Pangasinan State University
Region's Premier University of Choice

FABLAB
MAKING IDEAS

ADMATIC
PANGASINAN STATE UNIVERSITY - URDANETA CITY CAMPUS
ADVANCED DIGITAL MANUFACTURING, TECHNOLOGY AND INNOVATION CENTER

OPERATIONAL MANUAL

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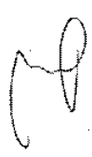


1. OVERVIEW OF THE PANGASINAN STATE UNIVERISTY

The Pangasinan State University, a higher educational institution created by the PD 1497 provides educational services to the resident-learners of Pangasinan, the Ilocos and nearby regions. With its nine (9) component campuses strategically located in the different municipalities and cities in the province. PSU a level IV SUC, and the first SUC in the Philippines to be awarded multi-campus ISO 9001:2015 certified for that reason considered as the region's premier University of choice because it nestles the greatest number of students in the entire Region I.

The Machine Automation and Technology Innovation Center (MATIC), based in PSU Urdaneta City Campus, Urdaneta City, Pangasinan, one of the ten (10) research centers of the University, is established on September 26, 2019 under BOR resolution No. 104 for the purpose of conducting R&D activities aimed at helping the nearby industries in the automation and innovation of their processes through technological development. The center is formerly Mechatronics Center and later changed to MATIC to further expand its scope of research especially on technology innovation, engineering, and automation which will support the industry and other centers of the university.

On the other hand, Pangasinan State University - Urdaneta (PSU - Urdaneta) is one of the 9 campuses of PSU situated in Urdaneta City, Pangasinan. Originally established as a satellite campus of the College of Arts and Technology in Asingan, it later became a full-fledged campus under the Pangasinan State University (PSU) system.

Now, the school offers a wide variety of programs to the citizens of Pangasinan and its nearby areas. Courses in the fields of Engineering (Computer, Electrical, Mechanical, Civil), Architecture, Teacher Education, Information Technology, Arts, and Sciences. Currently, there are about 6,000 students studying at PSU Urdaneta and 4,000 of them are taking engineering programs based on the PSU Urdaneta registrar office.

Faculty Engineers from the different Engineering programs of PSU-Urdaneta such as the Mechanical Engineering Department, a top-7 performing school in the 2019 Licensure Examination, Civil Engineering Department, a top-5 performing school in the CE Licensure Examination, Electrical Engineering Department, a consistent 100% passing percentage in the EE Licensure Examination for the first-time takers since 2015, and Computer Engineering boost the research, extension, and innovation capability of the University as well.

2. GENERAL INFORMATION

The Fabrication Laboratory at Pangasinan State University (PSU) continue a tradition of places for do-it-yourself (DIY) with technology for tinkering and inventing. It is a laboratory to serve the public, the micro, small and medium Enterprises (MSMEs) in particular and will address many gaps in the industry.

Pangasinan State University's Fabrication Laboratory is a publicly accessible workshops offering digital manufacturing technology and advanced tools to anyone, usually equipped with flexible computer-controlled tools includes laser cutters and engraver, Vinyl printer and cutters/digital knife, computer controlled (CNC) machines, a 3-axis CNC router, and a CNC Plasma Cutter. This laboratory is meant to support and translate creative ideas into prototype and mass production.

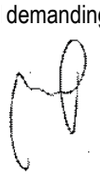
Industry Clusters in the region that are expected to benefit from this laboratory are: Gifts, Decors and Housewares, Electronics, Garments, Processed Food, Wood, Creative, ICT, Metal, Ceramics, Furniture, and other common materials. Faculty and Students of Pangasinan State University are also identified as the primary users of the facility.

The lab is supervised by Machine Automation and Technology Innovation Center (MATIC) of PSU under the office of the Vice President for Research, Extension, and Innovation, and is staffed by lab specialist, a Lab Tech/helpdesk and Student Assistants, who instruct and guide users in the use of the equipment.

2.1. PROJECT HISTORY

The PSU-FABLAB project was conceptualized by Engr. Rex B. Basuel in 2018 with the Department of Trade and Industry Pangasinan (DTI) to help local Micro, Small, Medium Enterprises (MSMEs) to increase their productivity. The proponent is a faculty at the Pangasinan State University Urdaneta Campus and then he was also the head of Machine Automation and Technology Innovation Center (MATIC) and concurrently the Chairperson of Computer Engineering on the said campus.

Meanwhile, most MSMEs in Pangasinan are micro enterprises who need assistance in packaging, labeling, gifts, decors and houseware's crafting, electronics prototyping, garments printing and embroidery, wood carving, metal and bamboo cutting and crafting , furniture designing. There are already building establishments with related equipment offering fabrication services, however, more people are still demanding for better



services to the public due to the lack of advanced technologies. The provincial government of Pangasinan described such technologies as "least available" among industries in Pangasinan. The FABLAB can definitely do a lot to rebuild the country's declining economy due to the COVID-19 pandemic.

With its strategic location and accessibility to entrepreneurs, the DTI approved to put up a Fabrication Laboratory in Pangasinan at Pangasinan State University Urdaneta Campus on 2021 with a budget amounting to 14 million pesos. The laboratory will also serve as an integral part of the Machine Automation and Technology Innovation Center (MATIC) and the Solid Freeform Fabrication Research Laboratory (SoFFReL) in research, fabrication and product prototyping.

2.2. PROJECT MANDATE

Fab Labs share the concepts of providing advanced equipment and facility for digital manufacturing to the general public, of stimulating innovation and of business creation with other, similar workshops like makerspaces and the Techshop chain.

FABLAB creates opportunities.

