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NIELIT

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and Information Technology**

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NEWSLETTER

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HIGHLIGHTS

- Overcoming the challenges in education delivery during COVID-19
 - Customization of BigBlueButton & Jitsi
- Digital Empowerment of Senior Citizen
- Enhancing capacity of student hostel at Srinagar
- Centre in focus - NIELIT Chandigarh
- Technical Article on VLSI



Dear Readers,

Hearty welcome to this issue of NIELIT Newsletter which encapsulates the notable activities of the organization during the challenging juncture of COVID-19 pandemic. It is highlighting different modes of conducting classes like Online, Blended, Flipped mode etc., which are adopted by various NIELIT Centres. The appropriate tools and processes of Education Technology adopted in teaching procedure in our centres are thought to be of pivotal support for different academic institutions.

It may be asserted without an iota of doubt that during the pandemic day's majority of educational institutions are experiencing unprecedented challenges in providing education to the aspirants. As such digital services have turned out to be the need of the hour. However, the necessity of adopting the same in different competitive sectors was felt long ago. The initial report on 'Industry 4.0' which was presented at Hanover Fair, Germany in April 2013 gave a suggestion to convert all services to handle with minimum human intervention. This bears testimony to the notion of going digital. For example, in earlier years, a workman cutting metal had to use his manual labour to perform his activities, but now after transformation; he requires knowing to operate the CNC machine. Similarly, in every domain proper skill training has become a must to survive in this era of Industry driven by Digital technology.

In today's digital world the term 'literacy' invariably stands for 'digital literacy'. Students or aspirants are expected to be literate digitally to keep pace with this fast moving world. Otherwise they would invariably lag behind. The digital classes initiated from our end reveal the average attendance of 51% which may not sound satisfactory; However, issues like poor connectivity, hidden cost due to high data usage, poor audio-video quality etc. can't be overlooked either. In addition, the qualities of digital services tend to deteriorate and loose competency when number of users vastly increases. So, a re-engineering is of paramount importance by adopting the best services of User Interface (UI) and User Experience (UX). The UI deals with making User's Interaction as simple and efficient as possible. The UX deals with a person's emotions and attitudes about a product, service, etc. including the practical, experiential, affective, meaningful and valuable aspects of Human-Device Interaction etc.

Keeping all the pros and cons in view, a few suggestions may be put forward on digital options of conducting lectures and concerned assignments which can be briefed as follows:

1. Prepare the lesson plan on a single lecture basis and prepare the contents accordingly. Provide all materials well in advance, so that students are aware and prepared.
2. Set a small clear objective for each lecture. As much as 30% of the subject can be converted in suitable manner as individual or teamwork assignment.
3. Allow cross preparation among students; and it may improve the Inter-personnel, Inter-Digital Communication. In future, students have to prepare for appearing in Digital viva or interview, etc.
4. Academic bodies need to change the syllabus and examinations process.
5. Adopt a Flipped classroom or Blended etc. Some new normal academic activities may look like.
 - ICT based Teaching: Either Blended or Flipped classroom etc may be adopted. In Blended mode, the candidates learn via electronic/online media as well as face-to-face teaching. In a Flipped classroom, the users have to engage with materials – in online or other mode followed by in-class activities that involve peer learning, small-group work. Good actions to flip are - discussions, debates, Q&A, demonstrations, simulations, peer tutoring and feedback, and role-playing, etc.
 - New process-examinations, Job recruitment and results
 - Proctored test/examination: A proctor is an officer who monitors candidates during a test. In an Online proctored test, someone will be watching the examinee using webcam or CCTV camera, or remote devices with strict timer-based control. Online Open Book examinations (OBE): In an OBE, the candidates are allowed to use some resources during the test-textbook and lecture notes. However, the questions are set to test on the synthesis, analysis, and application, rather than memorization. It requires good thinking and writing skills to appear in OBE with a strict time limit.
 - Job recruitment and Skill assessment: Recruiters are checking the 'Digital Skillset' & capacity to interact with peer and handle the customers using ICT. Many firms have adopted online verification of the documents.

To wind up, it is hoped that the readers will find the information covered in this issue interesting and helpful. Readers' valuable inputs are highly awaited at newsletter@nielit.gov.in

Enjoy reading!

Dr. Yumnam Jayanta Singh,
Director/Scientist-F

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Over Coming The Challenges In Education Delivery During COVID-19

The Covid-19 pandemic has forced educational institutions in the country to temporarily suspend the conventional mode of class room teaching. While the pandemic has thrown unprecedented challenges to most of us, NIELIT has handled this disruption in the academic sector by deploying different modes of learning through a mix of technologies and adopting work from home culture.

NIELIT Centres have been actively engaging the students through various mode of online classes like Cisco Webex, Google Classrooms, Moodle, Bigbluebutton etc. The practical sessions are also being conducted on virtual labs. In order to avoid any apathetic approach towards online learning, the Centres have come up with various features to make online classes friendly and interactive thereby keeping boredom at bay and introducing active learning. Apart from live online video classes, various e-content training material are regularly uploaded in the virtual class room, periodic assessments, assignments, attendance monitoring are done using the Moodle Learning Management System. Query resolution sessions are also scheduled with students.

The technology enabled learning has made the student-teacher interaction more productive and effective as the students can login to the e-classes and participate in the lectures in a free and flexible environment. It is observed that in some batches, students' average attendance has also increased.

A glimpse of online/virtual classrooms at some NIELIT Centres

NIELIT Chennai:- Customization of Bigbluebutton for online classes and Jitsi software for Web Meeting:

The Centre has deployed multiple Video Conferencing Server based on opensource Bigbluebutton software to conduct virtual training and service in and around NIELIT centres.

