

UNIVERSITY OF MUMBAI & DEPARTMENT OF ATOMIC ENERGY

CENTRE *for* EXCELLENCE IN BASIC SCIENCES



मौलिक विज्ञान प्रकर्ष केन्द्र

Information Brochure



Centre for Excellence in Basic Sciences
Health Centre Building, University of Mumbai
Vidyanagari, Kalina Campus, Mumbai 400098
Phone: 91-22-26524983, Fax: 91-22-26524982
Email: info@cbs.ac.in, web: www.cbs.ac.in

Introduction

The **Centre for Excellence in Basic Sciences (CBS)** was set up by the Department of Atomic Energy, Government of India and the University of Mumbai, beginning with the academic year 2007-08. Our goal is to impart high-quality science education in a vibrant academic ambience, with a faculty of very distinguished teachers and scientists. The aim of this special Centre is to nurture world class scientists for the country who will take up challenging research and other academic assignments in our country's R&D laboratories, universities, and industry. **CBS** is a residential course located in Mumbai, arguably the most metropolitan and modern of India's cities, with suitable accommodation and boarding provided for all students. Besides their intensive involvement in stimulating academic work, students will also have time for sports, cultural and other enriching activities.

The permanent campus of **CBS** is being built in a beautiful area within the sprawling Kalina Campus of the University of Mumbai. The Centre will finally have about 1000 students, 150 faculty members and support staff. **CBS** will have state-of-the-art infrastructure including research laboratories, library and computer facilities; the Centre's buildings are in the process of being designed and are anticipated to be ready in 2010. Until then **CBS** will continue to function from temporary locations within Kalina campus. CBS students will, upon graduation, be awarded degrees by the University of Mumbai.

Mumbai, the commercial capital of the country, is known for its multi-cultural milieu, dynamism and rich scientific legacy. Besides science departments, the Kalina Campus houses departments in arts, languages and the humanities. The city boasts of some of the premier scientific and educational institutions of the country, such as the Tata Institute of Fundamental Research (TIFR), Bhabha Atomic Research Centre (BARC) and IIT Bombay. Students joining CBS will be nurtured within this rich cultural and scientific environment.

CBS Governing Council

Dr. Srikumar Banerjee (Chairman AEC, Secretary DAE) - Chairperson
Dr. C.K. Murty (Acting Vice –Chancellor, Mumbai University) – Co-Chairperson
Dr. Mustansir Barma (Director, TIFR) – Member
Dr. S.K. Joshi – Member
Dr. Devang Kakkar (Director, IIT) – Member
Dr. R. V. Hosur (Director, CBS) – Member
Dr. P. Mukherjee – Member
Dr. Ajeenkya Patil – Member
Dr. A. D. Sawant – Member

CBS Academic Board

Dr. S. M. Chitre- Chairperson
Dr. Sumit Bhaduri
Dr. Dipan Ghosh
Dr. S. Kailas
Dr. Arvind Kumar
Dr. J. Maharana
Dr. Debashish Mukherjee
Dr. N. Mukunda
Dr. J. V. Narlikar
Dr. A. M. Narsale
Dr. R. R. Puri
Dr. M. S. Raghunathan
Dr. D. P. Roy

COURSES OFFERED

(A) Five year M.Sc. (Integrated) Programme in Basic Sciences

CBS will have a large variety of academic programmes for undergraduate and postgraduate education. To begin with, CBS will offer a 5-year M.Sc. (Integrated) Programme in basic sciences after 10+2 (or equivalent) schooling. The Centre will have major schools in mathematical, physical, chemical, and life sciences. After successful completion of their academic requirements, students will be awarded the degree of M.Sc. (Integrated) of the University of Mumbai in one of the four subjects: mathematics, physics, chemistry and life sciences. For the academic year beginning August 2010 admission will be in physics, mathematics, chemistry and life sciences streams. Candidates are expected to have a working knowledge of XII-standard science subjects

The programme has a balanced semester-based course structure with continuous assessment of students within a flexible, seamless curriculum that emphasizes the interdisciplinary nature of science in the 21st century and promotes exploration, innovation and research. One of the Centre's mandates is to help develop a pool of talented and motivated scientific personnel for the national programmes pursued by the Department of Atomic Energy, Government of India. The curriculum for the first two semesters (first year) is common to all and specialization begins with the third semester. The core courses in the subject of specialization provide strong foundations in both theoretical and experimental aspects of the discipline. In addition, students are required to go through a certain number of courses in other subjects also, covering topics like science communication, history and philosophy of science, environmental and energy sciences, and world literature.