3. VISION AND MISSION

VISION

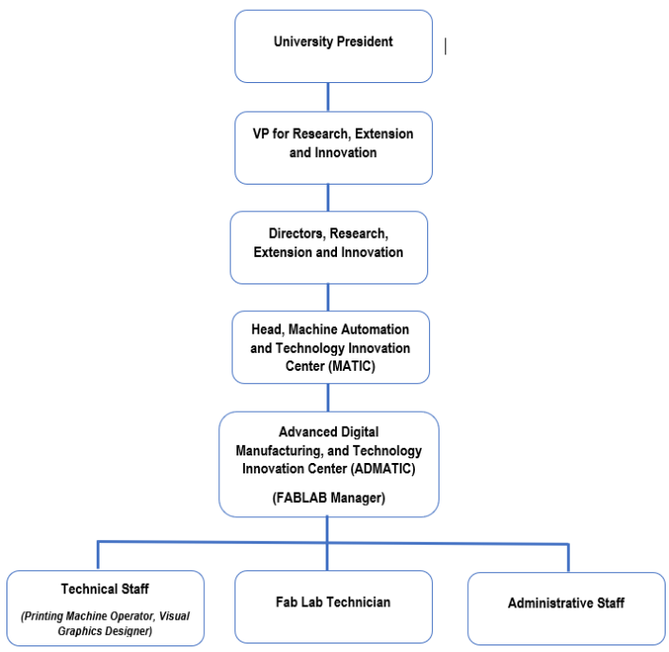
To be a reference center of advanced digital production in Region 1, in the management, development and support of processes of public innovation, through advanced technologies and facility.

MISSION

PSU-FABLAB aims to empower people and local entrepreneurs in the region to materialize concepts into innovative products and prototypes economically and quickly by providing access to an array of advanced manufacturing technology.

4. ORGANIZATIONAL STRUCTURE AND RESPONSIBILITIES

4.1. FABLAB ORGANIZATIONAL STRUCTURE



4.2. DUTIES AND RESPONSIBILITIES

4.2.1. PSU should hire a full-time employee (Fab Lab Technician, Technical, and administrative staff) for continuous laboratory operation. FabLab also accepts volunteer students in the university especially in the engineering program.

4.2.2. REQUIRED QUALIFICATIONS

FABLAB Technician and Technical Staff

4.2.2.1.1. Bachelor's degree in Technology, Engineering, or Machinist. Three (2) years of experience in manufacturing, automation or related field and also may include lab experience.

Administrative Staff

4.2.2.1.2. Bachelor's Degree is required
4.2.2.1.3. 2 years of administrative assistant experience
4.2.2.1.4. Knowledge of appropriate software including: Microsoft Word, Excel, and Microsoft PowerPoint
4.2.2.1.5. Must have professional or subprofessional eligibility.

FABLAB Manager

- Assumes all project accountability and responsibility of the project;
- Manage the administrative and financial operation of the fab lab, raises funds for fab lab and prepares WFP;
- Reviews and approves IPCR of personnel
- Set strategic and operational priorities and targets for the lab;
- Develop community programs for fab lab;
- Promote the Fab lab, gives tours of the fab lab and handles press;
- Approves financial and administrative requests

FABLAB Technician

- The Fab Lab Technician is responsible for overseeing the day-to-day operation of the Fab Lab and the maintenance of the equipment within the lab. Additionally, he/she will supervise, mentor, and promote the professional development of student and employees, who provide the first point of customer service and technical assistance to learners in the Fab Lab.

Administrative Staff

- In charge of all financial transactions
- Procurement of supplies and consumables
- Maintains all client and payment records
- Acts as overseer of all shared service facility operations
- Handles day-to-day business transactions

Technical Staff

- Responsible of all product development activities initiated by the facility
- Provide technical assistance to all clients and users in terms of how existing products can be improved and new ones to be introduced
- In-charge of production operations and quality checking of products/services rendered
- Assess the product performance characteristics required by clients
- Provide technical support and other extension services to the fablab
- Observe periodic maintenance of machines

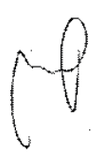
5. PROJECT PARTNERS/ STAKEHOLDERS

PSU-FABLAB is the first of its kind in the region and it is a collaboration project of the DTI and PSU. It is a good example of convergence with partners working together by putting in financial and technical resources to the project.

Total Project Cost: (2021)

Agency	Investment
DTI	13,799,300.00
PSU	5,420,000.00
TOTAL	19,219,300.00

The Pangasinan State University (PSU) has allocated a 49 sq. m. space to house the equipment given and to serve as training for makers and MSMEs.



6. PRODUCTS AND SERVICES

6.1. ENUMERATION OF SERVICES

Using the available machines and variety of raw materials, the Fab lab can provide but not limited to the following services:

Product Development	• Design Services • Rapid Prototyping • Project Consultations
Producing	• 2D/3D Printing and Modeling • Garments Printing • Embroidery • Laser Cutting and Engineering • Print and Cut Services
Teaching	• 2D & 3D Modeling • Mechatronics and Robotics • Additive Manufacturing • Product Design
Tours	• Guided Tours @ FabLab • Participation in Fairs/Shows

6.2. FEES AND CHARGES

The pricing per equipment uses per minute and/or per square feet is marked-up to 30% of the Operating Costs.

