



**JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY**  
WAKNAGHAT, P.O. – WAKNAGHAT,  
TEHSIL – KANDAGHAT, DISTRICT – SOLAN (H.P.)  
PIN – 173234 (INDIA) Phone Number- +91-1792-257999  
(Established by H.P. State Legislature vide Act No. 14 of 2002)



## **DEPARTMENT OF MATHEMATICS**

### **A Report on**

### **One-week Workshop on “Fundamentals of Differential Equations with Applications to Real World Problems”**

**Dates: (8<sup>th</sup> July -13<sup>th</sup> July 2024)**

The Department of Mathematics organized one week workshop entitled “Fundamentals of Differential Equations with Applications to Real World Problems” from 8<sup>th</sup> to 13<sup>th</sup> July 2024 in Jaypee University of Information Technology, Wagnaghat, Solan, Himachal Pradesh. The aim of the workshop is to provide participants with a solid foundation in the basic concepts and techniques of differential equations and to illustrate how differential equations are used to model and solve real-world problems in various fields.

The eminent resource persons for this workshop were Prof. Syed Abbas, School of Mathematical and Statistical Sciences, IIT Mandi, Dr. D. N. Pandey, Department of Mathematics, IIT Roorkee, Dr. Bidhan Chandra Sardar, Department of Mathematics, IIT Ropar, and Dr. Tanmay Sarkar, Department of Mathematics, IIT Jammu.

The topics covered by these experts in the workshop were as follows:

- Existence, uniqueness and continuation of solutions of Ordinary Differential Equations
- Stability theory with applications to Mathematical Modeling
- Introduction to Differential Inclusion and its application to Mathematical Modeling and Electrical/Mechanical Engineering
- Introduction to Multi-scale Analysis, Asymptotic expansion method with applications
- Advection equation, Burgers' equation, weak solutions, Riemann problem with applications

The session had a huge response, with 47 outstation attendees in attendance and 6 research scholars of the organizing department. The attendees included a varied variety of faculty members and researchers from India's prominent institutes like IIT's, NIT's, central universities and state universities from all over India.

The Workshop concluded successfully under the patronages of Prof. Rajendra Kumar Sharma, Vice Chancellor and Prof. Ashok Kumar Gupta, Dean of Academics. The convenor for the workshop was Prof. Rakesh Kumar Bajaj (HOD), Department of Mathematics. All the events of the workshop was skillfully organized under the co-ordinatorship of Dr. Bhupendra Kumar Pathak, Dr. Saurabh Srivastava, and Dr. Mandeep Singh of the Department of Mathematics. All the research scholars participated in the workshop as well contributed in organizing this event with full dedication.

The workshop received excellent feedback from the participants. They considered it incredibly precious and beneficial. Participants reported feeling more confidence in their abilities to explain topics simply and efficiently. They got familiar with the latest advancements in differential equations and its implementation in real world problems. They noticed that their Differential equations learning and teaching skills have improved. Participants provided feedback to help enhance future events.



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This one-week workshop on “Fundamentals of Differential Equations with Applications to Real World Problems” was a great success, and participants gained valuable knowledge to help them enhance their research and teaching abilities. The workshop's participatory style, materials, and delivery were all well received by the participants. Overall, the workshop achieved its objectives and had a significant impact on the participants. All participants who enrolled themselves and attended the workshop also received certificates after the completion of the workshop.





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### List of Participants (53)

