

## **PROGRAMME REPORT ON**

#### Six- Day FDP on Exploring Cutting-Edge Mathematics Innovations

**Resource Persons** 

Dr. TN. Shanmugam

Former Professor of Mathematics, Anna University Founder Director, Centre for Intellectual Property Rights Founder Dean, University College of Engineering Kanchipuram

> **Dr. V. Ravichandran** Professor of Mathematics, National Institute of Technology, Trichy

**Dr. B. Mohamed Harif** Assistant Professor of Mathematics Rajah Serfoji Government College, Thanjavur

Dr. S. Buvaneswari Associate Professor of Mathematics Periyar Maniammai Institute of Science & Technology, Thanjavur

Organized by

**Department of Mathematics** 

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## Six- Day FDP on Exploring Cutting-Edge Mathematics Innovations 27<sup>th</sup> April, 2024 and 13<sup>th</sup> to 17<sup>th</sup> May, 2024

Organized by

Department of Mathematics in association with Institution's Innovation Council (IIC)

Objective of the Programme:

The primary objective of this Six-Day FDP on "Exploring Cutting-Edge Mathematics Innovations" is to enhance the knowledge and skills of faculty members by introducing them to the latest advancements and methodologies in mathematics. This program aims to bridge the gap between traditional mathematical approaches and modern innovations, fostering a deeper understanding and application of contemporary mathematical concepts in both teaching and research.

Specific Objectives:

To familiarize participants with recent developments and emerging trends in Complex Analysis and Abstract Algebra.

To develop effective pedagogical techniques that engage and inspire students in learning advanced mathematics.



you are invited to

## SIX-DAY FDP ON EXPLORING CUTTING-EDGE MATHEMATICS INNOVATIONS 27 April 2024 and 13 to 17 May 2024

Organized by Department of Mathematics @ 10.00 am in DAWKIN"S HALL

Join us for a deep dive into the latest trends and breakthroughs in the world of mathematics.

02\_Invitation









#### "HOTS in Mathematics" Prof. Dr. T.N. Shanmugam

FORMER PROFESSOR OF MATHEMATICS , ANNA UNIVERSITY FOUNDER DIRECTOR, CENTRE FOR INTELLECTUAL PROPERTY RIGHTS FOUNDER DEAN, UNIVERSITY COLLEGE OF ENGINEERING KANCHIPURAM 27.04.2024 @ Dawkin's Hall

#### "Exploring Complex Analysis: A Comprehensive Tutorial"

Prof. Dr. V. Ravichandran PROFESSOR OF MATHEMATICS NATIONAL INSTITUTE OF TECHNOLOGY, TRICHY 13.05.2024 & 14.05.2024



13.05.2024 & 14.05.2024 Video call link: https://meet.google.com/nnj-rzby-efr

#### "Complex Analysis : Tutorial"



#### Dr. S. Buvaneswari Associate professor of mathematics Periyar Maniammai institute of science & technology

15.05.2024 Video call link: https://meet.google.com/nnj-rzby-efr

### "Abstract Algebra with its related problems"

Prof. B. Mohamed Harif ASSISTANT PROFESSOR OF MATHEMATICS RAJAH SERFOJI GOVERNMENT ARTS COLLEGE, TRICHY 16.05.2024 & 17.05.2024 @ LH ED 307 & LH TBI 331

Coordinators : DR. B. SRIDEVI (8667634196) & Dr. R. BALAKUMAR (9940757835).

#### SIX-DAY FDP ON EXPLORING CUTTING-EDGE MATHEMATICS INNOVATIONS 27 April 2024 and 13 to 17 May 2024 Organized by Department of Mathematics

03\_Brochure

4/25/24, 10:51 AM

Periyar Maniammai University Mail - Invitation- FDP on Exploring Cutting-Edge Mathematics Innovations begins @ 10 am in...



