

# Courses at NTNU NanoLab

End of November 2011 – March 2012

To apply for a course at NTNU NanoLab:

- Send an application via e-mail to [nanolab@ntnu.no](mailto:nanolab@ntnu.no) *at least five working days before the course starts.*
- For each course you want to attend, send an email with the subject “Training request for <course name>”. A separate mail has to be sent for each course to make sure that the automated system delivers the email to the correct engineer.
- For instrument courses, the email body must include the answers to the 8 questions below.
- Information about course place and time will be sent out to all participants after the application deadline.

Due to limited capacities, instrument courses will be given only to applicants who already have a NanoLab activity, or will start one within approximately one month from the course date. Additional courses will be arranged on a short time basis if there are more applicants than available places.

For all instrument courses, please answer the following questions in your course application. We need the information to be able to determine whether or not the instrument is suited for your samples, and your need for a course. Please give short and clear answers and do not send an abstract of your research project.

1. What do you intend to do with the instrument you request training for?
2. What kind of material/samples are you working on? Please describe the sample size and properties (e.g. magnetic, non-conducting, type of solvent if any).
3. Do you have previous experience with similar instruments/processes? If yes, how would you describe your level of experience? How often and for how long have you used such techniques/instruments before?
4. How often do you intend to use the instrument in question in NanoLab (!) in the near future (e.g. once a week, once a month, in the range of every third month)?
5. How long will your project at this instrument last (e.g. 1 month, 1/2 year, 3 years).
6. When will your work at this instrument start (e.g. directly after training, in 2 weeks, in 2 months, etc.)
7. Do you already have an activity in NTNU NanoLab? If yes, what is your activity number?
8. Have you taken the NanoLab cleanroom introduction and HSE course?

We will only be able to give a very limited amount of courses in January. Please contact us if your need is urgent.

For information about our different instruments, please visit [www.norfab.no](http://www.norfab.no).

***Cleanroom introduction course (2 day course)***  
***Part I - Introduction + HSE + practical training (3h)***

***Part II - Rules, Regulations and Procedures (3h)***

Date: 22<sup>nd</sup> + 23<sup>rd</sup> of November, 31<sup>st</sup> of January + 1<sup>st</sup> of February, 21<sup>st</sup> + 22<sup>nd</sup> of February, 13<sup>th</sup> + 14<sup>th</sup> of March (attendance both days is mandatory)

Available places: Unlimited, but divided into groups of 6 for the practical training.

Comment: This course is **mandatory** to get unsupervised access to the cleanroom. Part I is given the first day, Part II is given the second day.

***General introduction course for the lithography area***

Date: 28<sup>th</sup> of November, 6<sup>th</sup> of February, 5<sup>th</sup> of March

Available places: 12

Comment: This course is **mandatory** for all users who want to work in the lithography area.

***General photolithography course***

Date: 30<sup>th</sup> of November, 8<sup>th</sup> of February, 7<sup>th</sup> of March

Available places: 6

Comments: On the basis of a simple process, this course will show very general what photolithography means and what it can be used for. It is for those who have no previous experience with lithography processes, and is not mandatory. This is not a chemical introduction course!

***HF-course***

Date: 29<sup>th</sup> of November, 7<sup>th</sup> of February, 6<sup>th</sup> of March

Available places: 5

Comment: This course is **mandatory** for all users who want to work with HF.

