOMA IN PRINTING TECHNOLOGY

II YEAR

M SCHEME

IV SEMESTER

2015-2016 onwards

PRINT FINISHING PRACTICAL

CURRICULAM DEVELOPMENT CENTRE

STATE BOARD OF TECHNICAL EDUCATION & TRAINING, TAMIL NADU
DIPLOMA IN PRINTING TECHNOLOGY

M-SCHEME
(to be implemented for the student Admitted from the Year 2015-2016 onwards)

Course Name : DIPLOMA IN PRINTING TECHNOLOGY
Subject Code : **38247**
Semester : IV Semester
Subject Title : PRINT FINISHING PRACTICAL

TEACHING AND SCHEME OF EXAMINATION:

No. of weeks per semester: 15 weeks

Subject Title	Instructions		Examination			
	Hours/ Week	Hours/ Semester	Marks			Duration
			Internal Assessment	Board Examination	Total	
PRINT FINISHING PRACTICAL	4 Hrs	60 Hrs	25	75	100	3 Hrs

RATIONALE:

Binding and finishing are those activities performed on printed material after printing. Binding involves the fastening of individual sheets together, while finishing involves additional decorative actions, such as die-stamping, embossing, etc. This subject gives a comprehensive knowledge to the students and offers placement opportunities to work in print finishing houses.

OBJECTIVES:

At the end of the study of IV Semester the student will be able to:

1. Prepare an End Papers.
2. Bind a book by saddle and side stitching method.
3. Perform perforation and numbering.
4. Prepare a quarter bound cut flush book using French sewing.
5. Prepare of quarter bound turned-in book using tape sewing.
6. Prepare a half bound old style book using recessed cord sewing.
7. Prepare of half bound new style book using recessed cord sewing.
8. Prepare of full bound book using raised cord sewing.
9. Prepare a case bound book.
10. Perform edge decoration operations..

ALLOCATION OF MARKS

Internal Assessment	25 marks
Viva Voce	15 marks
Procedure	10 marks
Practical Exercise	50 marks
Total	100 Marks

PRINT FINISHING PRACTICAL

List of Exercises

1. Preparation of End Papers.
2. Binding a book by saddle and side stitching method.
3. Performing perforation and numbering.
4. Preparing a quarter bound cut flush book using French sewing.
5. Preparation of quarter bound turned-in book using tape sewing.
6. Preparing a half bound old style book using recessed cord sewing.
7. Preparation of half bound new style book using recessed cord sewing.
8. Preparation of full bound book using raised cord sewing.
9. Preparing a case bound book.
10. Performing edge decoration operations.

List of Tools and Equipment:

- Cutting Machine
- Wire Stitching Machine
- Perforating Machine
- Hard Press
- Needle
- Bodkin
- Scissors
- Binding Knife
- Scale

Materials required:

- Paper
- Calico
- Straw Board
- Thread, Tapes
- Cords
- Paste
- Fevicol

IV SEMESTER

PRINT FINISHING PRACTICAL

MODEL QUESTION PAPER

1. Bind a book by saddle and side stitching method and write the procedure for same.
2. Perform perforation and numbering and write the procedure for same.
3. Prepare a quarter bound cut flush book using French sewing and write the procedure for same.
4. Prepare a case bound book and write the procedure for same.
5. Perform edge decoration operations and write the procedure for same.

The college authority should ensure the safety to all the students during the workshop and the lab practical.

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V SEMESTER

DIRECTORATE OF TECHNICAL EDUCATION

DIPLOMA IN PRINTING TECHNOLOGY

III YEAR

M SCHEME

V SEMESTER

2015-2016 onwards

DIGITAL PREPRESS

CURRICULAM DEVELOPMENT CENTRE

STATE BOARD OF TECHNICAL EDUCATION & TRAINING, TAMIL NADU
DIPLOMA IN PRINTING TECHNOLOGY

M-SCHEME
(to be implemented for the student Admitted from the Year 2015-2016 onwards)

Course Name : DIPLOMA IN PRINTING TECHNOLOGY
Subject Code : **38251**
Semester : V Semester
Subject Title : DIGITAL PREPRESS

TEACHING AND SCHEME OF EXAMINATION:

No. of weeks per semester: 15 weeks

Subject Title	Instructions		Examination			
	Hours/ Week	Hours/ Semester	Marks			Duration
			Internal Assessment	Board Examination	Total	
DIGITAL PREPRESS	5 Hrs	75 Hrs	25	75	100	3 Hrs

Topics and Allocation of Hours:

Unit No.	Topic	Time(Hrs)
I	Digital Prepress – Introduction	13
II	Digital Photography & Digital Proofing	13
III	Digital Image Assembly and Data Formats	13
IV	Colour Management	13
V	Computer to Plate systems	13
	Revision and Test	10
	Total	75

Rationale:

With the advert of computers and its integration with the prepress systems made the CTP work flow and the way for digital imposition of pages with more advanced facilities. The colour management applications ensure for better colour reproduction with consistency in printing. CIE lab colour space and the colour measurement by spectrodensitometer are becoming important and being implemented by all the printers. The PDF and JDF workflows used in print production for better management of files and CIP3&CIP4 integration helps the organization in optimizing the task in digital prepress.

Objective:

At the end of the study of V Semester the student will be able to :

- Know the Fundamentals of Digital Prepress Techniques.
- Understand the Importance of Input and Output Resolution.
- Learn the Digital Photography and Flatbed Scanner.
- Learn the Image Capturing and Scanning Process.
- Understand the Sheet Assembly, Imposition and Raster Image Processing.
- Understand Imposition Software and their Workflow.
- Study the Colour Management Concepts and Colour Measuring Devices.
- Learn the Digital Proofing and Press Proofing Process.
- Understand the Computer to Plate Technology.
- Provide basic understanding CTP plates and lasers.
- Learn the Preflight Technology and Workflows.

DIGITAL PREPRESS

DETAILED SYLLABUS

Contents: Theory

Unit	Name of the Topic	Hours
I	**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.	**13 Hrs**
II	**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 and 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 designs and models, Flat bed Scanners - Diagram, functions of scanners and advantages of flatbed scanner. 2.4 - Digitizing and Redigitizing - Various Redigitizing Techniques - Copy dot, Descreening and mixed mode. Digital Proofs and Press Proofs.	**13 Hrs**
III	**Digital Image Assembly and Data Formats** 3.1 - Page Assembly and Imposition - Digital assembly 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, demands on Imposition programs and Imposition workflows and considerations for impositions. 3.4 - Raster Image Processor (RIP) - Workflow diagram – Interpreter, Renderer, Rasterizer 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.	**13 Hrs.**

Unit	Name of the Topic	Hours
IV	**Colour Management** 4.1 - Definition of Colour, Colour Management and Needs - Targets of Print Colour Management, CIE Chromaticity Diagram - CIE Lab Values – Spectrophotometry, Spectral Reflectance curves of colours. Colour perception and colorimetric description of colour. 4.2 - Colour measuring instruments, Colorimetry and Densitometry – Densitometer, Spectrophotometer diagrams and functions. 4.3 - Profiles 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. 4.4 - Image Reproduction Process using Colour Management - Implementing Colour Management, Diagram for Colour perception and the colorimetric description of colour and 3cs' of colour management.	**13 Hrs**
V	**Computer to Plate systems** 5.1 - Types of Computer to Plate Systems – 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 Definition 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.	**13 Hrs**

Text Book / Reference Book :

1. The Art of Colour - by Johannes Ittem.
2. Digital Colour Printing Technology - by Biswanath Chakkaravarthy.
3. Colour and its Reproduction - by Gray and Field.
4. Colour and Quality - by Heidelberg
5. Computer to Plate Primer - by Richard M Adams and Frank J Romano.
6. Desk Top Publishing - by Ron Strutt and Kirty Wilson Davis.
7. Digital Image - by A Practical Guide – by Adele Drobler, Greenberg and Seth.
8. Electronic Colour Separation – by Dr. R. K. Molla.
9. Introduction to Prepress – by Hugh M. Speirs.
10. Pocket Guide to Colour with Digital Application - by Thaomas E Schildgen, Frank Beah.
11. The PDF Print Production Guide - by Joseph Marin and Julie Sheffo.
12. Understanding Digital Colour – by Phol Green.
13. Understanding Digital Imposition – by Hal Hinderliter.

DIRECTORATE OF TECHNICAL EDUCATION

DIPLOMA IN PRINTING TECHNOLOGY

III YEAR

M SCHEME

V SEMESTER

2015-2016 onwards

E-PUBLISHING

CURRICULAM DEVELOPMENT CENTRE

STATE BOARD OF TECHNICAL EDUCATION & TRAINING, TAMIL NADU
DIPLOMA IN PRINTING TECHNOLOGY

M-SCHEME
(to be implemented for the student Admitted from the Year 2015-2016 onwards)

Course Name : DIPLOMA IN PRINTING TECHNOLOGY
Subject Code : **38252**
Semester : V Semester
Subject Title : E-PUBLISHING

TEACHING AND SCHEME OF EXAMINATION:

No. of weeks per semester: 15 weeks

Subject Title	Instructions		Examination			
	Hours/ Week	Hours/ Semester	Marks			Duration
			Internal Assessment	Board Examination	Total	
E-PUBLISHING	5 Hrs	75 Hrs	25	75	100	3 Hrs

Topics and Allocation of Hours:

Unit No.	Topic	Time(Hrs)
I	Electronic Publishing	13
II	PDF Production, Copy Editing and Proof Reading	13
III	HTML	13
IV	XML	13
V	Web to Print	13
	Revision and Test	10
	Total	75

Rationale:

E publishing gives authors the opportunity to reach a global audience in a cost effective manner. Also, E publishing is the happening phenomenon in the present day knowledge economy. This has mainly been due to the phenomenal success of the devices upon which we read e-books—digital, e-readers, tablet computers, smartphones, etc.—which bring with them the advantages of being convenient, portable, cost-effective and easy-to-use.

The digital publishing industry and e-books are bound to grow in importance in the coming years, especially with diminishing paper stocks, rising production costs and the advancement of technologies used to create feature-rich e-books.

Due to the comprehensive topics covered under this subject students can acquire an enormous amount of knowledge. Students attain scope to be placed in E-Publishing industries installed with sophisticated machineries.

