

L3Harris Engineering Center

*Semiconductor Manufacturing Program
At UCF
October 22nd, 2022*



UCF

UNIVERSITY OF CENTRAL FLORIDA

**College of Engineering
and Computer Science**

Current Semiconductor-Related Activities at UCF

- Spread over three colleges of CECS, COP, COS
 - More than 20 research-active faculty members
 - Close to \$20M research funding during the past 4 years
 - Spanning a range of expertise including Silicon Photonics, MEMS, Material Processing, Solar Cells, Interconnects, etc..
- Facilities
 - Central cleanroom operation managed by the office of research (OR)
 - Central characterization facility managed by OE
- Education
 - More than 40 courses (UG and GR) are offered over several discipline
 - Consistent hands-on fabrication training at graduate level

Current Training Activities

- Mostly focused on graduate students
- Consistently produced high-quality graduates that are hired by major players: Intel, TI, Micron, Renesas, etc...
- Recently extended to undergraduate in limited capacity



New Investments

\$3.1M in recurring and \$10.8M in nonrecurring Funds

Academic Excellence Program

- Cleanroom Equipment Budget (\$1,785,000 nonrecurring):
 - Advanced Electron-Beam Lithography System (\$1.5M)
 - E-Beam Evaporator System for Metal Deposition (\$280,000 with \$260,000 from UCF)
 - Plasma-Enhanced Chemical Vapor Deposition (PECVD) Chamber (\$255,000 with \$30,000 from UCF)
- **6 Faculty Lines** (\$1.15M recurring and \$3.8M startup fund)
- Two Cleanroom Technical Staff Positions (\$250K recurring salaries):
 - Manager of UCF's Nanofabrication Cleanroom Facilities
 - Equipment Maintenance Engineer

Jump Start Program

- Equipment Acquisition: A direct-write (maskless) photolithography tool (\$534,000)

Operational Excellence Funds

- **13 faculty lines** (\$1,950,000 recurring salaries and \$5,200,000 startup funds)

Major Equipment Acquired

- Two major equipment are ordered
- Installation planning is ongoing



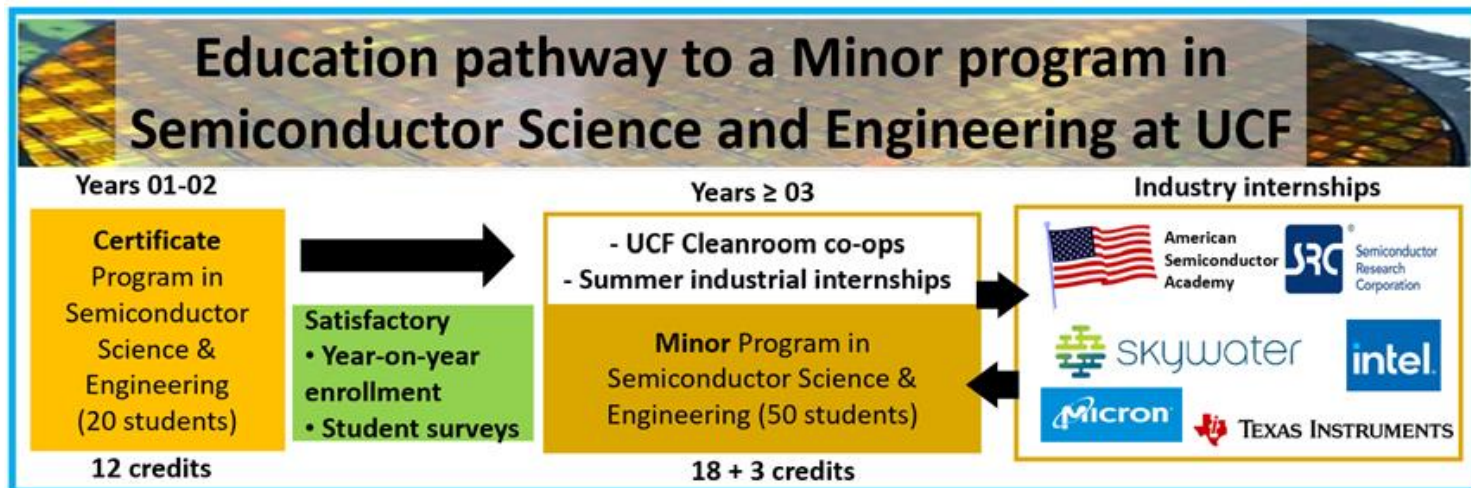
Raith EBP5150 Plus - Ultra High-Performance e-Beam Writer



DWL 66+ maskless photolithography system from Heidelberg, Inc.

Latest Announcement

- New Undergraduate Degree in Semiconductor Manufacturing is being planned at UCF
- A three-year budget of **\$250K/year** is allocated by the provost
- A task-force is formed to fast-track the program development
- A certificate in semiconductor science and engineering will be announced in spring 2023
- A degree program announcement in Semiconductor Manufacturing is expected in 3 years



The Potential

- More than 100 graduates per year is envisioned in 5 years
- Variety of skill set:
 - Semiconductor materials
 - Semiconductor processing
 - Process Integration
 - Yield management
 - Equipment operation and maintenance
- Job-ready graduates through:
 - Targeted skill-development curriculum
 - Summer internships to better prepare the students
 - Year-around on-campus cleanroom co-op positions to enhance the learning experience

The Industry Engagement

- Efforts have stated to recruit industrial partners
- An industrial advisory board will be formed to guide the program and shape it around the industry needs
- The industrial partners are expected to:
 - Review curriculum and offer feedback
 - Help in teaching the course through expert advice
 - Offer guaranteed internship lines to the students
 - Help fund the on-campus co-op positions
 - Help with acquiring training equipment and software
 - Provide major funding for renovation of the labs and building new space.

THANK YOU

