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NEWSLETTER July 2022 - October 2022

DEPARTMENT OF MATHEMATICS AND HUMANITIES



DoMH, SVNIT, SURAT NEWSLETTER

Welcome

Message from Head of the Department



Greetings

To mark the 135th birthday of the famous Indian mathematician Srinivasa Ramanujan, I am delighted to publish the third edition of the newsletter, 2022. Ramanujan's insight into the relationship between mathematics and God has driven him far further than he ever imagined.

Following in the footsteps of UNESCO's theme for the 2022 World Science Forum, "Science for Social Justice," I am hoping that the research we are pursuing will have an influence on social justice system by offering more productive and efficient uplifting solutions. In accordance with UNESCO's directives, I would urge the faculty, researchers, and students to continue Ramanujan's legacy by accomplishing bigger accomplishments in research by solving long-standing problems that will have an influence on the lives of future generations.

Best Wishes Dr. Jayesh M. Dhodiya

Message from Faculty Co-ordinator



Greetings

As the year 2022 comes to a close, I hope the two issues of the newsletter provided sufficient information about the department's activities.

December is a season of commemoration for our Indian mathematician Srinivasa Ramanujan, and I wish we could all carry forward his legacy of doing good research without hesitation, which will cost an ample amount of time.

I would like to extend my best wishes to the Class of '27 in their academic pursuit and look after many ongoing activities on campus by taking an active part, which will help in career development. I wish you all the best in your future endeavours

Best Wishes Dr. Saroj R. Yadav

About Department



Vision

To be a model for excellence in educational research in Mathematics and Humanities in order to meet the changing needs of society.

Mission

To become an exemplary Centre of Excellence for research and training in the Mathematical Sciences and Humanities by promoting learning, growth and development of young minds and finding solutions to scientific, technological and real-life problems.

In 2021, the Department of Mathematics & Humanities received its current status. Since 2009, it has been Applied Mathematics & Humanities, and before that, it was part of the Applied Sciences and Humanities Department. Through out these years, the department has evolved into one of the epicenters of research in India. Since 2007, the department has been offering its own 5 years Integrated M.Sc. Degree Program in Mathematics, in which students are enrolled through Joint Entrance Examination (JEE Mains). The department offers courses in Mathematics, English, and Management to undergraduate and postgraduate students in Engineering and other Science courses. A number of alumni from this department have attained prestigious positions in teaching and research in India and abroad.

The department has highly qualified faculty members including three Professors, three Associate Professors, and twelve Assistant Professors, who have extensive expertise in Fluid Mechanics, Special functions, Algebra, Integral Trans- forms, Approximation theory, Mathematical modeling, Magnetic fluid dynamics, Biomathematics, Data Mining, Finite element modeling, Techno innovation to Techno Entrepreneurship General Management, Entrepreneurship, Marketing, Postmodern Fiction, and Indian English fiction.

More than 283 students have enrolled in the department for Five Years Integrated M.Sc., and 87+ Ph.D. students are presently pursuing research. In total, 729+ papers have been published by the Department in the reputed SCI/SCIE and Scopus indexed journals. During the last five years, the department has published 117 H index papers and 109 i10 index papers. A total of INR 2,11,00,000/worth of projects have been carried out by the department in the last five years funded by different agencies such as Department of Science and Technology (DST), NBHM, ISRO and GUJCOST. So far, the department has produced 97+ Ph.D. students specializing in Mathematics, Management, and English and the department has a good placement record as well.

Dr. Urvashi Kaushal

Dr. Urvashi Kaushal has won Best Paper Award in Learning with MOOCS -VII International Conference organised by IEEE

Dr. Ranjan Kumar Jana

Dr. Rajan Kumat Jana has got the extension of the research project "Simulation and Land Data Assimilation to Community Land Model for Improving Rice Crop Dynamics" as Principal Investigator, sanctioned by DOS, ISRO, Govt. of India, upto August 31, 2023. Rs. 5.00,000/- has been released on October 7, 2022.

