

# Department of Mathematics and Statistics

## Inception and Growth

The Department of Mathematics started with the inception of the college in 1993, with one lecturer and three undergraduate courses (Maths-Physics-Chemistry, Maths-Physics-Electronics and Maths-Physics-Computer Science). Statistics was introduced in 1994 with one lecturer and one undergraduate course (Maths, Statistics, Computer Science). After 27 glorious years and the 28th year on, the Department of Mathematics and Statistics, which started with an intake of 60 students, has expanded to an annual intake of nearly 300 students. As on date, the Department has a strength of about 990 students, an increase of 16 times plus, the initial intake





Bhavan's Vivekananda College  
of Science, Humanities and Commerce  
Sainikpuri, Secunderabad  
Reaccredited with 'A' Grade by NAAC  
Autonomous College  
**Department of Mathematics and Statistics**

**Alumni Talk**

**12-08-23**

**Report**

**Objective:** Motivate students to develop entrepreneurial / employability skills and to improve practical knowledge along with professional aptitude.

Department of Mathematics and Statistics has organized an Online Alumni Talk, on 12-08-2023 from 10:00 AM to 12:00 Noon, which was a comprehensive event that encapsulated a diverse range of topics. Our Alumni Lt. Cdr Hem Kumar Naidu, Sr. Manager SLP, Amazon and Mr. Vijay Raghavan M, Director Operations- 24/7 were immersed in discussions about upcoming technologies, providing them with insights into the ever-evolving landscape of their respective fields. Employability skills took center stage, by enhancing the practical knowledge and professional aptitude of attendees. The entrepreneurial spirit was also nurtured through interactive sessions that shed light on the intricacies of starting and sustaining businesses. The event was further enriched by alumni success stories, inspiring current students with real-world examples of achievement and growth. Overall, the alumni talk served as a dynamic platform, fostering learning, networking, and motivation for both past and present members of the institution.

Total 110 number of students have attended the event.

## Alumni

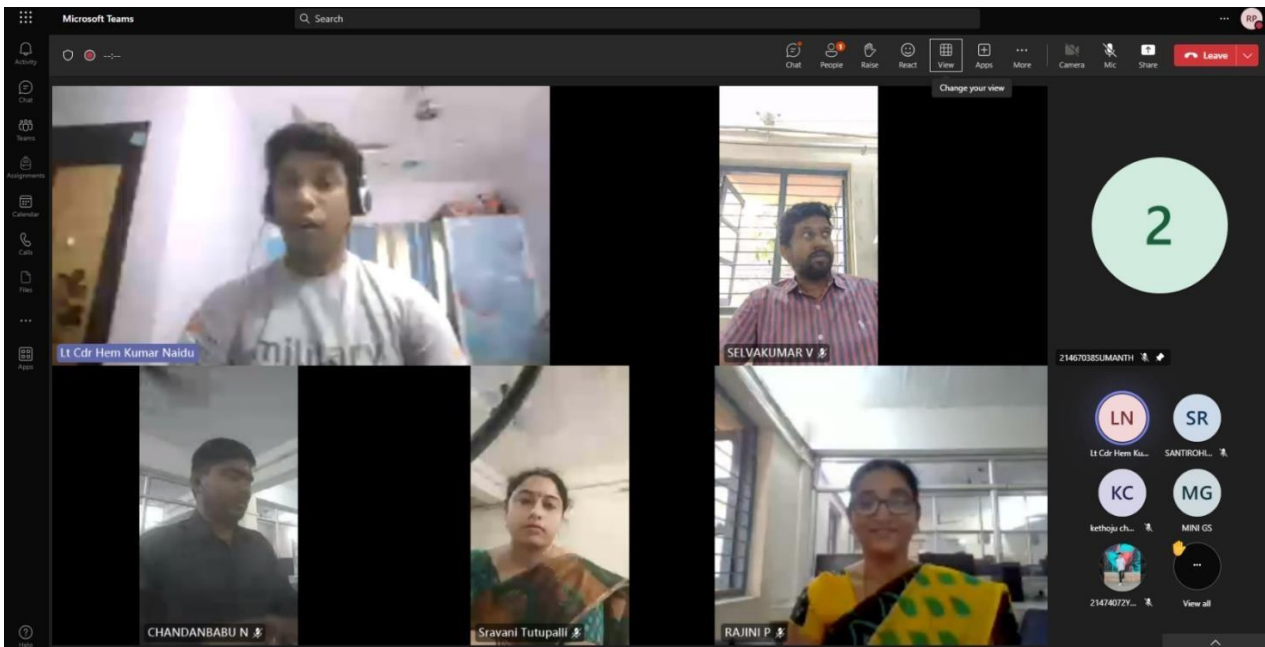
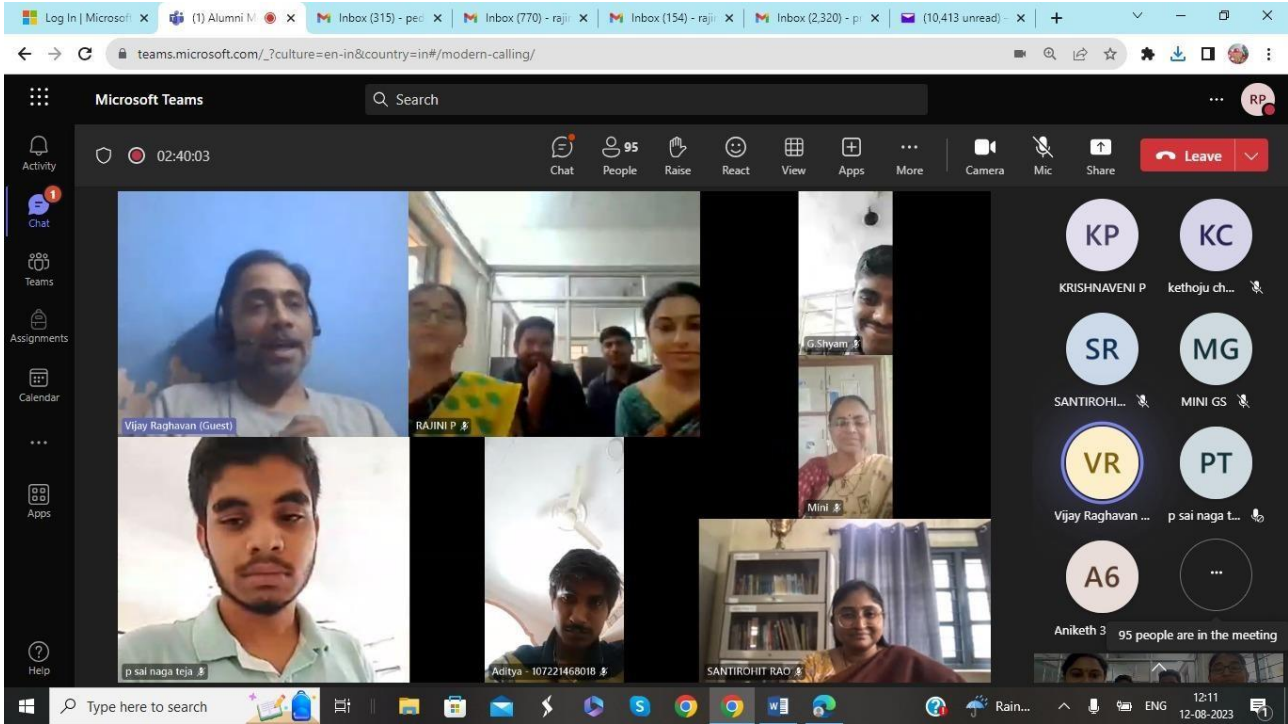


Lt. Cdr Hem Kumar Naidu,  
Sr. Manager SLP,Amazon



Mr. Vijay Raghavan M,  
Director Operations- 24/7

# Clicks during the event





## Basics of Statistics Using R

Value added course on R was organised by Department of Mathematics and Statistics under cluster college scheme from “15<sup>th</sup> February to 4<sup>th</sup> March 2023. This course was organised for students, research scholars of different colleges under twin cities. Total 47 students enrolled for this course.

Dr. N. Chandan Babu provided installation instructions for R, data frames, scalars, vectors, matrices, and lists in data frames. He also demonstrated how to use r-Types programming's of Operators, which include assignment operators, relational operators, logical operators, and arithmetic operators.

Dr. P. Rajini continued discussion of the subjects of probability distribution hypothesis testing and ANOVA which includes Binomial, Poisson, Exponential and Normal. For evaluating a hypothesis, large samples, small samples, Variances are included and ANOVA for one-way and two-way classification was also explained.

Dr. V. Selvakumar interpreted statistical techniques such as correlation, simple linear regression, multiple linear regression, and logistic regression , Autoregressive Model , Moving Average Model, Autoregressive Moving Average Model and ARIMA Model for forecasting the stock price exchange .

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**Value Added Course**  
under  
Cluster College Program  
organized by  
Department of Mathematics & Statistics

**Basics of Statistics Using R**  
15th February to 7th March, 2023  
from 6:30 pm to 8:30 pm

**COURSE DURATION : 30 HOURS**  
**FEES : RS 1000/-**  
**About the Course:**  
The value added course on Applications of R will help participants to understand the various concepts in R and also able to do a real-time project in Statistics. Participants will get hands on training on R.  
**Target group:** UG, PG Students, Research Scholars and Faculty members.  
**Registration Link** [Click here](#)  
**Note:** Certificate will be issued to all the participants who takes the test and qualifies at the end of the course.

**R Programming**

**RESOURCE PERSONS**

**Dr. V. SELVA KUMAR**  
Assistant Professor  
Department of Mathematics & Statistics

**Dr. PEDDI RAJINI**  
Assistant Professor  
Department of Mathematics & Statistics

**Dr. N. CHANDAN BABU**  
Assistant Professor  
Department of Mathematics & Statistics

**Platform Teams**

**Further Details Contact**

**Dr. V. SELVA KUMAR**  
Assistant Professor  
Department of Mathematics & Statistics  
9846118188

**Dr. K. Suvarechala Rani**  
Cluster College Coordinator  
9177554953

**Ms. G.S. Mini**  
Head, Dept. of Mathematics & Statistics  
9848822442

```
1 # data for one-way classification
2
3 v1 = c(10, 420, 101, 104, 103, 400)
4 v2 = c(37, 40, 37, 38, 39, 380)
5 v3 = c(33, 42, 33, 34, 35, 400)
6 v4 = c(34, 35, 34, 35, 36, 37)
7 v5 = c(36, 36, 34, 35, 36, 330)
8
9 control_data = data.frame(v1, v2, v3, v4, v5)
10 control_data
11
12 stored_data = paste(control_data)
13 stored_data
14
15 anova = anova(lm(v1 ~ stored_data))
16 summary(anova)
```

17

```
18 ## ANOVA
19
20 data = paste(control_data)
21
22 ## ANOVA
23
24 ## ANOVA
25
26 ## ANOVA
27
```

## ANOVA

Source	SS	Df	MS	F	Pr(>F)
Control_data	1.00e+05	4	2.50e+04	1.00e+01	0.000000e+00
Residuals	1.00e+05	20	5.00e+03		

## ANOVA

Source	SS	Df	MS	F	Pr(>F)
Control_data	1.00e+05	4	2.50e+04	1.00e+01	0.000000e+00
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Residuals	1.00e+05	20	5.00e+03		

### Poster Presentation on Role of Mathematics in Biological Sciences

As part of Bhavanotsav , under Asymptote a poster presentation was conducted by Mathematics and statistics department on “ **Role of Mathematics in Biological Sciences**” .

A total of 5 teams (i.e., 9 students ) participated in the event, out of which 1teams ( 1 participant) is from other colleges. The college is Keshav Memorial Institute of Commerce and Sciences. **Mrs.Y.Surya Vardhani** from Department of Mathematics, St.Francis College For Women,Begumpet,Secunderabad was the Judge of the event. Students participated with great zeal and enthusiasm.



	team	boys	girls	total
<b>BVC</b>	<b>4</b>	<b>2</b>	<b>6</b>	<b>8</b>
<b>Other college</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>1</b>
<b>Total</b>	<b>5</b>	<b>2</b>	<b>7</b>	<b>9</b>

## Antakshari in Mathematical terms

**Event: Antakshari Mathematics**

**Date: 09/02/2023**

**Time: 2:00 to 3:30pm**

**No. of Teams: 15 (28 participants)**

As part of Bhavanotsav , under Asymptote **Antakshari** was conducted by Mathematics and Statistics department .

A total of 29 teams (i.e., 57 students ) participated in the event, out of which 7 teams (14 participants) are from other colleges. The colleges are St.Anns College For Women, Keshav Memorial Institute of Commerce and Sciences. Mrs.Santi Rohit Rao has given brief introduction about the Antakshari. Ms. K . Chandana was the score board leader. A total of 6 rounds were conducted. Students participated with great zeal and enthusiasm.





## Data Analysis on Case Study Analysis

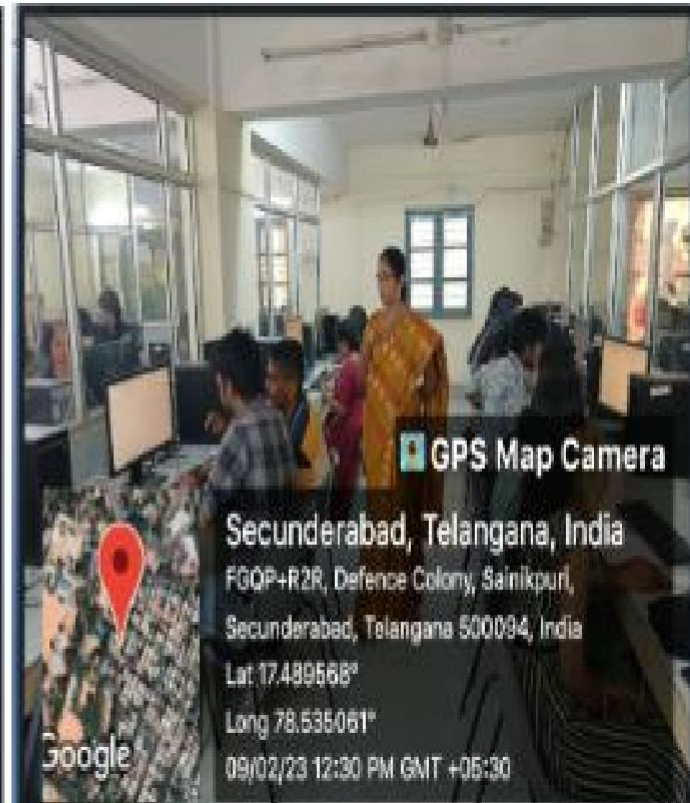
**Event: Data Analysis – Case study Analysis**

**Date: 09/02/2023**

**Time: 12:00 to 12:30pm**

**No. of Teams: 15 (28 participants)**

The Department of Mathematics and Statistics, BVC has organized an event named “Data Analysis” on occasion of “Bhavanotsav – 2023”. Dr. P. Rajini, In charge of the Event, has given a brief introduction about the Event. The event was about analyzing a given dataset using various statistical programming languages. “Hotel Reservation Dataset” was given to the participants for the analysis and interpretation, participants analysed the data using Ms Excel, R-Programming, Python Programming. The event was judged by Dr. P.R.Venugopal Asst. Professor, Department of Commerce, BVC. The efforts of everyone were appreciable.





## PowerPoint Presentations on Statistics in Data Analytics

**Event: Power Point Presentation - Statistics in Data Analytics**

**Date: 09/02/2023**

**Time: 12:45 to 3:00pm**

**No. of Teams: 15 (28 participants)**

The Department of Mathematics and Statistics, BVC has organized an event named “Power Point Presentation – Statistics in Data Analytics ” on occasion of “Bhavanotsav – 2023”. Dr.N.Chandan Babu, In charge of the Event, has given a brief introduction about the Event. The event was about Presentation of (Statistics in Data Analytics), where students had given a Presentation on the topic. Judge had asked few questions to the students regarding the topic, many more. The event was judged by Ms.S.Jayashree, Assistant professor, Department of statistics, RBVRR women’s college, Narayanaguda. The efforts of everyone were appreciable.

Out of 15 teams, 3 teams are from KMIC and 1 team from LFJC took participation in the Event



## **Basics of MATLAB**

The Department of Mathematics and Statistics conducted the value added course during 2<sup>nd</sup> Jan 2023 to 31<sup>st</sup> Jan 2023. Dr. Sateesh Kumar Associate Professor in Mathematics from KL University, Vijayawada was resource person. 31 students have registered and successfully completed the course.

The resource gave a lectures on MATLAB and its applications in the present field of Science and Technology .

The first day of the session was all about introducing the software MATLAB for beginners. Few sessions was for the participants to learn the basics of MATLAB and predefined MATLAB functions. Handling of arrays, Interpolation, 2d and 3d Plotting techniques were also taught. Concepts of linear algebra, data analysis using curve fitting toolbox, solving ordinary differential equations and Optimization techniques were discussed.

