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MAHATMA HANSRAJ FACULTY DEVELOPMENT CENTRE

(A centre of MoE, Government of India, under PMMMNMTT scheme)

Hansraj College, University of Delhi

NAAC A+ CGPA 3.62, NIRF Rank #9

Malka Ganj, Delhi-110007



सत्यमेव जयते

Website: www.mhrfdc.in

Email: fdp.hrc@gmail.com

Memorandum of Understanding (MoU)
between
Mahatma Hansraj Faculty Development Centre, Hansraj College, University of Delhi
and
Vivekananda College, University of Delhi

This is in reference to your proposal received at MHRFDC through an email regarding conduct of a Faculty Development Programme on "**MATHEMATICAL ANALYSIS AND ITS APPLICATIONS**" (via online mode). We are pleased to inform you that we are interested in the same for the dates (**July 26 - 31, 2021**). The following terms and conditions are agreed upon by the two parties:

1. Registration fee of **Rs. 500** per participant will be charged by MHRFDC.
2. Registration fee is **non-refundable**, which will also be mentioned on the Brochure clearly.
3. The registration link for the programme will be generated and the meeting will be hosted by MHRFDC (preferably on zoom or on any other available platform).
4. Brochure of the programme must be circulated in public domain, minimum at least 15 days before the programme.
5. Remuneration to Resource Person (i.e. **Rs. 2,000** per session) will be provided by MHRFDC.
6. Attendance of participants in all sessions will be taken and monitored by MHRFDC team.
7. A minimum criterion of attendance is to be met for issuance of FDP Certificate.
8. Feedback form link will be circulated by MHRFDC team after the valedictory session of the programme.
9. Registration for FDP will be through online mode only, Google form/ MHRFDC website link will be provided by MHRFDC.
10. E-certificates to all participants, convener, coordinator and appreciation letters to resource persons will be provided by MHRFDC.
11. Online programme link (zoom / online available platform) will be shared by MHRFDC in the participant's whatsapp group and through email.
12. Each session will be recorded and will be shared only after the consent of the Resource Persons.
13. Rules and regulations about the programme will be shared by MHRFDC team through whatsapp/ email in the participant's group, one day before commencement of the programme.
14. Certificate of participation will be provided to only registered participants (who have paid the registration fee).
15. Organising team members including Programme Convenor and Coordinator of the host institution will not pay the registration fee for attending all the sessions and the said members will get the certificates as per the details mentioned in Brochure only (participation certificate will not be issued).



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List of requirements from host institution (Vivekananda College, University of Delhi)

1. Proposal from host institution (Vivekananda College, University of Delhi).
2. The content for the Brochure shall be provided by the host institution (including the names of organising team members) which includes the topic name, duration (with dates), live sessions timing.
3. **Programme Schedule** (July 26 - 31, 2021) of FDP with details of session topics and the name of resource persons will be provided by the host institution along with the content of Brochure.
4. The coordination with the resource persons and coordination of the sequence of events during the programme will be carried out by the coordinator of the programme from host institution.
5. Assessment / Test of FDP will be taken online by the host institution (daily basis/ last day) as applicable. MCQs will be provided by the host institution and proofread of the prepared Google form for assessment.
6. The **report** (both session wise and consolidated) of the programme must be mailed by the Programme Convener/Coordinator to MHRFDC (fdp.hrc@gmail.com) within **three days** of the completion of the programme.
7. Certificates of the host institution organising committee will be given after receiving the FDP report.
8. Composition of host institution team:
 - i) Chief Patron (Principal/Director/Vice-Chancellor/Head of the Institution)
 - ii) Convenor (One)
 - iii) Coordinator (One)
 - iv) Member of organizing team (maximum two)

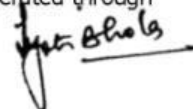
NOTE:

The Terms and Conditions of MHRFDC in reference to collaboration with other institutions are subject to change programme wise, in light of the proposal and fund generated through the registration fee / availability of funds with MHRFDC.

Date: 03rd July, 2021


(FDP Convenor/ Coordinator)
Vivekananda College, University of Delhi





(Vice Chancellor/ Director/ Principal)
Vivekananda College, University of Delhi


(Coordinator)
MHRFDC


(Chairperson)
MHRFDC


1.ii. Poster


The poster features a central graphic of various mathematical tools including a ruler, a protractor, a compass, and a pencil, all in vibrant colors. The background is a mix of olive green and dark grey. At the top, there are logos for Vivekananda College, the Ministry of Education, Government of India, and the University of Delhi. The text is arranged in a clear, hierarchical manner, starting with the college name and accreditation, followed by the program details, dates, and contact information for both participating institutions.

