Report

FDP-73 One Week Interdisciplinary Online FACULTY DEVELOPMENT PROGRAMME Organised by

Department of Computer Science, kalindi College

On

"Applications of Al-Machine Learning and Soft Computing Techniques"

29th Jan - 3rd Feb 2022 (1:30 pm to 5:00 pm) in collaboration with

MAHATMA HANSRAJ FACULTY DEVELOPMENT CENTRE

(A Centre of MoE, Govt. of India under PMMMNMTT Scheme)

HANSRAJ COLLEGE

Hansraj College Organising Team

Prof. (Dr.) Rama

Principal, Hansraj College & Chairperson, MHRFDC

Coordinator, MHRFDC: Dr. Jyoti Bhola Dy. Coordinator, MHRFDC:Mr.Ashutosh Yaday

Kalindi College Organising Team

Chief Patron : Prof Naina Hasija (Principal, Kalindi College)

Convener: Dr. Nidhi Arora(Associate Professor, Computer Science, Kalindi College)

Coordinators : Dr. Sapna Varshney (Assistant Professor, Computer Science, kalindi College)

Ms. Kanishka Bamania (Assistant Professor, Computer Science, kalindi College)

A one-week Interdisciplinary Faculty Development Programme was organized by Kalindi College in collaboration with Mahatma Hansraj Faculty Development Centre, Hansraj College, University of Delhi from 29th Jan - 3rd Feb 2022. The objective of this FDP is to present recent trends and provide the guidelines to explore Machine Learning and Soft Computing techniques for research work in varied fields of applications and research.

The Artificial Intelligence field is in its best phase currently driving the whole world with Machine Learning algorithms. These buzzwords have therefore now part of all the fields where data handling is required , be it commerce, physics, chemistry, Mathematics, zoology, Business administration , geography even humanities , languages, artistic and related fields , you name a work area , and you will find good application of Machine learning techniques .

The aim of the FDP was to dedicatedly provide training in this field, and to open varied applications of Machine learning to varied fields. This FDP provided a basic understanding of Machine Learning to our interdisciplinary attendees and give them ample space and clues to carry on their research work by using these techniques in their fields.

With 82 registrations from teaching and research scholars not only from Delhi/NCR but also from other states of India, the FDP was organized successfully, with 10 very informative and active sessions. Details of all sessions along with their report are listed below.

Day 1 (Saturday) - 29 Jan 2021

1:00 - 1:30 PM

Inauguration

Co-ordinators:

Dr. Sapna Varshney

Ms. Kanishka Bamania Inaugaral of the FDP started with a warm welcome of the respected Principal Ma'am, Prof. Naina Hasija of Kalindi College who joined for the inaugural event; and Principal Ma'am, Prof. Rama of Hansraj College for their constant support, encouragement and guidance; Dr. Jyoti Bhola (Co-ordinator), Mr. Ashutosh Yadav (Deputy Co-ordinator) and their team from Mahatma Hansraj Faculty Development Centre, Hansaraj College in organizing the FDP; all the experts / resource persons who will be enlightening the audience with knowledgeable sessions; Kalindi College organizing team – FDP convenor Dr. Nidhi Arora, Dr. Sapna Varshney and Ms. Kanishka Bamania as co-ordinators.

Prof. Naina Hasija, Principal Kalindi College, enlightened the audience with her words of wisdom and encouragement. Dr. Nidhi Arora, FDP Convenor also welcomed everyone and presented her thoughts about the FDP. The participants were told about the rules to be followed regarding proceedings of the FDP. Inaugural ended with a vote of thanks to the Principal Ma'am, organizing committee from Hansraj College and Kalindi College and the resource persons.





1:30 - 3:00 PM

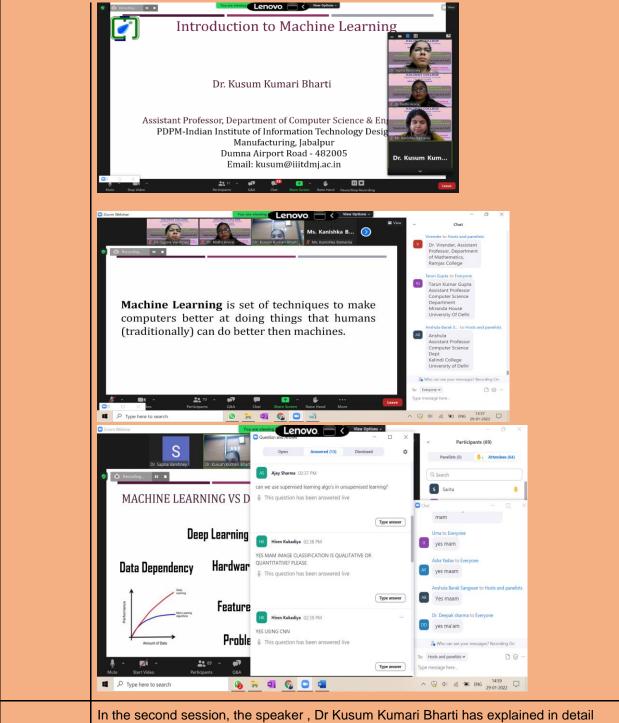
Session 1:

Introduction to Machine learning

Co-ordinator:

Dr. Sapna Varshney The session started by welcoming the resource person and the participants to the first session of the FDP. The resource person for this session: Dr. Kusum Kumari Bharti, Assistant Professor at Indian Institute of Information Technology, Design and Manufacturing, Jabalpur, Madhya Pradesh, was introduced.

