Six Semester Courses in Graphic Arts

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SIX SEMESTER COURSES IN GRAPHIC ARTS

A THESIS
SUBMITTED TO THE GRADUATE DIVISION OF
WESTERN MICHIGAN COLLEGE OF EDUCATION
IN PARTIAL FULFILLMENT OF THE REQUIREMENTS
FOR THE DEGREE OF MASTER OF ARTS

By
Glen D. Moerdyk
Western Michigan College of Education
June, 1954
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CHAPTER I
INTRODUCTION

A Six Semester Course in the Graphic Arts is the result of felt needs on the part of the author as a result of his three years of teaching in the area and three previous years of practical experience. These needs are to illuminate or minimize the monotonous routine of compose, proof, and distribute foundry type in the traditional printing course; to get a tangible, usable, finished project in the hands of students; to put more practical and new learning experiences into the curriculum to meet the demands for those wishing more work in the area; and to give the students a more complete knowledge of the total industry of mass duplicating the written and illustrated language.

From the first few weeks of the author's teaching career, it was apparent that changes had to be made in the printing courses to meet, hold, and increase the interest of the students. Students rebelled after a few weeks of the traditional compose, proof and distribute routine of letter-press printing. They wanted to produce jobs calling for presswork and usefulness. Advanced students wanted only to produce production jobs for school
organizations. The traditional courses had lost their holding power in the situation the author inherited and a stalemate of learning had been encountered.

The author had found a need in his own experiences for change. He had been trained in eighteen hours of letter-press printing as a general degree student in college. He was satisfied until he encountered a competitor using another method of duplication and taking the trade away from the establishment where he was employed. He found a need to know more about the total field of duplication in order to discuss business with his contacts and explain the methods employed by the two competing concerns. Thus, the author has been interested in the broader field of mass duplication and recognizes the need for broader training.

The need for change was apparent. A step in the direction of this thesis was underway in the Grand Rapids system in the junior high division upon the author's employment.

A course called "Survey of the Graphic Arts" based on the text, Exploring the Graphic Arts, had been started. Nothing had been done to the high school division curriculum. Thus, the author conceived the idea upon which this thesis is based. The high school courses needed to be revised to keep in step with the survey course of the eighth grade

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and to enliven student interest and initiative as well as to give the student a more complete picture of the graphic arts industry today.

Several approaches have been made to arrive at the course outlines as written in this thesis. The first was reading to get a general idea of areas and support to the idea. The second step was industrial visitation and talking with employees, plant superintendents, and owners. The third main approach was to formulate a few ideas on projects and approaches to the various areas and experiment with them in the classroom situation. The courses as given have not been completely tried as such. Several parts will need additional equipment in the author's present situation. The thesis has been arrived at and formulated to give a foundation and concrete structure to guide and direct the author. Time and experience will dictate the modifications and revisions.

Available published literature is weak in one main point. There are no statements on the number of semesters that should be offered in the area as general education courses. Therefore, the author has chosen six semesters as the amount of material and units to teach since that seems to fit best without rushing or crowding the learning processes. The author has attempted to consolidate the previous traditional courses of the system and add the new material to
fit into six semester courses. This makes the courses flexible to a three or four year high school. It gives the possibility of a minor or major sequence election by students. The courses allow for the use of a greater variety of individual talents.

The author's objectives in writing this thesis have been:

1. To consolidate his teaching approach.
2. To modernize the curriculum to the present industrial trends.
3. To give the student an organized set of assignment sheets to guide his learning experiences.

Before investigating the literature in support of this thesis, a clarification of terms should be made. Since this area of work was introduced about forty years ago in the industrial arts program, it has been known as "printing." In recent years the term, "graphic arts," has been applied to this area. The term "printing" has become associated with one phase of the total area by custom and that is the letter-press method of duplicating. Graphic arts is a general term used to include all types of mass duplication of the written and illustrated language and their allied industries. The curriculum arrived at in this thesis is built on the assumption that it would be a graphic arts type of curriculum and not built on the narrower field of printing.
A third term is used which has only recently been introduced into the field of graphic arts. The term is "mitography."\(^2\) Albert Kosloff has introduced this term in his recent book to identify the area of silk screen printing. "The term was taken from the Greek (mitos, meaning 'threads' or 'fibers'; graphein, meaning 'to write')."\(^3\)

The rest of the terms used are those that have been common to the particular area for some time and have been accepted by those working in the area.

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\(^3\) Ibid. p. 2.
CHAPTER II

SUPPORT FROM LITERATURE

Literature, both periodical and book publications, support the idea of this thesis. The one lacking element of support is the time allowance for a total program on the high school level or for individual parts. The trend to the broad field of Graphic Arts teaching is recent as educational change goes. Since printing has been one of the smallest and least taught areas in the total industrial arts field, the turnover in teachers is small and the resistance and reluctance to change has been great.

The most specific general statement to this situation was stated very recently by William C. Scott. It is as follows:

The writer wants to make clear that the teaching of graphic arts in our schools is challenged by two trends of thought. There is one group which visualizes the teaching of this subject as purely industrial with the idea of job possibilities alone, and the preparation of the student for the trade. This group is known as the teachers of traditional printing, who teach strictly trade printing such as typesetting, lockup, presswork, stock cutting and shop maintenance and management. Second, and more correctly is the group which views the subject from the cultural, aesthetic, and most important general educational angle.

In the writer's opinion the traditional printing course and the methods of teaching it are definitely

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on the way out. These are being replaced by more progressive teaching methods and the broader pupil centered graphic arts laboratory courses which have been, and are being developed throughout the Cleveland system.

For a composite trend of the whole area a review of three publications by the American Vocational Association will give the story of the switch from traditional printing to Graphic Arts. The first published in 1934 listed sixty-two things that a student should be able to do and seventeen things he should know. Every one of the eighty items dealt with letter-press printing achievements. No consideration was given the other methods of duplication. The 1946 bulletin listed virtually the same items with no consideration for the total picture. The 1953 bulletin was a complete revision.

The revision was thorough. The section title changed from printing to graphic arts. Objectives for the field were given. Examples on how to realize the objectives were given. Three main divisions were given as Basic Graphic Arts Manufacturing Processes, General Informational Topics, and Technical Informational Topics. Eight specific areas were touched on under each main division. Those areas are:

Relief printing, Lithographic offset printing, Etching and gravure printing, Stencil printing (silk screen, mimeographing, serigraphy), Duplicating (spirit, hectograph), Photographic processes (photography, photocopying, photostating, duplication and reproduction, ozalid printing, blueprinting), Bookbinding, and Paper and papermaking.6

R. W. Strum7 in gathering information for his thesis in 1939 found that his review of literature supported the following hypothesis: 1. That the graphic arts content as now offered in shop work in the secondary schools consists primarily of "letterpress" printing. 2. That the examples of industry require that graphic arts courses include a great deal more than letterpress printing. 3. That current educational trends demand a wider range of graphic arts content in the industrial arts curriculum. 4. That there is a lack of appropriate instructional material in related graphic arts content.