VIVEKANANDA COLLEGE
(NAAC "A" GRADE)
University of Delhi
Vivek Vihar , Delhi-110095
<http://www.vivekanandacollege.edu.in>

is organising
**ONE WEEK
ONLINE FACULTY DEVELOPMENT PROGRAMME**
on
**Mathematical Analysis and its
Applications**




@hrcduofficial

 Register by
scanning QR code
Last Date:
22nd July, 2021

**Live
Sessions**
10:00 a.m. - 1:15 p.m.
July 26 –31, 2021

in collaboration with
Mahatma Hansraj Faculty Development Centre
(A Centre of MoE, Govt. of India under PMMMNMTT Scheme)

HANSRAJ COLLEGE
(NAAC A+ CGPA 3.62, NIRF Rank #9)
University of Delhi
Mahatma Hansraj Marg, Malka Ganj, Delhi-110007
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 fdp.hrc@gmail.com
 www.mhrfdc.in

1.iii. Report

The FDP began with an inaugural session on July 26, 2021 with introductory speech by Dr. Ritika Nagpal followed by presenting a video of lighting the lamp before Maa Saraswati. Welcome address was given by Dr. Hina Nandrajog (Principal, Vivekananda College), Mrs. Anju Nagpal (FDP Coordinator). They apprised the audience about the programme “Mathematical analysis and its applications”, its objectives and learning outcome and emphasized about the importance of applications of Analysis in an academic set up.

The Inaugural address was followed by announcement of a set of instructions for the participants by Dr. Sandhya Jain (FDP Convener).

DAY-WISE REPORT

The program was held over the course of six days, two live sessions per day. The FDP covered a wide array of topics including their real life applications. At the end of each day, participants were given one-hour library time to do self study. At the end of all sessions one MCQ-based assessment was given to test their grasp of the topics and feedback form was also given so that program can be improved in the best manner

Day 1: 26th July, 2021 (Monday)

Session I: The first session of the FDP focused on “Inequalities and their connection with function spaces” and was delivered by Prof. Pankaj Jain (Professor, South Asian University). The session began with a welcome address by Dr. Ritika Nagpal. The session included the topics of functional inequalities. Prof. Jain had mentioned the important role of inequalities in several areas of Mathematical Sciences the lecture of Prof. Pankaj Jain was started with the basic school time inequalities, e.g. the relationship between the Harmonic Mean, Geometric Mean and Arithmetic Mean Geometric Mean and Arithmetic Mean. The first inequality he introduced was Holder’s inequality. He also discussed the Minkowski’s inequality and mentioned several cases on different parameters. Next, Sir had connected the relation of inequalities with the sequence space and described the properties of norm on the sequence space. Prof. Jain had highlighted several norms to introduce the Banach space. Furthermore, speaker talked about the connection of Holder’s inequality and Minkowski’s inequality with the sequence space. Prof. Jain had discussed the integral form/continuous form on the sequence space and introduced measurable functions named as Lebesgue space. The session ended with the vote of thanks expressed by Dr. Ritika Nagpal to the Speaker for his valuable share of knowledge and very interesting and informative talk.

Session II: The second session was held on the topic “Toral Automorphism” by Prof. Tarun Das (Professor, Department of Mathematics, University of Delhi). The session began with a welcome note by Mrs. Seema Taneja.

Prof. Das began his session by introducing the basics of Algebra followed by the results on symmetries, homeomorphism and automorphisms. He perfectly spotlighted the geometrical concepts of torus, the integral matrices with determinant $+ 1$ and -1 and discussed Total Automorphism on the quotient. The session ended with the vote of thanks expressed by Mrs. Seema Taneja to the Speaker for his very interesting and informative talk.

The presentation of both speakers enhanced their topic and made participants easy to understand. Both sessions were highly interactive and engaging.

Day 2: 27th July, 2021 (Tuesday)

Session I: The first session of the day was on “Mathematical analysis in learning theory” and the resource person was Dr. Sivananthan Sampath (Associate Professor, IIT Delhi). The session began with welcoming the speaker by Mrs. Preeti Chhachhia.