Expert Lectures delivered

Prof. Ajay Kumar Shukla has delivered talk on "Some Generalization of Mittag-Leffler Function" at 2nd (hybrid) International conference on Orthogonal Polynomials, Special functions and computer Algebra: Applications in Engineering (OPSFA-2022) organized by Ananad International College of Engineering, Jaipur, India supported by UNINETTUNO, Italy, during October 15-16, 2022.

Dr. Jayesh M. Dhodiya delivered a talk on "Real system fuzzy problems and their solutions by Mathematical Modelling and Simulation through Computational Methods" at Mathematics Department of C. K. Pithawala Engineering College. And he also delivered a talk on "Fuzzy Mathematical Modelling and their solution by Computational Techniques" at SVNIT in STTP on "Computational Techniques for Physical Science".

Dr. Urvashi Kaushal has conducted a session on "Decoding the Process of Ethical Research and Publication" in Capacity Building workshop on Qualitative Research organised by IQAC, M.T.B. Arts College, Sarvajanik Education Society, Surat.

Dr. Ranjan Kumar Jana delivered a lecture at 6th Reunion organized by Department of Mathematics, Midnapore College (Autonomous) during October 29–30, 2022.

Placement Statistics (July 2022 - October 2022)

Mihir Khambhati Samsung R&D

Mitkumar Patel TCS Ninja

Anusree C B TCS Ninja

Rambabu TCS Ninja

Rohit Verma TCS Ninja

Saurav Prakesh TCS Ninja

Ayushi Gupta TCS Ninja

Polamarasetty Desik Tata Elxsi

Priya Singh Adsome Global

Shivam Sharma

Tata Elxsi

Vishal Parmar TCS Ninja

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Niraj Velankar (I18MA005)

He has done an internship between May 16, 2022 - August 15, 2022 at Indian Institute of Technology, Bombay.

His work in his words:

I did an internship in Mathematics Department of IIT Bombay under the guidance of Dr Madhusudan Manjunath. During the internship, I studied the PhD thesis of Frank Vallentin titled 'Sphere Coverings, Lattices and Tilings (in Low Dimensions)'. The thesis is divided in two parts. In first part, the Voronoi's Reduction Theory is discussed and the concept of Duality between Delaunay Polytopes and Dirichlet-Voronoi polytopes is described.

My study began by understanding some introductory concepts like Positive Definite Quadratic Forms and how they are related with symmetric matrices. Then we defined Lattice as a discrete subgroup of the Euclidean Inner Product space. Following that, the bijection between arithmetical equivalence classes of positive definite quadratic forms and isometry classes of lattices was discussed.

The study of Voronoi's Reduction Theory was started with an introduction to a specific subdivision of the Euclidean space, known as Delaunay (aka Delone) subdivision. This subdivision is obtained using the Positive Definite Quadratic Forms. Then we computed the secondary cone of all such Positive Definite Quadratic Forms, which obtain same Delaunay Triangulation Delaunay Triangulation is a Delaunay subdivision containing simplices only. Then we discussed the Main Theorem of Reduction theory which states that, 'The topological closure of secondary cones of Delaunay Triangulations give a facet-to-facet tiling of the cone of positive definite quadratic forms. Moreover, under the action if the group GL(Z), there are only finitely many non-equivalent secondary cones.

Continuing further, I studied some properties of Parallelohedra. A parallelohedron is a polytope that gives facet-to-facet tiling of the Euclidean space by translates. Later, the Dirichlet-Voronoi Polytope was defined. This polytope is in fact a parallelotope. Before concluding the internship, I studied the duality between the Dirichlet-Voronoi polytope and the Delaunay polytope.

Priya Singh (118MA010)

She has done an internship between May 20, 2022 - August 1, 2022 at Eberhard Karl University of Tübingen.