D. D. Barnard arrived at twenty specific teaching units in writing his thesis in 19478 and in summarizing

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6Ibid, pp. 69-74.


the findings in an article in 1949. These units were submitted to a sample of teachers for their evaluation on importance from several standpoints. The arrived at order of units were: Letterpress printing, Block printing, Screen stenciling, Bookbinding, Papermaking, Typewriting, Stereotyping, Photoengraving, Lithography, Photography, Blueprinting, Stencil duplicating, Relief etching, Rubber plate printing, Intaglio engraving, Intaglio etching, Stenciling plain, Pantograph, Gelatin duplicating, and Marbling.

Barnard made the following statement in his article:

There has been a definite trend during the past several years for educators and leaders in the graphic arts field to include more than the conventional letterpress printing in courses offered in the industrial arts curriculum of the secondary schools.

G. J. Mills in discussing the aims of the printing teacher had the following to say:

Note should be taken of emphasis that there are three major printing processes rather than just letterpress which we so often refer to as "printing." At present relief printing is becoming less a part of the total printing produced. Printing teachers should acknowledge this trend and make an effort to show its importance even though they may not be in a position to give instruction in planography and intaglio. Plant visitation is a helpful tool in illustrating the rise of newer processes.


D. E. Carlsen writing outside the industrial arts periodicals opened this article with the following paragraph:

Graphic Arts, a phase of industrial arts, is an area of instruction which affords many opportunities to integrate various subjects in the secondary school curriculum.

He later followed up his opening paragraph with the following:

Not only do courses in the graphic arts laboratory contribute to the aims of education, but they also increase the holding power of our schools by making academic subjects interesting through their application to creative projects.

Carlsen gave the following units to be covered: type composition, block cutting, rubber stamps, celluloid engraving, silk screen, mimeograph, bookbinding, papermaking, ditto duplicating, planography, hay printing, blueprinting.

A number of theses have been written in the past few years in the graphic arts area. The two cited above by Strum and Barnard are the latest dealing with evaluation of the area content in general. Only two others suggest possible treatment of the same areas as the course in this

\[\text{\textsuperscript{11}D. E. Carlsen, "Graphic Arts a Factor in General Education," School Executive. 72: 46-48, February, 1953.}\\
\text{\textsuperscript{12}Studies in Industrial Education, AVA Bulletin No. 4, American Vocational Association, Washington, D.C., 1949.}\\
\text{Summaries of Studies in Industrial Education, Prepared by Research Committee, National Association of Industrial Teacher Educators. Published by Educational Services, Ford Motor Company. Dearborn, Michigan, 1953.}\]
thesis. Lawrence Brink\textsuperscript{13} wrote an introductory course to the graphic arts. The author received his first big stimulus to this idea from this thesis while pursuing most of his graphic arts training under Mr. Brink. Nelson M. Connet\textsuperscript{14} wrote for a complete high school curriculum. He stressed a course of study in the graphic arts for a large high school including typography, design, paper, engraving, presswork and bookbinding. The areas suggest that it is purely a letterpress course with design, paper and engraving as its allied branches. The areas independent of letterpress seem to be lacking from the summary.

Textbooks in this area may be divided into three main classes. These classes are: letterpress with possible brief treatment of one or two of the allied areas as related information, specialized in one of the areas, and general graphic arts. The majority are in the first class, the second class has been growing, while only two are written to cover the complete area fairly comprehensively without favoring any one area. The two general texts covering everything


are: Exploring the Graphic Arts\textsuperscript{15} and Graphic Arts Crafts\textsuperscript{16}.

Both have been published in the last twelve years.

The trend in the older established texts of the letterpress variety is to include chapters on the other branches in revised editions. The Practice of Printing by Ralph W. Polk\textsuperscript{17} is a good example of this. Mr. Polk has three chapters dealing with other methods. Another example is General Printing by Glen U. Cleeton and Charles W. Pitken.\textsuperscript{18} In adding ten new units, they have devoted four of them to other areas than plain letterpress.

While letterpress printing is still the dominate phase taught as an industrial arts course, the trend is towards a broader curriculum taking in every type of mass duplication method and their allied areas. The thesis of this report to broaden the offerings of the graphic arts shop is quite well supported.

\textsuperscript{15}Marinaccio and Osburn, op. cit.


\textsuperscript{17}R. W. Polk, The Practice of Printing. Peoria, Ill.: Charles A. Bennett Company, 1952 (Revised and Enlarged Edition).

CHAPTER III

THE COURSE OUTLINES

The course outlines in this thesis have been arrived at after consideration of the suggested units by Barnard and Carlsen in their periodical writing, the areas covered by Marinaccio and Osburn, and Kauffmann in their textbooks, and the available space, equipment, and possible expansion in the near future of the author's present shop.

The courses have been written on the assumption of a five day week with the semester running approximately twenty weeks. Flexibility to the course length has been given by making the last few assignments further practice and creative in skills already learned. The assignments have been prepared to work on an assumed schedule of one related day to four shop days. This will give approximately one technical or related assignment to every week with one shop assignment.

In some cases the instructor may want to vary, particularly in the early days of a semester, and give the first two or three related topics before assigning practical work. The courses are designed as guides. They have not been worked out in all details as to methods of presentation and visual aids as these may vary in different school systems or even from semester to semester in the same system.
Practical assignments have been left in the suggestive stage rather than suggested copy. This has been done to minimize stereotyping the work and in hopes of stimulating student imagination and initiative to create original jobs. The method does put more work upon the instructor in arousing some of the less imaginative students, but the author has found in his short time of teaching it is a little more gratifying than the results of a set repetitive job by everyone.

The course outlines, sample assignment sheets, and available bibliography to students for six semesters as sent to a jury of graphic arts men for evaluation are as follows:
Graphic Arts Course I

Fundamentals of Letter-Press Printing

Graphic Arts Course I, Fundamentals of Letter-Press Printing is a beginning course in the Graphic Arts area of Industrial Arts on the high school level. The semester is twenty weeks with the class meeting one hour daily.

A. Practical Projects, Jobs, and Operations:

1. Fundamental Steps and Operations in Type Setting:
   Spacing material, difficult letters, justification at end of line, removing type from stick, tying up, proofing, correction, distribution, setting a poem.

2. Centering a Line:
   Use of quads, setting an announcement.

3. Justification within a Line of Type:
   Spacing between words, space combinations, even spacing, setting a paragraph with regular indentation.

4. Continued Paragraph Setting:
   Use of square indentation.

5. Continued Paragraph Setting:
   Use of hanging indentation.

6. Platen Press Operations:
   Lockup, stone proof, makeready, feeding, inking, washup, oiling. Production job of centered lines as stationery, name card, memo pad, etc.

7. Alignment of Figures and use of Leaders:
   Composition using figure alignment and open dot leaders. Student class schedule suggested.

8. Continued Leader Composition:
   Use of diamond style of open dot leaders. Table of contents suggested.
9. Continued Leader Composition:
   Use of closed dot or hyphen leaders.
   Short order menu suggested.

