Society Activity Report 2018-19

Mathematics Society

-Workshops, Lectures, and symposiums:

Rubik's Cube workshop

In the odd semester, Rubik's Cube workshop was organized by the society on 29th and 30th August. It was the first event of the society in the year 2018-19 and was open to students from Stephen's College only. It was a workshop wherein the participants were taught how to solve a Rubik's Cube using a simple algorithm over a course of two days.

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SB Mathur Lecture series

SB Mathur Lecture series is a lecture series coordinated by the society. It was held on the 23rd and 24th of October. The two day lecture series saw Mr. A. Satyanarayaana deliver a lecture on "Applications of Linear Algebra in Graph Theory" and Dr. Subhendu Ghosh speaking on the topic," Computer, Brain and Mind".

THE MATHEMATICS SOCIETY

St. Stephen's College
Presents

Professor SB Mathur Memorial Lecture Series

MR. A SATYANARAYANA REDDY
School of Natural Sciences

Topic: Introduction to Algebraic Graph Theory
Date: 23rd October,2018
Time: 2 PM
Venue: Room XC

Kiran: +91-7907188330   Priyanka: +91-9746316999

THE MATHEMATICS SOCIETY

St. Stephen's College
Presents

Professor SB Mathur Memorial Lecture Series

DR. SUBHENDU GHOSH
Department of Biophysics, University of Delhi

Topic: Computer, Brain and Mind
Date: 24th October,2018
Time: 2 PM
Venue: Room XC

Kiran: +91-7907188330   Priyanka: +91-9746316999

Informative Session by Prof. Shobha Bagai

The society hosted another informative and interesting speaker session on 31st January 2019 by Prof. Shobha Bagai on Problem Based learning in Mathematics at undergraduate level.

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Invitation to deliver a talk   Inbox ×

MathSoc StStephens <mathsoc.ssc@gmail.com>   Wed, Jan 23, 2019, 10:41 AM
to Shobha

Respected Ma'am,

The Mathematics Society of **St. Stephen's College** is devoted to pursuing activities aimed at fostering interest in and creative expression of mathematical ideas, both in college and outside it. In the past, we have held talks by eminent mathematicians, organized discussions and released publications, in an attempt to share the joys of pursuing Mathematics with audiences from diverse backgrounds. From organizing events and national fests to starting the Mathematics Research Forum, a branch of the society aimed at promoting research in Mathematics, we do all we can to create and promote interest in Mathematics.

On behalf of the Mathematics Society, I would like to invite you to deliver a talk, on **30th December from 2-3 PM** (flexible). Please do let us know whether you would be comfortable with the given date.

The topic of the talk is entirely your choice.We are expecting audience from a general category from different backgrounds mainly undergraduate students in the college.

Looking forward to your presence.

Warm Regards,
Kiran Elizabeth Jose : +91 79071 88330
Priyanka Prakash Nair: +91 97463 16999
The Mathematics Society
St. Stephen's College

--

Picture

Shobha Bagai <shobhabagai@gmail.com>   Wed, Jan 23, 2019, 2:42 PM
to me

Will it be possible to have the talk from 12:00 to 1:00 or 1:30 - 2:30 ?

Shobha Bagai <shobhabagai@gmail.com>   Wed, Jan 23, 2019, 2:42 PM
to me

Will it be possible to have the talk from 12:00 to 1:00 or 1:30 - 2:30 ?

Or on Thursday afternoon ?
•••
--
Professor Shobha Bagai
Programme Coordinator - B.Tech (Information Technology and Mathematical Innovations)
Cluster Innovation Centre
3rd Floor, University Stadium
G C Narang Road
University of Delhi
Delhi - 110007
INDIA

Ph: 27666702 Extn: 211 (off.)
Mobile: +91 9810909650

MathSoc StStephens <mathsoc.ssc@gmail.com>   Thu, Jan 24, 2019, 5:34 PM
to Shobha

Dear Ma'am,

As discussed we can have the talk on Thursday from 2 P.M. to 3 P.M.

