

# **DEPARTMENT OF MATHEMATICS**

## **DEPARTMENT ACTIVITIES**

2017 - 2018

### **1. Guest lecture**

Organized UGC funded Guest Lecture on 17.07.2017 with **Mr.M.P.Sudheer Kumar**, IIT JEE Trainer, Velalar Vidhyalaya as the resource person. His talk mainly focused on pedagogical tools in teaching mathematics and demonstrated with the topic “Sets, Relations and Functions”. 180 UG students benefited from this lecture.

Organized UGC funded Guest Lecture on 21.09.2017 with **Dr.P.S.Srinivasan**, Assistant Professor of Mathematics, Bharathidasan University, Trichy as the resource person and he spoke on “Sequence and Series”. 180 UG students and faculty of the department benefited from this lecture.

### **2. Association competitions**

The **Mathmagic** Association conducted paper presentation, Math Modeling and Math Rangoli competitions for the students of I, II and III B.Sc., Mathematics. The winners were awarded with prizes.

### **3. State/National / International Workshops / Conferences / Seminars / Symposia organized**

#### **(i) Science Academies’ Lecture Workshop on “Real Analysis”**

Organized Science Academies’ Lecture Workshop on “Real Analysis” during 22 - 23 June, 2017 funded by the three Science Academies of India, Indian Academy of Sciences, Bangalore, Indian National Science Academy, New Delhi and National Academy of Sciences,

Allahabad with **Prof.P.Kandaswamy**, Energy Conservation Research Centre, Doshisha University, Kyoto (Formerly of Bharathiar University, Coimbatore), as convener.

The Workshop comprised four useful lectures handled by Fellows of Academies and eminent mathematicians. The first session was on 22.06.2017 by the convener of the Workshop **Prof.P.Kandaswamy**, entitled “Algebra and Analysis”. Session II was handled by the most spiritual Mathematician **Prof.V.Kannan**, University of Hyderabad and spoke on “Continuous and discontinuous set of points” and “Equicontinuous”. On 23.06.2017, **Prof.Ramajayam Sahadevan**, Director, RIASM, University of Madras, handled session III, and spoke on “Multivariable calculus and its Applications”. The last session entitled “Interpolation and Approximation” was handled by **Dr.S.Lalithambigai**, Assistant Madurai Kamaraj University, Madurai. A total of 162 participants from 32 colleges comprising PG students, research scholars and faculty members of mathematics are the beneficiaries of this workshop. The workshop ended with the valuable feedback from participants.

**(ii) DBT funded workshop on Differential Equations and their Applications**

Organized DBT funded workshop on “Differential Equations and their Applications” during 05 - 06 December 2017. On 05.12.2017, the session was started by **Dr.A.Tamilselvan**, Associate Professor & Head, Department of Mathematics, Bharathidasan University, Tiruchirappalli. Session II was handled by **Dr.K.Sakthivel**, Assistant Professor, Department of Mathematics, Indian Institute of Space Science & Technology. On 06.12.2017, in session III, **Prof.R.Sahadevan**, Ramanujan Institute of Advanced Studies in Mathematics was the Resource Person.

**(iii) DBT funded Hands on Training on SAGEMATH**

Organized DBT funded Hands-on Training on SAGEMATH on 13.12.2017 with **Dr.P.S.Srinivasan**, Assistant Professor, Bharathidasan University, Trichy as Resource Person.

