360 – PRINTING CRAFT PRACTICE

EXAMINATION STRUCTURE

The Trade Related subjects are Building/Engineering Drawing and Basic Electricity.

The General Education subjects are English Language, Mathematics, Economics, Physics, Chemistry, English Literature and Information Communication Technology.

Printing Craft Practice comprises the following modules:

361: PART I -	PRINTING ORIGINATION contains	
	Introduction to Printing Industry	CPR 11
	Design Appreciation	CPR 12
	Letter Assembly	CPR 13
	Process Camera Work I & II	CPR 14&15
PART II	MACHINE PRINTING AND FINISHING	
	Surface Preparation	CPR 16
	Machine Printing I & II	CPR 17&18
	Print Finishing	CPR 19

This Trade shall be examined in Two papers viz:

361 - I:- Paper 1, Section A shall contain 40 objective questions drawn across the syllabus. Section B (ESSAY) shall be in TWO parts: Part 1 shall contain FOUR questions to answer THREE and Part II shall contain THREE questions to answer TWO. In all, candidates will answer FIVE questions in TWO (2) hours.

361-II:- Paper II Practical
This is a project based examination on Machine Printing and Finishing. The project covers Design Text Finish Artwork, Camera Films and Plate Form . Candidates are to submit specified copies of the finished job as stated by the question paper, depending on the nature of the project. Question paper will be released to students before examination date.

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PRINTING ORIGINATION (CPR 11, 12, 13, 14 & 15)

S/N	Topic/Objectives	Contents	Activities/Remarks
1.	**Evolution Structures and Legal Aspects of the Printing Industry** a. Outline the historical development of printing in Nigeria and state the problems facing the industry. b. Identify and describe the trade houses in the Printing Industry. c. Explain the roles of the trade unions, employers association, professional bodies, examination bodies in the printing industry.	1.1 The contribution of printing to civilization. 1.2 Historical development of printing in Nigeria: Problems facing the industry in terms of (1) cost of materials and equipment (2) availability of equipment e.t.c. 1.3 Trade houses in the printing industry and their basic activities: (a) (i) Publishing (ii) Commercial press (iii) Gravure press (iv) Screen Printing Press (v) Metal Printing Press (b) Functions 1.4 The roles of the following in the printing industry: trade unions, employers' association, professional bodies, training institution and examination bodies. 1.5 Organizational oceanographic structure of a typical printing industry: e.g. (a) (i) Relief or letter press (ii) Planographic (iii) Intaglio process (iv) Screen process (b) (i) Commercial Printing (ii) package Printing (iii) Publishing (iv) In-plant (v) Quick service printing etc 1.6 Careers in the printing industry: (i) Machine operators	1. Brief history is required. Display of printed products are necessary for effective teaching of the module. 2. Local and foreign examples are required e.g. the Nigerian Institute of Printing. 3. This must include major departments and sections with their functions by using organizational chart.

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		(ii) Camera men (iii) Proof readers (iv) Binders (v) Estimators (vi) Sales people (vii) Sales Manager, etc. 1.7 Meaning of and legal obligations of the printer to the following terms: copy-right, imprint, libel, sedition as they affect the printers.	
2.	**Relief Process** a. Write the sequence of production for any given job in relief process. b. State the uses of the work ticket.	2.1 The relief process: The image and non-image areas e.g. forme. 2.2 Production sequence in the relief process e.g (i) production of scripts manufacturing dummy (ii) type composure (iii) making ready (iv) proofing (v) printing 2.3 Uses of the work ticket: (i) To guide the printer in knowing the quantity of material to use. (ii) Time to take (iii) Machine to be used, etc. 2.4 Relief process prints e.g.: Letter press print-on (i) Cards (ii) Textbooks (iii) Newspapers (iv) Stationaries, etc.	1. A chart showing the sequence of producing a letter press job. Students should be made to view the machines that produce. 2. Students to produce rubber stamps to the job; demonstrate relief printing. 3. Obtain sample of each kind of letter press job.
3.	**Planographic Process** Describe and write the sequence of production for any job in planographic process.	3.1 The planographic process: The image and non-image areas on the same plane e.g. the plate, Offset/Lithographic Printing. 3.2 Production sequence in the	1. Obtain a sample of a plate. 2. Visit a printing house that specializes in off-set printing

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		planographic process: e.g. lithographic printing (i) Layout and dummy preparation (ii) Type setting (iii) Stripping and camera work – Camera work film processing and stripping (iv) Plate making (v) Proofing (vi) Printing/machine work. 3.3 Planographic process prints e.g. pamphlets, cards, magazines etc.	
4.	**Intaglio Process** a. Identify the prints by the intaglio process. b. Write the sequence of job production in the intaglio process	4.1 Intaglio process: image and non-image areas: gravure, printing cylinder/plate. 4.2 Production sequence in the intaglio process e.g. (i) Layout (ii) Camera work (iii) Gravure plate (iv) Cylinder preparation (v) Proofing (vi) Press work. 4.3 Intaglio process prints – security materials, such as stamps, money label gift items, corrugated carton and light packaging wrappers, wall papers.	1. Students to collect samples of security job that are high lighted in the lecture. 2. Practical demonstration by teacher and students of these processes are required and 3. Product development required.
5.	**Stencil Process** a. Identify prints by the stencil process. b. Write the sequence of job production in stencil process.	5.1 Stencil process: image and non-image areas – screen mesh, stencil. 5.2 Production sequence in the stencil process e.g. (i) Layout (ii) Mesh stretching (iii) Exposure	1. Display a screen frame with mesh. 2. Display product of screen printing.

