

# SCIENCE ACADEMIES' LECTURE WORKSHOP ON "DIFFERENTIAL EQUATIONS AND THEIR APPLICATIONS IN MATHEMATICAL MODELING"

**Date: 06.01.2023 and 07.01.2023**

*Sponsored and Supported by*



*Indian Academy of Sciences  
Bengaluru*



*Indian National Science Academy  
New Delhi*



*The National Academy of Sciences, India  
Allahabad*

*Organized by*



**Since 1951**

**PG & RESEARCH DEPARTMENT OF MATHEMATICS  
(DBT Star College Scheme Funded Department)  
JAMAL MOHAMED COLLEGE (Autonomous)  
Accredited (3rd Cycle) with 'A' Grade by NAAC  
DBT Star College Scheme & DST-FIST Funded  
(Affiliated to Bharathidasan University)**

**TIRUCHIRAPPALLI – 620 020.**

**Website : [www.jmc.edu](http://www.jmc.edu)**

**75**  
**Azadi Ka  
Amrit Mahotsav**

## ABOUT SCIENCE ACADEMIES

Indian Academy of Sciences (IAS), Bangalore founded in 1934 by Sir C.V. Raman, aims at promoting the progress and upholding the cause of science in the pure and applied branches. Its major activities include publication of scientific journals and special volumes, organizing meetings of the Fellowship and discussions on important topics, recognizing scientific talent, improvement of science education, and taking up other issues of concern to the scientific community. As part of the science education programmes, the Indian Academy of Sciences, Bangalore in association with the Indian National Science Academy (INSA), New Delhi and The National Academy of Sciences, India (NASI), Allahabad organize programmes for the improvement of science education in the Universities and Colleges throughout the country.

The Science Academies have been supporting two/three-day lecture workshops and fifteen-day refresher courses on topics of current interest throughout the country. All the programmes conducted by the Joint Science Education Panel of the Academies are fully supported by the Department of Science and Technology, GOI DST has undertaken a series of activities to mark 75 years of India's Independence (Azadika Amrut Mahotsav). The Mahotsav is a series of S&T programmes and events to be organised to commemorate the 75th anniversary of India's Independence. The curtain raiser activities began from 12 March, 75 weeks prior to 15 August 2022. The lecture workshops/refresher courses are part of the series in these programmes. The Academy will also organize periodic lectures by eminent scientists. These programs will be adequately expanded in the celebration of the 75 years of Indian Independence.

## ABOUT THE INSTITUTION

Jamal Mohamed College was founded in 1951, as an affiliated college to the University of Madras and then affiliated to Bharathidasan University, Tiruchirappalli, when it was formed in 1982. Jamal Mohamed College is situated in the central part of Tamil Nadu, Tiruchirappali city. It was established as a religious minority institution with the primary objective of providing higher education to the downtrodden and socially backward section of the society in general and Muslim minority in particular.

The college is administered by the Society of Jamal Mohamed College. It is established in a sprawling land area of 87 acres, as a religious minority institution. Hajee M. Jamal Mohamed Sahib and Janab N.M. KhajamianRowther, of revered memory, were the founding fathers of this institution.

In the year 1957 the college got the single honor of being bracketed with the thirty best colleges in India when Dan forth Foundation of USA selected the college for the award of study fellowships in U.S.A. In 1963 the college was elevated to the status of a post-graduate college.

In the year 1972, the college was recognized by UGC New Delhi, for the purposes of Grants under section 2(F) and 12(B) of the University Grants Commission Act 1956. In 1977, on the recommendation of the University of Madras, the UGC recognized the college as one of the ten "Lead colleges" in the university area.

The College was accredited at Five Star Level by NAAC during 2002 and conferred with Autonomous Status by UGC, New Delhi and Bharathidasan University in 2004-2005. In January 2009, the College was accredited by NAAC with A-Grade (2nd Cycle) - CGPA 3.6 out of 4.0. Our College was bestowed with the unique honour of "CPE" status Phase-I and Phase-II by the University Grants Commission under the Scheme "Colleges with Potential for Excellence" in 2011 and 2016 respectively. We retained the 'A' Grade awarded by NAAC during the third cycle of accreditation in 2015.

