A Brief Report

on
Short-term Certificate Course
on

Internet of Things and Automation

(An Industry & Institute Partnership Program)

March 15 – 19, 2021

Organised By

RAJIV GANDHI NATIONAL INSTITUTE OF YOUTH DEVELOPMENT
Institution of National Importance by the Act of Parliament No.35/12
Ministry of Youth Affairs and Sports,
Government of India, Sriperumbudur – 602 105

In Collaboration With

NATIONAL INSTITUTE OF TECHNOLOGY, JALANDHAR
Institute of National Importance under the Act of Parliament – 2007
Ministry of Human Resource Development, Government of India
Jalandhar, Punjab - 144 011

NATIONAL INSTITUTE OF TECHNOLOGY, TRICHY
Institute of National Importance under the Act of Parliament – 2007
Ministry of Human Resource Development, Government of India
Trichirapalli-620015

NEOWARE TECHNOLOGY SOLUTIONS PRIVATE LIMITED
Chennai
(Industry Partner)

Contents

Preface and Acknowledgements

Imparting Education and Skill Development is of paramount significance to the Department of Youth Affairs, Ministry of Youth Affairs and Sports, Government of India as well as the imperative mandate of Rajiv Gandhi National Institute of Youth Development (RGNIYD), an Institution of National Importance by an Act of Parliament and functioning under the Ministry of Youth Affairs and Sports, located at Sriperumbudur, Tamil Nadu.

During the unforeseen and unprecedented second wave of the COVID-19 Pandemic, all the educational and training institutions have been required to shut down their operations across the world, particularly in India with the rising number of infected persons, more so, among the young people during this second consecutive year.

While the infections are on the rise, it is unjust to remain silent when the young people are deprived of various educational and skill development avenues. Therefore, RGNIYD during the continued to offer its flagship technical training courses and short-term job oriented certificate programmes of contemporary and futuristic relevance that will prepare the youngsters to embark on lucrative and sustainable careers.

As a sequel to four of its earlier short-term certificate courses on Cyber Security, Artificial Intelligence and Machine Learning, Recent Advances in Data Sciences and Cloud Computing, RGNIYD designed another innovative course on Internet of Things and Automation which is poised to drive the entire world in the near future.

RGNIYD in association with leading technological institutions in the country, *viz.*, the National Institute of Technology - Jalandhar, Punjab, the National Institute of Technology – Tiruchirapalli, Tamil Nadu both the organizations being Institutions of National Importance under the Act of Parliament – 2007 and functioning under the Ministry of Human Resource Development, Government of India and with Neoware Technology Solutions Private Limited, Chennai being the Industry Partner organized a Five-day Short-term Online Certificate Course on Internet of Things and Automation from March 15 – 19, 2021 through Cisco Webex Platform.

The Short-term Certificate course was thoughtfully designed and delivered as an Institution-Industry-Partnership-Programme in consonance with the priorities enshrined in the New National Education Policy, 2020 and the Revised National Youth Policy, 2021. The fifth of its kind, the course encompassed hands-on practical training by the industry experts to transfer the theoretical learning into the real-time situations.

I take this opportunity to profusely thank Shri. Kiren Rijiju Ji, the Minister of State (Independent Charge) for Youth Affairs and Sports, Government of India, Smt. Usha Sharma, IAS, Secretary to the Government of India, Department of Youth Affairs, Ministry of Youth Affairs and Sports, Government of India, Shri. Asit Singh, IRS Joint, Secretary to the Government of India, Department of Youth Affairs, Ministry of Youth Affairs and Sports, Government of India and Shri. Majoj Sethi, ICAS, Joint Secretary and Financial Advisor to the Government of India, Ministry of Youth Affairs and Sports, Government of India for their constant support and guidance being rendered to RGNIYD at every stage for serving the Youth of the country.

I would like to place on record our sincere thanks to the Heads of the Collaborating Institutions Prof.Lalit Kumar Awasthi, Director, NIT, Jalandhar and Prof. Mini Shaji Thomas, Director, NIT, Tiruchirapalli for considering to partner with RGNIYD to offer this online course for the benefit of socially and economically disadvantaged youth across the country. I would like to thank Shri Rajaraman Srinivasan, Co-Founder & CEO of M/s. Neoware Technology Solutions Private Limited for their handholding support rendered during this course as an Industry Partneer. In particular, I would like to extend our heartfelt thanks to Prof. S. K. Sinha, Dean, NIT, Jalandhar for playing an instrumental role in bringing institutional partnerships with RGNIYD and for his contributions in enabling RGNIYT to roll out the present and previous technical courses. I thank Dr. S. Muthukumaran, Dean, R & C, NIT Tiruchirapalli for his guidance and support in organizing this course as an Institutional partner. My sincere thanks to Prof. K. S. Ravichandran, Registrar, RGNIYD for his support in organizing this short-term course and bringing in synergy between RGNIYD and the Industry.