(1) <https://web.nielitchennai.edu.in> – To continue the regular PG Diploma/Diploma courses in Online mode with the Moodle Learning Management System (LMS) with concurrent capacity of 50 live users. (2) <https://webconf.nielitchennai.edu.in> – It has recording facility and concurrent capacity of 50 live users. (3) <https://conf.nielitchennai.edu.in> – Production rack based VC Server to conduct meeting and online classes with recording facility and concurrent capacity of more than 200 live users.

Also, the Centre has deployed multiple Web Meeting Server based on opensource Jitsi software to conduct web meeting and virtual training.

(1) <https://meet.nielitchennai.edu.in> – To conduct meeting among employees and live lectures for training with the concurrent capacity of 50 live users.

(2) <https://meeting.nielitchennai.edu.in> – To conduct Online courses and meeting with concurrent capacity of more than 200 live users.

NIELIT Calicut:- The Centre has already adopted online delivery mode and has been conducting ongoing formal and non formal courses in online with Moodle LMS offering for the enrolled students. Besides this, the Centre offered some high ended courses such as System Design using verilog HDL, Big Data Analytics Tools, RTL Design Verification etc. in online mode. Also, a day long webinar on 'Introduction to FreeRTOS' and 3 day online workshop on 'Electronic Design Automation using Verilog HDL' were organized. The live interactive sessions were recorded and published. Around 300 participants altogether have attended various courses apart from the regular ongoing courses.



NIELIT Delhi:- Within a week of lockdown, the Centre swiftly started dissemination of training through online mode to around 450 students who were already enrolled in various long terms and short term courses in order to curtail the loss of time. Now, the Centre has started various Online Certificate Courses for Industrial Training/ Summer Training from 20th May 2020 onwards in Big Data, Python, Digital Marketing, Machine Learning, Cyber Security, IoT, VLSI, Arduino etc. through Instructor Led –Live Classes. Around 400 participants have already joined the online certificate courses.

NIELIT Imphal :- More than 100 virtual classes are setup in-house using opensource learning management system (LMS) MOODLE catering to more than 1000 users for the ongoing formal and nonformal courses. The centre has also started new short term courses on purely online and customized online training is also being implemented on Emerging Technologies. Apart from the Online courses, the centre has also successfully organized a national webinar on “Cyber Crime Protection Strategies during the Lockdown Era” in collaboration with Cyber Police Station, Manipur. The event was attended by 230 participants from all over the country and participation e-Certificates were also issued at the end of the event.

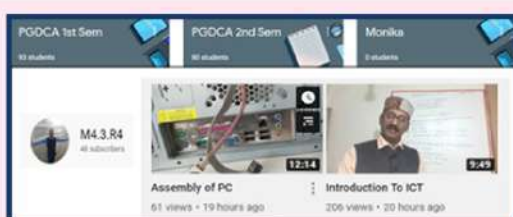


NIELIT Patna:- NIELIT Patna has launched E-learning Portal through Moodle Learning Management System. Students are enrolled on this portal and the courses are being uploaded. Online Classes are being conducted in NIELIT O & A Level, Cyber Shikshaa, Advance Diploma in Hardware Networking & Information Security (ADHNS), Electronics Production Technician; Printed Circuit Board Design and Manufacturing; Solar LED Lighting Product Design and Manufacturing; Installation & Maintenance of Photocopiers and Printer; and Diploma in repair of Consumer Electronics Product.



NIELIT Kohima:- The Centre has taken on various online platforms such as Google Classrooms, Whatsapp Group etc. for timely completion of syllabus. Around 50 online classes were conducted for the ongoing courses like Diploma in Computer Science and Engineering , O Level, Course on Computer Concepts, Certified Course on Web Design catering to around 323 students.

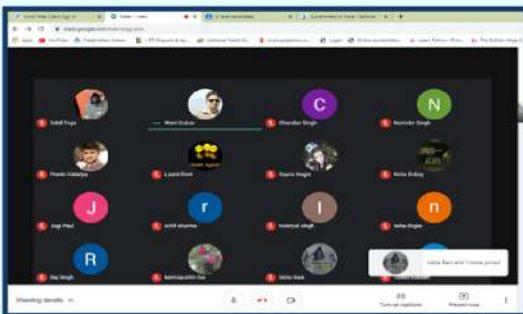
NIELIT Kolkata:- The nation is grappling with Covid-19 crisis, the city has witnessed another crisis arised due to Amphan Cyclone. Amid it, Kolkata Centre continued with dissemination of training through various online modes. Seen in the picture is a screenshot of 1 year O Level course for SC/ST jobseeker candidates registered with Employment Exchanges. The course is sponsored by Directorate General of Employment, Govt. of India.



NIELIT Shimla:- NIELIT Shimla is conducting online classes through Google Classrooms and Whatsapp Groups. The initiatives adopted by the center to provide online education has been highly appreciated by the students and their parents.