Equipment	PSU FABLAB	Alternatives
CNC Routing (Metal, Wood, Plastic)	P10.00 per min.	No such services in Pangasinan. Manila Price: P15.00 per min
Digital Printing & Cutting (Rolled Materials) Cutting is FREE	P 20.00 per sq. ft.	No such services in Pangasinan. Manila Price: P25.00 per sq. Ft.
Digital Embroidery	P10.00 per stitches	No such services in Pangasinan. Manila Price: P15.00 per stitches
Direct-to-Garment Printing with Heat Press	P6.00 per min.	No such services in Pangasinan. Manila Price: P10.00 per sq. Ft.
Laser Cutting & Engraving	P10.00 per min.	No such services in Pangasinan. Manila Price: P15.00 per sq. Ft.
Use of Conference Room	P300.00 per hr.	Standard Rate: P6,000.00 per day
Training-Workshop (10 persons) * • 2-days 2D Modelling • 2-days 3D Modelling	1500 / person	
Consultation and Digital Designing	350 / design	

** Participants shall pay for the materials to be used in the workshop.*
***Note:** Materials and the design is not included in the costs*

6.3. INTERNSHIP

The FABLAB also offering for summer internship programs specifically in the field of engineering and technology. The program provides hands-on experience and full access to the tools and machines available in the fablab. Certificates will be awarded to interns once completed the required number of internship hours.

Students undergo internship program requires a full-time commitment. It is not permissible to take academic classes or hold other employment during the internship. Students are required to participate for the full period of the Program. The maximum number of students accepted must not exceed five (5), this will be first come first served basis. Personal Protective Gears (PPE) to be used during lab hours must be provided by the intern students. This include but not limited to protective lab clothing, helmet safety gloves and shoes, shaded goggles, ear plug, face shield, and air purifying respirator.

6.3.1. REQUIREMENTS

- Letter of intent
- Transcripts for each undergraduate institution attended (transcripts can be unofficial)
- Current CV or resume
- MOA (must provide by the universities/collages that want to send their students to fablab's internship program and it will be reviewed first by fablab management prior to formal implementation)
- Medical Certificate
- NBI Clearance

Note: *all communication regarding internship program offered by the fablab should be forwarded to the office of the president of Pangasinan State University.*

6.3.2. DURATION OF THE INTERNSHIP

This part should make clear in the MOA. The amount of time will be based on the curriculum requirements of each program.

7. TRAINING/WORKSHOP

7.1. CNC Routing Training

PSU FABLAB offers a CNC Machine Operator program that focuses on the knowledge and skills relevant to industry. For example, covered skills include maintaining machines, recording SPC (Statistical Process Control) data, operating CNC machines, setting-up tooling and fixtures, and performing quality inspections. Target participants but not limited to faculty and students, professional engineers, machinist, designers or anyone interested in acquiring skills in CNC routing and cutting technology. The training is at least two (2) days with a maximum of 10 Participants.

Training program includes:

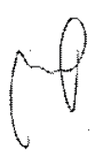
- CNC mill set-up and operation
- Tool identification, set-up, use, and maintenance
- Machining processes
- Statistical process control
- Quality and cycle time optimization
- CNC program operation
- Fixture set-up and operation
- CNC troubleshooting and maintenance for operators
- Precision measurement & gauging
- Print reading
- Geometric dimensioning and tolerancing processes.

7.2. Plasma Cutting Training

Plasma CNC Cutting Training will be equipped with the fundamental knowledge and skills to safely operate plasma cutting torches. A mix of the theoretical and practical, this training delivers basic knowledge of general health & safety, including plasma safety, alongside practical cutting skills development. Target participants but not limited to faculty and students, professional engineers, machinist, designers or anyone interested in acquiring skills in plasma cutting technology. The training is at least two (2) days with a maximum of 10 Participants.

Training program includes:

- Introduction to CNC gantries and safety
- Introduction to plasma cutters and safety
- Overview of routine plasma cutter maintenance
- Discussion of sheet metal safety
- Overview of CNC plasma cutting
- Mechanical design for plasma cutting
- Example cutting of mild steel



7.3. 2D and 3D Modeling

Autodesk AutoCAD is the industry standard for computer-aided design and drafting. In this training, trainees will learn to use effectively the many features of AutoCAD 2D, including commands, plotting, crosshatching, and palettes, trainees will also learn to use effectively the many features of AutoCAD 3D including commands, objects, surfaces, and solids. Target participants but not limited to faculty and students, professional engineers, architects, designers, advertisers, interior designers or anyone interested in acquiring skills in AutoCAD. The training is at least two (2) days with a maximum of 10 Participants.

Training program includes:

- Navigate the AutoCAD user interface.
- Use the fundamental features of AutoCAD.
- Use the precision drafting tools in to develop accurate technical drawings.
- Present drawings in a detailed and visually impressive manner.
- Work proficiently with 3D models
- Convert 2D objects to 3D objects
- Communicate design ideas using visual styles, lights, model walk-through tools and renderings.

8. REVENUE SHARING

8.1. Fees for the services availed by the clients will be used for the continuous operation of the FABLAB. Income of the FABLAB will be distributed properly. Twenty percent (20%) of collected fees per month will be given to the University as part of university income and utilities expense. The remaining eighty percent (80%) of the fees will be allocated to the revolving fund for payment of supplies, and other expenses of the FABLAB.

8.2. Eighty percent (80%) of the fees collected per research will be distributed to the following:

8.2.1. Sixty percent (60%) will be allocated on operational fund to provide necessary equipment, supplies, and materials necessary for FABLAB operation.

