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. Differential equations play a vital role in predicting little parts of perfect mechanism of the world. Hence a three days' science academies' lecture workshop on differential equations and their applications was organized in our college premises from 21 to 23 December 2011.

We have sent invitations to 170 colleges in and around Coimbatore district and 30 university departments. From these colleges we received more than 150 applications out of which 100 participants from 25 colleges were shortlisted on the first come first serve basis. 83 students comprising of PG and Research scholars and 16 Faculty members of our college also attended the workshop.
Total number of beneficiaries

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Particulars</th>
<th>No. of Students</th>
<th>No. of Faculty</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>PSGR Krishnammal College</td>
<td>83</td>
<td>16</td>
<td>99</td>
</tr>
<tr>
<td>2</td>
<td>Other institutions</td>
<td>76</td>
<td>32</td>
<td>108</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>76</strong></td>
<td><strong>32</strong></td>
<td><strong>207</strong></td>
</tr>
</tbody>
</table>

Total Number of Participating institutions: 25

The invited talks of the following resource persons were enjoyed by the participants over a period of 3 days.

1. Dr. P. Kandaswamy, FNASc, Bharathiar University
2. Dr. M. Venkatachalappa, FNA, Bangalore University
3. Dr. Girija Jayaraman FNASC, IIT, New Delhi
4. Dr. P. V. Arunachalam FNASC, Dravidian University
5. Dr. Alok Nath Chakrabarti, FNASC, IISc, Bangalore
6. Dr. BR Nagaraj, IISc, Bangalore
7. Padmashri Dr. R. M. Vasagam, Pro Chancellor, MGR Educational and Research Institute
21.12.2011 (Wednesday)

The workshop started at 9.30 am on 21.12.2011 with prayer, followed by the welcome address by the Principal Dr. N. Yesodha devi. The course outline and the importance of academy activities were explained briefly by Dr. P.Kandaswamy, FNA, Bharathiar University. Dr. E.Balaguruswamy who has graciously given his consent to deliver keynote address was unable to attend the function due to unavoidable circumstances. In his place Dr. P.V. Arunachalam, Former VC, Dravidian University has delivered the keynote address. His talk explained the need of learning both theoretical and practical aspects of mathematics with particular reference to differential equations. He also continued after tea break with technical session I on the topic historical development of the theory of differential equations. His lecture was very precise and completely exhaustive. The afternoon session with Dr. BR Nagaraj exposed the participants to the Nontrivial Improvements in Rellich Kondrachov Compact Embeddings. Dr M. Venkatachalappa gave introductory concepts of atmospheric waves in technical session III.

22.12.2011. (Thursday)

December 22nd being the birth day of Srinivasa Ramanujam, the technical session IV started with tribute to Srinivasa Ramanujan through powerpoint presentations which was appreciated by the participants greatly. Dr. P. Kandaswamy unveiled many interesting anecdotes from the life history of Ramanujan. Then the morning session continued with lectures of Dr. M. Venkatachalappa and Dr. BR Nagaraj on differential equation model of atmospheric waves and Nontrivial Improvements in Rellich Kondrachov Compact Embeddings.

In the afternoon Dr. Girija Jayaraman and Dr. Alok Nath Chakrabarti enlightened the audience about the differential equation models of ecosystems and Green Function techniques.
23.12.2011. (Friday)

Dr. Aloknath Chakrabarti and Dr. Girija Jayaraman continued with their respective topics on the third day of the workshop. In the afternoon Dr. P.Kandaswamy extensively explained the immune system models.

In the Valedictory function held on 23.12.11. at 3.30 pm Dr. R M Vasagam, Former Vice Chancellor, Anna University Chennai addressed the audience on the various applications of differential equations and their applications. He explained that the modeling of Rockets involve many mathematical simulations coupled with nonlinear time variant differential equations. He showed many employment avenues for the young mathematicians which included the cyber crime detections and astronomical and astrological problems.

The meeting was presided over by Dr. R. Nandini, Founder Trustee, GRG institutions. The highlights of the workshop were explained by Dr. P.Kandaswamy and vote of thanks was proposed by Dr. K. Sumathi.

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.

- The Lecture notes were compiled in a book form and was given to the participants.
# Time Table of the Workshop

**Date:** 21.12.2011 to 23.12.2011  
**Title:** "Differential Equations and their Applications"

<table>
<thead>
<tr>
<th>Date</th>
<th>9.30 a.m - 11 a.m</th>
<th>11.15 a.m - 12.45 a.m</th>
<th>12.45 p.m - 1.45 a.m</th>
<th>1.45 p.m - 3.15 p.m</th>
<th>3.15 p.m to 3.30 p.m</th>
<th>3.30 p.m - 5.00 p.m</th>
</tr>
</thead>
</table>
| 21.12.2011 | Inauguration and Keynote address  
**Dr. P.V. Arunachalam**  
Dravidian University | Technical session I  
Dr. P.V. Arunachalam  
Dravidian University  
*Historical development of the Theory of Differential Equations* | Technical session II  
Dr. N. Venkatachalappan  
Bangalore University  
*Differential Equation model of atmospheric waves, Part I* | | | Technical session III  
Dr. B.R. Nagaraj  
TIFR, Bangalore  
*Nontrivial Improvements in Rellich Kondrachov compact embeddings Part I* |
| 22.12.2011 | Technical session IV  
**Dr. N. Venkatachalappan**  
Bangalore University  
*Differential Equation model of atmospheric waves, Part II*  
Tea Break | Technical session V  
Dr. B.R. Nagaraj  
TIFR Bangalore  
*Nontrivial Improvements in Rellich Kondrachov compact embeddings Part II* | Lunch | Technical session VI  
Dr. Girija Jayaraman  
IIT New Delhi  
*Modelling Ecosystem through differential equations Part I* | | | Tea Break  
Technical session VII  
Dr. Alok Nath Chakrabarti  
IISc, Bangalore  
*Green Function Techniques for differential equations Part I* |
| 23.12.2011 | Technical session VIII  
**Dr. Alok Nath Chakrabarti**  
IISc, Bangalore  
*Green Function Techniques for differential equations Part I* | Technical session IX  
Dr. Girija Jayaraman  
IIT New Delhi  
*Modelling Ecosystem through differential equations Part I* | Technical session X  
Dr. P.Kandaswamy  
Bharathiar University  
*Differential Equation model for human immune system* | | | Valedictory  
Padmasri RM Vasagam  
Former VC  
Anna University Chennai |