The Resource Persons who have facilitated various sessions during this short-term course deserve much appreciation. They have delivered the content in a scintillating manner with simple teaching methodologies to overcome the barriers of online teaching. I would be failing in my duties if I don't acknowledge the contributions of my team at RGNIYD, particularly, Dr. P. Muralidassan, Consultant-Administration, Shri. Agilan, Assistant Registrar, Shri. P. David Paul, Training Officer, Shri. Ramkumar, Techniccal Officer and Shri. Balakrishnan, Programmer for their continued support for running this certificate course. I would like to finally thank all officials and personnel of our collaborating Institutions and Industry for extending their support behind the backdrop for the smooth conduct of this programme.

Looking forward to offering many such meaningful courses for the benefit of the youth of the country during the ensuing period, for the ultimate empowerment of the youth of our nation.

PROF. SIBNATH DEB, PhD, DSc
Director,
Rajiv Gandhi National Institute of Youth Development
(An Institution of National Importance by Act of Parliament No.35/2012)
Ministry of Youth Affairs and Sports, Government of India, Sriperumbudur, Tamil Nadu – 602 105, India
Member, Board of Directors, Institute for School-based Family Counseling, California, USA
Adjunct Professor, School of Justice, Faculty of Law, Queensland Univ. of Technology, Brisbane, Australia.

Introduction

RGNIYD organised a short-term Online Certificate Programme on **"Internet of Things and Automation"** from March 15-19, 2021 through online mode (Cisco Webex) as an Industry-Institution Partnership Programme.

The programme was offered for the youth who hail from science, computer and information technology backgrounds possessing or pursuing programmes at Diploma or Bachelor Degree levels or those who have completed their educational programmes and looking for employment opportunities.

The course intended to familiarise the participants on the basic concepts of Internet of Things and Automation. This programme sought to widen the career horizons for young people who wish to enter or advance their careers in this exciting and well-paying field or to enhance their learning for a higher technology role.

The sessions were facilitated by the senior faculty members from NIT Trichy, NIT Jalandhar and Industry Experts from Neoware Technology Solutions Private Limited Chennai. The highlight of this particular course was that, one whole day was devoted for practical training facilitated by experts from the partner Industry.

Background

Internet of Things is a trending career field and is rapidly transforming the world at an unprecedented level. The synchronized network between various smart devices and the sensors or software programmes backed up by internet enables the objects or gadgets that we use daily to function smartly with artificial intelligently is called the Internet of Things.

Advances in technology are making it possible to adopt Internet of Things, wherein micro sized cameras are today able to generate numerous images within human body, smart gadgets with micro sensors are able to detect body signals and deduce vital functions of the human body. Today many smart devices that we use on daily basis are becoming very popular which have reduced human effort and have almost automated most of the works we physically perform.

IoT is a programmed network consisting of devices with enablement to sense, assimilate and transfer instructions to control the devises integrated through IoT remotely. Internet of things is a sequence of devices such as vehicles, domestic appliances and gadgets that we use frequently in our day to day life built-in with sensors or programed with software that enable these connected gadgets to function based on the data or instructions provided. This technology has come very handy to the human beings which has also smartly transformed the world and has altered our lifestyle. These unified objects are often denoted as "Smart devices" supporting IOT a massive network that enables a smarter world function with less human involvement. All these smart devises provide us real-time information/data, which are highly useful in analysis and interpretation of assessments, results and estimations accurately. For instance, the devices which we use widely in our day to day life such as smart phones, smart watches, pulsomester, wearable health devises, health bands etc to monitor our body's blood pressure, heart rate, body movements, ambulatory monitoring of vital visceral organs and their functioning, driverless cars are few devices that are enabled through IoT.

Rationale

The present job-oriented short-term certification course on Internet of Things and Automation was offered to the underprivileged youth to enhance the employability skills of the youth of the country in the IT sector which has a large absorption potential for the youth.

