

# NanoScholar Technical Positions

---

## Defect Metrology Intern

### Description

Assist with defect metrology projects by conducting and interpreting results of experiments, performing data analysis, and operating SEM type of tools to characterize test wafers.

**Location:** SEMATECH

### Recommended College Curriculum

Graduate student in physics (optics) or materials science. Consideration may be given to electrical or chemical engineering student depending on other skills. Strong technical understanding of tool physics and applications related to laser, optical and high resolution microscopy. Statistical analysis and strong communication skills. Ability to work with other team members to guide experiments.

### Required Degree Plan

Grad

---

## ESH Engineer

### Description

Review and interpret 2004 NFPA 70E - Standard for Electrical Safety in the Workplace, with emphasis on determining appropriate arc flash personal protective clothing and equipment. Develop appropriate protocol and personal protective equipment requirements needed to bring ATDF into conformance with 70E, if necessary.

**Location:** ATDF

### Recommended College Curriculum

Electrical Engineering

### Required Degree Plan

BS/Grad

---

## E-Test Engineering

### Description

Support internal and external customer electrical testing requirements. Process raw data into quality presentations. Assist with reticle documentation and design layout. Assist with creation of test programs.

**Location:** ATDF

### Recommended College Curriculum

Electronics, Physics, Semiconductor or Nanotechnology, Electrical Engineering or Materials Science

### Required Degree Plan

BS/Grad

---

---

## E-Test Technician

### Description

Support internal and external customer electrical testing requirements. Process raw data. Assist with reticle documentation and design layout. Assist with creation of test programs.

**Location:** ATDF

### Recommended College Curriculum

Pre-Engineering, Electronics, Physics, Semiconductor or Nanotechnology, Mechanical Engineering, Electrical Engineering or Materials Science

### Required Degree Plan

AS/BS

---

## Facilities Mechanical Engineering

### Description

Provide AutoCAD support for the creation and update of Process and Instrumentation Diagrams (P & ID's) of facilities utility systems. Conduct verification of existing utility systems in an industrial environment. Update capacity and reliability documentation of facilities utility systems.

**Location:** ATDF

### Recommended College Curriculum

Mechanical Engineering, AutoCAD technician

### Required Degree Plan

BS/Grad

---

## Facilities Operations Technician

### Description

Provide technical and field support to implement systems assessment and improvement projects relating to cost savings. Develop a plan for project completion. Perform tasks necessary to complete projects with recorded documentation and a final technical presentation of project results summarizing both direct and future cost savings.

**Location:** ATDF

### Recommended College Curriculum

Mechanical Engineering

### Required Degree Plan

AS/BS

---

---

## Facilities Services

### Description

Update capacity and reliability documentation for facilities utility systems. Provide engineering recommendations to improve utility systems efficiency and reliability. Participate in the implementation of utility system recommendations.

**Location:** ATDF

### Recommended College Curriculum

Electrical Engineering / AutoCAD technician

### Required Degree Plan

AS/BS

---

## FEP Engineering

### Description

Support of atomic layer deposition, chemical vapor deposition, and/or rapid thermal processing engineering projects. Work will include assisting with design of experiments, running the experiments, and analyzing the results. Specific assignments or tasks can be tailored according to individual's strengths/background.

**Location:** ATDF

### Recommended College Curriculum

Chemical or Electrical Engineering

### Required Degree Plan

BS/Grad

---

## FEP Maintenance Technicians

### Description

Perform electrical or mechanical troubleshooting to determine problems in non-functioning electromechanical equipment used in the manufacturing process. Work on assignments that are semi-routine in nature where ability to recognize deviation from accepted practice is required.

**Location:** ATDF

### Recommended College Curriculum

Position requires progress towards an AAS degree in electronics technology, or equivalent training such as military training. Requires an ability to read and interpret blueprints, maintenance manuals and engineering sketches, and to utilize complicated drawings and specifications, advanced mathematics and a wide variety of precision measuring equipment.