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		(iv) Printing 5.3 Stencil process prints e.g. (i) Textiles (ii) Plastics (iii) Bottles (iv) Leather e.t.c. 5.4 Compare and contrast between relief planographic, intaglio and stencil print processes as regards, (i) Cost of production (ii) Time (iii) Durability	3. Description of the process and identification of their prints must not be left out.
6.	**The Factory Act** Outline the general requirements of the Factory Act affecting the Printing Industry.	6.1 The Factory Act: Its purpose 6.2 The Factory Act as it affects the printing industry.	Students to have a copy each of the Factor Act for personal reference.
7.	**Health and Safety** List the safety rules in the printing Industry and habitually apply them in working situations.	7.1 Hazards, their causes, industrial mishap and the precautions in the printing industry as it affects materials, equipment machines and clothing. 7.2 Safety rules and their application in the printing industry.	1. Examples of hazards to include: Obstruction of gangway, improper dressing exposure to toxic fumes, and chemical, working with faulty machines and equipment etc. 2. Various charts should be displayed to show dangers associated with each material or equipment.

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DESIGN APPRECIATION – CPR 12

S/N	Topics/Objectives	Content	Activities/Remarks
1.	**Instruments and Materials** Identify, state the uses and methods of care of design instruments and materials.	1.1 Uses and methods of using design instrument and materials e.g. set square, T-square, drawing board, drawing pens, brushes, instrument etc, etc. 1.2 Design elements e.g. guide lines, "X" heights, etc. 1.3 Construction of simple letter forms e.g. block lettering, script writing.	Students to construct alphabets from A-Z and from 1-9 using capital and lower case of various letterings and other text in the type case i.e. ligation. Currency, symbols, punctuation marks etc**.**
2.	**Layout Preparation** a. Identify various paper sizes, texture and grammage; Type faces and assess their suitability for various printing processes. b. Visualise and combine design elements to produce typographic layout.	2.1 Paper sizes, texture and grammage of A,B,C, SRA and RA, Paper Series. 2.2 Geometrical or mathematical methods of reduction and enlargement to scale of various items. 2.3 Type face and their suitability for printing processes such as: (i) Roman (ii) San-Serif (iii) Script (iv) Decorative type faces Ghotic etc. 2.4 Basic principles of design e.g. symmetric harmony and asymmetric harmony to enhance unity and balance. To know the process from thumb nail to rough, to comprehensive and final layout (camera ready copy) finish artwork. 2.5 Production of a typographic layout from design elements.	**1. Enlarge an art work using geometrical or mathematical methods of enlargement.** **2.** Obtain several printed samples and state the types of principle used in the designing either it is symmetrical or asymmetrical. **3.**Practical production of samples required in the layout.
3.	**Colour Combinations** a. Explain the	3.1 (a) Theory of colour: primary, tertiary, complementary,	Note: **Additive and subtractive colour**

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	Theory of colours. b. Carry out design involving a job at least two colours.	natural colours to ensure proper visibility. (b) Colour terms- monochromatic, analogous, triadic harmonies. (c) Missing of colours – colour wheel. 3.1 (a) Practical demonstration of a design of a least two colours. (b) The use of computer in preparing designs should be taught.	**mixture.** **Practical products required** Activity: **Prepare a colour wheel; use H20 colour to mix them to match on the colour wheel show samples of 4 colour harmonies printing work.**

LETTER ASSEMBLY – CPR 13

S/N	Topics/Objectives	Content	Activities/Remarks
1.	**Hand Composition** a. Identify and state the correct uses of the composing room tools. b. Obtain measurements accurately from composing sticks. c. Describe the type matter its composition, functions of its parts. d. Interpret and execute proof readers correction. e. Handle impositions scheme, mechanically composed jobs, simple paste-up work, and work,	1.1 Uses of room tools and equipment, e.g. the frame and its contents, types cases, composing sticks, typescales, galleys, chases. Quoins, imposing surfaces etc. 1.2 Location of alphabets type case 1.3 Difference between type faces; Roman, Italic and Bold, capital, small capital and lower case. 1.4 Methods of measurements from composing sticks – 12 pt letter Em lower case method, 12 pt quads methods, quotation method, mechanically set line method. 1.5 The type-matter, its composition and function of its composition and function of its setting.	Include frame and its contents type cases typescales, galleys, imposing surface, lead and rule cutter, mitering machine etc. Students to show samples of print where each of the type face has been used.