Dr. Sampath began his session by introducing the reproducing kernel Hilbert space. He gave an example of Sobolev space. After that he defined the notion of positive definite kernel. He also established that there is a one-one correspondence between the RKHS and the symmetric positive definite kernel and then discussed about the construction of RKHS using a given kernel K . Some concrete examples of positive definite kernel were also given along with regularization. The talk ended with a vote of thanks to the speaker given by Mrs. Preeti Chhachhia.

Session II: The second Session was on “Stability and Bifurcation- An Introduction” and the talk was given by Prof. Peeyush Chandra (Retired Professor, IIT Kanpur). The session started with the welcome and introduction of the speaker by Dr. Shivani Dubey.

The session started with the introduction of Ordinary differential Equation. In this talk, Prof. Chandra defined basic terminologies and form the base for Stability and Bifurcation. To that end, he defined critical points and linearization. He gradually defined the concept of Stability and phase plane analysis of linear and non linear system. As the audience got familiar with linear stability, he discussed the notion of non linear stability.

Prof. Chandra finally discussed about the Bifurcation and gave some examples. Advanced topic and Models of ecological system were left for the next session. At the end of the session, Dr. Shivani Dubey thanked the speaker for giving such a wonderful and an informative session. She further added that we are grateful for the time and effort you took to share your expertise knowledge with us.

Day 3: 28th July, 2021 (Wednesday)

Session I: The first session was conducted on “Modeling and Analysis of ecological system with harvesting” again by Prof. Peeyush Chandra (Retired Professor, IIT Kanpur). The session began with a welcome note by Dr. Shivani Dubey.

The session was in continuation of the last session delivered by him. Prof. Chandra started with the definition of model and gradually developed several standard models like General Prey-Predator model, non-dimensional model etc. He gave interesting examples on several models. In his talk, we have studied the existence of saddle node Bifurcation with the help of Sotomayor's theorem. He also established the global stability result of unique interior equilibrium point. Prof. Chandra's talk was very interesting and knowledgeable. He inspired and motivated us toward the development of Covid-19 model which is very celebrated topic in the recent time. The talk ended with the vote of thanks given by Dr. Shivani dubey.

Session II: The second session was held on “Mathematical analysis in learning theory” again by Dr. Sivananthan Sampath (Associate Professor, IIT Delhi). The session started with the welcome of the speaker by Mrs. Preeti Chhachhia.

In this session, Dr. Sampath introduced learning with the help of examples. This lecture was in continuation of the last session which was delivered by him on the same topic. He then defined some learning algorithms and discussed about convergence analysis for regularized learning algorithms. Dr. Sampath discussed a very interesting example of continuous Glucose monitoring from a human body which provide an estimated BG-values in every 5 or 10 minutes.

The talk was very interesting in the sense of real life applications of Analysis. The session ended with thanking the speaker for his valuable efforts by Mrs. Preeti Chhachhia.

Day 4: 29th July, 2021 (Thursday)

Session I: The opening session on Day 4 included a talk on the topic “Operators on Hilbert space and Positivity” which was delivered by Prof. Harish Chandra (Professor, Banaras Hindu University). The session began with welcoming the speaker by Dr. Sandhya Jain.

Prof. Harish Chandra started his session with the introduction of Hilbert spaces including basic results. He then defined bounded linear operators on a Hilbert space. As the basic terminologies developed, he moved to self adjoint Operators and also discussed their comparison with real numbers. Finally, he characterized positive Operators and compared them with positive real numbers. The session was very interactive and engaging. Prof. Chandra invited participants to send their queries personally. The talk ended with thanking the speaker by Dr. Sandhya jain.

Session II: The next session was on the topic “Weighted Shifts on directed graphs and their applications” and delivered by Prof. Sameer Chavan (Professor, IIT Kanpur). The session started with a welcome note and introduction of the speaker by Mrs. Seema Taneja.

In the first half of his talk, he overviewed the theory of weighted shifts on directed graphs. He also defined the notion of circularity and explained the topic through the help of interesting examples. In the second half, he discussed the role of weighted shifts on directed graphs in the wandering subspace problem and the Cauchy dual subnormality problem. He concluded his talk with some open problems. The session was very engaging and ended with a vote of thanks given by Mrs. Seema Taneja.

Day 5: 30th July, 2021 (Friday)

Session I: The topic for the first session was “Discontinuity at fixed points and applications to Neural networks” and the honorable speaker was Prof. R. P. Pant (Professor, Kumaun University). The session began with welcoming the speaker by Dr. Ritika Nagpal.

