Updated: 1/2025

About the Fab Lab

The Fab Lab at Lake Michigan College is an open access digital fabrication studio and collaborative workshop. We provide access to information, tools, software and space for anyone who has an interest to learn and create. The Fab Lab provides open access to design software, laser cutters, 3D printers, vinyl cutters, woodshop, various sewing machines, embroidery machine, CNC router (ShopBot) and various hand tools. You will only incur a charge once you start utilizing the equipment that we have available. Come hang out in the Fab Lab and get inspired, that's always free! Summer camps and workshops are also available for participants of all ages. See our calendar for the most up to date workshop offerings.

Contact Info	fablab@lakemichigancollege.edu 269-927-4851 - Chad Dee, Director, Extended Education
Location	Lake Michigan College Hanson Technology Center (Room H-102) 2755 E. Napier, Benton Harbor, MI 49022
Open Lab Hours	Maker Mondays - Noon - 6pm (except Summers) Available the rest of the week by appointment. **Other days are available for private bookings/workshops.** Please email with preferred date, time, and type of workshop that you are interested in hosting. Planned number of attendees is helpful as well. The Fab Lab will be closed when Napier Campus is closed. Fab Lab hours are subject to change each semester. Summer hours are reserved for summer camps.
Links	LMC Fab Lab Website **- Start here, General information!** Fab Lab's Newsletter Subscription **- Be the first to learn about new workshops and camps!** Facebook - Fab Lab at Lake Michigan College **- All workshops are listed as events here!**

FAB LAB SAFETY

For the safety of yourself and others around you, we ask that you adhere to the following safety standards.

- Dress appropriately, no loose fitting clothing, tie back long hair and hoodie strings, wear closed toe shoes
- Only use equipment that you have been approved to use/trained.
- Safety glasses are to be worn around all woodworking equipment and power tools
- Wear ear plugs & dust masks when appropriate
- Ventilation and dust collection systems are installed with the woodshop equipment, please insure that they are turned on and your equipment's blast gate is open
- First aid kits, fire extinguishers and eyewash stations are available in the shop

LMC Fab lab maintains the right to restrict Fab Lab use at any time due to a person's disregard of safety, impairment, lack of sleep, misuse of lab equipment or disruption of another person's access.

FAB LAB USE/ACCESS

We are an open community lab. Ages 8-108 are welcome to use the lab with proper supervision.

A Fab Lab Tech will be staffed during open MAKER DAY hours to assist with safety, troubleshooting and file preparation. The Fab Lab Tech is available to assist with any design or equipment roadblocks. However please keep in mind they are not assistants, each person is responsible for the execution of their own project. While operating equipment we ask you to monitor the operation and equipment. At no time should you leave a machine unattended, 3D printers are the only exception to this rule. Please be mindful of the workshop schedule as well. If this is your first visit to the lab, it's best to go when there are no other workshops scheduled.

HOUSEKEEPING

Please clean up after yourself! Not cleaning up after yourself is grounds for limited or no future lab use.

Scrap bins and large trash bins are located throughout the shop, please be sure you place your unwanted materials or trash in the appropriate location. For large waste items, please ask a Lab Tech for help disposing of your materials properly. Personal belongings are not to be stored in the lab overnight. The Fab Lab is not responsible for your belongings or personal projects left unattended. If you are working on a large project please consult a Fab Lab Tech regarding approval for temporary storage. These requests must be done in advance. Hand wash stations are available in the Fab Lab. Please be respectful of their use and do not use them to dump chemical or harmful products down the drain.

COMPUTER USE

Please use h102user as your user name and password to log onto the computers within the Fab Lab. If you are utilizing the Adobe Creative Suite, please create your own account with them (directions are in the Lab) and you'll be able to save your files on the cloud. The computers in the lab are "cleaned" often, so if you save it locally, it may not be there the next time you visit the lab.

PRIVATE EVENTS

We will be happy to provide a place for your private event. The Fab Lab has hosted events such as birthday parties, Girl Scout retreats/meetings, club events, and team building events. If you have a specific need and would like to incorporate an activity into your event, just email us at fablab@lakemichigancollege.edu and we will provide an estimate for your outing. Please give as many details as you can: preferred date, time, approximate number of participants and type of workshop that you are interested in hosting. Pricing will be determined per event, not per equipment hourly rates.

Past events have included painting logos, wood turned pens, glass/bottle etching, laser engraved items such as canvases and puzzles. Email the lab (fablab@lakemichigancollege.edu) for more details.

PRICING

Pricing varies per machine, please reference the individual equipment pages for available equipment and pricing. There is a summary page at the end of this document as well.

SUMMERS IN THE FAB LAB

Summers are typically reserved for our summer camp participants. However, we will have some "pop up" Maker Days that can occur. Check our social media platforms and the Fab Lab Calendars for the most up-to-date information on Maker Days.

