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AARUPADAI VEEDU INSTITUTE OF TECHNOLOGY



VINAYAKA MISSION'S  
RESEARCH FOUNDATION  
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**DEPARTMENT OF HUMANITIES AND SCIENCE  
MATHEMATICS DIVISION**

24<sup>th</sup> Jan'2021

## **Report on Workshop**

Department of Humanities and Science/ Mathematics division together with Departments of Electronics and Communication and Biomedical Engineering Jointly organized a one-day Virtual Workshop on “**Mathematical Applications in Electronics, Communication and Bio-Medical Engineering**” on **20<sup>th</sup> January 2021** for ECE and Biomedical Engineering Students. The Workshop was conducted mainly for the students to know the real time applications of Mathematics, which would be very useful when they go for any project or research, work in their own field. Nearly 60 students were participated in this workshop.

In this Workshop, the presentations were made by all the staff of Department of Mathematics and it was initiated by Dr.L.TamilSelvi, Head / Mathematics Division on “Graph Theory and its applications“, followed by her, the presentation was made by Dr.A.K.Bhuvanewari, Assistant Professor (G-II) on “Difference Equations and its applications”, followed by her, Mr.D.Balaji explained various applications of “Laplace Transforms”. Then the presentation on ” Applications of Mathematics in Signal Processing “ was done by Dr.M.Thamizhsudar and Followed by her, Dr.S.Gayathri has shown the various Mathematical applications of Fourier Series and Fourier Transforms, particularly in “Image Processing” and Finally by Ms.S.sarala done on “Matrix Decomposition and its applications”.

The Invitation, Program schedule, participants list and some screenshots during the presentations were attached herewith.

**AVIT**  
 VEDIC LITERATURE, SCIENCE, HISTORY & SOCIOLOGY

**VINAYAKA MISSION'S RESEARCH FOUNDATION**  
 DEPARTMENT OF HUMANITIES AND SCIENCE (MATHEMATICS DIVISION)  
 &  
 DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING (MATHEMATICS DIVISION)  
 DEPARTMENT OF BIO-MEDICAL ENGINEERING

**CORDIALLY INVITES YOU TO THE ONE DAY VIRTUAL WORKSHOP ON**

**MATHEMATICAL APPLICATIONS IN ELECTRONICS, COMMUNICATION & BIOMEDICAL ENGINEERING**

**DATE: 20.01.2021, TIME: 9.00 AM**

Presided by  
**Dr. K. L. SHUNMUGANATHAN**  
 Principal, AVIT

Felicitations  
**Dr. S. P. SANGEETHA**  
 VJ(Academics), AVIT

**Dr. D. VIJENDRA BABU**  
 VJ(Final Time Studies), AVIT

**Prof. L. PRABHU**  
 VJ(Academ.), AVIT

With warm regards  
**Dr. JENNIFER G. JOSEPH**  
 HOD / H&S

**Dr. L. K. HEMA**  
 Professor & HOD, Department of ECE & BME

**Dr. L. TAMILSELVI**  
 Head / Maths Division

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**VIRTUAL WORKSHOP ON MATHEMATICAL APPLICATIONS IN ELECTRONICS COMMUNICATION ENGINEERING AND BIO MEDICAL ENGINEERING**

















**PROGRAMME SCHEDULE**

09.00 - 09.30	- Dr. L. TamilSelvi	- Graph Theory and its Applications
09.30 - 10.00	- Dr. A. K. Bhuvaneshwari	- Introduction to Difference Equations and its Applications
10.00 - 10.30	- Mr. D. Balaji	- Applications of Laplace Transform in Electronics and Communication Engineering
10.30 - 11.00	- Dr. M. Thamisudar	- Applications of Probability and Statistics in Signal Processing
11.00 - 11.15	- Break	
11.15 - 11.45	- Dr. S. Gayathri	- Applications of Fourier Transform in Electronics and Biomedical Engineering
11.45 - 12.15	- Ms. S. Sarala	- Matrix Decomposition and its applications

