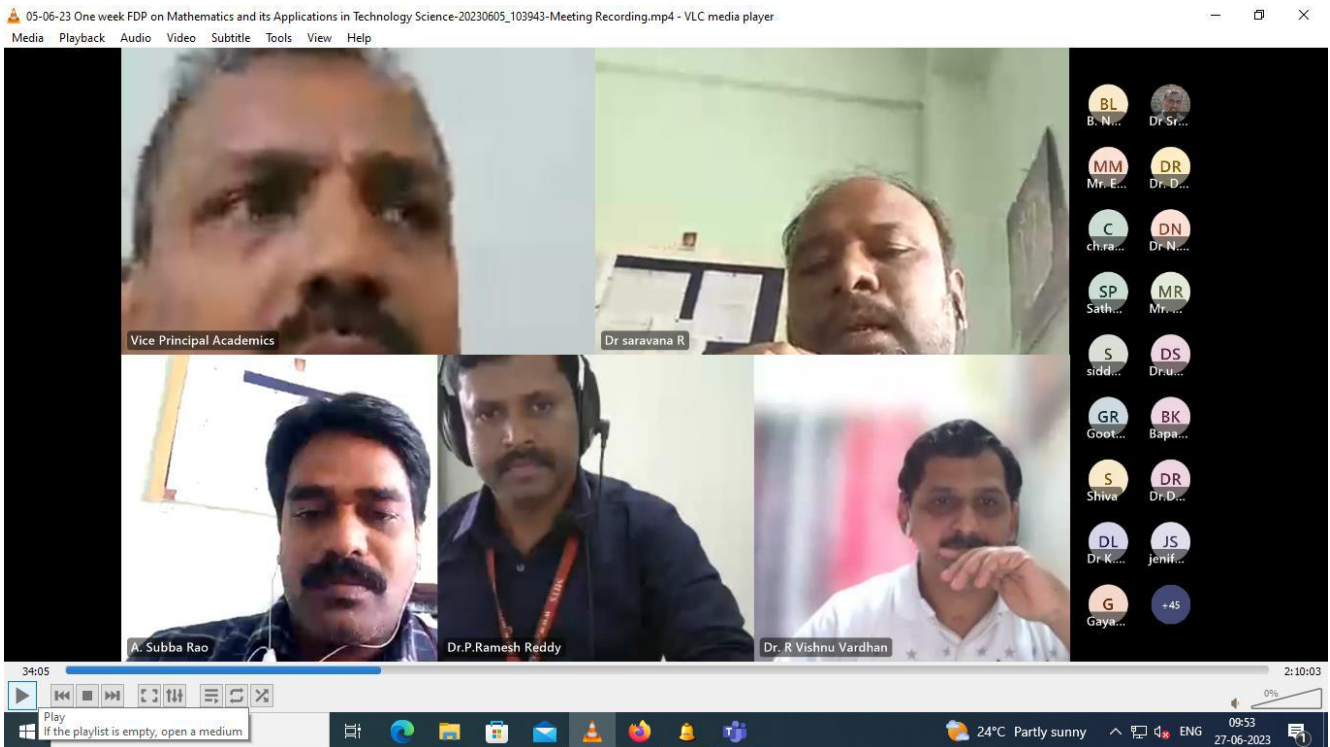


## Report on “**M**athematics and **I**t Applications in **T**echnology and **S**cience” 5.06.2023 to 09.06.2023



**Submitted by: Dr.P.Ramesh Reddy HoD-Mathematics**

**Report Received on 27/6/23**

The Department of Mathematics has successfully conducted a five day- Faculty Development Program on “**M**athematics and **I**t Applications in **T**echnology and **S**cience” from 5th June 2023 to 9th June 2023.

