MATHEMATICS CLUB

Activities conducted during the academic year 2021-22

S. No.	Name of the Event	Resource Person if any	Date(s)	No. of Participants
1	Guest Lecture on "Population Dynamic - A Mathematician Perspective"	Dr. T. Suman Kumar, Associate Professor, School of Mathematics and Statistics, University of Hyderabad-Hyderabad	30-09-2021	118
2	A six-day Short Term Training Program (STTP) on "Role of Statistics in Machine Learning and Data Science"	Various veterans from industry and academics	29-11-2021 to 04-12-2021	90
3	1729 Maths Magic Quiz	-	22-12-2021	193
4	Guest Lecture on "Mathematical Foundations for Data Analytics"	Dr. YVK. Ravi Kumar, Associate Professor CSIS Group, WILP Division BITS Pilani, Hyderabad	29-01-2022	340
5	Refresher course on "Tips to crack NET in the specialization of Mathematical Sciences"	Dr. V. S. Triveni, Professor and Dr. C. Gangadhar, Assistant Professor, Freshman Engineering Department, GCET	10-12-2021 to 05-02-2022	10
6	Board Games Activity	-	24-02-2022 and 25-02-2022	98
7	Guest Lecture on "Mathematics for Data Science with Case Studies"	Dr. J. Somasekar, Professor and HoD, CSE Department, Gopalan College of Engineering and Management, Bangalore	12-03-2022	207

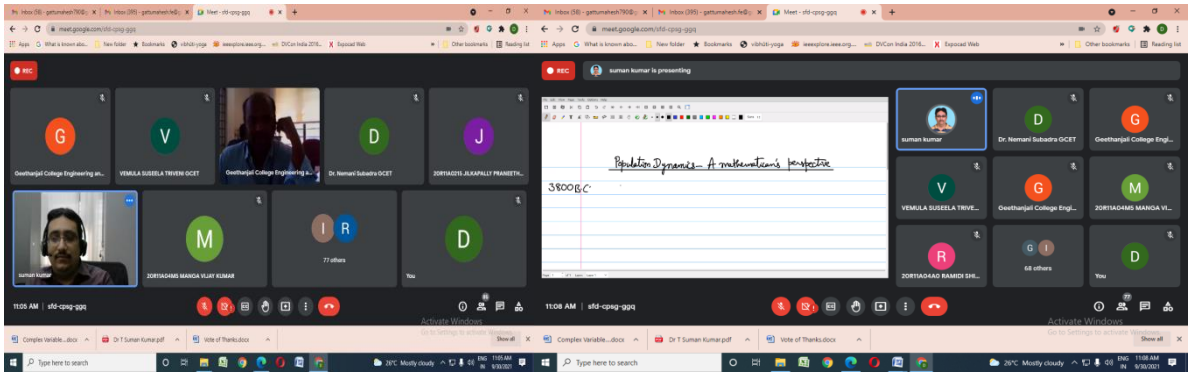
Guest Lecture

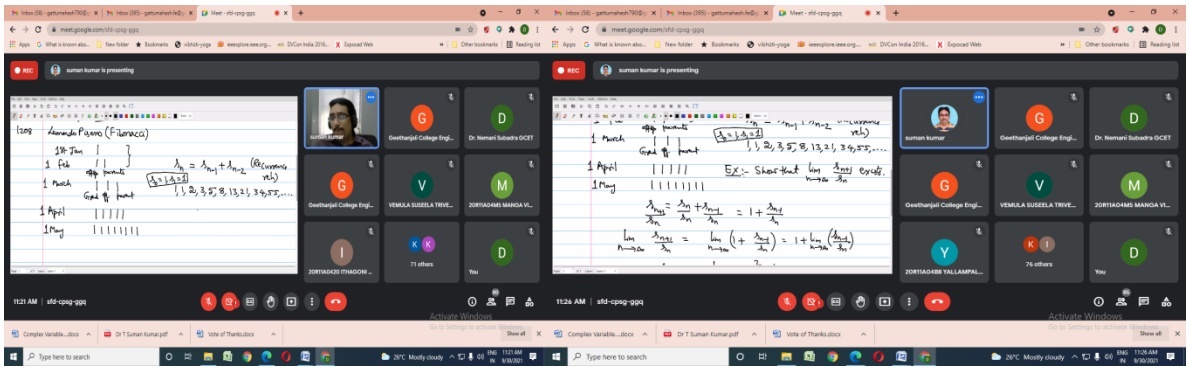
A guest lecture titled "**Population Dynamic - A Mathematician's Perspective**" was organized on 30th September, 2021 by Mathematics Club of Freshman Engineering department. Eminent speaker **Dr. T. Suman Kumar, Associate Professor, University of Hyderabad**, delivered the guest lecture.

Speaker started the session with the history of documentation of counting human population starting from 3800 B.C in Babylonia, continued till 225 A.D, 1086 A.D, 1208 A.D.., and explained the topic Fibonacci Model for population counting process. He introduced the sequence 1,2,3,5,8,13,21,…… called Fibonacci sequence that is n^{th} term of the sequence, $s_{n=}s_{n-1}+s_{n-2}$, for n=1,2,3…. where $s_0 = 1, s_1 = 1$, then he proved $s_n \to \frac{1+\sqrt{5}}{2}$. Then by using differential equation, he expressed population growth by $\frac{dp(t)}{dt} = (b-u)p(t)$, where b is per capita birth rate, u is per capita death rate and the solution of the differential equation is given by $p(t) = p_0 e^{rt}$, where $p_0 = p(0)$, then he moved to another model, GOMPERTZ model (1825), formula for growth given by a differential equation $\frac{dp(t)}{dt} = aq^t p(t), \ a < 0, q > 0$, and solution of this equation is given by $p(t) = cd^{qt}$, then the guest speaker explained how these models were applied to Physical Chemistry, Physical Biology, Physics. Finally, he interacted with the students and answered their queries.