### Required Degree Plan

AS/BS

---

---

## FEP Manufacturing Technician

### Description

Manufacturing Operator working in a semiconductor fab responsible for manufacturing wafers. Must be able to understand and implement quality techniques. Must be a team player.

**Location:** ATDF

### Recommended College Curriculum

Electronics technology or equivalent education with a minimum GPA of 3.0

### Required Degree Plan

AS

---

## Financial Analyst

### Description

Working with the Manager of Finance of ATDF, intern will assist in ensuring monthly close, developing periodic reporting packages for senior managers and completing period forecasts and annual budget; assist in special projects to analyze ATDF's business.

**Location:** ATDF

### Recommended College Curriculum

Accounting, Finance or Business degree plan

### Required Degree Plan

BS/Grad

---

## Front End Processing (FEP) Division Intern I

### Description

The successful intern candidate will work with professional scientists and engineers on state-of-the-art device fabrication, characterization or analysis. Topics of interest include:

- Electrical characterization to evaluate effectiveness of advanced processes developed in-house
- Performing electrical measurement using auto-prober
- Device reliability test and test automation programming
- Performing hands-on wet and dry etch in advanced device fabrication

**Location:** SEMATECH

### Recommended College Curriculum

Electrical Engineering, Physics, Mechanical Engineering

### Required Degree Plan

BS

---

---

## Front End Processing (FEP) Division Intern II

### Description

The successful intern candidate will work with professional scientists and engineers on state-of-the-art device processing and integration. They will carry out semiconductor device processing and characterization and will learn experimental techniques for successfully characterizing the processes. Topics of interest include:

- Ge, GeC, Epi and device processing/characterization
- Metal gate Work Function
- Metal gate Physical Characterization
- Thermal Treatment effects
- Device simulation [as pertains to High-k/Metal Gate devices & processing]

**Location:** SEMATECH

### Recommended College Curriculum

Electrical Engineering, Physics, Mechanical Engineering

### Required Degree Plan

Graduate

---

## Interconnect Division Intern I

### Description

Metrology support for damage measurement. Intern will learn metrology tools in the fab and measurement techniques.

**Location:** SEMATECH

### Recommended College Curriculum

Engineering, Physics

### Required Degree Plan

BS

---

## Interconnect Division Intern II

### Description

Experimental and analytical studies for process induced damage. Needs to be hands on. Background in materials science. Interns will learn and work on designing experiments. Receive hands on experience in running (metrology) equipment. Analyze data / draw graphs / established trends.

**Location:** SEMATECH

### Recommended College Curriculum

Engineering, Physics

### Required Degree Plan

Grad

---

---

## Interconnect Engineering

### Description

Intern will run experiments on new material through Etch tools (plasma etchers). Intern will be expected to take the data, format it using Excel or Access, and write a brief summary of their findings. They may also generate similar data for an Advanced Plasma Asher tool.

**Location:** ATDF

### Recommended College Curriculum

Physics, Chemistry, Semiconductor or Nanotechnology, Electrical Engineering, Chemical Engineering, Materials Science

### Required Degree Plan

BS/Grad

---

## Interconnect Maintenance Technicians

### Description

Perform electrical or mechanical troubleshooting to determine problems in non-functioning electromechanical equipment used in the manufacturing process.

**Location:** ATDF

### Recommended College Curriculum

Electronics / Semiconductor / Laser Electro-Optics or similar programs for Associates Degree Programs. Requires an ability to read and interpret blueprints, maintenance manuals and engineering sketches, and to utilize complicated drawings and specifications, advanced mathematics and a wide variety of precision measuring equipment.

### Required Degree Plan

AS/BS

---

## Interconnect Manufacturing Technician

### Description

Manufacturing Operator working in a semiconductor fab responsible for manufacturing wafers. Must be able to understand and implement quality techniques. Must be a team player.