This Online National Level Faculty Development Program was initiated with the abled guidance and support from our Principal and management and executed well with the team of Department of Mathematics, as there were more than **500 faculty members registered** for the program and on daily basis had **more than 150 participants actively involved** in the faculty development program, listening and getting involved with their questions and getting answers from the resource persons. The participants were responding to the feedback links about the daily session and giving their valuable feedback with lots of appreciation and thanks for conducting such information sessions. There were five sessions (each with 2 hours’ duration and 25 minutes’ discussion) in five days totally twelve hours. We have scheduled the sessions based on the time availability and dates given by the resource persons.

### Day-1

The FDP has been started on 5<sup>th</sup> June at 2:30 P.M. with inaugural session. The inaugural session was presided by Dr. P. Ramanathan, Vice principal, MITS as the Chief Guest of the function and has shared the highlights of Madanapalle Institute of Technology & Science and his views related to the significance of conducting virtual mode FDP for the benefit of faculty community. Dr. P.Ramesh Reddy, HOD Mathematics & Convener of the FDP has introduced the Department, Research activities and shared the objectives of the FDP, during the inaugural function. Dr.R. Saravana, Co-convener of FDP has given the instructions related to attendance and information about the all the sessions followed by the welcoming the first speaker. Dr.Chalpathi, Assistant Professor, Department of Mathematics, MITS has introduced the resource person to the FDP participants.

**Dr.R.Vishnu Vardhan, Professor, Department of Statistics, Ramanujan School of Mathematical Sciences, Pondicherry University** has delivered lecture on Predictive Modelling using R. He has explained linear regression, multiple linear regression and other predictive models viz. decision trees and neural networks. He has mentioned that 'Predictive Analytics' is widely used in risk management, collection analytics, direct marketing, CRM and Big-Data Management. Some of his examples are

- Fraud detection systems - Predictive modelling can be used to identify high-risk transactions/customers
- Pro-active customer retention - Predictive modelling can be used to predict the probability of a customer terminating his/her services.
- Risk Management & insurance - Predictive modelling can be used to determine the risk of accidents to policy holders
- Companies employ predictive analytics to find patterns in this data to identify risks and opportunities

He has concluded his talk with the scope and opportunities in Big-data analysis for the graduates.

### Day-2

The second day of the FDP, held on 6th June 2023, focused on applications of Graph Theory. Dr. Dipankar Saha, Assistant Professor, Department of Mathematics, MITS has introduced the resource person to the participants. The sessions were conducted by **Dr Kedar Nath Das, Associate Professor in the Department of Mathematics, NIT Silchar**. The following contents have been covered in the sessions:

- A brief introduction on genetic algorithm, how genetic algorithm can be applied to solve single and multi-objective optimization taking some real life examples.
- Euler graph and its various properties, bipartite graph, star graph, trees, spanning trees etc.
- Genetic optimization problem (maximization or minimization) that is associated with graph.
- Minimal spanning tree problem which deals with the problem of obtaining a tree of minimum weight that spans all the vertices of a weighted, undirected and connected graph, where the weight of the tree corresponds to the sum of weights of its edges.
- Kruskal and Prim algorithm which is often used to solve the MSTP
- How the graph theory can be used in Network System and its Security, Data Structures and Software Engineering?

### Day-3

The third day of the FDP, held on 7th June 2023, focused on "**Controllability and its Applications**". Dr. Ramaswamy Subramanyam, Assistant Professor, Department of Mathematics, MITS has introduced the resource person to the participants. The sessions were conducted by **Dr. T. Sathiyaraj , Institute of Actuarial Science and Data Analytics, UCSI University, Kuala Lumpur, Malaysia**.

