Modesto Junior College
Course Outline of Record
CGR 332

I. OVERVIEW
The following information will appear in the 2009 - 2010 catalog

CGR-332 Advanced Presses 3 Units

Formerly listed as: CGR - 332: Production Presses and Bindery

Advanced skills in the operation of Lithographic press and Flexographic press. Printing four colors in tight registration using a Lithographic press and a Flexographic press. Producing printed pieces for the college and meeting industry standards on those printing projects. Field trips might be required. Course is applicable to the associate degree.

II. LEARNING CONTEXT
Given the following learning context, the student who satisfactorily completes this course should be able to achieve the goals specified in Section III, Desired Learning:

A. COURSE CONTENT

1. Required Content:

A. Advanced Lithographic Press

1. Press parts
2. Registration
   a. definition
   b. procedure
   c. adjustments

2. Press setup
   a. Feeder systems
      1. feeder check
      2. components
   b. Delivery systems
      1. types
      2. components
      3. adjustments
   c. Inking systems
   d. Roller systems
   e. Makeready
3. Lithographic theory
   a. Ink
   b. Dampening solutions
4. Press printing procedures
   a. feeder check
b. image position  
c. registration check  
d. print  
e. cleanup check  
5. Press maintenance  
a. System analysis  
   1. components  
   2. fluids  
b. Pumps  
c. Maintenance  
   1. detection  
   2. diagnosis  
   3. correction  
d. Motors  
   1. electrical  
   2. configurations  
   3. adjustments  
   4. maintenance  
e. Scheduling techniques  
f. Lubrication routines  
6. Image carriers  
a. Types  
b. Exposure  
c. Processing  
d. Mounting  
7. Pre-run preparation  
a. Job docket  
b. Press sheet calculation  
c. Ink consumption calculation  
d. Press dummy  
B. Printing Processes  
1. Letter press  
2. Flexographic  
3. Lithographic  
4. Gravure  
5. Screen printing  
6. Web and sheet feed  
C. Advanced Narrow Web Flexographic Press  
1. Stack press  
2. Central impression
3. In-line press (the press we have)
4. Webbing
   a. Configurations
   b. Webbing with turner bar
   c. Webbing through finishing section
5. Plate making and mounting
   1. Materials
   2. Exposures
   3. Wash out
   4. Drying
   5. Plate cylinders and tapes
      1. Integral cylinders
      2. Demountable cylinders (ours)
      3. Continuous cylinders
      4. Plate cylinder addition (blow-on sleeve).
   6. Leveling and center plate
6. Gear drive and servo drive
7. Anilox Rolls
   a. Selection
   b. Cleaning
   c. Cell structures
8. Doctor Blades
   a. Types
   b. Care and maintenance
   c. Chamber blade system
9. Substrates
   a. Supercalendered
   b. Cast-coated
   c. Glassine
   d. Tissue
   e. Paperboards
   f. Foil
   g. Pressure sensitive coated films
10. Press Safety
    a. Lifting
    b. Common sense
    c. Pinch points
    d. Safety floor management
    e. Attitude
    f. Follow safety procedures
11. Inks and Solvents
   a. Types
   b. Components
   c. Systems
   d. Varnish
   e. Technology
   f. Viscosity
   g. pH
   i. Identification, handling, and Storage
   j. Characteristics of quality ink

12. Print station
   a. setup
      1. doctor blade
      2. pan or meter roll
      3. ink pan
      4. anilox
      5. meter roll and doctor blade settings
      6. plate cylinder impression
      7. ink setting
      8. reset plate cylinder impression
      9. registration from station to station
   b. Strobing print registration
   c. Registering to the dies

13. Finishing tooling
   a. Die selection
   b. Die instaltion and setting
   c. Underscore
   d. Waste removal
   e. Lamanating station

14. Rewinding
   a. single roll
   b. multiple rolls
   c. roll tension

15. Color matching
   a. PMS color swatches
   b. Anilox roll choices
   c. Ink mix

16. Performance and quality check
   a. visual
   b. strobed
2. **Required Lab Content:**

   A. Advance Lithographic Press
      1. Press prep
      2. Feeding
         a. feed table
         b. register table
         c. delivery
      3. Ink and water setup
      4. Plate mounting
      5. Blanket mounting
      6. Set fountain keys
      7. Zero micro adjustments
      8. Print single color
      9. Clean press
         a. fountain rollers
         b. ink system
         c. cylinders
         d. bearers
      10. Print two color
         a. feeder
         b. position
         c. registration check
         d. print
         e. clean
      11. Press maintenance
         a. daily
         b. weekly
         c. monthly
         d. bi-annually
      12. Four color press run
         a. feeder
         b. position
         c. register
         d. print
         e. clean
      13. Production press runs
         a. feeder @ 10,000 sheets per hour
         b. print 5,000 in 3 hour lab
         c. register two colors
d. maintain ink density within 10 points

B. Advanced Flexographic Web

1. Make and mount plates

2. Perform Press maintenance
   a. air systems
   b. motors
   c. mechanical systems
   d. daily, weekly, monthly and bi-annual

3. Select and setup tooling

4. Document the press run

5. Print single color

6. Print two or more colors

7. Print Process or CMYK
   a. setup web and tooling
   b. setup the print stations
   c. print and register first color to die
   d. register remaining for colors
   e. rewind into rolls
   f. finish rolls into customer size rolls or sheets

8. Trouble shoot press problems

9. Tour web Flexo printing facility

B. **ENROLLMENT RESTRICTIONS**

1. **Requisite Skills**
   *Before entering the course, the student will be able to:*

   a. Demonstrate flexographic press basics.

