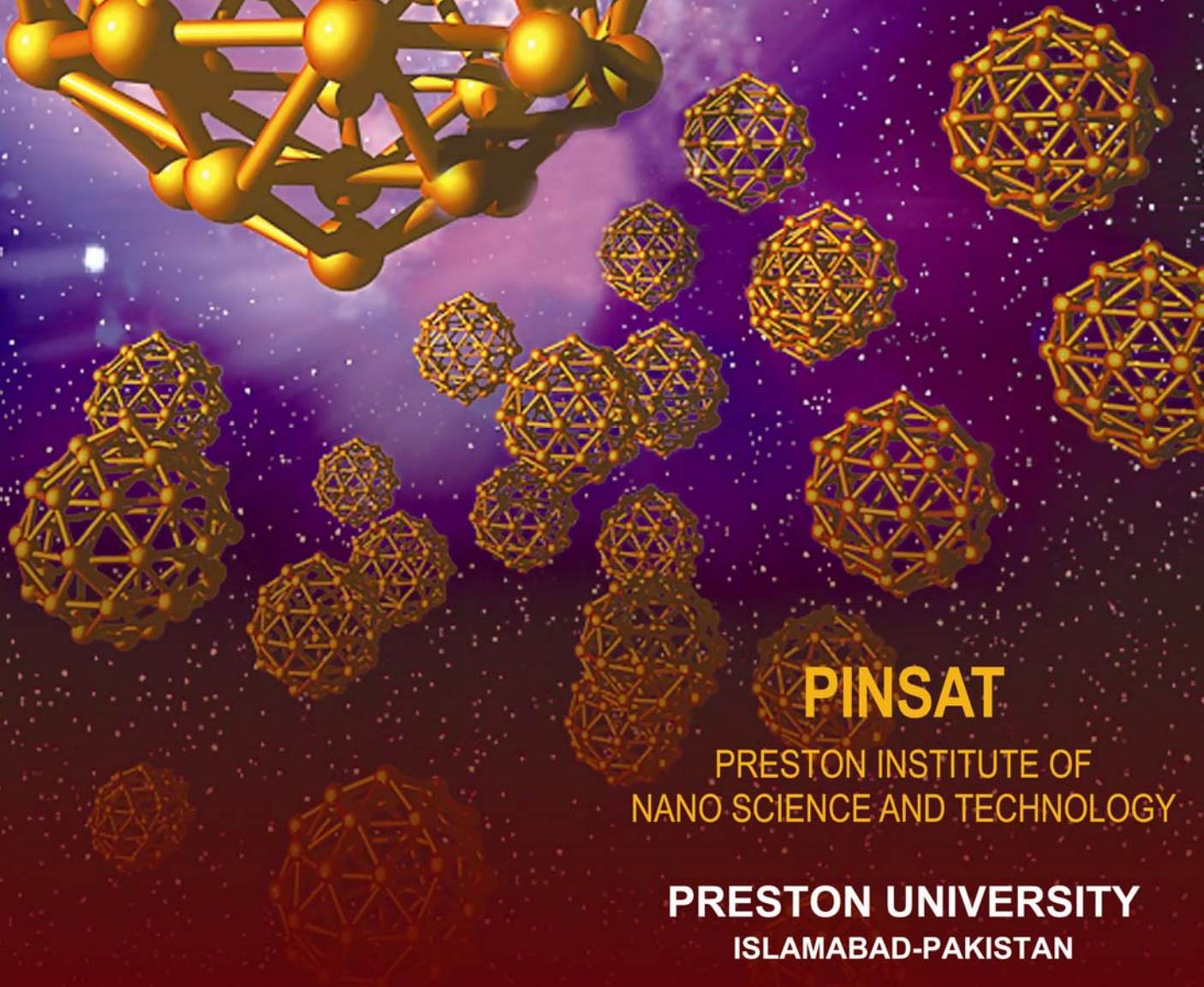
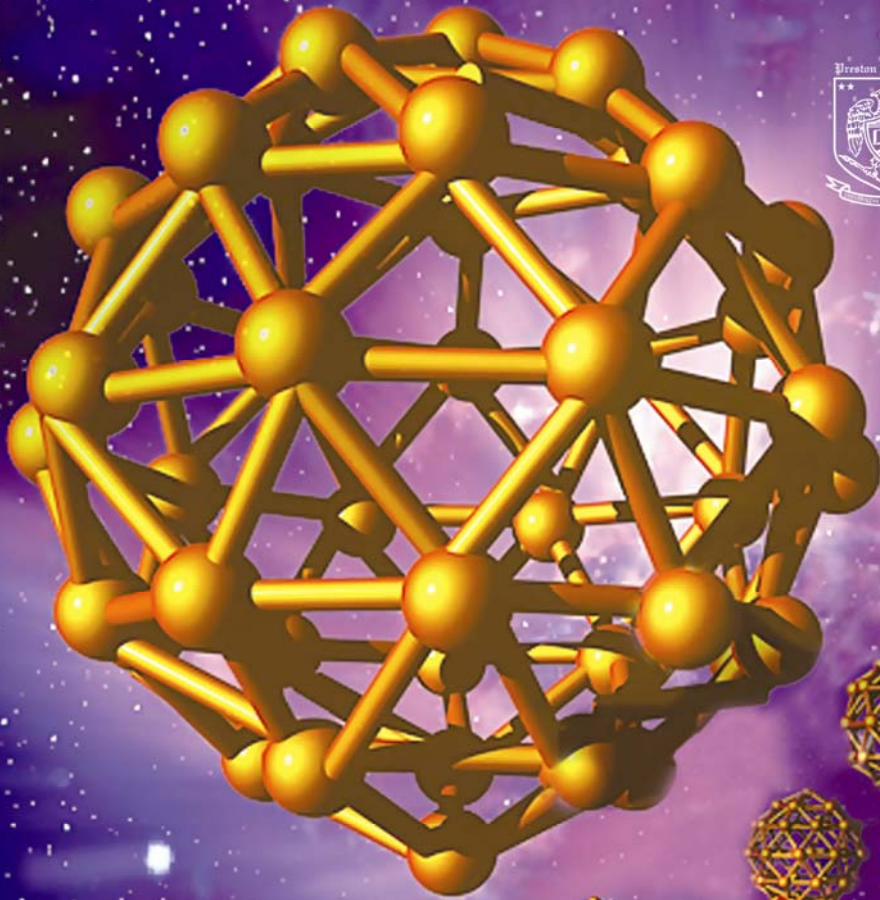