Objectives

This present course has been designed carefully by the academicians and industry experts to suit the futuristic requirements in real-time situations. The objectives of the course include:

- Providing the participants an overview of Internet of Things
- Promulgating knowledge to the learners on the underlying mechanisms of IoT
- Perceiving the scope and applicability of the IoT technology in automation process by the participating youth
- Promoting modern and employable skills among the youth through imparting techniques of programming and IoT protocols
- Preparing the youth to become employment ready to embark on futuristic sustainable careers
- Proliferating the chances for sustained employment among young people

The course will also focus on imparting hands on practical training on the application aspects of IoT by experts from Neoware Technology Solutions Private Limited.

Distinctiveness

This course unlike the previous courses was unique as it adopts Institution-Industry-Interaction Model bridging theory and practice. This course was a professional blend of theoretical inputs and their applicability aspects taught by eminent professors from illustrious technological institutions in the country, along with practical exposure of the application of the concepts taught to be provided by accomplished IT barons from industry.

Expected Outcome

IoT has much wider applicability and scope in domestic and industrial spheres which are expanding very rapidly. This course was in alignment with the latest industry requirement and standards aiming to imparting a thorough knowledge on the IoT architecture, services, applications and enabled technologies which will empower young people like you to embark on a specialized career in this trending field as one full day has been apportioned to impart practical skills besides theory sessions.

On completion of this course, the learners will be able to gain enormous knowledge on the IoT architecture, services, applications and enabled technologies which will also enable them architect computerized programs using IoT protocols.

Collaborating Institutions

Today, the Public-Private-Partnership Model is widely adopted across the country, particularly in education and skill development avenues. Therefore, RGNIYD recognizing the paramount significance of the model and its benefits to the young people of our country, embarked on an Institution-Industry-Interaction model roping in the renowned technological institutions such as National Institute of Technology – Tiruchirapalli, Tamil Nadu, National Institute of Technology – Jalandhar, Punjab and a leading IT based industry – the Neoware Technology Solutions Private Limited, Chennai which has established its own standing in the areas of data and cloud engineering, artificial intelligence, online technology integration and automation.

Participants

The programme was organised exclusively for the Youth of North Eastern Region. The registration link was hosted on the RGNIYD's Website through which a total of 561 registrations were received from youth belonging to 26 (including 7 North Eastern States)*viz.*, Andhra Pradesh, Bihar, Chhattisgarh, Delhi, Gujarat, Jammu and Kashmir, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Odisha, Puducherry, Punjab, Rajasthan, Tamil Nadu, Telangana, Uttar Pradesh, Uttarakhand, West Bengal and the north-eastern states include Assam, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim, and Tripura.

It was decided by RGNIYD to permit the youth from various other states who have evinced interest in the course and have applied as participants of the course. Accordingly the youth from various states other than the north-eastern region were also included as participants as it will not involve any additional cost to RGNIYD.

While there have been a large number of registrations, the programme was attended by 264 persons. Whereas,245 participants from 25 states viz., Andhra Pradesh, Bihar, Chhattisgarh, Jammu & Kashmir, Jharkhand, Karnataka, Kerala, Madhya Pradesh, Maharashtra, New Delhi, Odisha, Puducherry, Punjab, Rajasthan, Tamil Nadu, Telangana, Uttar Pradesh, Uttarakhand, West Bengal including 73 participants from six north eastern states viz., Assam, Manipur, Mizoram, Nagaland, Sikkim and Tripura secured attendance of 80% and above who were eligible to receive certificates. Among these regular participants, 49 candidates were those who have not registered but attended the course through known sources.

The details of participants entitled to receive certificate is provided as Annexure -1 and the state-wise number of participants provided certificates including the north-eastern region has been provided separately as Annexure – 2.

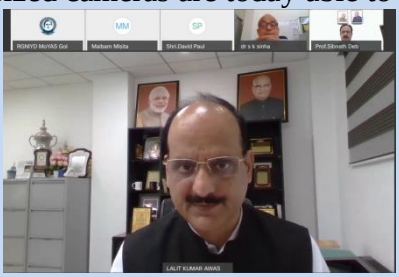
Inaugural Session

The short-term certificate course was inaugurated by the Secretary (Youth Affairs), Ministry of Youth Affairs and Sports, Government of India on 15th March 2021. In her presidential address, the Secretary (YA) she mentioned that IoT is a programmed network consisting of devices with enablement to sense, assimilate and