Sr. No.	Name of Participant	Affiliation of the Participant
1	Anil Kumar Pal	Thapar Institute of Engineering & Technology, Patiala
2	Dr. Deepak Gupta	Govt. Degree College Solan
3	Prof. Dr. Kalpana N. Pawar	Shivaji Science College, Nagpur, Maharashtra
4	Dr. Pradeep Kumar	Brahmanand P. G. College (CSJMU), The Mall, Kanpur
5	Dr. Preeti Devi	Govt. Degree College Solan
6	Dr. Rupesh Kumar Srivastav	Dr. Shivanand Nautiyal Government Post Graduate College, Chamoli
7	Dr. Sanjay Yadav	University of The People, USA
8	Dr. Satish Rathod	Rashtrasant Tukdoji Maharaj Nagpur University
9	Dr. Saurabh Kumar	Gautam Buddha University
10	Dr. Trushit Kumar Patel	University of The People, USA
11	Dr. Varun Kumar	University of The People, USA
12	Dr. Vidhya Tejpal Chauhan	Shivaji Science College, Congress Nagar Nagpur
13	Dr. Ankit Kumar Nain	National Institute of Technology Hamirpur
14	Bholanath Kumbhakar	Indian Institute of Technology Roorkee
15	Biren Karmakar	University Of Kalyani
16	Brij Mohan	University of Delhi
17	Darshana Devi	Tezpur University
18	Deeksha	Indian Institute of Technology Roorkee
19	Dipankar Patgiri	Gauhati University
20	Kanta	Central University of Haryana
21	Khurshida Parvin	Gauhati University
22	Kirti	Central University of Punjab
23	Komal	Central University of Haryana
24	Kuldeep Singh	University of Delhi
25	Laxman	Central University of Himachal Pradesh
26	Manoj Kumar	Indian Institute of Technology Mandi
27	Mitali Maji	Presidency University Kolkata
28	Namrata Arya	Banaras Hindu University



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29	Niladari Ghosh	University Of Kalyani
30	Pankita Kachari	Tezpur University
31	Piyali Das	University Of Kalyani
32	Pooja Yadav	Central University of Haryana
33	Prajwal Gupta	Banaras Hindu University
34	Pranab Jyoti Hazarika	Gauhati University
35	Punam Madhukar Lambat	S. S. E. S. Amravati's Science College, Congress Nagar, Nagpur
36	Ruprekha Devi	Gauhati University
37	Santana Mondal	Presidency University Kolkata
38	Satyabhan Singh	Banaras Hindu University
39	Sharmila	Central University of Haryana
40	Shashank Pandey	Indian Institute of Technology Roorkee
41	Shivam Kumar Mishra	Indian Institute of Technology Mandi
42	Sombir	Central University of Punjab
43	Subrat Kumar Nayak	Indian Institute of Technology Madras
44	Sukanta Dutta	University of Kalyani
45	Suparna Dash	Presidency University Kolkata
46	Tarun Kashyap	Central University of Himachal Pradesh
47	Vijay Kumar Singh	IIT (BHU), Varanasi
48	Himanshu Dhumras	Jaypee University of Information Technology, Wagnaghat
49	Jyoti	Jaypee University of Information Technology, Wagnaghat
50	Monika	Jaypee University of Information Technology, Wagnaghat
51	Muskan Kapoor	Jaypee University of Information Technology, Wagnaghat
52	Sonali	Jaypee University of Information Technology, Wagnaghat
53	Suyash Parkash Chauhan	Jaypee University of Information Technology, Wagnaghat



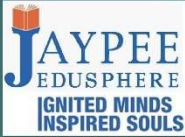

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## Flyer of the Workshop

One Week Workshop  
on  
**“Fundamentals of Differential Equations with Applications to Real World Problems”**  
 Date: 8<sup>th</sup> to 13<sup>th</sup> July 2024  
**Department of Mathematics**

**Venue: Jaypee University of Information Technology, Wagnaghat (Shimla Hills), Himachal Pradesh, INDIA**

**Chief Patrons**  
 Sh. Jai Prakash Gaur  
 Founder Chairman, Jaypee Group  
 Sh. Manoj Gaur  
 Executive Chairman, Jaypee Group

**Patron**  
 Prof. (Dr.) R. K. Sharma  
 Vice Chancellor, JUIT, Wagnaghat

**Dean (A&R)**  
 Prof. (Dr.) Ashok K Gupta  
**Finance Chair & Registrar**  
 Maj Gen (Retd.) Rakesh Bassi

**Important Dates**  
 Workshop Registration Begins: 05/04/2024  
 Workshop Registration Closes: 20/05/2024  
 Registration Payment Closes: 20/05/2024


**Registration Fee \* Details**

Category	Reg. Fee. (in INR) Till 10th May 2024	Reg. Fee. (in INR) Till 20th May 2024
Research Scholar / PG Student	3000/-	3500/-
Faculty/Others	4000/-	4500/-
Industry Participant	4500/-	5000/-