118 students from ECE and EEE of II B.Tech, I Sem attended the session through virtual mode from 11.00 am to 12.30 pm.

Feedback forms were also collected from the students who attended the guest lecture.





STTP

A Six-Day Short Term Training Program (STTP) on "**Role of Statistics in Machine Learning and Data Science**" sponsored by **AICTE and UGC-HRDC, JNTUH,** was organized by Geethanjali College of Engineering and Technology, Cheeryal(V), Keesara (M), Hyderabad, through Online Web Ex Platform from 29-11-2021 to 04-12-2021. There were four sessions every day, addressed by resource persons who were selected from the IITs/NITs/HCU/OU and other reputed academic institutions and software industries. Every day the session began at 10:00 am and finished by 05:15 pm. 90 Participants were registered for this training program.

The training was intended to provide preparedness on the Role of Statistics in Machine Learning (ML) and Data Science. This forum created a platform for exchanging the ideas and shares the knowledge on current challenges / issues in the real world in the emerging area of Statistics for Data Science and Machine learning.

The STTP was inaugurated by Dr. G.K. Vishwanadh (Director, UGC-HRDC, JNTUH, Hyderabad). During the six days of the training, various topics such as Introduction to the Role of Statistics in Data Science and Machine Learning and its implementation, Introduction to Probability Theory, Descriptive Statistics, Predictive Analysis, Distribution Theory, Testing of Hypothesis, Algorithms of Machine Learning were explained to the participants through presentations and hands-on practical sessions with R programming.

Day wise & Session wise report:

Day-1:

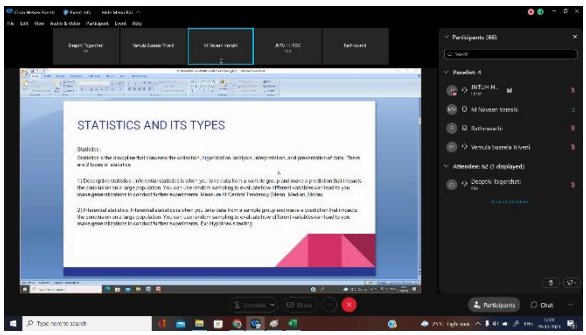
The program was inaugurated by Dr. G.K. Vishwanadh, Director, UGC-HRDC, JNTUH. Sir addressed the gathering on current technologies and the need to stay updated on them. Dr V.S. Triveni, the Co-ordinator, Geethanjali College of Engineering and Technology, Hyderabad, greeted the dignitaries and participants. Later she explained the importance of the course in the present scenario and its major role in the said area.

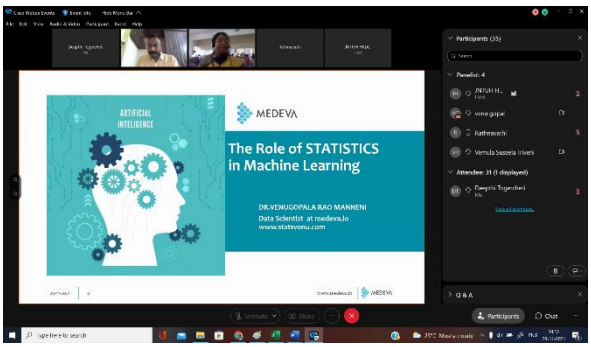
During the first day, first session Dr V.S.Triveni delivered a talk on the key concepts of statistics in Data Science and Machine Learning and its applications. She emphasised on the demand of the course Data Science and its future market.

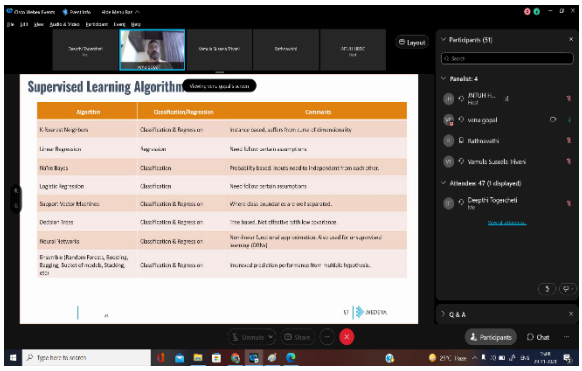
On Day one, session two, Mr. M. Naveen Vamshi, Technical Consultant, Virtusa, Hyderabad delivered a lecture on "Implementation of Statistics in Machine Learning" and he explained the basic concepts of statistics.

On Day one, session three was addressed by Dr. M. Venugopal, Data Scientist, Juxt-Smart Mandate, Hyderabad on "Role of Statistics in Data Science". He explained the topic in detail with live examples. Apart from that he gave the gist on new technologies.

On Day one, session four, Dr. Sampath Lonka, Sri Sathya Sai Institute of Higher Learning, Karnataka, delivered a lecture on "Classification Models in ML".