The participants induced a driving force to familiar themselves regarding such Mathematical solvers and software. The certificates of participation and feedback were given at the end of the program. The participants expressed their gratitude towards knowledge gained and indicated a happy learning experience at the end of the Course.

No. of Female students 18

No. of Male students 13



## Final Quiz of the National level quiz in Mathematics

**Event:** Final Round of National Level Online Quiz in Mathematics

**Date:** 22-12-2022

**Organizing Department:** Mathematics and Statistics

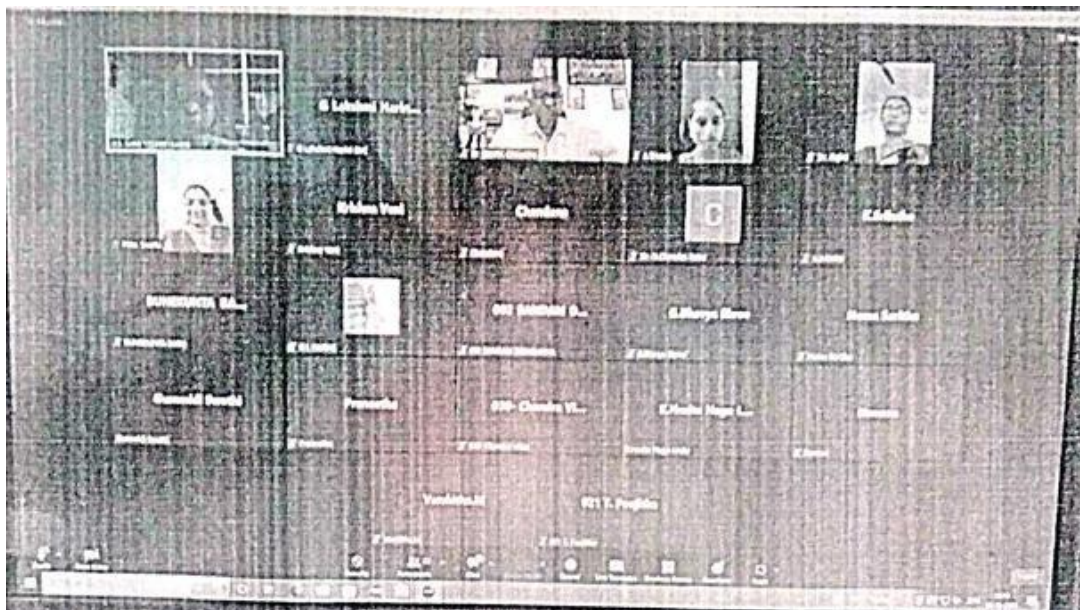
**Target Audience:** UG Students

**Total Participants:** 11

**Girls:** 8

**Boys:** 3

The Department of Mathematics and Statistics organized a final round of National Level Online Quiz in Mathematic for UG students on 22-12-2022 of the 11 participants 8 of them were girls and 3 boys. Chandra Vikas Thirpirishetty secured 2<sup>nd</sup> prize and Koppala Praneetha secured 1<sup>st</sup> prize. Certificates were sent to their registered mail-id





## Final Quiz for school students

Department of Mathematics and Statistics conducted the final round of Mega Quiz competition in Mathematics for School students on 17th December, 2022 in the college .Five government schools and one private school are participated.10 teams with two participants in each team participated. There were three-rounds including objective questions with options round, buzzer round and rapid-fire round which engaged the students for one hour.



### **Gnana Prajvalam(Outreach in college for school students) in Mathematics**

As part of the Outreach Program conducted by college on 17<sup>th</sup> December 2022 for students of various Schools, the department of Mathematics and Statistics presented a PPT/MODELS on topics Set Theory, Number Theory, Trigonometry, Lines, Data Handling, Circles and Matlab. Students of our college explained about these topics to the school students.



## National Level Online Quiz in Mathematics for UG students

**Event:** National Level Online Quiz in Mathematics for UG students

**Date:** 28-11-2022 to 03-12-2022

**Organizing Department:** Mathematics and Statistics

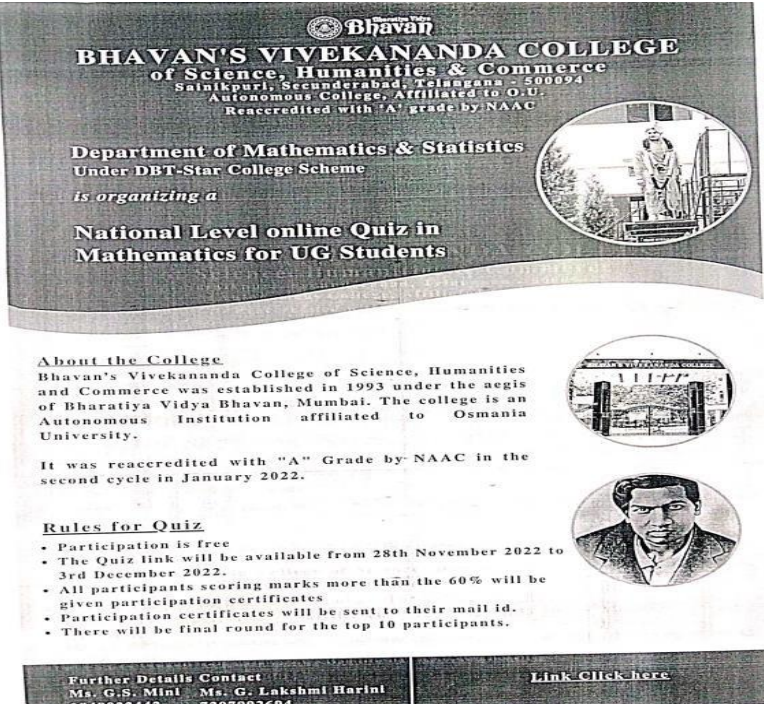
**Target Audience:** UG Students

**Total Participants:** 551

**Girls:** 398

**Boys:** 153

The Department of Mathematics and Statistics organized a National Level Online Quiz in Mathematics for UG Students from 28-11-2022 to 03-12-2022. Students from Telangana, Andhra Pradesh, Punjab, Odisha, Madhya Pradesh, Uttarpradesh and Bihar Participated in the Quiz. Of the 551 participants 398 of them were girls and 153 boys. 245 participants qualified In the Quiz by getting above 60% marks of which 176 participants secured distinction. Certificates were sent to their registered mail-Id.



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Department of Mathematics & Statistics  
Under DBT-Star College Scheme  
is organizing a  
**National Level online Quiz in  
Mathematics for UG Students**

**About the College**  
Bhavan's Vivekananda College of Science, Humanities and Commerce was established in 1993 under the aegis of Bharatiya Vidya Bhavan, Mumbai. The college is an Autonomous Institution affiliated to Osmania University.

It was reaccredited with "A" Grade by NAAC in the second cycle in January 2022.

**Rules for Quiz**

- Participation is free
- The Quiz link will be available from 28th November 2022 to 3rd December 2022.
- All participants scoring marks more than the 60% will be given participation certificates
- Participation certificates will be sent to their mail id.
- There will be final round for the top 10 participants.

Further Details Contact  
Ms. G.S. Mini Ms. G. Lakshmi Harini  
9848022442 7207992694

[Link Click here](#)



## Seminar on Unlocking a rewarding career in Data Science and Analytics

**Event: Seminar on Unlocking a rewarding career in Data Science and Analytics**

**Date: 11/10/2022**

**No. of Students Participated: 100**

The UNP seminar, held on 11th October 2022, started at 3:30 p.m. with the advent of the UNP team, Mr. Amarendra introducing the United Network of Professionals and its primary mission. With attractive presentation slides, Mr. Amar further explained the importance of Data Science in modern society and its applications in various fields.

Later Dr. Saptashri, who emphasized the importance of peer-to-peer learning. He explained to the data science students how to develop skills and expertise in data modeling and gain mastery through strong project experience in turning data into actionable business insights using advanced data science tools and techniques in Machine Learning. Mr. Abhishek Singh spoke about careers and opportunities for Data Science. Also, he explained about recruiters' expectations and how to prepare a resume. The platform was now open to questions from the audience.



**Value Added course**  
**Data Analytics with Tableau and R**

## UNP - United Network of Professionals

www.unp.education  
reachout@unp.education  
+91 75960 32269



**Department of Mathematics & Statistics,**  
**Bhavan's Vivekananda College of Science, Humanities & Commerce,**  
Sainikpuri, Secunderabad, Telangana - 500 094

### **Course: Data Analytics with R & Tableau**

**Course webpage:** <https://unp.education/data-analytics-with-tableau-r/>

**Description:** The key skills of a Data Analyst is to derive actionable insights from Data and be able to present them effectively to the stakeholders. The primary focus of the 'Data Analytics with R & Tableau' course is Project based learning where students will work on various Industry level Analytics projects and gain confidence in executing Data Analytics projects.

The course will be conducted over two schedules and will cover two most essential and industry relevant areas in the field of Data Analytics. Students will start with Predictive Analytics & Time Series Analysis with R-programming in November 2021. After the semester exams in February 2022, Students will unleash the power of Data Visualization, Descriptive Analytics, and Dashboarding with Tableau.

Each session will involve working on business case studies, examples, and assignments. Students will also work on and present 3 Capstone projects.

<b>Duration:</b>	30 hours [2 hours x 15 sessions]
<b>Dates:</b>	<b>Schedule I</b> (Session 1-10): Saturday, 27-Nov to Sat, 18-Dec 2021 <b>Schedule II</b> (Session 11-15): Thursday, 17-Feb to Sat, 26-Feb-2022
<b>Schedule:</b>	Tuesday, Thursday, Saturday 7-9 pm
<b>Pre-requisite:</b>	Basic hands-on programming experience in R

**At the end of the course:** Successful students will enhance their concepts in Statistics, R-programming, Tableau, and gain hands-on experience on relevant industry-related Analytics projects.

- ✓ They will be able to confidently apply the learnings to deliver Data Analytics assignments and projects.
- ✓ Be comfortable using Tableau and R, two widely used visual analytics and Statistical tools in the industry for data analytics projects.
- ✓ Be able to bridge the gap between 'college to corporate' and be job-ready. Showcase projects in their resume and confidently present during interviews.
- ✓ Publish their projects on GitHub and create their digital footprints.



## **CONTENT:**

### **Session 1 - 6: Predictive Analytics with R using ML Algorithms**

Session	Date	Content
1	27-Nov-21	Predictive Analytics – Introduction, Applications, Career Opportunities Data Handling, Preparation in R
2	30-Nov-21	Predictive Modelling Techniques: <b>Capstone Project – I Kickoff</b>
3	2-Dec-21	ML Algorithm for Predictive Analytics I - Linear & Logistic Regression
4	4-Dec-21	ML Algorithm for Predictive Analytics II - Decision Tree
5	7-Dec-21	ML Algorithm for Predictive Analytics III - Random Forest
6	9-Dec-21	<b>Capstone Project - I Presentation</b>

### **Session 7 - 10: Time-series Analysis with R**

Session	Date	Content
7	11-Dec-21	Time Series Analysis – Introduction, Applications, Techniques <b>Capstone Project - II Kickoff</b>
8	14-Dec-21	Time Series Analysis - Models (AR, MA, ARIMA)
9	16-Dec-21	Time Series Modeling using R
10	18-Dec-21	<b>Capstone Project - II Presentation</b>

### **Session 11 - 15: Data Handling, Visualization, Descriptive Analytics, Dashboarding with Tableau**

Session	Date	Content
11	17-Feb-22	Tableau Intro, Data Handling, Preparation <b>Capstone Project - III Kickoff</b>
12	19-Feb-22	Descriptive Analytics
13	22-Feb-22	Dashboarding & Reporting
14	24-Feb-22	Predictive Analytics using Tableau
15	26-Feb-22	<b>Capstone Project - III Presentation</b>

Resource Persons:

1. **Dr. Saptarshi Das, Ph.D.**

IIT- Bombay, Univ. of Vienna Energy & AI  
Industry leader, 11 Patents, 15+  
publications

**Data Science R & D Manager, Shell,**  
UNP Foundation Member



## 2. Amar Vajihala

Osmania University, IIT-Bombay, NYU Adjunct  
Instructor - New York University Co-founder,  
Workeave Tech,

**Ex-VP Nomura/Lehman Brothers  
UNP Founding Member / Director**

## 3. Vivek Kalyanarangan

**BTech, WBUT**

Data Science Leader, Financial Services  
Technical lead, IDfy

**UNP Founding Member**

## 4. Sayan Sen

**BTech, WBUT**

Data Science Leader, Financial Services  
AVP, HSBC Bank,

**UNP Founding Member**

## 5. Palash Pal

**Data Scientist**

3 Research Papers

**UNP Academic Program Manager**



Duration: 30 Hours

**Session 1: 27th November 2021 to 20th December 2021**

Session 2: 17th March 2022 to 26th March 2022

### Day 1:

**27<sup>th</sup> Nov, 2021**

The inaugural session of the UNP Data Analytics Course commenced on the platform of Zoom. The two hour session started at 7:00 p.m.

The first session started with an interaction about future goals and plans i.e., about professional careers and higher studies.

There were polls conducted at regular intervals highlighting the importance of analytics in the real world.

The session moved on to Mr.Amarendra, who gave a brief explanation about the UNP DA course and its outcomes.

This was followed by a Q and A session where students actively and enthusiastically interacted with the speakers and gained insights.

The programme transitioned to Mr.Saptarshi who briefed the attendees about R Programming language, its benefits and gave an overview of the R-Studio interface.

He also demonstrated the basic operations in R, i.e. assigning values to the variables, passing comments, printing vectors, matrixes, lists, and arrays and finding classes of data.

The session concluded with the feedback from attendees.

## **Day 2**

**30<sup>th</sup> Nov, 2021**

The session started with Mr.Amarendra, who gave a brief explanation about data science and analytics and their applications in the real world.

The programme transitioned to Mr.Saptarshi who briefed the attendees about predictive modelling, various regression models and a brief overview about neural network.

The session concluded with Mr.Palash sir explaining about the Capstone Group Project #1.

## **Day 3**

**2<sup>nd</sup> December, 2021**

The session started with Mr.Amarendra, who introduced the teams for capstone project and explained about it.

The programme continued with Mr.Vivek who displayed various functions and operations that can be performed on R-Studio.

The session concluded with Mr.Palash sir explaining about multiple datasets of the project and also briefed about the assignment for the students.

## **Day 5**

**7<sup>th</sup> December, 2021**

The session unfolded with a discussion about the concept of decision trees. The concept was explained in depth through examples and a case study where the respective data was classified into attributes accordingly. Many important definitions such as discussions about entropy were also held.

## **Day 6**

**9<sup>th</sup> December, 2021**

In this session of the UNP Data Analytics course conducted on Zoom, Mr. Amarendra asked the teams about their project's current status (Capstone Project). Many teams discussed about the problems they were facing while doing the project and their doubts were clarified during the session. The session lasted for a period of two hours

## **Day 7**

**11<sup>th</sup> December, 2021**

The day unfolded with teams presenting their projects and explaining them to everyone. All the lecturers judged their presentation and gave their valuable inputs to every team on how they can improve the efficiency of their mode; tell them about the mistakes they have committed and what else they could have done to make the overall presentation better. The judges were very impressed by the performance of the students and their team work considering this was the first time they were building models. Other participants were also given the opportunity to present their views on the performance of teams through a feedback form where they were asked to rate the performance of the teams. The session ended with all the lecturers addressing students on various topics and encouraging them to work hard and build their skills

## **Day 8**

**14<sup>th</sup> December, 2021**

The class was conducted in the evening, starting from 7 PM. The session was conducted on Zoom and lasted for three hours. It was the second day of group project presentations. The session began with group 4 presenting, followed by group 7 and 8. All the lecturers and instructors gave students valuable feedback to students on their presentations. Amar sir also spoke about how these groups learned from previous presentations and did a good job. After all the three groups completed presenting, a feedback form was shared in the chat which was filled by everyone present in the meeting. The audience was asked to rate every team's performance in the feedback form. Regular teaching resumed after this. At the end of the session, the students were asked to fill out their attendance forms.

**Day 9**  
**15<sup>th</sup> December**

The class was conducted in the evening, starting from 7 PM. The session was conducted on Zoom and lasted for three hours. The second Capstone Project was announced in this session. The instructors gave students details about the project. The students were informed that this project would be an individual project which they have to submit by 23<sup>rd</sup> December. There were 4 datasets:

1. Shampoo Sales Dataset
2. Min Daily Temperatures Dataset
3. 3-Monthly Sunspot Dataset
4. Daily Female Birth Dataset

Each student was assigned one dataset among the ones mentioned above.

**Day 10**  
**18<sup>th</sup> December**

The class was conducted in the evening, starting from 7 PM. The session was conducted on Zoom and lasted for three hours. The session began with discussions about the project assigned to students. Students asked their doubts and discussed any problem or challenge they were facing while doing their second project.

**Day 11**

17/03/2022

The meeting started at 7:10 PM and ended at 8:35 PM.

The number of students joined was 32.