In the session, an introduction to Machine Learning (ML) was given – general tasks in ML, how performance can be measured, how ML models can be built on some dataset. Examples of ML problems were discussed. Branches of ML – supervised, unsupervised, reinforcement learning were explained. A very brief introduction to deep learning was also given. The resource person also discussed differences between Machine Learning and Deep Learning. Several questions were asked by the participants related to the session which were answered to their satisfaction by the resource person. The session concluded with a vote of thanks to the resource person. The participants were informed to join again for Session 2 of the day.



3:30 - 5:00 PM

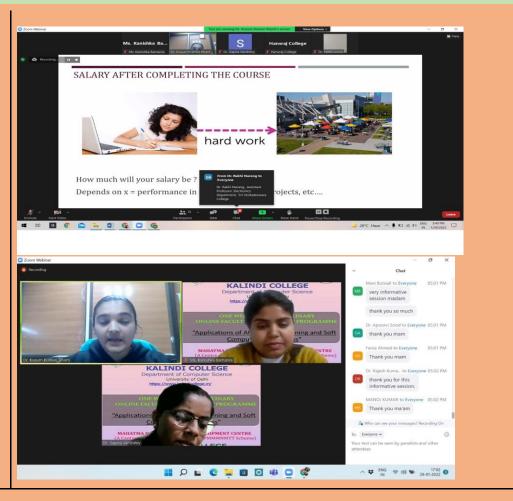
Session 2:

In the second session, the speaker, Dr Kusum Kumari Bharti has explained in detail "How Linear Regression is done with one variable". It was a very informative and indepth plenary session indeed. All the questions raised by the participants were answered on the spot. In the end, she gave a hands-on example also on python platform for the participants for a clear understanding and practical aspect. In the end, the session concluded with a vote of thanks to the speaker.

Simple Linear Regression

Coordinator:

Ms. Kanishka Bamania



Day 2 (Monday) - 31 Jan 2021

1:30 - 3:00 PM

Session 1:

Supervised Learning with Naive Bayes Algorithm

Coordinator: The session started by welcoming the resource person and the participants to the first session of the FDP. The resource person for this session: Dr. Ashish Kumar Tripathi, Assistant Professor with the Department of Computer Science & Engineering, Malviya National Institute of Technology (MNIT), Jaipur, was introduced. In the session, a basic introduction to Machine Learning (ML) was given. The session progressed with a discussion of supervised learning algorithms - attributes of a dataset, label of data instances - to make predictions on unknown data. How to build and train a model and then testing the model to improve accuracy of the model in making predictions. Naive Bayesian classifier was discussed in detail with the help of an example for better understanding of the participants. Several questions were asked by the participants related to the session which were answered to their satisfaction by the resource person. The session concluded with a vote of thanks to the resource person. The participants were informed to join again for Session 2 of the day.

Second session started by welcoming the resource person and the participants. The resource person for this session: Dr. Mukesh Saraswat , Associate Professor at Jaypee Institute of Information Technology, Noida was introduced. The session started with the

Dr. Sapna Varshney

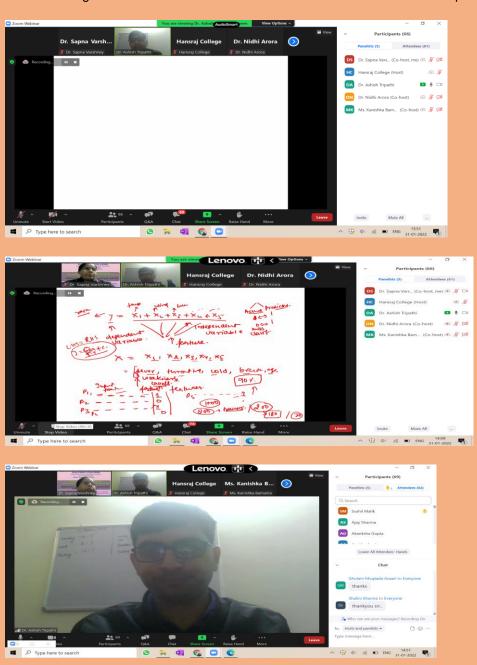
3:30 - 5:00

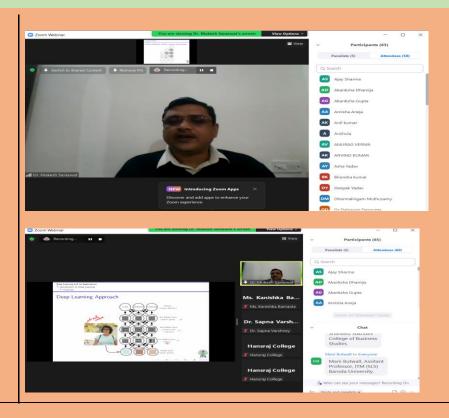
Session 2:

Introduction to Deep Learning and its Application

Coordinator:

Ms kanishka Bamania Introduction to "Deep Learning" and why it is important. The session proceeded with discussion on various different approaches to Deep learning. A wide range of applications of Deep learning were discussed. Many important aspects like Image classification, classification with localization, object detection, Semantic segmentation, Instance Segmentation, Image classification on Imagenet Dataset were discussed. Also the challenges faced by Deep learning approaches were also discussed. Perceptron , Multi-output Perceptron , Multi-Layer Perceptron Diagrams explained thoroughly. Neural Network explained step-by-step with a real- life example for a complete and better understanding. The session concluded with a vote of thanks to the resource person.





Day 3 (Tuesday) - 1 Feb 2021

1:30 - 3:00 PM

Session 1:

Bag-of-words for Classification

Co-ordinator:

Dr. Sapna Varshney

3:30 - 5:00 PM

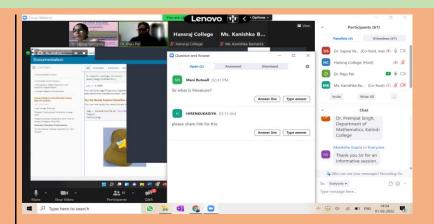
Session 2:

Swarm and Evolutionary Optimization The session started by welcoming the resource person and the participants to the first session of the FDP. The resource person for this session: Dr. Raju Pal, Assistant Professor at Jaypee Institute of Information Technology, Noida, was introduced.

In the session, a basic introduction to Image Classification, applications of image classification and challenges were presented. The session progressed with a detailed discussion of a supervised Machine Learning algorithm, Bag-of-words for Classification (originally for text classification), for medical image analysis - basic framework, feature extraction, feature encoding (each medical image is converted to bag of visual words / histogram), training the model (SVM, or K-means), testing the model, and evaluation metrics were discussed. Hands-on demo was given to the participants on MATLAB software. Several questions were asked by the participants related to the session which were answered to their satisfaction by the resource person. The session concluded with a vote of thanks to the resource person. The participants were informed to join again for Session 2 of the day.

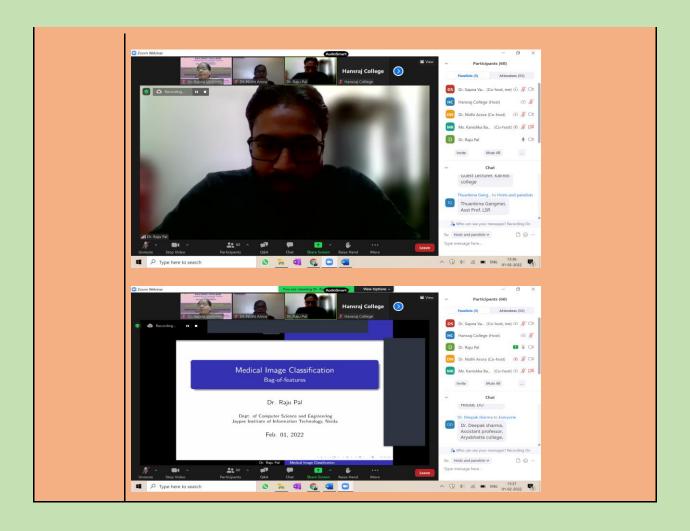
Coordinator:

Ms Kanishka Bamania



Second session started by welcoming the resource person and the participants. The resource person for this session: Dr. Mukesh Saraswat , Associate Professor at Jaypee Institute of Information Technology, Noida was introduced. The session started with a basic introduction to "The Optimization and the problems related with it". A Mathematical representation of Optimization Problem with an example explained. Two basic Optimization methods: 1) Deterministic and 2) probabilistic were discussed. After that many algorithms like Nature inspired algorithms and Evolutionary algorithms were discussed thoroughly. In Swarm based optimization, a step by step procedure explained on particle swarm optimization. After that Optimization in computer vision explained briefly with Image classification and Image Segmentation were explained in brief. All the questions imposed by the participants were resolved on the spot by the resource person. The session concluded with a vote of thanks to the resource person.





