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I. About this Handbook

- This guide compiles printmaking studio protocols and relevant reference material. It is designed for anyone teaching in the studios, graduate and undergraduate students enrolled at the School of Art & Design, and University of Michigan students enrolled in a class that specifically uses the Printmaking Studio.

- This handbook does not contain instructional materials specific to classes and is not a substitute for showing up for class.

- Things do change in the studio, so if you have not been around for a semester, or do not have a current handbook, please speak with the coordinator regarding materials, equipment, and studio use.

- This handbook is written and maintained by Ana Fernandez, Print Media Studio Coordinator at the School of Art and Design, University of Michigan-Ann Arbor. Please send any suggestions or comments regarding this handbook or its contents to aferna@umich.edu
II. Policies

1. Usage

Access to the print media studios is intended for students enrolled in classes that specifically use those studios (TMP Print and Advanced Print). TMP Print is taken during the second year of the undergraduate program and may encompass a number of print processes (intaglio, lithography, monotype & relief). Any School of Art & Design student who is not enrolled in a print-specific studio class must be in contact with the Print Media Studio Coordinator to discuss materials, access, and studio use.

Classes meet in the studios, and therefore, individual studio usage must not interfere with a class that is in session. A class may not always use the whole studio but always has priority use of the equipment and space. A schedule of classes will be posted on studio doors. Please be considerate and be aware that you may be asked to leave if a conflict arises. If you are unsure, please talk to the studio coordinator or a faculty member who is present regarding your intended use of the studio while a class is in session.

2. Security

Because of the nature of the equipment and materials, after-hours access to the print media studios is monitored. ‘After-hours access’ is defined as anytime outside of the M-F 8am-5pm schedule during the regular academic year. During the time classified as after-hours, the doors to the studio will be locked and only those students with access already granted via their Mcard will be able to enter the premises. Letting unauthorized students enter the premises for the purpose of their utilizing the equipment/tools in those premises is absolutely prohibited.

Since this is an open studio, please do not leave your personal belongings unattended in the studio as the School of Art and Design will not take responsibility for any lost or stolen items. Because of concerns regarding personal safety and overall security, the door must not be propped open after-hours.

3. After-hours Access

After-hours access is only permitted to students who are either currently enrolled in a print media class, or possibly others who may currently not be enrolled in a print class but have previous print experience and have demonstrated a knowledge in print procedures & safe studio practices. In either case, the student will need to contact the print studio coordinator in order to have after-hours access be granted on their key-card. A meeting & safety demo will be arranged where rules and expectations will be discussed, an access agreement signed, and then permission granted (key card access). Access may be revoked without prior notice. Please see the Resource/Access page for the agreement.
4. **Safety**

The print studio’s goal is to use the least toxic materials possible and to provide the safest environment for students to work. What types of materials, how and where those are used are of paramount concern. Please be aware of the following information:

1. Exposure to air-borne materials (fumes, sprayed paints, and particulates) and to liquid materials is reduced with provision of vents, gloves, face-shields, aprons, and restricted areas of use. Cleaning rags containing solvents/inks are disposed of in designated red oily-waste cans.

2. Fire hazards are a distinct concern. Rags used in cleaning up processing materials/inks are disposed of in designated red oily-waste cans. Many materials are stored in cabinets specifically intended for the storage of flammable materials … other storage is strictly prohibited. Do not pour mineral spirits, turpentine, and other oily substances down the sink drains. Make sure hot plates are turned off and flammable material cabinets are closed when not in use.

3. Chemical mixing requires that specific tasks be performed in specific areas. See table of incompatibility in the Resources/Material Handling section. Other chemicals others than the ones provided should not be brought into the studio. Consult with the studio coordinator if in doubt.

4. Equipment use involves the possibility of getting caught in moving mechanical parts. Watch for loose clothing and dangling wearables (necklaces, earrings, headphone cords), along with body parts (usually hands), around equipment.

