

Euro-Asian Cooperation for Education in Nanoelectronics. Need Analysis



<http://nanoel-asia.eu>

Rationale

To meet the challenges of the nano-electronics education needs to keep up with developments in the scientific sector. NanoEI-Asia – an e-learning initiative funded under the European Union's CBHE framework – is an important step in that direction.

Aim

Transferring knowledge between European and Chinese, Malaysian, Indian and Israeli HEIs to modernise university curricula in nanoelectronics. Common MSc courses development for the new skills needed for the new jobs in nanoelectronics.



Survey Methodology

Learning outcomes of 28 courses designed defined by the 11 academic institutions.

A short survey designed to analyse the nano-microelectronic industry training needs.

The survey was distributed via Opinio (on-line survey tool) to 140 companies CTO's or managers.

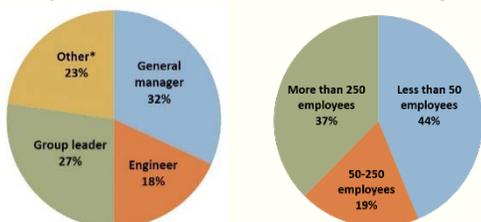
Results

The courses which are planned to be developed cover wide and different spectrum of competencies and are relevant to the companies and academy that respond to the survey

All the proposed skills and competencies are considered to fulfil average or high or mandatory need.

Knowledge and skills rated by >70% of the respondents as high need are:

- Analyze the results of characterization methods: AFM, STM, TEM, SEM, XRD, XPS;
- Advanced knowledge of a field of materials for nano electronics and their use in nano devices fabrication;
- Overview of the fundamentals of Scanning Probe Microscopy (SPM based nanolithography: STM, AFM, Near field optics) and of their application;
- Know and understand the operation principles, advantages and limitations of important experimental techniques in the field of nano science.



65% respondents from companies

Courses under Development

Nanomaterials for Electronics
 Nanomaterials Synthesis and Characterization Techniques
 Carbon Nano Tubes and Applications
 Graphene Nanoelectronics
 Advanced Nanoelectronic Devices: miniaturization of transistors and the resulting impact on their performance.
 Sensing at the Nanoscale
 MEMS Design
 Bioelectronics
 Socio- Ethical and Environmental Aspects of Nanotechnology
 Microelectronics Technology
 Nanoelectronics for ICT
 Design of Nanoscale MOS ICs

Advanced Optoelectronic Instrumentation & Materials
 Top-Down ASIC Design Flow
 Nanoelectronics Quantum Phenomena in Nanoscale Systems
 Nanotechnology for Solar Energy Utilization
 Functional Nanostructure: Synthesis, Characterizations and Device Applications
 Nanoelectronics: Processes, Computation and Design
 Nanoelectronics Systems: Future Nanoelectronic Devices and Manufacturing Processes
 Nanoelectronics Systems: Applications- Quality living with Smart Future, Present to Future Business Systems
 BioMolecular NanoComputing
 Memristor-Based Neuromorphic Systems

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