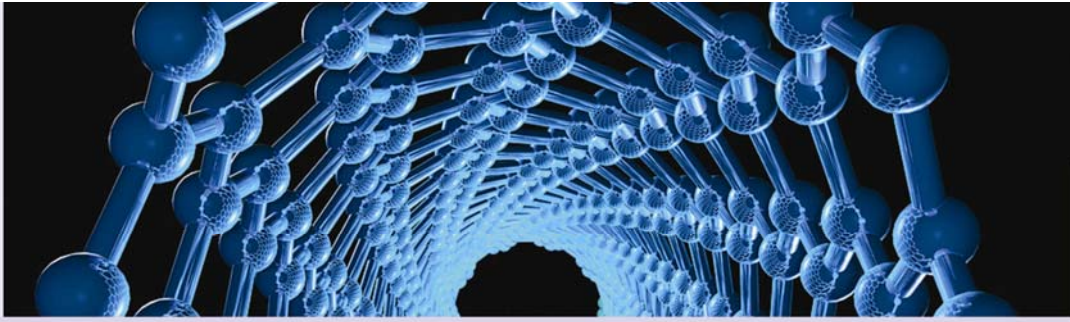
PRESTON
UNIVERSITY



PINSAT

PRESTON INSTITUTE OF
NANO SCIENCE AND TECHNOLOGY

PRESTON UNIVERSITY
ISLAMABAD-PAKISTAN



Preston Institute of Nano Science and Technology (PINSAT)

Introduction

Realizing the importance of the field of nanoscience/nanotechnology and considering the fact that nanotechnology promises to be a dominant socio-economic force and of direct industrial application for our society in the coming decades, necessitating the need of producing properly qualified human resource. Preston University has taken the initiative of establishing the "Preston Institute of Nano Science and Technology (PINSAT)". This is the first Institute of its kind in Pakistan and has been created with the following objectives:

- (i) To initiate an undergraduate degree programme in the field of nanoscience/nanotechnology and at a later stage introduce the MS and Ph.D programmes. This is essential for the reason that a very relevant and appropriately trained Human Resource for Industry and R&D will be needed.
- (ii) Promotion of Research and Development in the field of nanoscience/nanotechnology.
- (iii) To hold workshops in order to familiarize different segments of the society to the socio-economic importance of Nanotechnology.
- (iv) To establish direct and strong liaison with various industries to assess their future requirements in this field and to create public awareness regarding industrial and economic benefits as well as safety, moral, ethical and other societal issues linked with the development of nanotechnology.

