



DEPARTMENT OF MATHEMATICS

VISION AND STRATEGY

2007



Vision

*To be among the best mathematics departments
in the country and to establish an international
reputation as a centre for research and
teaching in mathematics.*

From its inception to the present, the Department of Mathematics has evolved and grown in several directions. In the last five years, this change has been particularly striking in terms of faculty recruitment, research output and the diversity of research pursued. To consolidate and sustain these achievements and to enable continued future growth we outline the Department's goals and the challenges it faces.

Goals

Human Capital and Support Systems:

- To attract and retain academics of a high calibre on the Department's faculty.
- To seek out promising post-doctoral fellows and to attract eminent researchers as long-term visitors to the Department.
- To attract motivated and talented students to the master's and doctoral programmes of the Department.
- To provide the best possible facilities for our faculty and students, particularly in the areas of computer facilities, library facilities and administrative support.

Research

- To create an environment that supports outstanding research.
- To pursue collaborative programmes with highly reputed national and international institutions.

Teaching

- To start a new undergraduate programme in Mathematics.
- To build on inter-disciplinary programmes with other departments within IIT Bombay.
- To provide a stimulating teaching environment for the undergraduate and graduate students of the Department.
- To groom a large pool of well-trained students as scientific manpower for quality national and international doctoral programmes, other post-graduate research programmes and industry, and to make available a large pool of well-educated individuals as potential teachers in colleges, universities and other institutions in India.

Interaction outside academia

- To pursue collaboration with the public and private sector in the form of research, projects and consultancy.
- To promote informed discourse on mathematics education at a national level and to popularise mathematics in society at large.

Areas of Interest and Strength

The research pursued in the Department of Mathematics includes a fairly wide spectrum of interests in both mathematics and statistics. Typically, each of the research areas below is pursued by four or five members of the Department's faculty.

- **Algebra**
- **Analysis**
- **Combinatorics**
- **Geometry and Topology**
- **Number Theory**
- **Numerical Analysis**
- **Partial Differential Equations**
- **Probability**
- **Statistics**

Key Challenges

While the Department has made a certain degree of progress in meeting its goals, several key challenges remain. These are outlined below, together with a brief discussion on how to address these challenges and strengthen the overall quality of the academic environment.

- Recruitment and retention of faculty members of the highest quality.
- Introduction of an undergraduate programme in mathematics.
- Improving the quality of students admitted to the master's and doctoral programmes.
- Provision of good computer and library facilities for all students and members of the faculty.
- Provision of efficient administrative support systems.
- Placement of Departmental graduates in suitable positions in industry and academia.

Perhaps the most important task before the Department is to increase the numerical strength of the faculty to at least forty-five. This will make it possible not only to start an undergraduate programme in mathematics but also to broaden and diversify the areas of research pursued in the Department. A sustained fiscal commitment over several years will also be necessary to renovate and refurbish the physical infrastructure of the Department. The very serious current constraints of lack of adequate space and of administrative support cannot be over-emphasised.

A further commitment will also be required to improve the academic environment: increased subscription to mathematics journals, facilitation of both short-term and long-term visits to the Department by post-doctoral scholars and more senior mathematicians, and increased funds for the “Special Years” which are sustained year-long programmes in specific areas of research hosted by the Department.

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