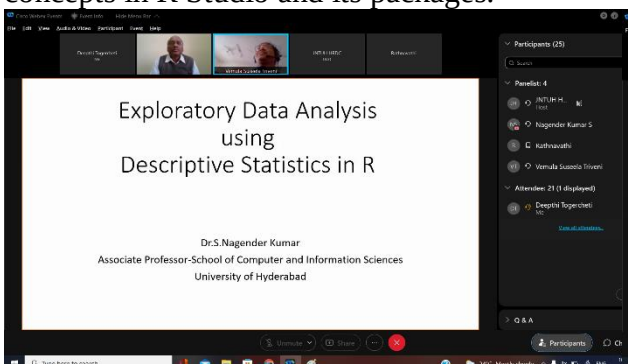


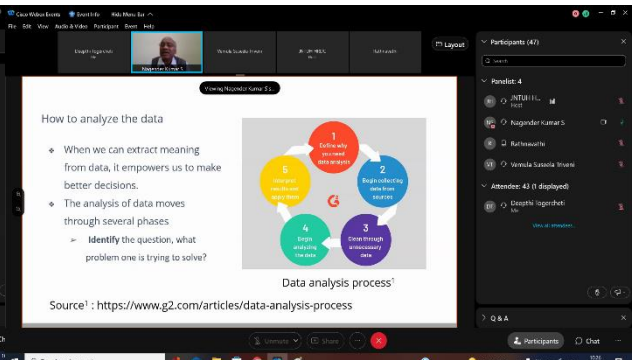
Day-2:

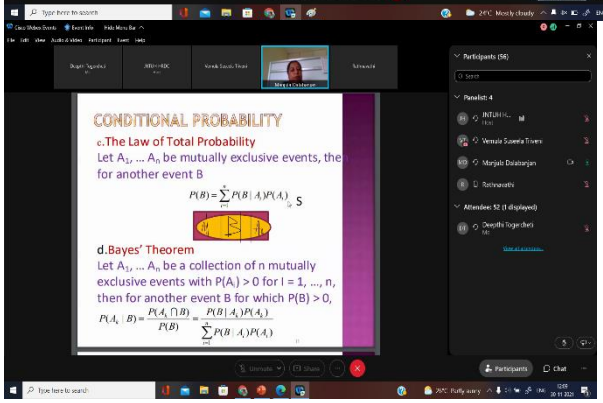
Session one, Dr. Nagendra Kumar Suryadevara, University of Hyderabad gave lecture on "Exploratory Data Analysis using Descriptive Statistics". Speaker had explained the basic concepts of Descriptive Statistics and explained clearly how to analyse the data using R tool.

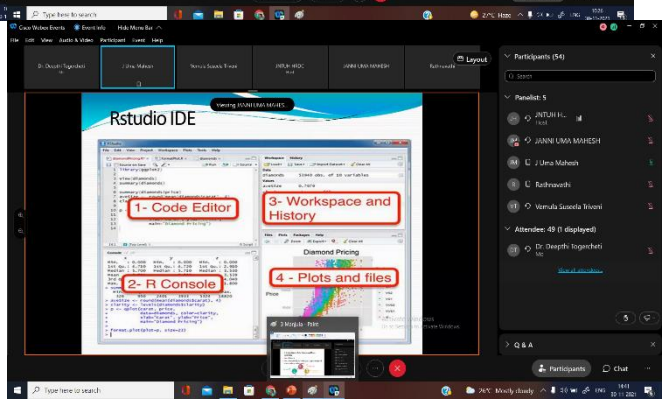
Session two was on the topic "Introduction to Probability Theory" delivered by Dr. Manjula S Dalabanjan, Don Bosco Institute of Technology, Bangalore. She gave a brief introduction to Probability with real time examples and extended the topic to Inequalities, Moments and Central Limit Theorem and its applications in Machine Learning.

Session three and four were handled by Mr. J. Uma Mahesh, JRF, NIT, Roorkela. He gave hands on training session on "Introduction to R Programming" and explained the basic concepts in R Studio and its packages.









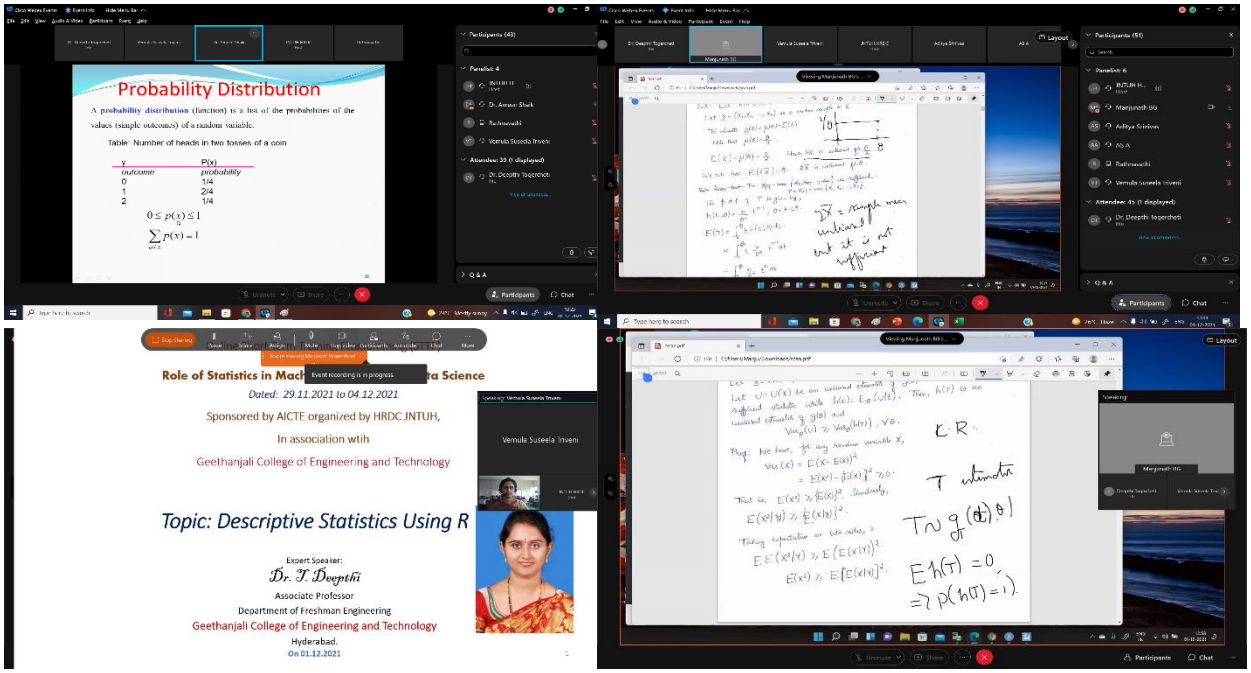
Day-3:

Session one, Dr. Ameen Saheb Shaik, B.V. Raju Inst. of Technology, Narsapur, gave a talk on theoretical concepts of "Distribution Theory." The speaker started his session with examples on statistics in Machine Learning and also explained the various distributions and its applications.