Objective:

At the end of the study of V Semester the student will be able to :

- Provide a basic understanding of E-Publishing
- Learn the steps involved in E-publishing
- Introduce Various applications for PDF production
- Study the Proof Reading Marks and Copy Editing techniques
- Learn basic tags and syntax in HTML and XML
- Understand purpose of CSS and templates
- Learn to create a XML document
- Learn concepts of web to print
- Study types of networking and interfaces
- Learn the digital workflow and production management/monitoring system

E-PUBLISHING

DETAILED SYLLABUS

Contents: Theory

Unit	Name of the Topic	Hours
I	**Electronic Publishing** 1.1 Introduction about E-publishing, Advantages and disadvantages of E-Publishing. 1.2 Basic principles of E-book, List of various manufactures of E-book and Application of E-book. 1.3 Steps involved for creation of e-book – Editing - Types of E-book editing – HTML compiler, PDF compiler, other compiler, Cover page design, E-book design, ISBN registration - Barcode, Copyright certification and Marketing. 1.4 Marketing strategies - Ezines, Joint ventures, Pay-per-click search engines, Search engines and Press releases and news.	**13 Hrs**
II	**PDF Production, Copy Editing and Proof Reading** 2.1 Introduction about PDF, Application of PDF, Adobe PDF for professional publishing, PDF production using Adobe Indesign, PDF predefined presets. 2.2 Steps involved in PDF production using Quark Xpress, Introduction about Adobe distiller and Steps involved PDF production using Adobe distiller. 2.3 Copy editing, Qualification and duties of copy editor. 2.4 Proof reading – Proof reading symbols and meaning and Methods of Proof reading.	**13 Hrs**
III	**HTML** 3.1 Introduction about HTML, Meaning for HTML, Definition of tag and syntax. 3.2 Basic tags – HTML, Head, Title and Body, Attributes of HTML – Bold, Italic, Underline, Paragraph, Break, Horizontal line, font, emphasize, teletype font, preserve the line breaks and horizontal spacing and meta. 3.3 Image handling using HTML – Background image, Aligning image, Display an alternate text for an image, make a hyperlink of an image, Background color and Text color. 3.4 Introduction about Cascading method and syntax (CSS) – Inserting style sheet and types of style sheet – External, Internal, Inline and Multiple style sheets. 3.5 Introduction CSS property – Background, Font border, Outline, margin, Padding, List and Table.	**13 Hrs.**

Unit	Name of the Topic	Hours
IV	**XML** 4.1 Introduction about XML, Advantages of XML, XML data, Design of XML, Features of XML and Difference between XML and HTML. 4.2 Basic XML tags and syntax and Examples of XML declaration method. 4.3 Steps for creation of XML document and Rules and regulations of XML document. 4.4 Advance XML Coding, C data, Encoding, Encoding errors, Name spaces, Declaring name space, solving the name conflict using a prefix and Default namespaces.	**13 Hrs**
V	**Web to Print** 5.1 Introduction about Web to print – Prepress process, digital content online and Print production and Merits and demerits of web to print. 5.2 Network concepts and Interfaces - network protocols TCP/IP, Client/Server concept, and three typical forms of network connectivity – Stand alone networks, Internal networking and External networking. 5.3 Classification of Network – Internet, Intranet, Extranet and Broad Band Networks. 5.4 Production Management/Monitoring Systems - Purpose, Application, and Optimizing print production by automating manufacturing operation.	**13 Hrs**

Text Book / Reference Book :

1. Handbook of Print Media - Helmut kipphan, Springer.
2. Digital colour Printing Technology - Bishwanath Chakkaravarthy
3. Printing in a digital world - David Bergsland.
4. On demand Digital Printing Primer - Howard M. Fentan – GATF.
5. Pocket Guide to Digital Printing – Frank Cost.
6. “DHTML AND CSS FOR THE WORLD WIDE WEB” Book, by Jason Cranford Publisher, 2001 Peachpit Press
7. “HOW TO USE HTML & XHTML” by Gary Rebholz,, Published 2001
8. “XML FOR THE WORLD WIDE WEB” by Elizabeth Castro, Published 2001, Peachpit Press
9. www.w3schools.org
10. www.learnthenet.com/english/section/webpubl.html
11. www.learnthenet.com/english/publish/000pub.htm
12. www.xml.com
13. www.pdfzone.com
14. www.wikipedia.org

DIRECTORATE OF TECHNICAL EDUCATION

DIPLOMA IN PRINTING TECHNOLOGY

III YEAR

M SCHEME

V SEMESTER

2015-2016 onwards

ADVANCED PRINTING TECHNOLOGIES

CURRICULAM DEVELOPMENT CENTRE

STATE BOARD OF TECHNICAL EDUCATION & TRAINING, TAMIL NADU
DIPLOMA IN PRINTING TECHNOLOGY

M-SCHEME
(to be implemented for the student Admitted from the Year 2015-2016 onwards)

Course Name : DIPLOMA IN PRINTING TECHNOLOGY
Subject Code : **38253**
Semester : V Semester
Subject Title : ADVANCED PRINTING TECHNOLOGIES

TEACHING AND SCHEME OF EXAMINATION:

No. of weeks per semester: 15 weeks

Subject Title	Instructions		Examination			
	Hours/ Week	Hours/ Semester	Marks			Duration
			Internal Assessment	Board Examination	Total	
ADVANCED PRINTING TECHNOLOGIES	6 Hrs	90 Hrs	25	75	100	3 Hrs

Topics and Allocation of Hours:

Unit No.	Topic	Time(Hrs)
I	Digital Printing Technologies	16
II	Non-Impact Printing Technologies	16
III	Security Printing Features and Materials	16
IV	Special Printing Technologies	16
V	Emerging Printing Process	16
	Revision and Test	10
	Total	90

Rationale:

Advanced Printing technologies covers a wide angle of latest technologies in the field of printing technology. Due to the comprehensive topics covered under this subject students can acquire an enormous amount of knowledge. Students attain scope to be placed in printing presses installed with sophisticated machineries.

Objective:

At the end of the study of V Semester the student will be aware of:

- Digital printing process.
- Direct imaging process & Computer to print process.
- Principles of Non–impact printing technologies.
- Types of NIP technologies.
- Design features of security printing process.
- The security inks and papers.
- Intaglio, Hybrid printing and Hologram printing process.
- Lenticular and Waterless printing process.
- Electronic Book, Electronic Ink and Electronic Paper.
- Green Printing and 3D printing.

ADVANCED PRINTING TECHNOLOGIES

DETAILED SYLLABUS

Contents: Theory

Unit	Name of the Topic	Hours
I	**Digital Printing Technologies** 1.1 Digital printing – Definition, Scope and job suitability of Digital printing process. 1.2 Basic principle of Computer-to-Film, Computer-to-Plate, Computer-to-Press and Computer-to-Print. 1.3 Computer-to-Press – Working principle of Direct Imaging with once imageable master and Working principle of Direct Imaging with re-imageable master. 1.4 Computer-to-Print – Working principle.	**16 Hrs**
II	**Non-Impact Printing Technologies** 2.1 Basic principle of Non-impact printing technology, Flow chart of NIP technology and Applications of NIP technology. 2.2 Basic principle of Electrophotography – Imaging, Inking, Toner transfer, Toner fixing and Cleaning. 2.3 Basic principle of Ionography – Imaging, Developing, Toner transfer, Toner fixing, Cleaning and Erasing. 2.4 Basic principle of Thermography – Direct thermography, Transfer thermography, Working principle of thermal transfer and thermal sublimation printing systems and Properties of ink tonner for Thermography. 2.5 Basic principle of Ink jet printing - Continuous ink jet and Drop on demand ink jet, Working principles of continuous ink jet and drop on demand ink jet and Properties of ink tonner for ink jet printing.	**16 Hrs**
III	**Security Printing Features and Materials** 3.1 Security design features - Pantograph screens, Void pantograph Screen, ODT - optical deterrent technology, Guilloches, Warning bands, Code safe, High resolution graphics and Padlock icon - Application of security printing. 3.2 Security papers – Safety paper, Chemical reactive paper, Special papers, Water mark paper and Copy evident paper. 3.3 Security threads - Metalized thread, Windowed thread, Holographic windowed thread, Micro text, Clear text and Thermo text. 3.4 Watermark, Classification of watermark - Line drawing watermark, shaded watermark and Digital watermark. 3.5 Security inks – Trademark colors, Color changing ink, Magnetic ink, Copy protection ink, Erasable ink, Fugitive ink, Pen reactive ink, Heat reactive ink, Coin reactive inks, Migrating ink, Bleeding inks, Florescent ink, Metallic ink and UV ink.	**16 Hrs.**

Unit	Name of the Topic	Hours
IV	**Special Printing Technologies** 4.1 Basic principles of hybrid printing system and Application of Hybrid printing systems. 4.2 Basic principles of holograms making process, Components of hologram making system - laser, lenses, beam splitter, mirrors, holographic film and Process steps of hologram making system. 4.3 Basic principles of lenticular printing process. 4.4 Basic principles of waterless offset printing, Plate structure of waterless offset printing, Merits and Demerits of waterless offset printing.	**16 Hrs**
V	**Emerging Printing Process** 5.1 Basic principles of E-book, List of various manufactures of E-book, Application of E-book, Basic principles of E-ink and Concept of E-ink with microcapsules filled with a coloring agent. 5.2 Basic principles of "Gyricon" E-paper, Types of display of E-paper, Application of E-paper, Concepts of rewritable paper, Imaging and erasing processes for rewritable paper. 5.3 Introduction about 3D printing, Types of 3D printing - direct and binder 3D printing, Steps involved in 3D printing process and Application of 3D printing.	**16 Hrs**

Text Book / Reference Book:

1. Handbook of Print Media - Helmut kipphan, Springer.
2. Handbook of Printing and Packaging Technology - Bishwanath Chakkaravarthy.
3. Digital colour Printing Technology - Bishwanath Chakkaravarthy
4. Printing in a digital world - David Bergsland.
5. On demand Digital Printing Primer - Howard M. Fentan – GATF.
6. Printing Materials – Science and Technology – Thompson, Bob – PIRA.
7. Pocket Guide to Digital Printing – Frank Cost.
8. Introduction to Printing and Finishing – Hugh M Speirs – PIRA.

DIRECTORATE OF TECHNICAL EDUCATION

DIPLOMA IN PRINTING TECHNOLOGY

III YEAR

M SCHEME

V SEMESTER

2015-2016 onwards

PACKAGING TECHNOLOGY

CURRICULAM DEVELOPMENT CENTRE

STATE BOARD OF TECHNICAL EDUCATION & TRAINING, TAMIL NADU
DIPLOMA IN PRINTING TECHNOLOGY

M-SCHEME
(to be implemented for the student Admitted from the Year 2015-2016 onwards)

Course Name : DIPLOMA IN PRINTING TECHNOLOGY
Subject Code : **38254**
Semester : V Semester
Subject Title : PACKAGING TECHNOLOGY

TEACHING AND SCHEME OF EXAMINATION:

No. of weeks per semester: 15 weeks

Subject Title	Instructions		Examination			
	Hours/ Week	Hours/ Semester	Marks			Duration
			Internal Assessment	Board Examination	Total	
PACKAGING TECHNOLOGY	6 Hrs	90 Hrs	25	75	100	3 Hrs

Topics and Allocation of Hours:

Unit No.	Topic	Time(Hrs)
I	Basics of Packaging Process	16
II	Packaging Materials	16
III	Packaging Machinery & Finishing	16
IV	Ancillary Packaging	16
V	Specialty Packages	16
	Revision and Test	10
	Total	90

Rationale:

Packaging is powerful because it tells consumers why your product and brand are different. With the increased importance placed on self-service marketing, the role of packaging is becoming quite significant. Thus, the only way to get some consumers to notice the product is through displays, shelf hangers, tear-off coupon blocks, other point-of-purchase devices, and, last but not least, effective packages.

Objective:

At the end of the study of V Semester the student will be able to :

- Study about the Folding Cartons.
- Know about Diemaking.
- Learn about plastics and metals in packaging.
- Know about food packaging.
- Study the Corrugated Boards & Boxes.
- Know about Rigid Boxes and Glass.
- Learn about Closures and Dispensing devices.
- Study about Cushioning materials
- Know about Thermoforming Packages.
- Learn about Radio Frequency Identification Tags.