Her work in her words:

The project was focused on geometric zeta functions of simplicial complexes. For the prerequisite we studied about Graph Theory and Reimann zeta function. Then we learnt about Ihara zeta functions, from Audrey Terras's book.

During this, we learnt how to define zeta functions for various types of graphs and several results regarding lhara zeta function. We also studied about Bass's proof of the lhara three-term determinant formula.

Later on we studied about simplicial complexes and labelling, and started working on generalisation of Ihara zeta function to higher dimensions using Bass's approach.

Vaibhav Gupta(I18MA013)

He has done an internship as an DAAD wise scholar at University of Münster.

His work in his words:

This project is centered about O-Minimal Approach and the application of Pila Wilkie Counting Theorem. In this project, we started with the proof of Tarski - Seidenberg Theorem. For the pre requisite we read about the Real Closed Fields from the Lang's book. Then we introduced some concept of Model Theory which were used to prove our theorem. Then we started learning about O minimality and then shifted focus to Pila-Wilkie Counting theorem. For this, we read Cell Decomposition Theorem, Re parameterisation theorem and Diophantine Approximation. We used these three results to prove our Pila Wilkie theorem.

The important application of this theorem is in Lang Conjecture, which we proved by this theorem. We used some observations from Algebra and then used Pila Wilkie and Galois Cyclotomic Extension for the upper and lower bounds respectively.

Polamarasetty Desik (I18MA024)

He has done an internship about 2 months at Duke and Clyde.

His work in his words:

Worked as a technical consultant where I worked on building an end to end multi speaker text to speech synthesis model. I worked on the crucial part of the model that converts text into speech using various deep learning techniques and trained the model using GPU.

Gannamaneni Sai Charan (119MA002)

He has done an internship between May 16, 2022 to July 20, 2022 at Sardar Vallabhbhai National Institute of Technology.

His work in his words:

During the summer of 2022, I got an opportunity to work under Dr. Sudeep Singh Sanga, SVNIT in the field of Queueing Theory. During my internship, I was given a paper on strategic joining for M/M/1 retrial to study and then extend the work to double orbit retrial queues. My work mainly concerned on developing observable and unobservable models for double orbit retrial queue with customers balking. With the developed theory of models, I have done the numerical comparison between individual and social benefits of customers based on equilibrium joining probabilities of the customers using MATLAB. We can observe the application of the model in electric vehicle charging station for two types of electric vehicles. Lastly I would like to thank Sudeep for giving me the opportunity to work under him during the summer vacation.

Mridul Sehgal (I19MA006)

He has done an internship between June 2, 2022 to July 30, 2022 at Infiniqe Marketing.

His work in his words:

I worked there as a Fullstack developer. My task was to build a Content management system(CMS) for clients working in real-estate business. The techStack I was working on was core PHP, mysql, laravel, WordPress.

Ayushi Singh (119MA009)

She has done an internship between May 17, 2022 to July 16, 2022 at Sardar Vallabhbhai National Institute of Technology.

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Her work in her words:

Topic - Bankruptcy detection using statistical tools and Machine learning.

Used Machine learning to predict the Bankruptcy of over 6819 firms. The data were collected from the Taiwan Economic Journal for the years 1999 to 2009. Company bankruptcy was defined based on the Taiwan Stock Exchange business regulations. The data set had a huge imbalance with 96.774% non-bankruptcy enterprises and 3.226% bankruptcy enterprises.

Performed Data Visualization and Data Analysis on the data set and used Oversampling technique to balance the data. Used different Statistical and Machine Learning models such as Logistic Regression, K Nearest Neighbour, Support Vector Machine, Decision Tree Classifier, and Random Forest Classifier. Made a report on the Mathematics used behind the working of the algorithms. Concluded the results for two scenarios:

- 1. When all the features were used for prediction.
- 2. When a lesser number of features were used after applying feature selection.

Sagar Saini (119MA011)

He has done an internship at Sardar Vallabhbhai National Institute of Technology during the May 25, 2022 to July 25, 2022.

