



**Sri Venkateswara University, Tirupati- 517 502**  
(REACCREDITED WITH "A" GRADE BY NAAC)

*Report of*

**Science Academies' Lecture Workshop on**  
**Mathematical Modelling in Science and Engineering**

**January 24-25, 2012**

**Sponsored by**

**Indian Academy of Sciences (IAS) Bangalore**

**Indian National Science Academy (INSA) New Delhi**

**The National Academy of Sciences (NASI) India, Allahabad**

## Report of the workshop

*Science is a differential equation. Religion is its boundary conditions*

- Alan Turing

Mathematics is a versatile subject and it can handle problems as varied as those of space and motion, chance and probability, statistics and social sciences, art and literature, music and architecture, war and politics, food and medicine, human thinking and electronic brains. Mathematical Modelling plays a vital role in predicting little parts of perfect mechanism of the world. Hence a two days' science academies' lecture workshop on Mathematical modelling in Science and Engineering was organized in our University premises during 24 and 25 January 2012.

<p style="text-align: center; font-weight: bold; font-size: small;">REGISTRATION FORM</p> <p>Name: _____  <small>(in Capital Letters)</small>          Designation: _____          College or Institution: _____          Address: _____          Pin Code: _____          E-Mail ID: _____          Phone Number: _____          Office: _____          Residential: _____          Mobile: _____          Signature of the participant: _____</p> <p style="font-size: x-small;"><small>** Students (M.Sc./M.Tech./Research Scholars, Faculty Members) can register and participate in the workshop</small></p>	<p style="text-align: center; font-weight: bold; font-size: small;">SRI VENKATESWARA UNIVERSITY TIRUPATI-517502</p> <p style="text-align: center; font-size: x-small;">Science Academies' Lecture Workshop on Mathematical Modelling in Science and Engineering (SMALE-2012)</p> <p style="text-align: center; font-size: x-small;">Organized by Department of Mathematics Sponsored by Indian Academy of Sciences (IAS), Bangalore Indian National Science Academy (INSA), New Delhi The National Academy of Sciences (NAS), Islamabad</p> <p style="text-align: center; font-weight: bold; font-size: small;">[JANUARY 24 &amp; 25, 2012]</p> <p style="text-align: center; font-size: x-small;">Prof. P. V. ARUNACHALAM (I.A.S.) Convener (SMALE-2012) Primary Vice-Chancellor, Chittoor University Manager, Sri Venkateswara University, Chittoor Prof. B. Vijaya Kumar Varma Dr. G. Venkatesh Reddy Dr. S. Sreenadh Dr. V. Srinivasan Dr. D. Bharathi Sri. K. M. Uthavi Dr. C. Jaya Subba Reddy</p>	<p style="text-align: center; font-weight: bold; font-size: small;">ABOUT UNIVERSITY</p> <p style="font-size: x-small;">Sri Venkateswara University, Tirupati was established in 1952. In the world famous temple town of Tirupati in the glowing campus of 1500 acres with a picturesque and peaceful town. The University has grown from strength to strength over the past five years as a premier institution of higher learning under the able and controlled leadership of successive Vice-Chancellors starting from Prof. Sreenadh in the present Vice-Chancellorship term in August. The University has been giving more emphasis on teaching, research and extension activities in different spheres. The range of subjects, departments, courses and research programmes undertaken and promoted during the last fifty-five years reflect the Sri Venkateswara University's commitment in promoting socially relevant and inter-disciplinary programmes. The University was started with six departments of Elementary, Physics, Mathematics, Zoology, Economics and Philosophy. The University has eight constituent colleges covering various conventional and advanced subjects, in order to provide good academic and an apt administrative service to one and all. At present, the University has 58 departments, wherein 11 different P.G. Courses and research topics and certificate courses are being run with the student faculty strength of 42 and 100 respectively and a student strength of 1500. Housing research centres, the University has been moving towards achieving academic excellence with a strong commitment and sustained approach by steadily setting up of a vision of its own.</p> <p style="text-align: center; font-weight: bold; font-size: small;">MATHEMATICS DEPARTMENT</p> <p style="font-size: x-small;">The Department of Mathematics of Sri Venkateswara University was started in September, 1954, when the</p>	<p style="font-size: x-small;">University was founded. For the first five years, the Department had the good fortune of being led by the renowned Indian mathematician, erstwhile Vice-Chancellor, Prof. S. Sreenadh. The Department has made good progress and established a multi-dimensional growth in the fields of Teaching, Research, Number Theory, Combinatorics, Group Theory, Approximation Theory, Fracturing, Fluid Dynamics, Cryptography, Operator Research, Differential Equations and Their Applications, etc.</p> <p style="text-align: center; font-weight: bold; font-size: small;">WORKSHOP THEMES AND FOCUS</p> <p style="font-size: x-small;">In the present century mankind is facing more challenging phenomena and health problems such as pollution, mutation of species, emergence of new diseases and surge of ageing diseases (AIDS, Cancer etc.). Mathematical models have been used to suggest solutions for real life problems that occur in many biological, industrial, systems, health and Engineering problems. Differential equations play a prominent role in engineering, physics, Economics and other disciplines. These equations are used in modelling ordinary entry process, technical, and biological processes. From several models, simple design to the interaction between neurons and help us to understand better the problems.</p> <p style="font-size: x-small;">This Workshop aims at Appreciating the formal theories by providing applications of special topics in a short series of lectures Presenting a platform for eminent researchers and aspiring scholars in differential equations to continue their work with each other about their current work. The topics of the workshop include various types of differential equations and their applications to Science and Engineering.</p>	<p style="text-align: center; font-weight: bold; font-size: small;">RESOURCE PERSONS</p> <ol style="list-style-type: none"> <li>1. Dr. P. V. Arunachalam, I.A.S. (IAS), Professor of Mathematics, Former Vice-Chancellor, Chittoor University</li> <li>2. Dr. V. Kandaswamy, I.A.S. (IAS), Department of Mathematics, Indian Institute of Technology, Madras</li> <li>3. Dr. S. Srinivasulu, I.A.S. (IAS), Centre for Advanced Studies in Pure Mathematics, Department of Mathematics, Central College Campus, Bangalore University, Bangalore-560 075</li> <li>4. Dr. A. Ananthulu, I.A.S. (IAS), Professor, Department of Mathematics, University of Hyderabad (Centre University), Hyderabad (A.P.)</li> </ol> <p style="text-align: center; font-weight: bold; font-size: small;">REGISTRATION</p> <p style="font-size: x-small;">All participants are required to register on or before 18.01.2012 by sending the duly completed attached registration form preferably by email to the workshop convener.</p> <p style="text-align: center; font-weight: bold; font-size: small;">NO REGISTRATION FEE FOR THE PARTICIPANTS</p> <p style="font-size: x-small;">Working lunch will be provided for all the participants.</p> <p style="text-align: center; font-weight: bold; font-size: small;">NO FEE WILL BE PROVIDED</p> <p style="font-size: x-small;">Limited participation will be accepted on first come first basis. Hence your registration is advised.</p>
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We have sent invitations to 100 colleges in and around Chittoor district and 30 university departments. From these colleges we received more than 150 applications out of which 25 participants from 26 colleges were shortlisted on the first come first serve basis. 90 students comprising of PG and Research scholars and 10 Faculty members of our college also attended the workshop.