Head Maths <headmaths@pmu.edu>

# Invitation- FDP on Exploring Cutting-Edge Mathematics Innovations begins @ 10 am in Marie Curie Hall on 27.04.24 - (Venue Changed from Dawkins Hall to Marie Curie Hall) - Reg

1 message

Head Maths <headmaths@pmu.edu> Thu, Apr 25, 2024 at 10:49 AM To: HOD ARCH <headarch@pmu.edu>, Head Civil <headce@pmu.edu>, Head Aero <headaero@pmu.edu>, HOD EEE <headeee@pmu.edu>, HOD BIOTECH <headbio@pmu.edu>, Head ECE <headece@pmu.edu>, HEADMECH <headmech@pmu.edu>, HOD CSE <headcse@pmu.edu>, headmca <headmca@pmu.edu>, headphy <headphysics@pmu.edu>, Head Political <headpoliticalscience@pmu.edu>, headchemistry <headchemistry @pmu.edu>, head social <headsocialwork@pmu.edu>, head commerce <headcommerce@pmu.edu>, headedu@pmu.edu, Head Maths <headmaths@pmu.edu>, Head MBA <headmba@pmu.edu>, headse@pmu.edu, maghesh.d@pmu.edu, pmiststaff@pmu.edu

Dear Sir / Madam,

Greetings of the day. I would like to inform you that a Faculty Development Programme (FDP) on EXPLORING CUTTING-EDGE MATHEMATICS INNOVATIONS is scheduled on 27/04/24 at 10 am in Dawkins hall, PMIST. All interested faculty members are invited.

\*Thanking You

\*Thanking You

With Regards

Dr.S.Buvaneswari,M.Sc.,B.Ed.,M.PHIL.,MCA.,Ph.D

Associate Professor & Head

Department of Mathematics Faculty of Humanities, Sciences & Management

04\_Programme e. mail circulation

4/25/24, 10:52 AM

Periyar Maniammai University Mail - Invited Speaker



Head Maths <headmaths@pmu.edu>

#### **Invited Speaker**

1 message

Head Maths <headmaths@pmu.edu> To: Tirunelveli Nellaiappan Shanmugam <drtns2008@gmail.com>

Tue, Apr 23, 2024 at 4:23 PM

Respected Sir Greetings! On behalf of the Department of Mathematics we cordially invite you for the Faculty Development Programme on 27.04.24 at 10.00am in Dawkins Hall, PMIST. We are eagerly waiting to hear your presentation.

\*Thanking You

With Regards

#### Dr.S.Buvaneswari, M.Sc., B.Ed., M.PHIL., MCA., Ph.D

Associate Professor & Head

Department of Mathematics Faculty of Humanities, Sciences & Management

05\_Communication to Resource person

#### **Department of Mathematics**

Periyar Nagar, Vallam Thanjavur - 613 403, Tamil Nadu, India Phone: +91 7358053699 Fax: +91- 4362 - 264660 Email: headmaths@pmu.edu Web: www. pmu.edu



# "Six-Day FDP on Exploring Cutting-Edge Mathematics Innovations" 27<sup>th</sup> April 2024 and 13<sup>th</sup> – 17<sup>th</sup>, May 2024

#### **PROGRAMME SCHEDULE**

	Day	1: 27.04.2024
Welcome Address	:	Dr. B. Sridevi
		Assistant Professor
		Department of Mathematics
		Periyar Maniammai Institute of Science &
		Technology, Vallam, Thanjavur
Presidential Address	:	Dr. S. Buvaneswari
		Associate Professor & Head
		Department of Mathematics
		Periyar Maniammai Institute of Science &
		Technology, Vallam, Thanjavur
Introduction of Chief Guest	:	Dr. S. Dilip Jose
Dr. T.N. Shanmugam		Assistant Professor
		Department of Mathematics
		Periyar Maniammai Institute of Science &
		Technology, Vallam, Thanjavur
FDP begins at 10.00 am and ends at	:	HOTS in Mathematics
2.30 pm on 27.04.2025 @ Dawkins		Dr. T.N. Shanmugam
Hall		Former Professor of Mathematics,
		Anna University
		Founder Director,
		Centre for Intellectual Property Rights
		Founder Dean, University College of Engineering Kanchipuram
		University Conege of Engineering Kanchipuram