His work in his words:

In the summer of 2022, I got a research work on the topic Topological Manifolds under the guidance of Dr. Amit Sharma, Sardar Vallabhbhai National Institute of Technology, Surat. I've followed the book ""An Introduction to Topological Manifolds."" by John M. Lee. Firstly, I've studied general topology with an emphasis on manifolds. With the formal definition of Locally Euclidean, Manifolds, and Manifolds with boundary (mathematically speaking, they may or may not be manifolds) author did a great job in profound theory and problems. After this, I learned how to create new spaces from the old ones. It includes Subspaces, Product, Disjoint Union, Quotient, and Adjunction Spaces with their characteristic property and uniqueness. With many known manifolds, it was time to play with their topological properties, such as connectedness, compactness, locally compactness, paracompactness, and proper maps. Now, I've shifted to Algebraic Topology with a brief introduction to cell complexes and compact surfaces, homotopy, and the Fundamental Group. By the end of this literature study, I have good knowledge of topological manifolds.

After completing the given work on topological manifolds, I have decided to pursue the field: the convergence of manifolds with boundary and Smooth manifolds."

Priyanshi Chandra (119MA012)

She has done an internship at Indian Statistical Institute, Kolkata during May 15, 2022 to July 16, 2022.

Her work in her words:

Studied about various types of methods in regression. Parametric approaches like Least Square regression, least absolute deviation regression, quantile regression were studied.

And analysed real life data using these techniques. Analysed the robustness properties of different regression equations and their different use cases according to it.

Among the non parametric approaches, I studied the generalised linear models, projection pursuit regression, piece wise constant and linear spline regression. All of them were studied on real data as well. Their drawbacks and advantages were analysed. Lastly, I studied the construction and nuances of regression trees and estimation of regression function using it.

Sakshi Hirani (119MA016)

She has done an internship between June 06, 2022 - August 06, 2022 at Tonic Worldwide.

Her work in her words:

Worked on a methodology called Gipsi – a unique insight mining practice that uses AI + HI (Artificial Intelligence + Human Intelligence) and maps the data with interests and searches, coupled with unique HI perspectives.

Worked for ORM (Online Reputation Management) – helped craft strategies to shape/influence the public perception of a brand using search engine marketing, public relations strategy, and studying crisis management, and competition benchmarking abilities. Analyzed and studied performance, and traction using Google Analytics, curated growth reports for campaigns deriving strategies for better marketing via social.

Deepshikha Rathore (I19MA018)

She has done an internship between May 16, 2022 to July 16 2022 at Sardar Vallabhbhai National Institute of Technology.

Her work in her words:

The project analyses the trends in Housing Prices in Indian Metropolitan Areas based on the data procured by Kaggle platform. Mumbai, Delhi, Chennai, and Hyderabad are four metropolitan cities of India that have been taken for project.

This project includes prediction using various regression techniques such as Decision Trees, Random Forest Tree, and Extreme Gradient Boosting Regression. Prediction of house prices from the dataset was done using all of the above techniques to find the best among them and allow people to predict exactly when they will buy their homes. Some of the related factors that impact the cost were also taken into considerations such location, Area and No. of bedrooms. Also, create a website which predict house price using longitude, latitude, Area and No. of bedroom as a parameter

Gouri Chirag (I19MA020)

He has done an internship at Sardar Vallabhbhai National Institute of Technology during May 16, 2022 to July 16, 2022.

His work in his words:

In this Intership I have tried to figure out "Data Mining" Techniques. I have Used DNA, RNA and Protein Database of various Organism's and used fuzzy and vague set to prepare various models for comparision and identification of organisms.

Dinesh Kumar (I19MA023)

He has done an internship between June 01, 2022 to July 05, 2022 at IISER Mohali.

