

National Workshop
ON
MATHEMATICAL MODELING
December 15-19, 2009

Sponsored
by

Department of Science & Technology
Government of India, New Delhi



Organized by
Centre for Mathematical sciences (CMS)
Apaji Institute of Mathematics &
Applied Computer Technology

Banasthali University
Banasthali 304022 (Rajasthan)
Banasthali University

University for women, University with a difference

Banasthali University, for women education is a unique university, which offers an integrated system extending from the primary to the Ph.D. level. It was founded on October 6, 1935 and attained deemed to be university status on October 25, 1983.

The University aims at the synthesis of spiritual values of the east and scientific achievements of the west. It develops all round personality of its students through its five-fold education programme. Considering its relatively short existence as a University, the institution has made phenomenal progress. At present, it has around 20 teaching departments offering 65 courses, over 350 teachers and nearly 5500 students. The institution offers several programmes in the emerging areas, which include advanced courses at undergraduate and postgraduate levels in Management, Biotechnology, Computer Science, Information Technology, Mathematical Sciences, and Electronics, besides the traditional courses in Humanities, Social Sciences, Home Science, Education and Fine Arts.

Apaji Institute of Mathematics and Applied Computer Technology (AIM & ACT) was founded in 1999 with the objective of achieving synergy between teaching and research in Computer Science, Electronics, Mathematics, and Statistics. Physics, Bio-informatics and Information Technology have been also added to this list later.

In this short span of about eleven years, Apaji Institute with its world-class infrastructure and education programmes has earned the reputation of one of the best centre of teaching and research not only in the state but also in India. The students get placement in all leading companies and organizations. Many of them have gone abroad for higher education and research.

One of the strong points of Apaji Institute is to infuse logical abilities and abstract thinking in its students by integrating learning of Mathematics in all its programmes. The ambitious programme of M.Sc. (Mathematical Science) was designed with inputs from leading experts from IIT's, IISc and TIFR and offers several specializations such as Theoretical Computer Science, Statistics and Operation Research in addition to Pure and Applied Mathematics in the institute. Now M.Phil. programme in Mathematical Science has also been started to provide the required research orientation to the desirous students. Institute has conducted the three major events for enhancements of R& D and making a recurrent research environment.

- i. National Seminar on Recent Trends in Combinatorics and its Applications (March 2006).
- ii. Training programme on 'Stochastic Process Modeling' (Dec 2-15, 2006).
- iii. National Workshop on 'Models of Embedded Computation' (March 2007).

To motivate research, Department of Science and Technology Govt. of India have declared Banasthali University as the **Centre for Mathematical Sciences (CMS)** in

November 2007. The first year of the establishment of the centre witnessed significant increase in the academic activities of the CMS. In addition to the usual seminar and in-house research the following conferences, workshops and training programmes were held:

- i. National Workshop on Bayesian Techniques and its Applications (October 1-7, 2008)
- ii. Training Programme on Optimization Techniques (December 24-29, 2008)
- iii. Pre Conference workshop on Discrete Mathematics (January 6-10, 2009)
- iv. Jubilee Conference on Discrete Mathematics (January 11-13, 2009)
- v. Seminar on Time series Modelling (October 03-06, 2009)

The events had very distinguished experts in the fields from IISc Bangalore, ISI Kolkata, ISI Delhi, IIT Mumbai and TIFR Mumbai, B.H.U. Varanasi, ISI, Hyderabad, ISI, Coimbatore.

This year also seminars on core areas of **Centre for Mathematical Sciences** has been planned as follow up of the last year conducted academic programmes. Seminar on Time Series Modeling was one of the activities held to promote research in Statistical Modeling. National Workshop in Mathematical Modeling is another approach in this direction.

National Workshop On Mathematical Modeling

Mathematical modeling is the process of constructing mathematical objects whose behavior and properties correspond in some way, to a particular real world system. So that it can also be defined as the art of translating problems from an application area into tractable mathematical formulations, whose theoretical and numerical analysis provides insight, answers, and guidance useful for the originating application.

APPLICATION AREAS

A wide variety of application areas exist where mathematical modeling is used extensively in Fluid mechanics, Biology, Medicine, and other areas are Architecture, Artificial intelligence, Astronomy, Chemistry, Computer Science, Criminal justice, Finance, Fine arts, Geosciences, Material science, Meteorology, Psychology.

BENEFITS

The goal of modeling is to adequately portray realistic phenomenon. Once a model, is developed properly a great deal can be learned about the real-life counterpart by manipulating a model's variables and observing the results.

Real-world decisions involve an overwhelming amount of detail, much of which may be irrelevant for a particular problem or decision. Models allow the user, to eliminate the unimportant details so that the user can concentrate on the relevant decision variables that are present in a situation. This increases the opportunity to fully understand the problem and its solution.

MATHEMATICAL BIOLOGY

Biomathematics is the term, which is also used for the mathematical biology. It includes, at least four major subfields: biological mathematical modeling, relational biology or complex systems biology, bioinformatics and computational biomodeling or biocomputing. It is an interdisciplinary academic research field, with a wide range of applications in biology, medicine and biotechnology.

Mathematical biology aims at the mathematical representation, treatment and modeling of biological processes, using a variety of applied mathematical techniques and tools. It has both theoretical and practical applications in biological, biomedical and biotechnology research.

The Seminar is intended for young faculty and researchers from Mathematical sciences, Computer Science, Electronics and Biological Sciences who is interested in the field from in and out Banasthali. The participants are required to be familiar with non-linear partial differential equations.

Eminent speakers in the field of who have consented tentatively are:

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|---------------------------|----------------------|
| 1. Prof. P. Chaturani | IIT, Bombay |
| 2. Prof. J.B. Shukla | IIT Kanpur |
| 3. Prof. Peeyush Chandra | IIT Kanpur |
| 4. Prof. Balram Dube | IIT Kanpur |
| 5. Prof. G.C. Sharma | Agra University |
| 6. Prof. P.G. Siddheshwar | Bangalore University |

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IMPORTANT DATES

Workshop: December 15-19, 2009

Registration Deadline: November. 30, 2009

Announcement of final list of participants: December 04, 2009

There is no registration fee. The selected participants will be informed by mail/phone/fax. They will be reimbursed **(AC-3 Tier)** (train/bus fare to and from Banasthali and will be provided free lodging and boarding at Banasthali university.

The completed registration form should be posted to

The Coordinator

Workshop in Mathematical Modelling

Centre for Mathematical Sciences (CMS)

Apaji Institute of Mathematics and Applied Computer Technology

Banasthali University-304022

Rajasthan

Phone: (01438) 228647/48 Fax: (01438) 228649

Or

It can be mailed at wmm.cms@gmail.com (Be careful about the dot in e-mail address for correspondence)

(Registration form can be downloaded from the university website www.banasthali.org)

Contact:

AIM & ACT

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How to reach Banasthali University:

Banasthali is located 72 km from Jaipur, 8 km off on Jaipur Kota road. Frequent bus service is available for Banasthali University campus/Newai from main Bus Stand (Sindhi Camp) Jaipur. Newai is 10 km from Banasthali. Conveyance is available at Banasthali Newai (WR, Jaipur Kota Broad-guage Line) Railway Station. Jaipur (Sanganer) Airport is 59 kms from Banasthali.

URL-<http://www.banasthali.org>