06\_Programme Schedule

	Day 2	2 : 13.05.2024
Introduction of Chief Guest Dr. V. Ravichandran & Dr. B. Mohamed Harif	•	<b>Dr. C. Vimala</b> Associate Professor Department of Mathematics Periyar Maniammai Institute of Science & Technology, Vallam, Thanjavur
Session begins at 2.00 pm and ends at 5.00 pm on 13.05.2024 https://meet.google.com/nnj-rzby-efr		Exploring Complex Analysis: A Comprehensive Tutorial Dr. V. Ravichandran Professor of Mathematics NIT, Trichy. 3 : 14.05.2024
Session begins at 2.00 pm and ends at 5.00 pm on 14.05.2024 https://meet.google.com/nnj-rzby-efr	:	Exploring Complex Analysis: A Comprehensive Tutorial Dr. V. Ravichandran Professor of Mathematics NIT, Trichy.
Session begins at 2.00 pm and ends at 5.00 pm on 15.05.2024 https://meet.google.com/nnj-rzby-efr	•	4 : 15.05.2024 Complex Analysis Dr. S. Buvaneswari Associate Professor & Head Department of Mathematics Periyar Maniammai Institute of Science & Technology, Vallam, Thanjavur

#### Day 5 : 16.05.2024

Session begins at 2.00 pm and ends at 5.00 pm on 16.05.2024 @ LH ED 307	:	Abstract Algebra with its related problems Dr. B. Mohamed Harif
5.00 pm on 10.05.202 f @ mi 112 507		Assistant Professor of Mathematics Rajah Serfoji Government Arts College, Thanjavur

#### Day 6 : 17.05.2024

Vote of thanks

Session begins at 2.00 pm and ends at 5.00 pm on 17.05.2024 @ LH TBI 331	:	Abstract Algebra with its related problems Dr. B. Mohamed Harif Assistant Professor of Mathematics Rajah Serfoji Government Arts College, Thanjavur
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:	Dr. R. Balakumar
	Assistant Professor
	Department of Mathematics
	Periyar Maniammai Institute of Science &
	Technology, Vallam, Thanjavur

06\_Programme Schedule

# "Six-Day FDP on Exploring Cutting-Edge Mathematics Innovations" $27^{th}$ April 2024 and $13^{th}-17^{th}$ , May 2024

#### Attendance Report

Number of Faculties (Male)	:	04
Number of Faculties (Female)	:	11
Number of Research Scholar (Male)	:	01
Number of Research Scholar (Female)	:	05
Total	:	21

07\_Attendance Report

# "Six-Day FDP on Exploring Cutting-Edge Mathematics Innovations" $27^{th}$ April 2024 and $13^{th}-17^{th}$ , May 2024

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	Six- Day FDP on Exploring Cutti 27th April, 2024 and	ng-Edge Mathematics 113 <sup>th</sup> to 17 <sup>th</sup> May, 202	
	List of Pa	articipants	
SLNo	Name of the Participants	Designation	Signature
1.	Dr. 3. Buraneswan	Asso. prof	Since
2.	Dr. A. Sosikale	HSSO. prof	abaulad
3.	pr. c. Vimala	Ano. Prop	Chi
4.	DY. J. JAYANTHI	AP (SG)	2. St
5	13 BOJEONORD	DP	Dujism?
6.	Dr. R. Ralakumer	AD/status.	min
7.	Mr. M. Havilamasan.	Personch Scholan	Milliam
8	Dr. K. Celvaraz	AP/mathe	R. John
9.	DO N. BALOMEISA	Aplmaths	N.Baby
10.	Dr. B. Sniden	APINath	Bics
11.	Dr. R. AROMOGAM	PESHAN	Dal
12.	Ms. B. Srie Ranjoin	Research Schike	B-huy
13.	Ms. v. Roovila	11	V.92
14.	Dr. P. Goatha	(22) qA	Gaz
15	Dr. P. N. Sudhe	APImate	P.N. etto
16	pr. S. Dilip Jala	APImathe	DTa.
17.	P.N. Kommalar	Revarch Scholar	3NJ E
18-	R. NITHYA	Research Scholar	R. way
19	NONVERD	Aplmaths	THE
20	D.VIDERPERSIVEN	850,959 (mate	as Prints
21	S. Vardhin	Research Scholor	8. NAS
21	S. Jandhin	Resaarch Scholer	a. Ma
			1.BL
	A		-
	Dr.S. Buvaneswari		2. 200
He	ad, Department of Mathematics		Coordinator