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Close Participants (61)

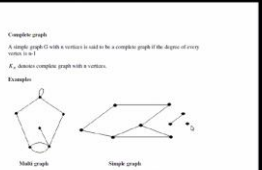
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- A A.o.K.BHUVANE... (me)  
- TS Tamil selvi L (Host)  
- balaji dur... (Co-host)  
- T THAMIZH... (Co-host)  
- VM Vismaya mohana c  
- A A.o.Padmapriya  
- Aishwarya Raj  
- AM AKASH M.J  

Invite

**Complex graph**  
 A simple graph G with n vertices is said to be a complex graph if the degree of every vertex is  $\geq 2$   
 $K_n$  denotes complex graph with n vertices.

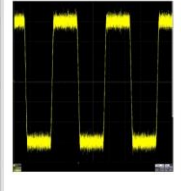
**Example**



Multi graph      Simple graph

Zoom Meeting

Consider a basic oscilloscope measurement of a noisy square wave as shown in Figure 1.



Participants (53)

- S. Gayathri (Me)
- Tamil selvi L (Host)
- THAMIZHSELVAM (Co-host)
- balaji duravamy (Co-host)
- A.K.BHUVANESHWARI
- A.Padmapriya
- AKASH M.J
- Abhishek Ch
- ARUN SUGATHAN
- S. Hemant 3471959354
- Bhaskar P. A.
- Chetan Kumar
- Chenna Dhanan (3471954501)
- Gautham

Invite    Remove Me    Raise Hand

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11:22 20-01-2021

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**Applications:**

- Analysis of electronic circuits:**  
Laplace Transform is widely used by electronic engineers to solve quickly differential equations occurring in the analysis of electronic circuits.
- System modeling:**  
Laplace Transform is used to simplify calculations in system modeling, where large number of differential equations are used.
- Digital signal processing:**  
One can not imagine solving digital signal processing problems without employing Laplace Transform.

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**Applications of Fourier Transform**

- Physics
  - Solve linear PDEs (heat conduction, Laplace, wave propagation)
- Antenna design
  - Synthetic arrays, side scan sonar, GPS, SAR
- Signal processing
  - 1D: speech analysis, enhancement ...
  - 2D: image restoration, enhancement ...

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If we expand the corresponding  $n+2$  by  $n+2$  determinant by the first row

$$D_{n+2} = aD_{n+1} - bcD_n$$

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Zoom Meeting Zoom Meeting View Options

**Example:**

$$A = \begin{pmatrix} 5 & 4 & -7 \\ 5 & -8 & 1 \\ -1 & 2 & -3 \end{pmatrix} = \begin{pmatrix} 5 & 0 & 0 \\ 3 & -12 & 0 \\ -1 & \frac{1}{5} & -3 \end{pmatrix} + \begin{pmatrix} 1 & \frac{4}{5} & -\frac{7}{5} \\ 0 & 1 & -\frac{3}{5} \\ 0 & 0 & 1 \end{pmatrix}$$

Where

$$L = \begin{pmatrix} 5 & 0 & 0 \\ 3 & -12 & 0 \\ -1 & \frac{1}{5} & -3 \end{pmatrix}$$

$$U = \begin{pmatrix} 1 & \frac{4}{5} & -\frac{7}{5} \\ 0 & 1 & -\frac{3}{5} \\ 0 & 0 & 1 \end{pmatrix}$$

Participants (52)

Find a participant

- S. Gayathri (Co-host, me)
- A.K.BHUVANESWARI (Host)
- Sarala S (Co-host)
- balaji durakowamy (Co-host)
- A.Padmapriya
- AKASH MJ
- Akhilesh CL
- ARJUN SUGATHAN
- B.Hemant 3471956504
- Blessymol P A
- Dhreena Dhayalan (3471954301)
- GANESH BABU LOGANATHAN
- Gnadhakumar
- J.Jeremiah Aisr 3471955510

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