NIELIT Guwahati and Shillong:-

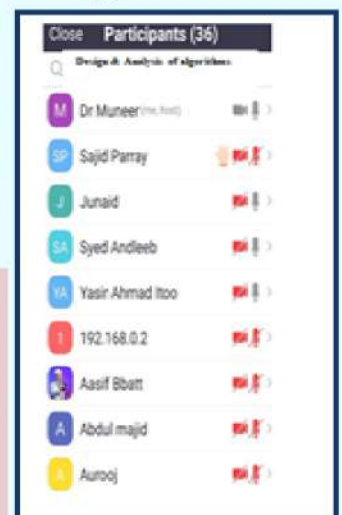
NIELIT Guwahati with its six extension centres in Assam located in Jorhat, Dibrugarh, Kokrajhar, Silchar, Tezpur, Majuli and NIELIT Shillong with its extension Centres at Tura are providing classes through different digital tools like Google Classroom, WhatsApp, Phone, Email, Bulk SMS. Students are also advised to join different courses offered by e-PG-Pathshala (<https://epgp.inflibnet.ac.in/>) of MHRD, Govt. of India, including other leading online learning portals. The online lectures as per demand are being recorded and videos are shared with the students located in the remote areas where internet speed is low. As per the daily feedback received from the students the digital classroom activates are very much encouraging for the students. Regularly on an average 400 students of NIELIT Assam is participating in the e-classes. Apart from teaching its regular students through digital mode, NIELIT Guwahati is in process to help other educational institutes such as Schools, Colleges in different part of Assam to start e-classes for their students through the latest technological advancements. In this regard, telephonic and online guidance is being provided by the faculty members to the institutes for setting up different digital classrooms for fulfilling their teaching requirements.



NIELIT J&K:- NIELIT Centre Srinagar and Jammu is conducting online classes using Google classroom, moodle etc.. Since there is 2G internet facility in Jammu and Kashmir, the Centre is using power point presentations, zoom white boards and moodle to deliver lectures and assignments regularly. eContents like tutorial, web links etc are being shared with

students through Google classroom and moodle. Online Classes are being conducted in formal courses like MCA and M. Sc IT and nonformal courses like O-Level, A- Level etc. besides short term courses. For M. Sc IT 4th semester of NIELIT Srinagar, the final project viva was conducted online by University of Kashmir via Google meets app.

With all its pedagogic exercises, NIELIT Centres are committed towards delivering quality education to the students and creation of a digital learning ecosystem. We hope that the world will be free from this pandemic soon with the development of preventives and therapeutics.



Digital Empowerment Of Senior Citizen Amid Corona Crisis

Amid Covid-19 outbreak, it is witnessed that people from all sections of society taking steps to help one another. NIELIT Centre Haridwar has come forward to digitally empower the senior citizens and housewives so that they use technology at their convenience as the pandemic has prompted to embrace digital transformation in order to reduce human interaction.

The 'One Week Awareness Programme' for 'Senior Citizens/Housewives' on 'Use of Mobile Applications for Digital Payment and e-Governance services' was designed to make senior citizens/housewives aware about the various e-Governance services like e-hospital; various apps launched by Government of India for the benefit of the citizens like Aargya Setu, Jeevan Pramaan, Umang, Bhim; use of social media etc. The participants learnt about different government and non-government online platforms as well as about the precautions and security features necessary for safeguarding against common cyber frauds. ***This programme is being offered to Sr. Citizens/housewives for absolutely free of cost.***

The programme proved successful as every participant appreciated the initiative, here are what they said:

Dr. Devinder Pal Singh Sehgal
Age: 60 Years



The course conducted on digital awareness is praiseworthy and definitely it would help us in many ways in the years to come.

Mr. Satya Bansal
Age: 68 Years



Very good initiative and I am very much thankful to you for this excellent programme full of knowledge for daily use.

Ms. Bhupinder Kaur
Age: 64 Years



The course is highly beneficial for senior citizens as we learnt about digital awareness, e-governance and social media platforms.

Giving back to the society is our duty, not charity

Enhancing capacity of student hostel at NIELIT Srinagar

Union Minister for Law & Justice, Communications and Electronics & Information Technology, Shri Ravi Shankar Prasad visited NIELIT Srinagar on 22nd January, 2020 and laid the foundation stone for two separate hostels for boys and girls besides inaugurating an IT Lab with a capacity of 40 seats. The Union Minister was accompanied by Advisor to Lt. Governor; Sh. Farooq Khan; Principal Secretary to Lt. Governor; Sh. Bipul Pathak; Deputy Commissioner, Srinagar; Sh. Shahid Iqbal; CEO Mission Youth; Sh. Syed Abid Rashid. He was warmly received by Director General, NIELIT and Joint Secretary (MeitY), Sh. Jaideep Kumar Mishra along with Vice-Chancellor, University of Kashmir, Prof Talat Ahma, Shri Janak Raj, Registrar, NIELIT and other senior officers of NIELIT.

The hostels with a capacity of 100 students will facilitate students of remote and rural areas of the valley in getting quality education. The Hon'ble Minister was apprised about the Cyber Shiksha programme through which skill development of women in cyber security is being undertaken. Out of a batch of 30 girls in the cyber shiksha programme, 12 girls have got placed in different companies. The Hon'ble Minister asked the officials to undertake skill development of Kashmiri youth in different job-oriented courses. He also interacted with the officials of Anti-Corruption Bureau who were undergoing Information Technology Training at NIELIT Srinagar.



BCA & B.Sc (IT) Courses to be conducted from NIELIT Srinagar

After obtaining permission from Higher Education Department, Govt. of J&K for the launch of BCA and B. Sc IT courses at NIELIT Srinagar, an inspection was conducted on 22nd February, 2020 by a high-profile team under the chairmanship of Dean, College Development Council, University of Kashmir. Sh. D. S Oberoi, Director In-Charge, NIELIT J&K gave a detailed presentation and briefed the team about the current activities. The committee appreciated and showed satisfaction at the efforts of NIELIT faculty and staff members.



Capacity Building of Anti-Corruption Bureau (ACB)



NIELIT Jammu and Srinagar has conducted training programme for Anti-Corruption Bureau (ACB) officials under sponsorship of Human Resource Development (HRD), J&K. The Officials were trained in Computer Basics as per their office requirements with an added

knowledge of Cloud Computing, Cloud Storage, e-Governance Concepts, Cyber Security concepts etc within a duration of 6 Weeks course.