C. **HOURS AND UNITS**

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<thead>
<tr>
<th>INST METHOD</th>
<th>TERM HOURS</th>
<th>UNITS</th>
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</thead>
<tbody>
<tr>
<td>Lect</td>
<td>18.00</td>
<td>1.00</td>
</tr>
<tr>
<td>Lab</td>
<td>108.00</td>
<td>2.00</td>
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D. METHODS OF INSTRUCTION (TYPICAL)

Instructors of the course might conduct the course using the following method:

1. Related material will be presented through combined lecture, discussion, and lab demonstrations.
2. Computer-assisted activities will be completed to develop skills in related topics.
3. Instructional manuals (specific to equipment being operated) will be used as reference documentation for additional studies.
4. Technical/Instructional manuals will be studied to explain individual equipment operation, in addition to course text(s).
5. Simulated maintenance will be conducted, on varied pieces of equipment, to correlate theory to practical application.
6. Audio visual presentations will augment lecture: (film, slides, video, Power Point, transparencies).
7. Guided tours of printing plants/businesses and related manufacturing facilities, such as a paper mill.

E. ASSIGNMENTS (TYPICAL)

1. EVIDENCE OF APPROPRIATE WORKLOAD FOR COURSE UNITS

   Time spent on coursework in addition to hours of instruction (lecture hours)

   Reading in the Offset Lithography Technology text weekly (1-2 hours)
   Reading in the Flexographic Narrow web training system manual (1-2 hours)
   Weekly during 7.5 week rotation on Flexo.
   Two research assignments one on Flexographic printing and one on Lithographic printing.

2. EVIDENCE OF CRITICAL THINKING

   Assignments require the appropriate level of critical thinking

   Research the causes of slurr on the offset press, and give a list of remedies.
   Research the types of film treatment devices available to increase the ability of the film to receive ink.
   If your offset press is not feeding correctly what would you check and correct if necessary?
   What could cause your die on the flexo web to only be cutting on one side? and what could have cause that problem?
   (Offset press question) If you are making micro adjustments in the up direction and you are getting opposite results what is the problem?

F. TEXTS AND OTHER READINGS (TYPICAL)


III. DESIRED LEARNING

A. COURSE GOAL
As a result of satisfactory completion of this course, the student should be prepared to:

Operate Lithographic press and print with precision registration. Students will also print with the Flexographic Web press with precision registration and finishing.

B. STUDENT LEARNING GOALS

Mastery of the following learning goals will enable the student to achieve the overall course goal.

1. **Required Learning Goals**

Upon satisfactory completion of this course, the student will be able to:

a. Apply the properties of lithographic theory to specific large format presswork problems.

b. Calculate the number of counts to complete a specific quantity of labels.

c. Design a large, sophisticated offset lithographic press configuration to include all systems discussed in lecture.

d. Demonstrate procedures used in the adjustment of feeder, register table, and delivery systems.

e. Categorize ink and paper type, and correlate each to the press running characteristics.

f. Calculate the quantity of ink and press sheets needed to complete a press run using registered plates if a four color project.

g. Distinguish between the various image carriers and outline the exposure control methods and processing steps related to each.

h. Describe the various types of registration systems used on press plates and complete a press run using registered plates on a four color project.

i. Measure pH an conductivity factors of various chemicals and identify those that meet acceptable range and explain how pH and conductivity affects the quality of print.

j. Troubleshoot for press problems during actual press run. Identify the problem in written format and describe steps taken to resolve the situation or problem.

k. Apply the properties of flexographic theory to specific narrow web press problems.

l. Measure pressure settings for roller and cylinder settings and make necessary adjustments.

m. Rewind finished product onto shipping size rolls.

n. Process plates for printing using data to select proper exposures.

o. Mount plates for four color printing.

p. Maintain and make necessary adjustments, as needed for quality printing.

q. Set up and feed paper with the proper pull and delivery on the PM52 or equivalent press.

r. Perform daily, weekly, monthly, an bi annual maintenance on Flexographic and Lithographic presses

s. Perform press maintenance, identification of defective parts and ordering for replacement and installation.

t. Set up and run UV ink, with proper drying, and cleanup.

u. Evaluate Electrical motors, configurations, adjustments, and maintain them.

v. Perform pre-run preparation, to include Job Docket, Press sheet or roll calculations, Ink consumption calculation, and Press dummy.
w. Maintain and analyze Flexographic and Lithographic pumps, and air systems.

x. Adhere to the proper safety procedures for Flexographic and Lithographic printing.

y. Adjust and select Flexographic inks for quality printing to include: viscosity using a Shell or Zahn cup, Ph, an automatic ink viscosity controllers, and matching ink with substrates.

a’. Web and setup the finishing operations to include: die cutting station, laminating station, waste removal station, exit nip roll, Web viewing, slitter station, static eliminators, rewind section components and rewind controls.

aa. Match color on the Flexographic press or the Lithographic press using the unique methods of each process.

ab. Maintain proper record keeping for Flexographic printed jobs.

2. **Lab Learning Goals**

   *Upon satisfactory completion of the lab portion of this course, the student will be able to:*

   a. Setup and run 5,000 process or cmyk sheets on the PM52 or equivalent lithographic press in two three our labs. Meeting industry standards.

   b. Setup and select all the proper tooling to run print 20,000 labels in process color or cmyk in one three hour lab and perform all finishing operations.

IV. **METHODS OF ASSESSMENT (TYPICAL)**

A. **FORMATIVE ASSESSMENT**

1. Demonstrated skill performance
2. Descriptive lab analysis
3. Group task analysis/troubleshooting
4. Problem-solving techniques
5. Product mockup creation
6. Small group class presentations
7. Task performance ratings
8. Written examinations to include essays
9. Written systems diagnosis/recommendations

B. **SUMMATIVE ASSESSMENT**

1. Final Test
2. Lab Final
3. Midterm tests