

Facilities, Equipment, and Other Resources

FACILITIES:

Laboratory:

Your Company LLC has a machine shop with assorted hand tools and power tools for mechanical prototyping and device packaging. The facility has microelectronics prototyping and basic electronic testing capability. Dry lab space is available.

The Mann laboratory (Biomedical Microsystem Laboratory) has 1,100 sq.ft. lab space and 500 sq.ft. class 1000 cleanroom located in the basement of Tutor Hall. The lab is specifically designed for the prototyping and development of microtransducers, microfluidics, biomedical microdevices, and bioelectronic interfaces using microelectromechanical systems technology.

All laboratory facilities are available for use in this proposed effort. 500 sq.ft. of this lab features flat slab gravity system to minimize vibrations. The lab is equipped for customized micro-electronic, -mechanical, and -fluidic testing; reliability testing; and cell culture (more than 1500 sq.ft. shared cell culture facility on the 5th floor). Both wet and dry lab space is available. A variety of microscopes and imaging tools are available within the lab and additional specialized imaging tools such as electron microscopy are available through state-of-the-art shared imaging facilities on campus. The lab also has a small machine shop suitable for machining of metals, polymers, glass, and ceramics.

Clinical:

N/A

Animal:

N/A

Computer:

Your Company LLC has several laptop and desktop workstations with chip layout, image processing, video capture and editing, graphic design, multimedia, graphing and data analysis, statistical analysis software, and word processing software. Printing and scanning are also available. All Your Company personnel have PCs and internet access to centralized facilities for file-sharing, file back-up, and email.

Your Company LLC also has access to an additional nine desktop and laptop computers with printers through Dr. Mann's laboratory facilities. These computers are equipped with advanced 3D modeling, finite element modeling, CNC machining, chip layout, image processing, graphic design, multimedia, graphing and data analysis, statistical analysis software, and word processing software. Specialized software packages are available for electrochemical analysis and data acquisition. All computers are connected to the internet via Ethernet or wireless access.

Office:

Your Company LLC has office space for all employees. Internet, phone, and video conferencing services are available. Administrative and secretarial support is available.

Dr. Mann has office space at the Department of Biomedical Engineering at the University. Office space for each trainee is available in the lab.

Other:

N/A

MAJOR EQUIPMENT:

Your Company LLC will have access to the major equipment available in Dr. Manns's lab and the W. M. Keck Photonics Laboratory at the University through the budgeted lab access fees.

The following major equipment is located in Dr. Manns's lab: Thinky polymer hybrid mixer, Parylene deposition systems (2), Epilog laser machining center, Taig computer numerical control (CNC) milling station, Wabeco lathe, AB Machinery injection molder, Delta benchtop drill press, Servo miniature drill press, mechanical convection ovens (2), Sun Electronics environmental chamber, programmable and digital stirrer hot plates (3), Signatone probe station, FemtoTools force probes, LabView instrumented computing stations (3), National Instruments data acquisitions systems, Keithley precision source meters (2), Keithley data acquisition system, Agilent precision power supplies (2), SRS high voltage power supply, Agilent precision LCR meter, Textronix oscilloscope, Textronix function generator, multimeter, soldering workstations (2), Gamry potentiostat, Nikon microscope with fluorescence and Nomarski modes, SPOT digital camera, PixelLink CMOS Firewire cameras (2), Vision Engineering stereoscope, Meiji compound microscope, Harvard syringe pumps (3), digital thickness gauge, precision load cell, precision motorized translation stage, digital analytic balances (2), contact angle meter, vibration isolation tables (3), Hybond deep access wedge bonder, anodic bonder, Branson ultrasonic cleaner, temperature controlled water bath, pH meter, OAI UV light source, Laurell spin processor, Technics reactive ion etcher, Lindberg Blue vacuum oven, photo etch system, stencil printing, thin film photoresist laminator, chemical wet benches (5), vibration isolation and optical tables (3), and Omega pressure calibrator.

All equipment and facilities are available for this effort.

OTHER RESOURCES:*W.M. Keck Photonic Laboratory*

The majority of the microfabrication work will be performed in the microfabrication facility located at the University. The W.M. Keck Photonic Laboratory is a 6500 sq.ft. class 100 shared cleanroom facility specifically for researchers and industry users to fabricate devices using micro- and nanotechnologies. It houses fabrication and metrology equipment for photolithography, wet and dry etching, metal and dielectric deposition, oxidation and diffusion. The lab requires access fees and user fees. The shared facility is available for this effort. A lab manager runs the facility. Major equipment available for use in the W.M. Keck Photonic Laboratory is listed below:

Photolithography:

- Solitec Semi-automatic Photoresist Spinner
- Solitec Semi-automatic Photoresist Developer
- Karl-Suss MJB3 type 100 UV mask aligner
- e-beam writer (Phillips Model XL30)

Thermal Processing:

- Mini Brute Model 80 Oxidation and Diffusion Furnaces
- AG Associates Heatpulse Model 610 Rapid Thermal Processing System
- LPCVD Silicon Nitride

Metallization (Al, Au, Pt, Ag, W, Si, etc.):

- Edwards BJD-1800 Electron Beam Metal Deposition System
- Sloan Electron Beam Dielectric Deposition System

Deposition:

- Plasma Technology PECVD (amorphous Si, Si_xN_y, etc.)
- Sputtering System for ZnO

Dry Etchers:

- Plasma Technology RIE with CF_4 , O_2 , and CHF_3
- Plasmaquest Model 98 ECR System with O_2 , Ar, Cl_2 , BCl_3 , H_2 , CF_4 , CH_4
- Technics RIBE 5.5 Reactive Ion Etch System
- XeF_2 Gas Phase Etching System
- Oxford Deep Reactive Ion Etch System

Metrology:

- Ellipsometer
- Dektak Surface Profiler Model DIIA
- Scanning Electron Microscope
- Microscopes and Stereoscopes

Other:

- Wire bonder
- Mechanical Convection Ovens
- Hotplates