**Location:** ATDF

### Recommended College Curriculum

Position requires an AA degree in electronics technology or equivalent education with a minimum GPA of 3.0

### Required Degree Plan

BS/Grad

---

---

## IT Intern for Process Characterization and Manufacturing Applications

### Description

Create a mechanism to track customer requests for Process Characterization work and determine the cost. Work with the Process Characterization Lab to implement algorithms to calculate and report month-to-date lab expenses for projects. Create a function to search comment fields for user-provided strings and display the results on the web. Update PHP scripts to accommodate multiple changes in the workflow for the Process Characterization Lab or other Manufacturing business units. Engineering data conveyance from WorkStream:

- Convert an existing data reporting application from WAMP to LAMP (or VAMP).
- Merge the functionality of another data reporting application into the LAMP-VAMP application; this includes adding cross-sections and reticle maps to the output files.

Work with IT Applications staff to create-or-improve an internal web portal for engineers to browse through and organize WorkStream data and perform a limited number of transactions that affect manufacturing operations.

**Location:** SEMATECH

### Recommended College Curriculum

Bachelor degree in Computer Science, Education in Industrial Engineering, Familiarity with LAMP development suite (Linux, Apache, MySQL, and PHP), Visual Basic, relational database concepts, SQL.

### Required Degree Plan

BS/Grad

---

## Litho Engineering

### Description

Support Litho engineers in process development, product creation and process sustaining work. Monitor existing processes and report on process deviations. Conduct experiments for litho engineers and record and analyze data. Write reports on the week's activities.

**Location:** ATDF

### Recommended College Curriculum

Chemistry, Chemical Engineering, Physics, Engineering

### Required Degree Plan

BS/Grad

---

---

## Litho Maintenance Technician

### Description

Will help to perform preventive maintenance and repairs on tracks, steppers, overlay tools and scanning electron microscopes. Repairs can include electric, electronic, mechanic, pneumatic, Replacing and repairing components and boards. Performing adjustments and calibrations. Updating data base and check lists Updating data base and check lists Testing tools after repair or PM.

**Location:** ATDF

### Recommended College Curriculum

None specified.

### Required Degree Plan

AS/BS

---

## Litho Manufacturing Technician

### Description

Manufacturing Operator working in a semiconductor fab responsible for manufacturing wafers. Must be able to understand and implement quality techniques. Must be a team player.

**Location:** ATDF

### Recommended College Curriculum

Electronics technology or equivalent education with a minimum GPA of 3.0

### Required Degree Plan

AS

---

## Lithography Division Intern II

### Description

Intern for lithography roadmap simulation study internship requires an individual with a good background in the understanding of semiconductor lithography. During internship you will run Monte Carlo simulation of lithography process with a range of input variables and analyze the results for variability. Intern will be engaged with Litho team working on projects that are member company/industry driven.

**Location:** SEMATECH

### Recommended College Curriculum

Good background in simulation of physical systems and statistics

### Required Degree Plan

BS

---



---

## Lithography Division Intern III

### Description

Error budget analysis on Photomasks for write & pattern placement plus other error contributors, within the overall tolerance for the device overlay, for the 45nm node HP, 32nm node HP, 22nm node HP (based on ITRS 2005). Includes return on investment calculation and system level tradeoffs for cost effective manufacturing. Interns will use their experience to gain knowledge of statistical process control, statistical methods used in manufacturing and metrology tool gauge capability methods helpful. responsibilities will include:

- Data collection required is performed via interviews, meetings, and possibly by survey.
- Data must be compiled, analyzed and summarized.
- Analytical capability, report writing, presentation writing (powerpoint format).

**Location:** SEMATECH

### Recommended College Curriculum

Engineering/science education, along with math and statistics.

### Required Degree Plan

BS

---

## Lithography Metrology Intern

### Description

Assist with litho metrology projects by conducting and interpreting results of experiments, performing data analysis, and operating various types of tools to characterize test wafers. Litho metrology includes critical dimension (CD) metrology, which is the accurate and precise measurement of size and shape of manufactured features, and overlay metrology, which is the accurate and precise measurement of alignment between different semiconductor layers. The project deals with world-class, state-of-the-art equipment and samples.