I kindly request you to send the topic for the talk.

Warm Regards,
Priyanka Prakash Nair
•••

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Symposium

The Department of Mathematics together with Mathematics society held a two-day state-level workshop on "Number Theory and Cryptography" on 27th and 28th March 2019. Eminent mathematicians from prominent institutions like ISI, IIT, DRDO, and IISER lectured undergraduate students on topics related to the field of Number Theory and Cryptography.

The following professor delivered lectures at the Workshop:

1. **Dr. Geetha Venkataraman** (Professor, School of Liberal Studies, Ambedkar University)
2. **Dr. Amitabha Tripathi** (Professor, Department of Mathematics, IIT Delhi)
3. **Dr. SK Pal** (Defence Research and Development Organisation)
4. **Dr. Kapil Hari Paranjape** (Professor, IISER Mohali)
5. **Dr.Indivar Gupta** (Defence Research and Development Organisation)

The lectures will be aimed at systematically exposing the students to various areas of **Number Theory and Cryptography.** The topics covered in the two days Workshop are as follows:
1) Number Theoretic Cryptography in Quantum Era
2) Public Key Cryptography
3) Number Theory in Cryptography
4) Computer Algebra System used in Number Theory

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-Competitions:

Treasure Hunt

Our most awaited event, Treasure Hunt was put together on 26th September. It is a fun event requiring students to use their logical abilities to solve puzzles and mathematical riddles and reach their desired destinations. It was larger than every event ever organized by the society. It saw a turnout of over 400 students from all over Delhi University.

Griphomania

Griphomania, a new event started by the society last year was conducted on 3rd October again this year. It is a puzzle solving event that challenges the brain cells of all the participants. It was a team event like almost every other event organized by the society and saw a better turnout than last year.

ROUND - 1

Q1) Solve the following KenKen Puzzle :

4 ×	2 /		1 -
	4 ×	5 +	
5 +			4 ×
	1 -		

Q2) There are 500 different students with different heights who are arranged in an array of 10 rows and 50 columns according to their respective heights.

Now, the tallest from each row is called out and the shortest one of them is marked as S. They are asked to go back to their respective position.
Then, the shortest from each column is called out and the longest one among them is marked as T.
Can you find out who between S and T is taller?

Q3) Guess the two missing pairs of letters given below?
      MA, ??, ??, SO, ND, JF

Q4)
      If 1 + 9 + 11 = 1, and 35 + 11 + 19 = 10,
      Then what is the value of
      12 + 11 + 9 = ?

Guesstimate

The society held another thrilling and exciting competition, Guesstimate, on 12th October. It is a competition based on the concept of guesstimates and making calculated guesses with logic behind them.

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Integration

The annual flagship event of the Mathematics Society, Integration 19 was held on 19th and 20th of February. It saw multiple events and competitions take place in college premises simultaneously. Some of the events that took place during the annual event were- Inaugral talk, Treasure Hunt, Mathopolis, Arithmancy, Griphomania, Pictionary and Mathematical Tambola.

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THE MATHEMATICS SOCIETY
ST. STEPHEN'S COLLEGE

INTEGRATION
2019

THE WORLD DIFFERENTIATES, BUT WE INTEGRATE!

CASH PRIZES UPTO 20K TO BE WON!!

19TH FEBRUARY
INAUGURAL TALK: 2 PM
PAPER PRESENTATION: 3 PM
TREASURE HUNT: 3 PM
ARITHMANCY: 5 PM

20TH FEBRUARY
MATHEMATICAL
TAMBOLA: 2 PM
MATHOPOLIS: 3 PM
GRIPHOMANIA: 3 PM
PICTIONARY: 5 PM

REGISTER HERE: https://tinyurl.com/Integration19

THE MATHEMATICS SOCIETY
ST. STEPHEN'S COLLEGE

Pictionary

COME AND JOIN US IN TEAMS OF TWO

CROSS COLLEGE TEAMS ALLOWED

DATE: 20th FEBRUARY 2019
TIME: 5 PM
VENUE: ROOM NCLT

Register at: https://tinyurl.com/Integration19

PRIZES WORTH 3K TO BE WON!