Session two was addressed by academician, Dr. B.G. Manjunath, University of Hyderabad, on the topic "Parameter Estimation."

Session three was hands on training session on "Descriptive Statistics using R" by Dr. T. Deepthi, Geethanjali College of Engineering and Technology, Hyderabad. She explained the basic concepts of Descriptive Statistics i.e., Data, Variables and its types, Measures of Central Tendency, Measures of Dispersion, Moments, Skewness and Kurtosis.

Session four was on “Machine Learning Techniques: Association Rules” by V. Aditya Srinivas, IT Analyst, Tata Consultancy Services, Hyderabad. During this session he discussed various algorithms in Machine Learning along with R programming.

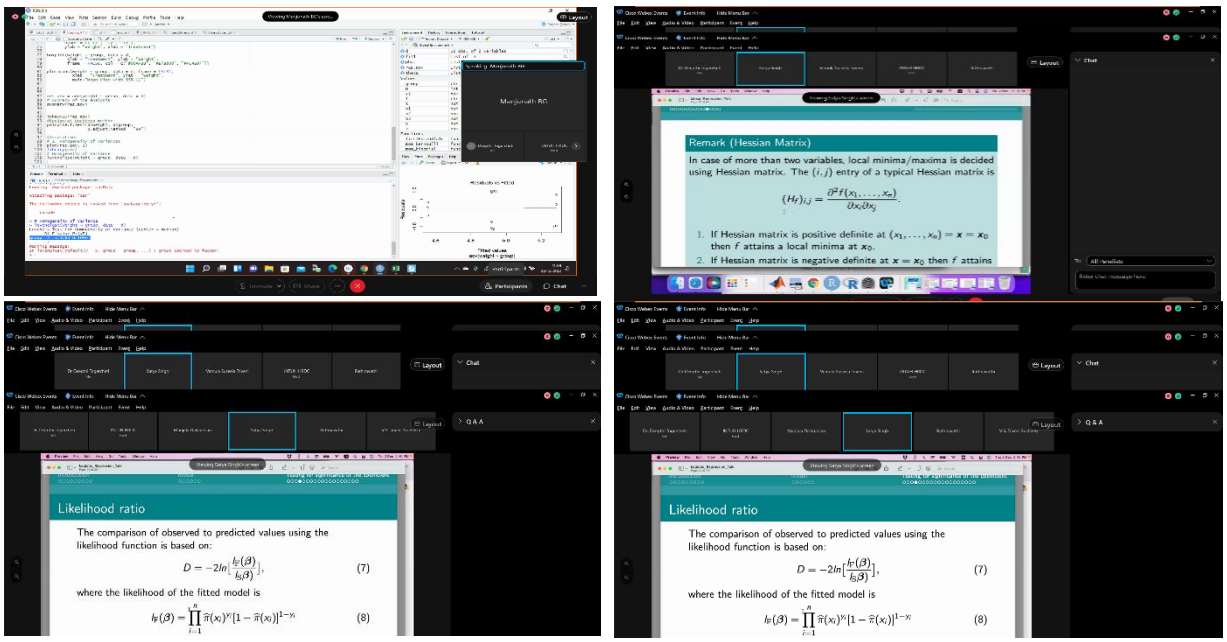


Day-4

Session one was dealt by Dr. B.G. Manjunath, University of Hyderabad, on the topic “Testing of Hypothesis.” He gave a lecture on theoretical and practical concepts of testing of hypothesis using R programming.

Session two and three were handled by Dr. Sathya Prakash Singh, IIT, Kanpur on the theory of “Predictive Analysis” and hands on training session by using R.

Session four was hands on practical approach “Data Simulation and Testing using R” by Dr. Ameen Saheb Shaik, B.V. Raju Inst. of Technology, Narsapur.