Day 4 (Wednesday) - 2 Feb 2021

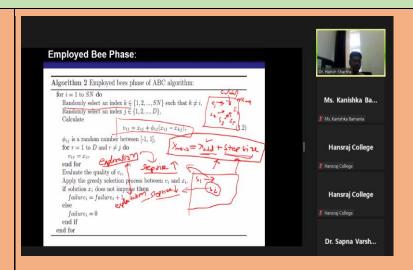
1:30 - 3:00 PM

Session 1:

Artificial Bee Colony
Optimization

Co-ordinator:

Ms Kanishka Bamania The session started by welcoming the resource person and the participants to the first session of the FDP. The resource person for this session: Dr. Harish Sharma is an Associate professor at Rajasthan Technical University, Kota in Department of Computer Science & Engineering. The session started with an introduction to the "Employed bee phase algorithm" which was further elaborated and explained step by step. Later on , continuing the topic a step by step procedure of the Artificial Bee Colony (ABC) algorithm was explained throughout the session with focusing on so many intriguing measures. Some questions were asked by the participants related to the session which were answered to their satisfaction by the resource person. The session concluded with a vote of thanks to the resource person. The participants were informed to join again for Session 2 of the day.



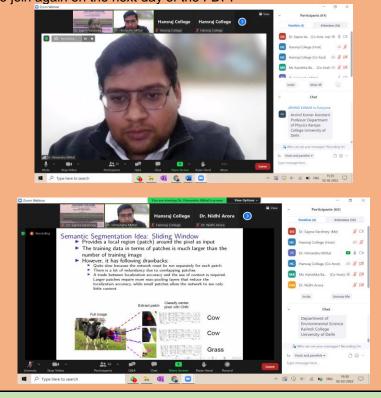
3:30 - 5:00 PM

Session 2:

Convolutional Neural Network, Deconvolution and Semantic Segmentation

Co-ordinator:

Dr. Sapna Varshney The session started by welcoming the resource person and the participants to the first session of the FDP. The resource person for this session: Dr. Himanshu Mittal, Assistant Professor at Jaypee Institute of Information Technology, Noida, was introduced. In the session, description of Convolutional Neural Network (CNN), architecture of CNN, basic operations in a CNN was given. Application of CNN for Computer Vision - Semantic Segmentation - was described in detail. Case studies and approaches of CNN were discussed. Deconvolution neural network was also described. Several questions were asked by the participants related to the session which were answered to their satisfaction by the resource person. The session concluded with a vote of thanks to the resource person. The participants were informed to join again on the next day of the FDP.



Day 5 (Thursday) - 3 Feb 2021

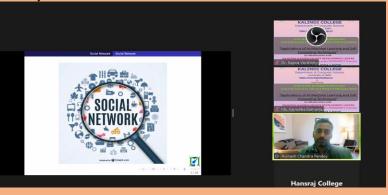
1:30 - 3:00 PM

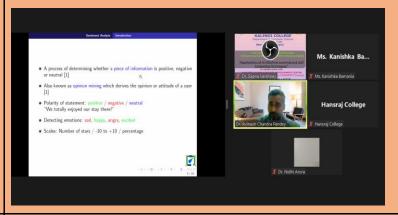
Session 1:

Computational Intelligence for Social Network Analysis The session started by welcoming the resource person and the participants to the first session of the FDP. The resource person for this session is Dr. Avinash Pandey.: Dr. Avinash Pandey is an Assistant Professor at Indian Institute of Information Technology, Design and Manufacturing, Jabalpur, Madhya Pradesh. The session started with an introduction to the "Social networking" which continued with explanation of two aspects of social networking i.e; Analyze the network and Analyze the information. Sentiment analysis methods which is part of analyzing the information were discussed briefly. After this , a demonstration on Developing a Sentiment analysis method was done using supervised learning approach. Some questions were asked by the participants related to the session which were answered to their satisfaction by the resource person. The session concluded with a vote of thanks to the resource person. The participants were informed to join again for Session 2 of the day.

Co-ordinator:

Ms Kanishka Bamania





3:30 - 5:00 PM

Session 2:

Guidelines for Machine

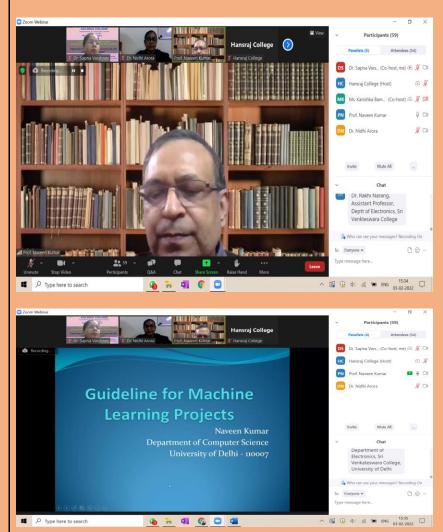
The session started by welcoming the resource person and the participants to the concluding session of the FDP. The resource person for this session: Prof. Naveen Kumar, Department of Computer Science, University of Delhi, was introduced. In the session, the historical perspective of Machine Learning and Deep Learning was presented. Courses on ML and DL on online learning platform Coursera were mentioned. Earliest successful ML models, setting up datasets, classifier accuracy, size of dev/test sets, evaluation metrics, how to improve accuracy of classifiers, regularization, normalizing inputs, learning curve related issues were discussed. The

Learning Applications

session summarized the ML concepts with points to ponder about while working on a machine learning task. It was a very interactive session with many questions discussed with the participants related to the session. The session concluded with a vote of thanks to the resource person. The participants were informed to join for the Valedictory session for conclusion of one-week FDP.

