



V.V. Sangha's
ರಾವ್ ಬಹದ್ದೂರ್ ವೈ ಮಹಾಬಲೇಶ್ವರಪ್ಪ ತಾಂತ್ರಿಕ ಮಹಾ ವಿದ್ಯಾಲಯ, ಬಳ್ಳಾರಿ
Rao Bahadur Y. Mahabaleswarappa Engineering College, Ballari
Department of Mathematics



FACULTY DEVELOPMENT PROGRAM (FDP) REPORT

Science Forum Initiative

5-Day Faculty Development Program (FDP)

On

“Advanced Mathematical Techniques in Engineering Research”

Date: 9th July 2025 – 13th July 2025

Organized by: Department of Mathematics

Institution: Rao Bahadur Y. Mahabaleswarappa Engineering College (RYMEC), Ballari
(Affiliated to VTU, Belagavi | Approved by AICTE | NAAC A+)

The poster is a rectangular graphic with a white background and a decorative border of hexagons. At the top, it features the college's logo on the left and a portrait of V.V. Sangha on the right. The text is centered and includes the college name in Kannada and English, the program title '5-Day Faculty Development Program (FDP)', the topic 'Advanced Mathematical Techniques in Engineering Research', the dates 'from 9th to 13th July 2025', and the organizing department 'Department of Mathematics'. It also mentions the inauguration details: 'Inauguration on 9th July 2025 | Time : 10.30 am | Venue : CSE Seminar Hall.' Logos for NEA and NAAC A+ are present. At the bottom, there is a list of names and titles in small text.

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RAO BAHADUR Y. MAHABALESWARAPPA ENGINEERING COLLEGE, BALLARI

SCIENCE FORUM INITIATIVE
5-Day Faculty Development Program (FDP)

on
Advanced Mathematical Techniques in Engineering Research
from 9th to 13th July 2025

organized by
Department of Mathematics

Inauguration on 9th July 2025 | Time : 10.30 am | Venue : CSE Seminar Hall.

ಶಿಕ್ಷಣ ನಿರ್ದೇಶಕರು | ಶಿಕ್ಷಣ ನಿರ್ದೇಶಕರು | ಶಿಕ್ಷಣ ನಿರ್ದೇಶಕರು | ಶಿಕ್ಷಣ ನಿರ್ದೇಶಕರು | ಶಿಕ್ಷಣ ನಿರ್ದೇಶಕರು | ಶಿಕ್ಷಣ ನಿರ್ದೇಶಕರು | ಶಿಕ್ಷಣ ನಿರ್ದೇಶಕರು
Dr. V.V. Sangha | Dr. V.V. Sangha | Dr. V.V. Sangha | Dr. V.V. Sangha | Dr. V.V. Sangha | Dr. V.V. Sangha | Dr. V.V. Sangha



2. Objectives of the FDP

The major objectives of the FDP were:

1. To strengthen foundational understanding of Linear Algebra, Probability & Statistics in engineering research.
2. To explore optimization techniques for solving real-world engineering problems.
3. To introduce Singular Value Decomposition (SVD) and its applications in data analysis and system modeling.
4. To provide exposure to mathematical modeling of fluid dynamics.
5. To familiarize participants with sampling techniques and nature-inspired computing methods.

3. Inauguration Ceremony

Date: 9th July 2025

Time: 11:00 AM – 11:30 AM

The FDP commenced with a formal inauguration in the presence of the Principal, HODs, conveners, faculty members and participants. The dignitaries addressed the gathering and emphasized the importance of advanced mathematical tools in modern engineering research.



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Inaugural Function



Address by Principal



Address by Chief Guest



Address by Chairman



Address by Secretary



Address by Chief Guest



4. Day-wise Detailed Report

Day 1 – 9th July 2025

Technical Sessions 1 & 2

Topic: Linear Algebra

Resource Person: Dr. Arulalan Rajan (Formerly, Faculty Proficiency Programme, CCE IISc Bangalore & Adjunct Professor, RVCE Bangalore)

The sessions covered:

- Vector spaces and subspace
- Eigen values and eigenvectors
- Matrix decompositions
- Applications in engineering systems

Technical Sessions 3 & 4

Topic: Probability & Statistics

Topics discussed included:

- Probability distributions
- Statistical inference
- Hypothesis testing
- Applications in engineering data analysis

The sessions were interactive and enriched with real-time examples.



Morning Session 09-07-2025



Afternoon Session 09-07-2025

Day 2 – 10th July 2025

Technical Sessions 5 & 6

Topic: Optimization Techniques

Speaker: Dr. Arulalan Rajan

Key Highlights:

- Linear programming models
- Nonlinear optimization



- Constrained optimization techniques
- Engineering case studies

Technical Sessions 7 & 8

Topic: Fluid Dynamics

Speaker: Dr. B. J. Gireesha

Professor, Kuvempu University, Shimoga

The session emphasized:

- Mathematical modeling of fluid flow
- Navier-Stokes equations
- Boundary layer theory
- Engineering applications



Morning Session 10-07-2025



Afternoon Session 10-07-2025



Day 3 – 11th July 2025

Technical Sessions 9 & 10

Topic: Singular Value Decomposition (SVD) in Data Analysis and System Modeling

Speaker: Dr. A. Padmanabha Reddy

Assistant Professor, VSK University, Ballari

Topics covered:

- Matrix factorization
- Dimensionality reduction
- Data compression
- Applications in system modeling

Special Lecture

Topic: Machine Learning Techniques for Detecting Plant Diseases

Speakers:

- Dr. A. Padmanabha Reddy
- Dr. Aishwarya M. P., Sanjay Ghodawat Engineering College

The lecture focused on:

- Supervised learning methods
- Image processing techniques
- Practical agricultural applications

Participants implemented SVD techniques for data analysis under expert guidance.



