DWARAKA DOSS GOVERDHAN DOSS VAISHNAV COLLEGE



(Autonomous)

College with Potential for Excellence

Linguistic Minority Institution

DEPARTMENT OF MATHEMATICS WITH COMPUTER APPLICATIONS

MATHOMANIA

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Life changing 2020-2021

One complete academic year has passed in these pandemic days. This year has changed every single student life. It is not only in student, also in teachers where teaching methodology has changed. Teachers could reach their students without board and chalk. Teachers are able to communicate with students without even looking at them. Students missed their college life but not their education. Not only chapters in the syllabus are taught to them, but we the department of Mathematics with Computer Applications made it a point to input students with more information about the subject and the current research works.



The Department of Mathematics with Computer Applications was started in the year 2011. This department is dedicated to excellence in teaching and is committed to serving the students.

It provides graduate students with an opportunity to develop a deep understanding of Mathematics, to become effective communicators, to enforce boundaries (personal, professional), and to prepare themselves for their future careers.

The department aims in moulding the students, to lead a balanced successful life with proper health, good relationships, and mental peace. Also, the goal of the department is to create a better world through education, research and extension activities.

FUN FACTS

Suppose I return N Home works randomly to my N students. What is the chance that no student gets back her own homework? In a class of 30? Would it be more or less if I had more students?

Surprising answer: the chance that no one gets back her own homework is approximately (1/e), which is approximately 36.8 percent of the time!

And the answer is about the same, no matter how many students you have! (It gets closer and closer to 1/e as N becomes larger.

VISION:

- To promote and support a comprehensive, innovative and dynamic learning environment.
- To assist students in acquiring a conceptual understanding of the nature and structure of mathematics, its processes and applications.

MISSION:

To establish an atmosphere of creative Endeavour that supports interdisciplinary collaborations, innovative projects, significant research, and informal discussions that mutually benefit students, faculty and the community at large.



- To provide graduate students an opportunity to develop a deep understanding and enjoyment of mathematics.
- To carry out original research, to become effective teachers and communicators, and to prepare themselves for their future careers





The Department of Mathematics with Computer Applications organized a National Webinar on "Recent Advancement of Fuzzy Theory" on 29.08.2020 in which Professor Dr. A. Nagoor Gani, Associate Professor and Research Advisor, Jamal Mohamed College, Tiruchirapalli, Tamil Nadu was the resource person.

This webinar was conducted to know the recent trends in Applied Mathematics so that the students get to know the latest advancements in the field of Mathematics. Our resource person made it simple and elegant so that our students can enrich their knowledge in this field. It was much more helpful and informative to faculty members and research scholars too. This webinar was conducted through online mode and was streamed live in YouTube

Powered by

eam **Yard**

CRYPTOGRAPHY - ??



Originated from Greek words, Kryptos-(CRYPTO)-means Secret Or Hidden message Graphein – (GRAPHY) means – Writing CRYPTOGRAPHY – The Art of secret writing Need ???

Secure communication over insecure channel

National Level Webinar on "An Overview of Cryptography"

A webinar for our students was conducted on 24th September 2020 whereinDr. T. Isaiyarasi, Assistant Professor, SRM Valliammai Eng. College, Kanchipuram District, Tamil Nadudelivered a vibrant lectureOn "An Overview of Cryptography"

She projected a clear understanding about the tools involved in the process of encryption and decryption in the two main types of crypto systems namely the Classical Cryptosystem and the Practical Cryptosystem or Public Key Cryptosystem with suitable examples. She further emphasized on research opportunities in this field.





A webinar on "AESTHETICS AND APPLICATONS OF MATHEMATICS" was conducted on 13th February 2021. Dr. A. Uma Maheshwari, Research Advisor, Tamil Nadu State Council for Higher Education was the resource person.

She rendered a fabulous speech relating to Tamil Illakiyam in Mathematics. This kindled the interest of our students about mathematics in various fields.

FUN FACT

If you are familiar with complex numbers, the "imaginary" number i has the property that the square of i is -1. It is a rather curious fact that i raised to the i -th power is actually a real number!

In fact, its value is approximately 0.20788.

Powered Short cut Methods $(i) \frac{1}{x(x+1)}$ $+2x+2 - \frac{1}{x^2 + 2x + 5}$ +2r+5) = 36 🖪 🗟 r. R. Muthucumaraswamy, Dean(Research), Professor and Head, Department of Applied Mathem

A webinar on "FUNDAMENTALS OF MATHEMATICS AND ITS APPLICATIONS" was held on 20th February 2021. The resource person for the session was Dr. R. Muthucumaraswamy, DEAN(Research), Professor and Head, Sri Venkateswara College of Engineering, Sriperumbudur.

He gave an idea about basic concepts of Mathematics and explained the same with real life examples also gave easy tips and methods to students to solve problems easily.