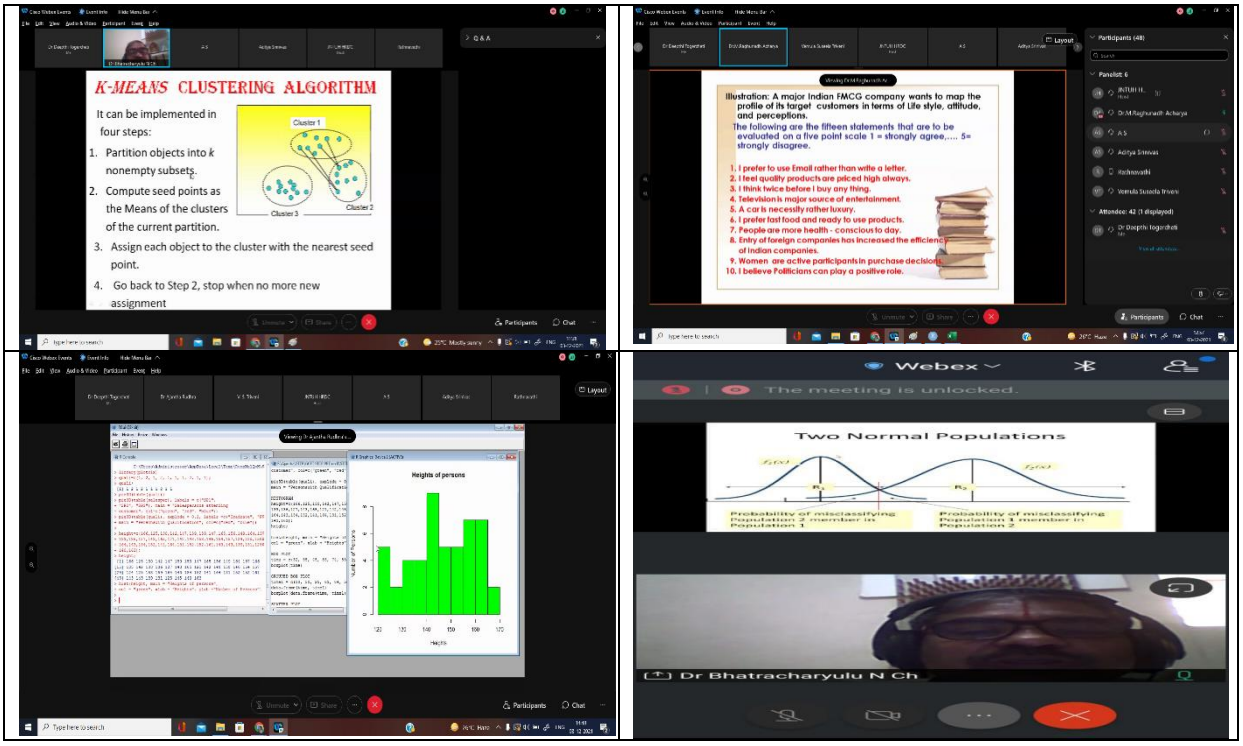
Day-5:

Session one was carried on the theoretical part of "Dimensionality Reduction" by Dr. N.Ch. Bhatra Charyulu, HOD, Department of Statistics, Osmania University, Hyderabad.

Session two was a practical session on "Dimensionality Reduction Techniques in R" by Dr. M. Raghunadh Acharya, Hindi Mahavidyalaya College, Hyderabad.

Session three was hands on training session on "Graphical Representation using R" by Dr. Ajantha Rudhra, Geethanjali College of Engineering and Technology, Hyderabad.

Session four focused on theory part of "Kernel Methods" that plays an important role in Machine Learning by Dr. N.Ch. Bhatra Charyulu, HOD, Department of Statistics, Osmania University, Hyderabad.



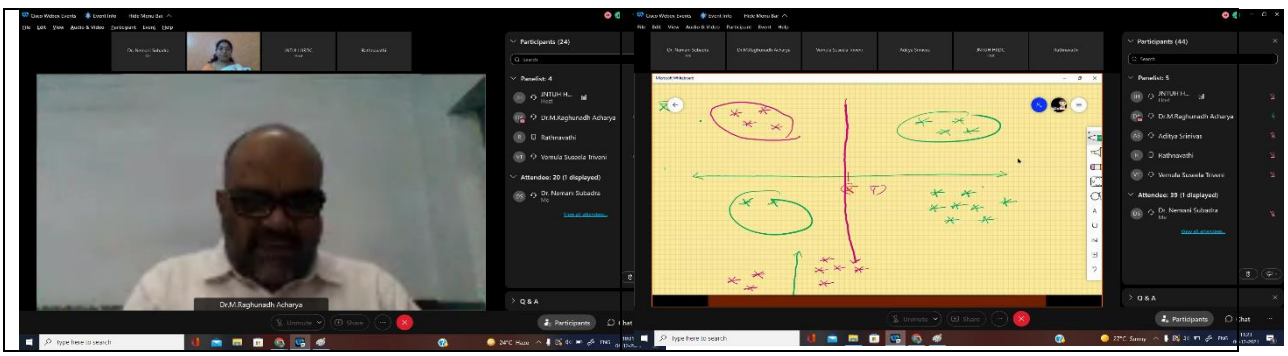
Day-6:

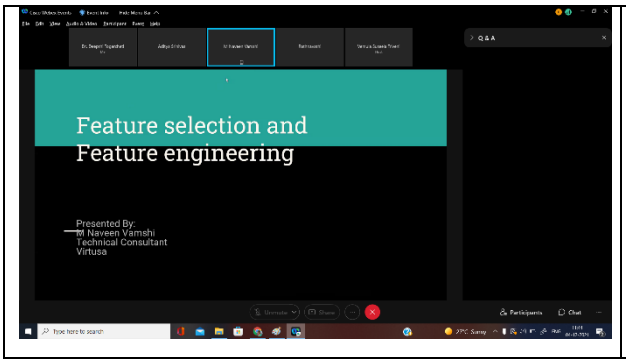
Session one was a practical session on "Kernel Methods using R" by Dr. M. Raghunadh Acharya, Hindi Mahavidyala College, Hyderabad.

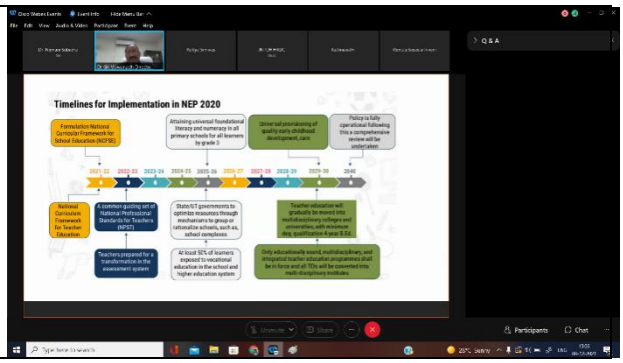
Session two was taken by Mr. M. Naveen Vamshi, Technical Consultant, Virtusa, Hyderabad on "Feature Engineering". He explained real life applications of ML and DS.