#### List of Participants

08\_List of participants

#### "Six-Day FDP on Exploring Cutting-Edge Mathematics Innovations" 27<sup>th</sup> April 2024 and 13<sup>th</sup> – 17<sup>th</sup>, May 2024 Organized by

#### Department of Mathematics in association with Institution's Innovation Council (IIC)

#### <u>Report</u>

Six-Day FDP on Exploring Cutting-Edge Mathematics Innovations has been arranged by Department of Mathematics in association with Institution's Innovation Council on 27.04.2024 and 13.05.2024 to 17.05.2024 at Periyar Maniammai Institute of Science & Technology (PMIST), Deemed to be University, Vallam, Thanjavur headed by Dr. S. Buvaneswari, Head and Associate Professor of Mathematics.

Dr. B. Sridevi has welcomed the gathering, Prof. Dr. S. Kumaran and Dr. C. Vimala have introduced our Guests Prof. Dr. TN Shanmugam, Prof. Dr. V. Ravichandran and Dr. B. Mohamed Harif on this occasion. End of the session Dr. R. Balakumar, Assistant Professor of Mathematics has delivered vote of thanks for this event. Exactly 06 research scholars and 15 faculty members were participated in this FDP.

The Faculty Development Program (FDP) titled "Exploring Cutting Edge Mathematics Innovation" was successfully conducted over six days, bringing together experts and educators to delve into advanced topics in mathematics. The sessions aimed to enhance participants' understanding and teaching methodologies in higher order mathematics. Below is a detailed report of each session.

#### Day 1: Higher Order Thinking Skills in Mathematics

#### Speaker: Prof. TN Shanmugam

**Overview:** Prof. TN Shanmugam led the first session, focusing on developing higher-order thinking skills in mathematics. He emphasized the importance of moving beyond basic memorization and calculation to foster critical thinking, problem-solving, and analytical reasoning among students.

09\_Programme Report

#### **Key Points:**

- Strategies to cultivate higher-order thinking skills.
- Importance of inquiry-based learning and problem-solving techniques.
- Examples of higher-order thinking tasks and assessments in mathematics.
- Role of teachers in guiding students to develop these skills.

#### Day 2 & 3: Exploring Complex Analysis: A Comprehensive Tutorial

#### Speaker: Prof. V. Ravichandran

**Overview:** V. Ravichandran presented a thorough tutorial on complex analysis, introducing participants to the fundamental concepts and advanced topics within this field. His session was designed to provide a deep understanding of complex functions, integration, and series.

#### **Key Points:**

- Introduction to complex numbers and their properties.
- Detailed exploration of complex functions and mappings.
- Techniques for complex integration and contour integration.
- Applications of complex analysis in various fields.

#### **Day 4: Complex Analysis**

#### Speaker: Dr. S. Buvaneswari

**Overview:** Dr. S. Buvaneswari continued the discussion on complex analysis, delving into more specific and advanced topics. Her session aimed to build on the foundation laid by Prof. V. Ravichandran, offering further insights and problem-solving strategies.

#### **Key Points:**

- Advanced topics in complex analysis, including residue theorem and its applications.
- Conformal mappings and their significance.
- Analytical continuation and its implications.

• Real-world applications of complex analysis.

#### Day 5 & 6: Abstract Algebra with Its Related Problems

Speaker: Dr. B. Mohamed Harif

**Overview:** Dr. B. Mohamed Harif conducted an engaging session on abstract algebra, focusing on both theoretical aspects and problem-solving techniques. The session was designed to help participants grasp the abstract nature of algebraic structures and their practical applications.