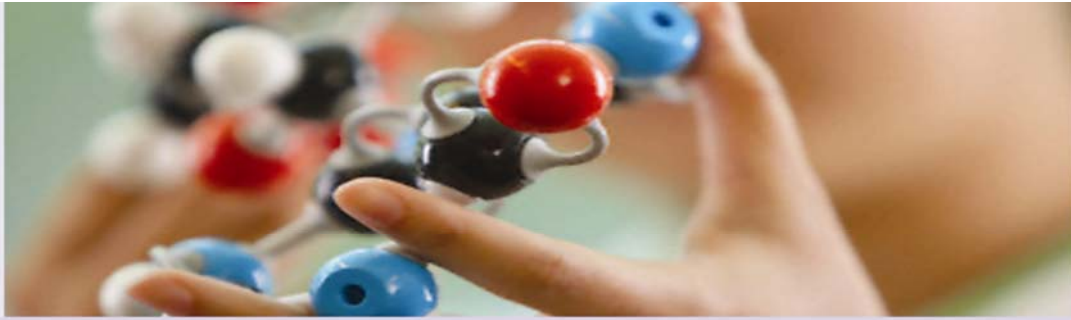
Preston University Introduction

Preston University has successfully completed 25 years of dedicated service to this country and the nation. From a humble beginning as a pioneer in private sector higher education, 26 years ago, Preston has grown by leaps and bounds and has emerged as a highly respected institution of higher learning in the country. The mammoth contribution Preston has made towards building the human capital of Pakistan, by imparting top quality education, has been duly acknowledged by the Government of Pakistan. In recognition of its meritorious services, the Government of NWFP and the Government of Sindh have conferred a university charter and degree awarding status on Preston University, Kohat and Preston University, Karachi respectively. The University takes genuine pride in the fact that it has been able to produce and provide more than 50,000 qualified and trained graduates to national, multinational and international organizations both within the country and abroad, since its inception.

Preston today has a large network of campuses in the country, with total enrollment exceeding 10,000 students. Keeping in line with the evolving technological advancements and requirements of the global business and national needs, Preston University is offering high-quality, market-driven education in the fast-growing and ever-expanding fields of Business Administration, Information Technology, Social Sciences, Natural and Applied Sciences and Engineering. Its nationwide network covers the major cities of Pakistan namely Kohat, Peshawar, Islamabad, Lahore and Karachi.

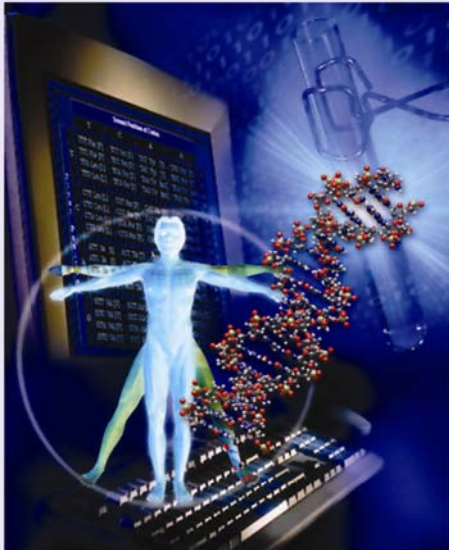
Charter/Recognition

Preston University, Kohat-NWFP is chartered by the Government of NWFP vide NWFP Ordinance No. LII of 2002. Preston University, Karachi is chartered by the Government of Sindh vide act V of 2004. Both, Preston University, Kohat-NWFP and Preston University, Karachi-Sindh are full-fledged degree awarding institutions of higher learning, in the private sector, and are duly recognized by the Higher Education Commission (HEC), Government of Pakistan.



Nanoscience/ Nanotechnology

Nano originates from the Greek word meaning "dwarf". A nanometre is one billionth (10^{-9}) of a metre, which is tiny, only the length of ten hydrogen atoms, or about one hundred thousandth of the width of a hair. Although scientists have used matter at the nanoscale for centuries, calling it physics or chemistry, it was not until a new generation of electron microscopes like Scanning Tunneling Microscope (STM) and Atomic Force Microscope (AFM) were invented in the 1980's that the world of atoms and molecules could be seen, manipulated and controlled.