PACKAGING TECHNOLOGY

DETAILED SYLLABUS

Contents: Theory

Unit	Name of the Topic	Hours
I	**Basics of Packaging Process** 1.1 - Introduction, Classification of Packaging – Flexible, Semi Rigid and Rigid Packaging, Functions of a Package, Factors influencing the design of a package. 1.2 - Functions/Objectives of a Packaging – physical, barrier, Agglomeration, information, marketing, security and convenience. 1.3 - Folding Carton, Common Styles and their uses - Glue end carton, Tuck in flap carton, Lock end carton, Lock bottom carton and Autolock bottom carton. 1.4 - Tube and Tray Style Cartons - One piece tray carton, Two piece tray carton and Window carton. 1.5 - Die Making process – Diagram preparation and manual/laser cutting, cutting and creasing rule bending and fixing.	**16 Hrs**
II	**Packaging Materials** 2.1 - Types of boards used in packaging – Solid bleached/unbleached board, Duplex, Pulp and Art boards. 2.2 - Types of Corrugated boards - Single face corrugated board, Double face corrugated board and Triple face (or) Double walled corrugated board. 2.3 - Plastic packaging materials - BOPP, HDPE, LDPE, LLDPE, PVC, PP, PET, Polyolefins, Polyamides and Non-woven. 2.4 - Metal packaging materials - Tin and Aluminium Foil – Properties and Applications.	**16 Hrs**
III	**Packaging Machinery & Finishing** 3.1 - Factors influencing the design of a package – product, distribution, marketing Statutory &regulation, packaging operation and cost. 3.2 - Structural Fundamentals of folding carton – Types of panels, types of flap, grain direction, creasing and cutting. 3.3 - Introduction to Food packaging and shelf life improving techniques, Introduction to Aseptic packaging (Tetra pack), Structural layers used in Aseptic packaging, Importance of Ultra Heat treatment Technology. 3.4 - Flexible pouch forming – Thermoform/fill/seal machines.	**16 Hrs.**

Unit	Name of the Topic	Hours
IV	**Ancillary Packaging** 4.1 - Closures - Screw cap, Lug cap, Roll on, Crown Cap, Child resistant closure and Tamper evident closure. 4.2 - Dispensing devices - Snip-top, Dial disc, Dip tube, Brush applicator, Shaker sifter and push-pull type. 4.3 - Cushioning Materials, Types - Resilient, Non-resilient and Space filers. 4.4 - Types of Strapping and Sealing tapes.	**16 Hrs**
V	**Specialty Packages** 5.1 - Shrink-Wrapping, Types of Shrink wrapping – Sleeve wrap and Envelope wrap, Skin Packaging, Blister Packaging. 5.2 - Strip Packaging, Blister Packaging and Stretch Wrapping. 5.3 - Introduction to RFID, QR Code and Barcode, applications in packaging, Symbols used in Packaging. 5.4 - Introduction - Aerosol Packaging and Modified Atmospheric Packaging, Application.	**16 Hrs**

Text Book / Reference Book :

1. Hand Book of Packaging Engineering – by Joseph F Hanlon, Robert J Kelsey, and Halline E Forcinio.
2. Guarding of Folding Box Gluers – by British Printing Industries federation.
3. Guarding of sheet fed cutting and creasing machine – by British Printing Industries federation.
4. A Handbook of Food Packaging – by Frank A. Paine and Heather Y. Paine, Leonard Hill Publishers, Glasgow G 642 NZ

DIRECTORATE OF TECHNICAL EDUCATION

DIPLOMA IN PRINTING TECHNOLOGY

III YEAR

M SCHEME

V SEMESTER

2015-2016 onwards

DIGITAL PREPRESS PRACTICAL

CURRICULAM DEVELOPMENT CENTRE

STATE BOARD OF TECHNICAL EDUCATION & TRAINING, TAMIL NADU
DIPLOMA IN PRINTING TECHNOLOGY

M-SCHEME
(to be implemented for the student Admitted from the Year 2015-2016 onwards)

Course Name : DIPLOMA IN PRINTING TECHNOLOGY
Subject Code : **38255**
Semester : V Semester
Subject Title : DIGITAL PREPRESS PRACTICAL

TEACHING AND SCHEME OF EXAMINATION:

No. of weeks per semester: 15 weeks

Subject Title	Instructions		Examination			
	Hours/ Week	Hours/ Semester	Marks			Duration
			Internal Assessment	Board Examination	Total	
DIGITAL PREPRESS PRACTICAL	4 Hrs	60 Hrs	25	75	100	3 Hrs

RATIONALE:

This subject is aimed at providing basic understanding of the fundamentals of practical sections; mainly designing logo, brochure, carton, image editing and pre-flighting technique.

The topics covered are based on the syllabus for Diploma in Printing Technology. The subject is planned to include sufficient practices which would help the student to understand the principles of Digital Prepress.

OBJECTIVES:

At the end of the study of V Semester the student will be able to:

1. Create a logo using FOSS software.
2. Redraw a logo using vector drawing software.
3. Draw a tray/tube style carton using vector drawing software.
4. Redesign a given tray/tube carton using vector drawing software
5. Apply UCR, GCR and colour separate the scanned Image using image editing software.
6. Create a multicolour invitation/certificate using image editing software
7. Performing the pagination and imposition for printing the job using imposing software
8. Perform pre-flighting operations for a given file.
9. Perform an image clipping path in FOSS software
10. Create a brochure using FOSS software.

ALLOCATION OF MARKS

Internal Assessment	25 marks
Viva Voce	15 marks
Procedure	10 marks
Practical Exercise	50 marks
Total	100 Marks

DIGITAL PREPRESS PRACTICAL

List of Exercises

1. Create a logo using FOSS software.
2. Redraw a logo using vector drawing software.
3. Draw a tray/tube style carton using vector drawing software.
4. Redesign a given tray/tube carton using vector drawing software
5. Apply UCR, GCR and color separate the scanned Image using image editing software.
6. Create a multicolour invitation/certificate using image editing software
7. Performing the pagination and imposition for printing the job using imposing software
8. Perform pre-flighting operations for a given file.
9. Perform an image clipping path in FOSS software
10. Create a brochure using FOSS software.

Systems Requirements

Hardware: Minimum 2 GB RAM, 320 GB HDD
Operating System: Windows XP / 7 and Above
Softwares: FOSS or Proprietary
FOSS: Inkscape- Vector Drawing
FOSS: Imposition Studio- Imposition Software
FOSS: Gimpshop, Photo Plus6 - Image Editing
Proprietary: CorelDraw, Photoshop, Illustrator, Quark Xpress and Indesign.

List of Equipment / Software

- Flat bed Scanner - 1 No.
- Colour Ink jet Printer - 1 No.
- Black Colour Laser Printer - 1 No.
- Software
- Computer systems

Materials Required

- Paper
- Color toner cartridges
- Black toner cartridge for laser printer
- CDs/DVDs/USB flash drive/memory cards.

V SEMESTER

DIGITAL PREPRESS PRACTICAL

MODEL QUESTION PAPER

1. Create a logo using FOSS software and write the procedure for same.
2. Draw a tray/tube style carton using vector drawing software and write the procedure for same.
3. Apply UCR, GCR and colour separate the scanned Image using image editing software and write the procedure for same.
4. Create a multicolour invitation/certificate using image editing software and write the procedure for same.
5. Create a brochure using FOSS software and write the procedure for same.

The college authority should ensure the safety to all the students during the workshop and the lab practical.

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DIRECTORATE OF TECHNICAL EDUCATION

DIPLOMA IN PRINTING TECHNOLOGY

III YEAR

M SCHEME

V SEMESTER

2015-2016 onwards

PACKAGING PRACTICAL

CURRICULAM DEVELOPMENT CENTRE

STATE BOARD OF TECHNICAL EDUCATION & TRAINING, TAMIL NADU
DIPLOMA IN PRINTING TECHNOLOGY

M-SCHEME
(to be implemented for the student Admitted from the Year 2015-2016 onwards)

Course Name : DIPLOMA IN PRINTING TECHNOLOGY
Subject Code : **38256**
Semester : V Semester
Subject Title : PACKAGING PRACTICAL

TEACHING AND SCHEME OF EXAMINATION:

No. of weeks per semester: 15 weeks

Subject Title	Instructions		Examination			
	Hours/ Week	Hours/ Semester	Marks			Duration
			Internal Assessment	Board Examination	Total	
PACKAGING PRACTICAL	4 Hrs	60 Hrs	25	75	100	3 Hrs

RATIONALE:

This subject is aimed at providing basic understanding of the fundamentals of practical sections; mainly checking the test properties of paper, board and ink and preparation of carton making.

The topics covered are based on the syllabus for Diploma in Printing Technology. The subject is planned to include sufficient practices which would help the student to understand the principles of packaging technology.

OBJECTIVES:

At the end of the study of V Semester the student will be able to:

1. Prepare a tube style/tray style folding carton.
2. Prepare a rigid box.
3. Find the peel strength of the given sample.
4. Determine the caliper/GSM of the given paper board.
5. Find the bursting strength of the given paper board.
6. Determine the scuff/rub resistance of the given sample.
7. Find the edge crush strength of the given sample.
8. Determine the Cobb value of the given sample.
9. Perform a skin packing/shrink packaging.
10. Find the tearing strength of the given sample.

ALLOCATION OF MARKS

Internal Assessment	25 marks
Viva Voce	15 marks
Procedure	10 marks
Practical Exercise	50 marks
Total	100 Marks

PACKAGING PRACTICAL

List of Exercises

1. Preparing a tube style/tray style folding carton.
2. Preparing a rigid box.
3. Finding the peel strength of the given sample.
4. Determining the caliper/GSM of the given paper board.
5. Finding the bursting strength of the given paper board.
6. Determining the scuff/rub resistance of the given sample.
7. Finding the edge crush strength of the given sample.
8. Determining the Cobb value of the given sample.
9. Performing a skin packing/shrink packaging.
10. Finding the tearing strength of the given sample.

List of Equipment and Instrument:

1. Digital physical balance
2. Bursting strength tester
3. Bench micrometer
4. Scuff resistance tester
5. Cobb tester.
6. Skin/Shrink packaging machine.
7. Tearing strength tester.
8. Adhesive Tester.
9. GSM tester.
10. Edge crush tester.

V SEMESTER

PACKAGING PRACTICAL

MODEL QUESTION PAPER

1. Prepare a tube style/tray style folding carton and write the procedure for same.
2. Find the peel strength of the given sample and write the procedure for same.
3. Determine the caliper/GSM of the given paper board and write the procedure for same.
4. Find the bursting strength of the given paper board and write the procedure for same.
5. Determine the scuff/rub resistance of the given sample and write the procedure for same.

The college authority should ensure the safety to all the students during the workshop and the lab practical.

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DIRECTORATE OF TECHNICAL EDUCATION

DIPLOMA IN PRINTING TECHNOLOGY

III YEAR

M SCHEME

VI SEMESTER

2015-2016 onwards

LIFE AND EMPLOYABILITY SKILL PRACTICAL
[COMMON TO ALL ENGINEERING BRANCH]

CURRICULAM DEVELOPMENT CENTRE

STATE BOARD OF TECHNICAL EDUCATION & TRAINING, TAMILNADU

DIPLOMA IN ENGINEERING – SYLLABUS – M Scheme

(Being implemented from the Academic Year 2016-2017 onwards)

Course Name : **All Branches of Diploma in Engineering and Technology and Special Programmes**

Subject Code : **30002**

Semester : **IV /V**

Subject Title : **LIFE AND EMPLOYABILITY SKILLS PRACTICAL**

Teaching and Scheme of Examination: **No. of Weeks per Semester: 15 Weeks**

Subject	Instruction		Examination			
			Marks			
	Hours/ Week	Hours/ Semester	Internal assessment	Board Examination	Total	Duration
Life and Employability Skills	4 Hours	60 Hours	25	75	100	3 Hours

Topics and Allocation of Hours:

Sl. No.	Section	No. of Hours
1	**Part – A** Communication	**30**
2	**Part – B** Entrepreneurship, Project Preparation, Productivity,	**20**

	Occupational Safety, Health, Hazard, Quality Tools& Labour Welfare	
3	**Part – C** Environment, Global Warming, Pollution	**10**
TOTAL		**60**

RATIONALE

Against the backdrop of the needs of the Industries, as wells as based on fulfilling the expectations of the Industries, the Diploma Level students have to be trained directly and indirectly in toning up their competency levels. Proficiency in Communication only, equips them with confidence and capacity to cope with the employment. Hence, there is a necessity to focus on these in the curriculum. At the end of the Course, the student is better equipped to express himself in oral and written communication effectively.

