

**Microfabrication Facility Rate Structure for 2012**

The Microfabrication Facility (MFF) is restructuring the facility and equipment rate structure in an attempt to improve the accessibility of the laboratory for both academic researchers and industrial users. It is challenging to create a rate structure that is satisfactory to every user's unique fabrication requirements while maintaining equity amongst the user community. The MFF staff has canvassed comparable university labs and examined their strategies and rate structures along with extensive modeling of historical income and expense data to construct the following cost-effective rate plans in addition to an overall 15-percent average reduction in hourly equipment rates.

**User Classifications:**

The following user classifications determine eligibility for specific rate plans:

**University of Washington and Affiliates:** University of Washington researchers or affiliate-sponsored researchers (e.g. UW APL). These candidates are eligible for Academic Limited and Academic Full rate plans and are not assessed an overhead rate as the UW overhead rates are already applied to the research grant.

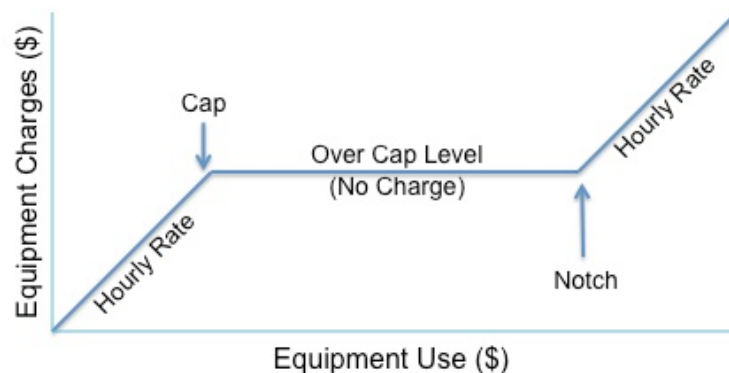
**Non-UW Academic, Non-Profit Organizations, and Government:** Researchers employed by or with appointments at non-UW academic institutions, recognized non-profit organizations, and state/federal government agencies or national labs. These candidates are eligible for the Academic Full rate plus a UW overhead charge of 15.6-percent.

**Industrial:** Any employees of non-academic and non-government organizations who intend on using the MFF facility for self-directed work. These candidates are eligible to select between the Industrial Fixed or Industrial Full plus a UW overhead charge of 15.6-percent rate plans.

**Contract:** Entities that solely seek to conduct limited scope process work that is to be conducted by MFF staff as contract services. Contract services will be provided on a best-effort, time and materials cost reimbursement basis that includes the pro-rated Industrial hourly equipment rate plus Engineering rate. If desired, Contract customers are encouraged to observe the operation of the contract work, but cannot directly conduct work at MFF.

**Notch Cap Concept:**

The cap and notched cap aid in establishing cost predictability for both academic research proposals and industrial fabrication overhead. The cap is a periodic ceiling of usage charges that establishes a relatively fixed price per person. A notch cap sets a not-to-exceed threshold on the cap to discourage wasteful equipment use or monopolization of cleanroom resources by a few users. Users exceeding the notch for their subscribed rate plan will pay the post-notch hourly rate for their classification. Due to the nature of usage tracking being cost-centric, the cap and notch will be based on a plans accrued equipment use charges.



*Rate Plans:*

These rate plans are available to users as dictated in the user classification section. Each project/user combination must be enrolled in a rate plan. Users with multiple affiliations and projects may be in multiple differing rate plans, but all plan charges, caps, and restrictions will be addressed individually for each organization/project/user combination.

**Academic Limited:** This rate plan is intended for light UW academic users who need minimal or periodic access to basic cleanroom fabrication capabilities. Academic users can enroll at any time but are expected to commit through the end of the calendar quarter. The fixed monthly fee covers unlimited lab access, basic photolithography equipment, standard resists/developers, and wet etch processes within the **quarterly** notch cap structure. Limited access users who need access to occasional advanced processes are able to do so at uncapped hourly academic rates. Stockroom supplies, such as wafers and tweezers, and precious metals are charged at cost plus nominal overhead to cover tax and shipping.

**Academic Full:** The full academic rate plan is directed to provide cost-effective access for fabrication-centric academic researchers. The plan provides a usage cap (with the exception of Electron-Beam Lithography) with a sufficiently high **monthly** notch to enable cost-prediction for grant proposals. Full academic users are eligible to be trained on relevant process equipment using their development samples without incurring Engineering charges. Academic Full users will be eligible for a single desiccator within the MFF cleanroom. Furthermore, to foster the development of process-centric research groups, interdepartmental projects or Principle Investigators with multiple **active** Academic Full students will receive a monthly rate discount on standard rates (3-4 students 10%, 5+ students 15%). Stockroom supplies and precious metals are charged at cost plus nominal overhead.