Smart Classes Training Program for Higher Education Department

NIELIT Jammu conducted Smart Class Training for Teachers of Higher Education Depts. of Jammu, region. Around 115 candidates were trained in 5-week program which started on 20th January and ended on 28th February, 2020. Along with smart class training, lectures were also given on e-Governance and Block Chain.





NIELIT Chandigarh

was established in the year 1978 as Regional Computer Centre (RCC) with objective to disseminate knowledge in the field of Information, Electronics and Communication Technology (IECT) and promote use of IT in Government Sector. The permanent campus of NIELIT Chandigarh has come up at Ropar with all amenities in sprawling 12 acre campus having state of the art infrastructure to impart hands-on training in the field of IT and Electronics. The campus has in-house facility of Girls Hostel, Boys Hostel & Guest House.

About NIELIT Chandigarh

Address

Permanent Campus : Bada Phull, Birla Farms, Ropar-140001.
Phone : 01881-257005,006
Facility at Chandigarh : IETE Building, Sector 30-B, Chandigarh. 160039
Phone : 0172-2650121
Email : dir-chandigarh@nielit.gov.in, training.chd@nielit.gov.in



Information Technology

- 1- NIELIT 'O', 'A' and 'B' Level Courses
- 2- Digital Literacy course like ACC, BCC, CCC, CCC Plus and ECC
- 3- Short Term and Industrial Training programme in latest technologies like Python for Data Science and Machine Learning, Java, Cloud Computing, Big Data Analytics, Blockchain, PHP, .Net, Android, CCNA, Cyber Security etc

Electronics

- 1- NIELIT CHM 'O' Level
- 2- Short Term and Industrial Training programme like Design & Mobile Design and Repair, Embedded System, Arduino / IoT, MATLAB, Raspberry Pi with Python, IoT with Augment Reality etc with aim to promote electronic design and development.



Area of Excellence

Artificial Intelligence and Machine Learning
Blockchain Technology
Cloud Computing and Virtualization
Big Data Analytics
Internet of Things
Digitalization Projects



NIELIT CENTRE

CHANDIGARH

Educational Project

The centre in association with National Council for promotion of Urdu (NCPUL) Language conducts one year course on "Computer Applications, Business Accounting and Multilingual Desktop Publishing" (CABA-MDP) through a network of more than 500 NCPUL accredited centres spread throughout the country. More than 30000 students are enrolled every year.

IT Enabled Services

Energy and Water Billing - Utility billing projects (domestic, commercial, small/medium supply, public lighting, agriculture, solar etc.) since 1980 for states of Punjab, Haryana and UT Chandigarh (57 lakh consumers).

Digitization projects - Various bulk digitization projects including National Population Register (NPR); Agriculture census and Minor Irrigation survey.



Software Development

Counselling Project

Online Counselling Project for admission to Class XI of Government schools in Chandigarh - More than 17000 candidates appear every year involving 40 schools.

Labour Bureau

Association with Department of Labour Bureau, Ministry of Labour and Employment since 1982 for generation of CPI (Consumer Price Index). Web based online data capturing and CPI generation software has been developed and is being maintained by the centre.

Health Projects

IT Solutions for many Govt. hospitals; e-Payment solution for Punjab State Power Corporation; e-Complaint Redressal solution for Govt. Departments and many more....



Faculty Development Programme

NIELIT Aurangabad in collaboration with Maharashtra State Board of Technical Education (MSBTE) conducted Faculty Development Training Program during 20-22 January, 2020. Faculty members from various polytechnics in Maharashtra State attended the training program.



They were given skilling in emerging areas of information technology, electronics, communication, mechanical and its related verticals like cyber security, mobile application development, software engineering practices, IoT, PCB designing, industrial automation, embedded systems etc. Shri. Saurabh Bansod, Sc. 'B' of NIELIT Aurangabad was the Co-ordinator of the training program. Dr. Sanjeev Kumar Gupta, Executive Director distributed certificates to the participants of the program.



Campus Drive

Tata Consultancy Service(TCS) Campus Drive was organised at Shri Chhatrapati Shivaji College, Omerga, Osmanabad District by Model Career Centre (MCC) NIELIT Aurangabad. A total of 113 students participated out of which 51 students were finally selected by TCS.



Shivaji Jayanti Celebrations

Shivaji Jayanti was celebrated at NIELIT Aurangabad on 19 February 2020. Dr. Sanjeev Gupta, Executive Director presided over the function. The students performed various cultural programmes and prizes were distributed at the end. The function also received wide press coverage.

Training for Police Personnel

Second batch of 21 days training program of 64 ASI and Head Constables of State Crime Record Bureau (SCRB), Madhya Pradesh Police was successfully conducted. Shri Chiranjeevi Prasad, Commissioner of Police, Aurangabad was the chief guest in the valedictory function.



Workshop for NIC Officials

DIO/ADIO workshop for NIC officials was organised at NIELIT Calicut during 27-30 January, 2020. The workshop was inaugurated by Dr. M. P. Pillai, Executive Director, NIELIT Calicut in the presence of Shri T. Mohandhas, DDG & SIO, NIC Kerala.



Shri. Seeram Sambasiva Rao, IAS , District Collector , Calicut addressed the officials. The workshop sessions (AI & Data Science, ML, DL, IoT & Edge Computing, Blockchain, Big Data Analytics, Python, Open Government Data, DevOps and Tools, Cloud computing and Data Centre, IS27001, Mobile Application Security, Software Project Management & Tools, Software Quality Management, Vulnerability Assessment & Server Handling, OWASP & Source Code Analyser etc.) were handled by NIC and NIELIT faculty.