transfer instructions to control the devises integrated through IoT remotely. Internet of things is a sequence of devices such as vehicles, domestic appliances and gadgets that we use frequently in our day to day life built-in with sensors or programed with software that enable these connected gadgets to function based on the data or instructions provided. This technology has come very handy to the human beings which has also smartly transformed the world and has altered our lifestyle. These unified objects are often denoted as "Smart devices" supporting IOT a massive network that enables a smarter world function with less human involvement. All these smart devises provide us real-time information/data, which are highly useful in analysis and interpretation of assessments, results and estimations accurately. For instance, the devices which we use widely in our day to day life such as smart phones, smart watches, pulsomester, wearable health devises, health bands etc to monitor our body's blood pressure, heart rate, body movements, ambulatory monitoring of vital visceral organs and their functioning, driverless cars are few devices that are enabled through IoT.

The Joint Secretary (Youth Affairs), Ministry of Youth Affairs and Sports, Government of India in his special address mentioned that Internet of Things is a trending career field and is rapidly transforming the world at an unprecedented level. The synchronized network between various smart devices and the sensors or software programmes backed up by internet enables the objects or gadgets that we use daily to function smartly with artificial intelligently is called the Internet of Things.

Advances in technology are making it possible to adopt Internet of Things, wherein micro sized cameras are today able to generate numerous images within human body, smart gadgets with micro sensors are able to detect body signals and deduce vital functions of the human body. Today many smart devices that we use on daily basis are becoming very popular which have reduced human effort and have almost automated most of the works we physically perform.



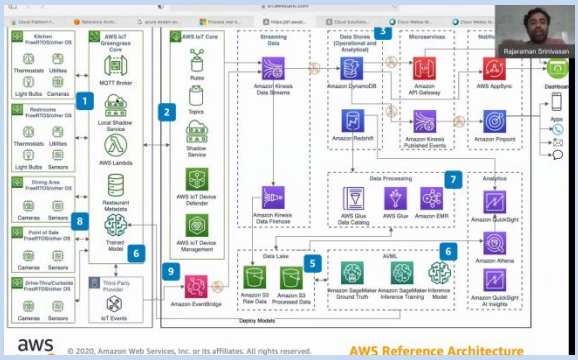
He mentioned that this course was unique as it adopted Institution-Industry-Interaction Model bridging theory and practice. IoT has much more wider applicability and scope in domestic and industrial spheres which are expanding very rapidly and concluded that there are plenty of career opportunities in this vertical globally. Mastering these technical skills, one can secure a job opening very easily he reiterated.

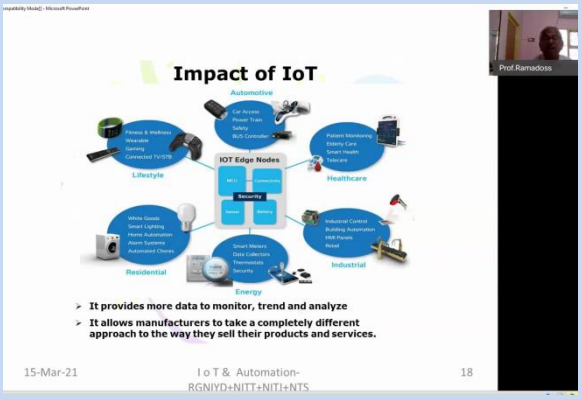
The Directors of the National Institute of Technology, Tiruchirapalli, Prof. Mini Shaji Thomas, Prof.Lalit Kumar Awasthi, Director, NIT, Jalandhar and Shri Rajaraman Srinivasan, Co-Founder & CEO-Neoware Technology Solutions felicitated during the occasion.

The Director, RGNIYD, Prof.Sibnath Deb welcomed the dignitaries, guests and the participants and detailed about the short-term certificate course on Internet of Things and Automation and spoke on the significance of the Institution-Industry Partnership Mode adopted for this programme. Prof S. K. Sinha, Dean, NIT Jalandhar delineated the objectives of the programme.