**Industrial Fixed:** The fixed industrial rate plan is directed toward consistently high volume users by providing a consistent monthly charge (for below notch utilization) with a 6-month use commitment. The fixed rate includes monthly card fee, unlimited daily access fees, all equipment charges below the **monthly** notch limit (except Electron-Beam Lithography), and the UW overhead of 15.6-percent. All equipment use that exceeds the notch limit is charged at the Post Notch Cap rate (33% of industrial hourly rate) plus UW overhead. Industrial organizations can enroll in this plan upon initial entry to the MFF. Persistent organizations can opt in and out of this rate plan in January and July. Organizations can have a mixed group of user slots between Industrial Fixed and Industrial Full plans, but must assign a specific project/user to the slot at the beginning of the calendar quarter. Stockroom supplies and precious metals are charged at cost plus overhead. Organizations with multiple fixed users can share notch limits among the **fixed** users, so the monthly usage before being assessed at the Post Notch Cap Rate for 2 fixed users is \$15,000 and 3 fixed users is \$22,500. Organizations with multiple fixed rate accounts will receive a monthly rate discount on the fixed rate fee (3-4 fixed users 10%, 5+ fixed users 15%).

**Industrial Full:** The full industrial rate plan is a standard industrial rate, uncapped plan for light or intermittent industrial users. All access and equipment use charges are billed at the industrial hourly rate plus UW overhead of 15.6-percent. Stockroom supplies and precious metals are charged at cost plus overhead.

**Electron-Beam Lithography (EBL):** The UW JEOL JBX-6300 EBL is one of the most advanced and cost-effective direct write tools in the nation. Despite this, MFF incentivizes its utilization by introducing the cap and notch cap constructs to this tool for each separate project/user combination. The cap is at 60 hours per year with the notch at 80 hours per year of direct write time.. Contract EBL is not eligible for the cap structure.

**Staff Support:** The staff will continue to provide detailed equipment training at standard equipment rates on user developmental samples and provide occasional assistance at no additional charge; however, extensive assistance, co-development, and superfluous retraining will be assessed the standard Engineering rates.

**Fee Schedule:**

Effective: April 1, 2012 (Early adoption option starting January 1, 2012)  
 The rate structure is valid for the calendar year January 1 – December 31.

<b>Organization</b>	<b>UW</b>	<b>UW</b>	<b>Non-UW</b>	<b>Non-UW</b>	<b>Non-UW</b>
<b>Tier</b>	Academic	Academic	Academic NPO/Gov	Industrial	Industrial
<b>Level</b>	Limited	Full	Full	Fixed	Full
<b>Overhead Rate</b>	0.0%	0.0%	15.6%	15.6%	15.6%
<b>Access Fees</b>					
<b>Month</b>	\$300.00	\$100.00	\$100.00	\$5,000.00	\$100.00
<b>Daily</b>	\$-	\$50.00	\$50.00	\$-	\$50.00
<b>Hourly</b>	Limited Academic Rates	Academic Equipment Rates	Academic Equipment Rates	Industrial Equipment Rates	Industrial Equipment Rates
<b>Caps</b>					
<b>Cap/Notch Reset</b>	<b>Quarterly</b>	Monthly	Monthly	Monthly	NA
<b>Access Cap</b>	NA	\$200.00	\$200.00	NA	NA
<b>Equipment Cap / month</b>	NA	\$1,350.00	\$1,350.00	NA	NA
<b>Post Notch Cap Rate</b>	100%	33%	33%	33%	NA
<b>Notch point (\$)</b>	\$1,025.00 <sup>1</sup>	\$3,875.00	\$3,875.00	\$7,500.00	NA
<b>Annual Budgetary Estimate (&lt;notch)</b>	\$3,600.00	\$20,000.00	\$23,120.00	\$60,000.00	NA
<b>Hourly Rates</b>					
<b>Photolithography</b>					
<b>HMDS</b>	\$-	\$25.00	\$25.00	\$75.00	\$75.00
<b>CEE1&amp;2, Headway</b>	\$-	\$50.00	\$50.00	\$150.00	\$150.00
<b>EVG-Aligner</b>	\$-	\$50.00	\$50.00	\$150.00	\$150.00
<b>ABM-Aligner</b>	\$-	\$50.00	\$50.00	\$150.00	\$150.00
<b>Spin-Dev</b>	\$-	\$30.00	\$30.00	\$85.00	\$85.00
<b>Wet Etch Suite</b>					
<b>WetBench</b>	\$-	\$-	\$-	\$-	\$-
<b>WetBench</b>	\$-	\$-	\$-	\$-	\$-
<b>SolventBench</b>	\$-	\$-	\$-	\$-	\$-
<b>Dry Etch Suite</b>					
<b>DRIE</b>	\$75.00	\$75.00	\$75.00	\$225.00	\$225.00
<b>Vision-RIE</b>	\$63.00	\$63.00	\$63.00	\$180.00	\$180.00
<b>Trion</b>	\$63.00	\$63.00	\$63.00	\$180.00	\$180.00
<b>Tegal</b>	\$63.00	\$63.00	\$63.00	\$180.00	\$180.00
<b>ICP-Fluorine</b>	\$75.00	\$75.00	\$75.00	\$225.00	\$225.00
<b>ICP-Chlorine</b>	\$75.00	\$75.00	\$75.00	\$225.00	\$225.00
<b>BarrelEtch</b>	\$-	\$53.00	\$53.00	\$150.00	\$150.00
<b>CVD Suite</b>					