SPECIFIC INSTRUCTIONAL OBJECTIVES

1. Emphasize and Enhance Speaking Skills

2. Increase Ability to Express Views & Opinions

3. Develop and Enhance Employability Skills

4. Induce Entrepreneurship and Plan for the Future

5. Expose & Induce Life Skills for Effective Managerial Ability

LIFE AND EMPLOYABILITY SKILLS PRACTICAL

SYLLABUS

Unit	Topics	Activity	Hours
I	**Communication, Listening, Training, Facing Interviews, Behavioural Skills**	-- instant sentence making – say expressions/phrases-- self- introduction/another higher official in company – describe/explain product – frame questions based on patterns – make sentences based on patterns	**30**
II	**Entrepreneurship, Project Preparation, Marketing Analysis, Support & Procurement**	-- prepare an outline of a project to obtain loan from bank in becoming an entrepreneur – prepare a resume	**10**
III	**Productivity – comparison with developed countries, Quality Tools, Circles, Consciousness, Management, House Keeping**	-- search in the website -- prepare a presentation – discuss & interact	**05**
IV	**Occupational Safety, Health Hazard, Accident & Safety, First-Aid,Labour Welfare Legislation, Welfare Acts**	-- search in the website -- prepare a presentation – discuss & interact	**05**

V	**Environment, Global Warming, Pollution**	-- taking down notes / hints – answering questions -- fill in blanks the exact words heard	**10**

LEARNING STRUCTURE **100 Marks**

-- Focus more on Speaking & Listening Skills
-- Attention less on Reading & Writing Skills
-- Apply the skills in fulfilling the Objectives on Focused Topics

a) Listening **25 Marks**

1. Deductive Reasoning Skills (taking down notes/hints) **10**
2. Cognitive Skills (answering questions) **10**
3. Retention Skills (filling in blanks with exact words heard) **05**

b) Speaking Extempore/ Prepared **30 Marks**

1. Personality/Psychological Skills (instant sentence making) **05**
2. Pleasing & Amiable Skills (say in phrases/expressions) **05**
3. Assertive Skills (introducing oneself/others) **05**
4. Expressive Skills (describe/explain things) **05**
5. Fluency/Compatibility Skills (dialogue) **05**
6. Leadership/Team Spirit Skills (group discussion) **05**

c) Writing & Reading **20 Marks**

1. Creative & Reasoning Skills (frame questions on patterns) **05**
2. Creative & Composing Skills (make sentences on patterns) **05**
3. Attitude & Aim Skills (prepare resume) **05**
4. Entrepreneurship Skills (prepare outline of a project) **05**

d) Continuous Assessment (Internal Marks) **25 Marks**
(search,read, write down, speak, listen, interact & discuss)

1. Cognitive Skills (Google search on focused topics)
2. Presentation Skills& Interactive Skills (after listening, discuss)

Note down and present in the Record Note on any 5 topics **10 Marks**
Other activities recorded in the Record note **10 Marks**
Attendance **05 Marks**

INTERNAL MARKS **25 MARKS**

EXTERNAL MARKS AT END EXAMINATION **75 MARKS**

MODEL QUESTION

Time: 3 Hours **Maximum Marks: 75**

A. LISTENING **25 Marks**

1. Listen to the content and take down notes/hints 10
2. Listen to the content and answer the following questions. 10
3. Listen to the content and fill in the blanks the exact words heard. 05

B. SPEAKING **30 Marks**

1. Say in a sentence instantly on hearing the word(5 words, one after another). 05
2. Say any five expressions commonly used in communication. 05
3. Imagine, a consultant has come to your department.
   Introduce him to your subordinates. 05
4. Explain/describe the product you are about to launch in the market. 05
5. Speak with your immediate boss about the progress you have made. 05
6. Discuss within the group on the topic of focus in the syllabus. 05

C. WRITING & READING **20 Marks**

1. Frame new questions from the pattern given by changing sets of words with your own. 05

a.	When	do	you	return?
b.	How	is	his performance?	
c.	Where	has	the manager	gone?
d.	What	is	the progress	today?
e.	Why	are	the machines	not functioning?

2. Make sentences from the pattern given by changing sets of words with your own. 05

a.	The workers	are	on strike		
b.	The labourers	are paid	well	in this factory	
c.	There	is	a rest room	for the workers	
d.	These	are	the new products	launched	by our company
e.	Almost everyone	come	to the company	on motorbikes	

3. Prepare a resume for the post of Department Manager. 05

4. Prepare an outline of a project to obtain a loan. (Provide headings and subheadings) 05

I. Guidelines for setting the question paper:

A. LISTENING :

ONLY TOPICS related to
POLLUTION /
ENVIRONMENT /
GLOBAL WARMING are to be taken.
These topics are common for all the three types of evaluation.

B. SPEAKING :

1. WORDS of common usage
2. Fragments – expression of politeness, courtesy, cordiality
3. Introduce yourself as an engineer with designation or
   Introduce the official visiting your company/department

4. Describe/Explain the product/machine/department
5. Dialogue must be with someone in the place of work.
6. Group of six/eight
   Discuss the focused topic prescribed in syllabus

C. WRITING & READING:

1. Provide five different structures.
   Students are to substitute at least one with some other word/words

2. Provide five different structures.
Students are to substitute at least one with some other word/words
3. Provide some post related to industries.
4. Outline of the project (skeleton/structure)
Only the various headings and subheadings
Content is not needed

II. Guidelines for recording the material on the Focused Topics in the Record note.

Write in the record note, **on any five topics**, from the list of topics given below. **10 Marks**
(5 topics x 10 marks = 50 marks. Thus, the **Average of 5 topics is 10 Marks)**

1. Productivity in Industries – Comparison with developed countries
2. Quality Tools, Quality Circles and Quality Consciousness
3. Effective Management
4. House Keeping in Industries
5. Occupational Safety and Hazard
6. Occupational Accident and First Aid
7. Labour Welfare Legislations
8. Labour Welfare Acts and Rights
9. Entrepreneurship
10. Marketing Analysis, Support and Procurement

LABORATORY REQUIREMENT:

1. An echo-free room
2. Necessary furniture and comfortable chairs
3. A minimum of two Computers with internet access
4.A minimum of two different English dailies
5. A minimum of Three Mikes with and without cords
6. Colour Television (minimum size – 29")
7. DVD/VCD Player with Home Theatre speakers
8. Smart board
9. Projector

Suggested Reading:

1. Production and Operations Management by S.N. Chary, TMH
2. Essentials of Management by Koontz &Weihrich, TMH
3. Modern Production / Operations Management by E.S. Buffa and R.K. Sarin, John Wiley & Sons
4. Production Systems: Planning, Analysis and Control by J.L.Riggs, 3rd ed., Wiley.
5. Productions and Operations Management by A.Muhlemann, J.Oakland and K.Lockyer, Macmillan
6. Operations Research - An Introduction by H.A.Taha, Prentice Hall of India
7. Operations Research by J.K.Sharma, Macmillan
8. Business Correspondence & Report Writing by R.C. Sharma and K.Mohan, TMH
9. How to prepare for Group Discussion & Interview (With Audio Cassette) by Prasad, TMH

10. Spoken English – A self-learning guide to conversation practice (with Cassette)
11. Introduction to Environmental Engineering by Mackenzie, L. Davis and A. David, Cornwell, McgrawHill, 3rd Ed.
12. Environmental Engineering by Peary, Rowe and Tchobanoglous, McgrawHill
13. Total Quality Management – An Introductory Text by Paul James, Prentice Hall
14. Quality Control and Applications by Housen&Ghose
15. Industrial Engineering Management by O.P. Khanna

VI SEMESTER

DIRECTORATE OF TECHNICAL EDUCATION

DIPLOMA IN PRINTING TECHNOLOGY

III YEAR

M SCHEME

VI SEMESTER

2015-2016 onwards

TOTAL QUALITY MANAGEMENT

CURRICULAM DEVELOPMENT CENTRE

STATE BOARD OF TECHNICAL EDUCATION & TRAINING, TAMIL NADU
DIPLOMA IN PRINTING TECHNOLOGY

M-SCHEME
(to be implemented for the student Admitted from the Year 2015-2016 onwards)

Course Name : DIPLOMA IN PRINTING TECHNOLOGY
Subject Code : **38261**
Semester : VI Semester
Subject Title : TOTAL QUALITY MANAGEMENT

TEACHING AND SCHEME OF EXAMINATION:

No. of weeks per semester: 15 weeks

Subject Title	Instructions		Examination			
	Hours/ Week	Hours/ Semester	Marks			Duration
			Internal Assessment	Board Examination	Total	
TOTAL QUALITY MANAGEMENT	6 Hrs	90 Hrs	25	75	100	3 Hrs

Topics and Allocation of Hours:

Unit No.	Topic	Time(Hrs)
I	Introduction	16
II	Material Inspection and Testing	16
III	Process Control	16
IV	Control tools, equipments & Procedure of calibration Process	16
V	Implementation of ISO for Print Quality	16
	Revision and Test	10
	Total	90

Rationale:

"Quality management" ensures superior quality products and services. Quality of a product can be measured in terms of performance, reliability and durability. Quality is a crucial parameter which differentiates an organization from its competitors. Quality management tools ensure changes in the systems and processes which eventually result in superior quality products and services.

Quality management methods such as Total Quality management or Six Sigma have a common goal - to deliver a high quality product. Quality management is essential to create superior quality products which not only meet but also exceed customer satisfaction. Customers need to be satisfied with our brand. Business marketers are successful only when they emphasize on quality rather than quantity. Quality products ensure that we survive the cut throat competition with a smile.

Due to the comprehensive topics covered under this subject students can acquire an enormous amount of knowledge. Students attain scope to be placed in E-Publishing industries installed with sophisticated machineries.