**(iv) DBT funded Interaction with International Experts**

Organized DBT funded Programme on “Interaction with International Experts” during 08 – 10 January, 2018. On 08.01.2018, in Session I **Dr.Vassia Atanassova**, Bulgarian Academy of Sciences, Bulgaria spoke on Wikipedia and explained about modification of existing Wikipedia articles and also contribution of new articles to Wikipedia in many languages. Then the students discussed with the speaker about using Wikipedia in Education. Session II was handled by **Prof.Taekyun Kim**, Kwangwoon University, South Korea. He started the session with Taylor’s series and Binomial series. He then derived Bernoulli’s series from Taylor’s series. Prof.Kim concluded with Bernoulli’s Distribution. On 09.01.2018, Session III was handled by **Dr.Shiv Prasad Yadav**, Professor, IIT, Roorkee. He started with an introduction of Linear Programming Problems and he explained about the method of solving Linear Programming Problem using Graphical method. Then students discussed with him about formulating and solving industrial problems using Linear Programming Problems. Session IV was handled by **Dr.Lyubka Atanassova Doukovska**, Bulgarian Academy of Sciences, Bulgaria. She gave a talk on “Moving Targets Detection and Parameter Estimation in Randomly Arriving Impulse Interference”. Her speech was entirely on the application of Mathematics in Defence Research. On 10.01.2018, in Session V, **Dr.Poonam Kumar Sharma**, Associate Professor, D.A.V. College, Punjab was the resource person. He delivered a speech on eigen values and eigen vectors. He clearly explained the properties and applications of eigen values and eigen vectors in Economics and Engineering. Session VI was handled by **Prof.N.Palaniappan**, Retired Professor, Alagappa University. His

topic was “Logical innovation in Automation”. He spoke on the applications of mathematical logic in automation.

**(v) DBT funded Workshop**

Organized DBT funded workshop on “Discrete Mathematics and its Applications” during 21 - 22 February 2018. On 21.02.2018, the first session was handled by **Dr.T.Govindan**, Assistant Professor, Department of Mathematics, Government College of Engineering, Bargur. The Second Session was enriched by the talk of **Dr.M.G.Karunambigai**, Assistant Professor, Department of Mathematics, Sri Vasavi College, Erode on 'Decomposition of Graphs – An Introduction'. On 22.02.2018, in session III **Dr.A.Muthusamy**, Professor, Department of Mathematics, Periyar University, Salem was the invited speaker and spoke on 'Application of Frames'. **Dr.T.Kavaskar**, Assistant Professor, Department of Mathematics, Central University of Tamilnadu, Tiruvarur continued his talk on 'Types of Colorings in Graphs'. In the last session, **Prof. R. Balakrishnan**, Adjunct Professor, Department of Mathematics, Bharathidasan University, Tiruchirappalli, delivered his lecture on 'Applications of Graph Theory'. 40 participants from various institutions in and around Erode, 57 UG students, 30 PG students and 13 research scholars of benefited out of this workshop.

**(vi) International Conference on Intuitionistic Fuzzy Sets and Systems (ICIFSS 2018)**

This summary captures a three-day programme of invited talks, paper presentations and interaction with international experts at the International Conference on Intuitionistic Fuzzy Sets and Systems, organized by the Department of Mathematics, Vellalar College for Women, Erode during January 8-10, 2018.

The event brought together about 100 researchers comprising of faculty members, Ph.D and M.Phil research scholars from Bulgaria, Mexico and South Korea and seven Indian States to discuss Intuitionistic Fuzzy Set (IFS) theory and its applications in various fields, extend IFS to address current and future development challenges, place few open problems on IFS in a global context. It also provided a valuable networking opportunity among researchers on the same field and paved a way for further intergovernmental cooperation research programmes.

The conference began with welcome address by Dr.D.Kamalaveni, Principal, Vellalar College for Women in the inaugural session and continued with invited talks, paper presentations and interaction with experts, relevant to the conference theme. The conference concluded with a valedictory session in which the participants expressed their feedback about the conference and shared their experience.

### **Inauguration**

Inaugurating the conference, **Dr.Vassia Atanassova**, Senior Assistant Professor, Bioinformatics and Mathematical Modelling, Institute of Biophysics and Biomedical Engineering, Bulgarian Academy of Sciences, Bulgaria, highlighted the need to develop IFS theory and its applications in real life problems. Dr.Vassia also focused on the applications of intercriteria decision making analysis.

**Prof. Oscar Castillo**, Research Chair of Graduate Studies, Tijuana Institute Technology, Mexico, addressed on the recent developments in IF sets and systems. Thiru.S.S. Kandasamy, President, Thiru.S.D.Chandrasekar, Secretary, Thiru.P.K.P.Arun, Treasurer, and Thiru.C.Jayakumar, Executive Committee Member, Vellalar Educational Trust offered their felicitation.