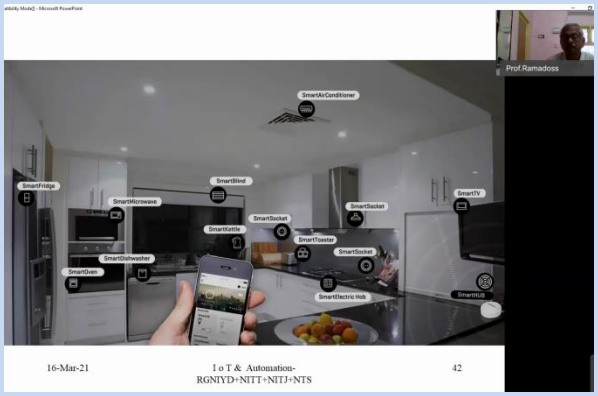
Proceedings of the Technical Sessions

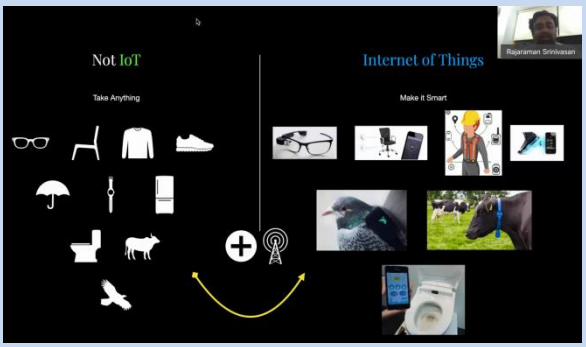
Following the inaugural session, the technical sessions of the course commenced. The **first day** had two technical sessions viz., "An Overview of IOT & Automation" facilitated by Prof.B.Ramadoss, Professor (HAG)-Retd., Department of Computer Applications, National Institute of Technology, Tiruchirapalli and "Data Deluge – Introduction to Internet of Things, Its Evolution and Future" handled by Shri. Rajaraman Srinivasan, Co-Founder & CEO – Neoware Technology Solutions Private Limited, Chennai.

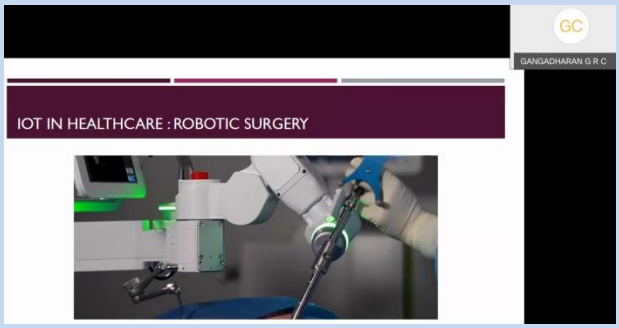




On the **second day**, there were three sessions viz., "IOT applications in Home security system" handled by Prof.B.Ramadoss, Professor (HAG)-Retd., Department of Computer Applications, National Institute of Technology, Tiruchirapalli, "Applications of IoT – Industries & Use Cases" by Shri. Rajaraman Srinivasan, Co-Founder & CEO – Neoware Technology Solutions Private Limited, Chennai and "IoT enabled WSNs for Agriculture Applications" facilitated by Dr.Samayveer Singh, Department of Computer Science Engineering, National Institute of Technology, Jalandhar.