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	produced through duplicating methods.	1.6 The point system in relation to type height, set width, unit value and general type setting. 1.7 Setting type matter into composing stick according to a given test. 1.8 Type matters from composing sticks to galley and imposing surface type-up. 1.9 Proofs, simple proofing press, proof-reading and corrections marks. 1.10 Type matter back to type cases. 1.11 Typographic designers working out layout – two/three colour work. 1.12 Simple tabular matter work. 1.13 Imposition schemes up to 16 pages of portrait and land-scapes-sheet work, etc. 1.14 Hand type, mono type lud low and other mechanically composed machine. 1.15 Casting up, casting off and methods of calculation e.g. a theory test positions, copyfiting, index, finger methods, etc. 1.16 Care and record keeping of types and forme. 1.17 Simple paste-up work for stick-on and transfer system. 1.18 Handling of works produced by duplication in the imposing surface. 1.19 Register galley and colour splitting.	Students to compose several lines of foundry types from any given copy. Use various sizes of types and carefully justify each line. The teacher should criticize the job and students should distribute the types back to the case. Student to be given jobs using typographic designers layout and using the correct types. In simple two or three colour work. Compose some headlines by the use of dry transfer.
2.	**Mechanical Composition** a. Identify and explain	2.1 Mechanical composing – linotype, monotype, stick-on machines.	1.2 Their functions should be emphasized.

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	the functions of the various mechanical composing linotype, monotype and strike-on composing machines. b. Operate the various machines and perform simple routine maintenance work on them.	2.2 The monotype-keyboard and caster: paper spool, measure on, running matters, centred matters simple tabular matters. 2.3 The die cast and the caster. 2.4 The mono caste: parts and functions – mould, wedges pump, etc, operation and maintenance. 2.5 The linotype machines, linotype and monotype matrices, measurement on linotype machine, spaces band and spacing techniques the magazines and distribution methods. 2.6 Alloys on the linotype and the monotype. 2.7 Strike-on machine: Uses of products and practical demonstration of simple job.	Visit several commercial printing plant and study their composing department. Carefully record the kind of composing machines that each company has and categorized them according to information presented in this section. Simple jobs on the linotype Practical are essential Practical product development required.
3.	**Photo-Composition** a. Obtain measures and simple jobs on the photo composing machines and process materials.	3.1 Photocomposing machines parts and their functions, practical use for jobs, measurement; filmset matters common errors, correction, including the use of computers in photocomposition. 3.2 Proofing assembled matters with use of Diazo or Ozalith paper.	Compose from a given text using any photocomposing machine in your school/establishment. Make proof of a photo composed job using Diazo or Ozalith.
4.	**Proof-Reading and Correction** a. Read proof, detect errors in typography or other subjects. b. Identify laws of publishing and printing.	4.1 Role of a proof-reader in the printing industry. 4.2 Proof-reading-international proofreaders marks. 4.3 Laws of publishing and printing e.g. imprint etc.	Obtain a cutting from any of your daily newspapers. Indicate the composing errors, using the proof-readers marks. Visit a printing house and spend sometime with the proof-reader and write a report on

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			your findings.

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PROCESS CAMERA 1 – CPR 14

S/N	Topics/Objectives	Content	Activities/Remarks
1.	**Cameras and Ancillary Equipment** a. Identify and state the functions of the parts of a process camera. b. List and state the functions of ancillary instruments c. List and state applications of materials used in process camera work.	1.1 (a) Gallery and darkroom camera (b) Advantages and disadvantages of each. 1.2 Vertical and the horizontal process camera 1.3 (a) Process camera. Parts and functions ancillary instruments e.g. densitometer, context cabi, drying cabinet, developing trays/sinks etc. (b) Materials for process camera work e.g. screen filters, gray scale, films, developers and other chemicals. (c) The characteristics of the above materials and chemicals.	1. Examine the process camera in your darkroom and identify the type of camera it is and learn the name of each part and its function. Advantages and disadvantages should be stressed. 2. Identify 2 or 3 photographic materials in your darkroom. 3. Get a piece of