The fourth and fifth years of the M. Sc. (Integrated) programme will be devoted to advanced courses in various disciplines. In the fifth year every student will undertake a substantial guided research project which, in the best cases, will develop into a full-fledged doctoral-level research project. The outcome of the fifth-year project will be reported in the form of a thesis.

Throughout the five-year programme, students are encouraged to take up summer/winter projects in reputed national laboratories and universities. Eminent scientists from India and abroad regularly give colloquia and seminars and interact with the students. In short, the CBS curriculum is designed to ensure depth in the area of specialization together with breadth of exposure and intellectual enrichment, and to prepare each student for a high-level professional research career in national laboratories, universities and industry.

Admission to the programme

Admission to the 5-year integrated Masters programme is through the **National Entrance Screening Test (NEST)**, held every year in May/June, at a large number of centres around the country. More details about NEST can be obtained at the NEST Website (www.nestexam.in), and from the NEST Brochure that can be download from that site. Information about NEST, including the NEST Brochure, is also available at the CBS Website (click on the NEST link).

Fee Structure at CBS

The consolidated fee for the course is Rs. 1,750 per semester (Rs. 75/- per semester for Reserved Category students). In addition students will pay a nominal monthly rent of Rs. 100/- for hostel accommodation and boarding facilities will be made available on payment of actual costs (approximately Rs. 2,000/- per month).

Scholarships and other incentives

All admitted students will receive a scholarship of Rs. 5,000/- per month. Students will also receive an appropriate grant to facilitate their academic pursuits, particularly to cover the costs of books, stationery, computer software, journals, magazines, etc. Those performing exceedingly well in the course may have a chance to be inducted into various R & D units and autonomous research institutions of the Department of Atomic Energy, Government of India.

Course Scheme at UM-DAE CBS

A group of distinguished scientists and educationists has formulated the detailed course scheme CBS, which is expected to be on par with the best universities and institutes in the world. The course structure is put up on the CBS website www.cbs.ac.in.

Hostel

CBS offers a residential course only and stay in the hostel is compulsory. A token amount of Rs. 100/- per semester is charged for hostel accommodation. A hostel warden has been appointed to look after the welfare of the students.

(B) Ph.D. Programme

Students are also admitted to pursue their Ph.D. in selected areas of Physics, Chemistry, Life Sciences, and Mathematics. Our Graduate Programme includes course-work and research, and is designed to prepare students for careers at the most advanced level of research in the basic sciences. Students are selected through the JEST, GATE and NET examinations, followed by an interview. They will do their doctoral work under the guidance of CBS Faculty, and on fulfilling the requirements will be conferred the Ph.D. degree by the University of Mumbai. We have strong collaborations with premier research institutions such as TIFR, BARC, IIT, RRI, etc., and some of the research may be pursued at these institutions.

All Ph.D. students are entitled to a monthly stipend, book grants and a contingency allowance according to DAE norms.

Research at CBS

At present, CBS Faculty carry out research in the following areas:

- Astrophysics, Accelerator Physics, Biological Physics, Strong Field Physics, Ultrafast Optics, Nuclear Physics
- Commutative Algebra, Algebraic & Differential Geometry, and Homogenous Spaces
- NMR , Structural biology, Biophysical chemistry, Protein folding
- Stress induced Proteins, Motor Proteins, Developmental Biology, Stem Cells, and Xenobiotics

CBS shares a dynamic research relationship with premier research institutions such as BARC, TIFR, IITB, HBCSE, Institute of Chemical Technology, Mumbai, Raman Research Institute, Bangalore, etc. The vibrant programme of research has already led to publications in high-quality journals like Science, Physical Review, Optics Express, etc. Ph.D. students are already enrolled in these research programmes and M.Sc. students will be able to participate as well.

CBS Faculty

Mathematics

Balwant Singh
Vikram Aithal

Physics

Arvind Kumar
Bhaskar Khubchandani
Gargi Shaw
Hemalatha. M
Mamta Aggarwal
Nagarajan R
S.B. Patel
Srinivas Krishnagopal
Surya Harikrishnan
Tejaswini Dalvi
Tushima Basak

Life Sciences

Jacinta D'Souza
Sushamma Yermal
Uma Ladiwala

Chemistry

R. V. Hosur
Swapn Ghosh
D. K. Palit
Nabanita Nag

CBS draws some of the best teachers from the Homi Bhabha Centre for Science and Education (HBCSE), Bhabha Atomic Research Centre (BARC), Tata Institute of Fundamental Research (TIFR), Indian Institute of Technology Bombay (IITB) and the University of Mumbai and affiliated colleges as Visiting Faculty to teach various courses.