## Sessions

In Session I, the featured speaker, **Prof. Oscar Castillo**, Research Chair of Graduate Studies, Tijuana Institute Technology, Mexico, focused on the Type-2 and intuitionistic fuzzy logic and their applications. In Session II, **Dr. Lyubka Atanassova Doukovska**, Associate Professor and Head, Department of Intelligent Systems, Institute of Information and Communication Technologies, Bulgarian Academy of Sciences, Bulgaria, made a presentation on “Moving targets detection and parameter estimation in randomly arriving impulse interference”. In her view, intuitionistic fuzzy logic is more useful in detecting moving objects, specifically, in defence research. In Session III, **Prof. Taekyun Kim**, Kwangwoon University, Seoul, South Korea spoke on “Some identities of special polynomials”. In Session IV, **Dr. Vassia Atanassova**, Senior Assistant Professor, Department of Bioinformatics and Mathematical Modelling, Institute of Biophysics and Biomedical Engineering, Bulgarian Academy of Sciences, Bulgaria, delivered a talk on “InterCriteria analysis: foundations and state-of-the-art” which was very interesting and discussed few open research problems for future research. In Session V, **Prof. Krassimir T Atanassov**, Bulgarian Academy of Sciences, Bulgaria gave an invited talk through Skype online on “Intuitionistic fuzzy modal operators”. Session VI, by **Prof.N.Palaniappan**, Alagappa University, India, focussed on “Logical innovation in automation” and focused on real life applications of fuzzy logic. Each session ended with Q & A and discussion on open research problems. At the outset, the invited talks covered the real life applications of (i) Hough transform for detection of linear trajectories of fast moving targets (ii) Wikipedia in Education and Science (iii) InterCriteria Analysis in petrochemical industry (iv) InterCriteria Analysis in ranking of Indian universities (v) Generalized Type-2 fuzzy sets in Robot control and navigation and (vi) Fuzzy logic in automatic washing machines.

## **Paper presentations**

There were about 60 paper presentations by the participants on various topics like IF algebra, IF topology, IF optimization, Decision making using IF sets and logic, applications of IF sets in pattern recognition and IF graphs.

In the valedictory address, **Prof. Taekyun Kim**, Kwangwoon University, Seoul, South Korea gave few open problems not only on IFS theory but also on Number theory and invited the participants to an International Conference which is going to take place in his university. At the end, participants expressed their feedback and suggestions. After distributing certificates, Dr.R.Parvathi, Organizing Secretary of the conference proposed vote of thanks.

As a result of three-day conference, the participants planned to collaborate with the speakers and prepare joint research papers on the topics of their own interest. Also, a network has been created among participants and speakers for future correspondence.

## **4. Laboratory Visit**

Made a **DBT funded Laboratory visit** to **Radio Astronomy Centre, Ooty** on 09.02.2018. It is an astrophysics research laboratory funded by Tata Institute of Fundamental Research, Govt. of India. There was a video show about the functioning of the centre followed by a site – visit. During the visit **Mr. Amith Kumar Mithal B.E.** explained the application of Fourier transforms and Fourier series in signal processing. Students are lightly motivated through his talk.

## **5. Extension Activity**

Organized UGC funded extension activity **“Teaching and Learning through Mathematical Models”** for class IX students of Government Higher Secondary School, Thindal. About 50 models including Rotating Paraboloid, Magic Square, Fit the Geometry, Infinity Tunnel, Missing Square, Normal Curve, Fantastic Mirrors, Binary Decimal, Finite, infinite, no solution related to their

curriculum were exhibited. A hands – on experience and explanation was given to school students by III B.SC (Maths) students. A documentary film about the life of Srinivasa Ramanujan, the famous mathematician of 20<sup>th</sup> century was shown to the school students as part of this activity. 85 students and 2 school teachers participated and benefited out of this activity.

## **6. Retraining of Teachers**

Organized UGC funded Retraining of Teachers programme on 22.09.2017.

**Prof. Annalakshmi Narayanan**, Department of Psychology, Bharathiar University, Coimbatore was the chief guest and delivered a talk on **“Women and Resilience”**.