10. Press Job or Project:
    Bookmark or alternate job within ability.

11. Punctuation Exercise:
    Paragraph composition using quotation marks
    and other punctuation marks not commonly
    used.

12. Initial Letters:
    Paragraph composition with initial letter.

13. Press Job or Project:
    Student choice of job within his ability.
    Suggested are identification card, stationery,
    membership card, Christmas or greeting card,
    memo pad. Possible use of linoleum blocks.

14. Border Composition:
    Composing motto card with brass or strip
    rule as border.

15. Continued Border Composition:
    Bookplate using foundry border.

16. Display Type and Long Measure:
    Composition of simple poster using display
    type and pieces of leads and slugs.

17, 18, 19 and 20. Student Initiated Jobs within
   Ability:
   Use of layout and planning. Suggested list
   of ideas available. Possible use of linoleum
   blocks.

D. Technical and Related Information Units:

1. Introduction to Graphic Arts:
   Explanation of different printing mediums,
   tour of shop, general outline of course.

2. Explanation of Printers' System of Measure and
   California Job Case:
   Explanation of printers' system of measure
   and its application with problems. The
   importance of the type case, kinds and layout
   of California job case and the importance
   of learning it by heart.
3. Type and Its Manufacture:
   Kinds of type by manufacture, sizes of type, parts, a piece of foundry type, styles of type faces.

4. English for Printers:
   Paragraph indentations, capitalization, punctuation and division of words.

5. Copyreading and Proofreading:
   Difference between the two jobs, set of marks for each, necessity for accuracy, exercises in both.

6. History of Printing:
   Early ways of recording, early written language, invention of printing, its spread from Germany to local community and the importance of John Gutenberg and Benjamin Franklin.

7. Safety and Health in the Print Shop:
   General conduct, safe practices around presses, cutter and other areas, care of solvents and rags, general health hazards and how to minimize condition.

8. Printing Machinery:
   Type setting machines and their basic operations, types of printing presses and elementary bindery machines.

9. The Printing Industry:
   Size and importance in the industrial world as well as the cultural world, types of shops, printing organizations in management and labor.

10. Allied Industries:
    Brief description and importance of offset lithography, silk screen, rotogravure, engraving, bookbinding.

11. Printing as a Career:
    Study by major divisions and by specific jobs.

12. Printing Vocabulary:
    Stress of main words student has encountered and their meanings and spelling.
13. Reproduction of Illustrations:
   Linoleum and wood block and engraving.

14. Elementary Layout:
   Paper size, margins, line length, five items
   copy should include, composing directions.

15. Paper and Ink:
   Raw materials in paper-making, steps in manufacture, kinds, grades, basic sizes and
   weights, Raw materials in making ink, steps
   in manufacture, kinds, grades, uses. Paper
   problems.
Graphic Arts Course II
Design in Printing

Graphic Arts Course II, Design in Printing, is the second course in the Graphic Arts area of Industrial Arts on the high school level. The semester is twenty weeks with the class meeting one hour daily. Graphic Arts I is a prerequisite.

A. Practical Projects, Jobs and Operations:

1. Elements of a Layout:
   Clip ads showing display lines, body type, and signature, clip ads showing formal and informal design, sketch a rough layout of one formal ad and compose it.

2. Type Designs:
   Clip samples of type by face design, width of face, and weight of face. Set a line of as many samples as the shop has. Compare.

3. Kinds and Uses of Paper:
   Collect as many samples of different types of printing as possible and identify the kind of paper used.

4. Commercial Printing Forms:
   Collect at least ten samples of printing jobs you could use as ideas. Rework an informal one into a formal one in layout form and compose.

5. Design of a Handbill:
   From real or imaginary copy, layout and design a formal style handbill (6 x 9 inches). List operational steps before starting to compose.

6. Indentions in Design:
   From original or imaginary copy, layout and design a 4 x 6 inch ad or 6 x 9 inch handbill using at least three indentions. Clip ads or printed pieces showing at least five different indentions.
7. Balance in Design:
   Layout and design an ad, handbill, title page or appropriate job having definite type groupings that are in balance.

8. Proportion in Design:
   Layout and design an ad, handbill, or appropriate job giving particular attention to proportion in size of page, type area to paper, and between elements in the type form. Clip and critically check some of the proportions.

9. Shape Harmony in Design:
   Layout and design a piece of printing from original copy or printed copy paying particular attention to shape harmony between elements.

10. Subject Harmony in Design:
    Layout and design a piece of printing with either masculine or feminine appeal. A product or event is suggested.

11. Tone Harmony and Contrast in Design:
    Layout and design a piece of printing having definite tone harmony between elements or using type only having a contrast between elements.

12. Color in Printing:
    Using all the elements of design previously stressed, design and layout a two color printing job of student's own choice.

13. Three Color Printing:
    Layout and design a three color printing job using a good three color combination.

14. Use of Borders and Ornaments in Design:
    Design a piece of printing using a border and possibly an ornament. Make sure of proportion and harmony.

15, 16, 17, 18, 19 and 20. Further practice in Layout and Design:
    Layout and design six jobs of student's own choice employing the principles of design.
B. Technical and Related Information Units:

1. Introduction to Layout and Design:
   What is a layout, importance of layout, essential in a layout, importance of design, main divisions of design.

2. Importance of Type in Design:
   Classification by face design, face width, face weight. Difference between old style, modern and sans-serif. Rules for mixing and using type designs.

3. Kinds of Paper:
   Classes of paper, their uses, importance of paper to the design, review of paper sizes and relationship to job design.

4. Commercial Printing Forms:
   Types of printing forms, general information included in each type, common sizes the form takes.

5. Introduction to Principles of Design:
   Five principles listed by Folk, six major and four minor principles by Chambers and I.T.U. Brief application and definition.

6. Use of Indentations in Printing:
   Types of line and paragraph indentations, their strong and weak points and their general uses.

7. Balance in Design:
   What it is, how it is used, its importance, differences between informal and formal balance, and mathematical and optical center.

8. Proportion in Design:
   What it is, how it is used, its importance, five oblongs and their factors, paper page to type page size, problems in figuring proportion.

9. Shape Harmony in Design:
   What it is, how used, its importance, five rules of typographic harmony, type design to shape harmony.
10. Subject Harmony in Design:

What it is, how used, its importance, four ways a piece must fit subject harmony, what is meant by thinking through a job.

11. Tone Harmony and Contrast in Design:

What is tone harmony, how used, its importance, three main tone values, what is contrast, how used, its importance, and its limitations.

12. Color in Printing:

Importance to printing, primary and secondary colors, warm and cold colors, complimentary colors, harmony in color, effect of colored papers, two, three, and four pleasing color combinations.

13. Use of Border and Ornaments in Design:

Types of borders, uses of borders and ornaments, guiding principles in selection, differences between border, panel and box.
Graphic Arts Course III
Advanced Composition, Presswork and Bindery Problems

Graphic Arts Course III, Advanced Composition, Presswork and Bindery Problems, is designed for those desiring more work in letter-press printing, particularly in the job printing field. Courses I and II are prerequisites. The course meets for twenty weeks with the class meeting one hour daily.