			Orthodochromatic, cut into 2 small pieces and expose one piece to white light, another to red light and ev
2.	**Photographic Image Production** a. Explain the optical principles involved in image formation. b. Name the various types of light sources available in process photography and illustrate their special distribution. c. Describe the process and the instruments used in evaluating the density of the image.	2.1 Image formation through process camera lens. 2.2 Lateral reversal in prism mirror. 2.3 Enlargement and reduction by conjugate foci. 2.4 Types of light services in photography, special properties e.g. red (safe light) white light etc. 2.5 Light sensitivity e.g. Orthochromatic and panchromatic films and gloss side of orchromatic film. **Note:** Example of light sensitive 2.6 Principles of image production on light sensitive emulsions. 2.7 Evaluation of image density by using: (a) gray scale (b) densitometer.	The optical principle should be emphasized e.g. silver bromide silver chloride etc. Practicals are required. Obtain a black and white art work and practice how to use it to produce a line negative/positive.
3.1	**Process Camera Operations** a. Apply the principle of half-tone dot filtration to comput screen distance. Calculate lens	3.1 to 3.3 Cropping and mounting, sitting, angle of light sources, focusing. 3.2 Computation of screen distance by half-tone dot filteration principle 3.3 Calculation of lens aperture and correct exposures. 3.4 Laterally reversed images by prisms and mirrors.	Obtain a continuous tone copy and calculate main and flash exposure for each. Expose, develop and evaluate the result.

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	aperture and apply it to derive correct exposure. b. Obtain constrast control using flashing techniques and produce combined line and half-tone positive from line and half tone negative. c. Produce dua-tone job.	3.5 Development times and correct exposures by densitometers in making half-tone negatives. 3.6 Contrast control by flashing techniques e.g. yellow filtered light before processing, 3.7 Combine line, half-tone positive line and half-tone negative by using contact printing or projection method. 3.8 Combine line, half-tone positive line and half-tone negative by using contact printing or projection method. 3.9 Direct positive by chemical reversal 3.10 Dua-tone, drop out, tint backgrounds and continuous tone negative/positive film.	Establish the basic exposure for making line negative with your camera and find the most suitable "F-stop". Emphasize practical production.
4.	**Computer Operation** a. Identify and state the function of the Computer b. List the parts that make up the whole computer unit . Identifying the computer soft ware		Examine the whole computer as a unit and separately. Advantages and disadvantages stressed. Operational procedures of the computer mastering the print in colour separation

PROCESS CAMERA II - CPR 15

S/N	Topics/Objectives	Content	Activities/Remarks
1.	**Retouching Instruments and Materials** a. List and describe instruments and	1. Retouching and colour corrections materials, e.g. scalpel, brush, lacquer etc. 2. Correct uses f various retouching materials.	A new development negative to be viewed and retouched on a light table.

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	materials used for retouching.		
2.	**Application of Chemicals** a. Explain the chemistry and application of the chemicals. b. Use munsell Oswald colour charts to deduce dot size combinations.	1. Proportional reducers, super proportional reducers, intensifiers, etc. 2. Usage of specified chemicals for density reduction of continuous tone negative dot-etching selected areas of half-tone negatives and positives to obtain required dot sizes. 3. Munsell and Oswald colour charts dot size combinations and colour corrections.	Their chemistry and applications should be emphasized, e.g. density reduction of continuous tonenegatives, dot-etching.
3.	**Retouching Techniques** a. Rectify defective negatives and positives b. Effect just a position of elements and apply air brush on continuous tone originals before exposure on the process camera.	1. Correction of defective negatives and positives by use of opaque, dyes. 2. Writing on negatives and positives, justaposition of elements. 3. Air-brushing effect.	Emphasize Practical production.

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MACHINE PRINTING AND FINISHING
SURFACE PREPARATION – CPR 16

S/N.	Topic/Objectives	Contents	Activities/Remarks
1.	**Process Engraving** a. Describe and state the use of various instruments, equipment and materials in process engraving. b. Develop exposed plate and use bituminous powder and dragons blood effectively. c. Explain the principles governing the powderless etching methods and operate machines to produce printable block. d. Explain the working principle of electronic engraving machine and produce plate such as varioklischograph	1.1 Materials, equipment and instruments for process engraving. 1.2 Line and half-tone work. Line work made of solid areas and of uniform tansity, half-tone-dots of varying shapes. **1.3** Conventional methods: Principles, advantage and disadvantages. **Gravure Cylinder** **Preparation** 4 ways are: i. by direct transfer ii. by diffusion etc iii. by the electro-mechanical iv. by laser cutting 1.4 Coating and preparation of materials: powder water, nitric acid etc using light sensitive emulsion with whirlers. 1.5 Development of exposed plates, etching, hardening of exposed plates before etching. 1.6 Depth of ideal and shouldered image. 1.7 Principles of powderless etching: Advantages and disadvantages, exposed plates, residual coating. 1.8 Etchant and mordant: Constituents and functions. 1.9 Etching machines: Operations for blocks and proffs, block finishing. 1.10 Processing non-metalic plates. Highlight time saving and cost effectiveness as advantages. i. obtain blanksensitive plate ii. Place plate and negative together in vacuum frame. iii. Exposure. iv. Spray etching solution v. Instal plate and print.	Use of bituminous powder and dragons blood to be highlighted. Use of magnifying glass to view half-tone print recommended here. Mix correctly for good Etching 1. Equipment such as vario-klischograph must be used.