The meeting started with the introduction of the new faculty Sovan Nayak. He gave a quick introduction about himself. The class started with descriptive analytics. They gave an introduction and explained the advantages of learning it.

They described about the top business intelligence software like Tableau and Power BI.

Installation and various features of Tableau were discussed. Then, a dataset was taken from excel and imported to Tableau. The dataset was explained and the various attributes and datatype of the attributes were discussed.

It was an interactive session in which students were asked to do tasks with them.

They started by explaining data filtering and using the calculation field. Students were given a small assignment and a time of 5 minutes to complete it.

After that, data visualization in Tableau was started using a data set. Various charts like bar charts, line charts, map charts, pie charts and scatter charts were discussed and various fields like labels, size, details and colors are shown.

**Day 12**

19/03/2022

The meeting started at 7:10 PM and ended at 9:00 PM.

The number of students joined was 20.

The Institute has provided the links to install the Power BI for the students. The class started with an introduction to the PowerBI user interface. They discussed the various options that students can use. The three types of views were told. Faculty Sovan sir then showed various



ways to get excel data into BI. They explored the data transformation using queries. The sort options datatype changing were discussed. The students were taught to apply relations between two datasets. Then they moved to data visualization. They explored the bar charts using a filter with priority, top n. The students were given an assignment to complete on bar chart in the class and the doubts were clarified. The DAX function LOOKUP was explained and students were given assignments. Then formatting of a given chart was explored. The visual format of x and y-axis, gridlines and data labels and in a general format including properties, effects, header icons and more were discussed. A quick introduction to Capstone Project 3 was given.

### **Day 13**

22/03/2022

The meeting started at 7:05 PM and ended at 9:00 PM.

The number of students joined was 25.

The class started with creating columns using custom columns in transform data. Then data visualization was explored using pie charts, tables, combo charts and cards. Conditional formatting for the values in tables was shown. The students were given a small assignment for 10 minutes and the solutions were provided. The next topic discussed was slicer and the various settings were shown. The sync slicer was shown to use same slicers for different pages. New measures creations using various functions such as sum, sumx, average and so on were shown. Various Dax functions related to dates were discussed. The sample dashboards that were already created were shown. Some tips were given to students to create their own dashboards.

Capstone project-3 details were shared with the students. The details related to teams and projects were given.

### **Day 14**

24/03/2022

The meeting started at 7:05 PM and ended at 9:00 PM.

The number of students joined was 18.

The class was started by the faculty Sovan Nayak of UNP with a new dataset in Power BI. He started by explaining the various text functions such as concatenate, left, right, upper, lower and so on. The logical functions were explored like if and or. "If" functions using various filters were shown. Create new tables using calculate table using various filters from the existing tables. Then students were given an assignment to do 4 activities. The various queries of the students were solved. The topic slicer settings was discussed

### **Day 15**

26/03/2022

The meet started at 7:05 PM and ended at 9:00 PM.

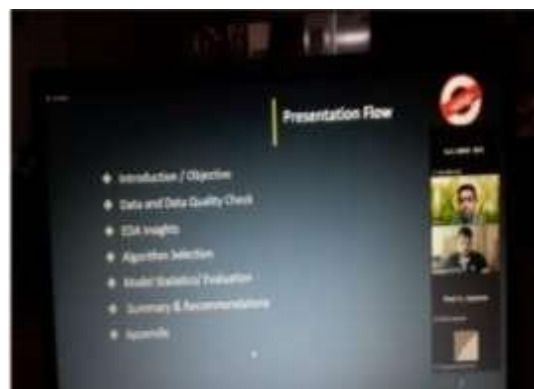
The number of students joined was 10.

The class was started by the UNP faculty Sovan Nayak in Power BI with advanced text functions. The advanced text functions to find and obtain certain characters were discussed. The students were taught how to get characters between two delimiters using transform data. The text functions such as mid and right using find functions. Students were given assignment and the doubts were solved by Sovan Nayak sir. The tips and tricks related to Power Bi were

explored. The Regression analysis was started as next topic. The scatter plot was shown and adding a trend line for a given plot was shown.

The various stages of a Power Bi project are discussed starting with how to ingest data, then client requirements and common queries was discussed. The final phases were shown such as how to publish data and what happens after that was explored.

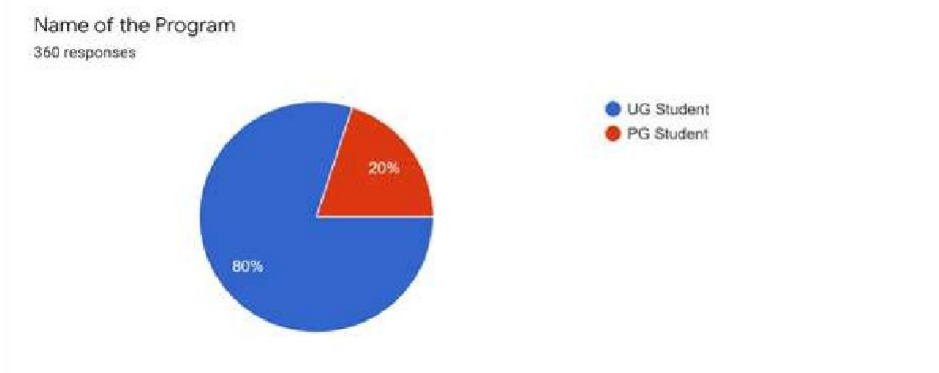
The Capstone project 3 reviews were started. Each group's progress was checked and all the doubts of the groups were cleared.



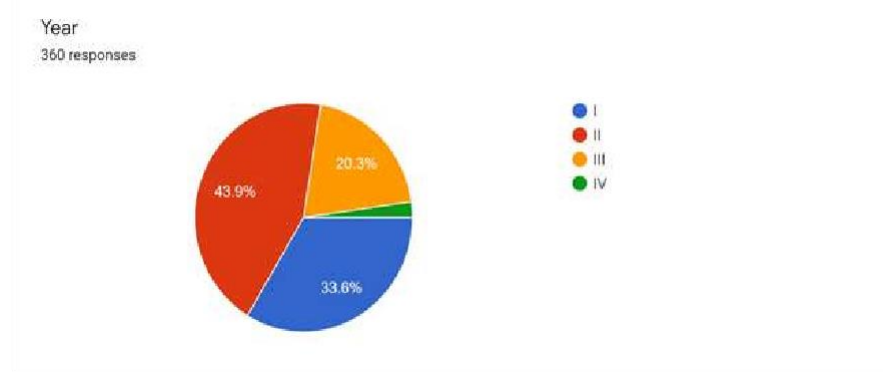
# E - Quiz on the Occasion of National Statistics Day

On the occasion of 15<sup>th</sup> National Statistics Day on 29/06/2021, the Department of Mathematics and Statistics, Under DBT-Star College Scheme, conducted an Online “E-Quiz in Statistics” to Commemorate the birth anniversary of Professor P.C.Mahalanobis, the father of Indian Statistics. This quiz was conducted for Undergraduate and Postgraduate Students in Statistics, Mathematical statistics, Data Analytics and Mathematics and Statistics from Basic/programming complementary level. Overall, 360 students participated from different states of India. Among them, 80% of the students were undergraduates from various disciplines and 20% were Postgraduate students. Participants who scored more than 60% marks were awarded E-certificate.

**Fig 1: Graduate participation in %**



**Fig 2: Year Wise Representation of Participation**



## Training on MATLAB March 29<sup>th</sup> – April 9<sup>th</sup> 2021

The department of Mathematics and Statistics conducted a 10 day Training on MATLAB.

Resource person details :1. Dr.Sanyasiraju VSS Yedida,Professor,  
Department of Mathematics ,IIT Madras, Chennai.

1.Dr.Sateesh Kumar Deevi, Associate Professor  
Dept. Of Mathematics ,KLUniversity, AP.

The topics discussed were Introduction to MATLAB, basic operations, plotting and different types of plotting, image processing, solving differential equations with given conditions,dot product, cross product of vectors, gradient, divergence,curl,integration, Linear algebra- solving linear systems of equations, Eigenvalues, Eigen vectors.

41 participants from all over the country participated.





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**10 day workshop cum training on Data Analytics using R for undergraduate students 23<sup>rd</sup> march - 3<sup>rd</sup> April 2021**

**Organized by** Department of Mathematics and Statistics, Bhavan's Vivekananda college of science, humanities and commerce, Sainikpuri, Sec-bad.

**Resource person:**Dr. R. Vishnu Vardhan, Assistant professor, department of statistics, Pondicherry central University, Pondicherry.

**No. of students applied:** 169,

**No. of students shortlisted:** 72 (Beneficiaries)

Aiming to provide an intense training on theory and practical aspects of statistical data analysis and interpretation using R Programming at undergraduate level for college students, a 10-day online workshop has been held from 23-03-2021 to 03-04-2021 by Bhavan's Vivekananda College, Sainikpuri, under DBT Star College Scheme. The Department of Mathematics and Statistics, to promote statistical data analysis, hosted the event, and the workshop was delivered by Dr. R. Vishnu vardhan , Assistant professor, department of statistics, Pondicherry central University, Pondicherry. The workshop has provided a practical hands-on session that helped the participants better understand the concepts. Overall, 169 students registered .Finally, 72 students were shortlisted for hands-on training workshop.

**DAY 1: INTRODUCTION TO R AND MATRIX OPERATION.**

On Day 1, the participants had to initially perform the installations required to practically implement the concepts being taught. The session started from the basics and went on to provide deep insight on the subject. It was a pretty interactive and informative session, which made the participants want to attend the further sessions.

**DAY 2: EXPLORATORY DATA ANALYSIS, DESCRIPTIVE STATISTICS**

On Day 2, the session started off with Exploratory Data Analysis using R, which was really interesting as it provided a visual insight on statistically analyzing the data. A lot of charts and graphs have been plotted and analyzed, not just as a subject matter but also in a very practical sense. The correlation concept has also been very keenly explained.

### DAY 3: DATA VISUALIZATION

On day 3, deep insight of graphs in R can be created easily, explained about plot commands .Explained about how to plot histogram, line chart, bar chart, box plot and scatter plot.

### DAY 4: PROBABILITY AND DISTRIBUTIONS

On day 4, had an explanation about basic probability distributions and how to make use of certain functions that can be useful to fit probability distributions. Explained about binomial, poisson, normal, exponential distributions. A lot of programs are written and explained about the various distributions.

### DAY 5 : TEST FOR NORMALITY AND HYPOTHESIS TESTING-I

On day 5, a pretty deep insight on the testing of hypotheses has been given using the R Programming. Many of the important tests such as the t-test(one and two samples), Z-test(one and two samples), F-test(one-way) have been used for hypothesis testing. Had an insight about parametric tests like one sample t-test, two sample t-test, analysis of variance, chi square test, paired sample t-test.

### DAY 6 : HYPOTHESIS TESTING-II

On day 6, Explained about One way analysis of variance, Two way analysis of variance using different examples and coding part was very interesting . And taught about the non parametric tests with examples.

### DAY 7 : REGRESSION MODELLING- SIMPLE AND MULTIPLE

On day 7, It started with R codes for simple linear regression and multiple linear regression and had a deep explanation about regression modeling with R code programming.

### DAY 8 : LINEAR PROGRAMMING PROBLEMS

On day 8, the session started with basics of linear programming which is basic mathematical modeling. Talked about some statisticians like Leonid Kantorovich who developed instrumental in developing linear programming ,George B Daunt zig who published simplex method solving linear programming problems. Had an explanation about the structure of LP programming.

### DAY 9: CLUSTER ANALYSIS AND LOGISTIC REGRESSION ANALYSIS

On day 9, introduced non-linear regression and performance analytic packages and presented a 3d representation of multiple linear regression. Explained all these with codes in R programming which was very useful and interesting.

### DAY 10: DIMENSIONALITY REDUCTION TECHNIQUES



On day 10, which was the last day of the workshop, we started off with a vote of thanks and gave an assignment to all students to be done in that session itself. It was a very informative session and was very useful.



# Day National Level Faculty Development

## programme Under DBT Star College Scheme

Online 5 Day National Level Faculty Development programme on MATLAB was conducted by Department of Mathematics and Statistics, Under DBT-Star College Scheme from 23 Feb 2021 to 27 Feb 2021 between 2:00 PM to 3:30 PM. This webinar was aimed at benefiting faculty.

The resource person Dr. Sateesh Kumar Deevi, Associate professor from KL Deemed to be University Vaddeswaram, Guntur, AP. The session plan followed for the five day FDP is given below:

Day1: 23-02-2021 Introduction to MATLAB & Basic Terminology with Examples

Day2: 24-02-2021 Roots and Solutions of Equations

Day3: 25-02-2021 Differential Calculus

Day4: 26-02-2021 Plotting 2D

Day5: 27-02-2021 Functions, loops and conditional operations.

Numerical analysis, Importing data.

Day-1(23-feb-2021):

Ms. Santi Rohit Rao, Assistant Professor, Department of Mathematics & Statistics started the meeting. Ms. G. S. Mini Officiating Head, Department of Mathematics & Statistics welcomed the Principal Prof. Y. Ashok and chief guest Dr. Sateesh Kumar Deevi, then Principal Prof. Y. Ashok addressed the gathering.

No. of participants: 55

Introduction to MATLAB & Basic Terminology with Examples

- MATLAB is a program for doing numerical computation. It was originally designed for solving linear algebra type problems using matrices. It's name is derived from MATrixLABoratory.
- MATLAB has since been expanded and now has built-in functions for solving problems requiring data analysis, signal processing, optimization, and several other types of scientific computations. It also contains functions for 2-D and 3-D graphics and animation.

Cleve Moler:

- The idea for MATLAB was based on his 1960s PhD thesis.
- Moler become a math professor at the University of New Mexico
- Started developing MATLAB's initial linear algebra programming 1967 with his one-time thesis advisor, George Forsythe. This was followed by Fortran code for linear

Equations in 1971:

- The first early version of MATLAB was completed in the late 1970 John N. Little and StreveBangert
- 1980 John Little and programmer StreveBangert re-programmed MATLAB in C.

- Created the MATLAB programming language.
- Developed features for toolboxes.
- 2016 including the MATLAB Live Editor notebook
- Present version of MATLAB 2020

MATLAB Headquarters:

Middlesex County, Massachusetts, United States, Near (16km) west of Boston. By 2018 the company had around 3,000 employees.

What are we interested in:

MATLAB

1. m-files: series of MATLAB commands
- a) functions: Input/Output
2. Command Line: Command execution like DOS Command window
3. mat-files: Data storage/loading

MATLAB:

MATLAB consists of 3 windows:

1. Command window
2. Editor window
3. Figure window

MATLAB symbols:

>> prompt  
 ... Continue statement on next line  
 , Separate statement on next line  
 % Start comment which ends at end of line  
 ; (1) Suppress output

(2) Used as a row separator in a matrix

: Specify range

MATLAB Special Variable:

ans Default variable name for results  
 pi Value of  $\pi$   
 eps Smallest incremental number  
 inf Infinity  
 NaN Not a number e.g. 0/0i  
 i and j  $i=j$ =square root of -1  
 realmin The smallest usable positive real number  
 realmax The large usable positive real number

MATLAB supports three logical operators.

~ % highest precedence  
 and & % equal precedence with or |  
 % equal precedence with and

Math & Assignment Operations:

Power  $^$  or  $.^$   $a^b$  or  $a.^b$  Multiplication

\*or  $.*$   $a*b$  or  $a.*b$  Division / or  $./$   $a/b$  or

$a./b$

Or  $\backslash$  or  $.\backslash$   $a\b$  or  $a.\b$  NOTE:

$56/8=8\backslash56$

MATLAB Matrices:

MATLAB treats all variables as matrices. For our purposes a matrix can be thought of an array, In fact, that is how it is stored.

Vectors are special forms of matrices and contain only one row OR one column.

Scalars are matrices with only one row AND one column

Day-2(24-feb-2021):

No. of participants: 48

Professor started day-2 by Quotation:

MATHEMATICS is not about numbers, equations, computations, or algorithms: it is about UNDERSTANDING. By William Paul Thurston.

TOPIC: Roots and Solutions of Equations:

- Solving System of equations.
- Rank, Echelon form, LU
- Decomposition.
- Roots of a polynomial.

Day-3(25-feb-2021):

No. of participants: 45

Professor started day-3 by Quotation:

Without mathematics, there's nothing you can do. Everything around you is mathematics. Everything around you is numbers.