In simple terms, nanoscience/nanotechnology can be defined as 'science/engineering at a very small scale i.e. the nano scale'. The properties of materials, whether physical, chemical, electronic or magnetic at such small sizes are very different from those at bulk scale. This makes the products of industry and systems made by using nano scale materials smaller in size and better in performance. The vision of nanotechnology dates back to the lecture delivered by the Nobel Laureate Professor Richard Feynman in 1959, "There is plenty of room at the bottom". In the years to follow, nanotechnology developed so fast that it has now come to be known as another "Industrial Revolution", with a potential of 1-2

trillion dollar marketing of nano based industrial products by 2015 and its application in industry for the foreseeable 40 to 50 years. Already, by Nov. 2009 some 2500 industrial products and applications of nanotechnology have come in the market, opening vast avenues for job market in industries, R&D organizations, intellectual property rights and influencing world economy and strategic applications for decades to come, thus necessitating the production of specifically trained human resource for such organizations.

The growth of nanotechnology is one of the most exciting developments in science and engineering in recent years. Much of the research in this field is interdisciplinary in nature, drawing expertise from different areas across the life science, physical science and engineering disciplines.

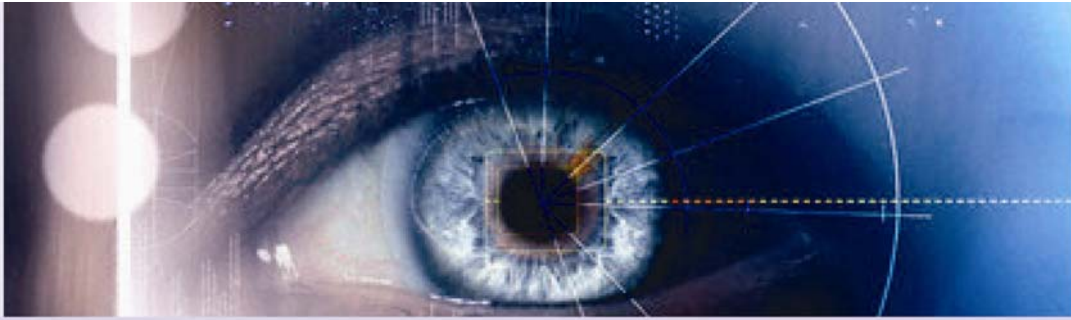
Research and Development

Promotion of Research and Development in the field of nanoscience and nanotechnology will also be one of the objectives of the Institute. Areas like nanomaterials, nanocoatings, nanosurfaces, nanoelectronics, nanosensors, nanobiotechnology, nanochemistry, nanomedicine and nanotechnology for energy,



healthcare and environment would be the main focus. The aim would be to help produce value added quality goods for the industries suitable for export like sports goods, textiles, leather goods etc. and to reduce the import of high quality and high technology goods from abroad in order to save foreign exchange of the country.





Industrial liaison

Efforts will be made for speedy transfer and utilization of the new technology by the industry for which joint R&D projects could be helpful. PINSAT will set up an industrial liaison office which will be responsible for active linkage between the Institute and the industry focusing on industries of national priority. This is very essential for the development of nanotechnology which has immense industrial applications of immediate nature for several industrial products of Pakistan, like sports, textiles, leather etc.



Career prospects for Graduates of PINSAT

In the coming decades, nanoscience and nanotechnology will undoubtedly become the driving force for a new set of public utility products, systems, and applications. They are even expected to become the basis for a new nanotechnology industrial revolution.



Within a few years, nanoscience applications are expected to impact virtually every technological sector and ultimately many aspects of our daily life. In the coming five-to-ten years, many new products and companies will emerge based on nanotechnology and nanosciences. These new products will stem from the knowledge developed at the interface of the various scientific disciplines offered in this graduate program of PINSAT. As a result, the students who graduate with a degree of B.S. in nanosciences and nanotechnology will be joining companies developing these new technologies. The

graduates will be able to go into R&D institutions and universities as well as industry. In the coming years, there will be a strong need for scientists and engineers whose expertise is precisely at the interface of these various disciplines, and these graduates will end up in jobs directly aligned to the education offered in this program. They will be employed by companies in the electronics sector, new and smart material industry, chemical technology, biotechnology companies, sports and textile industries etc. As graduates of the program, they will have an ideal background to become the interface between experts in all these disciplines and they will be able to use their broad perspective of nanotechnology to develop and create new products. With their basic education, they will also end up in R&D, product design, or product development, or they will have the capability to become independent



consultants in organizations like Intellectual Property Rights, Patent Offices etc. The job markets for nanotechnology graduates thus will be wide open at home and abroad.