5. Emergency situations:
   a. There are two eyewash stations (see studio map on page 10 for location) if hazardous materials should splash in/near eye area. Rinse for at least 15 minutes and seek prompt medical attention.
   b. Fire extinguishers are available in case of fire (see studio map on page 10 for location).
   c. Band-aids and cream are available for cuts and burns (see studio map on page 10 for location of first-aid kit).
   d. In all cases of injury, please follow up with a visit to U-M Health Services or your doctor.
   e. In cases of extreme injury or security problems, contact:
      - Campus Emergency 911
      - Campus Security 3-1131
   f. Material Safety Data Sheets (MSDS) are available and a HazCom Program is documented (see studio map on page 10 for location).
   g. No eating in the studio, except in designated areas.

6. Personal reaction to materials will vary from person to person. Repetitive exposure will also have an effect on the intensity of that reaction.
5. **Studio Etiquette**

All studio users are expected to pick up and clean up after themselves, return materials, consumables and equipment back to their storage location, and be conscientious to other studio users.

6. **Project Materials**

All print & photo classes have a lab fee attached to the class which covers most of the necessary supplies for that class. Materials are handed out on an on-demand basis for the projects assigned. However, paper, plates, and other material needs vary with scope of projects. Materials beyond those covered by that lab fee can often be procured through the studio coordinator during class time (preferably) or during business hours (M-F up until 4:30 pm). Coordinator will hand out a lab fee payment slip to be paid at the Cashier’s Office before receipt of materials. Other materials may be purchased locally or online as well (see Resources/Material Suppliers on page 17 for alternatives). Ask the print coordinator if in doubt.

Integrative Studio Students, independent working students, graduate students, and faculty are encouraged to procure project materials themselves. Depending on the situation, materials may be procured through studio via accounts maintained by the Art & Design Finance Office or lab fee payment slips.

7. **Consumables** (inks, solvents, etches, towels, etc.)

Materials openly available in the studio are paid for by lab fees and are to be used in the processing of plates, printing from plates, and cleaning and are not to be taken out of the studio. Please alert the studio coordinator or the studio monitor on duty if supply is out so that it may be restocked.

Please conserve – keep waste down, keep lab fees down.

8. **Tools**

Tool kits are purchased by A&D students during the Fall term of their first year. Each kit includes tools relevant to TMP Print along with many other useful tools (see Resource/Tools on page 11).

University students (non-A&D) may check-out specialized tools for TMP Print from the print coordinator for the duration of the course.

For advanced work, new tools may need to be purchased by the student from either the coordinator or external sources (see Resource/ Material Suppliers on page 17).

Other common tools are useful in the print studio. Please consider bringing pencils, erasers, x-acto knives, and Sharpies. The studio tools have specific purposes and must remain in the studio to assure availability to all (i.e. rulers, cutting-mats, etc.)
9. **Equipment**

Studio equipment is identified on the map on page 10 of this handbook. In some cases, rules are posted near or on the equipment – especially when there are adaptations or consistent mis-use.

*Priority for computer use is given to those needing to use the scanners or printers. Those working on image manipulation should use their own laptops for that purpose when others are waiting.*
III. Studio Layout

1. Classrooms
Room 2126 (photo classroom) has work-tables and electrical outlets for laptops, and a projection screen. It is home base for TMP Photo.
Room 2125 (digital computer lab) has 7 G4 computers with 5 inkjet printers (1), a flat-bed scanner (2), a slide scanner (3) and a plate-maker/transparency-makers laser printer (4). This room also has a matte cutter (5) and a paper cutter (6).
Room 2135 (print classroom) has a vacuum exposure-unit (7) for photo-sensitive plates and a light-table (8). It also has work-tables, electrical outlets for laptops, and a projection screen. This room is home base for TMP Print.

2. Paper Hallway
The paper hallway is an ink-free zone with counter spaces to cut paper down with two paper cutters (9) and a tear bar (10). There is also space to dampen printing paper: a sink for soaking (11), a surface for removing dripping water (12), a blotting area (13) for final paper preparation, and also a damp box (13). There are also a sink for cleaning hands (14), aprons (15), and rulers (16) (which must never leave the studio!)