8.2.2. Twenty percent (20%) will be allocated to the honorarium for personnel who are involve in the laboratory following standard and acceptable accounting procedures and policies. Honoraria will be given in a semestral basis. Allocation of honoraria are as follows:

University Shares (20%)

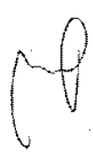
8.2.2.1. Two percent (2%) for the University President
8.2.2.2. Four percent (4%) for the five Vice presidents
8.2.2.3. Two percent (2%) for eleven (11) Campus Executive Directors
8.2.2.4. Five percent (12%) for FABLAB Head

9. POLICIES, GUIDELINES AND PROCEDURES

The Fabrication Lab is located in the new engineering building at Pangasinan State University Urdaneta Campus. The safety of students, faculty, staff, and guests/client is a prime consideration in every activity. The goal of the fab-lab safety and operational manual is to develop practical approaches regarding safety among all members. It will be necessary for the FABLAB manager, faculty and staff supervisors take an active role in initiating preventive measures to control the perils associated with activities under their direction. The success of this project depends upon the cooperation and support of all entities. The rules and guidelines in this document apply to the entire fab lab and makerspace areas and any other lab related work environment including impromptu installation work locations. All tools must remain in the Fabrication Lab or makerspace at all times and may NOT be checked out. At no point will tools will be allowed outside of the lab and its adjacent supporting areas.

9.1. OVERVIEW

An important part of your experience in making will be learning to follow practices and procedures that will prevent injuries to YOURSELF and OTHERS. Develop a positive attitude toward safety. This means that you have a strong desire toward safety and are willing to give time and attention to learning the safest way to perform your work. It means that you will be certain to work carefully and follow the rules – even when no one is directly watching you. Carefully study the safety rules which follow. The Lab supervisor may also recommend some additional rules. If you follow the rules and directions carefully, many of them will soon become safety habits that you will perform automatically. Please note that experience in a Lab does not equal good safety awareness. Many accidents occur not to beginners but from experienced workers that feel more comfortable in the Lab and therefore become more casual in their approach to safety guidelines. NEVER be afraid to ask a supervisor for help. NEVER use a new machine without first asking for assistance from a supervisor



9.2. SPECIAL ATTENTION AND/OR PERSONAL NEEDS

The fab lab requires any client with a medical condition to consult with their personal physician prior to using the fab lab, PSU-FAB does not assume responsibility for any harm that might occur to anyone as a result of a prior medical condition. Should such a medical condition be present, a doctor's approval in writing must be provided to the lab. Once read, please sign your initials next to each condition that may apply to you. Please inform the Fab-Lab supervisor immediately if you are sensitive to the following or have issues with any of the following. It will be your responsibility to inform the Fab-Lab supervisor on duty each time you enter the lab. Dust allergies. Latex allergies Any other allergies that may be present. Physical contact with your Fab-Lab supervisor. (If a supervisor notices you working improperly, they may physically move you for guidance or safety purposes.) Loud background noises and/or commotion caused by machines. Any other need that may require special attention.

9.3. FAB LAB ACCESS & Makerspace Access

Makerspace is open to all MSMEs, researchers, enthusiast, innovators, faculty and students throughout region 1 upon request.

Fab Lab is available to MSMEs, researchers, enthusiast, innovators, faculty and students throughout region 1 during open Lab hours or by appointment. They can only use the lab if their written request has been approved by FABLAB Manager. All users must attend a Safety Training session lecture, pass the safety exam and perform and pass skills tests on selected tools. All users will gain access to the Fabrication Lab or makerspace upon completion of mandatory trainings. Client who are interested in using the Laser Cutter must sign up in advance of using the laser. Lab access may be limited during peak times. Client must login and out in an effort to record usage of equipment.

9.4. SAFETY

Safety in the Fabrication Lab and Makerspace is the highest priority. Accidents may result in serious bodily harm or death. Following proper safety procedures and conforming to the policies as outlined in this manual will greatly reduce any chance of injury. Do not experiment with the tools or try to figure out how to use a machine on your own. If you do not use a tool or machine exactly how you have been shown or neglect to follow all safety rules, severe injury could result and your privileges to utilize the lab may be revoked.

9.5. LAB GUESTS AND VISITORS

Any individual who has completed the requirements for access may accompany Lab guests and visitors. He or she is responsible for that guest. Guests and visitors are not permitted to use any machines or tools and are not allowed in the machine use areas. Visits must be scheduled and approved by the Fab Lab manager. Visits should be as brief as possible.

9.6. TEST REQUIREMENTS

All users of the lab or space must complete the Use and Safety Training primer to gain access to the Lab. Lab safety training consists of: attending the Use and safety session/primer, complete the required video trainings, reading and completing the safety policy, successfully completing the written test and demonstrating safe practices during the skills tests on selected pieces of equipment. Test scores must be 90% or greater to gain access. Users can take the test a maximum of two times before they have to re-take training. The Safety Training schedule will be made available to you by the FABLAB Manager. Individuals must receive additional training for machines not included in the standard orientation.

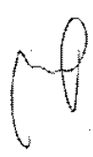
9.7. FAB LAB OCCUPANCY LIMIT

In order to maintain a safe work environment, strict user limits will be enforced. FabLab Staff need to be aware of this limit when planning Lab use and should utilize a laconic rotation or other strategy to avoid exceeding the occupancy limit. The maximum number of individuals allowed to work in the Lab at any given time is 10 people.

9.8. RESERVING THE FABLAB FOR CLASS USE

In order to ensure that there are sufficient open Lab hours for all users, only one class per day may reserve the Makerspace. Faculty in charge of the class must be present at all times while students are working in the space. When the space is reserved for a class, it is closed to other students. The Lab can be reserved Monday and Tuesday between 8:00pm and 5:00pm.

MSMes, walk-in clients, and visitors/tourists can make a reservation in the laboratory from Wednesday to Saturday between 8:00pm and 5:00pm.