#### **Key Points:**

- Introduction to groups, rings, and fields.
- Important theorems and proofs in abstract algebra.
- Problem-solving strategies for algebraic problems.
- Applications of abstract algebra in cryptography, coding theory, and other fields.

#### Day 6: Closing and Feedback

The final day was dedicated to summarizing the key takeaways from the FDP, sharing participant experiences, and gathering feedback. Highlights included:

- **Participant Presentations**: Attendees presented what they had learned and how they planned to apply it in their teaching.
- Feedback Session: Constructive feedback was collected to improve future FDPs.

#### **Conclusion:**

The six-day FDP on "Exploring Cutting Edge Mathematics Innovation" was a resounding success, providing participants with advanced knowledge and skills in higher order thinking, complex analysis, and abstract algebra. The expertise of the speakers and the interactive format of the sessions ensured a valuable and enriching experience for all attendees.

09\_Programme Report

#### **Recommendations:**

- Follow-up workshops or advanced courses on specific topics covered in the FDP.
- Creation of collaborative platforms for participants to discuss and solve mathematical problems.
- Implementation of higher-order thinking skill strategies in the curriculum to improve students' mathematical capabilities.

#### Acknowledgments

We extend our gratitude to Dr. T.N. Shanmugam, Prof. V. Ravichandran, Dr. S. Buvaneswari and Dr. B. Mohamed Harif for their invaluable contributions. Their insights and dedication significantly enhanced the quality of the program. We also thank all the participants for their active engagement and enthusiasm throughout the FDP.

SIX-DAY FDP ON EXPLORING CUTTING-EDGE MATHEMATICS INNOVATIONS 27 April 2024 and 13 to 17 May 2024







09\_Programme Report

### CERTIFICATE OF APPRECIATION

#### This is to cerify that

#### Name

#### Institute Name

has participated in the "Six- Day FDP on Exploring Cutting-Edge Mathematics Innovations" organized by Department of Mathematics , Periyar Maniammai Institute of Science & Technology, Deemed to be University, Vallam, Thanjavur on 27.04.2024 and 13.05.2024 to 17.05.2024

Dr. R. Balakumar Co-Ordinator

D. om

Dr. S. Buvaneswari Head- Mathematics

Dr. P. Vijayalakshmi Dean (i/c) - FHSM

### "Six-Day FDP on Exploring Cutting-Edge Mathematics Innovations"

27<sup>th</sup> April 2024 and 13<sup>th</sup> - 17<sup>th</sup>, May 2024



Fig.1. Prof. TN. Shanmugam has delivered lecture about HOTS in Mathematics on 27.04.24

11\_Geotag Photo

#### "Six-Day FDP on Exploring Cutting-Edge Mathematics Innovations" 27<sup>th</sup> April 2024 and 13<sup>th</sup> – 17<sup>th</sup>, May 2024

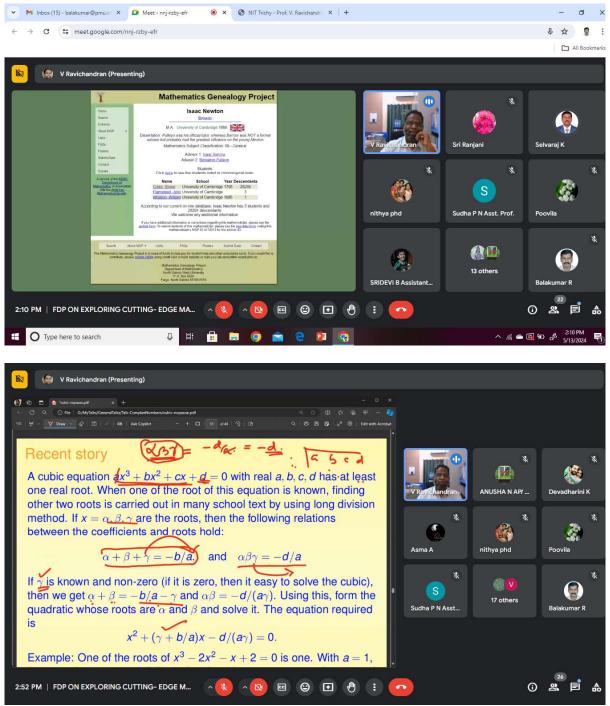


Fig.2. Prof. V. Ravichandran has delivered lecture about Complex Analysis on 13.05.24 and 14/05.24