Objective:

At the end of the study of VI Semester the student will be able to :

- Make Quality a culture in Printing Industry.
- Understand terms and tools used in TQM.
- Learn to inspect and test incoming materials.
- Test the characteristics of paper, ink and fountain solution.
- Control the process with reference to standards.
- Identify factors in wastage minimization.
- Understand the QC Instrumentation.
- Learn the calibration and profile setting for Input / Output devices
- Study ISO standard for printing industry and practices.
- Learn steps of implementation for Print Quality.
- Identify importance of customer satisfaction

TOTAL QUALITY MANAGEMENT

DETAILED SYLLABUS

Contents: Theory

Unit	Name of the Topic	Hours
I	**Introduction** 1.1 - Define: Quality, Quality assurance, Process Control, TPM, TQM and ISO. 1.2 - Quality control Process - Elements of success – Management, support , mission Statement, proper planning, bottom line, focus, measurement system, empowerment, teamwork, continuous improvement process and dedicated resources. 1.3 - Basic elements of Total Quality Management: Human resource, development and management, DMAIC Process - Define, measure, analyse, improve and control, DMADV – Design and validate. 1.4 - Statistical Process Control Tools: Purpose of SPC, cause and effect diagram, check sheet, flow diagram, pareto analysis, histogram, run chart and control chart. 1.5 - Basic concepts and benefits of Kaizen, LEAN, JIT, 5S and Six Sigma.	**16 Hrs**
II	**Material Inspection and Testing** 2.1 - Visual Inspection, Storage and Handling of Substrates and Chemicals. Maintenance of data sheets of materials – MSDS (Material safety data sheet), TDS(Technical data sheet). 2.2 - Testing procedures for Paper and board – Grain Direction, GSM, stiffness, tensile strength, tearing resistance, folding endurance, RH, smoothness, moisture, BULK, Bursting strength and COBB. 2.3 - Dampening solution testing methods – Testing of pH and conductivity. 2.4 - Ink testing methods – Draw down, grind gauge, Viscosity, Tack. 2.5 - Introduction to light viewing booth - different light sources in light booth.	**16 Hrs**
III	**Process Control** 3.1 - Quality control targets – registration mark, star target, Ink Coverage target and Line Resolution target. 3.2 - Control patches – Solid patches, Halftone, Slur/Doubling, Gray Balance, Solid overprint and Plate exposure control patches. 3.3 - Wastage Management: reduction of waste from overproduction, defects, waiting time and delay, accumulation of work in process and transport - wastage disposal process. 3.4 - Process control charts - recording, monitoring and controlling procedure.	**16 Hrs.**

Unit	Name of the Topic	Hours
IV	**Control tools, equipments & Procedure of calibration Process** 4.1 - Densitometer - Basic components and its working principles. 4.2 - Spectrophotometer - Basic components and its working principles. 4.3 - Analysis of Print Attributes: Solid Ink Density (SID), Dot Gain, Print contrast, Ink Trapping and Dot Area. CIE Lab and colour difference - Delta E. 4.4 - CTP calibration and Linearization process.	**16 Hrs**
V	**Implementation of ISO for Print Quality** 5.1 - Introduction to ISO standards, Steps involved in ISO 9001 Certification, Common ISO standards (9001/14001/osho etc) and ISO standards for printing process. 5.2 - Press Calibration to ISO-12647-2 standard. 5.3 - Implementation Process of ISO standards in printing organisation, maintaining and renewal process of ISO certification. 5.4 - Benefits of ISO implementation, Customer Satisfaction and Case Studies of ISO certified print industry.	**16 Hrs**

Text Book / Reference Book :

1. Total Quality Management, Dale H. Besterfield, Pearson Education, Delhi, 2002
2. Implementing Quality Management in the Graphic Arts, Herschel L and Michael J Apfelberg, GATF, Pittsburgh, 1999
3. Colour control in lithography, Kelvin Tritton, Pira International Surrey UK 1995
4. What the Printer should know about Paper, 3rd ed., Lawrence A. Wilson, GATF Press, Pittsburgh, 1998
5. What the Printer should know about Ink, Nelson R. Eldred and Terry Scarlett, GATF, Pennsylvania, USA 1990
5. Total Quality Management, Ken Holmes, Pira International, Leatherland, 1992.

DIRECTORATE OF TECHNICAL EDUCATION

DIPLOMA IN PRINTING TECHNOLOGY

III YEAR

M SCHEME

VI SEMESTER

2015-2016 onwards

PRINTING PRESS MANAGEMENT

CURRICULAM DEVELOPMENT CENTRE

STATE BOARD OF TECHNICAL EDUCATION & TRAINING, TAMIL NADU
DIPLOMA IN PRINTING TECHNOLOGY

M-SCHEME
(to be implemented for the student Admitted from the Year 2015-2016 onwards)

Course Name : DIPLOMA IN PRINTING TECHNOLOGY
Subject Code : **38262**
Semester : VI Semester
Subject Title : PRINTING PRESS MANAGEMENT

TEACHING AND SCHEME OF EXAMINATION:

No. of weeks per semester: 15 weeks

Subject Title	Instructions		Examination			
	Hours/ Week	Hours/ Semester	Marks			Duration
			Internal Assessment	Board Examination	Total	
PRINTING PRESS MANAGEMENT	5 Hrs	75 Hrs	25	75	100	3 Hrs

Topics and Allocation of Hours:

Unit No.	Topic	Time(Hrs)
I	Principles of Management	13
II	Estimating and Costing	13
III	Planning for Print Production	13
IV	Accounting and Budgeting	13
V	Human Resource Management	13
	Revision and Test	10
	Total	75

Rationale:

Printing press management subject has given the exposure on the principle and functions of management for effective functioning of printing presses. The estimating and costing helps the students on the procedure and cost of various materials used in printed products and the cost of printing process involved and in producing competitive estimates. Production system administration is an important area where job turnover brings more productively in terms of job and quality assurance. It also imbibes the value system in the industry to maintain good will. It also throughs light on accounting and budgeting methods followed in successful industries. The most important strength of any organization is its human resource. Employee requirement training & development employee wastage, professional ethics are part of the HRM. The EHS (Environment, Health & safety) systems and regulation in printing industry all included in the syllabus.

Objective:

At the end of the study of VI Semester the student will be able to :

- Understand the Principles of management and structure of printing press management.
- Learn the Purpose of business management.
- Do estimating and costing for various printed products.
- Learn the preparation of estimates for print jobs and costing.
- Study about planning for print production.
- Study about material planning and role of supervisors and managers in management.
- Understand the accountancy principles and stock exchange.
- Study about book keeping methods and importance of budgeting.
- Understand the concept of employee recruitment and training.
- Study about the Productivity and waste management.

PRINTING PRESS MANAGEMENT

DETAILED SYLLABUS

Contents: Theory

Unit	Name of the Topic	Hours
I	**Principles of Management** 1.1 - Principles of management – Scientific management, Taylorism, Maslow's hierarchy needs, Leadership management, Management grid, Organizational development, and Business process management. 1.2 - Management principles and functions – Managing men, Machines, Materials, Money and Morale – Principle of Management, Definition of Management, Functions of Management and Elements of Management. 1.3 - Management Structure – Structure of organization, Formal and Informal organization, Market research, Sales promotion and Purpose of business management. 1.4 - Business communication and coordination – Business communication, Channels of communication, Methods of business communication, Management information system, Benefits of MIS and Application of MIS.	**13 Hrs**
II	**Estimating and Costing** 2.1 - Estimating for various printed products – Definition of costing and estimating, Components of cost, Advantages of costing, Difference between costing and estimating. 2.2 - Costing for printing materials and Production – Qualification of an Estimator, Estimating form, Estimating for Paper, Calculating the number of sheets required for a job and Cost of Paper for job. 2.3 - Overhead Expenses and Classification of Overhead Expenses and Importance of Overhead Expenses. 2.4 - Preparation of Competitive Estimate and Costing – Economical consideration for preparing competitive estimates, Fixed and variable cost in printing – Graphical representation of fixed and variable cost.	**13 Hrs**
III	**Planning for Print Production** 3.1 - Production system administration, Planning for various printed Products – Production control systems – Works initiaton Procedures - Estimate, Purchase order, Raw material purchase, job card, changes in the specification of the Job, Proof, Material release authorization and final print order. 3.2 - Planning consideration - Material purchasing and inventory control suitable material selection – Material management, Principles of purchasing, Production planning and control – Production scheduling, Production control, Quality control and Press layouts. 3.3 - Value system in the industry - Developing Interpersonal management skills and Communication skills. Decision making and stages of decision making. 3.4 - Role of supervisor and manager in effective management workflow	**13 Hrs.**

Unit	Name of the Topic	Hours
	– managerial roles, Management influences and process integration, Ergonomics – Physical requirements of employees – Working environment - Lighting, Glare and Contrast, Climate, Safety and Noise.	
IV	**Accounting and Budgeting** 4.1 - Accounting principles – Meaning of accounting principles, Classification or sub-fields of accounting – Financial accounting, Cost accounting, Management accounting and Tax accounting. 4.2 - Definition of book keeping and Book keeping methods – Double entry book keeping and Advantages of Double Entry System. 4.3 - Definition of Budgeting and Importance of Budgeting – Annual Budget : Meaning of Budget, Purpose of Budget, Types of Budgets – Sales Budget, Production Budget, Marketing Budget, Sales and Turnover, Channel distribution and Sales Forecasting. 4.4 - Type of Companies - Private and Public Limited – Characteristics of Private and Public Limited Companies, Meaning of Stock Register - Maintenance of Stock Registers and Advantages of Stock Registers.	**13 Hrs**
V	**Human Resource Management** 5.1 - Employee Recruitment, Training and Retention – Human Resource Management, Meaning of Recruitment, Objective of the Recruitment Process, Training and Development, Out sourcing, E-Recruitment, Employee Retention. 5.2 - Employee Motivation and Welfare – How to Motivate Employees, Employee Benefits, Work Study and Method Study – Time Management and Productivity Tools and Reduce or Minimizing the Wastages. 5.3 - Professional Ethics - Honesty, Integrity, Transparency and accountability. Media Ethics and law, Copyright - Obtaining and enforcing copyright and MSME Registration. 5.4. - Safety, Health and Environmental Regulations in Graphic Arts Industry – Safety of Machinery in Printing Industry, Safety aspects in machines and House keeping.	**13 Hrs**

Test Book / Reference Book :

1. Printer's Costing and Estimating - by B.D. Mendiratta.
2. Printing Estimating Primer - by Don Ment, GATF.
3. The Print and Production Manual - by Michael Barnard.
4. Management Aspect of Printing Industry - by T.S. Saifuddin
5. Printing Management : A Reference Manual - by Print India Journals.
6. Estimating Methods and Cost Analysis for Printer - by K. S. Venkataraman and K. S. Balaraman
7. Book Production - by John Peacock.

DIRECTORATE OF TECHNICAL EDUCATION

DIPLOMA IN PRINTING TECHNOLOGY

III YEAR

M SCHEME

VI SEMESTER

2015-2016 onwards

PRINTING MACHINERY MAINTENANCE

CURRICULAM DEVELOPMENT CENTRE

STATE BOARD OF TECHNICAL EDUCATION & TRAINING, TAMIL NADU
DIPLOMA IN PRINTING TECHNOLOGY

M-SCHEME
(to be implemented for the student Admitted from the Year 2015-2016 onwards)

Course Name : DIPLOMA IN PRINTING TECHNOLOGY
Subject Code : **38263**
Semester : VI Semester
Subject Title : PRINTING MACHINERY MAINTENANCE

TEACHING AND SCHEME OF EXAMINATION:

No. of weeks per semester: 15 weeks

Subject Title	Instructions		Examination			
	Hours/ Week	Hours/ Semester	Marks			Duration
			Internal Assessment	Board Examination	Total	
PRINTING MACHINERY MAINTENANCE	6 Hrs	90 Hrs	25	75	100	3 Hrs

Topics and Allocation of Hours:

Unit No.	Topic	Time(Hrs)
I	Maintenance Management	16
II	Power Transmission	16
III	Mechanical and Electrical Elements	16
IV	Lubrication and Reconditioning	16
V	Maintenance of Mechanisms	16
	Revision and Test	10
	Total	90

Rationale:

The main purpose of regular maintenance is to ensure that all equipment required for production is operating at 100% efficiency at all times. Through short daily inspections, cleaning, lubricating, and making minor adjustments, minor problems can be detected and corrected before they become a major problem that can shut down a production line.

Preventive maintenance makes economic sense as it may reduce or potentially eliminate the need for, and the extent of, major repair projects. The importance of an effective maintenance program cannot be overlooked because it plays such an important role in the effectiveness of Lean manufacturing.

Objective:

At the end of the study of VI Semester the student will be able to :

1. Learn the Objectives of Maintenance Management.
2. Understand the Safety and Housekeeping Procedures in presses.
3. Know about the Need of Power Transmission Devices.
4. Understand the Importance of Maintenance of Power Transmission Devices.
5. Study Various Machine Elements.
6. Know the Applications of Machine Elements in Printing Machinery.
7. Understand the Importance of Lubrication and Lubrication Devices.
8. Impart the knowledge on Reconditioning.
9. Study Various Auxiliary Equipments.
10. Understand the Application of Auxiliary Equipments in Printing Industry.