At least one weeks' notice must be given to reserve the makerspace for use and should include a brief description of what the lab will be utilized for. A trained monitor must be present at all times while clients are working in the space. The Lab will be Monday to Friday 8AM to 5PM.

9.9. OPEN LAB HOURS

Hours are posted on the Lab bulletin board. Lab hours may vary, depending on the activities taking place in and around the space. If the space is reserved, there are no open hours during that time. At the discretion of the Lab Manager, the Lab may be closed. If the school is closed, so is the Lab and makerspace. Staff absence may cause closure of the Lab or space.

9.10. GENERAL LAB SAFETY RULES

The hazards associated with fabrication work require special safety considerations. Whether you work in a metal lab, wood lab, or any other lab, the potential hazards for injury can be numerous. In an emergency call (075) 632 2559 from a university phone, or 09985567015 from a cell phone. All clients entering the fab lab or makerspace must acquire the appropriate safety gear prior to operating any machine or tool. All clients must clean up after themselves; clients who do not clean up after themselves will lose all lab privileges for a minimum of 1 week. Users are liable to pay for any loss or damage of tools and equipment arising during their stay and use.

9.11. PERSONAL PROTECTION

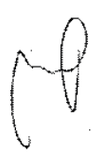
- There are several measures you must take to protect yourself from work hazards.
- Put on your safety glasses/goggles as soon as you enter the lab.
- Do not wear loose fitting clothing.
- Do not wear loose fitting long sleeve shirts/sweatshirts.
- Do not wear neckties.
- No jewelry should be worn in the fabrication lab or makerspace. (Including earrings, watches and excessive rings)
- Snug fitting clothing is essential to your safety.
- Make certain that long hair is not loose, but is pulled back away from equipment.
- Always wear safety glasses when working with any lab equipment. Additional protection using goggles or face shields may be necessary for work such as grinding, chiseling or chipping. Notify fablab staff if you notice any unsafe work conditions.

  ******* If you neglect to follow all safety rules and practices, severe injury could result and your privileges to utilize the lab may be revoked. *******

9.12. SAFETY GUIDELINES

Follow these guidelines for general work safety:

- Never work alone. There must always be at least fablab staff present in the fabrication lab.
- Always wear appropriate safety gear and protective clothing, including closed toed shoes.
- Eye protection is required while operating any machine.
- Know where the fire extinguishers are located and how to use them.
- Never work impaired. This also does not simply mean impaired from drugs or alcohol, but also from sleep deprivation.
- Know the hazards associated with your work. Be sure you are fully educated on the proper use and operation of any tool before beginning a job. If you cannot do a job safely, don't do it. Think through the entire job before starting.
- If you are unsure about how to safely execute the operation of a tool, ask for help. Have the fabrication lab staff assist, demonstrate, and observe to help you become familiar and comfortable.
- If you have not worked with a specific material before, consult the fabrication lab staff for precautions, methods and instruction prior to beginning work.
- Do not work in the lab if you are in a hurry, this almost always ruins the work and often results in injury.
- Leave tool and equipment guards in place.
- Before starting any machine be sure to check that it is set up correctly and fully operational.
- Check power cords and plugs on portable tools before using them.
- Use a brush, or special tool for the removal of chips, shavings and debris. Do not use your hands to clean shavings or cuttings – they can be sharp!



- When doing heavy sanding face masks or respirators should always be worn.
- Keep your fingers clear from the point of operation of machines by using special tools and devices such as push sticks and paddles. Never use a rag near moving machinery.
- Keep the work area free from debris, clean spills immediately and remove all sawdust and wood chips. Do not bring food or drink in to the fabrication lab or Dirty makerspace. All food and drink should be confined to the lounge area of the clean makerspace or outside.
- Clean up after yourself. Before you leave be sure all tools are returned to their appropriate position and all the machines are clean and the floor is swept. Allow a minimum of 20 minutes for your cleanup procedure.
- Earphones, cell phone use and texting are not allowed in the Lab or space. We need to be able to get your attention and you need to hear what's going on around you. Cell phone use and texting are distractions. Simply go elsewhere to use your phone.

9.13. HAND TOOL SAFETY

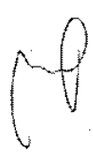
These tools, while they do not involve the same dangers as power machinery, should be used cautiously. Often, the type of injury sustained while misusing these tools are small cuts and lacerations - sometimes requiring stitches. Please observe the following guidelines while using hand tools. Hand tools are non-powered tools. They include wrenches, hammers, chisels, screw drivers, and other hand-operated mechanisms. Even though hand tool injuries tend to be less severe than power tool injuries, hand tool injuries are more common. Because people take everyday hand tools for granted, simple precautions for safety are easily forgotten. Hand tools must remain in the Fabrication Lab or Makerspace at all times and may NOT be checked out. At no point will tools will be allowed outside of the lab and its adjacent support areas.

9.14. HAND-HELD POWER TOOLS

Only change blades, bits, etc., when the tool is off and unplugged. It is very easy to accidentally turn the tool on. Know what direction it moves and be prepared to compensate for the torque of the motor. Wear eye protection at all times - some tools such as the router and plasma cutter may also require the use of a face shield. Always keep your hands a safe distance from cutters and blades. Make sure all guards and safety devices are in place. Do not use a machine without the proper guards. Keep the machine clean. Know the physics of the machine and where the cutting force wants to throw the material. Make sure to turn all power tools off before unplugging, and always check that it is turned off before plugging in. All hand-held power tools must remain in the lab and may NOT be checked out. At no point will tools will be allowed outside of the lab and its adjacent support areas.