## Total number of beneficiaries

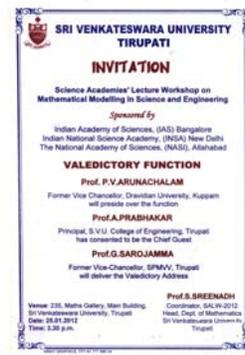
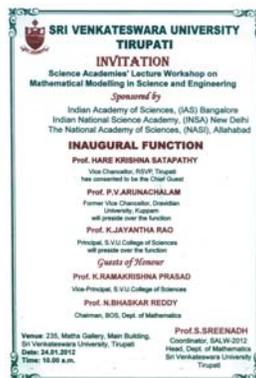
S.No.	Particulars	No. of Students	No. of Faculty	Total
1	Sri Venkateswara University	90	10	100
2	Other institutions	0	25	25
<b>Total</b>				<b>125</b>

## Total Number of Participating institutions : 26

The invited talks of the following resource persons were enjoyed by the participants over a period of two days.



1. Dr.P.V.Arunachalam, FNASc, Dravidian University
2. Dr T Amaranath, Hyderabad University
3. Dr.Nagaraj, TIFR, Bangalore
4. Dr. P. Kandaswamy, FNASc, Bharathiar University



### **24.01.2012 (Tuesday)**

The workshop started at 9.30 am on 24.01.2012 with prayer, followed by the welcome address by Dr. P. Kandaswamy, FNASc. The course outline and the importance of academy activities were explained briefly by Dr.P.V.Arunachalam, FNASc, Former Vice-Chancellor, Dravidian University. Dr.Nagaraj, TIFR, Bangalore who has graciously delivered the keynote address. His talk explained the need of learning both theoretical and practical aspects of mathematics with particular reference to mathematical modelling in science and engineering. Dr.K.Ramakrishna Prasad gave introductory concepts of mathematical modelling. After tea break Dr.P.V.Arunachalam, FNASc, Former Vice-Chancellor, Dravidian University explained some applications of Mathematical Modelling in science and engineering. His lecture was very precise and completely exhaustive. The afternoon session started with Dr. BR Nagaraj exposed the participants about the applications of mathematical modelling through partial differential equations. Dr. P. Kandaswamy, FNASc, Bharathiar University gave introductory concepts of Modelling in Human Immune System in technical session III.

### **25.01.2012. (Wednesday)**

The morning session was started by Dr.T.Amarnath, Hyderabad University and he gave a talk on Differential Equation Model for Stokes Flow. After tea break Dr.P.V.Arunachalam FNASc, Former Vice-Chancellor, Dravidian University described various models applicable in biology and medicine. After lunch the last session of the workshop was started by Dr. BR Nagaraj, TIFR, Bangalore. He explained PDE models in viscous flow theory.

The Valedictory function held on 25.01.12. at 3.30 pm Dr. P.V.Arunachalam, Former Vice-Chancellor, Dravidian University addressed the audience on the various applications of differential equation models.

The meeting was presided over by the Principal Dr. A.Prabhakar, College of Engineering, Sri Venkateswara University, Tirupati. The valedictory address was

delivered by Dr.G.Sarojamma, Former Vice-Chancellor, Sri Padmavathi Mahila Vishwavidyalayam, Tirupati. The highlights of the workshop were explained by Dr.P.V.Arunachalam and vote of thanks was proposed by Dr. S.Sreenadh, Head, Department of Mathematics, S.V.U. College of Sciences, Sri Venkateswara University, Tirupati.

### **Highlights**

- ❖ Interactive sessions with the resource persons were arranged after the lectures. All the resource persons stayed at least one evening and spent their valuable time with the participants which resulted in fruitful discussions.
- ❖ Participants were informed about the publications of the academy through display of journals sent by the academy and good interest was evinced among the participants in knowing the activities of the academy.



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