***Mask aligner MA56***

Date: 6<sup>th</sup> of December, 7<sup>th</sup> of February, 6<sup>th</sup> of March

Available places: 6

***Ultracentrifuge***

Date: 30<sup>th</sup> of November, 8<sup>th</sup> of February, 7<sup>th</sup> of March

Available places: 3

***RTP***

Date: 24<sup>th</sup> of November, 2<sup>nd</sup> of February, 1<sup>st</sup> of March, 29<sup>th</sup> of March

Available places: 3

***NanoSight***

Date: Date: 30<sup>th</sup> of November, 8<sup>th</sup> of February, 7<sup>th</sup> of March

Available places: 3

***Particle Size Analyser***

Date: 30<sup>th</sup> of November, 8<sup>th</sup> of February, 7<sup>th</sup> of March

Available places: 3

***Microwave-oven***

Date: 15<sup>th</sup> of December, 23<sup>rd</sup> of February, 22<sup>nd</sup> of March

Available places: 3

***Autoclave***

Date: 15<sup>th</sup> of December, 23<sup>rd</sup> of February, 22<sup>nd</sup> of March

Available places: 3

***EBL***

Date: 22<sup>nd</sup> of November, 31<sup>st</sup> of January, 28<sup>th</sup> of February, 27<sup>th</sup> of March  
Available places: 4  
Comment: The course in November only has 2 places.

***PECVD***

Date: 25<sup>th</sup> of November, 3<sup>rd</sup> of February, 2<sup>nd</sup> of March, 30<sup>th</sup> of March  
Available places: 3

***RIE / ICP-RIE***

Date: 6<sup>th</sup> of December, 17<sup>th</sup> of January, 14<sup>th</sup> of February, 13<sup>th</sup> of March  
Available places: 3

***E-beam evaporator***

Date: 5<sup>th</sup> of December, 16<sup>th</sup> of January, 13<sup>th</sup> of February, 12<sup>th</sup> of March  
Available places: 4

***Veeco AFM***

Date: 8<sup>th</sup> of December, 19<sup>th</sup> of January, 9<sup>th</sup> of February, 8<sup>th</sup> of March  
Available places: 2

***NanoSurf AFM/STM***

Date: 7<sup>th</sup> of December, 18<sup>th</sup> of January, 8<sup>th</sup> of February, 7<sup>th</sup> of March  
Available places: 2

***NanoSurf FlexAFM***

Date: Date: 14<sup>th</sup> of December, 22<sup>nd</sup> of February, 21<sup>st</sup> of March  
Available places: 3

***S(T)EM***

Date (theoretical introduction): 5<sup>th</sup> of December, 13<sup>th</sup> of February  
Date (practical session): 7<sup>th</sup> of December, 14<sup>th</sup> of February, 15<sup>th</sup> of February  
Available places: 2 (for each practical session)  
Comment: Participation in the theoretical introduction course is mandatory for participation in the practical “hands-on” session.

***FIB***

Date (theoretical introduction): 5<sup>th</sup> of December, 12<sup>th</sup> of March  
Date (practical sessions): 7<sup>th</sup> of December, 13<sup>th</sup> of March, 15<sup>th</sup> of March  
Available places: 2 (for each practical session)  
Comment: Participation in the theoretical introduction is mandatory for participation in the practical “hands-on” session.

***Small sputterer/evaporator***

Date: 7<sup>th</sup> of December, 18<sup>th</sup> of January, 15<sup>th</sup> of February, 14<sup>th</sup> of March  
Available places: 4

For all other instruments in the cleanroom training is provided on demand. For practically all instruments, also those not in this list, at least a short introduction is required before use. Always ask an engineer whether a certain instrument needs training or not.

- *Plasma cleaner*
- *Profilometer*
- *Table top SEM*
- *Maskaligner in student area (MJB3)*
- *Wafer saw*
- *Scriber*
- *UV/Ozone-cleaner*
- *Calcination oven*
- *Tabletop centrifuge*
- *Dip coater*
- *Electrophoreses*
- *Ovens*
- *Scales*
- *Laminar Air Flow benches*
- *pH-meter*
- *Spin coater*
- *Ultrasonic baths*
- *Ultrasonic probe*
- *Glove boxes*
- *Surface Plasmon Resonance instrument*
- *Microscopes (fluorescence, DIC, stereo, etc)*
- *SEM sample preparation sputter coater*
- *Wire-bonder*