9.15. MACHINE SAFETY

- To operate a machine safely, you must know more than just how to turn it on and off. You must know how to perform the basic operations and how to make simple adjustments. Always maintain a healthy respect for the tool's capabilities and limits. Never use a machine for a job it was not designed for and never experiment – if you are unsure about how to perform a certain operation, ask for help. The more you know about a machine, the safer you will be. Don't become over confident - that leads to carelessness, which causes accidents. The following are general guidelines for stationary machines. Wear eye protection at all times - some tools may also require the use of a face shield.
- Always keep your hands a safe distance from cutters and blades. Make sure all guards and safety devices are in place and in perfect operating order. Do not use a machine without the proper guards. Know the physics of the machine and where the cutting force wants to throw the material. When feeding material through a machine with the hands, be aware of the direction you are pushing (away from blade or cutter). Never operate a power tool when alone in the Lab.
- Defects in material can be dangerous. Check the stock carefully for knots, splits, and other defects. Keep the machine clean. Remove all tools, lumber, and unnecessary materials. Objects left on the machine can vibrate into revolving cutters. They can then be thrown from the machine with great force. Never clean a machine while it is running. Always work with a plan of procedure. Consider and think through each step ahead of time. Never make an adjustment unless the power is off.
- The tool must come to a complete stop. Your stance is also important - stand in a comfortable, balanced (defensive) position when working with power tools. Both feet should be firmly on the floor. If something doesn't sound right, or feel right - turn off the machine and inform the supervisor or monitor. Above all, think before you perform any task. Know the tool's capabilities and the work it is intended for. If you feel unsure, STOP and ask for assistance.



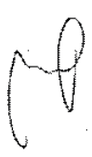
9.16. LASER CUTTER USE AND SAFETY

There are 3 procedures that must be done prior to laser cutting. Make sure the laser exhaust system is properly turned on. Make sure the air assist is on Properly focus the laser. ACCEPTABLE MATERIALS: -Chipboard up to 4-Ply -Museum board up to 1/8” thick -Basswood and Hobby Plywood up to 1/8” thick -Limited Acrylics up to 1/4” thick (Absolutely no PVC material, such as Lexan, or other Polycarbonates) -Styrene up to 1/4" thick Important: If cutting acrylic, the material must have some type of label stating that it is in fact acrylic. If the material does not have this, it will not be cut or engraved. The appropriate acrylic material is stocked in the Fab Lab. When cutting acrylic please bring tape to cover the gaps in the laser door. Other materials are prohibited from the laser unless prior consent from a Fab Lab staff is given.

10. MATERIALS

Tools and Machinery in the Lab each have an intended use to specific materials. Please see the Lab staff if you wish to work with unique materials in the Lab. Used wood and wood-based materials may be processed in the Lab as long as the material is clean, free of dirt, grit, grime, metal, paint, varnishes, enamel, moisture or abrasive materials. Material that is excessively contaminated with any of the above will not be permitted. Lab users using used materials may be found liable for damage to the tools and equipment caused by those materials,

No pressure treated/chemically treated wood allowed in the Lab. No green wood - tree limbs, etc. unless they are completely dry. Consult with before attempting to cut unstable materials (limbs, etc.) as they pose potential dangers when processing. Plaster objects may not be worked on any of the equipment or machines in the Lab. These rules are meant to insure a safe and orderly work environment; please respect them.



11. PROCESS FLOW

TITLE	**CLIENT INQUIRY AND SERVICING**
SCOPE	This procedure starts the moment the client/user walks in and inquiries about the FABLAB services until the client/user leaves the facility.
OBJECTIVE/S	To provide prompt, courteous and proper information and service to the client.

RESPONSIBLE PERSON/S	**PROCESS / ACTIVITY**	**QUALITY MEASURES / REFERENCES**
FABLAB STAFF	Greet and facilitate log in of client/user	CLIENT/USER LOGBOOK
FABLAB STAFF	Initiate conversation with client	
FABLAB STAFF	Provide proper information to client inquiry	SERVICE REQUEST FORM
FABLAB MANAGER	Evaluate need and inform service procedures	
FABLAB MANAGER	Check, and arrange schedule of servicing	FABLAB CALENDAR
FABLAB MANAGER	Affirm and close client service need	
FABLAB STAFF	Facilitate service form preparation	JOB ORDER FORM JOB TRACKING LOGBOOK
FABLAB STAFF	Provide Service	PROTOTYPE SPECIFICATION FORM
FABLAB MANAGER	Provide billing statement	BILLING STATEMENT FORM
FABLAB STAFF	Close transaction and bid client goodbye	RECEIPT AND CLIENT SATISFACTION FORM
FABLAB STAFF	Complete Job Tracking Logbook	JOB TRACKING LOGBOOK

TITLE	**USE OF MACHINE AND EQUIPMENT**
SCOPE	This procedure starts from the time the client/user engages to use any machines/ equipment until completion and payment of usage fees.
OBJECTIVE/S	To facilitate the proper flow and usage of machines and equipment.

RESPONSIBLE PERSON/S	PROCESS / ACTIVITY	QUALITY MEASURES / REFERENCES
USER	Log in the FABLAB logbook for User	CLIENT/USER LOGBOOK
USER	Fill up client information sheet and service request form	SERVICE REQUEST FORM
FABLAB MANAGER	Check the availability of machine and equipment	
FABLAB MANAGER	Wait for approval of FABLAB manager	FABLAB CALENDAR
USER	Commence use of machine and equipment	JOB TRACKING LOGBOOK MACHINE USAGE LOG
FABLAB STAFF	Facilitate use of machine and equipment	
FABLAB STAFF	Complete the machine usage log	MACHINE USAGE LOG
FABLAB STAFF	Provide User billing statement	BILLING STATEMENT
USER	Fills up client/user feedback form	CLIENT SATISFACTION FORM
FABLAB STAFF	Records transaction in Job Tracking Logbook	JOB TRACKING LOGBOOK

TITLE	**REQUEST FOR USE OF CONFERENCE ROOM/CONDUCT OF ACTIVITIES AND WORKSHOPS**
SCOPE	This procedure starts from the time the client engages to use the conference room, until completion and payment of usage fees.
OBJECTIVE/S	To facilitate the proper flow and usage of the conference room..