3D PRINTER

Equipment	Pimiho Official Creality Ender 5 Pro Business Grade 3D Printer Ender 5 User Manual Anycubic Photon Mono X 6K LCD 3D Printer- 7.7inch Creality CR30 Conveyor Belt 3D Printer- Available September 2023
Software	MatterControl free download for PC and Mac MatterControl Getting Started Guide
File type	.STL (Stereolithography or Standard Tessellation Language)
Safety	**Heated bed and extruder**: Can reach temperatures as high as 700 F, allow 10 minutes for cool down before interacting **Moving parts:** Refrain from interacting with the machine while it is operational and keep objects or loose articles clear of print area
Cost	3D printers- 10 cents a gram (minimum $2 prints) Resin printers- 50 cents a mL (minimum $3 prints)
Supply Kit	SD Card, Filament Clipper, Print removal tool, Paper Scrap, Glue stick
Materials	1.75mm filament - we can not stock every color. Please ask a tech about color choices before starting the printer. No ABS or filament that requires additional ventilation 3D Printing and Toxic Emissions: Everything You Need to Know *Refer to Approved Materials & Suppliers table at end of document

VINYL CUTTER/HEAT PRESSES

Equipment	Roland CAMM GS-24 CAMM-1 GS-24 Desktop Cutter Specifications Roland BN-20 Roland BN-20 Manual
Safety	**Sharp blade:** Use caution when installing, handling and storing the blade. Adjust the blade holder when not in use so the blade is not protruding from the holder. **Moving parts:** Refrain from interacting with the machine while it is operational and keep objects or loose articles clear of print area
Software	Illustrator
Cost	$10/Hour Vinyl for CAMM GS-24 (various colors)- $2 per 12”x24” section (ask a Tech- do NOT cut on your own) Vinyl for BN-20 (various formats)- $2 per 12”x20” section (ask a Tech- do NOT cut on your own)
Supply Kit	Scissors, Application tools, Tweezers, Masking tape, Exacto, Blade holder & standard vinyl blade
Materials	*Refer to Approved Materials & Suppliers table at end of document
Educational Resources	Roland Cutter Blade Knowledge Roland Academy Roland OnSupport Manual & Guides (located on desktop of Vinyl PC’s)
Heat Presses	T-shirt and Mug presses available for us, $5 per 30 minutes (30 minute minimum)

Discounts given for large jobs.

LASER CUTTER

Equipment

Epilog Zing [12" x 16"] User Manual - The Zing is currently unavailable as of Spring 2022
Epilog Mini [12" x 18"] User Manual
Epilog Helix [18" x 24"] User Manual
Glowforge [11” x 19.5”] User Manual
Orion Motor Tech [20” x 28”] - Currently only available for large jobs starting May 2019. Please email fablab@lakemichigancollege.edu or see a tech for more information. This laser does not follow the current pricing structure.

Safety

Ventilation: Various materials cause off gassing in the cutting and engraving process. Air filtration and ventilation is provided for each laser and must be on during the process. Filtration is to code for approved laser materials only, please be sure you follow the provided list below or ask a Fab Lab Tech if you are unsure for your safety.
Fire hazard: Lasers use a high intensity light beam that generates high temperatures. Never leave the laser unattended and be sure to carefully monitor use. Stop any operation that causes fire or smoke and use the air assist when vector cutting. A fire extinguisher is located on the wall directly next to the lasers.

Software

Illustrator- for Epilogue lasers (No software needed for the Glowforge)

Cost

$10/hour (one hour minimum)

Supply Kit

Digital Calipers
Laserable Materials Compatibility
Material Examples
Materials Settings

Materials

Laserable Materials Compatibility
Cermark - Laser Engraving Spray
*Refer to Approved Materials & Suppliers table at end of document

Educational Resources

Epilog Laser YouTube Channel

CNC

Equipment	ShopBot 4’ x 8’ Router Model AT/MT7073-070
Safety	**Moving Parts** **Ventilation**
Software	V Carve- Located in the back row of computers in the Design Center as well as the computer with the ShopBot
Cost	$25/per hour Please email the Fab Lab for the pricing structure for your project (fablab@lakemichigancollege.edu)
Supply Kit	Spindle key Collet wrench Collets [⅛” ¼” ½”] Endmills [¼’ ½’] Digital Caliper Brass Screws Brad nails Metal Putty Knife
Materials	*Refer to Approved Materials & Suppliers table at end of document
Educational Resources	Selecting the Right Bit / Feeds and Speeds Chart Holding Down Material for Cutting ShopBot User Guide

SEWING DEPARTMENT

Equipment	Elna Experience 520	Sewing Machine
	Elna 664 PRO	Overlocker Sewing Machine(4 thread)
	Janome Memory Craft 350e	Embroidery Sewing Machine
	Consew 206RB-5	Walking Foot Sewing Machine

Safety **Needles**
Moving mechanisms
Electricity

Software Embroidery Design software built in to Janome Memory Craft 350e
SewArt

Cost $5/hour for any machine except the CNC embroidery machine ($10 per hour). One hour minimum

Supply Kit Supplied at each machine station

Materials Refer to each machines recommendations
Users supply own thread and fabrics

Educational Resources

Elna Website	**http://www.elnausa.com/en-us/sewingideas.php?sic=1**
Janome Community Forum	**http://janome.com/en/support/janome-forum/**
Consew Website	**http://www.consew.com/View/Consew-Model-206RB-5**

WOODSHOP

Equipment

16" Scroll Saw
16" Woodworking Bandsaw
Drill Press
Table Saw
Belt Sander & Disc Grinder
Oscillating Spindle Sander

Hand Tools

Routers
Skill Saws
Jig Saws
Belt Sanders
Orbit Sanders
Biscuit Jointers
Reciprocating Saws
Corded Drills
Nail Guns

Cost $10/per hour

Safety

Ventilation Proper dust collection systems and air ventilation are provided for each piece of equipment. Please ensure the collection system is turned on and the local blast gate for the equipment you are using is open.