TOPIC: Differential Calculus and Differential equations:

- Derivative
- Integrations
- Solving Differential Equations
- Differentiation-MATLAB

Mathematical Operator MATLAB Command

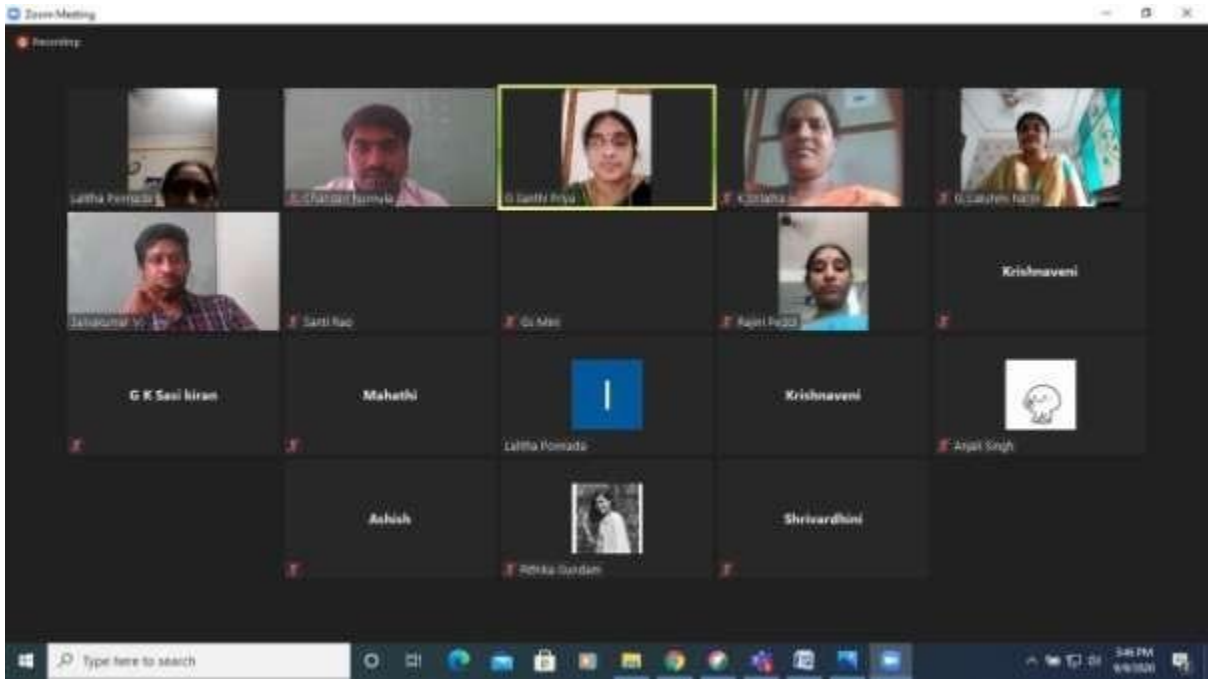
$df$

$diff(f)$  or  $diff(f, x)$

$da$   $Diff(f,$

a)





## **Outreach Program for school students**

An outreach program for high school students was organized for 2 days, on 22<sup>nd</sup> and 23<sup>rd</sup> Feb. 2021 by dept. of Mathematics and Statistics, Bhavan's Vivekananda College, Sainikpuri, Secunderabad, at MJPTBCWR School, Yakuthpura, Karwan, Hyderabad, located at Kompally. The main focus was to familiarize the students with few mathematical concepts and Geogebra software. A total of 200 students of IX standard and 140 students of X standard participated in this program.

The program started with a warm welcome organized by Mrs.Sarala Devi, Principal, MJPTBCWR School, and their team. Later Mrs.Sarala, retd. Principal, MJPTBCWR School, also joined the Program.

Under this program the faculty members Mrs.G.S.Mini, Mrs.P.Krishnaveni, Mrs.P.Rajini, Mrs. Santi Rohit Rao, Mr.N.Chandan Babu and Mrs.K.Srilatha, BVC, took the classes on the following topics: Triangles, Surface Area and Volume, Polynomials and Quadratic Equations, Pythagoras theorem, Probability, Geogebra/Trigonometry, Statistics and Tangents and Secants.

On Day 2, activities were conducted in which all the students of class IX actively participated. Students who won 1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup> positions and also the students who were responsive and interactive with the teachers during both the days were awarded prizes.

This Outreach was of great help to the students of the Govt. School in understanding mathematics through geogebra software.









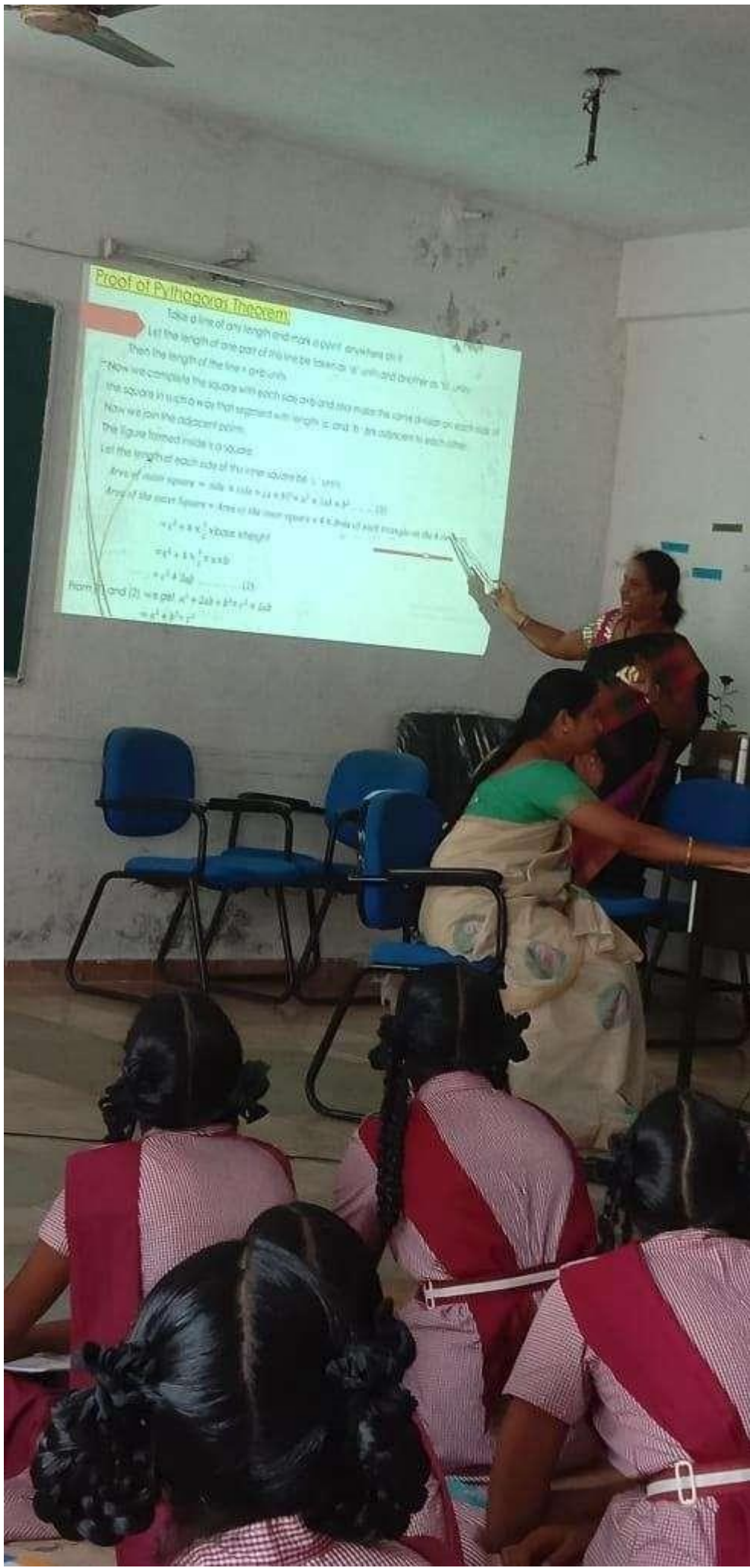












### Proof of Pythagorean Theorem

Take a line of any length and mark a point anywhere on it.  
Let the length of one part of this line be taken as 'a' unit and the other as 'b' unit.  
Then the length of the line = a + b units.  
Now we complete the square with each side 'a' and 'b' and also make the same division on each side of the square in such a way that adjacent sides are equal and they make the same division on each side.  
Now we join the adjacent points.  
The figure formed inside is a square.  
Let the length of each side of this inner square be 'c' units.  
Area of outer square = side × side = a × a + b × b = a<sup>2</sup> + b<sup>2</sup> ..... (1)  
Area of the inner square = Area of the inner square + 4 × Area of each triangle in the corner  
$$= c^2 + 4 \times \frac{1}{2} \times a \times b$$
$$= c^2 + 2a \times b$$
$$= c^2 + 2ab$$
 ..... (2)  
From (1) and (2) we get a<sup>2</sup> + b<sup>2</sup> = 2ab + c<sup>2</sup> + 2ab  
$$= c^2 + 4ab$$







## Outreach programme for college teachers

**No. of Lectures attended : 30 No. of colleges participated : 17**

The Department of Mathematics and Statistics at Bhavan's Vivekananda College of Science, Humanities and Commerce conducted an Outreach programme on „Data Analytics with R-Programming“ sponsored by DBT- Star College Scheme.

The Resource persons were Mr. K. Srikanth and Mrs. P. Rajini. This programme was attended by 30 Lecturers from 17 different colleges on 15 February. The programme was about Data Analytics, Statistical analysis, Quantitative methods and Computer based models to gain insight about business operations, make better decisions and analyze the future. There were three sessions, First session was about introduction to R and the other two sessions were carried out in the lab with hands-on experience.

The programme was concluded by Vote of thanks by the department of Mathematics and Statistics.

The following students actively helped in the conduct of the programme

SNO	ROLL NO	NAME OF THE STUDENT
1	107219467030	M. Deshik Datta
2	107219467032	N. Shreya
3	107219467006	D. Anil
4	107219467040	P. VineethKumar
5	107219467031	M. Gnyanadeep Sharma





## Outreach Programme for college teachers on Research Methodology and Statistical Analysis using spreadsheet

An Outreach Programme for college teachers on “Research Methodology and Statistical Analysis using spreadsheet” was conducted on 9<sup>th</sup> Feb 2021 which has two sessions, on the platform of Teams, for faculty of various colleges and Research scholars from different Universities.

**Session I:** The Resource person Mr. N. Chandan Babu, Assistant Professor, Department of Mathematics and Statistics, BVC delivered a lecture on Research methodology. He explained in detail about the difference between Project and Research. Then he suggested how to write objectives of the Research. Next he explained the difference between Research and Research Methodology, types of research, steps for writing a research article, and the process of Research.

**Session II:** The Resource person P. Rajini, Assistant Professor, Department of Mathematics and Statistics, BVC delivered a lecture on Statistical Analysis Using MS- Excel. She explained basic statistical concepts using secondary data which was downloaded from statistical data sets from Google search engine. The statistical concepts like Descriptive statistics, Correlation, Regression, Testing of hypothesis (parametric tests), and ANOVA were discussed.



## Training Programme on Linear Algebra-Usage of ICT Tools

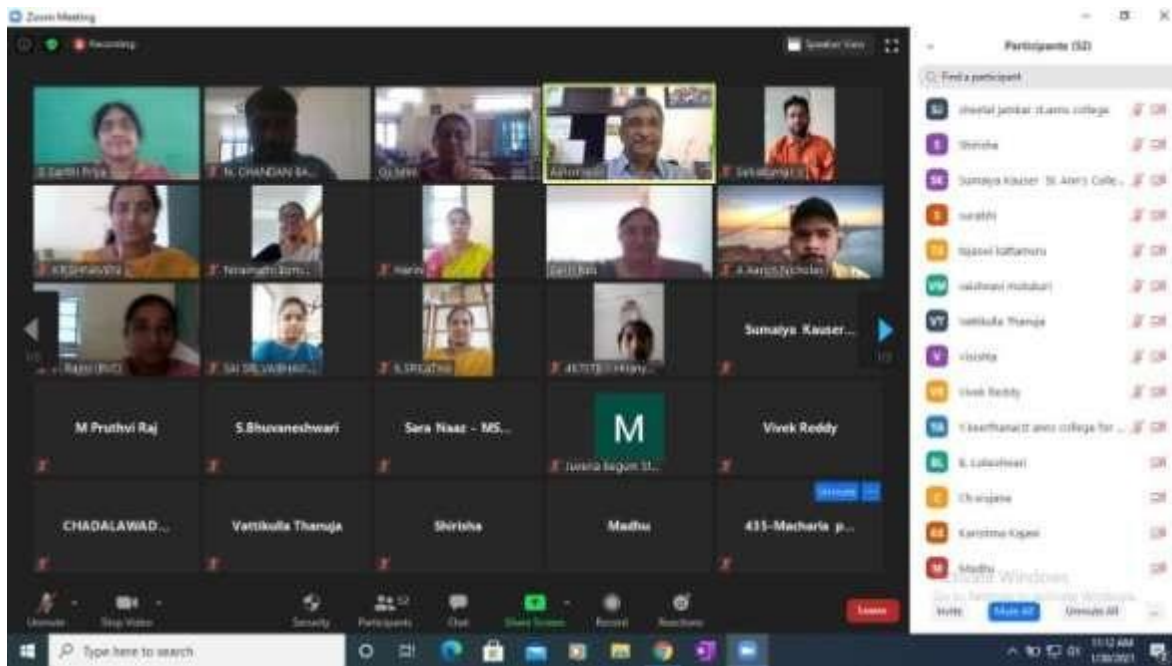
### Linear Algebra Toolkit

Department of Mathematics and Statistics Organised a Training programme on “Usage of Linear Algebra Toolkit” for undergraduate students on 30-01-2021 under DBT Star College scheme. Mrs G Santhi Priya, Assistant Professor, Bhavans’ Vivekananda College, was the resource person. Mrs Santhi Priya explained the importance of improvising the skills to learn using the online tools for Mathematics.

Most of the concepts of Linear Algebra for UG courses of BSc Physical sciences were briefly explained with examples. Different modules in Linear Algebra Toolkit: Row Operations, Echelon Forms, Solving System of Linear equations, Linearly Independent & Linearly dependent Sets, Basis, Null Space, finding kernel and range of Linear Transformations were explained with plenty of examples. It was also mentioned that usage of Online tools has to enhance the understanding of the concepts rather than just using it as a substitute.

Mrs. G S Mini, Officiating HOD Dept of Mathematics & Statistics, other faculty members of the department, 103 students of III year BSc Physical Sciences(MPCs,MSCs&MECs) from various colleges were present for the webinar.







**Purpose**

- Learning Mathematics
- Online learning
- Usage of online tools
- Enhancing perspectives of learning

Participants (15):

UJ	Ushata Jankar st. anns college	🔊	📹
U	Ushata	🔊	📹
SK	Somaya Kaveri St. Ann's Colle...	🔊	📹
S	Sarathi	🔊	📹
BJ	Bejant Bhatnagar	🔊	📹
VM	Vishwanath Motilal	🔊	📹
VT	Vishvika Thangaraj	🔊	📹
V	Vivanta	🔊	📹
VB	Vivika Reddy	🔊	📹
YA	Yashwanth Jankar college for ...	🔊	📹
BL	B. Subashini	🔊	📹
KA	Karishma Rajani	🔊	📹
M	Madhu	🔊	📹
SD	Sridha Desai	🔊	📹

**Purpose**

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U	Ushata	🔊	📹
SK	Somaya Kaveri St. Ann's Colle...	🔊	📹
S	Sarathi	🔊	📹
BJ	Bejant Bhatnagar	🔊	📹
VM	Vishwanath Motilal	🔊	📹
VT	Vishvika Thangaraj	🔊	📹
V	Vivanta	🔊	📹
VB	Vivika Reddy	🔊	📹
YA	Yashwanth Jankar college for ...	🔊	📹
BL	B. Subashini	🔊	📹
KA	Karishma Rajani	🔊	📹
M	Madhu	🔊	📹
SD	Sridha Desai	🔊	📹

## **4 day's workshop / Hands on Training on MATLAB**

Online 4 day's workshop / Hands on Training on MATLAB was conducted by Department of Mathematics and Statistics, Under DBT-Star College Scheme from 27 Jan 2021 to 30 Jan 2021 between 2:30 PM to 4:00 PM. This webinar was aimed at benefiting faculty. 15 faculty have attended this workshop.

The resource person was from Capricot Technologies, Hyderabad. The session plan followed for the four day training is given below:

### **Introduction to MATLAB**

MATLAB is a high-performance language for technical computing. It integrates computation, visualization, and programming in an easy-to-use environment where problems and solutions are expressed in familiar mathematical notation. Typical uses include:

- Math and computation
- Algorithm development
- Modeling, simulation, and prototyping
- Data analysis, exploration, and visualization
- Scientific and engineering graphics
- Application development, including Graphical User Interface building

MATLAB is an interactive system whose basic data element is an array that does not require dimensioning. This allows you to solve many technical computing problems, especially those with matrix and vector formulations, in a fraction of the time it would take to write a program in a scalar non-interactive language such as C or FORTRAN.

The name MATLAB stands for matrix laboratory. MATLAB was originally written to provide easy access to matrix software developed by the LINPACK and EISPACK projects, which together represent the state-of-the-art in software for matrix computation.

MATLAB has evolved over a period of years with input from many users. In university environments, it is the standard instructional tool for introductory and advanced courses in mathematics, engineering, and science. In industry, MATLAB is the tool of choice for high-productivity research, development, and analysis.