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		1.11 Electronic engraving principles: (a) Original copy (photo or line drawing) attached to copy cylinder. (b) Photo electric cell scan the copy. (c) Transfering to the cutting head a background in electronics is needed to understand completely the principles of electronic engraving.	Emphasize practical production.
2.	**Duplication Process and Foundry-Work** a. Describe various tools material and equipment used in duplicate plates making state their uses. b. Prepare forme for stereotyping and duplicate plates using various methods. c. List advantages of electroplating duplicate plates and produce electrotype shell. d. Carry out proofing of duplicate plates.	2.1 Duplicate Plate-making; tools equipment and ,materials, advantage, 2.2 Stereotype and conventional letter press printing forms. 2.3 Forme and moulds for duplicating plates. Stereotype making (a) Assembling of type and original image carriers. (b) Forming of matrix or mould (c) Metal poured on matrix-casting (d) Remove excess metal from non-image areas. 2.4 Methods of casting duplicate plates 2.5 After-treatment for fat-bed stereotype duplicate plates. 2.6 Faraday's first and second laws of electrode position. 2.7 Eletroplating duplicate plates: Advantages: e.g. (a) Sharpness of image retention of original size of image. (b) Perfect register © Longevity of plate etc. 2.8 Electroplating:- Process of transferring very small bits (Tons) of one type of metal to another type of metal. Electrotype shell and after-	Obtain a sample each, kind of letter press image carriers in local graphic commercial presses. Application of these laws to electrotype duplicate and plate making. Mount and build each images type height. Proof each image carrier under scace condition. Use magnifying glass to compare result of each proof. Compare the image carriers with each other.

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		treatment. 2.9 Proof reading of duplicate plates.	Practical production of samples required.
3.	**Litho Plate Making** a. Identify, select and use various litho plate making materials and equipment and state their applications. b. Explain the importance of printing on litho plates. c. Describe the characteristics of different types of light sources. d. Plan and assemble films using precision aid.	3.1 Applications of litho-plate making materials and equipment e.g. whirler, vacuum frames etc. - Plate developing sink - plate finishing table - plate storage cabinet and drying cabinet know various types of plates such as: (i) Direct image, (ii) Pre-sensitized and (iii) one step Photographic plates desensitized plate. 3.2 Chemistry of Plate-making i.e. the effect of light on light sensitive coating why ink is attracted to image area. 3.3 Wettability of surfaces contact angles and their effects on litho-graphic printing. 3.4 Importance, materials and equipment for printing litho-plates. 3.5 Grains: Types and methods of production. 3.6 Characteristics of types of light sources in litho plate making. 3.7 Basic exposure bases and under-cutting: Causes and remedy (i) Failure to use vacuum plate maker. (ii) Multiple source light will have negative effect on the exposure etc. 3.8 Precautions for good litho plate production – use point source light - Platemakers transparent gray scale. - Vacuum frame plate make. 3.9 Planning and assembling films using precision aids e.g. blud ling keys etc. 3.10 Multiple image reproduction: Manual step and repeat. 3.11 Surface deep etch presensitised and	Emphasis should be on presentised plates which printers prefer today. Have a standard exposure time (1) Secure a presensitised plate and examine marking on the plate list the purpose of each of the markings. (2) Make two printing projects. (i) using presensitise

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		multimetal plates.	plate. (ii) Using one-step photographic plates.
4.	**Gravure Plate Making** a. Describe materials and equipment used in gravure plate making and state their applications. b. Exposed and process the carbon tissue. c. Etch copper plate, finish the cylinder and obtain good proof from finished plate or cylinder.	4.1 Gravure plate making: Materials and equipment e.g. (i) electronic gravure engraving machine. (ii) Etching machines (iii) Microscope b. 3 main types of gravure image carriers (i) flat plate (ii) wraparound (iii) cylinder 4.2 Conventional screen and gravure screen. Gravure screen contains transparent lines. 4.3 Conventional gravure plate making and half-tone plate making 3 steps: (i) mask exposure, (ii) attaching mask to cylinder (iii) etching 4.4 Carbon tissue exposure and processing. 4.5 Etching solution: composition and preparation e.g. 30% Be-45% BE 4.6 Copper plate/cylinder etching with etching solution. **Note:** The etching depth is determined by the thickness of gelatin in each rectangular dot. Proof from finished plate or cylinder.	**Activities 4.1 – 4.6** 1. Visit a gravure printing plate. Carefully observe the gravure printing process and analyse your observation. 2. Produce a dry-point engraving and reproduce several copies from it. Practical capability required.
5.	**Stencil Preparation** a. Produce hand made stencils. b. Prepare a good	5.1 Use cardboards to make hand made stencils, know the cutting tools. 5.2 Paper stencil, blockout stencil, washout stencil: Be familiar with the process.	