A. Practical Projects, Jobs and Operations:

1. Use of rules as Blank Lines and Ruled Form:
   Compose, run and pad a statement.

2. Tabular Form Without Rules:
   Compose and run a tabular form without rules using multiple justification.

3. Tabular Form with Rules:
   Compose and run a ruled tabular form having column headings in one form.

4. Work and Twist Form:
   Compose and run a ruled form having all type and horizontal rules in one form and top and bottom rules with all vertical rules in second form. Space in lockup together so as to run work and twist.

5. Use of Numbering Machine:
   Design, compose and run a ticket or similar job requiring numbering machine in one color composition.

6. Use of two Numbering Machines and Perforating Rule:
   Design, compose and run coat check or similar job requiring two numbering machines and a perforating rule.

7. Two Color Angle Printing and Punching:
   Design, compose and run a tag in two colors on a square piece of paper to read as a diamond with a hole punched in one corner (after press run).
8. Two Color Close Register:
   Design, compose and run a job using two color ornaments or plates requiring close register.

9. Use of Irisket:
   Design, compose and run a greeting card, poster, handbill, or similar job requiring use of an iris ket to block out. It may be a multi-color job.

10. Four Color Halftone Work:
     Using transparent inks run a four color cut.

11. Tint Blocks or Ben Day Screens:
     Design, compose and run a multiple color job using either rubber block or Ben Day Screen for background tint.

12. Multiple Page Lockup and Saddle Stitching:
     Design, compose and run a dance program, memorandum booklet or similar project requiring saddle stitching and simple multiple page lockup, sheetwise or work and turn. (Possible group project of 2 to 3 persons.) Possible scoring.

13. Two, Three or Four Up Press Run, Perforate, Stitch:
     Design, compose and run a job requiring the same printed form two, three, or four up. (Suggest a two or three up receipt book.) Run 200 copies without perforating rule on colored stock, 100 without perforating rule on white stock, and 100 with perforating rule on white. Set up perforator to make necessary perforations in the unperforated white stock. Gather and side stitch into books. (2 to 3 person project)

14. French Fold and Score:
     Design, compose and run a four page program or menu on heavy stock to be scored for a French fold. (2 to 3 person project)

15. Six Page Folder:
     Design, compose, run and fold a six page folder. (2 to 3 person project)
16. Paneling:  
Make a panel card for announcement or name card.

17. Printing on Ribbon or Cloth:  
Design, compose and run an award ribbon or bookmark.

18. Napkin Printing:  
Design, compose and run a napkin job.

19. Die Cutting:  
Design, compose and run a job requiring die cutting of the stock.

20. Embossing:  
Design, compose and run a job requiring embossing.

B. Technical and Related Information Units:

1. Rule and Tabular Composition:  
Types of rules -- strip and brass, face designs, use of rules in forms, multiple justification, alignment of figures.

2. Study of Modern Presses:  
Styles -- platen, cylinder -- vertical and horizontal, web, rotary, multiple color. Types of work best suited for each style.

3. Special Form Composing:  
Composition techniques for work and twist, sheetwise, and work and turn forms. Uses for each method. Advantages and disadvantages of each.

4. Problems in Numbering and Perforating:  
Planing numbering machines and perforating rules in type forms. Press problems with the numbering machine and perforating rule. Protecting rollers and not cutting stock too much.

5. Multiple Color Printing:  
With type forms, close registered cuts and ornaments, four color cuts. Use of color and color combinations.
6. Background Tints and Cuts:
   Use of rubber blocks and Ben Day Screens for background tints, use of cuts for background.

7. Outstanding Men or Printing:
   Reading and discussion assignment on such men as Caslon, Bodoni, Alston, Hoe, Mergenthaler, and others.

8. Figuring and Ordering Paper Stock:
   Figuring number of pieces out of basic stock, figuring cost of stock, problems in use of paper catalog.

9. Cost Estimating:

10. Halftones:
    Suiting halftones to paper, to ink; problems in overlaying and underlaying on press, pre-makeready, study of mountings -- wood -- metal base.

11. Use of Frisket and Printing on Ribbon:
    What a frisket is, its use. Problems with frisket on the press. Press problems in printing on ribbon and cloth.

12. Bindery Operations:
    How to pad, saddle and flat stitch, setting up stitcher, setting up perforator, setting up punch.

13. Career Opportunities:
    On-the-job training, apprentice training, advanced vocational training, regular college training, executive jobs and teacher training.

14. Paneling and Scoring:
    Ordering pre-panelled cards, making panelled cards, composing form and press makeready, necessity for and method of scoring stock for folding.

15. Die-Cutting and Embossing:
    Buying dies, same made with cutting rule, problems in press makeready, making of embossing dies and press makeready.
Graphic Arts Course IV

Planography and Bookbinding

Graphic Arts Course IV, Planography and Bookbinding, is designed to give the student general knowledge in the fast growing field of planography, especially the offset lithography area, and in the methods of binding the final printed job into useable form. Courses I, II and III are prerequisites. The course meets for twenty weeks with the class meeting one hour daily.

A. Practical Projects, Jobs and Operations:

1. Direct Application:
   Prepare a paper plate with typewritten copy and line drawings.

2. Direct Application:
   Set some copy in letter-press type and pull a proof on a paper plate for running offset.

3. Tabular Form:
   Prepare a tabular form by direct application on paper plate.

4. Ruled Form:
   Prepare a ruled form by direct application on paper plate.

5. Two Colors:
   Prepare paper plates for two color. One or both plates having line drawings, no close register.

6. Two Colors:
   Prepare paper plates for a two color close register job.

7. Halftone Illustrations:
   Prepare paper plate with copy by direct application and a stripped in halftone illustration.

8. Paste up Clippings:
   Prepare a page layout of three or four ads, copy to be clipped from previous published ads, and pasted up for camera.
9. Paste up Ad:
Prepare a full page plate ad to represent several items to be advertised by a department store, supermarket, or drugstore.

10. Halftones and Copy:
Prepare a page of glossy photographs to be photographed and stripped into a page or pages with other copy.

11. Plates from Letter-Press Proofs:
Prepare letter-press form to be proofed and photographed.

12. Reduction of Original:
Prepare an over-sized piece of copy to be reduced by camera.

13. Binding, Loose Sheets:
Design a small booklet, run single sheet, bind by drilling and sewing, cover with hard cover.

14. Plastic Binding:
Design a small booklet, run single sheet and bind with plastic bindings.

15. Magazine Binding:
Bind at least six saddle stitched or four flat staples magazines into a single volume with a hard cloth covered cover.

16. Repair and Rebind a Book:
Take apart, strengthen, repair and rebind a book.

17. Hard Cover on Pocketbook:
Put a hard cover on a pocketbook edition.

B. Technical and Related Information:

1. History and Development:
Discovery and early history, transition from stone to metal, direct to offset.

2. Stone Lithography:
Type of stone, preparation for printing, type of presses.
3. **Offset Lithography:**
   Theory of operation, advantages over stone, commercial applications in comparison to other types of presses.