The college has obtained the prestigious 79th rank among Top ranking institutions in NIRF Rankings - 2022. It is remarkable to state that the college has been recognized with Three Star status by the Institutions Innovation Council (IIC), MHRD innovation cell, Government of India in 2019. Department of Science and Technology (DST), Government of India has accorded FIST Scheme to the Departments of Zoology, Botany and Physics in 2004 and to the Department of Mathematics in 2008. Again DST FIST Scheme has been extended to the Departments of Mathematics, Physics, Botany, Zoology and Computer Science in 2019. Five Science Departments such as Mathematics, Physics, Chemistry, Botany and Zoology have been short-listed after a meritorious presentation, among many competing institutions and awarded the Star Status Scheme by the Department of Bio Technology (DBT) in 2020.

Over a period of 71 years the college was able to scale greater heights and raise to the present status as a multi-faculty institution with 25 UG and 21 PG courses. 18 departments of the college are functioning with the status of approved research centres. The college has a strength of around 12000 students. There are 145 Government Aided teaching faculty and 357 staff members are working under the self finance stream. The college celebrated its silver Jubilee in 1971, subsequently the Golden Jubilee and Diamond Jubilee in 2001 and 2011 respectively.

With many milestone achievements, the College has been marching towards fulfilling marvelous plans, matching the vision and mission of our noble founders and the present Management Committee Members. "The Jamal" journey continues with all gentle Jamalians for still more greater heights of glory in higher education.

## **ABOUT THE DEPARTMENT**

The Department of Mathematics of Jamal Mohamed College, was started as one of the earliest department in the year 1951. B.Sc., and M.Sc. Mathematics programmes were started in 1957 and 1963 respectively. The Department was elevated into a research department in the year 2002 by offering M.Phil. (Full Time & Part-Time) and Ph.D. (Full-Time & Part-Time) programmes. B.Sc. Mathematics (Self-Financing Section) was started for women in 2003. M.Sc. Mathematics (Self-Financing Section) was started for women and men in 2005 and 2010 respectively. In the year 2008, the Department was identified for the award of FIST – Grant by the Ministry of Science and Technology of Government of India. The Department has highly qualified faculty members actively engaged in teaching, research, continuing education programmes and consultancy. In the last 14 years, the members of the Department have written 10 books, 93 research scholars were awarded Ph.D. degrees, published more than 670 research papers in National and International journals and presented many research papers in National and International Conferences

## ABOUT THE WORKSHOP

The study of differential equations is a wide field in pure and applied mathematics, physics, and engineering. All of these disciplines are concerned with the properties of differential equations of various types. Pure mathematics focuses on the existence and uniqueness of solutions, while applied mathematics emphasizes the rigorous justification of the methods for approximating solutions. Differential equations play an important role in modeling every physical, technical, or biological process, from celestial motion, to bridge design, to interactions between neurons. Differential equations such as those used to solve real-life problems may not necessarily be directly solvable, i.e. do not have closed form solutions. Instead, solutions can be approximated using numerical methods.

Many fundamental laws of physics and chemistry can be formulated as differential equations. In biology and economics, differential equations are used to model the behaviour of complex systems. The mathematical theory of differential equations first developed together with the sciences where the equations had originated and where the results found application. However, diverse problems, sometimes originating in quite distinct scientific fields, may give rise to identical differential equations. Whenever this happens, mathematical theory behind the equations can be viewed as a unifying principle behind diverse phenomena. Organizing this type of lecture workshop with highly accomplished experts to discuss scientific advances in their chosen fields will also enhance the interest of students to pursue higher studies and research.

## REGISTRATION

The workshop is open to UG & PG students, Research Scholars and Faculty members of Mathematics and other related disciplines. There is No Registration fee to attend the workshop.