Information Security Awareness for Kerala Police



A two day's training program on cyber security for Kerala Police officials was conducted. It was inaugurated by Shri. Ashok Yadav, IPS, the Inspector General of Police, Kerala Police North Zone & Nodal Officer Cyberdome. The training was conducted as a part of ISEA (Information Security Education and Awareness) project. Around 82 officials at various levels from 8 districts of North zone Kerala Police attended this two days awareness program .

Some Proof of Concept Design by Calicut Students

Embedded System Group of NIELIT Calicut has successfully completed conduction of 32nd Batch of PG Diploma in Embedded System Design (ED500) on 7th February 2020. NIELIT Calicut is conducting such PG Diploma Programs from 2003 onwards. The participants of this program have developed innovative proof concept designs in Embedded Systems and Internet of Things. An Exhibition with live demo of these projects was organized on 6th and 7th February 2020.

IoT based Dustbin Monitoring System

This project proposes an IoT based Dustbin Monitoring System, which is designed to collect data regarding level of waste bin and to deliver it through wireless network. The system consists of sensors to measure the level of the waste inside the bin. The system also adapt with network environment, to manage all the information from waste management. In this method, the sensor modules placed on the bin will send data to cloud continuously. The Authorities can monitor the dust bin details through a webpage. Whenever the dustbin is filled, it informs them that the bin is full and requires urgent replacement. Thus they can collect the waste and dispose it at the earliest.



The prototype of the system is implemented using Node MCU Microcontroller system and ultra sonic sensors. The firmware development has been done using Arduino platform.

Automatic Attendance Logging System using Face Recognition

This project makes use of the face of an individual to mark their attendance at a school, college, institution, office. An image database is created with images of the students/staff, belonging to the institution/office. When the recognition process runs, it detects the face of the person facing the camera and after matching it with the database, it writes to the attendance database for the recognized face. This project is also helpful in present situation as the practice of bio-metric attendance system is discouraged to avoid spreading of Covid 19 infection.



PG Diploma Courses

NIELIT Chennai centre conducts regular Post Graduate Diploma courses on advanced areas of Electronics & Information Technology such as Data Science, Information Security, Cloud Computing, Embedded systems and IoT. These courses are offered in full time mode for 6 month duration twice a year starting in February and August month. The second batch of PG Diploma in Data Science and Analytics was successfully completed during Feb-2020. Shri. Martin K.M., Director, NIELIT Chennai distributed the certificates and speaking on valedictory occasion, he highlighted the team effort of the students for successfully completing 12 group projects. Also, another batch of 10 students have been certified in "PG Diploma in Information Security".



Training Program for Ex-Serviceman for Second Career



The Directorate General Resettlement (DGR) is an inter service organization functioning directly under Department of Ex-serviceman Welfare, Ministry of Defence. It assists ex-serviceman to obtain training and acquire additional skills and facilitate their resettlement through a second career.

NIELIT Chennai centre has started 3rd batch of O level training program for ex serviceman from 20th March 2020. A total of 38 participants from Army, Navy and Air Force have joined the program. Shri Martin K.M, Director, NIELIT Chennai has welcomed the participants and motivated them to utilize this opportunity for shaping their second career. Also, another batch of CHM-O training for 36 ex-serviceman has been recently completed by the Centre.

Lecture on Impact of Physical System and IoT

A session on 'Impact of Physical Systems and IoT for Industry Revolution' By Dr K K Soundra Pandian, Scientist-'D', O/o Controller of Certifying Authority, MeitY was organised at NIELIT Chennai on 3rd January 2020. Dr. Pandian has highlighted the vulnerabilities and exposure of cyber threat to common citizen in today's era and easy steps to safeguard our personnel and professional interests. The session covered topics such as Relevance of block chain in government systems, Big data vs IoT and Challenges and opportunities in cryptography and cyber security.



Workshop on Digital Marketing

NIELIT Delhi Centre organized a 10 days in-house workshop on 'Digital Marketing' in the month of March, 2020 for creating awareness about the hidden secrets of online sales, optimizing the websites and for managing day-to-day operations on social media platforms. The workshop highlighted how key digital techniques and tools can support and enhance the marketing, promotion and communication strategy of an organization. The workshop was attended by about 20 Technical/Non technical officials/officers of the Centre



Faculty Development Program on Python Programming

NIELIT Delhi Centre organized an in-house Faculty Development Program on 'Programming and Problem Solving through Python'. Python has been recently introduced in O/A level syllabus as per 5th revision. Senior Officers and faculty members attended the training.

Training Programme for the officers of BSF

NIELIT Delhi Centre organized a three day training program on 'Big Data Analytics' for the officers of BSF during 3-5 February, 2020. The training was organized in NIELIT HQ and was also attended by Shri Rajesh Nirwan(IPS), IG Provisioning and Shri Arvind Dutt Abdali, DIG IT of BSF.



Also, a 10 days training program on 'CCNA Routing' for about 20 officers/officers of BSF was conducted. The training program covered detailed knowledge of Computer Networks, various protocols used in Communication, hands on training on managing and configuring Cisco Switches and Routers and various WAN technologies. Through this training, the participants have also been prepared to acquire CISCO CCNA Certification.

Cyber Security for National Security Guard (NSG)



NIELIT Delhi Centre conducted 3 days training programs on 'Cyber Security-Risk Mitigation' for two batches of NSG officers. The training covered the basic principles of cyber security from the perspective of providing security awareness and its best practices for the real world, latest Internet security techniques, firewalls etc. The

training also covered various aspects of Cyber Threats, Cyber-attacks, awareness about various ways to mitigate the risks.