3. Press rooms
Room 2143 is primarily geared for the printing of intaglio plates (16 gauge) with three etching presses: a French-Tool (17), a Charles-Brand (18), and a Whelan press (19). There is a Vandercook proofing press (20) for relief printing and a metal-shear (21) for the cutting of metal plates. There are also inking counters, hot-plates, ink and tarlatans, drying walls and drying stacks.
Room 2142 is set for lithographic printing in both stone & plate with three litho presses: a Charles-Brand (22), a Takach-Garfield (23), and a Griffin press (24). There is also a graining sink (25), a wash-out vent table (26), and 2 sinks (27/28) - sink 27 has an eyewash.

4. Solvent Rooms and Solvent Area
The solvent rooms have various counters and specialized ventilation systems for: initial copper plate polishing (29), stop-out application (30), hard-ground application (31), spray-paint booth (32), air-brush hook-up (33), aquatint box (34), hardground/softground hot plate (35), soft-ground application (36), and solvent table for ventilated cleaning (37).

5. Etching Area
The etching area has ferric-chloride baths (38/39) for etching copper (copper only!!) and a sink for rinsing plates (40).
6. **Developing Area**
   The developing area (41) is a multi-use counter with ventilation for developing photo-litho plates, imagon, solar plates and spit-biting. There is also a sink (42) and an emergency eyewash/shower (43)

7. **Storage Room**
   This room is for coordinator/monitor/faculty access only. This is the main storage for consumable materials, flammables, and acids. Authorized personnel only.
a. **Studio Layout Map**

Key

Starred locations: fire extinguishers
Hexagonal locations: eyewash stations
Triangle locations: first-aid kit & Material Safety Data Sheets (MSDS)

For vent and light switches see Resources/More Maps (pages 20 & 21)
VI. Resources

1. Tools

From A&D Kit:
18” Aluminum Ruler
Utility Knife
Handyman File Pack*
Wire brush
Clamps
Pencil sharpener
x-acto knife
Putty knife
Safety glasses
Three sided scraper*
India stone
Burnisher/point*
Dividing tool*
Scissors

In-studio tools:
Putty knives
Scrapers
Rollers/brayers
Files
Clamps
Hair dryers
Etching needles
Intaglio rakes
Paper cutters
Mat cutting blades

Student Provided tools (sometimes professor-required)
Sharpies
Pencils*
Plastic erasers
x-acto blades
Writable CDs/flash-drives/hard-drives
Brushes
Smocks

*can’t do much without these
2. Personal Protective Equipment (PPE)

Gloves
Nitrile gloves keep solvents and etches from being absorbed through the skin. One pair of reusable nitrile gloves is given to each student enrolled in TMP Print and Advanced Print classes. Please write your name on and keep track of them.

The print studios also occasionally stock disposable nitrile gloves. Additional protective solvent-resistant gloves are available locally. Look for bluettes and one-use nitrile gloves (Home Depot is usually a good place). Call in/pick-up orders with Grainger can provide you with good gloves.

Be aware that not all gloves are made of the same materials and therefore they have different resistance levels. Latex dishwashing gloves will not hold up to most solvents.

Cotton jersey knit gloves are helpful when inking and also keep the ink from traveling. The studio keeps some of these available in the printing rooms. These tend to get dirty quickly. It is recommended that students get their own: gardening gloves and work gloves are available at most hardware stores, and close-fitting lotion (beauty) gloves are available at Rite-Aid, CVS, or Kroger.

Eyewear
Students may get liquids splashed into their eyes when working in certain areas of the studio. Face-shields are available to use for those situations where that may be possible. Eye glasses are provisioned in the A&D tool kits.

Clothing
Plastic aprons are provided in the studio. Beware that inks stain clothes forever; as does the ferric chloride. Students also have a tendency to lean against equipment and counters, which are often dirty. Because of that, some students bring in their own smocks or have “printmaking clothes” to avoid staining their clothes.

Respirators
For those students who have a higher sensitivity to solvents, purchase of a respirator may be recommended. Ventilated work areas in the print media studio are regularly monitored for exposure levels of any toxic materials provided by the studio.
3. Equipment

Etching presses

Emboss the paper into an inked plate so that the paper picks up the ink from the plate’s crevices.