His work in his words:

The fundamental ideas, tenets, and techniques of Functional Analysis and its applications. Normed spaces, banach spaces, completeness, compactness, boundedness, functionals, inner product space, hilbert space, hahn banach theorem, duality, orthogonality, orthogonal sets and sequence, operators and Hilbert adjoint operator are the topics covered along with the fundamental lemma and theorems like Zorns lemma, Hemil basis (application of Zorns lemma), Riesz theorem, Hahn banach theorem and it's extension along with its applications

Suryam Gupta (I19MA038)

He has done an internship between May 15, 2022 to July 15, 2022 at Indian Institute of Management Ahmedabad (IIMA).

His work in his words:

I worked with Linear/Integer Optimization using Python (pulp library) and AMPL software. For real life problems having an objective function (which either needs to be minimised or maximized) and bound to constraints, I developed their Mathematical Models and implemented them by writing their codes in Python using the pulp library and also in AMPL, a propriety software exclusive for Linear Programming problems.

Dhanani Jatin (I20MA022)

He has done an internship at Technocolabs Softwares during May 16, 2022 to July 4, 2022.

His work in his words:

In my Internship; We have done a one project on Mortage Backed Securities Prepayment Ability Prediction. In this project first we done a data cleaning on 2,60,000 raws data. And then we performed a EDA(Exploratory Data Analysis) using statistical techniques and interpret data. Then we performed a feature engineering and use Binary Encoding Technique and Hash Encoding to encode categorical variable. To build a machine learning model we tried different scaling techniques. We used Random Forest Classifiers and Linear Vector Classifier for model building. For deployment we used Django and Flask in backend; and had a final deployment on heroku."

"Pramiti Inauguration"

The Department of Mathematics and Humanities organized an event to release the 1st edition of Pramiti, Departmental Annual magazine. Dr. Jayesh M. Dhodiya, Head of the Department, began the session welcoming and presenting a bouquet to Prof. A. K. Shukla, Prof. V. H. Pradhan, and Prof. Neeru Adalaka. Then the three faculty members continued the session addressing the release of the magazine. Afterwards, the session was continued by Dr. Jayesh M. Dhodiya by presenting the document to the members present in the session. Then the session continued by appreciating the committee members involved in preparing the document. Then a photo session was arranged with faculty and students of the annual magazine committee.The session concluded with a vote of thanks and high tea.

"Teachers Day"

The Department of Mathematics and Humanities organized an event on the occasion of the birth anniversary of Dr. Sarvepalli Radhakrishnan, which is celebrated as Teachers Day. Ms. Vandana Kakran opened the session by discussing the works of Sarvepalli Radhakrishnan. The session was continued by presenting the Departmental video. Then the session was continued by presenting a bouquet to the faculty members and teaching assistants. A cake cutting ceremony was arranged for the teachers day celebration. Then the session ended with a vote of thanks given by Academic Affairs Secretary, Mr. Sarvesh. The event concluded with tea and snacks.

"Interaction with Prof. V. P. Saxena"

The Department of Mathematics and Humanities organized a series of talks by Prof. V. P. Saxena. There were three sessions by the professor, where the first two talks were delivered on the 30^{th} August 2022. The first session was started by Dr. Jayesh M. Dhodiya, Head of the Department, by inviting Prof. V. H. Pradhan to present a bouquet and introduce prof. V. P. Saxena. Then the first session continued by Prof. V. P. Saxena, where he interacted with the faculty members of the Department. In this session, he gave his insights to the faculty members on the importance of a wide range of research areas. Then the second session was organized on the same day, where he interacted with the research scholars of the department. At first, he began the session with an expert lecture and then continued to talk about the importance of mathematics in a variety of fields and gave some useful tips on how to work on improving their research work. Then the third session was organized on the 31st August 2022. for the M.Sc. students, where he interacted with the students and clarified various queries. Then the sessions are concluded with a vote of thanks and high tea.