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	screen mesh strecher and correct merge materials. c. Develop correctly, and register stencil produced for printing.	5.3 Be familiar with other commercial films used for screen printing operation. 5.4 Screen preparation with mesh stretcher and merge materials, degreasing screen. 5.5 Direct stencil work: by retouching positive coating, mixing photographic emulsion, coating screen, and drying 5.6 Computation of exposure time by inverse square law (New Distance old time = (Old Distance x 1 New Exposure Time Closing of angle of incidence for change of angle of light (New distance Old Time = New Exposure (Old Distance x 1 time Cosine of angle of incident 5.7 Development and exposure of presensitised film for indirect work. Retouching stencils for printing; cleaning and screening with suitable solvents.	1. Write your name with any lettering design and cut the stencil. 2. Construct a screen printing unit for flat or cylindrical objects - prepare a design - use any of the stencil methods to prepare the stencil. Practical production required.

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MACHINE PRINTING – CPR 17

S/N.	Topic/Objectives	Contents	Activities/Remarks
1.	**Letter Press. Materials, Equipment and Job Planning** a. Set out and interpret specifications in the work ticket and write	1.1 Work ticket specifications e.g. quantity of books or forms, type of paper, colour of stock Basic sheet size ink colour, length of run, etc. 1.2 Job operational sequence: (i) composing (ii) lockup and imposition (iii) Proofing (iv) Make ready and printing	**Activities** 1. Draw a complete lockups, illustrating both kinds of locking up methods. Indicate the best location for the quoins.

	the sequence of operation for a given job. b. Identify and classify hand tools and materials used in letter press. Select and use the appropriate tool in a given situation. c. Identify various types of printing papers, covers and boards by their sizes, substance colour and grammage. d. Describe the composition and properties of printing inks and explain their reaction to additives.	1.3 Letter-press printing surfaces e.g. forme of movable types, lines and half-tone blocks etc. 1.4 Features of an imposed forme e.g. the head, back gutter, tail etc. 1.5 Precautions in arranging materials to lock up forms. 1.6 Hand tools and materials in letter-press printing and their applications e.g. imposing stones, quoins, quoin keys planner blocks, reglets, chases, furnitures. 1.7 Precision aids e.g. type, height guage micrometer, registerscope etc. 1.8 Execute imposition scheme up to 16 pages including irregular imposition schemes such as roll-rold and concertina. 1.9 Mounting bases for blocks, metal rubber etc. 1.10 Printing papers, covers and boards e.g. (i) Newsprint (ii) Uncoated papers and coated papers (iii) Boards, (iv) Parchment, (v) Non-paper e.g. plastics. 1.11 Printing inks – composition and properties i.e. pigment, verticle and additives. Letter-press inks - must be viscous – tacky and dry mainly by oxidation. 1.12 Metallic inks – composition and application. Metal powders suspended in a vehicle. Such as aluminium bronze (used in plate of silver and gold) 1.13 Thermographic materials and their applications i. metallic powder and thermography machine, ii. application greeting crds, business cards, formal announcements etc.	2. Looked at an old text-book and examine the back. Try to make an estimate of the size of the original sheet of paper. Types by size, substance colours and grammage. Identify the Printing inks in your workshop.
2.	**Letter-Press**	2.1 Platen machine packing of tympan	

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	Make-Ready Operations a. Obtain correct packing of the tympan on the platen machine. b. Explain and demostrate the process of embossing on the letter-press platen machine. c. Fan and stack paper correctly. d. Match colours to suit given specimen.	Dressing the press. a. insert the hanger sheets under the bottom but not on top bail. b. Position the tympan over the hanger sheets and secure the bottom bail. c. Place a sheet of press board under the last hanger sheet. d. Control of proper impression can be difficult if paper is thin. 2.2 Rollers bearers, ink rollers, type gauges ink-on-store, duct roller i.e. inking the press. Pull an impression. 2.3 Embossing on letter-press/platen machine. 2.4 Dies-male and female, die stamping – special techniques for which platen presses can be adapted. Others are creasing and perforating. 2.5 Impression cylinder. 2.6 Trail run precaution on the platen machine – insert the chase – control image position on the press sheet – pull an impression. 2.7 Paper gauges and use caret marks with guage pins for registered jobs. Friskets should also be used. 2.8 Paper fanning, neat stacking. 2.9 Feeding systems – automatic suction nozzles etc. 2.10 Impression making overlap – hard cut or mechanical. 2.11 Primary colours and their various combinations.	
3.	**The Platen Machine Operations and Job Production.** a. Describe the major parts and operate the platen	3.1 Platen machines – parts and functions: Operations with control buttons and other gadgets and continuations running: Problems courses and remedies e.g. platen machine parts; i. Platen (ii) ink fountain (iii) ink duct (iv) Platen guard, (v)	Practicals required. Plan a job to be printed on a platen press. Compose and lockup the forme in the correct manner.