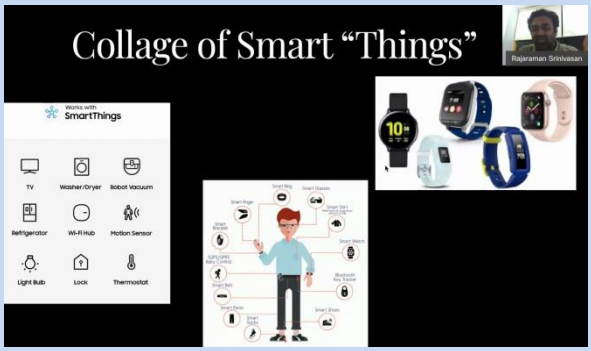


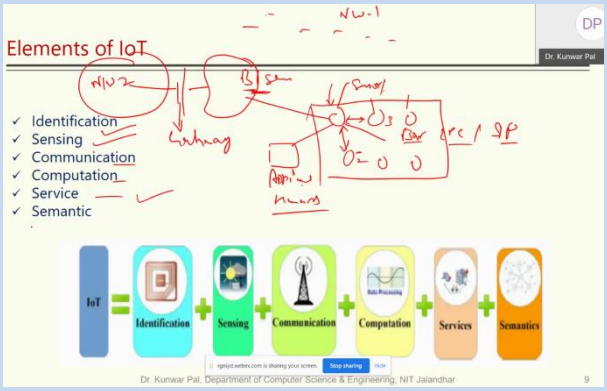




Three technical sessions were covered on the **third day**. The topics of the sessions included "Smart Health Monitoring System using IoT – Part-1" handled by Dr.G.R.Gangadharan, Associate Professor, Department of Computer Applications, National Institute of Technology, Tiruchirapalli. During this session, the Resource Person started with the discussions on ideas of IoT applications in the healthcare sector that can improve the efficiency level of treatment and monitoring of patients. He later described the enabling technologies for smart IoT-based healthcare solutions such as Cloud Computing, Fog/Edge Computing, Artificial Intelligence & Big Data Analytics, Sensors, and Body Area Networks. In conclusion, he explained a minimal and simple fog-based architecture for IoT-based healthcare applications.

Following this session, the second session was on "Technology Architecture for IoT and Adjacent Technologies" by Shri. Rajaraman Srinivasan, Co-Founder & CEO – Neoware Technology Solutions Private Limited, Chennai and the last session was on



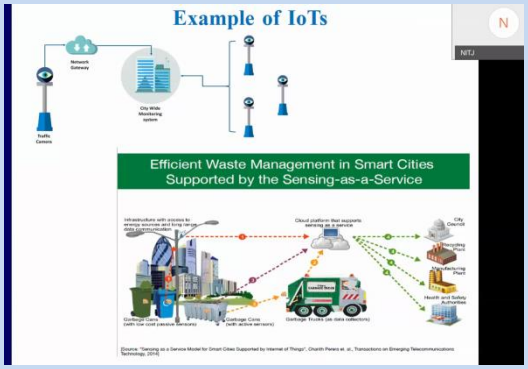


"Internet of Things Security: Challenges and Opportunities" facilitated by Dr.Kunwar Pal, Department of Computer Science Engineering, National Institute of Technology, Jalandhar.

During the **fourth day**, three technical sessions were conducted. The first session was on "Smart Health Monitoring System Using IoT – Part-2" handled by Dr. G. R. Gangadharan,

Associate Professor, Department of Computer Applications, National Institute of Technology, Tiruchirapalli. In his lecture he discussed at length the design and development aspects of a smart healthcare monitoring system (a system that monitors the pulse and body temperature of patients and environmental conditions including humidity) in the IoT environment. Later during his session he explained the smart IoT-based healthcare solutions in Indian context using various case studies. Towards the end of his session, he discussed in detail on various research challenges and open issues in IoT healthcare.

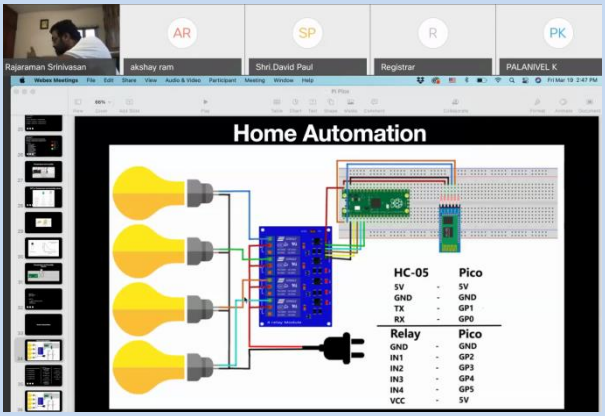
The second session dealt with the “Connected Nature of IoT: Its Applications and Examples” handled by Shri. Rajaraman Srinivasan, Co-Founder & CEO – Neoware Technology Solutions Private Limited, Chennai. The last technical session on Day-4 was on “IOT and Its Industrial Applications” led by Dr. Nisha Chaurasia from the Department of Information Technology, National Institute of Technology, Jalandhar.