MATLAB features a family of application-specific solutions called toolboxes. Very important to most users of MATLAB, toolboxes allow you to learn and apply specialized technology. Toolboxes are comprehensive collections of MATLAB functions (M-files) that extend the MATLAB environment to solve particular classes of problems. Areas in which toolboxes are available include signal processing, control systems, neural networks, fuzzy logic, wavelets, simulation, and many others.

MATLAB is a fourth-generation programming language and numerical analysis environment. Uses for MATLAB include matrix calculations, developing and running algorithms, creating user interfaces (UI) and data visualization. The multi-paradigm numerical computing environment allows developers to interface with programs developed in different languages.

MATLAB is used by engineers and scientists in many fields such as image and signal processing, communications, control systems for industry, smart grid design, robotics as well as computational finance.

## **MATLAB System**

MATLAB system consists of five main parts:

### **MATLAB language**

This is a high-level matrix/array language with control flow statements, functions, data structures, input/output, and object-oriented programming features. It allows both "programming in the small" to rapidly create quick and dirty throw-away programs, and "programming in the large" to create complete large and complex application programs.

### **MATLAB working environment**

This is the set of tools and facilities that you work with as the MATLAB user or programmer. It includes facilities for managing the variables in your workspace and importing and exporting data. It also includes tools for developing, managing, debugging, and profiling M- files, MATLAB's applications.

### **Handle Graphics**

This is the MATLAB graphics system. It includes high-level commands for two-dimensional and three dimensional data visualization, image processing, animation, and presentation graphics. It also includes low-level commands that allow you to fully customize the appearance of graphics as well as to build complete Graphical User Interfaces on your MATLAB applications.

### **MATLAB Application Program Interface (API)**

This is a library that allows you to write C and Fortran programs that interact with MATLAB. It includes facilities for calling routines from MATLAB (dynamic linking), calling MATLAB as a computational engine, and for reading and writing MAT-files.

**27 Jan 2021**

## **Day-1**

- Introduction to MATLAB
- What is MATLAB?
- The dominance of MATLAB over other languages
- Power of Matrix computations
- The application of MATLAB in various fields of engineering MATLAB Environment
- Basic matlab commands
- Arithmetic Functions in MATLAB
- Matrices and Vectors
- Creating Matrices and Vectors
- Matrix Operation
- Array Operation

Link:

<https://capricottechnologies.webex.com/capricottechnologies/j.php?MTID=me3a91e19c6cce83d2e0f1e9b509237ff>

**28 Jan 2021**

**Day-2**

- Practice and revision on arithmetic, relational and logical operation
- Introduction to basic programming structure
- Introduction to Image Processing
- What is Image Data?
- Image Processing Toolbox
- How to Display Image
- Image Operations
- Introduction to Graphical User Interface
- Application and Demos

Link:

<https://capricottechnologies.webex.com/capricottechnologies/j.php?MTID=m9ce9be4684b7e36d14764faed5bbeefb>

**29 Jan 2021 and 30 Jan 2021**

**Day-3 and 4**

Simulink is a simulation and model-based design environment for dynamic and embedded systems, integrated with MATLAB. Simulink, also developed by MathWorks, is a data flow graphical programming language tool for modelling, simulating and analyzing multi-domain dynamic systems. It is basically a graphical block diagramming tool with customizable set of block libraries.

It allows you to incorporate MATLAB algorithms into models as well as export the simulation results into MATLAB for further analysis.

Simulink supports –

- System-level design
- Simulation
- Automatic code generation
- Testing and verification of embedded systems

There are several other add-on products provided by MathWorks and third-party hardware and software products that are available for use with Simulink.

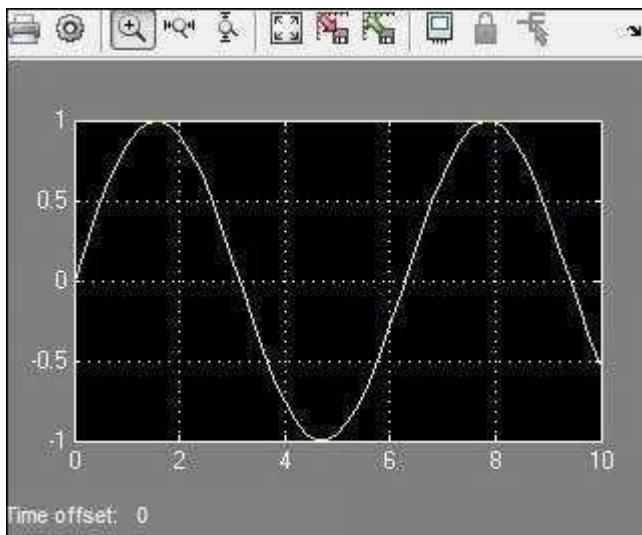
The following list gives brief description of some of them –

- **Stateflow** allows developing state machines and flow charts.

- Simulink Coder allows the generation of C source code for real-time implementation of systems automatically.
- xPC Target together with x86-based real-time systems provide an environment to simulate and test Simulink and Stateflow models in real-time on the physical system.
- Embedded Coder supports specific embedded targets.
- HDL Coder allows to automatically generate synthesizable VHDL and Verilog.
- SimEvents provides a library of graphical building blocks for modelling queuing systems.

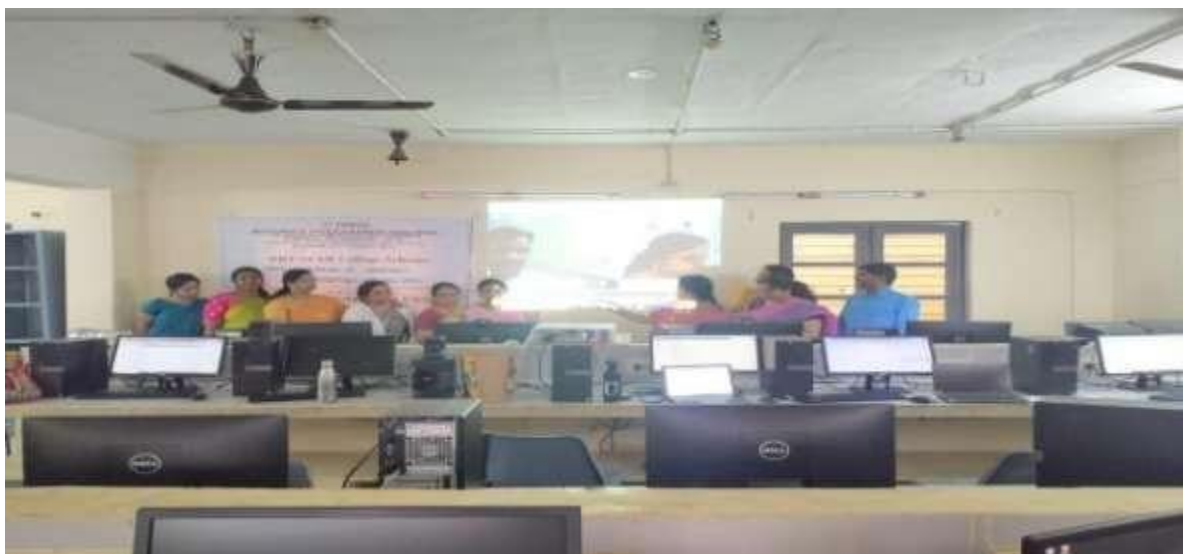
Simulink is capable of systematic verification and validation of models through modelling style checking, requirements traceability and model coverage analysis.

Simulink Design Verifier allows you to identify design errors and to generate test case scenarios for model checking.



Link:

<https://capricotttechnologies.webex.com/capricotttechnologies/j.php?MTID=m5ba2ce08fab5b7d940e4ebeaca37a9c9>







## “VectorCalculusanditsapplications”

A Webinar was conducted by the department of Mathematics and Statistics on 21<sup>st</sup> January, 2021, between 3 P.M. to 3:50 P.M. on the topic “Vector Calculus and its applications”. This was done in order to familiarise students with the meaning of Vector Calculus and its applications through real time examples.

The Webinar started by the Introduction of Dr N. Pothanna, Assistant Professor of the Department of Humanities and Sciences, in VNR Vignana Jyothi Institute, by Mrs GS Mini (HOD of Mathematics and Statistics) in the presence of other faculty members and students.

It was followed by the welcome address to students by Dr N. Pothanna. He further proceeded by introducing students to Vector Calculus. Dr N. Pothanna’s presentation started with a brief explanation on topics like The Greens Theorem, The Divergence Theorem, Line Integrals and Surface Integrals.

He let the students know more about the applications of Vector calculus in various vector fields. The students were asked to give their feedback on the webinar through filling a form.



APPLICATIONS OF VECTOR CALCULUS By Dr. POTANNA

18:50

Contents

- ▶ Vectors, Scalars
- ▶ Gradient and its Applications
- ▶ Divergence, Curl and its Applications
- ▶ Vector Integrals and its Applications
- ▶ Vector Integral Theorems and its Applications

potanna\_n@nrvjkt.org

15:00 23-09-2021

APPLICATIONS OF VECTOR CALCULUS By Dr. POTANNA

19:43

Vectors and Scalars

- ▶ Vector has both magnitude and direction but scalar has only magnitude
- ▶ ~~scalar has only~~
- ▶ We can find out as to how a football player should hit the ball to give a pass to another player of the team, when you watch a football match, by determining the direction and force, which are vectors.
- ▶ How airplane pilots receive instructions to land at airports. During a visual approach, the Air Traffic Control instructs pilots to fly a particular heading (direction) for a certain distance (magnitude). This is exactly what a vector quantity is: something that has a magnitude and direction.

## Application of First Order Differential Equations

A webinar was conducted by the Department of Mathematics and Statistics on 21st January, 2021, between 2 P.M. to 3 P.M. on the topic, "Application of First Order Differential Equations" in order to familiarise students with the real time applications of first order differential equations.

The Webinar started with the introduction of Dr.P.Aparna, Senior Assistant Professor of the Department of Humanities and Sciences, in VNR Vignana Jyothi Institute, by Mrs.G.Mini, the Head of the Mathematics and Statistics Department. It was followed by the welcome address by Mrs. Santi Rohit Rao, faculty of the Department of Mathematics.

The Webinar transitioned to the explanation and discussion of various topics related to first order differential equations by Dr.P.Aparna. Her presentation and talks started with the introduction of Orthogonal Trajectories, which was explained in detail along with examples.

This was followed by the explanation of Kirchhoff Laws, which is applicable in the use of circuit boards and general circuitry. This was continued with a brief about the usage and importance of differential equations in tumour growth and cancer studies. Newton's Law of Cooling was also explained, in terms of differential equations. The final topic was about the application of first order differential equations to determine the compound interest, which is widely used by banks.

The Webinar concluded with the vote of thanks given by Mrs. Santi Rohit Rao, after which the staff members collected the student's feedback on the webinar.

## AI-DataandInsights

This webinar was organised on 18-01-2021, to create awareness about the ML(Machine Learning)- Supervised and Unsupervised learning,role of AI(ArtificialIntelligence)-data and Insights in current technology.

Resource Person Mr Sreekanth Reddy Soudary, Senior Consulting Manager, Data Analytics, Wipro Limited.

Mr Sreekanth ReddySoudaryexplained the practical applications of data and statistics in day to day life and gave a good information on how data recorded and used for the purpose of analysis and gave examples on usage of data in flipkart like how flipkart is using data analytics and algorithm to help the burgeoning number of sellers get better insight into their business during the festive season. And also gave an example on airlines regarding route distance, altitudes, aircrafttype, weight, weatheretc.Andalso gave an examplein bookingof travel services such as Ola, Uber etc.

Also have a good explanation on ML (Machine Learning)- Supervisedlearning, Unsupervised learning and clear cut information on how supervised learning is the task of learning a function that maps an input to an output pairs and how unsupervised learning is a machine learning technique.

Briefed us about what actually AI(Artificial Intelligence) is all about and what are its most popular programming languages, and also explained about AI neural networks. How can AI be relateable to statistics and data, and also summarised the topic how one can explore the ocean of statistics in various sectors for analysing the data and organizing it in apt form.





### Applications of Linear Algebra

Department of Mathematics and Statistics Organised a webinar for undergraduate students on “Applications of Linear Algebra” on 18-01-2021, under DBT Star College scheme.

Dr. Saroj M Revankar, Associate Professor, Stanley College of Engineering & Technology, was the resource person. Dr. Saroj explained the graphical view of Linearly independent & Linearly dependent vectors. She explored the concepts such as product of vectors, multiplication of matrices with their geometrical interpretation.

The use of linear combinations in neural networks was explained with different examples. The significance of matrices as pixel matrices in Image processing was discussed in brief. Solving systems of linear equations as solutions for various problems in different fields was explained with examples. The process of coding and decoding, concepts of cipher text, using inverse of matrices was explained with examples. Overall the importance of Linear Algebra in various emerging fields like Artificial Intelligence, Data Science etc. was explained with good examples.

Mrs. G S Mini, Officiating HOD Dept of Mathematics & Statistics and other faculty members of the department, 67 students of III year BSc Physical Sciences (MPCs, MSCs & MECs) were present for the webinar.

# **ONLINE THREE-DAY NATIONAL WORKSHOP ON**

**“STATISTICAL THINKING THROUGH PYTHON”**

**FOR UNDERGRADUATE and POSTGRADUATE STUDENTS**

**Held during 16-19 January,2021**

**Organizedby : Department of Mathematics and Statistics, Bhavan’sVivekananda College of Science,  
Humanities and Commerce, Secunderabad**

**Resource Person: Kantam Srikanth**

**Data Consultant: Larsen & Toubro Infotech Limited (L & T)**

**No. of Students Applied: 147**

**No. of Students Shortlisted: 60 (beneficiaries)**

Aiming to provide an intense training on theory and practical aspects of statistical data analysis and interpretation using Python at undergraduate level for college and university students, a three-day online workshop has been held on the days 16<sup>th</sup>, 18<sup>th</sup> and 19<sup>th</sup> January, 2021 by Bhavan’s Vivekananda College, Sainikpuri, under DBT Star College Scheme. Department of Mathematics and Statistics, to promote statistical data analysis, hosted the event, and the workshop has been delivered by Kantam Srikanth, Data Consultant, Larsen & Toubro Infotech Limited. The workshop has provided a practical hands-on session that helped the participants better understand the concepts. Overall, 147 students registered from various states. Finally, 60 students are shortlisted for hands-on training workshops.