Co-ordinator:

Dr. Sapna Varshney

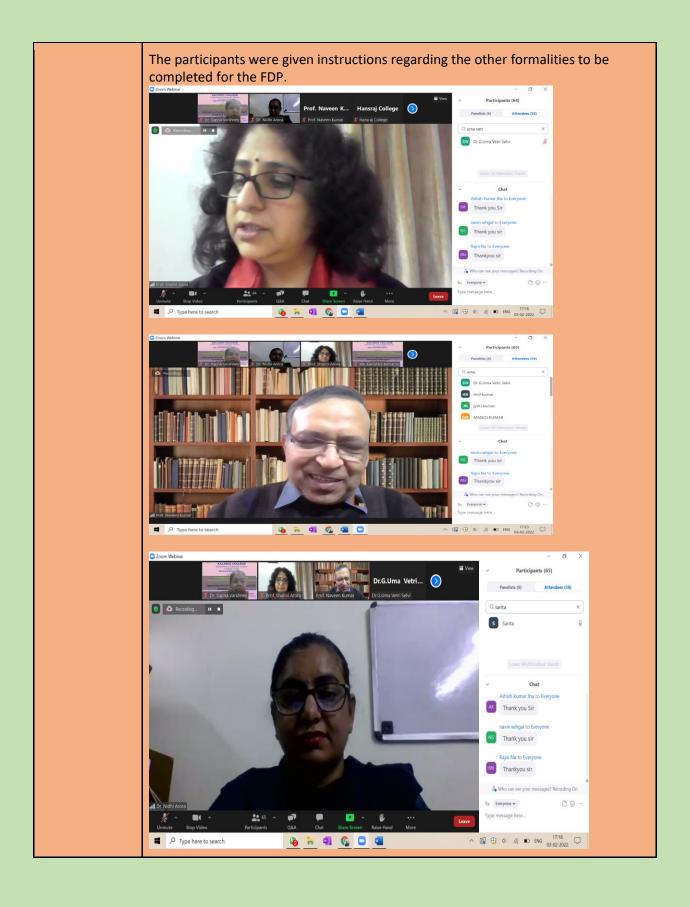


5:00 PM

Valedictory Session

Co-ordinator:

Dr. Sapna Varshney After the last technical session of the FDP, Valedictory session started by extending a vote of thanks to the respected Principal Ma'am, Prof Naina Hasija, Kalindi College and Prof. Rama of Hansraj College for their unwavering support and encouragement, all the resource persons for their time and knowledgeable sessions; and all the participants for their patient participation during this week. The Guest of Honour, Prof. Shalini Arora at IGDTUW, Delhi and Special Guest as well as Resource Person, Prof. Naveen Kumar at the Department of Computer Science, University of Delhi were welcomed. Prof. Arora and Prof. Kumar shared their thoughts and enlightened the audience with their words of wisdom. Prof. Naina Hasija, Principal Kalindi College, also graced the occasion with her presence. Several participants were invited to share their thoughts about the FDP. The valedictory session concluded with a formal vote of thanks by Dr. Nidhi Arora, FDP Convenor.



Basic Computer and IT Skills

Value Added Course by Department of Computer Science, Kalindi College. 27 January,2022

Event Report

- Event Name-Basic Computer and IT Skills.
- Department- Computer Science Department.
- Name of the TIC/Convenor/Coordinator/Other-Ms. Arokia Ramya (Course Coordinator), Dr. Nidhi Arora(Course Convenor), Dr. Rini Pundhir(Convenor, Value Added Course Committee), Mr. Rajesh Kumar Meena(Co-Convenor, Value Added Course Committee)
- Date/s (-to-) and time (-to-) of activity-27th January 2022 to16 th February 2022, 5:15 p.m.-7:15 p.m.
- Collaborating agency, if any- CETPA Infotech Pvt. Ltd. D-58, Sector-2, Near Red FM. Noida -201301, Noida, Uttar Pradesh, Uttar Pradesh 201301.
- Number of students and Teachers- 88 students (including 3 student volunteers) + 4 teachers (Dr. Rini Pundir, Dr. Rajesh Kumar Meena, Dr. Nidhi Arora, Ms. Arokia Ramya).
- Number of participants from outside of Kalindi College None
- Google Meet Link- https://meet.google.com/frf-xqqc-yvo
- Proofs to be attached-
 - 1.Poster/Banner etc.-Attached
 - Schedule of the course-Attached
 - 3. Google attendance sheet of all participants-Attached
 - 4.Feedback form responses-Attached
 - 5.Name of Resource person/s-
 - i) Ms.Arokia Ramya, Assistant Professor, Department of Computer Science, Kalindi College.
 - ii) Mr. Karthik Ahuja, Digital Marketing Trainer, CETPA Infotech Pvt.Ltd.
 - iii) Mr.Sanjeev Kumar-CCNA and CCNP Trainer, CETPA Infotech Pvt.Ltd.
 - 7. Names of student coordinators
 - i) Divya Singh B.Sc.(H) Computer Science 1st year