Expert Lecture on "Basics of FEM and solution of singular perturbation problems, singular problem with cubic B-splines"

The Department of Mathematics and Humanities organized an expert talk on 4th August, 2022 entitled "Basics of FEM and solution of singular perturbation problems, singular problem with cubic B-splines" by Dr. K N S Kasi Viswanadham. Dr. K. N. S. Kasi Viswanadham is a Professor of Mathematics at National Institute of Technology, Warangal.

The session was started by Dr. Jayesh M. Dhodiya, Head of the Department where the head welcomed and presented a bouquet to Dr. Viswanandham. The session was handovered to the speaker and the speaker has gone through the basics of Finite Element Method and further moved on with solutions of perturbation problems using cubic B-splines. During the session, the speaker has provided various examples to showcase how the process progresses. The session concluded with a vote of thanks and high tea.

Workshop on "Article Writing"

On August 24th and 25th, 2022, the Department of Mathematics and Humanities organized an Article Writing Workshop. The aim of the programme is to enable students to creatively write articles without malpractice. On the 24th, the workshop was inaugurated by Dr. Jayesh M. Dhodiya. He welcomed the speakers, Prof. V. H. Pradhan, Dr. Urvashi Kaushal, and Miss. Nisha Pokharna, and all the participants, and he mentioned that they should better use the opportunity by learning for the workshop and publishing the same articles in AMaThing.

The first session of the workshop was taken by Prof. V. H. Pradhan. In a talk called "Basics and Importance of Article Writing," which Prof. Pradhan gave, he told students to be creative when writing articles. The second session of the talk was taken by Dr. Urvashi Kaushal, titled "How to Write an Article." Dr. Kaushal has given a brief introduction to the use of grammar and various resources which could help in writing, framing, and finalizing a good article.

The third session of the talk was taken by Miss. Nisha Pokharna and was titled "Poem Writing." Miss Pokharna has provided various intutions in writing the poem, which include observing nature, etc. The workshop was concluded for the first day.

On the 25th, the fourth session of the workshop was taken by Dr. Jayesh M. Dhodiya, titled "How to Write an Article in a Real World Scenario". Dr. Dhodiya has given the participants the inspiration to write the article using real-world ideas. He gave the participants a few keywords and helped them figure out how to write their articles. The workshop concluded with a vote of thanks and high tea.

"Rangoli Competition"

On October 19th 2022, the Department of Mathematics and Humanities organized a Rangoli Competition on the theme "Mathematical Pattern" for all students. In total, six teams have participated in the competition. The competition began at 16:00, and participants were provided with the guidelines of the competition along with colors. During the competition, snacks and tea were provided to the participants. The competition came to an end at 18:15. The Judge Team for the competition, composed of Prof. V. H. Pradhan, Dr. Urvashi Kaushal, and Dr. Saroj R. Yadav, have observed the rangolis, and participants in each team have provided information regarding the Mathematical Pattern behind the rangoli. The judges decided the winning teams to be Team 2 and Team 6 (tie). The judges motivated the participants, and the competition came to an end.

"Mock Interviews"

The Department of Mathematics and Humanities organized mock interviews for M.Sc., final year students from 23 August to 26 August, 2022. These sessions were intended to polish and prepare students for upcoming interviews for job and research opportunities. Students turned out for practice interviews in significant numbers, proving the sessions to be fruitful. The head of the department, Dr. Jayesh M. Dhodiya, began the session with his motivational speech. Additionally, Dr. Urvashi Kaushal provided valuable insights into effective communication during interviews, considering both verbal and non-verbal communication.

The approach she took was to place an emphasis on the strengths of the students and to provide them with strategies to deal with their weaknesses. Mock interview sessions were conducted by Mr. Sudhakar Rathod and Dr. Syeda Beenish S.M., who guided students and helped them overcome their concerns about the interview process. In mock interviews, the goal was to provide ample opportunities for students to flourish and stay confident. There were around 25 students who participated in the mock interviews, and they found the sessions beneficial.