\* Reg Fee includes accommodation, Food & Welcome Kit

**Registration Link**  
<https://forms.gle/75cFis6ThnxcWM127>

**QR Code for Registration**



**Payment & Account Details**  
 NAME OF BENEFICIARY : JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY  
 NAME OF THE BANK : PUNJAB NATIONAL BANK  
 BRANCH NAME : SHIMLA  
 ACCOUNT NUMBER : 0427002100682105  
 RTGS/IFSC CODE : PUNB0042700

**Coordinators:**  
 Dr. Bhupendra K Pathak (98161 81519)  
 Dr. Saurabh Srivastava (99972 00244)  
 Dr. Mandeep Singh (83603 13092)  
**Email ID:** bhupendra.pathak@juitsolan.in

**Convener:**  
 Prof. (Dr.) Rakesh K Bajaj  
 HoD, Department of Mathematics, JUIT,  
 Wagnaghat, HP. Mob. 98163 37725

**About the University**

The Jaypee University of Information Technology (JUIT), Wagnaghat (Shimla Hills), was conceived by a joint vision of the Govt. of Himachal Pradesh and the Founder Chairman of Jaypee Group Shri Jai Prakash Gaur in 2000. The University campus is spread over 25 acres of lush green picturesque slopes of Wagnaghat hills in the Solan District of Himachal Pradesh. The smart campus is pollution free and enjoys lovely weather throughout the year. JUIT offers a challenging academic environment to its students. It aims to instill the habit of life-long learning and therefore, provides a learner-centric rather than a teacher-centric educational process. The system has been designed to provide students the freedom to learn what they want to learn at a desired pace.

**About the Department**


The Department of Mathematics is committed to impart high quality education in Mathematics at Undergraduate and Doctoral levels. The young and dynamic faculty members of the department have versatile experience both in teaching and research in various fields of Mathematics. In addition, the department runs its own Bachelor's degree B.Sc. (Hons.) in Mathematics and Computing & Ph.D. in Mathematical Sciences.

**About the Workshop**


This workshop is intended for Ph.D. students/PG Students/faculty in the universities and research institutions, participants from industry and others with the aim to enlighten the valuable insights into the fundamentals and latest advancements in differential equations. This workshop will be indeed immensely helpful to the researchers who are already familiar with the basics of DEs. Some of the highlights of the workshop are:

- Existence, uniqueness and continuation of solutions of Ordinary Differential Equations
- Stability theory with applications to Mathematical Modeling
- Introduction to Differential Inclusion and its application to Mathematical Modeling and Electrical/Mechanical Engineering
- Introduction to Multi-scale Analysis, Asymptotic expansion method with applications
- Advection equation, Burgers' equation, weak solutions, Riemann problem with applications


**Resource Persons**




**Dr. Syed Abbas**  
 Professor,  
 School of Mathematical  
 and Statistical Sciences,  
**IIT Mandi**



**Dr. D. N. Pandey**  
 Associate Professor,  
 Department of  
 Mathematics,  
**IIT Roorkee**



**Dr. Bidhan C Sardar**  
 Assistant Professor,  
 Department of  
 Mathematics,  
**IIT Ropar**



**Dr. Tanmay Sarkar**  
 Assistant Professor,  
 Department of  
 Mathematics,  
**IIT Jammu**







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## Flex of The Workshop

**JAYPEE EDUSPHERE** **IGNITED MINDS INSPIRED SOULS** **INSTITUTION'S INNOVATION COUNCIL** **JUIT** **ACCREDITED WITH GRADE A+ NAAC**

**One-week Workshop on**  
**Fundamentals of Differential Equations with Applications to Real-World Problems**  
(08 - 13 July, 2024)  
**Department of Mathematics**

			
<b>Dr. Syed Abbas</b> IIT Mandi	<b>Dr. D. N. Pandey</b> IIT Roorkee	<b>Dr. Tanmay Sarkar</b> IIT Jammu	<b>Dr. Bidhan Chandra Sardar</b> IIT Ropar

**Coordinators:** Dr. Bhupendra Kumar Pathak, Dr. Saurabh Srivastava, Dr. Mandeep Singh **Convenor:** Prof. Rakesh Kumar Bajaj

**Jaypee University of Information Technology, Waknaghat, Solan (H.P.)**