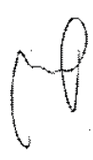
RESPONSIBLE PERSON/S	**PROCESS / ACTIVITY**	**QUALITY MEASURES / REFERENCES**
CLIENT	Log in the FABLAB logbook for clients	CLIENT/USER LOGBOOK
CLIENT	Inquire through the front desk or online	
CLIENT	State date purpose and no. of participants	
FABLAB MANAGER	Wait for confirmation from personnel	FABLAB CALENDAR
CLIENT	Fill up client service request form	SERVICE REQUEST FORM
MANAGER	Finalize and affirm transaction and schedule	
FABLAB STAFF	Plots schedule in FABLAB service calendar	FABLAB CALENDAR
FABLAB STAFF	Call and remind client of the activity	
CLIENT	Actual use/conduct of activity	ATTENDANCE SHEET/ FACILITY USAGE LOG
CLIENT	Fills up Client Service Feedback Form	CLIENT SATISFATION FORM

TITLE	**REQUEST FOR FABLAB TOURS AND VISITS**
SCOPE	This procedure starts from the time the client engages to undertake a FABLAB tour and visit until completion.
OBJECTIVE/S	To facilitate the proper flow in requesting for an activity/workshop.

RESPONSIBLE PERSON/S	**PROCESS / ACTIVITY**	**QUALITY MEASURES / REFERENCES**
CLIENT	Submit letter request for approval	LETTER REQUEST/ACTIVITY DESIGN
PRESIDENT	Confirm approval of request	FABLAB CALENDAR
FABLAB MANAGER	Arrange and finalize details of activity	FABLAB CALENDAR
CLIENT	Fill up request form	FABLAB SERVICE REQUEST FORM
FABLAB MANAGER	Finalize and affirm transaction and schedule	FABLAB SERVICE FORM
DESK PERSONNEL	Call up and remind Client of the activity	
CLIENT	Actual conduct of the activity	ATTENDANCE SHEET/ FACILITY USAGE FORM
CLIENT	Fill up Client Feedback Form	CLIENT SATISFACTION FORM
FABLAB STAFF	Prepare Post Activity Report	POST ACTIVITY REPORT

TITLE	**REQUEST FOR DESIGN DEVELOPMENT AND PROTOTYPING**
SCOPE	This procedure start at the time of inquiry to the time of acceptance, payment of charges and completion of request and payment of service fees.
OBJECTIVE/S	

RESPONSIBLE PERSON/S	**PROCESS / ACTIVITY**	**QUALITY MEASURES / REFERENCES**
CLIENT	Log in FABLAB client logbook	CLIENT/USER LOGBOOK
CLIENT	Fill up client inquiry form	SERVICE REQUEST FORM
CLIENT	Show initial draft design with FABLAB Designer/ Manager	
DESIGNER/ FABLAB MANAGER	Discuss details with Designer	
FABLAB MANAGER	Finalize and affirm transaction	JOB ORDER FORM
FABLAB STAFF	Schedule Designing and Data Making	FABLAB CALENDAR
DESIGNER	Present design output for comments	SERVICE REQUEST FORM
DESIGNER	Finalize design output	
DESIGNER	Proceed to machine Prototyping	PROTOTYPE SPECIFICATION FORM
FABLAB STAFF	Provide Billing Statement	BILLING STATEMENT
CLIENT	Present O.R. and receive item	O.R. AND CLIENT SATISFACTION FORM
FABLAB STAFF	Complete Job tracking log	JOB TRACKING LOGBOOK



TITLE	**PAYMENT OF FABLAB SERVICE FEES AND CHARGES**
SCOPE	This procedure starts from the time of completion and payment of FABLAB service rendered.
OBJECTIVE/S	To facilitate payment of FABLAB services.

RESPONSIBLE PERSON/S	**PROCESS / ACTIVITY**	**QUALITY MEASURES / REFERENCES**
FABLAB STAFF	Check client job order form/ machine usage log	JOB ORDER FORM/MACHINE USAGE LOGBOOK
FABLAB STAFF	Compute charges of service rendered	JOB ORDER FORM/MACHINE USAGE LOGBOOK
FABLAB STAFF	Issue billing statement to client	BILLING STATEMENT FORM
CLIENT	Submit billing statement and pay to cashier	BILLING STATEMENT FORM
PSU CASHIER	PSU Cashier issue Official Receipt	OFFICIAL RECEIPT
PSU CASHIER	Cashier records transaction in Journal	OFFICIAL RECEIPT
CLIENT	Present OR and give a copy of billing statement to the technical staff with written OR number on it.	BLLING STATEMENT FORM
FABLAB STAFF	Secure a copy of the OR number of the transaction	JOB TRACKING LOGBOOK
FABLAB STAFF	Give client satisfaction form	CLIENT SATISAFACTION FORM
CLIENT	Fill-up client satisfactory form	CLIENT SATISAFACTION FORM
FABLAB STAFF	Close the transaction by receiving the form and release the prototype/product	

12. SUPPORT SERVICES

TITLE	**PREVENTIVE MANTENANCE OF FACILITY, MACHINES AND EQUIPMENTS**
SCOPE	This procedure starts at the time the facility commences daily operations and so forth.
OBJECTIVE/S	To facilitate care and maintenance of facility, machines and equipment.