Yoga Championship 2020 held at Bali, Indonesia



NIELIT Imphal felicitated Ms. Gangmei Gaigangmeilu, a DECE student of the Centre who won gold in the 7th International Yoga Championship 2020 held at Bali, Indonesia during 11-13 January, 2020. Center also facilitate employee namely, Smt. Laishram Bijayalakshmi Devi and Shri Thokchom Premjit Singh who won Silver Medal and 4th position respectively.

Annual Sports Meet 2020

Annual Sport Meet 2020 was celebrated at NIELIT Imphal during 5-6 March, 2020 with great enthusiasm, zeal and excitement.





e-Waste Management Workshop

A Workshop on e-Waste Management was conducted by Shri Imopishak Thingom, Sc-D of NIELIT Imphal on 13th February 2020 as a part of Swachhta Pakhwada . A total of 150 staff and students participated in the programme. An anti-polythene drive was also conducted around the campus on 12th Feb '20

Hon'ble MoS (E&IT) takes review of NIELIT Agartala

A meeting under the Chairmanship of Shri Sanjay Shamrao Dhotre, Hon'ble Union Minister of State for HRD, Communications, Electronics & IT, GoI to review the activities of NIT's, NIELIT and STPIs in the North Eastern states was held at NIT Agartala on 14th Jan 2020. Shri Anurag Mathur, Director In-charge, presented the status report of NIELIT Agartala.



Proposal for Centre of Excellence

A Consultative Meeting under the chairmanship of Shri Rajiv Kumar, Joint Secretary, MeitY was held at STPI Agartala on 29th Jan 2020 with the stake holders for establishing Center of excellence (CoE) with innovation zone in eight NE states by MeitY, Govt of India under Digital North East Vision 2022. Officials of STPI, NIELIT, NIT Agartala, IIM Kolkata, Tripura University and representatives of IT/ITES based industries were present in the meeting



Training for Health and Family Welfare Dept.



Training on Computer Application and Skills for Ministerial Staff of Health and Family Welfare Dept., Govt of Tripura inaugurated in presence of Shri Subhasis Das, Joint Secretary, Health and Family Welfare Department, Government of Tripura and Director In-charge, NIELIT Agartala centre on 20th Jan 2020

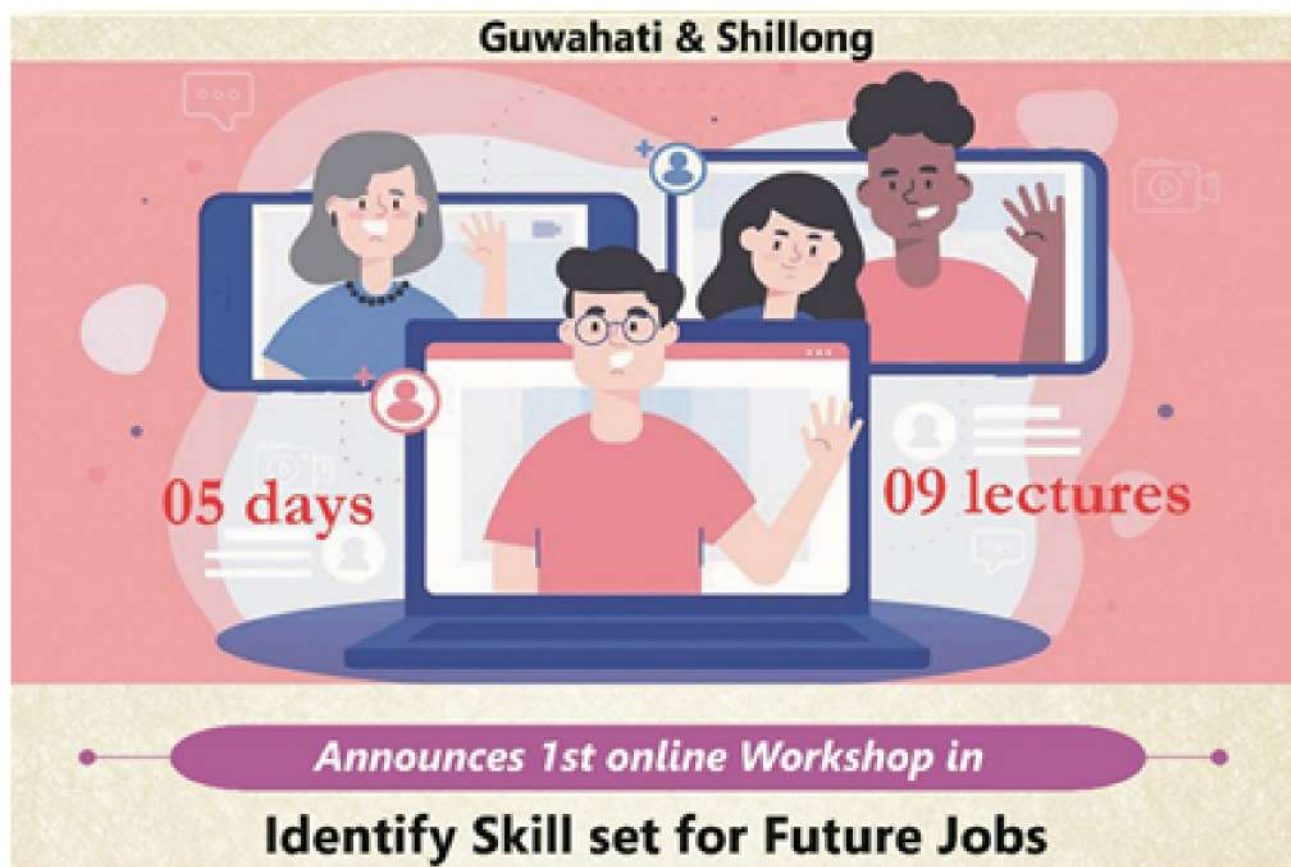
Cyber Forensic for Tripura Police

A 2-day Cyber Forensic Workshop was conducted by NIELIT Agartala for Tripura Police Cyber Cell Investigating Officers at KTDS Police Training Academy, Agartala on 19th & 20th March 2020. The Workshop was inaugurated by Principal, KTDS Police Training Academy and OSD to Chief Minister, Tripura and Shri Anurag Mathur, Director Incharge, NIELIT Agartala. The Centre will act as consultant of the Cyber Forensic Lab of the Police Training Academy.