"NET/GATE Sessions"

The Department of Mathematics and Humanities has started the NET/GATE sessions from August 25, 2022 and they will be organized at 16:00 on Thursday of every week. The intuition of the sessions is to improve the problem-solving abilities of the students, which will directly help them to crack NET/GATE. As of now, five sessions have been set up, and different Ph.D. students in the department have delivered talks in the sessions. There is a good response from students and the Department intends to continue the session for the benefit of M.Sc. students which will also help Ph.D. students in improving their teaching skills.

List of NET/GATE sessions conducted until October, 2022.

Date	Name	Торіс
25/08/2022	Lalchand Verma	Group Theory
01/09/2022	Lalchand Verma	Group Theory
08/09/2022	Jayesh Savaliya	Real Analysis
15/09/2022	Jayesh Savaliya	Real Analysis

STTP on "Computational Techniques for Physical Sciences and Engineering"

The programme was organized by Prof. V. H. Pradhan, Dr. Jayesh M. Dhodiya and Dr. Yogesh Sonvane from 19th to 23rd September, 2022 in association with the Center for Continuing Education. The Chief Guest of the programme was Prof. V. P. Saxena, Former Vice Chancellor of Jiwaji University, Indore, Madhya Pradesh. The purpose of the programme is to bring together leading academic scientists, researchers, and research scholars. This will enable them to exchange and share their experiences and research results on all aspects of computational techniques and simulation in the physical sciences.

In addition, it provides a premier interdisciplinary forum for researchers, practitioners, and educators to present and discuss innovations, trends, and challenges. It also offers some solutions adopted in the fields of Mathematical Modelling and Simulation in the physical sciences like Scientific Computation based modelling, Overview of Linux and Python programming, High performance computing, Density functional theory, Molecular Dynamics, Monte-Carlo Simulations, Data Science, Machine Learning.

STTP on Academic Writing using LaTeX

The programme was organized by Dr. Sudeep Singh Sanga and Dr. Amit Sharma from 26th to 30th July, 2022 in association with the Center for Continuing Education.

The programme succeeded in reaching out to Academicians and Research Scholars, and they have discovered Introduction to LaTeX, Writing Text Applications, Classes and Packages (Enumerate, Itemize, AMS Package), Text Formatting, Page Layout and Style, Mathematical Environments along with different formats for equations, Famous LaTeX Packages like the Chemfig command, TikZ Package, Technical References/ Bibliography database collection and citation using Jabref. Furthermore, it provided insights into how to handle tables, figures, and make wonderful presentations using beamer.

Publications

Bhagya Shree Meena, Sushil Kumar, Computational study on 2D space-time fractional single-phase-lag bioheat model using RBF and Chebyshev polynomial based space-time collocation method. Waves in Random and Complex Media online: Online on 10 October 2022. https://doi.org/10.1080/17455030.2022.2136418

Rohit Verma, Sushil Kumar, Numerical study on heat distribution in biological tissues based on three-phase lag bioheat model. Palestine Journal of Mathematics 11 (Special Issue III) (2022), 1-11

Rakesh Meena, Sushil Kumar, Solution of fractional order SIR epidemic model using residual power series method . Palestine Journal of Mathematics 11 (Special Issue III) (2022), 12-2

Yogeshwari F. Patel and Jayesh M. Dhodiya, Exact Solution of Nonlinear Newell Whitehead Segel Equation Using Semi Analytical Approach, Mathematical Methods in the Applied Sciences (WILEY) (SCIE) http://doi.org/10.1002/mma.8843

Aaishwarya Bajaj & Jayesh Dhodiya : Multi-objective quasi oppositional Jaya algorithm to solve multi-objective solid travelling salesman problem with different aspiration level, International Journal of Systems Science: Operations & Logistics, Taylor & Francis, 2022, DOI: 10.1080/23302674.2022.2127340 (SCI)

Yogeshwari F. Patel and Jayesh M. Dhodiya, Efficient algorithm to study the class of Burger's Fisher equation, International journal of applied Non-Linear Science, Vol-3, No-3, pp:242-266.(Scopus-Elsevier).