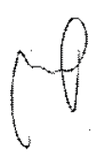
RESPONSIBLE PERSON/S	**PROCESS / ACTIVITY**	**QUALITY MEASURES / REFERENCES**
FABLAB STAFF	Inspect facility, machines and equipment	MACHINE MAINTENANCE MONITORING RECORD
FABLAB STAFF	Conduct daily cleaning activities of facility, machines & equipment before use	STAFF LOGBOOK
FABLAB STAFF	Ensure tools are in the proper place before use	PROPERTY MAINTENANCE LOGBOOK
FABLAB STAFF	Check condition of machines and equipment	PROPERTY MAINTENANCE LOGBOOK
FABLAB STAFF	Record status of machine & equipment in machine& equipment logbook	PROPERTY MAINTENANCE LOGBOOK
FABLAB STAFF	Report to FabLab Manager for any malfunction	PROPERTY MAINTENANCE LOGBOOK
FABLAB STAFF	Check and clean machine and equipment after every usage	PROPERTY MAINTENANCE LOGBOOK
FABLAB STAFF	Clean facility area and turn off computers	PROPERTY MAINTENANCE LOGBOOK
FABLAB MANAGER	Close and properly lock facility	PROPERTY MAINTENANCE LOGBOOK

TITLE	**TROUBLESHOOTING OF MACHINE AND EQUIPMENT BREAKDOWN**
SCOPE	This procedure starts during periodic maintenance checkup and troubleshooting of machine malfunctions.
OBJECTIVE/S	To facilitate machine and equipment check up and malfunction troubleshooting.

RESPONSIBLE PERSON/S	**PROCESS / ACTIVITY**	**QUALITY MEASURES / REFERENCES**
FABLAB STAFF	Check property maintenance status logbook	PROPERTY MAINTENANCE LOGBOOK
FABLAB STAFF	Check machine and equipment operations manual	OPERATIONS MANUAL
FABLAB STAFF	Follow machine & equipment operations manual periodic maintenance instructions	OPERATIONS MANUAL
FABLAB STAFF	Record activity in the property maintenance logbook and report any malfunction	PROPERTY MAINTENANCE LOGBOOK
TECHNICIAN	Follow procedure in treating malfunctions in the operations manual	OPERATIONS MANUAL
TECHNICIAN	Report status to Manager for any spare part replacement	REQUEST FORM
FABLAB MANAGER	Report status to Business Manager for action	REQUEST FORM
TECHNICIAN	Contact qualified technician	OPERATIONS MANUAL
FABLAB STAFF	Replace spare part and test run machine/equipment	MACHINE OPERATIONS MANUAL
FABLAB MANAGER	Record activity in the maintenance logbook	PROPERTY MAINTENANCE LOGBOOK

TITLE	**MATERIAL S AND SUPPLIES REQUEST AND INVENTORY CONTROL**
SCOPE	This procedure start from listing materials and supplies in the FABLAB, its utilization and inventory management.
OBJECTIVE/S	To facilitate request, utilization and inventory of materials and supplies.

RESPONSIBLE PERSON/S	**PROCESS / ACTIVITY**	**QUALITY MEASURES / REFERENCES**
FABLAB STAFF	Prepare list of materials and supply needs	SUPPLIES REQUEST FORM
FABLAB STAFF	Prepare Request Form	SUPPLIES REQUEST FORM
SUPPLY OFFICE	Prepare and submit request form to supply office	SUPPLIES REQUEST FORM
FABLAB MANAGER	Receive materials and supplies	SUPPLIES INVENTORY
FABLAB MANAGER	Check and classify materials and supplies and record in supplies inventory	SUPPLIES INVENTORY
FABLAB MANAGER	Release materials and supplies using First In First Out (FIFO) method of inventory	SUPPLIES INVENTORY
FABLAB STAFF	Record material releases and monitor stocks	SUPPLIES INVENTORY
FABLAB STAFF	Prepare weekly summary of stock inventory	SUPPLIES INVENTORY
FABLAB STAFF	Prepare replenishment request of stocks as the need arises	SUPPLIES REQUEST FORM
FABLAB STAFF	Prepare monthly inventory report	SUPPLIES INVENTORY



TITLE	**RECORDING, BOOKKEEPING AND REPORT GENERATION**
SCOPE	This procedure starts from client inquiry to service completion, payment and status reporting.
OBJECTIVE/S	To facilitate recording of facility transactions and generating status reports.

RESPONSIBLE PERSON/S	**PROCESS / ACTIVITY**	**QUALITY MEASURES / REFERENCES**
FABLAB STAFF	Record all inquiry forms in service logbook	CLIENT INQUIRY FORM
FABLAB STAFF	Record all service transactions in logbook	FABLAB SERVICE FORM
FABLAB STAFF	Post all billing statements in Journal	BILLING STATMENT
FABLAB STAFF	Prepare monthly FABLAB service reports	SERVICE FORM
PSU CASHIER	Post all paid service transactions in Journal	OFFICAL RECEIPTS
PSU CASHIER	Post all expenses incurred in Journal	DISB. VOUCHERS
PSU CASHIER	Prepare Monthly Revenue & Expense Report	GENERAL JOURNAL
PSU CASHIER	Provide copy to FABLAB MGT.	MONTHLY REVENUE & EXPENSES REPORT
PSU CASHIER	Safe keep O.R., reports and Journal	

Prepared by:

REX B. BASUEL, M.Eng. CpE, CCpE
Head, MATIC