**Location:** ISMI

### Recommended College Curriculum

Undergraduate or graduate student in physics, applied physics or materials science. Consideration may be given to electrical, mechanical or chemical engineering student depending on other skills. Basic understanding of tool physics and/or applications related to electron beams, optical microscopy, Atomic force microscopy, or spectral ellipsometry would be a plus, but could be learned as long as applicant has strong understanding of electromagnetics or basic optics. Some knowledge of statistical analysis, and strong communication skills. Ability to work with other team members to guide experiments. Excel familiarity also important. Experience in Powerpoint or writing macros in Excel a plus.

### Required Degree Plan

BS/Grad

---

---

## Manufacturability System Analyst

### Description

Develop system to extract data from manufacturability database, perform basic statistical analyses, and output analysis to multiple formats:

- Create specific graphics for manufacturability reporting,
- Create real time graphics for the manufacturability assessment web-based interface
- Develop data analysis components for the assessment process
- Enhance statistical reporting features.

Assist technical experts to derive or develop consensus process flows for semiconductor process module manufacturability assessment, Investigate risk areas to determine specific issues related to manufacturability attributes, Investigate possible mitigation solutions for specific manufacturability issues cited in an assessment, Assist experts in the planning (and possible development) of future manufacturability assessment mechanisms, Equipment Productivity/Fab Productivity data retrieval:

- Modify/Update existing Microsoft Excel macros for EPITalk Subscription data retrieval
- Establish Microsoft Access database for Equipment metrics
- Develop macro to upload data into database from Microsoft Excel template
- Create an automated graphs package from the input data.

**Location:** ISMI

### Recommended College Curriculum

Bachelor degree in Computer Science, Education in Operations Research and/or Industrial Engineering , Strong MS Excel/Access skills, along with the familiarity of relational database concepts, Visual Basic, SQL knowledge a plus, Statistical analysis and reporting expertise

### Required Degree Plan

BS/Grad

---

## Metrology Engineering

### Description

The Intern will obtain spectra on new layers and material on Ellipsometry tools. They will assist with writing recipes on MTH35 which will include developing pattern recognition development on new products.

**Location:** ATDF

### Recommended College Curriculum

Physics, Materials Science

### Required Degree Plan

BS/Grad

---

---

## Metrology Manufacturing Technician

### Description

Intern will operate Ellipsometry, Defect Measurement, and Particle Scanning tools (this includes performing Statistical Process Control operations on these tools). Intern will also help collect data for tool demos utilizing this same tool set as well as a few others depending on the particular requirements for the demo.

**Location:** ATDF

### Recommended College Curriculum

Physics, Semiconductor or Nanotechnology, Materials Science, Pre-Engineering

### Required Degree Plan

AS

---

## Process Characterization Analyst

### Description

Intern will be working alongside Process Characterization scientists and will assist in sample preparation and basic operation of analytical techniques that will include one of the following: Atomic Force Microscopy, Secondary Ion Mass Spectrometry, Transmission Electron Microscopy, Total reflection X-ray Fluorescence (TXRF), or X-ray Photoelectron Spectroscopy.

**Location:** ATDF

### Recommended College Curriculum

Materials Science, Chemistry, or related technique. A strong understanding of materials science and chemistry is required.

### Required Degree Plan

Grad

---

## Process Characterization Technician

### Description

Intern will function as an analytical laboratory technician and will learn to perform sample preparation for Scanning Electron Microscopy and other analytical techniques as needed and if time permits, will also learn basic microscopy techniques. Interns may be working in a chemical environment and will receive the appropriate laboratory safety training. They will be provided training on the Scanning Electron Microscopy. There are two classifications of Process Characterization Technicians, SEM and TEM.