Session three was handled by Dr. G.K. Vishwanadh (Director, UGC-HRDC, JNTUH, Hyderabad) on "NEP." Sir explained year wise policies and amendments of NEP.

Session four ended with Online QUIZ. There were thirty questions with the time limit of thirty minutes. Quiz link was shared to the participants. Participants attempted the quiz enthusiastically.







Valedictory

The concluding remarks were given by Dr. V.S. Triveni, STTP Coordinator, Geethanjali College of Engineering and Technology, Hyderabad. She explained the success of the STTP, an incredible number of participants -45, 12 Eminent Experts and 36 hrs of rigorous course training was the essence of this STTP. Participants updated their knowledge on statistical concepts, its role in Machine Learning and Data Science. The program had given a hands-on experience on various statistical concepts with the help of R programming tool to solve real world problems. She conveyed heartfelt thanks to the AICTE, UGC-HRDC, JNTUH for sponsoring this STTP.

Feedback

Most of the participants rated the STTP as very good /excellent on the whole. As per their feedback, course contents and sessions were excellent. They also felt happy for attending this program and related hands-on sessions on R programming and expressed that they will utilize these concepts in future.

On the successful completion of this one-week STTP, E-certificates were distributed to the participants.

Quiz

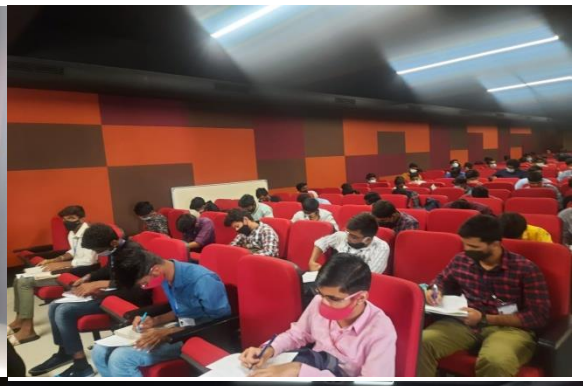
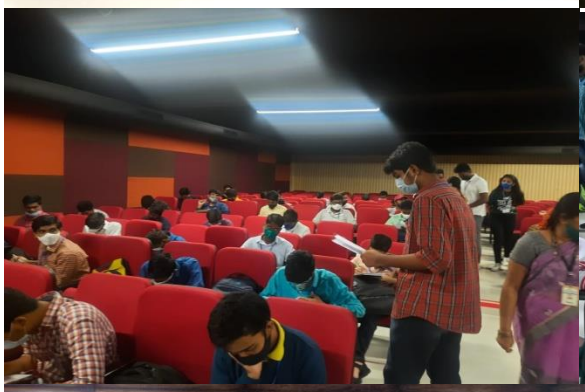
In Commemoration of Ramanujan's Birthday on December 22, Mathematics Club of Freshman Engineering Department, organized a quiz competition titled **"1729 Maths Magic"** for B.Tech and MBA students on 22-12-2021 at 2.50 pm in Seminar Hall, Block-4.

20 MCQ's were given in the quiz from Engineering Mathematics, Brain Teasers, Aptitude, Reasoning, Non-verbal Reasoning to enhance their problem-solving ability, Logical Reasoning skills.

The HoD (FE), Dr. G. Neeraja Rani was the Convener and Dr.V.S. Triveni was the Co-ordinator for the Quiz program. 290 students registered for the competition and 193 students participated in the Quiz. The program was a successful venture as the B.Tech and MBA students participated enthusiastically. Winners were appreciated with Merit Certificates and the list is here under:

1729 Maths Magic Winners List

S.No	Name of the Student	Roll No.	Branch & Section	Prize
1	M. Pavani	21R11A66C3	CSE(AIML)-C	I
2	Shaik Mohammad Adil	21R11A6688	CSE(AIML)-B	II
3	S. Prakash Reddy	21R11A05Q8	CSE-E	II
4	G. Harshith	21R11A0519	CSE-A	III
5	P. Nitya	21R11A66C6	CSE(AIML)-C	III
6	M. Charan	21R11A05C9	CSE-C	III
7	G. Abhinav	21R11A6925	CSE(IoT)	III