- ii)Yachna Rupwal B.Sc.(H) Computer Science 1st year
- iii) Kunjal Singh B.Sc.(H) Computer Science 2nd year
- 8. Detailed Report-Attached
- 9. Certificate Sample-Attached
- 10. Geotagged Photographs-Attached
- 11. Newspaper clip or photograph if published: NA

Main Poster of the Event



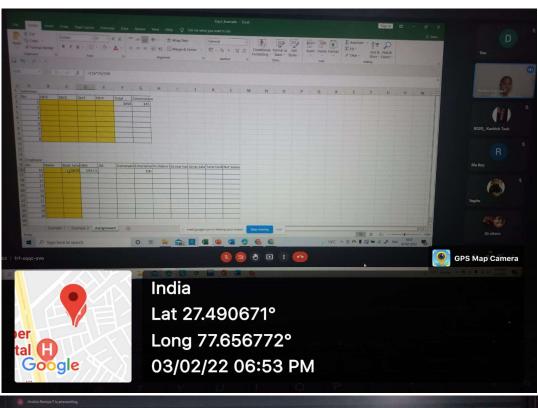
Short description of the event:

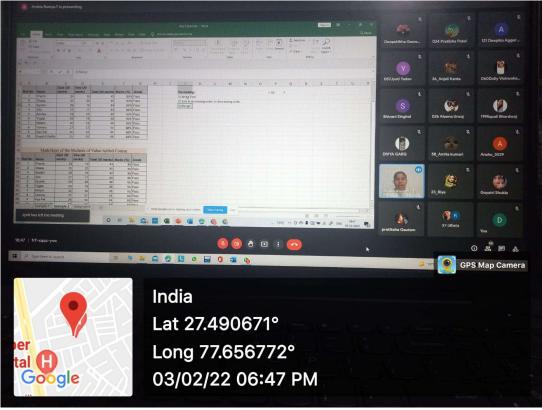
The Computer Science Department of the Kalindi College in collaboration with Value Added Course Committee of the Kalindi College had organised a 15 days Value Added Course on Basic Computer and IT Skills from 27th January 2022 to 16th February 2022 in online mode by taking live sessions from 5:15 p.m.to 7:15 p.m.(Monday to Friday) for non-Computer Science background students in association with Cetpa Infotech Private Limited, D-58, Sector-2, Near Red FM. Noida -201301, Uttar Pradesh 201301. The course has marked a large number of registration from 635 students, out of which 85 students belonging to Humanities and Science stream were selected for the course.

The course was inaugurated by Ms. Arokia Ramya who introduced the resource person Mr.Kathik Ahuja to their participants. Divya Singh anchored the inaugural session. She gave the basic instructions to the students and emphasised on their eligibility criteria for the certificate. Karthik started the session on Word processing software with the necessity of basic computer knowledge in our day-to-day life. The word processing software were taught by Karthik sir for 3 days with the theory for 1 hour, in continuation with practical hands-on session for next 1 hour. The basics of Word Processing software such as opening and closing of the existing documents, creation of new blank document, the creation and manipulation of the text using cut, copy, paste operations, the formatting of text by changing different font type, size, style; Table handling operations; spell check, language setting and thesaurus operation; printing of word document.