PECVD	\$60.00	\$60.00	\$60.00	\$180.00	\$180.00
LPCVD-Nitride	\$43.00	\$43.00	\$43.00	\$120.00	\$120.00
LPCVD-LTO	\$43.00	\$43.00	\$43.00	\$120.00	\$120.00
AtmTubes	\$43.00	\$43.00	\$43.00	\$120.00	\$120.00
CNT	\$43.00	\$43.00	\$43.00	\$120.00	\$120.00
RTA-Clean	\$50.00	\$50.00	\$50.00	\$150.00	\$150.00
RTA-General	\$50.00	\$50.00	\$50.00	\$150.00	\$150.00
<b>PVD Suite</b>					
Ebeam-Clean	\$63.00	\$63.00	\$63.00	\$180.00	\$180.00
Ebeam2 (new)	\$63.00	\$63.00	\$63.00	\$180.00	\$180.00
Ebeam-Liftoff	\$53.00	\$53.00	\$53.00	\$150.00	\$150.00
Sputter-Lesker	\$70.00	\$70.00	\$70.00	\$210.00	\$210.00
Sputter-Oxford	\$70.00	\$70.00	\$70.00	\$210.00	\$210.00
Precious Metal Surcharge	Cost+OH	Cost+OH	Cost+OH	Cost+OH	Cost+OH
<b>Metrology Suite</b>					
Microscopes	\$-	\$-	\$-	\$-	\$-
P15	\$53.00	\$53.00	\$53.00	\$150.00	\$150.00
Alphastep	\$-	\$-	\$-	\$-	\$-
Wyko	\$53.00	\$53.00	\$53.00	\$150.00	\$150.00
JEOL-SEM	\$60.00	\$60.00	\$60.00	\$180.00	\$180.00
<b>Standalone Tools</b>					
E-beam Litho	\$125.00	\$125.00	\$125.00	\$450.00	\$450.00
EVG-Bonder	\$60.00	\$60.00	\$60.00	\$180.00	\$180.00
Nanoimprint	\$55.00	\$55.00	\$55.00	\$165.00	\$165.00
CopperBath	\$42.00	\$42.00	\$42.00	\$120.00	\$120.00
GoldBath	\$62.00	\$62.00	\$62.00	\$180.00	\$180.00
<b>Packaging Suite</b>					
KS-Saw	\$52.00	\$52.00	\$52.00	\$175.00	\$175.00
Tempress-Saw	\$52.00	\$52.00	\$52.00	\$150.00	\$150.00
CO2 Laser	\$30.00	\$30.00	\$30.00	\$85.00	\$85.00
WireBond	\$42.00	\$42.00	\$42.00	\$120.00	\$120.00
ScreenPrinter	\$25.00	\$25.00	\$25.00	\$70.00	\$70.00
<b>Services</b>					
Engineering Rate	\$100.00	\$100.00	\$100.00	\$100.00	\$100.00
Training Rate	\$-	\$-	\$-	\$-	\$-
Supplies	Cost+OH	Cost+OH	Cost+OH	Cost+OH	Cost+OH

<sup>1</sup>Limited tier notch is calculated quarterly for a notch of \$3,075 (or approximately 120 hours of photolithography/wet etch processing). This gives students maximum flexibility in lab utilization over the quarter to allow for the research cycle of fabricating, characterizing, and publishing.

**Private Equipment Access:** Academic and industrial organizations may elect to operate and maintain private equipment within the cleanroom laboratories. Due to the wide range of equipment complexity and value to the laboratory and the resulting impact on the staff, workflow, and facilities these arrangements will be negotiated on a case-by-case basis with a standard fee of \$200 per unit per month and is subject to the standard 15.6% UW overhead for external (non-UW) users.