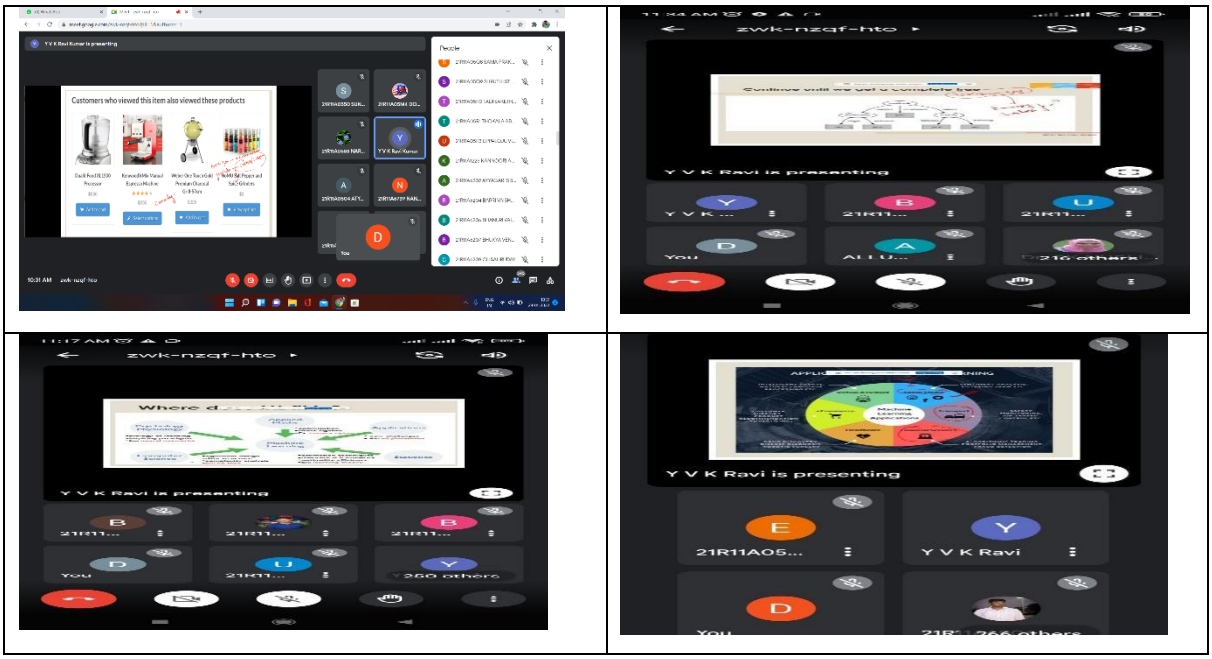





Guest Lecture

A Guest Lecture on "**Mathematical Foundations for Data Analytics**" is organized by Mathematics Club of Freshman Engineering Department, Geethanjali College of Engineering and Technology, Cheeryal(V), Keesara (M), Hyderabad on 29.01.2022 by **Dr. Y. V. K Ravi Kumar, Associate Professor, CSIS Group, WILP Division, BITS, Hyderabad.** Session began at 10.00 am and finished by 11.30 am through Online (Google Meet) for Students of I year B.Tech - CSE, CSE(AIML), CSE(CS), CSE(DS), CSE(IoT), and IT. The link (https://meet.google.com/zwk-nzqf-hto) was shared in their respective WhatsApp groups.

Dr. Y.V.K Ravi Kumar started his session with examples such as True caller which uses mode concept and Probability to identify the Spam calls and then explained the applications of Machine Learning in social media, Transport, Financial services, Virtual Assistant and Health care as Robotic Surgery with pictorial representation, and online ticket booking like IRCTC (Indian Railway Catering and Tourism corporations) which uses Bayes theorem to decide the probability of ticket confirmation.

He explained the importance of mathematics in Probability, Statistics, Linear algebra, Vector Calculus, Data Structure and Analytic Geometry which are useful for Computer Science students. He taught about the algorithm used in placing the tickets in the railways. Further, he explained about the application of Machine Learning which also requires mathematical knowledge such as Vector Matrix, System of Linear equations, Vector Space and Basis and also taught how nature is connected with mathematics. He also gave detailed explanation with real applications on Customers viewed products (Food Processor, Manual machine, Salt pepper and Spice Grinders) on Flipcart and explained how these applications are implied to mathematics like Vectors and Bayes Probability and also extended his talk on applications on how the food items can be ordered in Swiggy, Zomato through online so that one can find the shortest distance. On the whole he gave real life applications on how mathematics plays a major role for Data Analytics.



The Lecture was intended to provide preparedness on the Mathematical Foundations for Data Analytics. This forum created a platform for exchanging the ideas and shares the knowledge on current challenges / issues in the real world in the emerging areas of Mathematical Foundations for Data Analytics.

Total 340 students attended the session and also interacted with the Speaker regarding their queries. Feedback link was posted in the chat box and responses were collected.

Refresher Course

Refresher course on Tips to crack NET in the specialization of Mathematical Sciences
Dates: From 10 Dec, 2021 to 05 February, 2022. Venue: CM Lab
Dr V S Triveni and Dr C Gangadhar conducted classes on the topics Real Analysis, Complex Analysis, Linear Algebra, Numerical analysis, Algebra and discussed previous papers to crack National Eligibility Test (Mathematics) in the following dates:
December, 10th, 18th, 24th, 31st, 2021 and January 7th, 15th, 22nd and February 5th, 2022
On the First day (10th Dec) Dr. V.S Triveni and Dr. C. Gangadhar discussed the syllabus, Cutoff marks and previous papers of CSIR-NET and suggested the members to choose the topics accordingly.
On the Second day (18th Dec), topics in Real analysis and related problems in previous papers were discussed, Third day (24th Dec) topics in Complex analysis, Fourth day (31st Dec) topics in Linear algebra, Fifth day (7th Jan) topics in Algebra, on sixth day (15th Jan) topics in Numerical analysis and related problems in previous papers were discussed. In the last two classes (22nd Jan and 5th Feb, 2022) problems from previous year CSIR-NET papers were solved.
Feedback forms were collected and the members conveyed their gratitude towards the resource persons for the sessions.
Participants: All Mathematics faculty of FE Department



Event

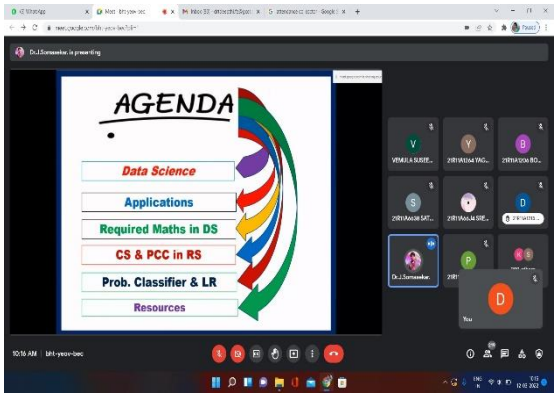
Department of Freshman Engineering, Mathematics Club organized an activity on "**Board Games"** on February 24th and 25th, 2022 from 2.00 pm to 3.30 pm, in AECS Lab, Block-1 for B. Tech I year Students. 100 students registered for the activity and 98 participated in the event.
Various Board Games list: Chess, Chinese Checkers, Cross Word, Kalaha, Ludo, Pack of Cards, Tic-Tac-Toe, Pop it, 9 Men Morris, Brain Vita, Prime climb, Magnetic Dart Game, Foos Ball, Zenga.