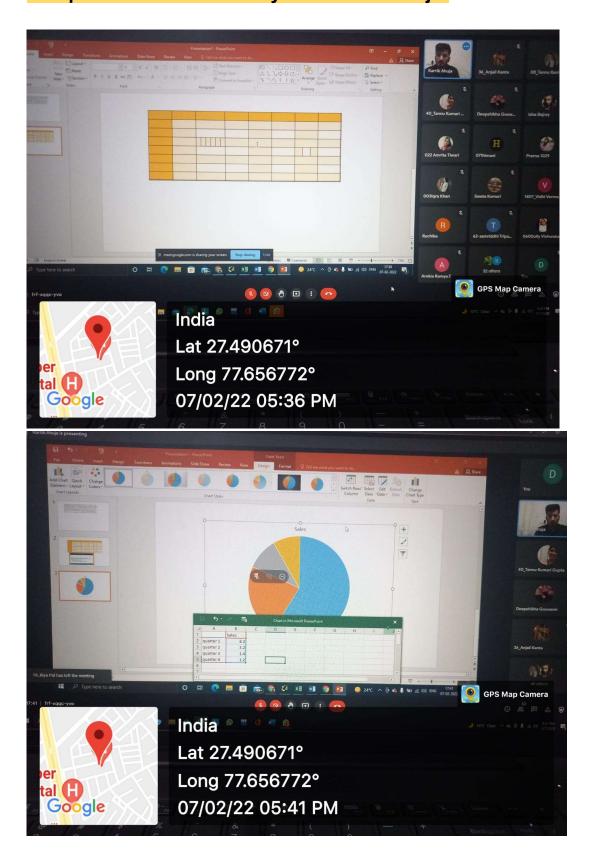
The resource person of MS-Excel spreadsheet software is Arokia Ramya. She begun the session from basics of the spreadsheet and taught the students about the operations such as manipulation of cells, formulas and functions, editing and printing of spreadsheet. The performance of the students was assessed throughout the session such as uploading the weekend assignments related to the previous topic, they learnt in Google classroom. The study material related to the topic were also uploaded in the Google classroom by the organizing team.