PRINTING MACHINERY MAINTENANCE

DETAILED SYLLABUS

Contents: Theory

Unit	Name of the Topic	Hours
I	**Maintenance Management** 1.1 - Maintenance – Definition, Objectives, Types of Equipment Maintenance – Planned maintenance and unplanned maintenance. 1.2 - Types of Planned maintenance - Preventive Maintenance, Predictive Maintenance and Scheduled maintenance - Merits and demerits. Unplanned maintenance - Breakdown Maintenance or Emergency maintenance - Merits and Demerits. Contract maintenance - Definition - Merits and Demerits. 1.3 - Preventive Maintenance Functions - Planning, scheduling, Repair cycles, Dispatching and Controlling. 1.4 - Safety Precautions and House Keeping – safety precautions to be followed in press area and Five steps of housekeeping (5S method).	**16 Hrs**
II	**Power Transmission** 2.1 - Chain Drives - Introduction, Types of Chains – Roller Chain, Silent Chain, Ewart Chain and Bead Chain, Merits and Demerits of Chain Drives. 2.2 - Belt Drives - Introduction, Types of Belts – Flat belt, Rope belt, Tooth Belt, V belt and Timing Belt, Merits and Demerits of Belt drives. 2.3 - Gear Drives - Introduction, Types of Gears – Spur gear, Helical gear, Bevel gear, Worm gears and Herringbone gear, Merits and Demerits of gear drives. 2.4 - Maintenance and Lubrication of Drive Systems - Chain Drive, Belt Drive and Gear Drive. 2.5 - Direct drive technology – Introduction, Advantages and Application in the printing field.	16 **Hrs**
III	**Mechanical and Electrical Elements** 3.1 - Bearings, Types of Bearings - Sliding bearings and Antifriction bearings – Ball bearings, Needle bearings and Roller bearing. Merits and Demerits. 3.2 - Cams and Follower, Types of Cams and Followers – Disk Cam, Translation Cam, Groove Plate Cam, Cylindrical Cam, Eccentric Cam and Tow Wipe Cam. Advantages of cam and Follower. 3.3 - Springs, Types of springs – Helical Spring, Conical spring, Volute Spring and Torsion Springs and its application. 3.4 - Electrical Elements - Introduction to Contactors and its types, Introduction to Limit Switches and its application, Introduction to over Load Relay Switches and its types, Thermal and Magnetic,	**16 Hrs.**

Unit	Name of the Topic	Hours
	Introduction to Sensors and Detectors and its application, Introduction to Electrical Panels.	
IV	**Lubrication and Reconditioning** 4.1 - Lubrication – Introduction, Advantages, Types of Lubricants - Solid, Semisolid and Liquid. Lubrication Schedule, Chart and Paint Marks. 4.2 - Equipments and Tools used in Erection and Reconditioning - Cranes, Hoists, Spanner, Wrenches, Screwdriver, Spirit level, Dial Indicator with gauge, Feeler gauge, Micrometer and Vernier Calipers, Application. 4.3 - Test Run – Types of test runs - Idle, Performance, Accuracy, Rigidity and Vibration test.	**16 Hrs**
V	**Maintenance of Mechanisms** 5.1 - Electrical Maintenance – Introduction to AC and DC motors, Maintenance Check list for motors, Common problems with Electricity. 5.2 - Pneumatic System Maintenance - Introduction to pneumatic system functioning, Compressor types - Reciprocating and Rotary compressor, Application in Printing Field and Check List for pneumatic system maintenance. 5.3 - Hydraulic System Maintenance - Introduction to Hydraulic System, Application in Printing field and Check list for Hydraulic System maintenance. 5.4 - Mechatronics – Introduction and applications in Printing Field.	**16 Hrs**

Text Book / Reference Book:

1. H. P. Garg, Industrial Maintenance - by S. Chand and company Ltd.
2. Reading in Maintenance - by Lewis and Tow, Cohners Book.
3. A manual for Lithographic press operation - by A.S. Porter, Lithographic Training Services.
4. Litho Printing - by Ian Faux, Blueprint Publications.
5. Lithographers Manual - by Graphic Arts Technology Foundation, USA.
6. Design of Machine Elements - by Fairs, The Macmillan Co., London.
7. Mechanical Engineering Design - by Shirley McGrawhill.
8. “Machine Elements” - by DubrovalskyDaniel, MIR Publications.
9. Web offset press operating - by Daniel G. Wilson – GATF

DIRECTORATE OF TECHNICAL EDUCATION

DIPLOMA IN PRINTING TECHNOLOGY

III YEAR

M SCHEME

VI SEMESTER

2015-2016 onwards

PRINT QUALITY ASSURANCE PRACTICAL

CURRICULAM DEVELOPMENT CENTRE

STATE BOARD OF TECHNICAL EDUCATION & TRAINING, TAMIL NADU
DIPLOMA IN PRINTING TECHNOLOGY

M-SCHEME
(to be implemented for the student Admitted from the Year 2015-2016 onwards)

Course Name : DIPLOMA IN PRINTING TECHNOLOGY
Subject Code : **38264**
Semester : VI Semester
Subject Title : PRINT QUALITY ASSURANCE PRACTICAL

TEACHING AND SCHEME OF EXAMINATION:

No. of weeks per semester: 15 weeks

Subject Title	Instructions		Examination			
	Hours/ Week	Hours/ Semester	Marks			Duration
			Internal Assessment	Board Examination	Total	
PRINT QUALITY ASSURANCE PRACTICAL	5 Hrs	75 Hrs	25	75	100	3 Hrs

RATIONALE:

This subject is aimed at providing basic understanding of the fundamentals of practical sections; mainly checking the paper, ink, plate properties and the use of measuring instruments in engineering applications.

The topics covered are based on the syllabus for Diploma in Printing Technology. The subject is planned to include sufficient practices which would help the student to understand the principles of quality assurance.

OBJECTIVES:

At the end of the study of VI Semester the student will be able to :

1. Standardization of plate exposure using step wedge.
2. Testing of GSM for the paper/board sample.
3. Testing of paper grain direction for the paper sample.
4. Measuring solid print density using process colour control bar.
5. Determining the trapping tendency of the given print samples.
6. Determining the print contrast and tonal value of the given sample.
7. Measuring Gray Balance using colour control strip.
8. Determining CIE Lab values of the given print samples.
9. Finding the pH/Conductivity of the dampening solution.
10. Testing of Ink using draw down test method.

ALLOCATION OF MARKS

Internal Assessment	25 marks
Viva Voce	15 marks
Procedure	10 marks
Practical Exercise	50 marks
Total	100 Marks

PRINT QUALITY ASSURANCE PRACTICAL

List of Exercises

1. Standardization of plate exposure using step wedge.
2. Testing of GSM for the paper/board sample.
3. Testing of paper grain direction for the paper sample.
4. Measuring solid print density using process colour control bar.
5. Determining the trapping tendency of the given print samples.
6. Determining the print contrast and tonal value of the given sample.
7. Measuring Gray Balance using colour control strip.
8. Determining CIE Lab values of the given print samples.
9. Finding the pH/Conductivity of the dampening solution.
10. Testing of Ink using draw down test method.

Equipment Required

- Spectrophotometer/Densitometer.
- pH meter
- Conductivity meter.
- Printing down frame.
- Magnifier.
- GSM tester (Electronic / Mechanical).

Materials Required

- Reference Colour Patches.
- pH strips, buffer tablets (Solution).
- Colour control bar.
- Step wedge.
- Platemaking chemicals.
- Temperature meter.
- Ink.
- Knife.
- Various Paper/Board.

VI SEMESTER

PRINT QUALITY ASSURANCE PRACTICAL

MODEL QUESTION PAPER

1. Measuring solid print density using process colour control bar and write the procedure for same.
2. Determining the trapping tendency of the given print samples and write the procedure for same.
3. Determining the print contrast and tonal value of the given sample and write the procedure for same.
4. Find the pH/Conductivity of the dampening solution and write the procedure for same.
5. Test of Ink using draw down test method and write the procedure for same.

The college authority should ensure the safety to all the students during the workshop and the lab practical.

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DIRECTORATE OF TECHNICAL EDUCATION

DIPLOMA IN PRINTING TECHNOLOGY

III YEAR

M SCHEME

VI SEMESTER

2015-2016 onwards

MACHINERY MAINTENANCE PRACTICAL

CURRICULAM DEVELOPMENT CENTRE

STATE BOARD OF TECHNICAL EDUCATION & TRAINING, TAMIL NADU
DIPLOMA IN PRINTING TECHNOLOGY

M-SCHEME
(to be implemented for the student Admitted from the Year 2015-2016 onwards)

Course Name : DIPLOMA IN PRINTING TECHNOLOGY
Subject Code : **38265**
Semester : VI Semester
Subject Title : MACHINERY MAINTENANCE PRACTICAL

TEACHING AND SCHEME OF EXAMINATION:

No. of weeks per semester: 15 weeks

Subject Title	Instructions		Examination			
	Hours/ Week	Hours/ Semester	Marks			Duration
			Internal Assessment	Board Examination	Total	
MACHINERY MAINTENANCE PRACTICAL	5 Hrs	75 Hrs	25	75	100	3 Hrs

RATIONALE:

This subject is aimed at providing basic understanding of the fundamentals of practical sections; mainly carrying the maintenance activities like lubrication, cleaning, dismantling and assembling.

The topics covered are based on the syllabus for Diploma in Printing Technology. The subject is planned to include sufficient practices which would help the student to understand the principles of printing machine maintenance.

OBJECTIVES:

At the end of the study of VI Semester the student will be able to :

1. Know about handling and application of tools like Pipe wrench, Spanner, Vernier Caliper, Micrometer, Feeler Gauge, Dial Gauge and Screw Driver.
2. Learn removing, tensioning and mounting of various drives (Belt and Chain).
3. Check the levelling/alignment of the machine or motor surface.
4. Check the performance of Gripper.
5. Learn assembling and dismantling of bearings/gears/cams/springs.
6. Perform Oil changing, air filter cleaning and lubricating the points.
7. Check and replace electrical component.
8. Perform the solid print test for identifying mechanical problems in the machine.
9. Learn about removing of damaged screws/pins/bolts and nuts.
10. Check the sensors & detectors.

ALLOCATION OF MARKS

Internal Assessment	25 marks
Viva Voce	15 marks
Procedure	10 marks
Practical Exercise	50 marks
Total	100 Marks

MACHINERY MAINTENANCE LAB

List of Exercises

1. Handling and application of tools – Pipe wrench, Spanner, Vernier Caliper, Micrometer, Feeler Gauge, Dial Gauge and Screw Driver.
2. Removing, Tensioning and mounting of various drives (motor belt and transfer & delivery chains).
3. Checking the leveling/alignment of the machine or motor.
4. Checking and adjusting the performance of Gripper.
5. Assembling and dismantling of bearings/gears/cams/springs.
6. Oil changing, air filter cleaning and lubricating the points.
7. Check and replace electrical component like fuses.
8. Performing the solid print test for identifying mechanical problems in the machine.
9. Trouble shooting in maintenance – removing damaged screws/pins/bolts and nuts.
10. Checking the sensors and adjusting its setting.

List of Equipment and Instrument:

1. Pipe wrench, Spanner set, Hammer, Nylon rod, File set.
2. Vernier calliper.
3. Micrometer.
4. Feeler gauge.
5. Bearing puller / Blanket gauge / Durometer / Dial gauge / Torque wrench.
6. Oil and grease gun.
7. Punch set.
8. Allen key set.
9. Screw driver set.
10. Sprit level.