BS (4-Year) DEGREE PROGRAM *in* NANOSCIENCE & TECHNOLOGY (Being offered at Islamabad Campus)

Program duration

4 years (8 semesters): 131 Cr. Hrs.

Eligibility

F. Sc. (with at least 1st Division) / A-levels (Grade 'C') with Pre-medical or Pre-engineering background. Those awaiting results may apply; however, their admission will be subject to their fulfilling the minimum requirements for admission. In addition to the minimum qualification, candidates are required to qualify a written test and an interview, for admission to BS Degree Program.

Program Requirements

A student must satisfactorily complete course work for eight semesters (four years) for the award of BS degree in Nanotechnology. In addition to the requirements of earned credits, a cumulative GPA of minimum 2.2 on a scale of 0.0-4.0 must be attained.

Program (Salient features)

- The course structure envisages to prepare the students to learn the core subjects that are vital for Nanotechnology viz: Maths, Physics, Chemistry, Biology and Nanotechnology with Applications in Industry.
- These core subjects will be compulsory for the first two years
- In the 3rd year, the students will take elective subjects giving them a background in different fields of Nanoscience and Nanotechnology.
- At the end of 3rd year, during the summer semester, the students will undergo Internship in Industry.
- In the 4th year, the students will undertake a major Research Project, supported by more elective subjects.
- Total credit hours: 131, of these 27 credit hours are devoted to compulsory subjects to fulfill the requirement of HEC.

BS Nanotechnology: 131 Credit Hours

First Semester (17 Cr. Hr.)

- English - I
- Mathematics - I
- Computer Science
- Chemistry - I
- Physics - I
- Nanoscience/Industrial Applications

Second Semester (17 Cr. Hr.)

- English - II
- Mathematics - II
- Pakistan Studies
- Chemistry - II
- Physics - II
- Nanomaterials - I

Third Semester (18 Cr. Hr.)

- English - III
- Mathematics - III
- Chemistry - III
- Physics - III
- Cell Biology
- Nanomaterials - II

Fourth Semester (17 Cr. Hr.)

- Islamic Studies
- Electronics
- Biochemistry
- Statistics
- Synthesis and Characterization Techniques of Nanomaterials

Fifth Semester (18 Cr. Hr.)

- Materials Science
- Nanotoxicology and Ethics
- Quantum Mechanics
- Molecular Biology
- Analytical Techniques

Sixth Semester (14 Cr. Hr.)

- Nanoelectronics
- Nanotherapeutics
- Technical Project Management
- Nanoelectronic Devices

Summer Semester (6 Cr. Hr.)

- Internship in Industries

Seventh Semester (12 Cr. Hr.)

- Computer Simulation Techniques
- Research Paper Writing and Publishing
- Nanobiotechnology
- Nanochemistry

Eighth Semester (12 Cr. Hr.)

- Research Project



SCHOLARSHIPS

- 5 Full Merit Scholarships
- 5 Partial Merit Scholarships will be made available to deserving students.

Our Highly Qualified and Experienced PhD Faculty

Dr. N.M.Butt, S.I

Ph.D. (Birmingham) / D.Sc. (Birmingham),
Chairman PINSAT

Dr. Khwaja Yaldram

Ph.D. (Strasbourg)

Dr. Muhammad Kalim Tahir

Ph.D. (Sweden)

Dr. Anwar Khitab

Ph.D. (France)

Dr. Muhammad Ilyas

Ph.D. (UK)

Dr. Iftikhar ul Hasan

Ph.D. (Albany)

Dr. Javed Iqbal Saggi

Ph.D. (China)

Dr. Toqeer Ahmed Malik

Ph.D. (QAU)

**BS Nanoscience and Technology Degree Program
is offered at Islamabad Campus.**

PRESTON INSTITUTE OF NANO SCIENCE AND TECHNOLOGY (PINSAT)

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Degree College
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PESHAWAR CAMPUS

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University Town
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LAHORE CAMPUS

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New Garden Town, Lahore
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KARACHI

MAIN CAMPUS

15, Bangalore Town,
Shahrah-e-Faisal
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