Glimpse of session taken by the resource person, Ms. Arokia Ramya-

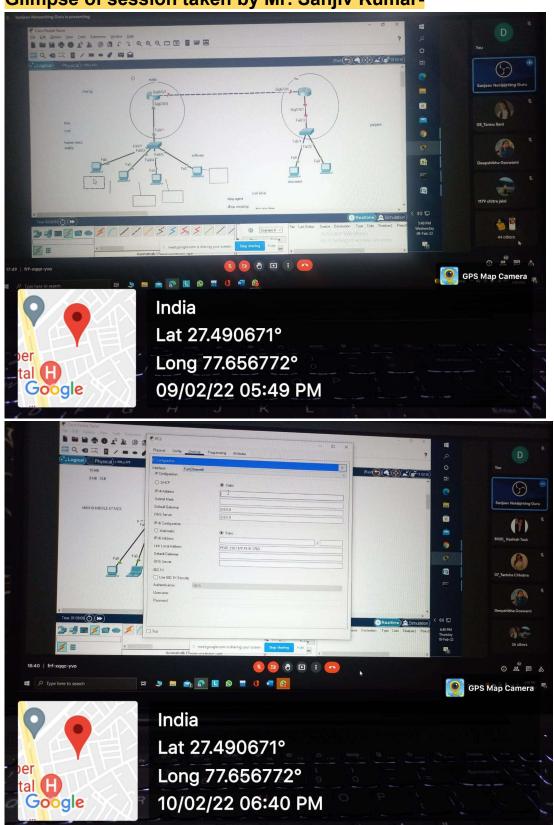




Glimpse of session taken by Mr. Karthik Ahuja-



Glimpse of session taken by Mr. Sanjiv Kumar-

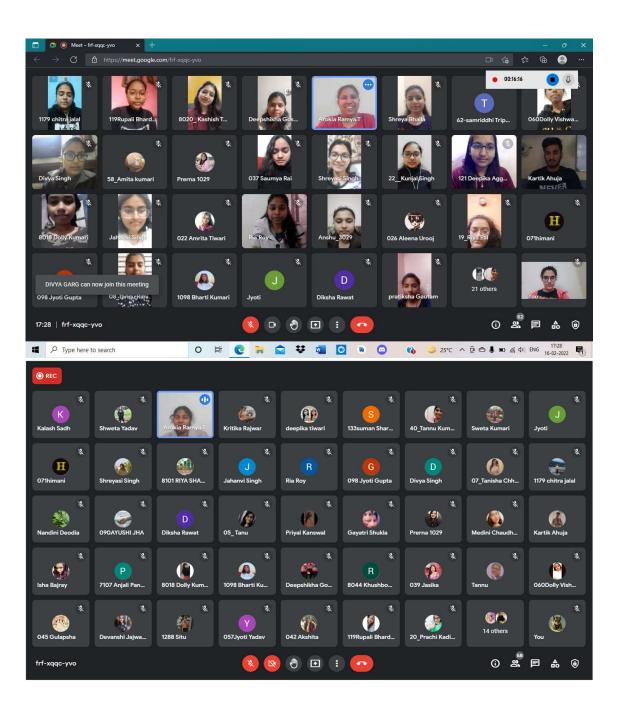


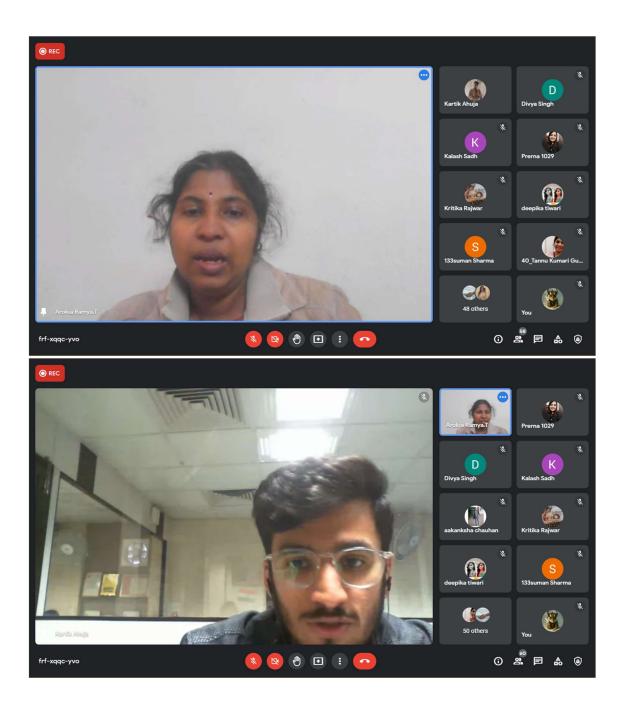
Mr. Karthik Ahuja taught them about the MS Word, MS Power Point, awareness of useful mobile applications such as UMANG application, Digi-Locker, financial mobile applications like UPI, BHIM, PhonePay. The basics of PowerPoint presentation software such as opening, creating and closing of the presentation & slideshows, making tables & graphs in a slide were explained in an elaborate way. The classes used to end with Question and Answer session where the students sorted out their doubts with the instructor.

Mr. Sanjeev Kumar had introduced the students to internet, World Wide Web, web browser, computer and internet security. The basics of computer network such as troubleshooting of URL, domain name, IP address is explained with the network simulator software. The session on awareness of dark web, strong passwords, cyber security threats was taken with the real time examples in our daily life.

The last session of the course was quite overwhelming as students share their learning experience. The students also pour their heart their out as they expressed their gratitude. The session was concluded with the Vote of Thanks by the Arokia Ramya, Course Coordinator of the course with the best wishes to the participants for their future endeavours.

At the end, the participants were asked to appear the final Multiple-Choice Quiz through google forms on the 16th February 2022 from 7:30 PM to 8:00 PM and viva by the external examiner Dr. Diksha Grover, guest teacher, Kalindi College on 19th February 2022 and 20th February 2022 from 2 PM to 5 PM in two slots. There were 54 students has done exceptionally very well on all grounds such as attendance, active participation in the classes, weekend assignments, viva and MCQ test and earned their certificate. There were students benefitted from the value added course belongs to different courses namely B.COM, B.A Programme, B.A(H) Political Science, B.A(H) Sanskrit, B.A(H) History, B.A(H) Journalism, B.A(H) English, B.Sc(H) Physics, B.Sc(H) Maths, B.Sc(H) Chemistry, B.Sc Life Science and B.Voc Web Designing.





Schedule of the Course

Schedule for Value Added Course starting from 27th January 2022 to 16th Timing: 5:15 pm-7:15 pm

S.No	Topic	Syllabus Outline	#Hours	Date
1	Understanding Word Processing in MS Office Word Software	Word Processing Basics; Opening and Closing of documents; Text creation and Manipulation; Formatting of text; Table handling; Spell check, language setting and thesaurus; Printing of word document.		27-01-2022 28-01-2022 31-01-2022
2	Using Spread Sheet in MS Office Excel Software	Basics of Spreadsheet; Manipulation of cells; Formulas and Functions; Editing of Spread Sheet, printing of Spread	6 (3 days)	01-02-2022 02-02-2022
3	Making Small Presentation in MS Office PowerPoint	Basics of presentation software; Creating Presentation; Preparation and Presentation of Slides; Slide Show; Taking printouts of presentation / handouts.	6 (3 days)	04-02-2022 07-02-2022 08-02-2022
4	Introduction to Internet, WWW and Web Browsers	Basic of Computer networks; LAN, WAN; Concept of Internet; Applications of Internet; connecting to internet; What is ISP; Exploring the Internet; Basics of internet connectivity related troubleshooting, World Wide Web; Web Browsing softwares, Search Engines; Understanding URL; Domain name; IP Address; Using e-governance website		09-02-2022 10-02-2022
5	Computer and Internet Security	Awareness of Dark web, Usage of strong password, Identifying Cyber security threats, vulnerabilities & risks, Introduction to Virus, Malware, Spam, Antivirus Software	4 (2 days)	11-02-2022 14-02-2022
6	Digital Financial Tools and its applications	Awareness of different types of Financial Tools such as UPI, AEPS, eWallet etc., Internet Banking, Online Bill Payment	2 (1 day)	15-02-2022

7	Tools in Computer and	Conversion of files types(JPEG to PDF), Video Editing Software, Digital Locker, Accessing E-Governance services using UMANG App		16-02-2022
		Total	30 hours	
8	Viva Assessment			23-02-2022 (Tentative)