

Precision Engineering Laboratory – FIB/SEM/ECS Systems

CO-ORDINATOR : Dr Andrew Cockburn
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PRE-REQUISITES: Basic engineering principles

RATIONALE:

To provide the student with an insight into the capabilities of combined SEM, Focussed Ion Beam systems in the areas of imaging, machining, material deposition and chemical analysis. Students will gain practical experience in the use of FIB systems for both patterning and characterisation at the nano scale.

The session will cover the principles, operating characteristics and practical applications of the system.

OBJECTIVES/LEARNING OUTCOMES/COMPETENCES: (Numbered list)

1. Introduction to Focused Ion Beam imaging and machining
2. Gain an understanding of the capabilities and limitations of FIB machining
3. Develop the skills required to allow the independent use of FIB systems.
4. Develop an understanding of the capabilities and of EDS chemical analysis systems

SYLLABUS/RANGE:

- SEM
 - Sample preparation
 - Control of electron beam
 - Image acquisition
- FIB system
 - Sample positioning
 - FIB imaging
 - FIB milling
 - Gas assisted FIB deposition
- EDS
 - Introduction to EDS
 - Use of EDS for chemical mapping

Reference Material:

- (1) Focused Ion Beam Systems, Nan Yao, Cambridge University Press

STUDENT WORKLOAD: Hours	
Staff/Student Contact Time: Laboratory	6
Independent Learning Time: Private Study	2
Total	8