To enhance the interests of CSIR -NET aspirants an Online Quiz series "Consisting of 11 quiz competitions and was conducted from 3rd week August to last week of November 2020. Every week the test was conducted in one Topic Algebra, (Abstract Linear Algebra, Real Analysis and Complex Analysis) to equip the participants in gaining confidence. It helped the participants to be expert in all subjects for effective teaching learning process.





ORIENTATION PROGRAM

On 24th September, a mentoring session was conducted for 1st year students (freshers Meet) through G-meet to give a brief note on the curriculum, rules and regulations of the college. A motivational talk was given to the students

regarding the academics, safety measures and on online classes. Finally, it ended with a mathematical game to make the students to interact with the faculties easily. Article

GEOGEBRA- TEACHING MATHEMATICS

ABSTRACT:

The open-source software GeoGebra provides an easy way to create interactive and dynamic web pages. In this article we explain how this done and present first experiences of the use of this new tool for teaching mathematics at the college.



INTRODUCTION:

GeoGebra (the name is a portmanteau made from the two words GEOMETRY and ALGEBRA) is an interactive geometry, algebra, statistics and calculus application, intended for learning and teaching mathematics and science from Primary School to University level. GeoGebra's creator, Markus Hohenwarter started the project in 2001 as part of his master's thesis at the University of Salzburg. After a successful Kickstarter campaign, GeoGebra expanded its offering to include an iPad, an Android and a Windows store app version. It includes both commercial and not-for-profit entities that work together from the head office in Linux. Austria, to expand the software and cloud services available to users.



Creating Teaching material:

GeoGebra is dynamic mathematics software for all levels of education that brings together geometry, algebra, spreadsheets, graphing, statistics and calculus in one easy-to-use package. GeoGebra is a rapidly expanding community of millions of users located in just about every country. With the advance of information and communications technologies, new teaching tools are becoming more pervasive.

GeoGebra as a dynamic mathematics software allow users to explore multiple representations of mathematics concepts. The paper deals with the problem of deployment of GeoGebra in Lithuanian's primary math education and the main purpose of this study is to investigate reasons/factors affecting teacher's decision to utilize GeoGebra and learning objects prepared by it in their teaching process.

The main obstacles in teaching mathematics are:

- concepts without an adequate illustration
- Mathematical graphs are static in classical way of teaching mathematics i.e., drawing it on a piece of paper.
- Static objects do not allow for generalization of the concept.

INTERFACE:

GeoGebra has a very clear and initiative interface divided into parts corresponding to the algebra and geometry. Depending on your needs it can be freely modified to suit the considered issue.

We have several views:

- Algebraic view,
- Geometric view,
- Spreadsheet view,
- CAS view,
- Protocol design view,
- Command line

Article by, Meena. U Mahalakshmi. K III Year B.Sc Maths with CA

The Fibonacci Sequences

Fibonacci Sequence is a set of numbers that start with a one, and proceeds based on the rule that each number is equal to the sum of the preceding two numbers. 0, 1, 1, 2, 3, 5, 8, 13, 21, 34, 55, and so on

Written as a rule, the expression is: $X_n = X_{n-1} + X_{n-2}$



The Origin of The Fibonacci Sequence

Leanardo Pisano Bogollo (Fibonacci was his nickname) first introduced the series of numbers known as the Fibonacci sequence in his book Liver Abaci in 1202.

Fibonacci discovered the sequence by posing the following question:

"If a pair of rabbits is placed in an enclosed area, how many rabbits will be born there if we assume that every month a pair of rabbits produces another pair and that rabbits begin to bear young two months after their birth?"

Though Fibonacci's question concerning the rabbits is an unrealistic scenario, the sequence can be observed everywhere in nature, from the leaf arrangement in plants to the pattern of the florets of a flower, the bracts of a pinecone, or the scales of a pineapple in the array of sunflower seeds, and the shape of galaxies and hurricanes. The Fibonacci numbers can be thought of as Nature's numbering system.

The Fibonacci Spiral and The Golden Ratio

Fibonacci numbers themselves and the closely related "Golden" elements. If we take the ratio of two successive numbers in Fibonacci's series, (1, 1, 2, 3, 5, 8, 13, ...) and we divide each by the number before it, we will find the following series of numbers: 1/1 = 1, 2/1 = 2, 3/2 = 1.5, 5/3 = 1.666..., 8/5 = 1.6, 13/8 = 1.625, 21/13 = 1.61538... The larger the numbers in the Fibonacci sequence, the closer the ratio is to the golden ratio.

The Fibonacci sequence is often visualized in a graph in which each of



the squares illustrates the area of the next number in the sequence. The Fibonacci spiral is then drawn inside the squares by connecting the corners of the boxes.

The squares fit together perfectly because the ratio between the numbers in

the Fibonacci sequence is very close to the golden ratio, which is approximately 1.618034. The spiral and resulting rectangle are also known as the Golden Rectangle.

FIBONACCI RETRACEMENT

Fibonacci retracement is a method of technical analysis which uses the Fibonacci sequence to determine at what point the price of a financial asset will stop and reverse in the opposite direction. Stock traders frequently take a cue from Fibonacci retracement to predict future share prices.