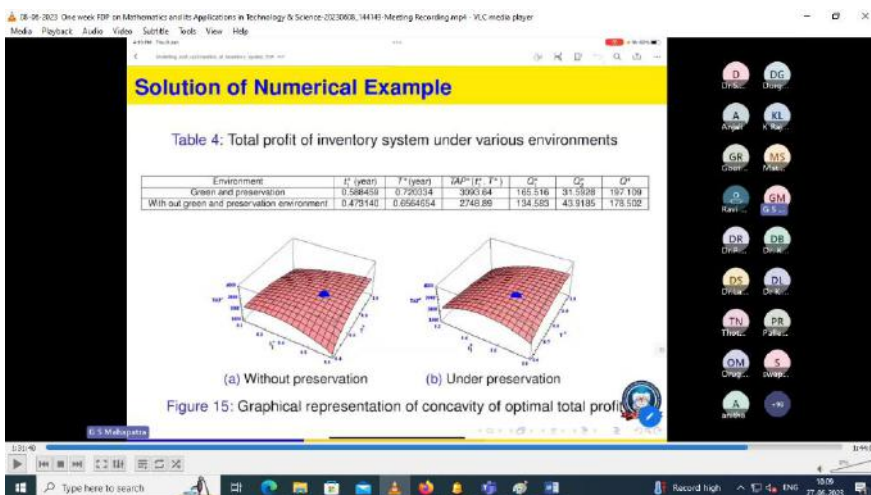
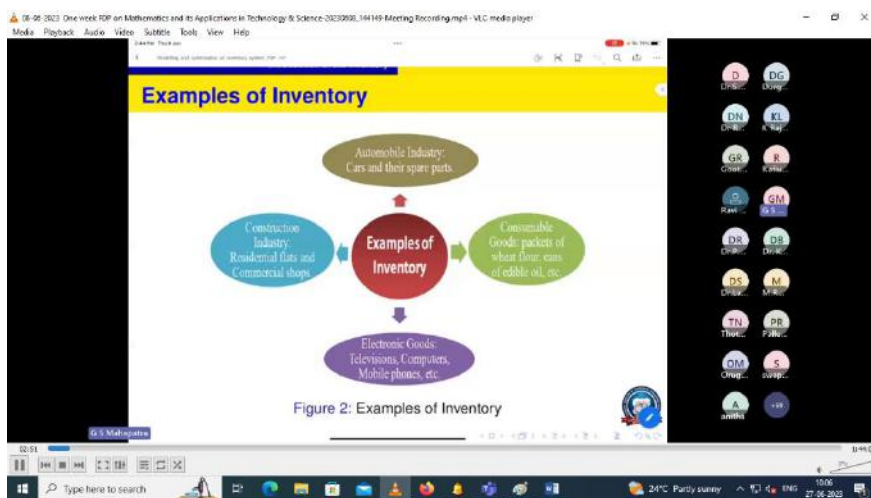
The following contents have been covered in the sessions:

- The role of Controllability in a control system
- stabilization of unstable systems by feedback, or optimal control.
- How to Successfully Apply Controllability.
- Infrastructure and custom application monitoring
- Log analytics
- Application monitoring (APM)
- Alerts correlation
- End-to-end operational and alert management platform
- Production-centralized knowledge-base management
- A single dashboard for all monitoring platforms
- Runbook automation (RBA)
- Production reports and business intelligence analysis
- Robust escalation policies

## Day-4

The fourth day of the FDP, held on 8th June 2023, focused on "**Modelling and Optimization of Inventory System**". Ms. Durgabhavani, Assistant Professor, Department of Mathematics, MITS has introduced the resource person to the participants. The sessions were conducted by **Dr.G.S.Mahapatra, Associate Professor, NIT Puducherry**. The following contents have been covered in the sessions:

- An overview of inventory modelling and inventory control.
- Formulation of the inventory model under various situations like constant demand and time-dependent demand, with or without deterioration and shortages.
- How to optimize the inventory system to get optimal profit or cost?
- How to incorporate impreciseness, green technology, carbon tax while modelling the inventory system?
- Advanced inventory model formulation under a sustainable environment
- Applications of inventory modelling
- Research Scope in inventory modelling to solve different issues in Business management.