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	machine. b. List common running problems. State their causes and remedies	Feedback, (vi) Delivery board (vii) impression liver, (viii) Counter. 3.2 Practical operation of platen machine. 3.3 Rectify running problem.	Obtain or cut the paper that you will need for your job. Competency required Suggested jobs and stationery address, cards etc Print the desired number of items with the platen press. Set up, operate and clean the press properly.
4.	**Flat-Bed Cylinder Machines: Make-Ready Operations.** a. Dress the impress on cylinder with full complement of sheets. b. Carry out competently the operations of the cylinder machine stating precautions to be taken in order to obtain good registration of the machine.	4.1 Cylinder dressing for hard, medium and soft packing uses. 4.2 Impression cylinder – dressing with outer manila and inner sheets. 4.3 Setting front and side lays conveyor tapes and runners. 4.4 Feeding systems – automatic feeders e.g. single sheet feeder, stream feeder, cross feeder etc. 4.5 Feed pile table-paper fanning and loading. 4.6 Precautions on running performance of cylinder machine. 4.7 Setting delivery system of cylinder machine 4.8 Supply of ink – inking roller and bearers and adjusting to type height guage, in-on-slab, duct keys, doctor roller, vibrator roller. 4.9 O.K. proof and final running.	**Note:** Perfect image transfer takes place with proper make ready. Also, lubricate press, kep oil reservoir full. Install roller etc. Practical students to carry out these operation under guidance of the teacher.
5.	**Flat-Bed Sheet – Fed Letter-Press Cylinder Machines.** a. Operate the letter using the	5.1 Flat-bed sheet-fed letter press cylinder machines – parts and functions. Such as (i) type form, and chase bed, - forme (ii) feeder unit	1 Outline the steps necessary to clean a cylinder press.

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	control keys. b. Maintain the cylinder machine	(iii) impression cylinder, (iv) Ink rollers (v) Ink fountain etc. 5.2 Operation with control keys. 5.3 Inking – wash up procedures for rollers and ink duct. 5.4 Maintenance e.g. dalling oiling of moving parts etc. 5.5 Cutting, creasing and perforating paper and boards by various methods. 5.6 Numbering.	2. Lubricate a cylinder press using the Press Operators manual.
6.	**Letter Press Rotary Machine: Make Ready Operations.** a. Describe materials and process used in producing duplicate plates. b. Operate the letter-press rotary machines.	6.1 Rotary machine-parts and functions e.g. (i) Plate cylinder, (ii) Impression cylinder (iii) Ink rollers 6.2 Duplicate plates – materials and processes e.g. single colour and perfecting presses. 6.3 Bases for duplicate plates mounting 6.4 Inking rollers, numbering, perforating, pull through and regular feeding. 6.5 Mounting reel on shaft, passing web through machine regular feeding. 6.6 Rotary Press 6.7 Printing procedure.	Competency required. Visit a commercial press house where Rotary Printing is used and write a paperon your visit.
7.	**Lithographic Printing Materials** Identify and state the correct uses of the various lithographic printing materials.	7.1 Lithographic printing plates and their uses e.g. albumen or surface plates, deepetch presentised plates etc. Polyvying alcohol (PVA) diazo and photopolymers are now in use. Lithoplate could be classifued as Deepetch and bimetal or negative acting /positive acting - base materials are now commonly aluminium. 7.2 Chemical solutions for lithographic printing and their composition e.g. Plate etch, etc.	Prepare the damperning and inking system of the press. Make the necessary checks on the dampening system rollers, the inking system pressure. Get proper supervision and make the adjustments.

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8.	**Lithographic Printing: Make Ready Operation** a. Interprete specifications in work ticket and write the sequence of operation for a given lithographic job. b. Identify and state uses of various tools and materials in lithographic printing	8.1 Work ticket specifications, such as (i) Composing (ii) Camera (iii) Stripping (iv) Plate (v) Press, (vi) Binding 8.2 Operational sequence 8.3 Tools and materials in lithographic printing. 8.4 Precision aids e.g. macro meter guage etc. 8.5 Packing plate and blanket cylinders 8.6 Inking-rollers, slab, duct keys, duct roller vibration roller. 8.7 Feeding systems – fanning paper on feed pile, lithographic automatic feeders fronts and side lays, conveyor tapes, wheels and brushes, etch for smooth running of paper. 8.8 Feeding system controls - Speed control lever - Left and right jogger control knobs - Vacuum control etc. 8.9 Precautions for good registration and running performance or lithographic printing machine. 8.10 Delivery system, inking system, dampening system and Blanket installation. 8.11 Delivery system, colour mixing.	
9.	**Lithographic Production** a. Identify and explain functions of major parts of single colour offset lithographic machine.	9.1 Single colour off-set lithographic machine – parts and function viz (i) plate cylinder (ii) impression cylinder 9.2 Monochrome coloured, line, half-tone perfect book 9.3 Running problems and routine maintenance of lithographic machines. 9.4 Blanket preservation by prompt and regular washup	(Project work) Start from the beginning and print a job by using off-set lithography plan, compose, complete the photography work prepare the plate and print.

