



# SRI GURU NANAK DEV KHALSA COLLEGE

## Dev Nagar, Delhi - 110005



### Post-Event Report

<b>Event</b>	National Workshop
<b>Topic</b>	Mathematical Modelling and Simulation
<b>Organizer</b>	Asankh - The Mathematics society
<b>Date</b>	13th-17th February, 2024
<b>Time</b>	2:30 pm-6:00 pm
<b>Duration</b>	5 Days
<b>Place/Platform</b>	Zoom(Online)
<b>Number of Participants</b>	90+
<b>Guest Speaker/Trainer</b>	Prof. Peeyush Chandra, Dr. Prashant Kumar Srivastava, Dr. Nilam
<b>Welcome Speech</b>	Dr. Meena Singh, Ms. Deepinder Kaur, Dr. Bhawna Kohli
<b>Activities</b> <ul style="list-style-type: none"><li>● National workshop on various topics under Mathematical modelling and simulation.</li><li>● It was a five days online event.</li></ul>	
<b>Main Ideas :</b> <p>To Engage the participants so they can get knowledge about Mathematical modelling and simulation like:-</p> <ul style="list-style-type: none"><li>● Understanding the methodology of solving SIR models for disease spread.</li><li>● Learning significance of dieting model that provides important insights and guides to a biomedical issue that is of interest to the general public.</li><li>● Understanding nonlinear systems and phenomena with stability analysis ranges from phase plane analysis to ecological and mechanical systems.</li><li>● Using Monte Carlo simulation technique to approximate area under a given curve and volume under a given surface.</li></ul>	
<b>Vote of thanks</b>	Dr. Bhawna Kohli, Dr. Neeti Goel
<b>Feedback (Share the link of the Google Form &amp; attach the Excel File generated therein) :</b> <a href="https://forms.gle/qGMX8YZXYnwGZhNM8">https://forms.gle/qGMX8YZXYnwGZhNM8</a>	



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**Dev Nagar, Delhi - 110085**

Poster (Attach below)

 **SRI GURU NANAK DEV KHALSA COLLEGE**   
(University Of Delhi)  
(Accredited With Grade 'A' By NAAC)

Under the Aegis Of IQAC  
**DEPARTMENT OF MATHEMATICS**

*is Organizing*

**FIVE DAYS (ONLINE) NATIONAL WORKSHOP**

*ON*

**MATHEMATICAL MODELLING AND  
SIMULATION**

Date : 13<sup>th</sup> – 17<sup>th</sup> Feb 2024  
Timings: 2:30 – 6:00 pm

Venue : Zoom  
Mode: **ONLINE**

Dr. Bhawna Kohli  
(Workshop Convenor)

Ms. Deepinder Kaur  
(Department Convenor)

Prof. Gurmohinder Singh  
(Principal)



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(Attach Five Photos)

**Mathematical Modeling Process**

- This requires translation of real world problem as a world model with a specific goal. There is a large element of compromise in this translation. The majority of interacting systems in the real world are far too complicated in their entirety. Hence the first level of compromise is to identify the most important parts of the system. These will be included in the model, the rest will be excluded. Thus a model retains only those features/ characteristics which are relevant and significant from the point of view of 'goal'.

Zoom meeting interface showing a whiteboard with handwritten notes and a Zoom control bar at the bottom.

**Epidemiology:** It is a discipline, which deals with the study of infectious diseases in a population.

Disease is 'a condition of the body or some of its part in which its functions are disturbed causing a departure of from normal state of health'.

**Infectious Disease** is when normal state of health is disturbed by a 'causative agent' (e.g. virus, bacteria, protozoa, toxin etc) which is transmitted from one host to another by some mode.

**KEY TAKEAWAYS**

- A Monte Carlo simulation is a model used to predict the probability of a variety of outcomes when the potential for random variables is present.
- Monte Carlo simulations help to explain the impact of risk and uncertainty in prediction and forecasting models.
- A Monte Carlo simulation requires assigning multiple values to an uncertain variable to achieve multiple results and then averaging the results to obtain an estimate.
- Monte Carlo simulation is an efficient computer-based mathematical technique which enables people to account for variability in their process to improve decision making. Although a number of practitioners find it difficult to use, it provides many benefits to an organization. It is not used often in small and medium-sized projects.
- If you need effective forecasts for your business, Monte Carlo Simulation is for you.
- Monte Carlo simulations assume perfectly efficient markets.

**Example (A competition model):**

$$\frac{dx_1}{dt} = 14x_1 - \frac{1}{2}x_1^2 - x_1x_2$$

$$\frac{dx_2}{dt} = 16x_2 - \frac{1}{2}x_2^2 - x_1x_2$$

For critical points, we solve

$$14x_1 - \frac{1}{2}x_1^2 - x_1x_2 = 0,$$

$$16x_2 - \frac{1}{2}x_2^2 - x_1x_2 = 0.$$

Which gives : (0, 0), (0, 32), (28, 0), (12, 8) as critical points.

Attach Photocopy of two Certificates : NA

Signature: *Deepinder kaur*

Name: Deepinder kaur

(Convenor)