Online Workshop on future Skill Sets

NIELIT Guwahati and Shillong jointly conducted a week long Online awareness Workshop on “Identify Skill set for Future Jobs” covering the basics of different areas to make the potential students aware of future skills and career prospects in those areas. The workshop was conducted between 15-19 June 2020 wherein 227 participants registered. The workshop covered lectures in Python Programming, IoT, Cloud Computing, Image Processing, Bioinformatics, Data Analysis using Hadoop and Full stack web application using MVC



Blended training for Institutions on E-learning portal setup

NIELIT Guwahati and Shillong is launching a blended (Online & Offline) training course on “E-learning Portal Setup” course using Moodle for the educational institutions of Assam and Meghalaya. Under the training programme, online and offline training will be provided to the faculty members as well as the system administrators on setting up of Moodle based E-learning portal.

FinFET - New trend in VLSI Technology

Abstract

The CMOS devices are shrinking to the nanometer regime, increasing the implications of short channel effects [1] and variations within the process parameters which will the effect reliability of the circuits further as performance. To resolve these problems of CMOS, FINFET is the best among the promising and better technologies without sacrificing reliability and performance for its applications and therefore the circuit design.

Introduction

CMOS technology scaling has been a primary driver of the EDA industry and has provided a path towards each denser and quicker integration. As size of the transistors is deceased, the thickness of the chemical compound gate material has steady decreased to extend the gate capacitance and thereby drive current, that provides rise in device performance [2].

The shrinking geometries demands scaling of CMOS devices, it also demands lower operating voltages, higher frequencies, which will cause a negative impact on the device by increasing the short channel effects (gate outpouring and sub-threshold leakage) inside the device is increasing perpetually [3][4]. The scaling technologies and battery-operated devices has magnified the necessity for low power-based circuits. CMOS based circuits are not be used as a result of the matter in its basic material, short channel effects, and high power, higher technologies are required for handling the varied effects of MOSFET technology [5]. as a result of the flat MOSFETs show a vast SCE (Short Channel Effect) and therefore the designers contemplate FinFETs, that have negligible SCE for the identical channel length. Over the few decades the FinFETs device has been looked with great attraction by industry.

The scaling of standard MOSFET semiconductor unit has become more and more tough below 32nm Technology. Reducing of MOS device dimensions' dimension and length additionally results in lower performance and higher average power consumption. Fin-type field-effect transistors (FinFET) are a promising substitute for bulk MOS at the technology nodes but 32 nm [6].

History of FinFET and ages before FinFET

The concept of FinFET was presented by Former TSMC CTO and Berkeley professor Chenming in 1999. A thin body (10nm), so the gate capacitance is closer to the whole channel was the basic principle of the structure. As the body is so thin there is no leakage path from the gate. The gate of the FinFET device can effectively control the leakage which was the major disadvantage of the CMOS devices.

A complementary symmetric circuit configuration [7] which consists of a n-channel and p-channel transistor was unveiled in 1963, by Frank Wanlass and C.T.Sah of Fairchild . The CMOS what we extensively use today is this. It draws almost zero static power dissipation. Early ICs used NMOS technology because the NMOS process was fairly simple, less expensive and more devices could be packed into a single chip compared to CMOS technology.

Disadvantages of CMOS Technology

Short channel effects and leakage current are a major source of power dissipation in MOSFETs at the nanoscale [8]. An effect referred to as drain-induced barrier lowering (DIBL) takes place once a high-drain voltage is applied to a short-channel device and therefore the supply injects carriers into the channel surface which does not depend on the gate voltage. Tunneling of electrons from gate oxide may result in leakage once there's a high field across a thin gate layer. Electrons or holes can cross the interface and reach the oxide layer because of a strong electric field near the Si/Sio₂ interface. Punch through leakage occurs when there is a decreased separation between depletion regions at the drain-substrate and the source-substrate junctions. Reduction in power dissipation can be achieved by reducing the supply voltage but this has a disadvantage of increasing the delay. Reduction in threshold voltage increases leakage current. Lowering the capacitance has adverse effects on system performance. These disadvantages of CMOS have led to the use of FinFET Technologies at lower Technology nodes [8].

FinFET Technology and its advantages

Researchers are striving hard to develop transistors with low cost and high performance, one such development is a FinFET. The fin-like structure of FinFET enables the engineers to create faster and more compact circuits and computer chips, compared to conventional Flat structures[9][10]. A non-planar, double-gate transistor built on an SOI substrate, based on the single gate transistor design is called as a FinFET. A conducting channel is wrapped by a thin Si "fin", as shown in figure 1 which forms the body of the device is the most important characteristic of FinFET. The effective channel length of the device is determined by the thickness of the fin. In Figure 1 we can see a FinFET structure consists of a thin (vertical) fin of silicon body on a substrate. FinFET has excellent control from three sides of the channel as the gate is wrapped around the channel. As shown in Figure 1 Si body resembles the back fin of a fish, so the structure is called as FinFET

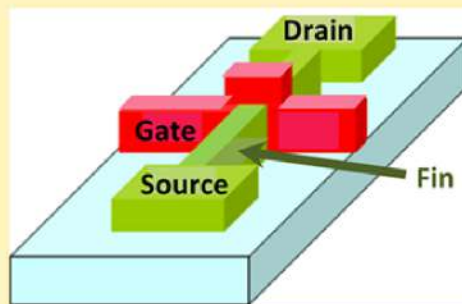


Figure 1

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Fabrication Technique used to fabricate FinFET is Silicon on insulator (SOI) process [11]. The specialty of this process is that it ensures ultra-thin device regions. Electrical potential throughout the channel is controlled by the gate voltage in FinFET Technology. As the current conduction path between source and drain is very close to the gate control electrode the above said control is possible in this technology. The short channel effect will be minimum in FinFET because of these characteristics.