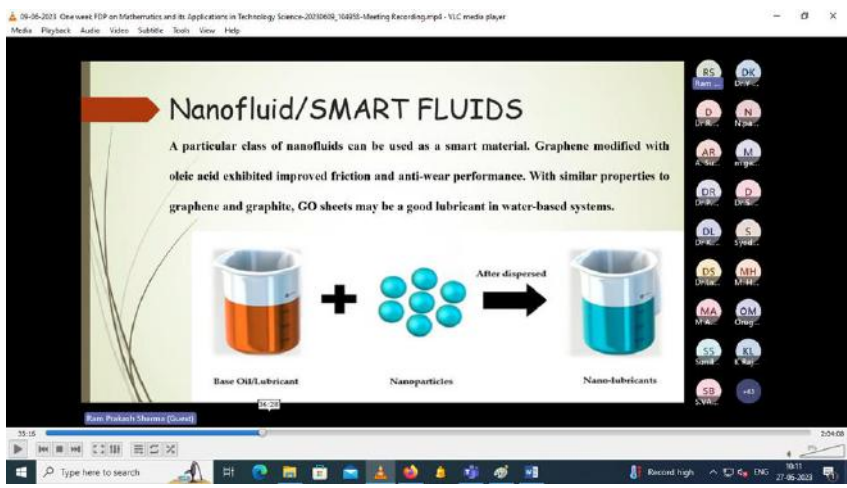
## Day-5

The fifth day of the FDP, held on 9th June 2023, focused on "**Nano fluids and its Applications**". Dr.A.Subba Rao, Assistant Professor, Department of Mathematics, MITS has introduced the resource person to the participants. The sessions were conducted by **Dr.R.P.Sharma, Professor, NIT Arunachal Pradesh**.

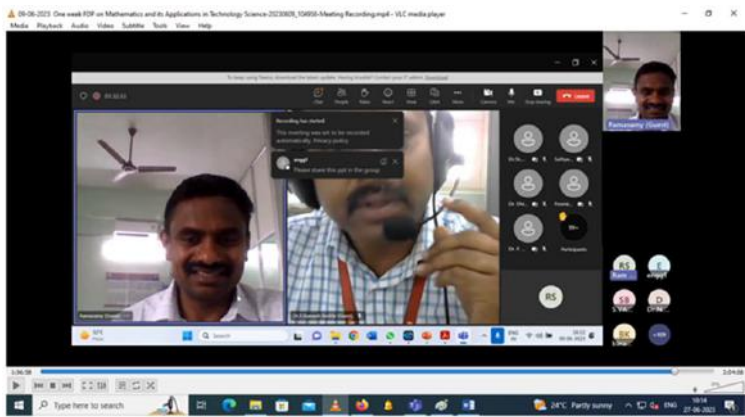
The following contents have been covered in the sessions

- Hybrid Nano fluid models and its vigorous role in industries, chemical engineering and biomedical sciences.

- Properties, thermal conductivity, methods for the preparation, stability, structure, advantages and disadvantages of Nano fluids.
- The classification of Nano fluids such as metallic Nanoparticles, Metallic Oxide Nano fluids, carbon based Nano fluids, Hybrid Nano fluids, functionalized Nanoparticles where the base fluid may include water, kerosene, Ethylene Glycols etc.
- Applications of Nano fluids been elaborately explained.
- The new challenges in the area of Nano fluid/Hybrid Nano fluid through the increase of viscosity, interfacial layering, Nano fluid agglomeration or dispersion has been specified.



The resource person explored his recent research articles with the participants. The current presentation will be supportive of understanding the functionalized Nanoparticles, Hybrid Nano fluid thermal features, mass transfer, magneto-hydrodynamic effects with elastic deformation behaviour and flow characteristics through the porous medium. Finally, the session was concluded by the vote of thanks delivered by Dr. P.Ramesh Reddy , Convenor of this FDP. He extended his gratitude to the Management, Principal, Vice-Principals, Resource persons and the participants for the successful completion of the program.



**Sample Certificate**