Prof. Pant started his talk by introducing Fixed point theorem. He then discussed the problem of continuity at fixed points. He established the existence of fixed points and discussed continuity and discontinuity at those points by developing some concepts like k -continuous self mapping. He illustrated the theorem in Euclidean case. Finally he gave application of the above theorem in Neural networks with discontinuous activation function. The talk was full of interesting areas of Analysis. He motivated all participants to do research in this area. The session ended with thanking the speaker by Dr. Ritika Nagpal.

Session II: The title of the session was “Wavelet transform” and the resource person was Dr. Ashish Pathak (Assistant Professor, Banaras Hindu University). The session began with welcome address by Mrs. Anita Bakshi.

The session started with the introduction of wavelet in Sobolev space over local fields of positive characteristics. He then defined the concept of Multilevel Wavelet Packets in Sobolev Space over Local Fields of positive Characteristic and gave many interesting examples. He also introduced biorthogonal wavelets and biorthogonal wavelet packets in Sobolev space over local Fields of positive Characteristic. Finally he discussed about wavelets for Non-uniform Non-Stationary MRA on $H^s(K)$. The session ended with a vote of thanks given by Mrs. Anita Bakshi.

Day6: 31st July 2021 (Saturday)

Valedictory Session

A valedictory session was held to mark the end of the six-day journey of the FDP on the July 31, 2021 in august presence of Dr. Hina Nandrajog (Principal, Vivekananda College), Dr. Sandhya Jain (FDP Convener), Mrs. Anju Nagpal (FDP Coordinator) and all the Faculty members of the Department of Mathematics of Vivekananda college. The valedictory session was duly conducted to honour the dignitaries as well as the speakers, panelists and the participants.

The session started with a welcome address by Dr. Shivani Dubey. The session was addressed by Mrs. Anju Nagpal (FDP Coordinator) who delivered a formal vote of thanks and congratulated all participants for successful completion of the FDP and learning about Mathematical analysis. She heartily congratulated and appreciated the entire organizing teams for their efforts for the smooth conduct of the program. She also encouraged that more advance programs should be organized as it has become very integral part of the academia. They appreciated the resource persons for their presentations. At the end, Dr. Sandhya Jain concluded the FDP and spoke at length about the benefits of such kinds of programmes that are increasingly relevant in the field of higher education in this pandemic. She further added that these kind of educational programmes are very encouraging for the teaching fraternity. She expressed her gratitude to the guests for their gracious presence and thanked the Resource Persons, Panelists, Members of Organizing Team and all the Participants for their enthusiastic cooperation.

1.iv.Screenshots

The image displays two screenshots from a Zoom webinar. The top screenshot shows a man with a mustache, identified as Dr. Sivananthan Sampath, speaking and gesturing with his right hand raised. The bottom screenshot shows a slide titled "Algebraic Compendium Model for Two-Species with Harvesting" and "Bifurcations". The slide contains two theorems:

Theorem
The system (25) undergoes a saddle-node bifurcation around $S(\bar{x}, \bar{y})$ with respect to bifurcation parameter β_1 , when $AB > 0$, $B^2 - 4AC = 0$ and $\gamma_1 > \frac{B}{2A}$.

Theorem
The system (25) undergoes a transcritical bifurcation between $S_2 = (0, \gamma_2)$ and $S_* = (x_*, y_*)$ with respect to bifurcation parameter α_1 if $\alpha_1 = \frac{\gamma_1}{\gamma_2} = \frac{\beta_1}{\beta_2}$.

Zoom Webinar | You are viewing Dr. Ashish Pathak's screen | View Options

Recording Paused

Wavelets on local fields of positive characteristic

Ashish Pathak
Assistant Professor
Department of Mathematics, Institute of Science
B.H.U., Varanasi - 221005, India
FDP Mathematical Analysis and its Applications
26th July - 31st July 2021

July 30, 2021

Dr. Sandhya Jain

Preeti Chhachhia

Preeti Chhachhia

Anita Bakshi

Unmute | Start Video | Participants (39) | Q&A | Chat | Share Screen | Raise Hand | Resume/Stop Recording | Leave

Type here to search

11:43 30-07-2021

Zoom Webinar | You are viewing Dr. Ashish Pathak's screen | View Options

Switch to Shared Content | Remove Pin | Recording Paused

Anita Bakshi

Unmute | Start Video | Participants (40) | Q&A | Chat | Share Screen | Raise Hand | Resume/Stop Recording | Leave

