

Nanotechnology - Educational Scenario

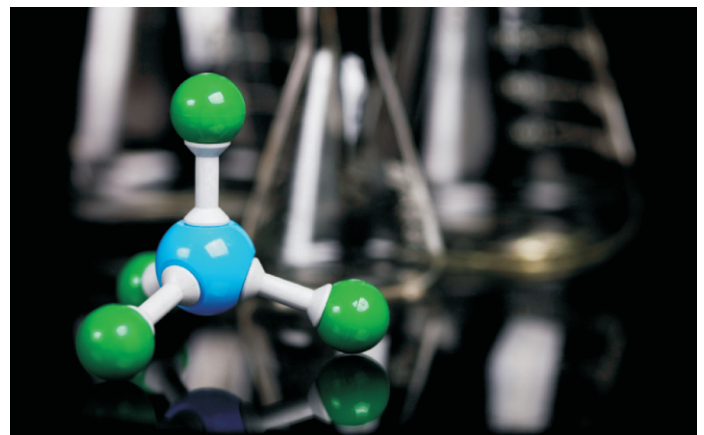
DEVIKA GAUR

The potential of Nanotechnology makes India to focus on proper education and research in this field for better development. This field is expected to boom in the future and throw up a large number of job opportunities. There is a need for better awareness and investments.

Technological advancements demand higher education and higher education leads to technological advancements. Today's technological institutes have to cope up with not only the dynamic industrial scenarios at the global level, but also the demands of huge investment and skilled manpower.

Nanotechnology is potential technology for future emerging applications in various filed. Scientist portend that it will impact lives of humans in every imaginable area right from medicine to food packaging. The potential is practically unlimited or right now unknown. Some scientists believe that it would be used to convert sunlight into power, deliver a drug to a malignant cell without going through the whole human system or be able to produce protective clothing that can block harmful effects of radiation. There has been considerable progress in developing nanomaterials for use in various industries. Scientists have developed nanoparticles, which can be used in pesticides to kill crop-destroying pests but will leave the soil and environment chemical free.

Nanotechnology is truly interdisciplinary; it involves manipulating and controlling individual atoms and molecules to design and create new materials, nanomachines, nanodevices for application & financial growth of nanotechnology market in all aspects of our lives. Recent advances and envisioned developments in enabling nanotechnology provide challenges to academia in educating and training a new generation of skilled engineers, competent scientists, efficient economist & financial wizards. These engineers and scientists should possess the ability to apply



knowledge of mathematics, science, and engineering in order to design, analyze and fabricate nanodevices and nanosystems, which are radically different when compared with traditional technological systems. The importance of nanotechnology has been widely understood by all counties. In India, the nanoscience and technology undertaking has primarily been a government led initiative. Department of Science and Technology (DST) established the Nanoscience and Technology Mission (NSTM) for coordinating all research activities by various scientific organizations, laboratories and universities.

Nanotechnology Education in India

India is a promising country with lot of prospects. The global market is focusing to invest in India. Hence there is a need for skill-based education. In India, Nanotechnology targeted to the main flow such as electronics, industrial products and healthcare markets. Scope for the nanotechnology is a tremendous and is one of greatest carrier option for the engineering

At present nanotechnology and its theories have great significance in the research areas because of the dynamic and brilliant properties of nano particles and nano devices. Nanotechnology education involves general and multi discipline sciences education including physics, molecular biologics, biometrics, mathematics and chemistry. Its diversity and applicability make nanotechnology very important branch of science that must be considered for advancement in technology and engineering sector.

graduates. But it is just at a starting level and it needs the interest and contribution from the students and other people for the development in further stage.

In India there is a huge demand for skilled students and engineers in a good number of industries and laboratories. Even several new institutes are introducing several degree and postgraduate courses for the same.

There are quite a number of institutes that offer Nano-Technology Courses in India. The M. Tech. in Nanotechnology is a post graduate degree courses that provides a thorough understanding on the core concepts of nanostructuring, nanofabrication, nanodesigning, characterization techniques and testing techniques for nano devices. Other courses include M. Tech. in Health Care Nanotechnology and Ph.D. in Nanoscience and Technology. These kind of courses enhances the professional development of the students.

Nanotechnology Institutes in India

There are several schools which run the nanotechnology courses. - Jawaharlal Nehru Center for Advanced Scientific Research, Bangalore

- Central Scientific Instruments Organization,

Chandigarh

- Indian Institute of Science, Bangalore
- National Physical Laboratory, Delhi
- National Chemical Laboratory, Pune
- Defence Materials Store Research & Development Organization, Kanpur
- Amity Institute of Nano-technology, Noida
- Solid State Physics Laboratory, Delhi;
- Indian Institutes of Technology at Kanpur, Chennai, Guwahati, Delhi and Mumbai.
- Banaras Hindu University, Varanasi

Job Prospectus and Career Options in nanotechnology Education

Nanotechnology application and scope are tremendous. There are very expanding opportunities in this field and this field have rises impact on daily lives. The major application development areas are information technology, medical and pharmaceuticals, electronics, energy chemicals, magnetics and optoelectronics, textiles and advanced materials. The professional in this technology can work in fields of nano-medicine, stem cell development, bio-informatics, nano toxicology, pharmaceutical companies, and the nano power generating sectors. The Nanotechnology in India is still in infancy stage. Several efforts are being to avoid any lagging. Since Nanotechnology is an interdisciplinary field hence the pass-out students with a degree in nanotechnology find employment opportunities in a various fields. Some of the areas where a nano-technologist can seek employment include the following:

- Medical Industry research and consulting-pharmaceutical, medical, agriculture, food and beverage, hospitals, environment industries.
- Research and development in government, universities and private research institutes
- Education, teaching and academic
- Entrepreneurial, management and investment advisors in biotechnology and research and development industry.
- Product development and advising.
- Communication and media, interfacing of new technologies.
- Many new industries emerging as a result of advances in nanotechnology
- Also in forensic, space research.