4. **Types of Offset Presses:**
   Office duplicators, small presses, one color and multiple color.

5. **Types of Offset Plates:**
   Advantages, disadvantages and limits of paper, aluminum, and zinc plates. Preshrunk and coated plates -- steps and methods of preparing direct plates.

6. **Photolithography:**
   Preparation of copy for camera, clipped copy, proofs, phototype, paste-ups, lino-film, operation of camera.

7. **Career Opportunities:**
   Classifications of jobs, needed training, apprenticeship, wage scales.

8. **Photo-Gelatin Process:**
   Theory of collo-type, extent of use, comparison of product to other types of printing.

9. **History of Bookbinding:**
   Early forms of books, early binding before invention of printing, outstanding early binders, early customs, introduction of modern techniques.

10. **Types of Bindings and Materials:**
    Hand and machine sewed, hand drilled and sewed, use of cords and tapes, leather and cloth bindings, printing on covers.

11. **Marbling End Sheets:**
    Demonstration on how to marble paper. Equipment and supplies needed.

12. **Care and Use of Books:**
    Stress on using books, storing and preserving of books, things to look for in purchasing books.
Graphic Arts Course V

Lithography, Papermaking, Intaglio, and Office Duplicators

Graphic Arts Course V, Lithography, Papermaking, Intaglio, and Office Duplicators, is designed to acquaint the student with some of the allied and competitive branches of Graphic Arts. Courses I, II, III and IV are prerequisites. The course meets for twenty weeks with the class meeting one hour daily.

A. Practical Projects, Jobs, and Operations:

1. Regular Stencil Method:
   Design and cut an ordinary regular stencil having to use bridges.

2. Paper Stencil Monogram or Silhouette:
   Design and cut a paper stencil for monogramming stationery or a silhouette on a poster. (May be in connection with relief printing.)

3. Lettering with Paper Stencil:
   Prepare and print paper stencil containing lettering with possible illustration.

4. Two Color Lithography:
   Prepare and print paper stencils to give lettering in one color and surrounding background in another color.

5. Straight Copy by Lithography:
   Use mimeograph stencil to print straight copy by lithography.

6. Lacquer Stencil:
   Design, cut, adhere and print a lacquer stencil.

7. Paper Making:
   Make a few homemade pieces of paper to be used in printing etchings.

8. Engraved Etching:
   Prepare a line drawing, prepare plate and etch, print a few copies.
9. Drypoint Etching:
Prepare a line drawing, prepare plate and make a drypoint etching and print a few copies.

10. Mimeograph - Straight Copy:
Prepare and print straight copy.

11. Mimeograph - Illustrated:
Prepare and print a job calling for illustrations as well as copy.

12. Mimeograph - Tabular:
Prepare and print a tabular form calling for multiple tab stops.

13. Mimeograph - Ruled Form:
Prepare and print a ruled form with column heads.

14. Ditto - Straight Copy:
Prepare and print straight copy.

15. Ditto - Illustrated:
Prepare and print a job calling for illustrations as well as copy.

16. Ditto - Tabular:
Prepare and print a tabular form calling for multiple tab stops.

17. Ditto - Ruled Form:
Prepare a ruled form with column heads.

18. Hectograph - Straight Copy:
Prepare and print straight copy.

19. Hectograph - Illustrated:
Prepare and print a job calling for illustrations as well as copy.

20. Hectograph - Ruled Form:
Prepare and print a ruled form.

B. Technical and Related Information:

1. History and Uses of Hithography:
Stencil origins, application to silk, recent growth as a commercial industry, uses by artists.
2. Equipment and Supplies:
   Frames, squeegees, grades of silk, types of
   paints and inks, tusche and glues, solvents,
   cleaning agents.

3. Types of Stencils:
   Paper, block-out, resist, shellac, lacquer,
   photographic, celluloid, cellophane, mimeograph

4. Printing Surfaces:
   Advantages, disadvantages, special treatments
   for paper, cardboard, glass surfaces, cloth,
   metal and wood surfaces.

5. Career Opportunities:
   Training needed for artists, for commercial
   advertising, for avocations.

6. History and Development of Intaglio:
   Origins, development and contributions by
   artists, decline and revival of the art.

7. Study of Various Branches:
   Bitten Line Etching -- hard and soft ground,
   drypoint etching, aquatint, mezzotint.

8. Commercial and Artistic Uses:
   Artists' etching and rotogravure.

9. Study of a Collection of Prints:
   Presentation of outstanding etchings, past
   and present.

10. Career Opportunities in Intaglio Printing:
    Outlet for etchings, rotogravure occupations.

11. History and Development of Office P duplicators:
    Trace origin and development of mimeograph,
    multigraph, ditto, multilift.

12. Advantages and Disadvantages of Office P duplicators:
    Analysis of type of work and comparisons
    with other methods, costs and time.

13. Study of various makes, models and methods
    within a classification.
Graphic Arts Course VI

Graphic Arts Production and Management Problems

Graphic Arts Course VI, Graphic Arts Production and Management Problems, is designed for several reasons.
1. To give the student desiring additional training as a possible avocation or secondary vocation choice while pursuing college preparatory or some other program.
2. To give the older student the chance to work on production problems in any area and especially in letter-press on the automatic fed platen and cylinder press.
3. To give the student training in record keeping and in handling of students. This course would have limited enrollment of the very best students and not at sacrifice to the complete general education of the student. It would, also, be the related course for the on-the-job training students. Courses I, II, III and IV are prerequisites. The course meets for twenty weeks with the class meeting one hour daily.

A. Practical Projects, Jobs and Operations:

1. Feeding Cylinder Press:
   Learn to feed press until student can hit practically every time at moderate speed.

2. Kluge Feed Adjustment:
   Learn to setup and adjust Kluge Feeder for 8 1/2 x 11 bond paper.

3. Kluge Feed Adjustment:
   Learn to setup and adjust feeder to run a 4 x 6 office form work and twist. (sheet is 8 x 6 inches.)

4. Newspaper Makeup:
   Makeup form for one run of the school paper on cylinder press. Makeup ads, heads, and learn to work with linotype set material.

5. Cylinder Press Make-ready:
   Make-ready the newspaper form in four above including changing the tympan, under and over laying of halftones, adjusting ink well, and all other adjustments necessary for good printing.
6. **Multiple Page Lockups:**
   Make up, fold and number a series of multiple page dummies to real size. Make up pages to size and place them properly in chase allowing for margins and trim. (3 forms as minimum.)

7. **Production Planning:**
   Plan a work schedule for all production to get maximum flow of work. Plan composition schedule, availability of presses and press time, bindery operations to meet a delivery schedule.

8. **Cost Accounting:**
   Estimate the cost of a job -- stock, composition time, special materials, lockup time, press time, any bindery costs including time. Then keep track of actual time and costs. Do this for every job.

9. **Foremanship:**
   Conduct the affairs of the class under the direction of the teacher. Keep needed records, assign work, check progress of work. Hold position of foreman for at least two weeks.