Done By

R. Madhumithra

P.R. Tejaswini

II Year B.SC Maths with CA

Wronskian Calculation

In Mathematics, the need sometimes arises to prove whether functions are dependent or independent of each other in a linear sense. If you have two functions that are linear dependent, graphing the equations of those functions result in points that overlap. Functions with independent equations do not overlap when graphed. One method of determining whether functions are dependent or independent is to calculate the Wronskian for the functions.

What Is a Wronskian?

The Wronskian of two or more functions is what is known as a determinant, which is a special function used to compare mathematical objects and prove certain facts about them. In the case of the Wronskian, the determinant is used to prove dependence or independence among two or more linear functions.

The Wronskian Matrix

To calculate the Wronskian for linear functions, the functions need to be solved for the same value within a matrix that contains both the functions and their derivatives. Note that the Wronskian can be used for larger sets as well. If for example, you test three functions with a Wronskian, then you might populate a matrix with the functions and derivatives of f(t), g(t) and h(t).

Solving the Wronskian

Once you have the functions arranged in a matrix, cross-multiply each function against the derivative of the other function and subtract the first value from the second. For the example above, this gives you

$$W(f,g)(t) = f(t)g'(t) - g(t)f'(t)$$

If the final answer equals zero, this shows that the two functions are dependent. If the answer is something other than zero, the functions are independent.

Wronskian Example

To give you a better idea of how this works, assume that

$$f(t) = x + 3$$
 and $g(t) = x - 2$

Using a value of t = 1, you can solve the functions as

$$f(1) = 4$$
 and $g(1) = -1$

As these are basic linear functions with a slope of 1, the derivatives of both f(t) and g(t) equal 1. Cross-multiplying your values gives to

$$W(f,g)(1) = (4 + 1) - (-1 + 1)$$

which provides a final result of 5. Though the linear functions both have the same slope, they are independent because their points to not overlap. If f(t) had produced a result of -1 instead of 4, the Wronskian would have given a result of zero instead to indicate dependence.

We can conclude that f and g are linearly independent. This is a system of two equations with two unknowns. The determinant of the corresponding matrix is the Wronskian. Hence, if the Wronskian is nonzero at some t_0 , only the trivial solution exists.

> DONE BY, PRIYADHARSHINI.U II year B.SC Maths with CA

FACULTY PAPER PRESENTATION





Mrs. J. Kavitha, Assistant Professor, Department of Mathematics (Shift-II)

Papers published

- "Symmetric bi derivations in GK Algebra" in Compliance Engineering Journal Vo. 2, Issue 3, March 2020.
- "A Note on Multipliers in GK Algebra" published in the JXAT Journal, Volume XII, issue 4, Apr 2020.
- 3. ''FUZZY SUBALGEBRA AND IDEALS OF GK ALGEBRA'' in the Journal of Shanghai jiaotong University (Science) in volume 16, Issue 7, Julv 2020.



Papers Presented



Mr. R. Shankar, Assistant Professor, Department of Mathematics (Shift-II)

"Some more strong sets in Generalized topological space with a Hereditary Class H" at National E- Conference on Recent Trends in Mathematics (NECRTM 2021) organized by the Department of Mathematics, Faculty of Arts and Science, Bharath Institute of Science and Technology, Thiruvencheri, Chennai on 22nd January 2021.

2. "ON SEMI -II- REGULAR SETS IN GENERALIZED TOPOLOGICAL SPACE" at the International Conference on Applied Mathematics and Civil Structures (ICAMCS 2021) from February 12-13,2021 at SRI Sivasubramaniya Nadar College of Engineering, Kalavakkam.

3. "H- AB sets in Generalized topological space" in the International Conference on Mathematical techniques and Applications (e- ICTMA 2021) organized by Department of Mathematics from 24th to 26th March 2021 at SRM Institute of Science and Technology, Kattankulathur, Tamil Nadu.



We would like to acknowledge that the following final year students were placed in different organisation.

S.NO	NAME	COMPANY
1	Meena. U	Deloitte Usi Consulting
2.	Hitesh.A	NAT WEST GROUP (RBS)
3.	MohanaSankaran. B	Cognizant Technologies Solution
4.	Nitheesh.N	Cognizant Technologies Solution
5.	Rathish .C	Cognizant Technologies Solution
6.	Afzal Ahmed. A	Infosys
7.	Mahalakshmi.K	Infosys
8.	Anuj Kumar B	Sitel India



CERTIFICATE COURSE



A Certification Course on R- Programming was conducted for 1st and 2nd year Students of B. Sc Mathematics with Computer Applications in the month of March 2021.

The most famous and trending language in the field of software is R language which was developed by Ross Ihaka and Robert Gentleman in 1993. R language provides a wide range of methods such as statistical methods, graphical methods, etc. Many features such as machine learning algorithm, linear regression, time series, statistical interface and many more are included in this R language. R language is used by many large companies such as Uber, Facebook, Google and many more.

Thank You

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