- **DAY 1 : INTRODUCTION TO PYTHON**

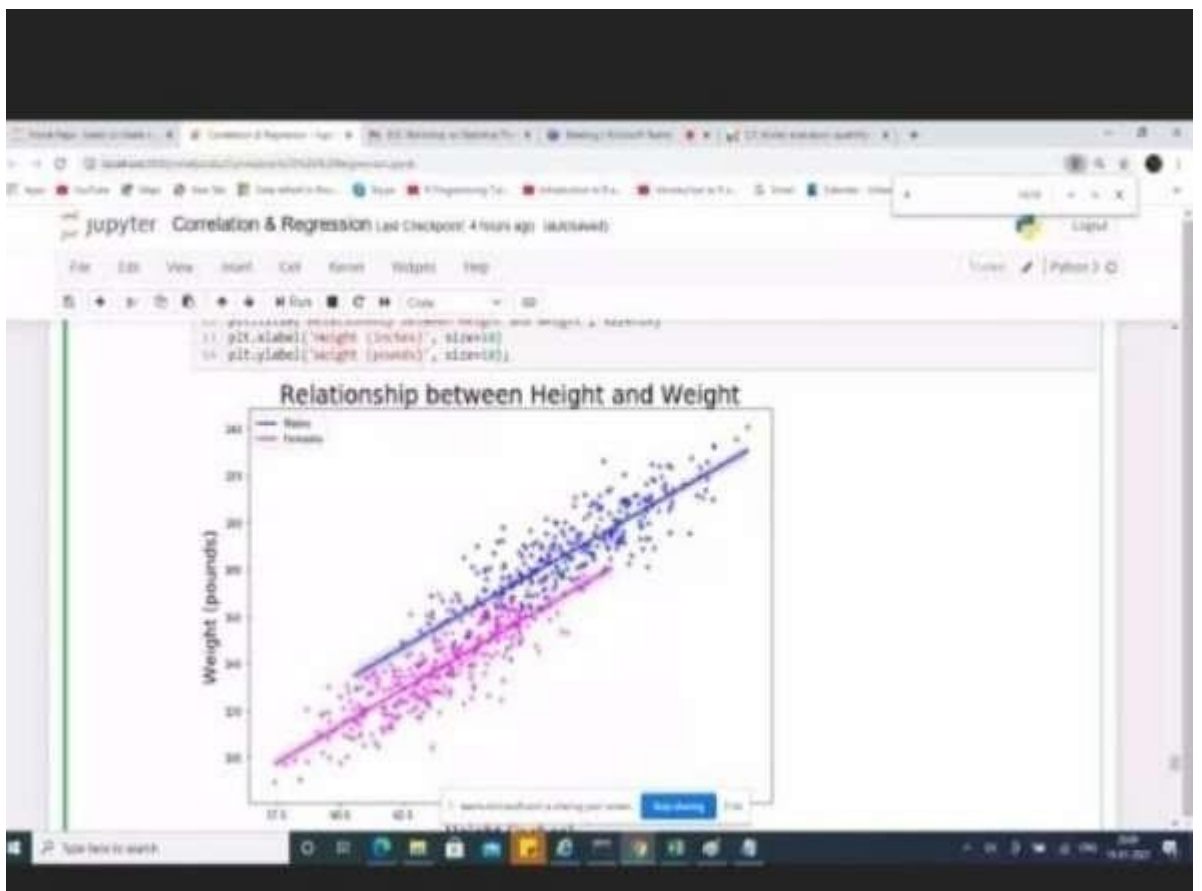
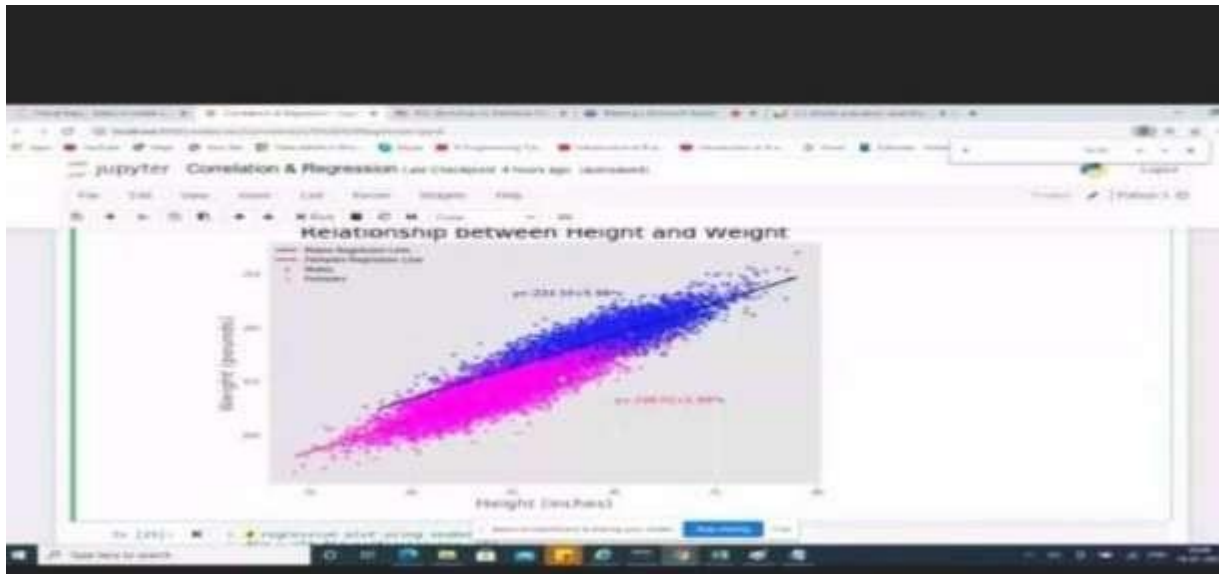
On Day 1, the participants had to initially perform the installations required to practically implement the concepts being taught. The session started from the basics and went on to provide deep insight on the subject. It was a pretty interactive and informative session, which made the participants want to attend the further sessions.

- **DAY 2: EXPLORATORY ANALYSIS WITH PYTHON**

On Day 2, the session started off with Exploratory Data Analysis using Python, which was really interesting as it provided a visual insight on statistically analyzing the data. Multiple important modules, including OS, NumPy, Pandas, Matplotlib, and Seaborn, have been imported and worked with. A lot of charts and graphs have been plotted and analysed, not just as a subject matter but also in a very practical sense. The correlation concept has also been very keenly explained.

- **DAY 3 : APPLICATION OF HYPOTHESIS TESTING USING PYTHON**

On day 3, which was the last of the sessions, a pretty deep insight on the testing of hypotheses was given using the python language. Many of the important tests such as the t-test(one and two samples), Z-test(one and two samples), F-test(one-way) have been used for hypothesis testing. The decision-making process in the hypothesis testing has been clearly taught and monitored by Prof. Srikanth, who has also given visual and practical reasoning for the same.



## Data Science–Role of Visualisation

A Webinar on „Data Science – Role of Visualisation“ was conducted on 12<sup>th</sup> January 2021, on the platform of Teams, for the students of Bhavan“s Vivekananda College.

The Guest, Mr Naveen Kumar, Principal Analyst, Juxt Smart Mandate, Medivia.io, started the webinar with the explanation of the word Visualisation. He further pontificated the importance of it in the designing process.

The session continued, with the explanation of Data Visualisation and how they are connected to Data Science. He briefly stated that communication of data in a visual manner, or turning raw data into insights that can be easily interpreted. Then he showed the importance of creating a portfolio in order to have a prosperous career in the field of data science.

The presentation was also fascinating as it explained the use of data visualisation in the form of images, diagrams or animations and how visualisation can put their message easily and make sure that the receiver understands it completely.

The next rhetorical question that Mr Naveen Kumar asked us was “Why is Data Visualisation?” Which was answered in the slide by stating that it is the practice of translating information into a visual context, such as a map, diagram or graph, to make data easily interpretable, enabling us to observe trends, patterns and outliers in large data sets. Moreover, he explained how data must be visualised in order for conclusions to be made.

The program concluded by Mr Naveen Kumar showing us further considerations of data visualisation which was a list of things one should check before finalising their data visualisation.



## DataScience-Trends and Applications

A Webinar on „Data Science–Trends and Applications“, was conducted on 12<sup>th</sup> January 2021, on the platform of Teams, for the students of Bhavan’s Vivekananda College.

The Guest, Mr.M.Venugopal Rao, Data Scientist & General Manager, Juxt Smart Mandate, Medivia.io, started the webinar with the explanation of the word Data Science. He moved on to describe the rising importance of data and that data has become a key and integral part of society.

The seminar continued, with the explanation of various new technologies and how they are connected to Big Data. Mr.M.Venugopal, soon explained the trends and facts of how data science is growing to be one of the most demanding jobs in the future.

The presentation was also fascinating as it explained the use of data, in various services like Amazon Go, Google Assistant and many of Mr.M.Venugopal’s own endeavours.

The program proceeded, with explaining how one can get exposure, in the field of Data Science, by participating in Kaggle Competitions, attending MeetUps, Reading Online Blogs, among many others. This was a very useful part of the session as it helped the students, by providing a way to approach the subject.

The program reached its final conclusion, where Mr. M. Venugopal emphasised the importance of statistics in the field of Data Science, and also that a knowledge of multiple subjects is required for understanding Data. He emphasised again, the overarching effects of demand and necessity of handling data in the growing world.





## **MATHEMATICS DAY 22ND DECEMBER 2020**

Our life is just like a sum of mathematics. No matter how tough it seems, in the end, it all simplifies and comes down as solved. Happy National Mathematics day. This year, we at Bhavans Vivekananda College organized a Math Day Event as a tribute to one of our humblest souls, Late Dr. Rao (HOD Department of Mathematics and Statistics) in addition to paying homage to India's best mathematician, Ramanujan, the man who knew infinity.

Online quiz competition and a virtual treasure hunt competition were conducted as this year's math day events with an overwhelming response received from students of different states and colleges.

The event began with a video message from-

who had been a mentor to our dearest departed soul, Dr. Rao. In his message, he emphasized on the virtue of Dr. Rao being an earnest learner and giving his best to every step that he took in the field of mathematics.

It was followed by a message from Dr. Uma Dixit, who happens to be an ex-colleague of Late Dr. Rao. She reminded us about some of Dr. Rao's most humble memories she had of working with him. She let us know that he was a man of few words and was a very down-to-earth and compassionate colleague.

This was followed by Mini ma'am's report on all the events and activities taken by the department of mathematics and statistics in this year. Prof. Y. Ashok, Principal, BVC additionally spoke on the eminent personality of Dr. Rao and urged the department to fill in his shoes and remember him, his dedication towards the department by organizing events at a national level.

Later, students presented their poems, posters and presentations related to maths. These presentations included everything from constants like  $\pi$  or  $e$  to application of integration and statistical methods used in a solid waste management paper. Topics like regression to mean method, IPL statistics analysis reminded us, yet again that maths is everywhere.

On a whole, the program instilled a sense of learning, growing yet was a somber affair because of the absence of our beloved person. We transcribed a sense of responsibility and hoped that we follow his footsteps to reach great heights for our department.

## Envelope and Evolute

The faculty of Department of Mathematics and Statistics of Bhavan's Vivekananda College organized a webinar on "Envelope and Evolute" on 19 December, 2020 which was held from 2:30 PM to 3:30 PM. The webinar was conducted to have a brief glance on "Envelope and Evolute" under DBT-Star college Scheme.

The speaker of the session was Dr. V. Kiran, Assistant Professor in Osmania University.

The Welcome Address was delivered by G. S. Mini, and by prof Y. Ahsok, Principal, BVC.

### COURSE CONTENT:

The basic idea on envelopes were discussed in this session.

The speaker of the session "Dr. V. Kiran" has given a brief explanation on the definitions of envelope and evolute from Differential calculus

*Envelope, in mathematics*, a curve that is tangential to each one of a family of curves in a plane or, in three dimensions, a surface that is tangent to each one of a family of surfaces. For example, two parallel lines are the **envelope** of the family of circles of the same radius having centres on a straight line.

*Evolute*, a curve which is the locus of the centres of curvature of another curve.

He also explained the other topics like : Relation between envelope and evolute : That is **to** say that when the center **of** curvature **of** each point on a curve is drawn, the resultant shape will be the **evolute of** that curve. The **evolute of** a circle is therefore a single point at its center. Equivalently, an **evolute** is the **envelope of** the normals **to** a curve.

Observation of each and every problem which is discussed in the session. The first year students of B.Sc have this topic in semester 1. This webinar was attended by 97 Students.



KRISHNAVENI P started recording



Ashok Yaski (Guest)



LAKSHMIHARINI G



MINI GS



SELVAKUMAR V



SANTIROHIT RAO



Kiran



KRISHNAVENI P



# Curvature

The faculty of Department of Mathematics and Statistics of Bhavan's Vivekananda College organized a webinar on "Curvature" on 18 december, 2020 which was held from 2:30 PM to 3:30 PM. The webinar was conducted to have a brief rebound on "Curvature" under DBT- Star college Scheme.

The speaker of the session was Dr. V. Kiran, Assistant Professor in Osmania University.

The Welcome Address was delivered by G.S. Mini, and by prof Y. Ahsok, Principal, BVC **Course**

## **Content**

The basic ideas on Curvature were discussed in this Session.

The speaker Dr. V. Kiran has given a brief explanation on the definition of Curvature from Differential Calculus. He mentioned that an important property of a curve is its curvature. Curvature plays an important role in laying tracks, roads etc. Curvature of curve is a measure of rate of change of blindness. He explained about

6 Angle of Curvature.

Radius of Curvature.

Length of Curvature

- a. Cartesian Equation
- b. Parametric Equation
- c. Polar equation.

Centre of curvature.

Based on the above topics she explained Derivations and Problems.

The first year students of B. Schavethi topic in semester 1. This webinar was aimed at benefiting them. 142 Students have attended this webinar.



## BASICSOFMATLAB

22/7/2020

The Department of Mathematics and Statistics organized an online National Webinar on,,'**Basics of Matlab**' on 22/7/2020 from 10:00 am to 11:30 am under DBT Star scheme. Dr. P. Aparna, Asst. professor, VNRVJIET,Hyd. was the resource person. 532 students from Telangana, Andhra Pradesh, Tamil Nadu, Kerala and Rajasthan had participated and were provided with the online certificate also.The webinar provided the basic information on Applications of Matlab, Books on Matlab, Getting started with Matlab, using Matlab for plotting and visualization of 2D and 3D graphs.

The webinar started with the welcoming and introduction of the resource person followed by a slideshow of a ppt. prepared by our resource person. Students learnt that Matlab stands for Matrix Laboratory and is a software package used for high performance numerical computations and visualization. Under Applications of Matlab , students got to know that Matlab can be used for finding solutions of O.D.E's,P.D.E's,system of linear equations,

Curvetracing, Curvefitting, findingtherootsofpolynomials, operationsonmatriceslike addition, multiplication, rank, inverse of a matrix etc.

Thewebinar gaveabriefideaabout theprogramminginMatlabwhichwasveryenriching.



Zoom Meeting

MATLAB R2019a

HOME PLOTS APPS

File Edit View Command Window

Current Folder: C:\Program Files\MATLAB\R2019a\bin

```
>> x(3)
ans =
     6

>> x(2:4)
ans =
     2     5

>> x(1+2:5)
ans =
     2     6     9

>> x([2 4]2 -5:3)
ans =
     2     4     6
     2    -5     3
     9     7    -8
```

Workspace:

Name	Value
x	[1,2,3,4]
ans	[2,6,9]
b	[1,2,3,4]
c	[4,1,5;-4,6,4;1,1,1]
d	[1-18.678;-27.830;-75....
e	[13.714;1003.4;32...
f	[4.0000;-1.0000;2.000...
g	[1.0000;0.0000;1]
h	[1.462;-3.223;-8]

Type here to search

10:42 AM 7/22/2020

Zoom Meeting (Locked)

N CHANDAN SA. P JASRAJ S. Karamath Jyavani Rama. Kishwani (BVC) G Saithi Priya.

Ready

Mute Stop Video Security Participants Chat Share Screen Record Mute

11:25 AM 7/22/2020

A Brief report on Harnessing the power of Data Analytics Using Python for undergraduate students - 18th July, 2020.

Organized by Department of Mathematics and Statistics, Bhavan's Vivekananda college of science, humanities and commerce, Sainikpuri, Sec-bad.

Resource person: Mr. K. Raju – Sr. Data analyst, IBM, No. of

students participated: 255

The course content delivered in the webinar is as follows: The impact of recent technology in Data Science in the living environment was discussed in this session. The Speaker of the Session Mr. K. Raju spoke on "Introduction to Data Science". He discussed the basic concepts used in the technology relating with best suitable real life examples which are essential for the understanding of technology. He projected a clear understanding of the importance of intelligent robots and future problems in the real world. He inspired the audience by lively interacting on topics such as new trends in applying Data-driven, Machine Learning approaches for business decisions and incorporation of Artificial Intelligence, Big Data, and Machine Learning applications. He discussed about analyzing structured and unstructured data using different tools and techniques, developing an understanding of descriptive and predictive Analytics, building models for day-to-day applicability, forecasting to take proactive business decisions, using data concepts to represent data for easy understanding. He emphasized on Business Analytics career opportunities in India and global market and gaining practical mastery over applications of machine learning through a hands-on project using Python. He projected on comprehending the theoretical concepts and relating to the practical aspects of Artificial Intelligence. He insisted on modeling algorithms for deep learning, clustering, and recommendation systems. Also the feedback about the session was collected from all the participants to improve the sessions that will be conducted in future.



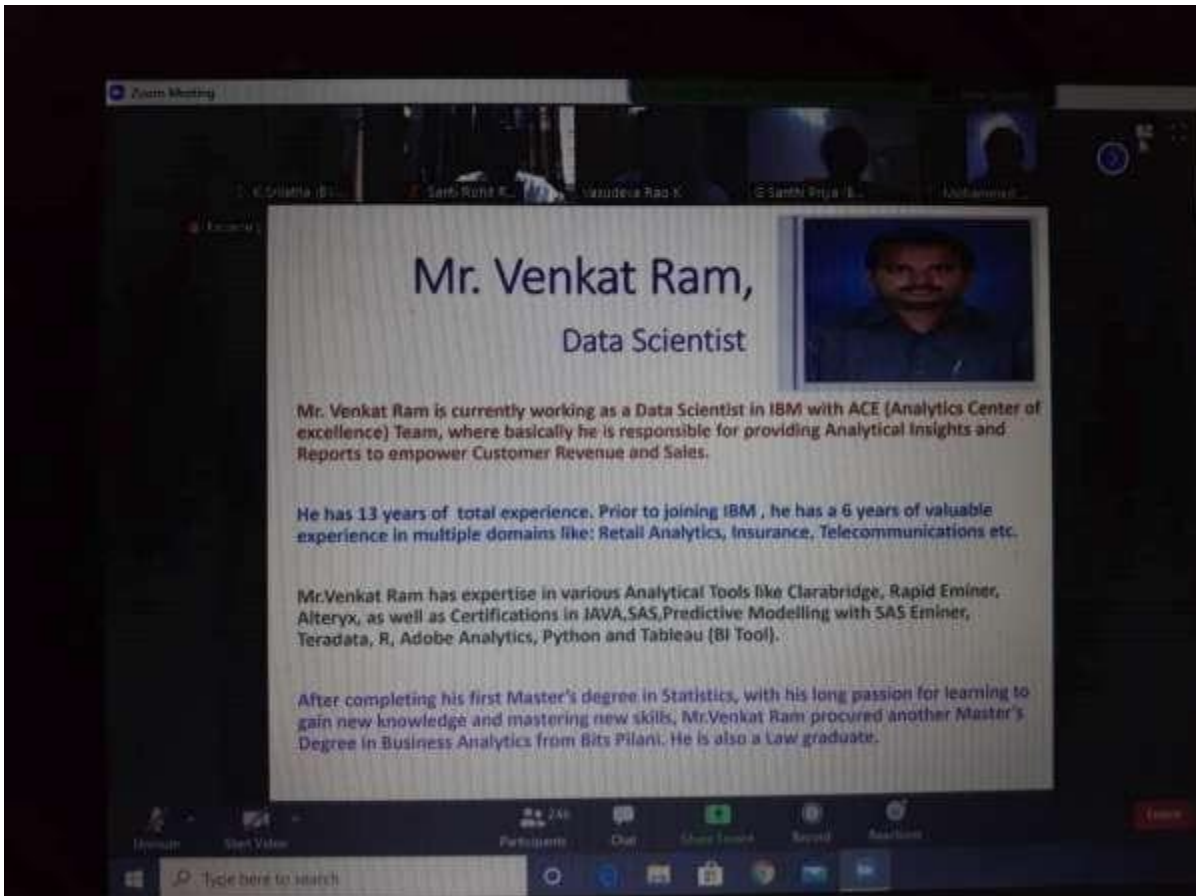


## PowerofDataAnalyticsUsingPython

This webinar was organised on PowerofDataAnalyticsUsingPython on 23-05-2020, for the faculty members from various colleges.

