A Report on the National Level One Week Familiarization Workshop on

"Remote Access to Lab: Lab on a screen"

A National Level One Week Familiarization Workshop on "Remote Access to Lab: Lab on a Screen" has been organized by Jorhat Kendriya Mahavidyalaya, under the aegis of Incubation Innovation Center, IOAC, Department of Zoology, Botany, Chemistry and Physics, JKM, and in association with Department of Physics, Jorhat Engineering College, Jorhat; Department of Electronics, University of Jammu, and Chitkara University, Himachal Pradesh .The main objective of the workshop was to familiarize the concept of Virtual Lab which is a modern and effective educational system of E-Learning platform and to provide training on how to use Virtual Lab on a screen so as to give the students with a comprehensive knowledge about the new technologies.

The event commenced on virtual platform on 27th of July 2021 with the inaugural session.The National workshop was inaugurated by the Honourable chief guest , Vice Chancellor of Dibrugarh University, Prof. L.K Nath Sir with the virtual ligting of the lamp followed by the welcome address by the Principal of JKM Dr.Dulen Saikia Sir. Addressing to all the dignitaries he gave a brief introduction to the objectives of national workshop on Virtual Labs, and the different types of Virtual Labs available on online platforms such as Labster, O-Lab, Praxi -Lab. E -Lab, PhET, 3 D Lab etc and its operation Techniques. In the inaugural address by Honble Vice Chancellor of Dibrugarh university Prof L.K Nath ,Sir acknowledged the importance of virtual lab and extended his gratitude towards Jorhat Kendriya Mahavidyalaya for its initiative for organising this Workshop .It was followed by the remarks by special guest of honors Prof.Ananthakrishnan Srinivasan ,Prof,Dept. of physics IIT ,Guwahati; Prof. Jiten Hazarika ,Registrar, Dibrugarh university, Guest of honors, Prof. Parveen k. lehana , Dept, of Physics, university of Jammu, Prof. Rakesh Vaid ,Prof. Dept. of electronics. University of Jammu Dr .K.K. Mishra ,Associate Director Accreditation and Quality assurance cell. Chitkara university, Himachal Pradesh. All of them encouraged the use of virtual labs for doing the experiments so that the students can gain a complete knowledge of theory as well as the practicals. The event was witnessed by faculty members and students from various institutes across India.

The one week workshop comprised of 5 Technical Sessions ,4 Practice Teaching Sessions conducted by guest speakers from different institutes and faculty members of Jorhat Kendriya Mahavidyalaya on the subjects, Physics, Electronics ,Chemistry ,Biotechnology and English.

Technical Session-I, Physics +Electronics Lab on 27th July 2021 at 2-5 pm.

There were three speakers, Dr Dulen Saikia, Principal JKM, Dr.Sidananda Sarmah ,Technical Officer, Dept. of Physics,IIT Guwahati and Prof. Rakesh Vaid Sir, Dept. of Electronics, University of Jammu.

Coordinator of session was Mr. Rajiv Bordoloi, HOD, Dept. of Physics. JKM

Dr. Dulen Saikia, described about the virtual lab and its applicability in different subjects i. e.; Physics, Chemistry and Biology for practical experiments.

Sir demonstrated two Physics experiments through Phet virtual lab – 1) Circuit connection kit: DC, 2) Faraday's law.

Then through the Praxi Virtual Lab Sir demonstrated "Measurement of Ohmic resistance".

and through O Lab "Transistor characteristic" and using the same lab he demonstrated one chemical science experiment in the field of molecular absorption spectroscopy "Effect sample concentration of absorbance: Beer law" and "Ohms law" too.

Dr. Sidananda Sharma first explained about "Bread Board and the connection of ICs in Bread Board" also he has discussed basic logic gate (NOT, OR, AND) and Universal gates (XOR, NAND). Sir has demonstrated six Electronics practical experiments through IIT Guwahati Virtual Lab, 1) Test of AND gate, 2) Test of OR gate, 3) Test of XOR gate, 4) Test of NAND gate, 5) Half adder using the logic gate, 6) Full adder using the logic gate.

Prof. Rakesh Vaid initially explained about the Microprocessor and different important parts of the microprocessor. Briefly discussed Architecture Pie diagram of 8085 Microprocessor and also explained about block diagram of 8085 Microprocessor. Sir demonstrated a program practically through IIT Bombay virtual lab, Microprocessor interfacing lab "addition of two 8bit numbers" and also executes the different program. Sir, also successfully addressed a lot of queries from students attending the session.

Practice session -I (28th July, 2021) from 11-12.30pm..

Speaker of the session – Sabikur Rehman, Asst. Prof. Dept of Physics, JEC.

"Mechanics and Magnetism",

Rahman Sir demonstrated three experiments, namely,

1) "Moment of inertia of a flywheel"

2) "Hall effect experiment: determination of charge carrier density"

3) "Determination of plank's constant" experiment.

The speaker also successfully addressed a lot of queries from students attending the session.

Technical session –II, Physics + Electronics Lab (28th July, 2021) at 2-5pm.

Speaker for the session was Dr Hrishikesh Chakrabarty, Assistant Prof, Department of Physics, Jorhat Engineering College, Assam.

Described about “Errors in Measurement Accuracy, Precision, error propagation, data analysis”. He has explained about the importance of uncertainity , how do error propagate , how statistical analysis are done etc. He ended up the session with a great question -answer discussion round.

Second speaker was Prof. Rakesh Vaid, Department of Electronics, University of Jammu. He had started his valuable discussion on microprocessor 8085 and 8086 programming. During his discussion, he showed how a student can execute a program on computers.