11\_Geotag Photo

#### "Six-Day FDP on Exploring Cutting-Edge Mathematics Innovations" 27<sup>th</sup> April 2024 and 13<sup>th</sup> – 17<sup>th</sup>, May 2024

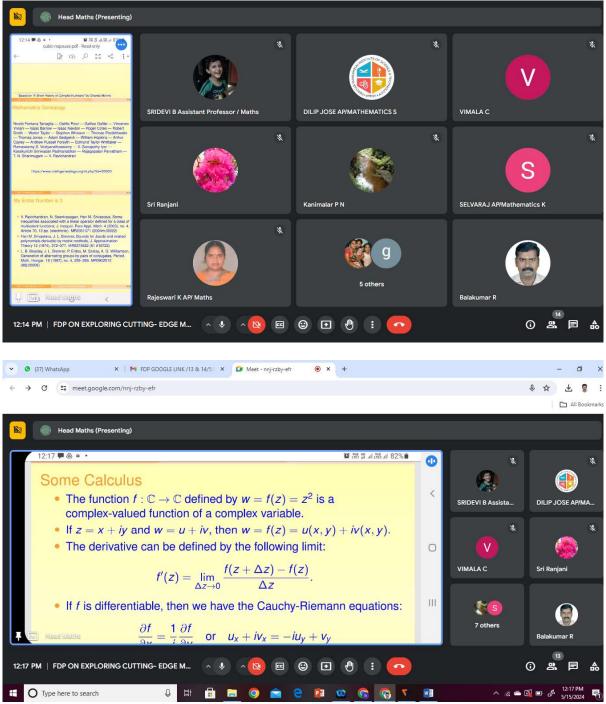


Fig.3. Dr. S. Buvaneswari has delivered lecture about Calculus on 15.05.24

## "Six-Day FDP on Exploring Cutting-Edge Mathematics Innovations" 27<sup>th</sup> April 2024 and 13<sup>th</sup> – 17<sup>th</sup>, May 2024



Fig.4. Dr. B. Mohamed Harif has delivered lecture about Abstract Algebra on 16.05.24 and 17.05.24

6/21/24, 12:58 PM	M FDP on Exploring Cutting-Edge Mathema	tics Innovations - 27.04.24 and 13.05.24 to 17.05.24
	FDP on Exploring Cuttin Mathematics Innovation 13.05.24 to 17.05.24 Department of Mathematics	
	Name of the Participant *	
2.	Affiliation *	
3.	Designation	
4.	e. mail *	
5.	Whatsup Number *	

ogle.com/formald/1HPFdYG7bPk2DF9jSvqPB\_WI5V9lZ4HTCyonUgXhml-cledit

12\_Feedback Form

1/4

6/20/24, 2:10 PM

6. How would you rate the overall quality of the FDP on exploring cutting-edge mathematics innovations?

Mark o	only one oval.				
	1	2	3	4	
Sati	0	0	0	0	Excellent

How would you rate the balance between theoretical content and practical applications in the FDP sessions?

Mark only one oval.



8. Were the sessions well-organized and effectively delivered?\*

Mark only one oval.

Strongly disagree Disagree Neutral Agree Strongly agree

https://docs.google.com/forms/d/1HPFdYG7bPk2DF9jSvqPB\_WI5V9/Z4HTCyonUgXhmi-cledit

2/3

\*

12\_Feedback Form

6/20/24, 2:10 PM	FDP on Exploring Cutling-Edge Methematics Innovations - 28.04.24 and 13.05.24 to 17.05.24
9.	Did the speakers demonstrate expertise and provide valuable insights into cutting- edge mathematics innovations?
	Mark only one oval.
	1 2 3 4
	Sati O Excellent
10.	In what ways has the Faculty Development Program on exploring cutting-edge mathematics innovations influenced your teaching methods or research approach? Please provide specific examples and suggestions for further improvement.