Only Limited entries are available (FCFS). Selected participants will be intimated through their registered Mail ID and the Selection list will be made available on our College website by 30.12.2022. **This workshop will be conducted only through offline.**

**Registration link:** <https://forms.gle/4pzg6ayRJRdzLPSHA>

**Last date of registration: 15.12.2022.**

**Special Feature:**

- No Registration fee
- Eminent Scholars as Resource Persons
- Tea, Snacks and Lunch will be provided to all the Participants
- Any number of participants from a College

**Dr. SATYAJIT ROY**

**CONVENER**

**Professor**

**Department of Mathematics**

**Indian Institute of Technology**

**Madras, Chennai - 600036**

**Dr. A. PRASANNA**

**COORDINATOR**

**Assistant Professor**

**PG & Research Department of Mathematics**

**Jamal Mohamed College (Autonomous)**

**Tiruchirappalli – 620 020**

**Mobile: 9976162422**

**PROGRAMME SCHEDULE**

Time	Event	Speaker	Title of Talk
<b>06.01.2023</b>			
08.30 am - 09.00 am	Registration		
09.00 am – 9.30 am	Welcome and Inaugural		
09.30 am – 11.00 am	Lecture 1	<b>Dr. Satyajit Roy, F.N.A.Sc., Professor Department of Mathematics Indian Institute of Technology Madras, Chennai-600036</b>	<b>Numerical Approaches to Nonlinear Boundary Value Problems</b>
11.00 am- 11.15 am	Tea Break		
11.15 am – 12.45 pm	Lecture 2	<b>Dr.P. Kandaswamy, F.N.A.Sc., Professor &amp; Head (Rtd.) Bharathiar University Coimbatore</b>	<b>Mathematical Model for Electronic Human Immunology</b>
12.45 pm – 02.00 pm	Lunch Break		
02.00 pm – 03.30 pm	Lecture 3	<b>Prof. G D Veerappa Gowda F.N.A, F.N.A.Sc.,F.A.Sc., TIFR Centre for Applicable Mathematics Sharada Nagar, Yelahanka New Town Bangalore-560065</b>	<b>Numerical Methods for Partial Differential Equations- I</b>
03.30 pm – 3.45 pm	Tea Break		
3.45 pm – 05.15 pm	Lecture 4	<b>Dr. Jitraj Saha Assistant Professor Department of Mathematics National Institute of Technology Tiruchirappalli - 620015</b>	<b>Ordinary Differential Equations and Numerical Solution for Real Life Problems-I</b>

**PROGRAMME SCHEDULE**

Time	Event	Speaker	Title of Talk
<b>07.01.2023</b>			
09.00 am – 9.30 am	Re - registration		
09.30 am – 11.00 am	Lecture 5	Dr. P. Kandaswamy, F.N.A.Sc., Professor & Head (Rtd.) Bharathiar University Coimbatore	Mathematical Model for Electronic Equipment Cooling
11.00 am- 11.15 am	Tea Break		
11.15 am – 12.45 pm	Lecture 6	Dr. Jitraj Saha Assistant Professor Department of Mathematics National Institute of Technology Tiruchirappalli - 620015	Ordinary Differential Equations and Numerical Solution for Real Life Problems-II
12.45 pm – 02.00 pm	Lunch Break		
02.00 pm – 03.30 pm	Lecture 7	Prof. G D Veerappa Gowda F.N.A, F.N.A.Sc.,F.A.Sc., TIFR Centre for Applicable Mathematics Sharada Nagar, Yelahanka New Town Bangalore-560065	Numerical Methods for Partial Differential Equations-II
03.30 pm – 3.45 pm	Tea Break		
3.45 pm – 05.15 pm	Lecture 8	Dr. Satyajit Roy, F.N.A.Sc., Professor Department of Mathematics Indian Institute of Technology Madras, Chennai-600036	Mathematical Modelling for Internal and External flow problems
05.15 pm-05.45 pm	Concluding Session		

***All Are Invited***