10. **Handle Production Jobs:**
    Balance of work will be to handle what production jobs that do come to the shop requiring any operations. Keep track of time on each job and operation. Estimate cost first and keep track of actual cost, figuring an agreed upon wage per hour.

B. **Technical and Related Information:**

1. **Cylinder Press Operation:**

2. **Kluge Feed Operation:**
   Use of air suction theory of operation, steps of preparing press, adjustments, safety precautions.

3. **Newspaper Makeup:**
   Technical makeup operations in shop, theories on front page, editorial, and inside page designs, theory of ad layouts.
4. Magazine and Book Makeup:
   Making press dummy, type of pages required
   and their usual design, figuring margins and
   trim.

5. Production Planning:
   Need for planning and scheduling, working out
   a job plan, routing, and scheduling considering
   other jobs.

6. Cost Accounting:
   Figure estimates and keeping actual cost
   records. Necessity of business to figure
   and to keep records today.

7. Foremanship:
   What it takes to be a foreman, how to plan
   work schedules, points in handling men,
   need to stress safety, need for keeping
   records.

8. Keeping Up on Trends:
   Requirement to read on problems that arise
   and on current industry publications, mini­
   mum of two articles a week.
Course I - Assignment 1

Fundamental Facts on Letter Press

I. Purpose:
To give the student a brief survey of letter-press printing, the equipment and material he will work with and to give him the elementary operational steps in type setting.

II. Study Questions:

1. Name the main divisions of a print shop.

2. List fifteen vocabulary words and give their meaning as used in letter-press printing.

3. Give the steps that a printed job goes through in the composing room.

4. How does letter-press vary from other printing methods; i.e. lithography, rotogravure, mitography?

5. List the four demons of type and other difficult letters.

III. References:

1. Cleeton and Pitkin, General Printing, pp. 11-53


3. Karch, Graphic Arts Procedures, pp. 208-252

4. Polk, The Practice of Printing, pp. 31-64, 67-71

IV. Practical Application:

1. Select copy -- short poem or similar type material.

2. Take a working plan of procedure.

3. Secure materials and proceed, justifying on end of the line.

4. Take job to proof press and receive instructor's approval.
Course II - Assignment 5

Introduction to Principles of Design

I. Purpose:

To get an overall view of the principles of design before investigating any one completely.

II. Questions:

1. What are the five principles of design as listed by Polk in The Practice of Printing?

2. What are the six major principles of design as listed by Chambers in Display Composition? What are the four minor ones?

3. Define each class in one or two above.

4. What does Polk mean by fitness?

III. References:

1. Chambers, Display Composition, lesson 3

2. Hague, Printing for the Schools, chapter 13, p. 97

3. Polk, The Practice of Printing, chapter 25, p. 200

IV. Practical Application:

1. Secure or makeup copy for a 6x9 inch handbill on a school project (real or imaginary).

2. Make several rough sketch layouts in the formal style.

3. Select best one and draw a final layout putting in all details needed to compose.

4. Write out procedure for setting and receive instructor's okay before composing.

5. Compose elements of job.


7. Proof and secure okay of instructor.

8. Lockup and print.
Course III - Assignment I

Rules and Their Uses

I. Purpose:

To give the student technical and practical knowledge in the various uses of rules in composition, particularly in ruled forms.

II. Study Questions:

1. What are the two basic types of rules, their main face designs and body thicknesses?

2. What are the uses for rules?

3. Give the rules for using the different face weights in a ruled form, i.e. top and bottom, other horizontal lines, and vertical lines.

4. Explain multiple justification and how it works.

5. List techniques of aligning figures and why it is important.

6. What is metal furniture and how used?

III. References:

1. Cleetcn and Fitkin, General Printing, pp. 98-102
2. Hague, Printing for the Schools, pp. 130-141
3. Karch, Printing and the Allied Trades, pp. 46-50

IV. Practical Application:

1. Design and layout a statement using rules as blank lines, top and vertical.

2. Take out a plan of procedure and check with instructor.

3. Compose, lockup, make-ready and run.
I. Purpose:

To give the theory of offset lithography as it differs from plain lithography and to prepare a tabular form to be run by the offset.

II. Study Questions:

1. Draw a sketch of the offset cylinders and explain each cylinders purpose.

2. What advantages has offset with light weight plates over direct with stone? What disadvantages if any?

3. What advantages does offset have over letterpress? What disadvantages.

4. Discuss steps and materials needed in preparing an offset plate direct.

III. References:

1. Cleeton and Pitkin, General Printing, pp. 8, 10, 150, 142
3. Karch, R. R., Graphic Arts Procedures, pp. 3-4, 233
4. Kauffmann, L., Graphic Arts Crafts, pp. 161-165
5. Polk, R., The Practice of Printing, pp. 301-304

IV. Practical Application:

1. Design a tabular form to be run by offset.
2. List materials needed and steps of operation.
4. Prepare plate and print.
Course V - Assignment 3

Types of Stencils

I. Purpose:

To gain an understanding of the different types of mitographic stencils and to gain further practice in mitography.

II. Study Questions:

1. Name the various types of stencils used in mitography.

2. What are the advantages and disadvantages of each type of stencil?

3. Why is the laquer film the more popular?

4. What are the main difficulties with paper stencil, particularly when lettering is involved?

III. References:


2. Kosloff, A., Elementary Silk Screen Printing, pp. 19-28

3. Kosloff, A., Mitography, 16-29

4. Kauffmann, D., Graphic Arts Crafts, pp. 124-131

5. Marinaccio and Osburn, Exploring the Graphic Arts, pp. 162-177

IV. Practical Application:

1. Design mitographic job containing lettering.

2. Draw job to finish layout.

3. Trace to stencil paper.

4. Cut out areas that are to print

5. Adhere to screen and print.
Course VI - Assignment 1

Cylinder Press Operation

I. Purpose:
   To give the student an understanding of the cylinder press as a production press and to have a practical experience with it.

II. Study Questions:

   1. Explain the theory of cylinder press operation and how it varies from platen and rotary.

   2. Explain the differences between horizontal and vertical cylinder presses.

   3. What are the main uses for the cylinder press?

   4. What are the advantages and disadvantages of the cylinder press.

   5. What are the safety precautions in operating a cylinder press, particularly a hand fed horizontal.

   6. What are some of the check points for press operation before starting press?

III. References:


   2. Folk, F., Elementary Platen Presswork, pp. 13-20

IV. Practical Application:

   1. Secure a pack of paper at least 17x22 inches.

   2. Observe demonstration by instructor on checking press and hand feeding.

   3. Feed press without rollers or form until you are feeding every time and working throw off lever.

   4. Put on a form and roller and try feeding without error.
Graphic Arts Bibliography

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Kauffmann, L., Graphic Arts Crafts, D. VanNostrand Company, 1948

Klinefelter, L. E., Bookbinding Made Easy, The Bruce Publishing Co., 1934

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Kriechel, H. C., Encyclopedia of Printing Inks, Superior Printing Ink Co., 1932


Palmer, L. W., A Course in Bookbinding for Vocational Training, Employing Bookbinders of America, Inc., 1927


Polk, K., Elementary Platen Presswork, Manual Arts Press, 1931

* Polk, K. V., Bulletin No. 279, Training for Safety, The State Board of Control for Vocational Education, Lansing, Michigan, 1942

*Polk, K. V., The Practice of Printing, Charles A. Bennett Company, 1952
CHAPTER IV

EVALUATION OF THESIS

What is the value of this study? Does it have value? Does it meet a standard? To make sure that the course outlines measure up to acceptable teaching content, they were submitted to a jury of persons in Graphic Arts work.