The resource person Mr Venkat Ram, Data Analyst, IBM, Hyderabad.

Mr Venkat Ram explained the practical applications of data, Data Science and statistics in day to day life and provided good information about data recording for the purpose of analysis and gave real life examples. Through the example he explained about: Data Analytics, Data Science, turn data into data products, Types of Analytics, life cycle of Data Science / Data Analytics, Skill sets required for Data Analytics, applications Python, features and applications of Python, objects & basic packages of Python, descriptive Statistics in Python, practical examples using Python.



The image is a screenshot of a Zoom meeting. At the top, there are several small video thumbnails of participants. The main focus is a slide titled "Mr. Venkat Ram, Data Scientist" with a portrait of Mr. Venkat Ram. The slide contains the following text:

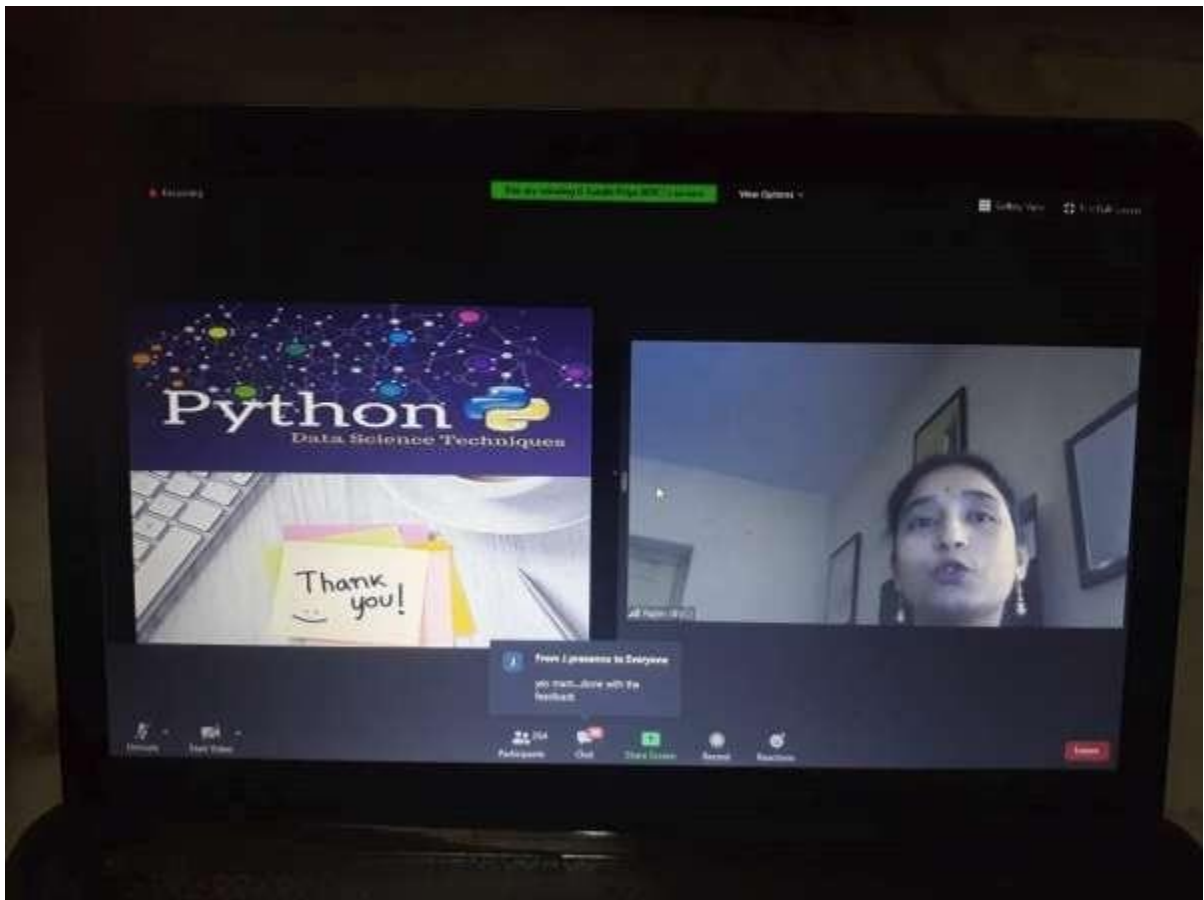
Mr. Venkat Ram is currently working as a Data Scientist in IBM with ACE (Analytics Center of excellence) Team, where basically he is responsible for providing Analytical Insights and Reports to empower Customer Revenue and Sales.

He has 13 years of total experience. Prior to joining IBM, he has a 6 years of valuable experience in multiple domains like: Retail Analytics, Insurance, Telecommunications etc.

Mr. Venkat Ram has expertise in various Analytical Tools like Clarabridge, Rapid Eminer, Alteryx, as well as Certifications in JAVA, SAS, Predictive Modelling with SAS Eminer, Teradata, R, Adobe Analytics, Python and Tableau (BI Tool).

After completing his first Master's degree in Statistics, with his long passion for learning to gain new knowledge and mastering new skills, Mr. Venkat Ram procured another Master's Degree in Business Analytics from BITS Pilani. He is also a Law graduate.

The Zoom interface at the bottom shows a search bar with the text "Type here to search" and various icons for meeting controls like Mute, Stop Video, Participants, Chat, Share Screen, Record, and Reactions.



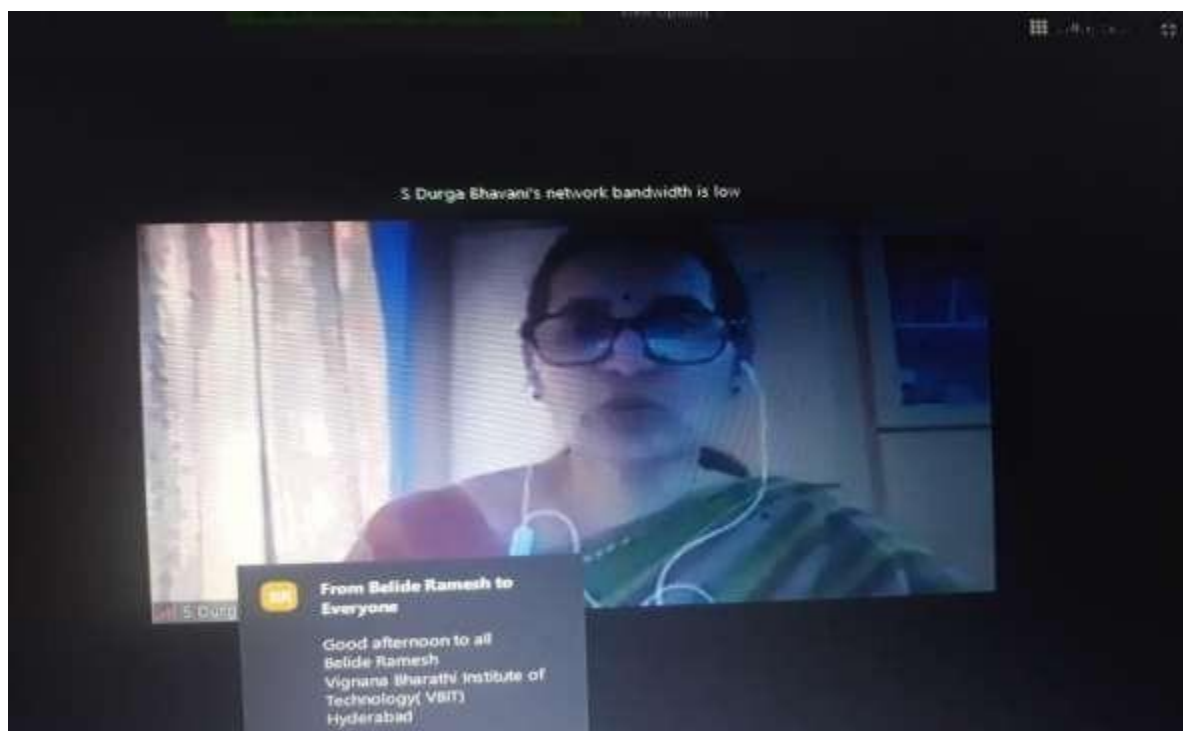
## Webinar on Applications of Linear Algebra in Computer Science

The Department of Mathematics and Statistics conducted the webinar on “Applications of Linear Algebra in Computer Science” on 23<sup>rd</sup> May 2020, under DBT Star College scheme for teaching faculties. Prof. S Durga Bhavani, Associate Professor, University of Hyderabad, was the resource person.

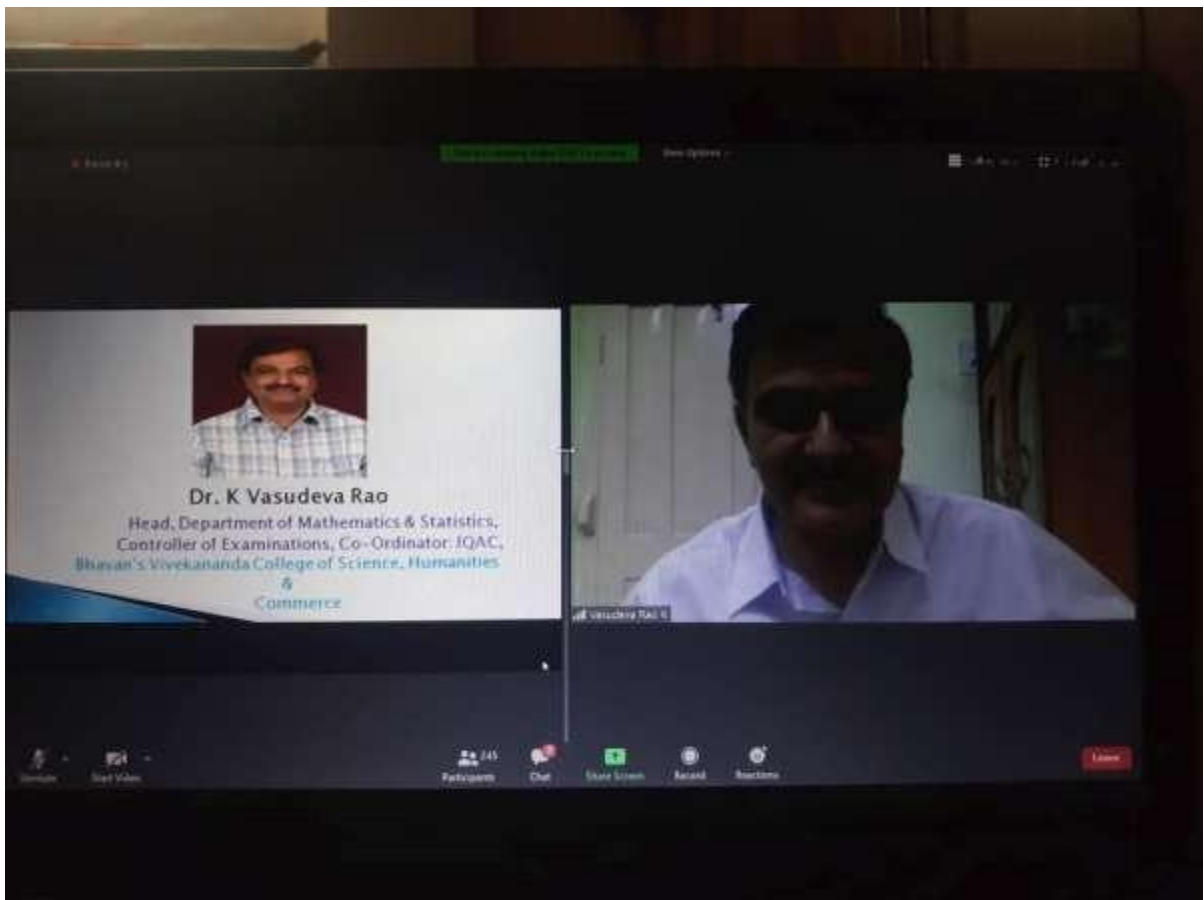
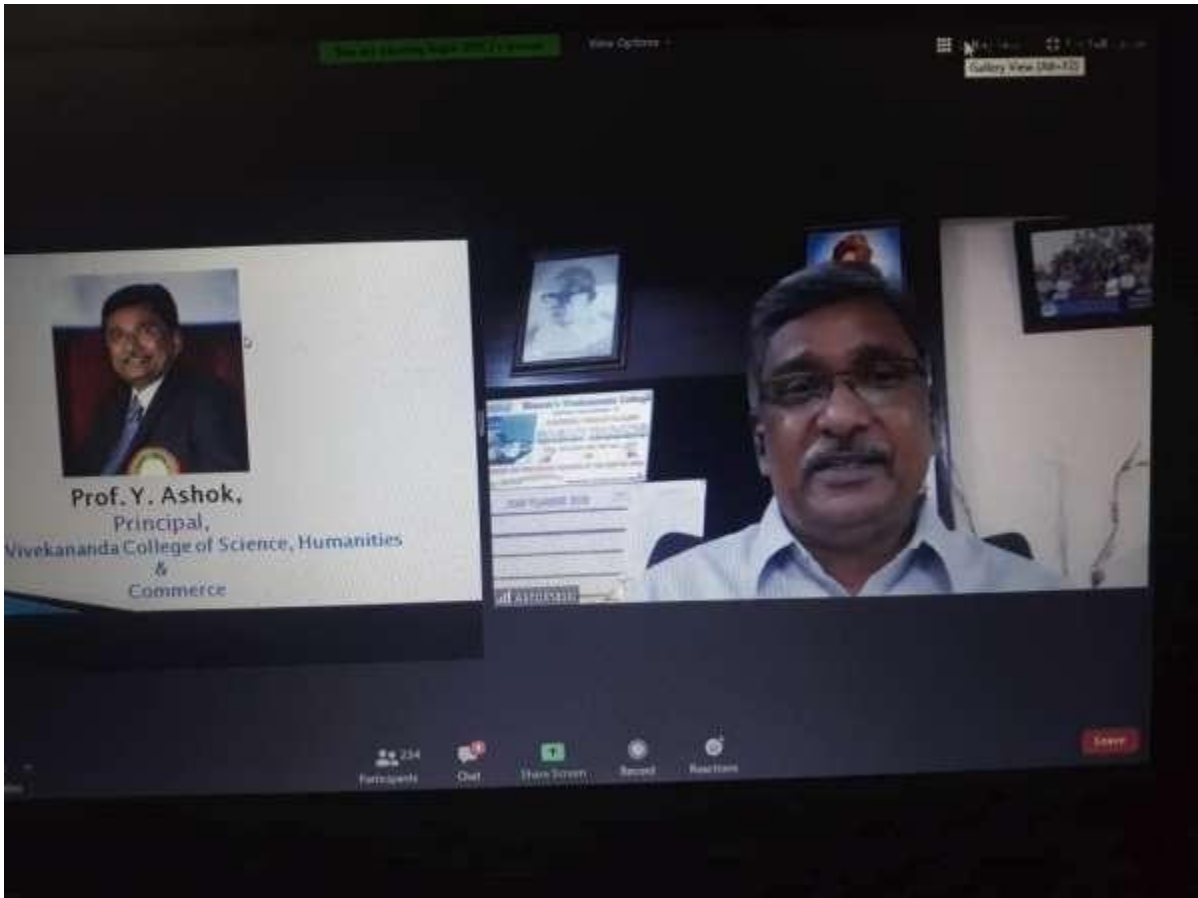
The speaker of the session explained how Linear Algebra is applied to Graph Theory, Image processing, Computer games, Optimization, Web Search, Cryptography and Coding with examples in brief.