- A bed is rolled between 2 steel rollers exerting about 15,000 pound of pressure per square inch.
- Pressure is set for a specific materials and conditions. In our case, 16 gauge copper is the chosen material. Do not change the pressure.
- Advanced undergraduate students and graduate students may receive instructions on resetting the pressure on the Brand Press, but they will be setting it back to the “default” for all other users once done printing.
- The number and order of felts are important. Please, keep them in the correct order.
- Keep each set of felts with its designated press.
- When printing, make sure to catch the ends of the felts under the roller.
- When not in use, remove the felts from under the roller and balance bed.
- Keep bed and felts clean as this will prevent other people’s work from getting stained.
- Bevel plates and remove burrs off the back in order to facilitate the roller stepping up onto the plate, and also to keep the plate from cutting into the paper, felts, and bed.
- These presses are communally used – be courteous and share the press by removing all of your materials from the bed immediately after each print is made.
- Alert coordinator, faculty, or monitors on duty of any press problems.

Lithographic press

Print planographic plates (woodblocks and monotypes have also had their success printed this way with the proper press set up).

- The bed is rolled between a steel roller underneath and a leather covered wood scraper bar on top.
- The leather scraper bar slides across a greased tympan and is not meant to “step up” onto the plate – or else the scraper bar will break!
- It is the user’s responsibility to set up the press properly by choosing the correct scraper bar and tympan size, adjusting the pressure for your work, and setting the start/stop marks on the press-bed.
- It is the user’s responsibility to break down the set-up so that the next person can set the press according to their own situation and needs.
- There is a press sign-up list on the press box of each litho press.
- To print with plate on press: roll up plate with ink; put printing paper and packing paper down; put tympan down (make sure there is sufficient grease on it); roll bed to start mark; apply pressure; roll to stop mark;
release pressure; unstick leather from tympan; roll bed back into printing position; remove tympan, packing, and print; repeat process.

- Common problems: the pressure is down but the bed does not move.
- Possible solutions: the scraper bar is down before the plate or paper and cannot step up; too much pressure; not enough grease; “clutch” not disengaged.
4. **Process Cheat Sheets**
   (simplified; does not replace attending demonstration or taking notes)

a. **Intaglio Hardground application**
   - degrease plate (polish if needed)
   - brush and cook hardground onto plate
   - draw into ground with scribe (or anything pointed) to reveal the plate
   - etch
   - repeat drawing, etching, and stop-out as needed
   - clean hardground off plate, then proof

b. **Intaglio printing**
   - prepare: paper, ink, tarlatans, registration
   - check: press bed, felts, hotplate
   - apply ink to plate with chip, wipe with tarlatan (may also use phone-book pages or hand)
   - place on press in this order: mylar, plate, printing paper, newsprint, felts
   - roll bed through
   - pull off felts and paper, remove plate and mylar
   - set print to dry (tape on drying-wall, or place in weighted-stacks or drying rack)
   - if last one printing, remove felts from pressure and balance bed

c. **Aquatint**
   - degrease plate and dry thoroughly
   - crank aquatint box 10 times, wait 15 seconds, put plate on rack, wait 15-30 seconds, put printing plate on hot plate to melt rosin (3-5 minutes)
   - etch and stop-out (or vise versa) repeatedly
   - clean plate with alcohol and proof plate

d. **Sugar-lift**
   - degrease plate
   - brush on sugar-lift solution and let dry
   - brush on thin layer of hard-ground and let dry
   - place plate in warm water to lift hard-ground over the sugar-lift area
   - let plate dry and apply aquatint
   - stop-out and etch as needed
   - clean with alcohol and mineral spirits

e. **Stopout**
   - brush stopout solution over etching grounds (hard-ground, aquatint, etc.)
   - keep layer thin and apply to dry plate to keep the stopout from running
   - stopout will never completely “dry”
   - careful of brushstrokes
f. **Develop photo-litho plates**
   - place freshly exposed plate over designated portable plastic surface
   - pour developer onto sponge and wipe sponge over plate
   - scrub hard when needed (up to 5 minutes)
   - rinse plate & plastic surface with cold water in sink,
   - hang plastic surface to dry and blot-dry plate with blue shop-towel
   - check plate in light for appropriate developing of image areas
   - if more developing is needed, do right away with fresh developer
   - after rinsing and drying plate, pour a quarter size drop of plate cleaner and buff tightly
   - keep out of light as much as possible
   - rinse sponge with water & store away