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Google Forms

https://docs.google.com/forms/d/1HPFdYQ7bPk2DF6j8vqPB\_WI5V9lZ4HTCyonUgXhmi-c/edit

3/3

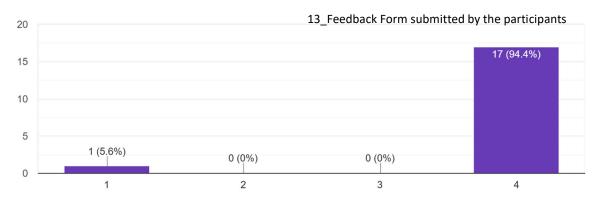
12\_Feedback Form

## FDP on Exploring Cutting-Edge Mathematics Innovations - 27.04.24 and 13.05.24 to 17.05.24

Department of Mathematics

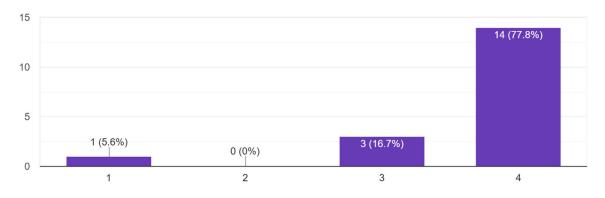
## How would you rate the overall quality of the FDP on exploring cutting-edge mathematics innovations?

18 responses

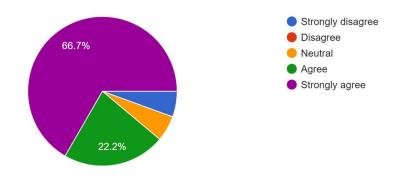


How would you rate the balance between theoretical content and practical applications in the FDP sessions?

18 responses

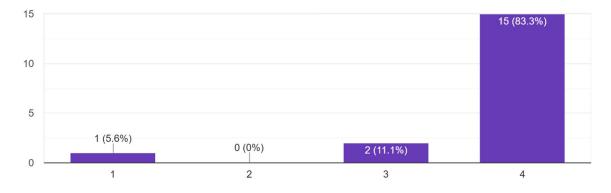


Were the sessions well-organized and effectively delivered? 18 responses



Did the speakers demonstrate expertise and provide valuable insights into cutting-edge mathematics innovations?

18 responses



In what ways has the Faculty Development Program on exploring cutting-edge mathematics innovations influenced your teaching methods or research approach? Please provide specific examples and suggestions for further improvement. 18 responses

Nil	
-	
Its very motivating	
theoretical mathematics. This	fted my research focus towards practical applications of includes exploring solutions toabstract algebra and of research has not only increased the relevance of my st.

This program provided a foundation for approaching the national level exams

From this FDP I have learned many things: groups, subgroups, ring, field and vector space. Also I have learned how to crack set/net examinations. Thank you very much for organizing such a fruitful programme.

Yes

Suggestions-Nil-

It's really informative

Very interesting and useful

This FDP helps to study and solve maths in different ways. Kindly arrange more FDP like this

13 Feedback Form submitted by the participants

Very useful information in this session and valuable insights

All good

Organize like this FDP oftenly

Increase this type program

# "Six-Day FDP on Exploring Cutting-Edge Mathematics Innovations" $27^{th}$ April 2024 and $13^{th}-17^{th}$ , May 2024

Organized by

Department of Mathematics in association with Institution's Innovation Council (IIC)

#### **Outcomes of the programme:**

Upon successful completion of this FDP, the participants

- Developed a thorough understanding of higher-order thinking skills (HOTS) and their importance in mathematical problem-solving and teaching.
- Revisited and strengthened their knowledge of the fundamental concepts of complex analysis.
- Strengthened understanding of core concepts such as groups, rings, and fields.
- Created networking opportunities for faculty members to connect with peers and experts in the field of mathematics.

Dr. R. Balakumar

Russ

Dr. B. Sridevi

fessor & Head nent of Mathematics Periyar Manlammai Institute of Science & Technology Periyar Nagar, Vallam, Thanjavur-613 403.