Eight men in four classifications of endeavor were selected. Two men with varied backgrounds were chosen in each division. The divisions were teacher training, vocational education, industrial arts education, and industry. The jury was selected from persons engaged in these fields within the state of Michigan.

The jury of evaluators is as follows:

I. Teacher Training:

Irwin M. Campbell, assistant professor at Central Michigan College of Education. He has twenty-four years of experience. He is a graduate of Central Michigan College and the University of Michigan.

Lawrence J. Brink, associate professor at Western Michigan College of Education. He has fourteen years of experience. He is a graduate of Western Michigan College and the University of Michigan.
II. Vocational Education:

Kenneth Ross, instructor at Ferris Institute. He has twenty years of experience. He is a graduate of Western Michigan College of Education and the University of Michigan.

Elmer L. Courtney, instructor at Lansing Technical School. He has thirty-two years of experience. He is a graduate of DePauw University.

III. Industrial Arts Education:

J. Herbert Cigard, instructor at Lansing J. W. Sexton High School. He has thirty-one years of experience. He is a graduate of Stout Institute. He is regional vice-president of the International Graphic Arts Education Association.

James Fohey, instructor at Bay City Central High School. He has seven years of experience. He is a graduate of Western Michigan College.

IV. Industry:

Gerald R. Hotelling, owner and general manager of Ace-Hi Displays of Grand Rapids. It is a silk screen process printing plant. He has had seven years of experience and no college.

Arthur E. Ormsbee, partner in the Commonwealth Printing Company of Grand Rapids. It is a general letter-press printing firm. He has fifty-four years of experience.
These men were asked to evaluate the courses of study and sample job sheets as found in chapter three pages 15 to 43. Besides making marginal comments on the course outlines, they were asked to complete the following "Evaluation Sheet for Thesis" with the "Introduction to Evaluators."
Introduction to Evaluators

Six Semester Courses in Graphic Arts is a thesis designed by the author to meet a felt need in his teaching situation. There was need to revise existing courses based strictly on letter-press printing to give more emphasis on the other areas. "A Survey Course in Graphic Arts" is an eighth grade requirement for one semester which added to the necessity to change so that the high school courses were in keeping with the introductory course which had to be brief by time limitation.

The course outlines and accompanying assignment sheets are designed as guides and minimum requirements. They are not intended to be the maximum or the limit that will be covered. The practical assignments have been put in suggestion form to allow for variation, individual differences, initiative, and to avoid stereotyping of composition.

Teaching techniques, methods, and mediums of presenting the material have not been included as these would by necessity vary depending on the circumstances; i.e. The instructor finds at the present time most of the high school classes contain mixed levels. Therefore, at times he will instruct a course on an individual or small group level and at other times on a formal class level. Instructional aids will be employed wherever possible.

The courses have been designed on the idea of one assignment sheet a week. The week to be broken down to one hour related and technical information and four hours practical. This setup will by necessity vary with the different units, particularly early in each semester.

The foregoing is designed to give the evaluator a general background sketch of how the following material will be used in the teaching situation. The bibliography is a general one listing available texts in the school shop for student use.
The evaluation is threefold. 1. To evaluate the complete outline and sample assignment sheets through the use of the evaluation sheets. 2. To give suggestions and comments in the margin of the course outlines. 3. To give suggestions and comments in the margin of the sample assignment sheets.

The author wishes to thank you for your time and help in evaluating this thesis section.
1. Are the courses in keeping with the objectives of general education? Yes ( ) No ( )

2. In what ways, if any, may the courses be strengthened in keeping with the objectives of general education?

3. Are the courses in keeping with the objectives of Industrial Arts? Yes ( ) No ( )

4. In what ways, if any, may the courses be strengthened in keeping with the objectives of Industrial Arts?

5. Do the separate courses adequately cover the area as set forth in its title? Yes ( ) No ( )

6. What changes, if any, in course titles or material under course titles should be made to adequately cover the areas?

7. Is there proper balance between operational, technical and general learning experiences? Yes ( ) No ( )

8. What changes, if any, should be made to bring proper balance between learning experiences?
9. Are the assignment sheets prepared in an understanding manner? Yes ( ) No ( )

10. What changes in the assignment sheets would you suggest? (If you have samples, would you please send some to the writer?)

11. Are the study questions stated clearly? Yes ( ) No ( )

12. Are there suggested changes in form or additions or subtractions to be made?

13. Are the references adequate for the level and area? Yes ( ) No ( )

14. If there are additional references needed, please list here or on separate sheet.

15. Are the practical assignments stated clearly? Yes ( ) No ( )

16. What changes would you suggest in making practical assignments?

17. Does the course provide sufficiently for individual differences and initiative? Yes ( ) No ( )
18. What changes, if any, would you suggest to provide for individual differences and initiative?

Any further comments on the course that would help the writer are solicited here or further comments on the above where sufficient room was not provided. If you have material you believe would help the author, it would be greatly appreciated.

Signed by evaluator ________________________________

Present position ________________________________

Degrees ___________________________ College _______________________

Number of years that you have been in Graphic Arts Work ______
The questions one, three, five, seven, nine, eleven, thirteen, fifteen, and seventeen calling for a yes or no answer were all in the affirmative by the evaluators.

Question two bearing on the courses' relationship to general education objectives bore out two points in the main. One person emphasized the need for reference material with the pupil doing more of the related side on his own. The second was that the outlines have taken a vocational subject closer to general education.

Question four asking for suggestions on strengthening the outlines towards the objectives of industrial arts brought three general comments. One was the need for instilling motivation by letting the student know the why, when, where and how each assignment fits into the total picture. Another reaction was the need for more emphasis on consumer knowledge. There was some feeling expressed that the courses approached vocational objectives.

Question six did not bring much comment. One evaluator thought the project should be separated from the operational suggestions in the outlines.

Question eight asking about changes to bring about proper balance between learning experiences brought the suggestion that extra jobs or jobs requiring more difficult operations and procedures to challenge the fast workers and to change routine should be available.
Question ten bearing on the assignment sheets provoked one comment. Since the assignments for practical work were stated general, the evaluator wondered on the availability of sample jobs.

Question twelve dealing with the study questions brought two reactions that were almost directly opposite while the majority of evaluators passed over the question without comment. The one point of view was that the questions were very good along with the references including page numbers. The second point of view was that "perhaps they are too comprehensive for high school students to master in one week."