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Afternoon Session 11-07-2025



Morning Session 10-07-2025

Valedictory Function

Date: 11th July 2025

The valedictory ceremony was conducted in the presence of dignitaries. Feedback was collected from participants, and certificates were distributed.



Distribution of Certificates



Group Photo with Resource Persons & Organizers

Day 4 – 12th July 2025 (Online Mode)

Technical Session 12

Topic: Sampling Techniques & Their Applications

Speaker: Dr. Subhash Kumar Yadav

Associate Professor, Babasaheb Bhimrao Ambedkar Central University, Lucknow

The session covered:

- Random sampling methods
- Stratified and cluster sampling
- Applications in engineering and social sciences



Online Session 12-07-2025

Day 5 – 13th July 2025 (Online Mode)

Technical Session 13

Topic: Nature Inspired Computing

Speaker: Dr. B. Vishnu Vardhan

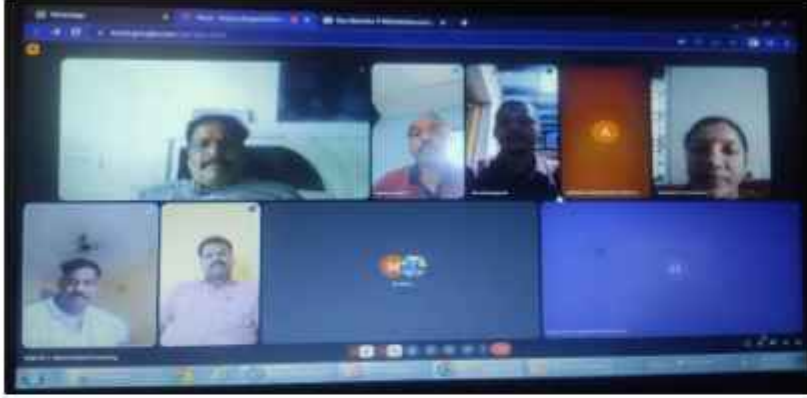
Principal & Professor of CSE, JNTUH University College of Engineering

Key areas discussed:

- Genetic Algorithms
- Particle Swarm Optimization
- Ant Colony Optimization
- Real-world optimization applications



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Online Session 13-07-2025

5. Participation Details

- Participants included faculty members from Mathematics, Physics, Chemistry, and Engineering departments.
- No registration fee was charged.
- Accommodation was provided on request.
- The FDP received enthusiastic participation and active engagement.



6. Organizing Committee

Chief Patrons

Dr. Kanekal Mahantesh, President, V. V. Sangha, Ballari.
Sri. Janekunte Basavaraj, Vice President, V. V. Sangha & Chairman, RYMEC, Ballari.
Dr. Aravind Patel, Secretary, V. V. Sangha, Ballari.
Sri. Yalpi Meti Pampanagouda, Joint Secretary, V. V. Sangha, Ballari.
Sri. Byaluvaddigeri yerriswamy, Treasurer, V. V. Sangha, Ballari.
Sri. Prabhu Swamy S M, GB Member, RYMEC, Ballari.
Sri. Badada Prakash, GB Member, RYMEC, Ballari.

Conveners

Dr. Sumangala B – HOD, Mathematics
Dr. B. Veeresh – Assistant Professor, Mathematics

Organizing Committee

Sri. H. M. Manjunath, Asst. Professor, Mathematics
Sri. K. Sangameshwar, Asst. Professor, Mathematics
Smt. A. Sivamma, Asst. Professor, Mathematics
Sri. Prabhakara Meti, Asst. Professor, Mathematics
Smt. Ambika G M, Asst. Professor, Mathematics
Smt. Gangamma G, Asst. Professor, Mathematics
Mr. M. Manikanta, Asst. Professor, Mathematics
Ms. Anjali, Asst. Professor, Mathematics
Mr. Karthik Reddy K, Tech Asst, Mathematics
Smt. Chandana, Asst. Professor, Chemistry
Ms. Sneha K, Asst. Professor, Chemistry

Patrons

T. Hanumantha Reddy, Principal, RYMEC, Ballari.
Dr. Savita Sonoli, Vice-Principal, RYMEC, Ballari.

Advisory Committee

Dr. Kottureshwara N. M, Professor & HOD, Chemistry
Dr. Nagabhushana N. M, Asst. Professor & HOD, Physics
Dr. N. Nagaraja, Professor, Physics

Event Coordinators

Dr. P. Shaik Sha Vali, Asst. Professor, Mathematics
Smt. M. Jayashree, Asst. Professor, Chemistry
Dr. K. R. Bhagya, Asst. Professor, Physics
Dr. Anand Thipperudra, Asst. Professor, Physics



Feedback Summary

- Participants rated the FDP as highly informative and well-structured.
- Participants suggested conducting more advanced computational workshops in future.
- Sessions started and concluded on time.
- Coordination by the organizing committee was highly appreciated.
- Smooth conduct of both offline and online sessions.

Outcomes

- Strengthened research orientation among faculty.
- Improved understanding of advanced mathematical modeling.
- Enhanced interdisciplinary collaboration.
- Increased awareness of modern optimization and computational techniques.

8. Conclusion

The 5-Day Faculty Development Program on “**Advanced Mathematical Techniques in Engineering Research**” was successfully conducted with academic rigor and enthusiastic participation. The FDP effectively bridged theoretical mathematics with practical engineering applications, thereby fulfilling its objectives.

The Department of Mathematics expresses sincere gratitude to the Management of V. V. Sangha, Principal, resource persons, organizing committee members, and all participants for their valuable contribution to the success of the program.