KIRAN: +91-7907188330   TUSITA: +91-9205075463

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THE MATHEMATICS SOCIETY
ST.STEPHEN'S COLLEGE

MATHOPOLIS

Come as lone wolves or in a pack of two!

Cash prizes of upto 3k to be won!

20th February · 3:00 p.m.
Room C

Register at :
https://tinyurl.com/Integration19

Priyanka:+91 97463 16999   Vansh:+918726880777

THE MATHEMATICS SOCIETY
ST STEPHEN'S COLLEGE
presents

PAPER PRESENTATION COMPETITION

19th February
3:00 p.m.
OCLT

Anson:+91 99102 94743   Rahul:+91 94978 21868   Rhema:7701869879

The Mathematics Society
St. Stephen's College
Presents

ARITHMANCY

MATHLETES, GEAR UP!

19th February
5pm onwards
Venue: NPLT & OPLT

PRIZES UPTO RS 3K TO BE WON

FACEBOOK.COM/THEMATHEMATICSSOCIETY   REGISTER BY SCANNING:

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-Other events:

Professor Nagpaul Fellowship

The Professor Nagpaul Fellowship started in the month of September. It is a collaboration between a group of students and a teacher where they work together to produce a research paper on a topic in Mathematics. The fellowship started four years ago and is one of the most prestigious fellowships in college. Over the years, it has nurtured budding researchers in the college. St. Stephen's College is well known for undergraduate research and the Professor Nagpaul Fellowship aims at providing the students with just that.

Brouwer's fixed Point theorem and some Applications

Murtaza Farooq
Mentor: Dr Jaspreet Kaur

Apr 9,2019

Nagpaul Fellowship

Rajat Chandra Mishra
Guide: Prof. Shobha Bagai
Area of Study: Numerical Methods

April 2019

Abstract

Numerical methods are mathematical methods that are used to approximate the solution of complicated problems so that the solution consists only of addition, subtraction, and multiplication operations. These are very useful because they are suitable for the use with computers because computer processors can only add, subtract and multiply. This paper deals mainly with numerical methods for second order nonlinear differential equations.

Acknowledgements

I would like to acknowledge Professor Shobha Bagai, my project guide for the completion of this research project under Nagpaul Fellowship. I would like to thank her for taking me as a student, and helping me understand the topic I had chosen. Her guidance has been invaluable. I would also like to thank the Department of Mathematics, St Stephen's College, for giving me an opportunity to work on this project.

1 Introduction

With the advent of modern high speed electronic digital computers, numerical methods have been successfully applied to study problems in mathematics, engineering, computer science and physical sciences such as biophysics, atmospheric sciences and geosciences. Most of these problems are modelled by differential equations. The differential equations could be a boundary value problem (with boundary conditions known) or an initial value problem (with known initial conditions).

In this project I studied the finite difference methods to solve nonlinear boundary value problems, and used them to solve some nonlinear second order ordinary differential equations. These methods usually convert the given boundary value problem to a system of transcendental equations. This paper also focuses on Newton-Raphson Method and LU Decomposition, which are used to find the solution of a system of transcendental equations.

2 Newton-Raphson Method

A problem of great importance is that of determining the solution of an equation of the form

$$f(x) = 0 \tag{1}$$

If $f(x)$ is a linear or quadratic function, its root can be directly determined.

We present an iterative scheme of finding the roots of (1), which starts with an initial approximation to the root and then finds successively better approximations to the roots.

MathSoc Open

MathSoc Open 2019, an official World Cubing Association cubing event was organized by the society on 9th & 10th February. We witnessed an amazing turnout of over 150 participants. It is a really interesting two-day event of speed solving of puzzles where we saw World Records being made by participants of a varied age group. This event is one of the best platforms for students to showcase their talents and polish their hobby of speedcubing.

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