Shubha Agnihotri and Jayesh M. Dhodiya, VARIANTS OF GENETIC ALGORITHM TO SOLVE MULTI-OBJECTIVE INTERVAL SOLID TRANSPORTATION PROBLEM, Palestine Journal of Mathematics, Vol. 11 (Special Issue III)(2022), 189–201. (Scopus-Elsevier)

Patel Yogeshwari, and Jayesh M Dhodiya, Analytical approach to study water infiltration phenomenon in unsaturated soils using reduced differential transform method Songklanakarin J. Sci. Technol. 44 (3), 708–719, 2022.

Kaushal, Urvashi and Tripathi, P. Women Breaking the Silence over Violence: Revising Historiography through Sorayya Khan's Novels. Interdisciplinary Literary Studies: A Journal of Criticism and Theory, 2022. (Scopus listed) forthcoming

Anila A. Pillai and U. Kaushal. "Duryodhana, 'the leader': traced beyond 'the known'" Int. J. Indian Culture and Business Management, (Indexed in Web of science, ESCI) Vol. 27, No. 3, pp 317–335 • November 3, 2022 https://doi.org/10.1504/IJICBM.2022.126959

Archana Varsoliwala and Twinkle Singh, "Analysis of brain tumour growth model by Adomian Decomposition Method", International Journal of Dynamical Systems and Differential Equations, 2022, pp 267-280, https://doi.org/10.1504/IJDSDE.2022.125207 Archana Varsoliwala and Twinkle Singh, "Solution of Fingering Phenomenon Arising in Porous Media in Horizontal Direction by Combination of Elzaki Transform and Adomian Decomposition Method", Advances in Mathematical Modelling, Applied Analysis and Computation 2022 DOI:10.1007/978-981-19-0179-9_29

Jani, Haresh P., and Twinkle R. Singh. "A robust analytical method for regularized long wave equations." Iranian Journal of Science and Technology, Transactions A: Science, 2022: 1-13.

A Jani, Haresh P., and Twinkle R. Singh. "Solution of time fractional Swift Hohenberg equation by Aboodh transform homotopy perturbation method." International Journal of Nonlinear Analysis and Applications, 2022

Jani, Haresh P., and Twinkle R. Singh. "Aboodh transform homotopy perturbation method for solving fractional-order Newell-Whitehead-Segel equation." Mathematical Methods in the Applied Sciences.

A. Pal, R. K. Jana and A. K. Shukla, "Generalized integral transform and fractional calculus properties involving extended ${}_{p}R_{q}(\alpha,\beta;z)$ function", Journal of the Indian Mathematical Society, Vol. 89, Nos. (1–2), 2022, pp. 100–116. https://doi.org/10.18311/jims/2022/29310

D. J. Bhatt, V. N. Mishra and R. K. Jana, A study on approximation properties of Durrmeyer type operator based on beta function, Nonlinear Studies, Vol. 29, No. 2, 2022, pp. 411-427.

A. Mondal; D. K. Jana and R. K. Jana, Competition of Forward and Reverse supply chain for selling two substitutable products: novel game theory approach, Operations Research Forum, 3:66, 2022, pp. 1–34. https://doi.org/10.1007/s43069-022-00175-3

Sachin Devaiya, Shailesh Kumar Srivastava, "Error of Approximation of Functions by – C^{γ} .T – Means of its Fourier-Laguerre series," Palestine Journal of Mathematics, Vol. 11 (Special Issue III), 90–97, 2022 (Scopus Indexed, Published Online: August 01, 2022).

Conference Publications

Sunil B. Bhoi, Jayesh M. Dhodiya, Multi-objective university course scheduling for uncertainly generated courses, CRC Press, Taylor & Francis Group, Vol-1, Page-12, https://doi.org/10.1201/9781003303053

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