g. **Registration**
   - For intaglio:
     - mark T & bar and plate size on back side of registration mylar
     - if paper is bigger than plate, mark corresponding T & bar on back of paper to line up with mylar
   - For litho:
     - mark T & bar on plate with scribe or x-acto knife
     - if paper is smaller than plate/bigger than image, mark corresponding T & bar on back of paper to line up with marks on mylar
VII. Resources

a. Local

- **Art Attack** – for general art supplies
  731 West Crossing St., Ypsilanti 734-483-7975
- **Art Warehouse** – for general art supplies
  217 North Main St., Ann Arbor 734-662-2626
- **Copper and Brass** – for copper, cheaper at 500lbs+
  6555 East Davison St., Detroit 313-365-7701
- **Hollander’s** – for paper, pva glue, brushes. Located in the Kerrytown Shops
- **Michigan Book and Supply** – for general art supplies and paper
  317 South State Street, Ann Arbor 734-665-4990  www.michbook.com

b. Mail Order

general art supplies:

- **Daniel Smith** – general art & printmaking supplies  www.danielsmith.com
- **Edward C. Lyons** – printmaking tools  www.eclyons.com
- **Graphic Chemical & Ink Co.** – printmaking supplies  www.graphicchemical.com
- **McClain’s** – woodblock print supplies & Asian papers  www.imcclains.com
- **Rembrandt Graphic Arts** – printmaking supplies  www.rembrandtgraphicarts.com
- **Renaissance Graphic Arts** – printmaking supplies  www.printmaking-materials.com
- **Stones Crayons** – lithography supplies  www.stonescrayons.com
- **Takah Press** – lithography supplies & presses  www.takashpress.com

paper:

- **Hiromi Paper** – Asian papers  http://hiromipaper.com/
- **New York Central** – paper & general art supplies  www.nycentralart.com
- **Takah Paper Co.** – paper  www.takashpaper.com

framing:

- **American Frame** – framing & matting supplies  www.americanframe.com
- **Framing Supplies** – mat cutting blades  www.framingsupplies.com

metal (for etching plates):

- **CG Metals** – metal  www.cgmetals.com
VII. Material Handling

a. Cleaning Table

<table>
<thead>
<tr>
<th>Situation</th>
<th>Solvents</th>
<th>Area Used</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hardground off copper</td>
<td>Mineral spirits cuts hardground, the alcohol cuts mineral spirits</td>
<td>Solvent table</td>
</tr>
<tr>
<td>Aquatint off copper</td>
<td>Alcohol dissolves the rosin</td>
<td>Solvent table</td>
</tr>
<tr>
<td>Stop out off copper</td>
<td>Alcohol dissolves stop-out</td>
<td>Solvent table</td>
</tr>
<tr>
<td>Ink off copper</td>
<td>Mineral spirits cuts ink, alcohol cuts mineral spirits</td>
<td>Solvent table</td>
</tr>
<tr>
<td>Ink off imagon or solarplates</td>
<td>Mineral spirits cuts ink, water cuts mineral spirits (alcohol will dissolve polymer)</td>
<td>Solvent table</td>
</tr>
<tr>
<td>Ink off rollers/brayers</td>
<td>Mineral spirits cuts ink, do not use alcohol or water or simple green on rollers/brayers</td>
<td>Solvent tables (solvent room or litho press room)</td>
</tr>
<tr>
<td>Ink off photo-litho plate</td>
<td>Plate cleaner cuts ink and puts down printing base. Make sure to buff cleaner in when ink is all removed</td>
<td>If used sparingly at press is ok. If used liberally, go to solvent table in litho press room.</td>
</tr>
<tr>
<td>Ink off counter tops or other surfaces</td>
<td>Scrape ink with putty knife or scraper blade. Simple Green will cut remaining ink and leave surface degreased. Stubborn ink may need to be cut with corn oil then followed with Simple Green.</td>
<td>anywhere</td>
</tr>
<tr>
<td>Ink off press beds</td>
<td>Simple Green will cut remaining ink and leave surface degreased. Stubborn ink may need to be cut with corn oil then followed with Simple Green.</td>
<td>anywhere</td>
</tr>
<tr>
<td>Ink off polyester plates</td>
<td>There has been little success reclaiming plates but – cut ink with corn oil (do not buff in) and liberally cut oil with Simple Green</td>
<td>anywhere</td>
</tr>
</tbody>
</table>
## b. Chemical Incompatibility