VI SEMESTER

PRINT QUALITY ASSURANCE PRACTICAL

MODEL QUESTION PAPER

1. Check the leveling/alignment of the machine or motor and write the procedure for same.
2. Check and adjusting the performance of Gripper and write the procedure for same.
3. Assemble and dismantling of bearings/gears/cams/springs and write the procedure for same.
4. Find Oil changing, air filter cleaning and lubricating the points and write the procedure for same.
5. Check and replace electrical component like fuses and write the procedure for same.

The college authority should ensure the safety to all the students during the workshop and the lab practical.

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DIRECTORATE OF TECHNICAL EDUCATION

DIPLOMA IN PRINTING TECHNOLOGY

III YEAR

M SCHEME

VI SEMESTER

2015-2016 onwards

INDUSTRIAL EXPOSURE AND REPORT

CURRICULAM DEVELOPMENT CENTRE

STATE BOARD OF TECHNICAL EDUCATION & TRAINING, TAMIL NADU
DIPLOMA IN PRINTING TECHNOLOGY

M-SCHEME
(to be implemented for the student Admitted from the Year 2015-2016 onwards)

Course Name : DIPLOMA IN PRINTING TECHNOLOGY
Subject Code : **38266**
Semester : VI Semester
Subject Title : INDUSTRIAL EXPOSURE AND REPORT

TEACHING AND SCHEME OF EXAMINATION:

No. of weeks per semester: 15 weeks

Subject Title	Instructions		Examination			
	Hours/ Week	Hours/ Semester	Marks			Duration
			Internal Assessment	Board Examination	Total	
INDUSTRIAL EXPOSURE AND REPORT	3 Hrs	45 Hrs	25	75	100	3 Hrs

RATIONALE:

The major benefits accruing to students who participate conscientiously in industrial training are the skills and competencies they acquire. These relevant production skills (RPSs) remain a part of the recipients of industrial training as life-long assets which cannot be taken away from them. This is because the knowledge and skills acquired through training are internalised and become relevant when required to perform jobs or functions.

INDUSTRIAL EXPOSURE AND REPORT

Objective of industrial training is to provide to students the feel of the actual working environment and to gain practical knowledge and skills, which in turn will motivate, develop and build their confidence. Industrial training is also expected to provide the students the basis to identify their key operational area of interest.

During 4th Semester vacation students have to undergo 4 weeks of Industrial Exposure Training and during 5th Semester vacation students have to undergo 3 weeks of Industrial Exposure Training (Total duration - 7 weeks). In 6th semester, each student will be required to submit a typed report (2 copies) as "Industrial Exposure Report" giving industrial experience along with the details about the press, the process, their findings etc. in detail as a part of industrial training.

Performance during industrial exposure provided in industrial unit will be evaluated, based on the report to be submitted by each student and necessary assessment / certificate as may be obtained by the Institute from the concerned unit. 100 marks are assigned for industrial training.

The marks will be based on regularity in attendance (minimum 75%), conduct and progress as reported by the industrial supervisor, quality of report and viva voce examination, besides behavior etc.

Once the student has been selected / deputed for Industrial Training by the institute, he/she shall not be permitted to undergo Industrial exposure elsewhere. In case students make direct arrangements with the industry / press for Industrial Training, these will necessarily have to be approved by the institute.

Responsibilities of institute and the student/trainee with aims & objectives have been prescribed for adherence.

1. RESPONSIBILITIES OF THE STUDENTS

1 Should be punctual.
2 Should maintain the training logbook up-to-date.
3 Should be attentive and careful while doing work.
4 Should be keen to learn and maintain high standards and quality of work.
5 Should interact positively with the Industry staff.
6 Should be honest and loyal to the Press and towards their training.
7 Should get their appraisals signed regularly from the HOD's or training manager.
8 Gain maximum from the exposure given, to get maximum practical knowledge and skills.
9 Should attend the training review sessions / classes regularly.
10 Should be prepared for the arduous working condition and should face them positively.
11 Should adhere to the prescribed training schedule.

12 Should take the initiative to do the work as training is the only time where you can get maximum exposure.

13 Should, on completion of Industrial Training, handover all the reports, appraisals, logbook and completion certificate to the institute.

2. RESPONSIBILITIES OF THE INSTITUTE

1 Should give proper briefing to students prior to the industrial training

2 Should make the students aware of the industry environment and expectations.

3 Should notify the details of training schedule to all the students.

4 Should coordinate regularly with the press especially with the training manager.

5 Should visit the press, wherever possible, to check on the trainees.

6 Should sort out any problem between the trainees and the press.

7 Should take proper feedback from the students after the training.

8 Should brief the students about the appraisals, attendance, marks, logbook and training report.

9 Should ensure that change of Industrial Exposure Press is not permitted once the student has been interviewed, selected and has accepted the offer.

10 Should ensure trainees procure training completion certificate from the press before joining institute.

Scheme of Evaluation:

Internal Marks	25 marks
Industrial Report	45 marks
Viva Voce	30 marks
Total	100 marks

For award of marks, 25% marks of Industrial Exposure would be on the basis of feed-back from the industry in a prescribed **Performance Appraisal Form (PAF).** It will be the students' responsibility to get this feed-back/assessment form completed from the industry/press for submission to the institute at the end of Industrial Training. For the remaining 75% marks, students would be assessed on the basis of report/seminar/presentation of reports/Viva voce before a select panel. The presentation would be limited to only one key area of the student's interest. A hard copy of the report will also have to be submitted to the panel.

Industrial Exposure Report should be in A4 size not exceeding 100 pages. Appearance should not display extravaganza

INDUSTRIAL TRAINING

PERFORMANCE APPRAISAL FORM (PAF)

Name of Student: _____ **Reg. No.:** _____

Institute/College: _____ **Duration:** **working days**

Name of the Press/Industry: _____ From: _____ To: _____

Appearance

Immaculate Appearance, Spotless dressings, Well groomed hair,	5
Smart Appearance, Crisp dressings, Acceptable hair,	4
Well Presented, Clean dressings, Acceptable hair,	3
Untidy hair, Creased ill kept dressings,	2
Dirty / disheveled, Long / unkempt hair,	1

Punctuality / Attendance (_____ days present out of _____ days)

On time, Well Prepared, Ready to commence task, Attendance Excellent	100%	5
On time, Lacks some preparation but copes well, Attendance Very good	90%	4
On time, Some disorganized aspects-just copes, Attendance Regular	80%	3
Occasionally late, Disorganized approach, Attendance irregular	60%	2
Frequently late, Not prepared, Frequently absent without excuse	50%	1

Ability to Communicate (Written / Oral)

Very confident, demonstrates outstanding confidence & ability both spoken/written	5
Confident, Delivers information	4
Communicates adequately, but lacks depth and confidence	3
Hesitant, lacks confidence in spoken / written communication	2
Very inanimate, unable to express in spoken or written work	1

Attitude to Colleagues / Supervisors

Wins / retains highest regard from colleagues has an outstanding rapport with superiors	5
Polite, considerate and firm, well liked.	4
Gets on well with most colleagues.	3
Slow to mix, weak manners, is distant has insensitive approach to superiors	2
Does not mix, relate well with colleagues & superiors	1

Attitude to Supervision

Welcomes criticism, Acts on it, very co-operative	5
Readily accepts criticism and is noticeably willing to assist others.	4
Accepts criticism, but does not necessarily act on it.	3
Takes criticism very personally, broods on it.	2
Persistently disregards criticism and goes own way.	1

Initiative / Motivation

Very effective in analyzing situation and resourceful in solving problems	Demonstrates ambition to achieve progressively.	5
Shows ready appreciation and willingness to tackle problems	Positively seeks to improve knowledge and performance	4
Usually grasps points correctly.	Shows interest in all work undertaken.	3
Slow on the uptake.	Is interested only in areas of work preferred.	2
Rarely grasps points correctly.	Lacks drive and commitment.	1

Reliability / Comprehension

Is totally trust worthy in any working situation. Understands in detail, why and how the job is done.	5
Can be depended upon to identify work requirements and willing to complete them. Readily appreciates, how and why the job is done.	4
Gets on with the job in hand. Comprehends, but doesn't fully understand work in hand	3
Cannot be relied upon to work without supervision. Comprehends only after constant explanation.	2
Requires constant supervision. Lacks any comprehension of the application.	1

Responsibility

Actively seeks responsibility at all times.	5
Very willing to accept responsibility.	4
Accepts responsibility as it comes.	3
Inclined to refer matters upwards rather than make own decision.	2
Avoids taking responsibility.	1

Quality of Work

Exceptionally accurate in work, very thorough usually unaided.	5
Maintains a high standard of quality	4
Generally good quality with some assistance.	3
Performance is uneven.	2
Inaccurate and slow at work.	1

Quantity of work

Outstanding in output of work.	5
Gets through a great deal.	4
Output satisfactory.	3
Does rather less than expected.	2
Output regularly insufficient	1

Total _____/ 50

Stipend Paid: Rs._____ (if any)

Name of Appraiser: _____ **Signature:** _____

Designation of Appraiser: _____**Date:** _____

Signature of Student: _____**Date:** _____

DIRECTORATE OF TECHNICAL EDUCATION

DIPLOMA IN PRINTING TECHNOLOGY

III YEAR

M SCHEME

VI SEMESTER

2015-2016 onwards

PROJECT WORK

CURRICULAM DEVELOPMENT CENTRE

STATE BOARD OF TECHNICAL EDUCATION & TRAINING, TAMIL NADU
DIPLOMA IN PRINTING TECHNOLOGY

M-SCHEME
(to be implemented for the student Admitted from the Year 2015-2016 onwards)

Course Name : DIPLOMA IN PRINTING TECHNOLOGY
Subject Code : **38267**
Semester : VI Semester
Subject Title : PROJECT WORK

TEACHING AND SCHEME OF EXAMINATION:

No. of weeks per semester: 15 weeks

Subject Title	Instructions		Examination			
	Hours/ Week	Hours/ Semester	Marks			Duration
			Internal Assessment	Board Examination	Total	
PROJECT WORK	4 Hrs	60 Hrs	25	75	100	3 Hrs

RATIONALE:

By bringing real-life context and technology to the curriculum through a Project work approach, students are encouraged to become independent workers, critical thinkers, and lifelong learners. Teachers can communicate with administrators, exchange ideas with other teachers and subject-area experts, and communicate with parents, all the while breaking down invisible barriers such as isolation of the classroom, fear of embarking on an unfamiliar process, and lack of assurances of success. A project is an extended, in-depth investigation of a topic, ideally one worthy of the students attention and energy. In other words, projects involve students in conducting research on phenomena and events worth learning about in their own environments.

In the process of these investigations students have opportunities to pose questions, to generate theories and predictions concerning possible answers, to seek answers to their questions (answers from which they are likely to generate still more questions), to interview experts and others from whom relevant information can be obtained, and to engage in other activities involved in collecting information. Projects provide contexts in which children can apply a wide variety of social and intellectual skills in, addition to the basic academic skills being learned in the more formal parts of the curriculum.

PROJECT WORK

Details of Mark allocation	Max Marks
Marks for Report Preparation, Demo, Viva-voce	65
Marks for answers of 4 questions which is to be set by the external examiner from the given question bank consisting of questions in the following two topics Disaster Management and Environmental Management. Out of four questions two questions to appear from each of the above topics i.e. 2 questions x 2 topics = 4 questions 4 questions x 2 ½ marks = 10 Marks	10
Total	**75**

The Objective of project work is to make use of the knowledge gained by the student at various stages of the diploma course and to enable the students to work in convenient groups of not more than six members in a group on a project involving theoretical and experimental studies related to Printing Technology.