Additional references were given under question fourteen that have been found useful by the evaluators. These references are:

Hunter, D., Paper Making in the Classroom
Spicher, C. R., The Practice of Presswork
Polk, R. W., Essentials of Linoleum Block Printing
Composite Analysis of Printing Trade, Research Problem of National Graphic Arts Association
A Manual of Style, University of Chicago
Clark, M. A., Applied Course for Student Printers, Charles Bennett Company

Education for Safety Through the School Shop - 1952,
Association of Casualty and Surety Companies, New York University, New York.

Question sixteen did not bring any further significant comment other than already touched on in references.
One of the evaluators stated to question eighteen dealing with individual differences and initiative the following: "None. Printing probably takes care of the individual differences like no other study."

Under further comments each evaluator had something to say. Most of them acknowledged a rather complete job. Some considered that possibly too much was attempted for the time allotted. One thought that unless a survey course preceded, students not taking the complete six semesters would have gaps in their graphic arts education.

As to comments on the course outlines, there were only scattered comments. Except that there was possibly too much material to be covered in each course, there was no one thing that aroused any general comment. Most comments were hints on teaching techniques or questioning remarks if a phase or word meant to include a larger meaning or specific meaning. The points to be emphasized herein will deal with subject content for the most part.

Under related item thirteen on course one, the suggestion was made to include electrotypes and other duplicated plates under reproduction of illustrations.

Under related item fifteen in course one it was suggested that the topic should be separated into two items reading "paper," "ink" instead of one reading "paper and ink."

One evaluator raised the question on the order of courses between II and III. The question was on advanced composition
and presswork coming before design. This possibly would give the student more experiences to carry into design.

Under practical project item four of course three, it was suggested that work and tumble, work and turn and work and shift types of forms be included. This was, also, included under related item three.

Under related item five in course three, it was suggested to include an item on the need for special process ink in using four color cuts.

It was suggested adding present or more modern names to the study of outstanding men of printing as stated in related item seven of course three.

One evaluator questioned the combination of Planography and Bookbinding in course IV. The suggestion was made that planography belonged in unit V.

Course V raised a couple of important questions. The first was the use of the term, "mitography" for silk screen work. There was some feeling that the term was too recent an innovation and had not been accepted by the industry. It was felt that "silk screen" or "screen process" printing should be used for clearer understanding by all. The second was the questioning as to whether the office machines area should be included in Graphic Arts or left to the commercial department.

The question of time and of prerequisites seemed the points of the evaluators on course VI. Time is always a
factor in accomplishing a task. Some of these assignments may take longer to accomplish because of their nature. This course has fewer assignments which may answer the point. The second point was on the limiting of the type and number of students. It was the evaluator's opinion that all boys should have the type of work asked for in the course.

In closing the author has refrained from commenting on the points brought forth by the evaluators. There seemed to be no major differences that would call for revision of the course outlines. The author will discuss the points more in the next chapter.
CHAPTER V

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

The author believes that he has been able to formulate general education and industrial arts courses in the graphic arts which meet acceptable standards of education. The author started from the feeling of felt needs in his teaching situation. Through these course outlines a guide and foundation has been established to give direction, to give more concrete experiences, and to give broader learning experiences to the students. The base is layed by this research and formulation of thinking for further study and improvement in teaching to meet the needs of students and the changing trends of industry.

These course outlines cannot be accepted as final and the only method of teaching the Graphic Arts. They are a beginning, a foundation, a stepping stone on which to improve. As stated earlier, most of the courses have not been tested as complete units. Revision, deletion, addition may and should come with usage. No course outline should be accepted as final. It should be flexible to keep up with technical advance and research.

Practice and experience will be the only tests that can tell whether too much or too little is included in each course. These courses are quite a change from the traditional
printing courses. The author has condensed some of the tradition by asking for less repetition of certain types of composition. He has included generally only one job of each type as an experience rather than two or more to gain accomplished skill.

It is on this point that fewer jobs requiring the same operations are included that the author maintains he is not approaching vocational training. The courses with the possible exception of VI do not allow for repetitious practice on certain operations to become skillful at their performance. A vocational course does call for repetition of practice projects to accomplish skill. Second, the courses cannot be construed as vocational by close analysis in that they are not devoted to one area within a division of Graphic Arts or to one division. The courses call for broader knowledge of all fields.

As to the order or combination of teaching units, experience will have to be the guide. Design was placed ahead of advanced composition and pressowrk by the author for several reasons. Most basic to the author was the need of instilling initiative and creativeness in the students before they form the habit of pursuing routine or handed out jobs. The author desired to make more use of the students' ability at design by including it early rather than late in the training program. Third, the author feels that the student would have more use for designing and evaluating
printing from the design standpoints than in being able to do advanced composition and presswork in later life.

The author has attempted to keep as much balance as possible to course content in relationship to its industrial importance, available equipment, and student interest. Therefore, the author has included planography and bookbinding together. Offset lithography is the biggest area in planography. It is, also, the fastest growing of all the graphic art areas at the present time. It cannot be placed into a course already crowded for a once over view and casual passing. Bookbinding can fit in well with lithography as many of the finished products in lithography will need bindery operations. It is granted that bookbinding could fit with either letterpress or lithography. Course content and time seemed to place it as is.

The author will not contest the point that the most logical place for mimeograph, ditto, and hectograph is in the commercial department along with typing, just as blueprinting belongs to mechanical drawing. The reason for inclusion in graphic arts is to give the students, who are mostly boys, a complete picture of the reproduction field. The areas are not touched on until the latter stages in the commercial department and few boys, particularly those pursuing these courses, would come in contact with this instruction. These areas are competitors in the short run
field and must be considered. They cannot be ignored by the graphic arts as unimportant.

As to terminology appearing any place in any type of course, it is an educator's responsibility to make clear all terms. Silk screen process probably should be used in place of mitography because of present usage, but the term should not be dropped from the course as the student should be aware of it.

The author has formulated his course of study on a new trend. It is a break from tradition. It will take effort and selling not only to traditionalists but to students who are inclined to pursue the line of least resistance by wanting to follow lines already learned rather than branch out into new learning. The course outlines set the course of direction. The task now is to implement them into being and smooth out the kinks and rough spots. Continued research and revision is always necessary.

Some of the areas are lacking in adequate instructional materials written on the high school level. Therefore, there is the task of gathering and formulating materials. The field is far from exhausted. Graphic arts education is in transition and the challenge lies in this change.

Some areas as cited in chapter two have been included under some of the larger areas or ignored in the course outlines. Most of the areas involved are either taught
in other areas or because of their expense are impractical to consider in the present circumstances of the author. They are areas which have still to be accepted as mass duplication methods for the most part. They are areas that cannot be ignored possibly in the future but would take considerable thought on how to work them into the total school offering.

It is the author's recommendation that the courses be tried in actual situations. The author needs first to give them a thorough trial in his own teaching and to make sure of the complete continuity and usability of the assignment sheets and outlines with needed revisions. The second step is to have other instructors use them and give their reactions. This may be possible in the author's present situation as there are five high school instructors in the system in five different buildings.
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D. THESIS