X indicates incompatibility

<table>
<thead>
<tr>
<th></th>
<th>Ferric chloride</th>
<th>Nitric Acid</th>
<th>Mineral spirits</th>
<th>Turpentine</th>
<th>Alcohol</th>
<th>Ammonia</th>
<th>Plate Oil</th>
<th>Flash Oil</th>
<th>Developer</th>
<th>Simple Green</th>
<th>Soy Solve</th>
<th>Plate cleaner</th>
<th>Vinegar</th>
<th>Ajax cleaner</th>
<th>Acetone</th>
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<td>Ferric Chloride</td>
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<td>Nitric Acid</td>
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<td>Turpentine</td>
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<td>Alcohol</td>
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IX. More Maps

a. Light Switches
b. **Ventilation**
X. Print Media Studio After-hours Access Agreement

General Guidelines:

• All Students must be approved for access at other than scheduled course meeting times.
• Only the Studio Coordinator may approve after hours access.
• Training for safety, security, studio maintenance, supply usage, and the operation of studio equipment must be completed.
• Unauthorized students or acquaintances are not allowed in the studio without first requesting special permission from the studio coordinator.
• Alcohol and illegal drugs are prohibited in the studios.
• Residue from work must be cleaned up before leaving the studios. If you do not speak up when another student is leaving and remind them of their mess it now becomes your mess.
• **Studio Coordinators may revoke access for non-compliance with these guidelines.**
• Misconduct in one studio may cause your privileges to be revoked in all studios.
• Tampering with any locking mechanisms or monitoring devices will result in immediate disciplinary action.

My signature indicates that I have read and agree to the above guidelines:

________________________________________________________________________
Print Media Student User, printed name
__________________________________________
Print Media Instructor, printed name

________________________________________________________________________
Print Media Student User, signature*
__________________________________________
Studio Coordinator, signature**

__________________________
Date Signed

__________________________
Date Signed

__________________________
Student Level: ____________________
UMID  _____ Graduate  _____ Undergraduate

__________________________
Course Type: ____________________
 _____ TMP  _____ Non-TMP

__________________________
Course Length: ____________________
 _____ 7 Weeks  _____ 14 Weeks

___________
uniquename

* Once you have completed as much of this form as completely as possible, submit it to the studio coordinator to officially request Mcard access to the print media studios.

** This form can only be submitted by the studio coordinator.
XI. Sample Ground Rules and Check List

Ground Rules -- Key access for Print Media Studio F07

1. All students must demonstrate knowledge of this studio’s procedures and protocol and maintain contact with Ana Fernandez, Print Media Studio Coordinator.

2. After-hours access is restricted to students currently enrolled in print classes or others allowed by the studio coordinator based on their previous print experience & studio knowledge.

3. The doors will not be propped open during key only access hours. Studio must be left locked when not in use or no one is in the studio to avoid thefts and/or harassment.

4. There must be respect for and communication with others in the studio (i.e. radio volume, space hogging, etc.). This is a communal studio.

5. Key access is not a replacement for attending class.

6. Use of the studio must not interfere with the running of classes (coordinators or profs must not have to clean up prior to class).

7. No “extreme” all-nighters.

8. If you have not been taught/introduced to something new, don’t do it. Ask coordinator or faculty.

9. There will be no smoking, drinking alcohol, or taking drugs in the studio, or being under the influence of those substances.

10. Re-filling of supplies will be done by monitors or the studio coordinator. If running out of consumable materials becomes a problem, let the studio coordinator know.

11. Must use materials safely and in the manner demonstrated. Equipment must be handled with care.

12. If the ground rules are not adhered to and the check list not followed, the student may lose access to the studio.