During the session, the attendees shared opinions, thoughts and suggestion and also about the issues arise in laboratory activities due to covid 19 –pandemic and how the teachers and the students find a way through virtual lab to fulfill their studies.

Practice session –II (29th July, 2021) at 11-12.30pm:

Dr. Sidananda Sarmah was the speaker. He demonstrated three Physical science practical Experiment in the field of Optics,

1)Measurement of focal length of the combination of the two lenses separated by a distance

2) Measurement of wavelength of monochromatic source of light with the help of Fresnel’s Bi Prism.

To study Polarization of light using He-Ne Laser, through virtual lab, IIT Kanpur. Also demonstrated one practical Experiment in the field of Electricity, “Cary Foster Bridge to measure specific resistance of material”.

Sir demonstrated two Physics Practical Experiment in the field of Solid State Physics, (1) Resistivity by Four probe method, (2) Susceptibility measurement by Quinck’s method, using Amrita Vishwa Vidyapeetham, Virtual lab. Sir, also said importance of these experiment in the field of Research.

Sir also demonstrated four Electronics Practical Experiment, (1) Washing machine control using basic AND & NOT gates. (2) Basic NOT gate and its application in Fuel level indicator, (3) Seat belt warning system using basic AND & NOT gates, (4) XOR gate and its application in staircase light control, with the help of IIT Bombay, Digital application virtual lab.

Dr. Sidananda Sarmah, gave thanks to the Ministry of Education, Govt of India for Initiation to develop Virtual lab, Virtual lab development team IIT, Guwahati, IIT Kanpur, IIT Bombay, Amrita Vishwa Vidyapeetham and Organizing committee of the Workshop and Participants.

Technical session-III, Bioinformatics (29th July 2021) at 2-6pm.

The first honourable speaker Dr. Subrata Sinha, Assistant Professor, Center for Biotechnology and Bioinformatics, Dibrugarh University.He delivered a nice and informative presentation on database creation. Sir also demonstrated how easily only using a computer and high speed internet connection we can accessed and managed by RDBMS- like MY SQL, Oracle, MS-SQL,Postgre SQL, V-lab, DB designer SQL line software on virtual lab and we can create the data in bioinformatics for the work of research, UG and PG students.

The second speaker was Dr. Pankaj Chetia, Assistant Professor, Department of Life Sciences, Dibrugarh University, delivered on the Topic,"**Sequence alignment and phylogenetic analysis** " in a very simple and beautiful way. He started from the basic things of molecular biology, that is the structure of DNA molecule, Chargaff rule, monomeric unit of DNA, Concept of genome (entire DNA content of a cell), Human Genome (46 chromosomes + mitochondrial genome) .

Practice Session –III (30th July,2021) at 11-12.30pm:

The first speaker for the session was Mrs. Trisha Rajguru, Department of Zoology, Jorhat Kendriya Mhavidyalaya ,

Topic-Primary structure of Protein using Port Param tool, on V-lab in Amrita Vishwa Vidyapeetham.

Mr. Bhaskar Kalita, Assistant Professor, Department of Botany, JKM, Jorhat.

Topic - The protein content analysis in Covid-19 virus and FASTA format on V-lab in Amrita Vishwa Vidyapeetham.

Technical session –IV, Chemistry Lab (30th July, 2021) at 2-5pm:

Speaker, Dr. Poritosh Mondal, Professor & HOD, Department of Chemistry, and Assam University Silchar. Dr Mondal emphasized on the theoretical general organic chemistry with simulation via Gaues software. He has shown various tools how to design and analysis various chemical reactions through simulation software.

Dr. Sinki Kalita of jkm .She delivered on Virtual lab application for synthetic chemistry through the Govt. of India Funded virtual platform Olabs.

Practice session IV (31th July, 2021) at 11-12.30pm:

The first speaker for the session was Mrs. Parinita Baruah, HOD, Department of Chemsitry, Jorhat Kendriya Mhavidyalaya. She described about “V-lab” execution on physical practical such as viscosity measurement and acid base titration. She has explained about the Ostwald Viscometer and determines the strength of an unknown acid solution.

The second speaker was Mr. Binod Kr. Hazarika, Assistant Professor, Department of Chemsitry, JKM on various accessible e-lab on the website for the chemistry department. During his discussion, he showed how a student/faculty could execute a lab remotely on e-lab.

TECHNICAL SEESION V (FROM 2PM TO 3PM)

SPEAKER Dr. Debojit Bora,Asst. Prof. center of nano and material science ,Jain university ,Bangalore.

Topic- The transition from wet lab to virtual in the era of the COVID -19and the different options available for the nana researchers. He also discussed various research papers published in journals like ACS, PUBS, on online education,

Next session was the English lab session coordinated by Dr. Arunima Borah and the faculty members of English Dept. Mr. Pranjal Dutta. Mrs. Ratnamoni Dutta of Jorhat Kendriya Mahavidyalaya.

Topic was on Listening Skills on Virtual Platform. It was a very informative, interesting and interactive session.

The whole sessions of the Virtual Lab was coordinated by HOD of the respective subjects, Mrs.Ely Phukan, HOD, Dept. of Zoology; Mr. Rajib Bordoloi, HOD, Dept. of Physics; Mrs. Pinaki Hazarika, HOD, Botany Dept. and Parinita Barua, HOD, Chemistry Dept. JKM.

The report on the workshop was prepared by the help of Dr.Panchali Karmakar ,faculty members of JKM and compiled by Pinaki Hazarika, Coordinator of the Workshop.

Submitted By-

Mrs. Ely Phukan

(Convenor)

Mrs. Pinaki Hazarika

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