The advantages of FinFET are as follows

Excellent control of short channel effects in the submicron regime and making transistors still scalable. The small- length transistor can have a much Lower off-state current and larger intrinsic gain when compared to bulk counterpart because of this excellent control of short channel effects. [12].

- Promising matching behavior.
- Low cost
- Higher technological maturity than planar DG.
- Suppressed Short Channel Effect (SCE)

FinFET is one of the promising and better technologies for its applications and the circuit design for better performance and reliability [6]. The conventional MOSFET manufacturing processes can also be used to fabricate FinFET. FinFET Technology provides better area efficacy compare to CMOS [8]. The mobility of the carriers can be improved by using the FinFET process when compared to the strained silicon process.

The following table shows the comparison of FinFET with CMOS technology [8]

Performance Parameter	CMOS	FinFET	% change in FinFET as compared to CMOS
Average Power in SRAM Read Operation	124uW	8.76uW	92.93% reduction
Average Power in SRAM Write Operation	896.17nW	19.76nW	97.8%
Average Power in 45nm Inverter	12.8uW	5.2uW	59.38% reduction

Current trends in the industry with FinFET

In 2012 the Intel has introduced a Ivy-Bridge Processor at the 22 nm Technology using Trigate FinFET [5]. TSMC, Global Foundry, and Samsung are the other foundries which uses FinFET Technologies [7]. First fully functional ARM-based networking processor with 16nm FinFET technology was released in 2014, by the fabrication giant TSMC.

A mobile processor at 28nm using FinFET Technology was released in 2012 by STMicroelectronics using FD-SOI technology. IBM, Global Foundry, and Samsung are other foundries offering FD-SOI technology. AMD's processor, PowerPC microprocessor and Sony's PlayStation are some of the products using SOI technology[7]. The Technology nodes like 14nm, 10nm, and 7nm nodes have all used FinFETs technologies for taping out latest products. 2D channel structure of the FinFET, vertical "fins" which increases the contact area between the transistor channel and the gate.

Conclusion

The limitations of CMOS scaling are reviewed. It is observed that FinFETs are capable to overcome these limitations effectively [9][12]. FinFETs can replace conventional MOSFETs under 32nm technology, as FinFETs based logic circuits are promising substitutes for conventional Mos. Various FinFET models also discussed in this paper and the latest trend in the industry was also discussed.

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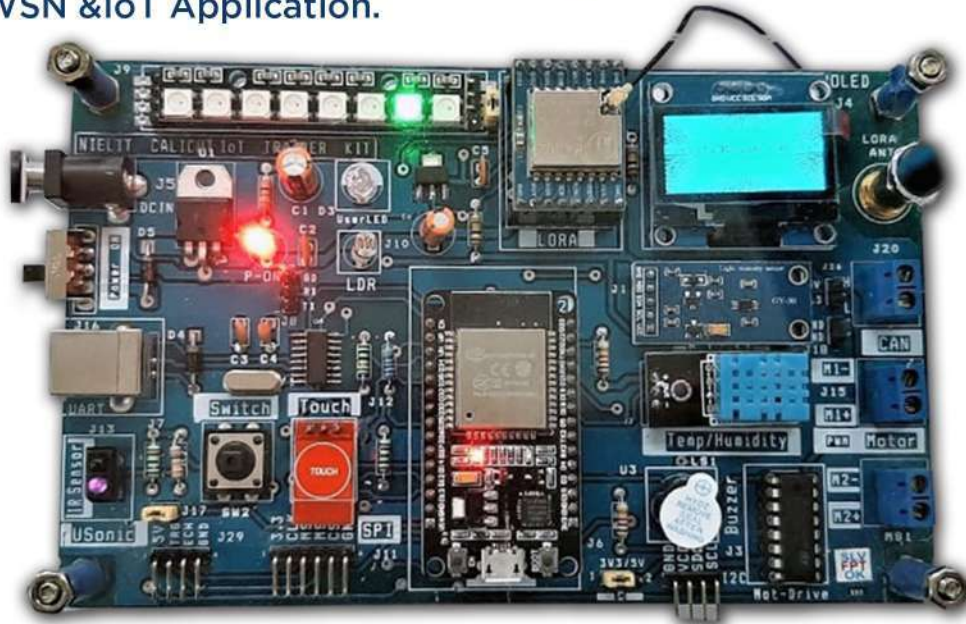
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Sreejeesh SG, NIELIT Calicut (sreejeesh@nielit.gov.in)

Jayaraj U Kidav, NIELIT Calicut (jayaraj@nielit.gov.in)

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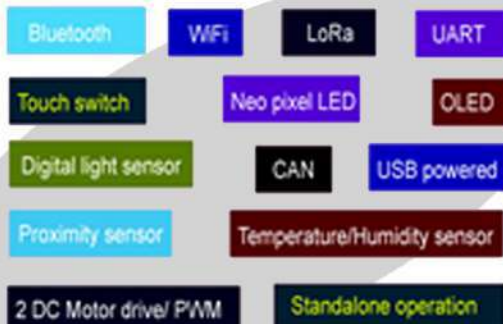


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