Major project work is meant for Publication of books on latest and emerging trends in Printing Technology along with any one value addition process by applying the knowledge and skills gained through various subject areas. It is expected that students will be sent to various printing industry for about 4 weeks at a stretch (during industrial exposure) and they will be asked to take live problems from the field as project work.

Identification of project titles and project activities, which can be taken in them, should begin well in advance. Students should also be asked to identify suitable project and project activities, which can be taken by them. One teacher is expected to guide, supervise and evaluate the project work of 4 - 6 students.

This helps to judge the level of proficiency, originality, and capacity for application of the knowledge attained by the student at the end of the course.

Twelve periods per week in VI semester shall be allotted in the Time Table for this important activity and this time shall be utilized by the students to receive directions from the Guide, on library reading, laboratory work, Printing press activities, computer analysis or field work as assigned by the Guide and also to present in periodical seminars the progress made in the project.

Each student shall finally produce a comprehensive report covering background information, literature Survey, problem statement, project work details and conclusions. This final report shall be typewritten form as specified in the guidelines. Every Project Work shall have a Guide who is a member of the faculty of the Institute.

The following factors are to be considered while selecting the projects

1. The project has to be done by the students themselves and not by any outsider, that is, the diploma students with their own knowledge and skill shall be able to do the project with somebody's guidance.
2. Repetition of same project done by any other batch of same year/previous years shall not be permitted.
3. The main motive of the project shall be gaining of knowledge and skill by the students.
4. The expense towards the project work shall not be a big burden to the parents.
5. The total number of students in a batch shall not exceed six
6. There should be enough staff guidance an available in the Institution.

EVALUATION FOR BOARD EXAMINATION:

Details of Mark allocation	Max Marks
Marks for Report Preparation, Demo, Viva-voce	65
Marks for answers of 4 questions which is to be set by the external examiner from the given question bank consisting of questions in the following two topics Disaster Management and Environmental Management. Out of four questions two questions to appear from each of the above topics i.e. 2 questions x 2 topics = 4 questions 4 questions x 2 ½ marks = 10 Marks	10
Total	**75**

DETAILED SYLLABUS

ENVIRONMENTAL & DISASTER MANAGEMENT

1. ENVIRONMENTAL MANAGEMENT

Introduction – Environmental Ethics – Assessment of Socio Economic Impact – Environmental Audit – Mitigation of adverse impact on Environment – Importance of Pollution Control – Types of Industries and Industrial Pollution.

Solid waste management – Characteristics of Industrial wastes – Methods of Collection, transfer and disposal of solid wastes – Converting waste to energy – Hazardous waste management Treatment technologies.

Waste water management – Characteristics of Industrial effluents – Treatment and disposal methods – Pollution of water sources and effects on human health.

Air pollution management – Sources and effects – Dispersion of air pollutants – Air pollution control methods – Air quality management.

Noise pollution management – Effects of noise on people – Noise control methods.

2. DISASTER MANAGEMENT

Introduction – Disasters due to natural calamities such as Earthquake, Rain, Flood, Hurricane, Cyclones etc – Man made Disasters – Crisis due to fires, accidents, strikes etc – Loss of property and life..

Disaster Mitigation measures – Causes for major disasters – Risk Identification – Hazard Zones – Selection of sites for Industries and residential buildings – Minimum distances from Sea – Orientation of Buildings – Stability of Structures – Fire escapes in buildings - Cyclone shelters – Warning systems.

Disaster Management – Preparedness, Response, Recovery – Arrangements to be made in the industries / factories and buildings – Mobilization of Emergency Services - Search and Rescue operations – First Aids – Transportation of affected people – Hospital facilities – Fire fighting arrangements – Communication systems – Restoration of Power supply – Getting assistance of neighbors / Other organizations in Recovery and Rebuilding works – Financial commitments – Compensations to be paid – Insurances – Rehabilitation.

LIST OF QUESTIONS

1. ENVIRONMENTRAL MANAGEMENT

1. What is the responsibility of an Engineer-in-charge of an Industry with respect to Public Health?
2. Define Environmental Ethic.
3. How Industries play their role in polluting the environment?
4. What is the necessity of pollution control? What are all the different organizations you know, which deal with pollution control?
5. List out the different types of pollutions caused by a Chemical / Textile / Leather / Automobile / Cement factory.
6. What is meant by Hazardous waste?
7. Define Industrial waste management.
8. Differentiate between garbage, rubbish, refuse and trash based on their composition and source.
9. Explain briefly how the quantity of solid waste generated in an industry could be reduced.
10. What are the objectives of treatments of solid wastes before disposal?
11. What are the different methods of disposal of solid wastes?
12. Explain how the principle of recycling could be applied in the process of waste minimization.
13. Define the term ‘Environmental Waste Audit’.
14. List and discuss the factors pertinent to the selection of landfill site.
15. Explain the purpose of daily cover in a sanitary landfill and state the minimum desirable depth of daily cover.
16. Describe any two methods of converting waste into energy.

17. What actions, a local body such as a municipality could take when the agency appointed for collecting and disposing the solid wastes fails to do the work continuously for number of days?
18. Write a note on Characteristics of hazardous waste.
19. What is the difference between municipal and industrial effluent ?
20. List few of the undesirable parameters / pollutants anticipated in the effluents from oil refinery industry / thermal power plants / textile industries / woolen mills / dye industries / electroplating industries / cement plants / leather industries (any two may be asked)
21. Explain briefly the process of Equalization and Neutralization of waste water of varying characteristics discharged from an Industry.
22. Explain briefly the Physical treatments “Sedimentation” and “Floatation” processes in the waste water treatment.
23. Explain briefly when and how chemical / biological treatments are given to the waste water.
24. List the four common advanced waste water treatment processes and the pollutants they remove.
25. Describe refractory organics and the method used to remove them from the effluent.
26. Explain biological nitrification and de-nitrification.
27. Describe the basic approaches to land treatment of Industrial Effluent.
28. Describe the locations for the ultimate disposal of sludge and the treatment steps needed prior to ultimate disposal.
29. List any five Industries, which act as the major sources for Hazardous Air Pollutants.
30. List out the names of any three hazardous air pollutants and their effects on human health.
31. Explain the influence of moisture, temperature and sunlight on the severity of air pollution effects on materials.
32. Differentiate between acute and chronic health effects from Air pollution.
33. Define the term Acid rain and explain how it occurs.
34. Discuss briefly the causes for global warming and its consequences
35. Suggest suitable Air pollution control devices for a few pollutants and sources.
36. Explain how evaporative emissions and exhaust emissions are commonly controlled.
37. What are the harmful elements present in the automobile smokes? How their presence could be controlled?
38. What is the Advantage of Ozone layer in the atmosphere? State few reasons for its destruction.
39. Explain the mechanism by which hearing damage occurs.
40. List any five effects of noise other than hearing damage.
41. Explain why impulsive noise is more dangerous than steady state noise.
42. Explain briefly the Source – Path – Receiver concept of Noise control.
43. Where silencers or mufflers are used ? Explain how they reduce the noise.
44. Describe two techniques to protect the receiver from hearing loss when design / redress for noise control fail.

45. What are the problems faced by the people residing along the side of a railway track and near to an Airport? What provisions could be made in their houses to reduce the problem?

2. DISASTER MANAGEMENT

1. What is meant by Disaster Management? What are the different stages of Disaster management?
2. Differentiate Natural Disasters and Man made Disasters with examples.
3. Describe the necessity of Risk identification and Assessment Surveys while planning a project.
4. What is Disasters recovery and what does it mean to an Industry?
5. What are the factors to be considered while planning the rebuilding works after a major disaster due to flood / cyclone / earthquake? (Any one may be asked)
6. List out the public emergency services available in the state, which could be approached for help during a natural disaster.
7. Specify the role played by an Engineer in the process of Disaster management.
8. What is the cause for Earthquakes? How they are measured? Which parts of India are more vulnerable for frequent earthquakes?
9. What was the cause for the Tsunami 2004 which inflicted heavy loss to life and property along the coast of Tamilnadu ? Specify its epicenter and magnitude.
10. Specify the Earthquake Hazard Zones in which the following towns of Tamilnadu lie: (a) Chennai (b) Nagapattinam (c) Coimbatore (d) Madurai (e) Salem.
11. Which parts of India are experiencing frequent natural calamities such as (a) heavy rain fall (b) huge losses due to floods (c) severe cyclones
12. Define basic wind speed. What will be the peak wind speed in (a) Very high damage risk zone – A, (b) High damage risk zone, (c) Low damage risk zone.
13. Specify the minimum distance from the Sea shore and minimum height above the mean sea level, desirable for the location of buildings.
14. Explain how the topography of the site plays a role in the disasters caused by floods and cyclones.
15. Explain how the shape and orientation of buildings could reduce the damages due to cyclones.
16. What is a cyclone shelter ? When and where it is provided ? What are its requirements ?
17. What Precautionary measures have to be taken by the authorities before opening a dam for discharging the excess water into a canal/river ?
18. What are the causes for fire accidents ? Specify the remedial measures to be taken in buildings to avoid fire accidents.
19. What is a fire escape in multistoried buildings ? What are its requirements ?
20. How the imamates of a multistory building are to be evacuted in the event of a fire/Chemical spill/Toxic Air Situation/ Terrorist attack, (any one may be asked).
21. Describe different fire fighting arrangements to be provided in an Industry.

22. Explain the necessity of disaster warning systems in Industries.
23. Explain how rescue operations have to be carried out in the case of collapse of buildings due to earthquake / blast / Cyclone / flood.
24. What are the necessary steps to be taken to avoid dangerous epidemics after a flood disaster?
25. What relief works that have to be carried out to save the lives of workers when the factory area is suddenly affected by a dangerous gas leak / sudden flooding ?
26. What are the difficulties faced by an Industry when there is a sudden power failure? How such a situation could be managed?
27. What are the difficulties faced by the Management when there is a group clash between the workers? How such a situation could be managed?
28. What will be the problems faced by the management of an Industry when a worker dies because of the failure of a mechanical device due to poor maintenance? How to manage such a situation ?
29. What precautionary measures have to be taken to avoid accidents to labourers in the Industry in a workshop / during handling of dangerous Chemicals / during construction of buildings / during the building maintenance works.
30. Explain the necessity of medical care facilities in an Industry / Project site.
31. Explain the necessity of proper training to the employees of Industries dealing with hazardous products, to act during disasters.
32. What type of disaster is expected in coal mines, cotton mills, Oil refineries, ship yards and gas plants?
33. What is meant by Emergency Plan Rehearsal? What are the advantages of such Rehearsals?
34. What action you will take when your employees could not reach the factory site because of continuous strike by Public Transport workers?
35. What immediate actions you will initiate when the quarters of your factory workers are suddenly flooded due to the breach in a nearly lake / dam, during heavy rain?
36. What steps you will take to avoid a break down when the workers union of your Industry have given a strike notice?
37. List out few possible crisis in an organization caused by its workers? What could be the part of the middle level officials in managing such crisis?
38. What types of warning systems are available to alert the people in the case of predicted disasters, such as floods, cyclone etc.
39. Explain the necessity of Team work in the crisis management in an Industry / Local body.
40. What factors are to be considered while fixing compensation to the workers in the case of severe accidents causing disability / death to them?
41. Explain the legal / financial problems the management has to face if safely measures taken by them are found to be in adequate.
42. Describe the importance of insurance to men and machinery of an Industry dealing with dangerous jobs.

43. What precautions have to be taken while storing explosives in a match/ fire crackers factory?
44. What are the arrangements required for emergency rescue works in the case of Atomic Power Plants?
45. Why residential quarters are not constructed nearer to Atomic Power Plants?

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