**Location:** ATDF

### Recommended College Curriculum

Undergraduate in Materials Science, Chemistry or related discipline

### Required Degree Plan

AS/BS

---

---

## Process Integration Engineer (45nm Development)

### Description

Advanced 45nm Complementary Metal Oxide Semiconductor (CMOS) Process Baseline Performance Enhancement. Design and analyze experiment on 45nm Development. Recommend baseline changes to improve Transistor performance. Support device modeling and testing.

**Location:** ATDF

### Recommended College Curriculum

Electrical Engineering, Electronics, Physics or Semiconductor related fields.

### Required Degree Plan

Grad

---

## Process Integration Engineer (85 Baseline)

### Description

85nm Complementary Metal Oxide Semiconductor (CMOS) Baseline Performance Enhancement. Design and analyze in-line experiments. Recommend and qualify baseline changes to improve CMOS performance. Support device modeling and testing.

**Location:** ATDF

### Recommended College Curriculum

Electronics, Physics, Semiconductor or Nanotechnology, Electrical Engineering, Chemical Engineering or Materials Science

### Required Degree Plan

Grad

---

## Process Integration Engineering Technician

### Description

Support 85-45nm Complementary Metal Oxide Semiconductor (CMOS) Baseline Performance Enhancement efforts. Help design and analyze in-line experiments. Perform in-line lot maintenance, run predefined experiments, submit Failure Analysis lab requests. Manage lot movement in the fab.

**Location:** ATDF

### Recommended College Curriculum

Pre-Engineering, Electronics, Physics, Semiconductor or Nanotechnology, Electrical Engineering, Chemical Engineering or Materials Science

### Required Degree Plan

AS/BS

---

---

## Product Engineer

### Description

Set up products based on customers' provided Design of Experiment (DOE) for short flows of testing structures and then eventually for complete transistor flows of NMOS, PMOS or CMOS devices. Work with:

- WorkStream as Manufacturing Information System (MIS) Software
- Workflow system software for customer orders
- Product flow modules and related Fab area/tools
- Negotiating customer requirements and developing process flows to support processing for experimental deep sub-micron transistor device in a team environment.
- Interacting between customers and Process Engineering
- Addressing issues related to the process flows for lots processing in the fabrication facility.

Requires good understanding of transistor theory and devices manufactured in a wafer fabrication facility plus proficiency with Microsoft Office.

**Location:** ATDF

### Recommended College Curriculum

Electrical Engineering

### Required Degree Plan

BS/Grad

---

## Quality Engineer

### Description

Quality engineering to analyze Business Operations, identify sources of problem and implement fixes to improve product quality. Learn and apply ATDF 8D problem solving methodology. If you like TV series such as 'ER' or 'CSI', this Quality Engineering position is one that you must check out!

**Location:** ATDF

### Recommended College Curriculum

Electrical Engineering, Electronics or Semiconductor related fields.

### Required Degree Plan

BS/Grad

---

---

## Reticle Design Engineer

### Description

Responsibilities will center on contributing to the Lithography Reticle Design Group in support of the photolithography operations in the ATDF.

**Location:** ATDF

### Recommended College Curriculum

Associate degree in drafting and/or related experience in mask design is helpful. Experience working with CAD tools is highly favorable, specifically with CADENCE Design Framework and Virtuoso Layout editor. Familiar with UNIX platform is a must.

### Required Degree Plan

BS/Grad

---

## Simulation Analyst

### Description

Perform factory simulations of semiconductor fabs using Autosched software. Analyze the impact of metrics and parameters on cycle time and productivity of 300mm wafer fabs using static and dynamic modeling tools; CRM, ASAP/AMOD. Update automated material handling systems (AMHS); advanced multi-rail, bi-directional flow with under-track storage capabilities. (AutoMod features). Perform analyses of AMHS and investigate methods to improve fab performance. Investigate vehicle velocity and AMHS capacity and cost modeling of reconfigured fabs. Learn simulation software packages – Cost Resource Model, AutoSched, AutoMod.

**Location:** ISMI

### Recommended College Curriculum

Operations Research, Industrial Engineering

### Required Degree Plan

BS/Grad

---