Prof. S Durga Bhavani Mam also gave many applications of Linear Algebra in Computer Science like from simple circuit solving to large web engine algorithms, and how linear algebra is used in generation and formation of computer coding schemes.

And many more examples were explained briefly. 304 Participants attended from various institutions.







Security LIVE STREAMING FROM A COMPUTER View Options Microphone: On Video: Off Settings


### Profile

Prof. S. Sujata Sharda has done her Ph.D. in Mathematics from University of Hyderabad. She joined as a lecturer and is currently a Professor at the School of Computer and Information Sciences in the University of Hyderabad.

She has nearly 20 years of Teaching and Research experience and has guided several M.Tech students and 4 Ph.D. students. She has a personal interest in pedagogy. Her areas of research interest are Algorithms, Social and Statistical Network Analysis, Fractals and Chaos Theory and IT for society.

She has worked on three funded projects in Network Science under University of Hyderabad.

She worked on Cryptographic projects with ISRL, Hyderabad.



Prof. S. Sujata Sharda

From S. Sujata Sharda to Everyone

Good afternoon

Participants: 2/11

Chat

Share Screen

Raise Hand

Reactions

Leave

## Guest Lecture on Applications of statistics in various domains and Advanced Experimental Designs

Date of the event: 11/01/2020

A wonderful seminar was given by Dr. Ravi Kumar Dasari, Statistical Specialist, Novartis, Hyderabad, on Data Science and Pharma Industry who works in Novartis Hyderabad. Sir has given a brief introduction about Statistics and application of statistics in various domains. He also explained about Advanced Experimental Designs. Students had a very interactive session with Ravi Kumar. He gave a clear lecture on Pharma Industry with a case study, which was very helpful for the students.



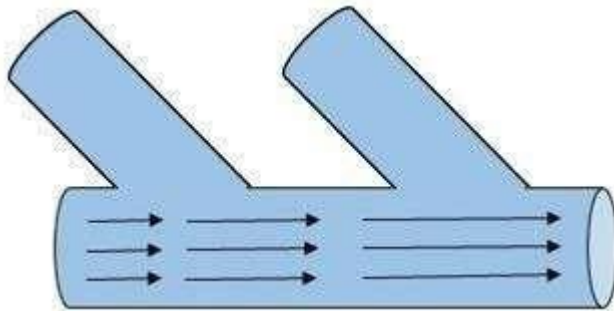
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## GUESTLECTURE On Vectors and its applications

Dr. Aparna, Sr. Assistant professor in VNRVJIEET gave a talk on „vectors and its applications“. The talk was for students of B.Sc III year on December 10<sup>th</sup> 2019 in Room No. 71. The students had a paper on Vector Calculus in their sem 5. This talk was on the applications. The speaker gave an insight into the physical interpretations of different concepts of which the students learnt only the mathematical aspects. In the fifth semester students had various concepts like gradient, divergence, curl, irrotational, solenoidal vector.

Divergence:

Consider water flowing through a large pipe. Now, it has smaller pipes joined to it. Hence, as the water flows, more water is added along the way by the smaller pipes. Hence, the mass flow rate increases as the water flows.



In another case, consider that there is a leakage in the pipe. Hence the mass flow rate decreases as it flows. **This change in the flow rate through the pipe, whether it increases or decreases, is called divergence.** Divergence denotes only the magnitude of change and so, it is a scalar quantity. It does not have a direction.

When the initial flow rate is less than the final flow rate, divergence is positive (divergence  $> 0$ ). If the two quantities are the same, divergence is zero. If the initial flow rate is greater than the final flow rate, divergence is negative (divergence  $< 0$ ).

Curl:

Imagine pouring water in a cup. The water won't just flow linearly but rather, as it reaches the end of the cup, it will flow in a rotational motion before settling in the cup. Or consider water draining down the sink, it will swirl in a rotational motion before going out. If we plot this rotational flow of water as vectors and measure it, it will denote the Curl.

**Curl is a measure of how much a vector field circulates or rotates about a given point.** When the flow is counter-clockwise, curl is considered to be positive and when it is clockwise, curl is negative. Sometimes, curl doesn't necessarily flow around a single time. It can also be any rotational or curled vector.

Learning about gradient, divergence and curl are important. They help us calculate the flow of liquids and correct the disadvantages. For example, curl can help us predict the vorticity, which is one of the causes of increased drag. By using curl, we can calculate how intense it is and reduce it effectively. Calculating divergence helps us understand the flow rate and correct it to suit our needs.

In vector calculus a solenoidal vector field (also known as an incompressible vector field, a divergence-free vector field, or a transverse vector field) is a **vector field**  $\mathbf{v}$  with divergence zero at all points in the field:



The speaker has given a clear picture of the physical interpretation in fluid dynamics. The concept of energy flow and heat transfer in a machine in a vehicle was explained clearly. The students were very happy with the content and relevance of the lecture.



# Outreach programme for high school teachers

No. of Teachers attended :47 No.  
of schools participated :30

Outreach programme for high school teachers was conducted by the Department of MATHEMATICS & STATISTICS on 27 July 2019 on the concepts of Geometry and basic Statistics. The Resource persons were Mrs. G. Santhi Priya, Mrs. P. Rajini and Mr. N. Chandan Babu. There was an overwhelming response by the teachers from twin cities . There were 47 teachers from 30 schools including private and government schools who attended the programme and participated in all the activities very actively.

The following students actively helped in the conduct of the programme.

SNO	ROLL NO	NAME OF THE STUDENT
1	107219467030	M. Deshik Datta
2	107219467032	N. Shreya
3	107219467006	D. Anil
4	107219467040	P. VineethKumar
5	107219467031	M. Gnyanadeep Sharma



## GUEST LECTURE IN MATHEMATICS On Introduction to MATLAB

A Guest Lecture on Introduction to MATLAB by Dr. Aparna Dode, Associate Professor in University college of Engineering on Introduction to MATLAB was conducted by department of Mathematics and Statistics on 12 July 2019. The speaker gave a lecture on MATLAB and its applications in the present field of Science and Technology. The lecture was organized only for the faculty of Physical Sciences.

MATLAB is a high-performance language for technical computing. It integrates computation, visualization, and programming in an easy-to-use environment where problems and solutions are expressed in familiar mathematical notation. Typical uses include:

- Math and computation
- Algorithm development
- Modeling, simulation, and prototyping
- Data analysis, exploration, and visualization
- Scientific and engineering graphics
- Application development, including Graphical User Interface building

MATLAB is an interactive system whose basic data element is an array that does not require dimensioning. This allows you to solve many technical computing problems, especially those with matrix and vector formulations, in a fraction of the time it would take to write a program in a scalar noninteractive language such as C or Fortran.

The name MATLAB stands for matrix laboratory. MATLAB was originally written to provide easy access to matrix software developed by the LINPACK and EISPACK projects, which together represent the state-of-the-art in software for matrix computation.

MATLAB has evolved over a period of years with input from many users. In university environments, it is the standard instructional tool for introductory and advanced courses in mathematics, engineering, and science. In industry, MATLAB is the tool of choice for high-productivity research, development, and analysis.

MATLAB features a family of application-specific solutions called toolboxes. Very important to most users of MATLAB, toolboxes allow you to learn and apply specialized technology. Toolboxes are comprehensive collections of MATLAB functions (M-files) that extend the MATLAB environment to solve particular classes of problems. Areas in which toolboxes are available include signal processing, control systems, neural networks, fuzzy logic, wavelets, simulation, and many others.

The MATLAB System

The MATLAB system consists of five main parts:

The MATLAB language.

This is a high-level matrix/array language with control flow statements, functions, data structures, input/output, and object-oriented programming features. It allows both "programming in the small" to rapidly create quick and dirty throw-away programs, and "programming in the large" to create complete large and complex application programs.

The MATLAB working environment:

This is the set of tools and facilities that you work with as the MATLAB user or programmer. It includes facilities for managing the variables in your workspace and importing and exporting data. It also includes tools for developing, managing, debugging, and

profiling M-files, MATLAB's applications.

#### HandleGraphics:

This is the MATLAB graphics system. It includes high-level commands for two-dimensional and three-dimensional data visualization, image processing, animation, and presentation graphics. It also includes low-level commands that allow you to fully customize the appearance of graphics as well as to build complete Graphical User Interfaces on your MATLAB applications.

#### TheMATLABmathematical functionlibrary:

This is a vast collection of computational algorithms ranging from elementary functions like sum, sine, cosine, and complex arithmetic, to more sophisticated functions like matrix inverse, matrix eigenvalues, Bessel functions, and fast Fourier transforms.

#### TheMATLABApplicationProgram Interface(API).

This is a library that allows you to write C and Fortran programs that interact with MATLAB. It includes facilities for calling routines from MATLAB (dynamic linking), calling MATLAB as a computational engine, and for reading and writing MAT-files.

This session was very informative and faculty were very keen to learn new techniques.



## Guest Lecture On DataSciences For a wonderful present and a brilliant future

The Department of Mathematics and Statistics has organized a guest lecture on 29<sup>th</sup> June 2019 on “Data Sciences- For a wonderful present and a brilliant future” by Prof. V. V. HaraGopal, department of mathematics, BITS Pilani, Hyderabad. Prof. V. V. HaraGopal briefed us about the importance of Data- Sciences, all the trends and applications of data sciences its uses to the world and the predictions we can make using it. Data Sciences is one of the most growing fields of today’s generation, his speech about the same is really helpful for the students who aspire to build a career in this field. Also he helped us understand the benefits of entering this field and encouraged us to actually opt for it.

On the occasion of National Statistics day the department of Mathematics and Statistics conducted a statistical Quiz and 23 teams participated in this quiz. Baba and Pooja from B.Sc (MSCs-III A) stood 1<sup>st</sup> in the quiz and were awarded the certificates by the guest and Dr. K. Vasudeva Rao, Head Department of Mathematics and Statistics also appreciated the prize winners and participants.

Dr. K. Vasudeva Rao addressed the students about the importance of statistics and various trends of new software related to statistics. Finally we concluded the program by vote of thanks.





## Guest Lecture on Active learning methods

A Guest Lecture by **Dr. Jayashree**, Associate Professor in VNRVJIET on Active learning methods was conducted by department of Mathematics and Statistics on 18<sup>th</sup> June 2019. The speaker stressed on the present day education system which not only needs curriculum knowledge but also students must be acquainted with more online courses. In today's competitive world it is important for students not only have good basics in their subjects but also have some extra skill set. To have some extra knowledge one of the best is online courses because a certificate is also present for proof. Different means of improving skill set was discussed. The different online sites like moocs, Nptel, mhrd etc., were discussed.

The present industry related topics like data analysis and its demand in the industry was discussed. Online courses help to get practical skills using the latest computer technology to enable them to solve real-world problems and prepare students for a career in a wider range of areas such as finance, investment, information technology, environmental management, health, marketing, logistics, defence, media, education and research.





### National Science Day

National Science Day was celebrated on 28 February 2019 . All the students of Physical Science actively participated in poster & micro presentations in all the subjects. 100 students in all participated in poster presentations in Mathematics and Statistics. Poster presentations in Mathematics were about the Mathematicians and their contributions in our syllabus and topic for statistics was real life applications of statistics. Judge for Mathematics is Mr. B. Mahendra from Sai Sudheer College and judge for Statistics is Mrs. S. Jayashree from RBVRR Women's college really appreciated the students participation and their effort put in.



## National Mathematics Day

Poster and Powerpoint presentation by students on Indian Mathematicians as a part of National Mathematics Day celebrated on account of Birth Anniversary on 22/12/2018. 35 students participated.





## **National Science Day**

The faculty of Physical and Life Sciences, Bhavan's Vivekananda College of Science, Humanities and Commerce, celebrated National Science Day on 27th February, 2018. The theme of this intercollegiate event was "Scientific issues for the development of the Nation". The Science Day began with an inaugural session presided over by Prof. Y Ashok, Principal, BVC, Vice Chairman, Air Comdr. (Retd) J. L. N. Sastry, VSM, faculty members and students of Physical and Life Sciences. Prof. Y Ashok appreciated the efforts of the various Departments of Sciences for their team work. Vice Chairman, Air Comdr. (Retd) J. L. N. Sastry, VSM, gave his blessings and discussed the importance of science in our daily life. The keynote speaker and the Chief Guest for the inaugural, Smt. G. Krishnaveni, Member Secretary (FAC), TSCOST, gave an insight into the objective of TSCOST which was propagating science in educational institutions at Mandal, District, State and National level. She emphasized the importance of living with science rather than celebrating science. The Guest of Honour Brig. P. Ganesham, VSM (Retd.), Founder President, Palle Srujana, while addressing the audience urged the need of using Gandhian Technology based on MLM- more from less for many, with a focus on grassroot innovations. The highlight of the event was a documentary on "Role of Science & Technology in developing 70 years of Independent India". Events conducted during the Science fair were live experiments, poster presentations, display of models and an essay competition in English. There was an enthusiastic response from students of colleges like St. Pious X Degree & P.G College for Women, Nacharam; University College for Women, Koti, St. Francis College for Women, Begumpet; Kasturba Gandhi Degree & P.G College for Women, Marredpally; Ideal Degree College for Women, Dilsukhnagar to name a few. A total of 390 students registered for various events in the Science fair, of which 68 were from other colleges and 322 were in-house participants. The number of students who participated in Essay writing was 53 and some of the current issues dealt with were Plastic roads, electricity theft, biodegradable packaging, printing organs for transplantation, air pollution, food fortification to combat malnutrition, detecting drunk people, microplastics, and solid waste management. 192 posters were presented by the students of which 107 were from life sciences, 64 from physical sciences and 21 were from computer sciences. A total of 136 models were displayed for the event including 90 live demonstrations. The National Science Day celebration was a grand success.







## Guest Lecture On Applications of Numerical Analysis

Talk on Applications of Numerical Analysis and Vector Algebra by Dr. Aparna from VNRVJIET College on 19/12/2018. The Guest Speaker discussed various aspects of Numerical Applications and its importance in real life, also about vector algebra and its aspects. It was a really very interactive session with students. She encouraged everyone about maths and it's useful in real big problems. 100 students attended.



## **Talk By Alumni:**

Talk on "Career prospects for B.Sc Physical sciences students", by Shavian Affrin, an Alumni of the college on 28/9/18. The talk was attended by more than 100 students which gave them insight about the job prospects after their graduation. She mainly discussed the aspects and opportunity for the mathematics graduates in the field of defense.



## Guest Lecture On Application of Statistics & Mathematics in Industry

Guest Lecture in Application of Statistics and Mathematics in Industry by Dr. Venkat KC Timmaraju, Principal Data Scientist ATOS (USA)

Talk by Dr. Venkat "Pester your lecturers with questions!" said Dr. Venkat, an alumnus of Bhavan's Vivekananda College who had taken some time off his schedule to speak and enlighten the students of our college. Dr. Venkat has masters in applied mathematics, York University, a PhD in statistics and mathematics, an MBA from Henley Business School, UK. He had given a talk on the applications of statistics and mathematics in the industries which was very enlightening for our students for the foray into the future as to how to put their knowledge into good use after they graduate. He had mentioned a huge number of options for the students and has opened their minds to the potential of the subjects they've chosen. He had stressed very much on the concept of 'Big Data' as it is deemed to be the next big thing in the industry, a major potential which lacks people. He shared his views and got the students interested and motivated. A total of **95 students** attended the lecture.



## **Outreach Program**

As a part of department activities, Mathematics and Statistics department organized a 3 day Outreach program on “STATISTICS, STATISTICAL DATA AND ANALYSIS OF STATISTICAL DATA THROUGH MEASURES OF CENTRAL TENDENCY” from 26,27,29 AUG 2016 at Z.P.H. School, Nagaram, Ranga Reddy District for 10th class students.

Following faculty members of our department took classes .

- Mrs. P. Rajini
- Mr. N Chandan Babu

The Following Student Volunteer took part in this Program

- G Rajashree (B.Sc (MSCs IIIA))
- R Gowtham Kumar (B.Sc (MSCs IIIA))
- V Swathi (B.Sc (MSCs IIIB))
- N Sandhya (B.Sc (MSCs IIIB))

The course covered the topics :

- Introduction to Statistics and Computation of Mean, Median, Mode
- Drawing Ogive Curve
- Computation of Mean, Median, Mode through Ms Excel

The faculty were happy and got a different experience from teaching to school students. The feedback from school students is appreciated. We are thankful to ZPH School Headmaster, Mr. Aravindan Kumar and faculty members for their cooperation and support for the successful completion of the Outreach program. We will try to provide more topics in the forthcoming programs to improve more student understandability.

**2016-17**

*Madhava Mathematics Competition*

It is conducted by the Department of Mathematics, S.P. College, Pune and HomiBhabha Centre for Science Education, TIFR, Mumbai. This exam is conducted for undergraduate students in Mathematics to motivate them to pursue higher studies in Mathematics. Our college is the regional centre, 400 students participated from various colleges.



**2015-16**

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