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	b. Produce monochrome and coloured, line, half-tone jobs and perfect book work sections. c. Carry out routine maintenance of lithographic machines	- clean the cylinder system - lubricate needed parts in preparation for the next printing jobs. - Turn of all electrical power to the press when machine is not working - Cover the press with dust protector cloth.	Identify the five major systems of off-set lithographic presses Competency must be required.

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MACHINE PRINTING II – CPR 18

S/N.	Topic/Objectives	Contents	Activities/Remarks
1.	**Gravure Machine Printing** a. Describe the various plates used in gravure machine b. Name common solvent used in gravure machine and determine the viscosity of ink.	1.1 Gravure machine – plates e.g. flat copper plate, copper sleeves mounted on cylinder e.t.c. solvents e.g. xyol etc. 1.2 Most solvents used are:- a. Aliphatic b. Aromatic hydrocarbons. 1.3 Inking: Volatile inks, viscosity of ink by shell cup method – they must dry by absorption or evaporation. - Gravure ink must have sufficient body to be pulled from the printing plate.	Collect several different printing items. Identify the printing process used to print the items and try to establish what kind of ink was used to print the item.
2.	**Gravure Printing Make ready Operations** a. Describe the basic types of photo-gravure machines and explain the functions of the major parts. b. Write the sequence of operation for a given gravure jobs stating the precautions to be taken in order to achieve good registration and running performance. c. Identify production defects and	2.1 Photogravure machines (a) Sheet or web fed (i) flat plate (ii) curved cylinder b. Large or small 2.2 Doctor blade and ink transfer, gravure plate cylinder - wipes ink from the non-image area of the cylinder. - Must be held in firm contact with cylinder and moves back and forth 2.3 Inking system of gravure printing machine 2.4 Operational sequence of gravure printing machine, under-packing for plate cylinder – The cylinder rotates through a fountain of ink, the ink is wiped by a doctor blade. - paper passes between image and impression cylinder. 2.5 Paper fanning and stacking, sheet pile the reel. 2.6 Feeding systems of gravure machines usually from large rolls. 2.7 Precautions for good performance.	Highlight differences between them. Highlight functions of doctor blade.

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	provide suitable remedy.	2.8 Delivery system colour mixing, production defect and remedies, operational safety measure.	Competency development required.
3.	**Gravure Production Printing** Operate and maintain gravure machines.	3.1 Operation of: (i) single unit gravure machine (ii) Four-unit reel fed gravure machine and routine maintenance.	Write a term-paper on Gravure printing production – high lighting various methods of gravure cylinder preparation and printing. Competency development is essential
4.	**Screen Printing** a. Identify and state the uses of common tools materials and equipment in screen printing. b. Select and use correctly; tools equipment and materials for given screen printing job.	4.1 Screen printing materials and equipment uses emulsions, films, squeegee screen, fillers, masking tapes, etc. 4.2 Registration of jobs. With registration tab or transparent sheet. 4.3 Inking and surfaces and taking proofs. 4.4 Hand or semi-automatic printing machines in one to four colours. 4.5 Racking system for drying printed jobs either – clothes line, stacking, or use of heat curing dryers.	Plan, prepare and print a product suitable for screen printing. Select the most appropriate image carrier for the particular job. Remember to use the correct ink. **Project for CPR 18** Produce a print each of: (a) Letter Press (b) Lithography © Gravure and (d) Screen printing Competency required.

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PRINT FINISHING – CPR 19

S/N.	Topic/Objectives	Contents	Activities/Remarks
1.	**Print Finishing** a. List and describe equipment and accessories used in print finishing operation. b. Explain common technical terms in print finishing operations.	1.1 Equipment and accessories in print finishing operations. 1.2 Bench and machine operations. 1.3 Technical Terms in print finishing: Glueing up signatures, guarding, staggered stiching etc.	**Class Project**: Plan and produce from 50-100 copies of a booklet. E.g. Sewing frame, backing machine line press etc. Complete the necessary paper cutting, trimming, folding, scoring and binding operations competency and development required.
2.	**Warehouse Routine** Take inventory of materials in the warehouse and classify paper.	2.1 Book binding materials and their applications. 2.2 Inventory, stock receipt and issues procedure in the ware-house. 2.3 Classification of paper	2.1 e.g. leather, buckram, PVAC, coated paper, gold foil etc. Sizes, substance, grammage, texture, colour etc.
3.	**Print Finishing Operations.** a. Carry out the different types of print finishing operations. b. Perform folding operations and collate correctly sections of a book	3.1 Folding operations on folding machine. 3.2 Sections of a book-collation. 3.3 Bunding and storage. 3.4 Stitching operations with manual and power operated machines. 3.5 Imposition and the print finisher. 3.6 Hand and machine sewing 3.7 Gluing-up operations 3.8 Trimmed and edged-out job 3.9 Rounding and backing operations. 3.10 Guillotine – its use for	Competency development required. Competency development required.

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		print finishing. Binding operations e.g. quarter binding, half-binding, full-binding, book edge decoration, spring-line and colouring.	

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