Type here to search

11:44 30-07-2021

1.v..Attendance

SNO.	Title	Name	Total Attendance (OUT OF 11)
1	Dr.	Abhay Kumar	11
2	Ms.	Adiba Naz	11
3	Mr.	Ajay Kumar	4
4	Ms.	AMARPREET KAUR SABHERWAL	4
5	Mr.	Ankit Kumar	11
6	Mr.	Arabind Kumar	11
7	Mr.	Ashish Kumar	11
8	Ms.	Babita Bist	8
9	Dr.	Balendra Pratap Singh	11
10	Ms.	BHAWNA BANSAL GUPTA	11
11	Mr.	CHANDRA PRAKASH	11
12	Dr.	CHANDRA PRAKASH BAN	10
13	Dr.	Charu Arora	9
14	Dr.	Chintaman Tukaram Aage	8
15	Dr.	Devendra Kumar	11
16	Dr.	Dinesh Kumar	9
17	Dr.	DURVESH KUMAR VERMA	11
18	Ms.	GAYATRI TANWAR	11
19	Ms.	Geeta Rani	11
20	Ms.	HARSHA KHARBANDA	11
21	Ms.	Harshita Shekhar	11
22	Mr.	Kapil Kumar	8
23	Dr.	Karunesh Kumar Singh	11
24	Dr.	Kavita	11
25	Ms.	Komal	11
26	Ms.	Komal Deswal	11
27	Dr.	Majid Ali Choudhary	11
28	Dr.	Manisha Aggarwal	11
29	Ms.	Manju Devi	11
30	Dr.	Manoj Kumar	11

31	Ms.	MEENAL SAMBHOR	11
32	Ms.	Megha Madan	11
33	Dr.	Monika Yadav	9
34	Dr.	Mradul Veer Singh	11
35	Mr.	MUKESH AGGARWAL	10
36	Mr.	Muthu Meena Lakshmanan, Esakkivelu	11
37	Mr.	Nabaraj Adhikari	11
38	Mr.	Naresh Kumar Kodam	11
39	Ms.	NIKITA MITTAL	11
40	Mr.	Om Prakash Meena	11
41	Dr.	Palvinder Kaur	11
42	Mr.	PANJABI SINGH	11
43	Dr.	Pankaj Mishra	11
44	Ms.	Parul	11
45	Dr.	Pawan Kumar	2
46	Mr.	Piyush Bansal	8
47	Ms.	Poonam Meena	11
48	Ms.	Poonam Saini	11
49	Dr.	Poonam Sharma	11
50	Ms.	Prachi Gupta	1
51	Dr.	Praveen Kumar	11
52	Dr.	Preeti	9
53	Ms.	Preeti Chhachhia	11
54	Dr.	Priyambada Tripathi	0
55	Mr.	Rahul Panchal	11
56	Dr.	Raj Kamal	11
57	Dr.	Rajender Kumar	11
58	Ms.	Rajni Gupta	11
59	Dr.	Ravi Parkash Bhokal	9
60	Ms.	Reetika Chawla	11
61	Miss	Renu Choudhary	9
62	Dr.	Ritika Nagpal	11
63	Ms.	Ritu	11
64	Dr.	S.Padmasekaran	9
65	Dr.	Saikat Kanjilal	11
66	Ms.	SALONI GUPTA	11
67	Mr.	Sandeep Bhatt	9
68	Dr.	Sarita Rani	11

69	Ms., Dr.	Sariya Bano	8
70	Dr.	Satish Verma	0
71	Mr.	Satpal singh	11
72	Mr.	Saurav Kumar	10
73	Ms.	SAVITA DAHIYA	11
74	Dr.	Seema Khurana	11
75	Dr.	Shailendra Kumar Bharati	8
76	Dr.	Shivani dubey	11
77	Ms.	Sonia	11
78	Dr.	Subedar Ram	5
79	Ms.	Sudesh	11
80	Dr.	Sunila Sharma	4
81	Ms.	Surksha	9
82	Dr.	Sushomita Mohanta	11
83	Ms.	Vandna Pandey	9
84	Mr.	Vikendra Singh	0
85	Mr.	Vishal Khare	11
86	Mr.	Vishwas Khare	11
87	Mr.	Rohit Goel	0
88	Dr.	Chirag Garg	8