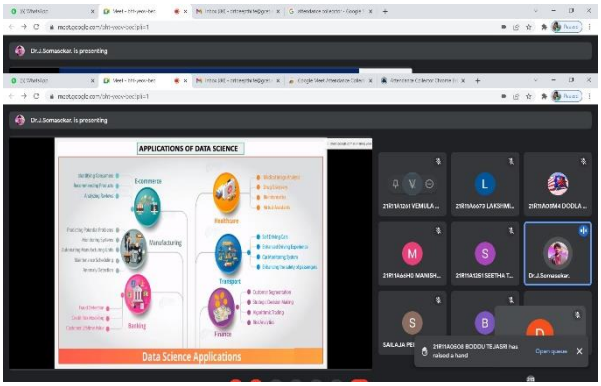
28 students of B.Tech I year coordinated with the faculty members for the smooth conduct of the event. Playing board games reduces stress, refreshes mind, helps to set goal and be focused. Participants felt very happy and played each game very enthusiastically. E-certificates were distributed to the student organizers.

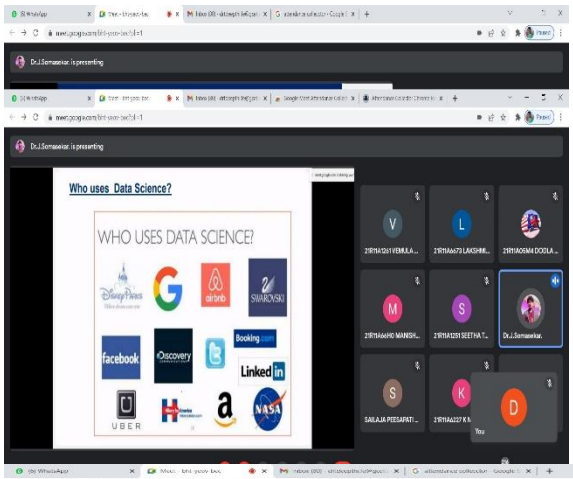
Guest Lecture

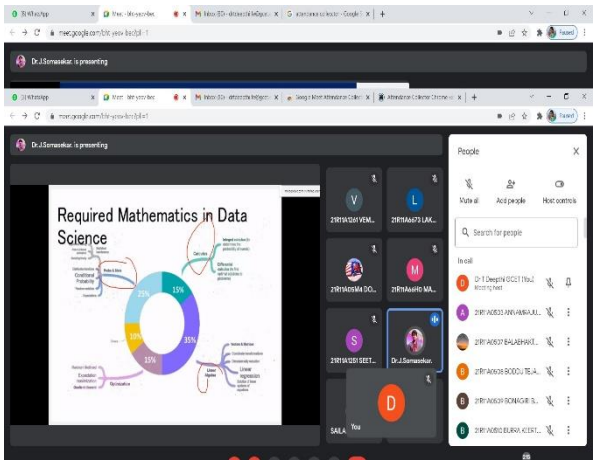
A Guest Lecture on "**Mathematics for Data Science with Case Studies**" was organized by Mathematics Club of Freshman Engineering Department, Geethanjali College of Engineering and Technology, Cheeryal(V), Keesara (M), Hyderabad, through Online Google Meet Platform on 12.03.2022 by **Dr J. Somasekar, Professor and HOD, CSE Department, Gopalan College of Engineering and Management, Bangalore.** The session started at 10.00 am and completed by11.30 am. Total 207 students attended and the session was very interactive.

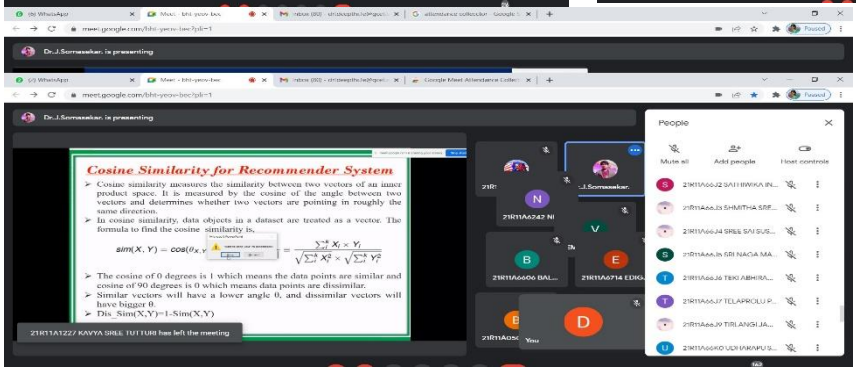
Dr J. Somasekar started his session with applications, objectives of Data Science and explained with case studies. He explained briefly the role of various topics of mathematics in Data Science, Deep Learning and Machine Learning and its importance in all engineering fields. Few topics which were discussed by him are Probability and Statistics, Matrices, Linear Algebra, Vectors. He also extended his talk on how Data Science can be used in various companies such as Disney Parks, Google, Facebook, LinkedIn, Uber, etc. and also explained about how Similarity Measure is used to review the items in recommendation system by taking an example on rating the movies for testing the unit matrix. He discussed a case study about Corona Virus (Pandemic) health symptoms and its treatment by using Data Science. On the whole, he gave real life applications with case studies on how mathematics plays a vital role in Data Science.











This lecture was interactive and students clarified their doubts by asking questions to the speaker, and the speaker clarified their doubts with real life examples.