DESIGN CENTER

Equipment

6 Desktop Computer stations with dual monitors
1 Presentation station with touchscreen
Projector and screen
Black and white printer
Color printer for posters and larger printing (plotter). Available for $5 per poster print size

General information

Food and drink allowed in lab, please be respectful at design center and keep food/drink on clean tables
Do not save to local computer, keep files on a USB drive, google drive or email to yourself.
Any files left on the computer will be deleted regularly.

Software

Fusion 360
Fusion 360 tutorials
Student and enthusiast account registration
    Fusion 360 is a cloud based program. To set up your own personal login account to save and share files, use the provided link. Students are offered a free 3 year trial, enthusiast can sign up for a renewable 1 year trial.
Adobe Creative Cloud now available on all computers
Matter Control
SolidWorks now available on all 6 computers
V Carve on computers 4, 5, and 6 only
SewArt on Computer 1 only

ADDITIONAL EDUCATIONAL RESOURCES

Instructables
edX
Lynda.com
Unprofessional Development Toolbox
Girls Garage
Project H
Fusion 360 3D Printing Guide
SeeMeEducate YouTube Channel
SeeMeCNC YouTube Channel
SeeMeEducate Curriculum
Print Quality Troubleshooting Guide
How to Succeed when Printing in PLA
PinShape Filament Guide Part One & Part Two
Makers Guide to 30 Thrilling Types of 3D Printer Filament
All3DP
3DPrint.com
Designing for 3D Printing
Instructables
Youtube
Pinterest

Project ideas Thingiverse MyMiniFactory YouMagine Instructables Cults3D
Treatstock Pinshape WikiHouse opendesk

To contribute to this document please email suggested additions, updates and revisions to fablab@lakemichigancollege.edu

APPROVED MATERIALS & SUPPLIERS

3D print	
SeeMeCNC	Filament
MatterHackers	Filament
Maker Geeks	Filament
Clean Strands	Filament
Laser	
Inventables	Acrylic & Cork
	LaserBits
CNC	
ShopBot	Endmills & Collets
Bits	Lowes, Home Depot, Menards
Vinyl Cutter	
Wensco	Transfer Tape & Vinyl
Other	Ada Fruit

PRICING

3D Printers

• Ender 3 and 5 printers- Great for small hobbyist projects. Maximum printable dimensions 8”x8”x10”. Cost is 10 cents a gram
• Resin Printer- ANYCUBIC Photon LCD Printer. Cost- 50 cents a mL. Minimum $3.
• Creality CR30 Conveyor Belt 3D Printing (Infinite Z). 3D printer that has a conveyor belt print bed, can print multiple items continuously or can print longer items in one print. Cost is 10 cents a gram.

Laser Cutters/Engravers

• Epilog Mini, 40W, 12”x18”, $10 per hour, has rotary attachment capability
• Epilog Helix, 30W, 18”x24”, $10 per hour, has rotary attachment capability
• Glowforge, 35W, 11”x19.5”, $10 per hour
• Orion Motor Tech, 80W, 20”x28”, priced per job

Materials*
▪ 12”x12” 3mm plywood- $5
▪ 12”x18” 3mm plywood- $7

Heat Press

• T-shirt press - $5 per 30 minutes (30 minute minimum)
• Mug Press- $5 per 30 minutes (30 minute minimum)

Vinyl Cutter

• Roland CAMM GS-24 – 24” rolls of solid color vinyl. $10 per hour, one hour minimum PLUS vinyl cost of $2 per 2 square foot (12”x24”), 2 square foot minimum.
• Roland BN-20 – 20” printable on various types of vinyl and will cut prints as well. $10 per hour, minimum one hour PLUS material costs, $3 per foot (one foot minimum)

Sewing

• Elna Experience 520 sewing machine - $5 per hour (minimum one hour)
• Elna 664 PRO Overlocker sewing machine- $5 per hour (minimum one hour)
• Janome Memory Craft 350e Embroidery sewing machine- $10 per hour plus thread costs (minimum one hour)
• Consew 206RB-5 Walking Foot sewing machine- $5 per hour (minimum one hour)

Woodshop

• CNC Router (Shopbot)- 4’x8’ bed, $25 per hour
• Other woodshop equipment (scroll saws, bandsaw, lathes, sanders, skill saws, drills, etc)- $10 per hour to use any, one hour minimum.

*Scrap material available for testing at no cost as available.
*Wood/acrylic pen kits are also available.