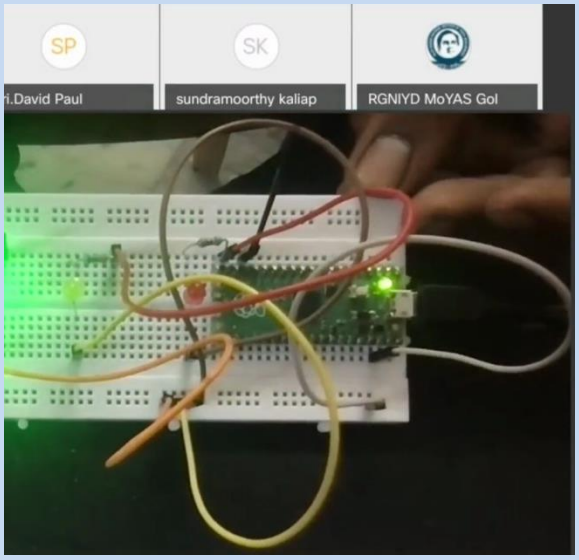


Practical Sessions

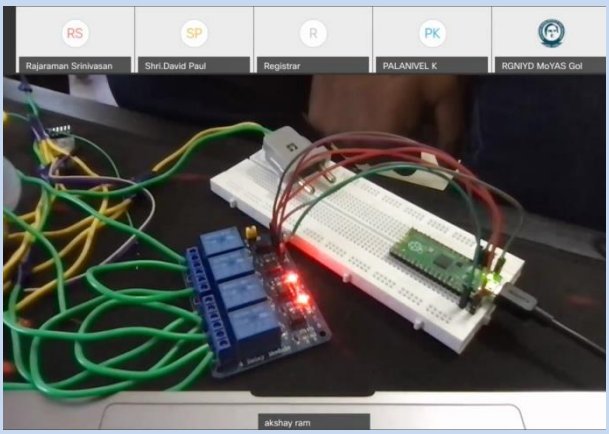
The highlight of this particular course was that, one whole day was devoted for practical training facilitated by experts from the partner Industry – M/s. Neoware Technology Solutions Private Limited, Chennai.

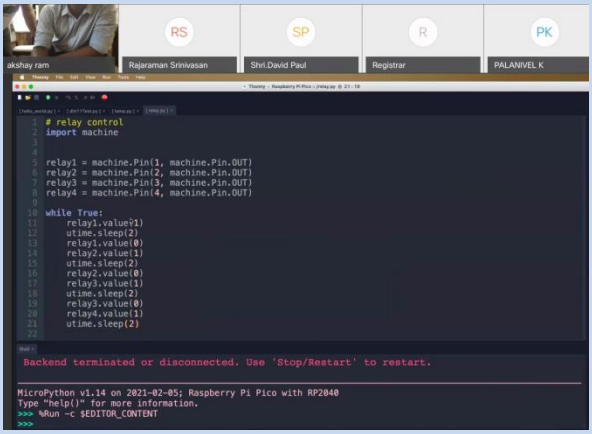
The **fifth day** of the Course, all the three sessions were allotted for practical work. Mr. Rajaraman Srinivasan, CEO and Co-Founder, Neoware Technology Solutions Private Limited and Mr. Akshay Ram Ramchandra, Data Scientist, Neoware





Technology Solutions Private Limited were the main facilitators of the practical sessions who were jointly co-facilitating the entire day’s activities. Further, Mr. SriramKalyanasundaram, Delivery Manager, Neoware Technology Solutions Private





Limited and Ms. Suriya Kumar – Software Engineer, Neoware Technology Solutions Private Limited assisted the facilitators during the practical sessions.

The gadgets required for practical purposes were listed and sent to the participants through e-mail in advance along with the details of prices and sources of availability including online sources for purchase. The participants were required to assemble and programme those devices along with the facilitators through demonstration virtually.

The demonstrations during the practical sessions included rasberry pi running with push coding with micropython, connecting other components with resberry pi via usb, connecting relay to control the AC bulbs, building in bluetooth module with the Pi pico, operating bulbs from phome through bluetooth controlled by the rasberry with the power for the bulbs from wall socket, resistors for intro LED setup and LEDs for introduction setup.

Valedictory

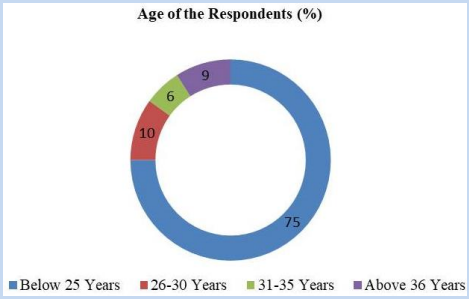
During the valedictory session, Prof. K. S. Ravichandran, Registrar, RGNIYD delivered the valedictory address. During his address he recapped the crux of entire technical sessions besides bringing out the advantages of equipping the youth with skills on Internet of Things.

Mr. Rajaraman Srinivasan, CEO and Co-Founder, Neoware Technology Solutions Private Limited was the guest of honour during the valedictory session. In his special address during the valedictory, he delineated the training, courses and job opportunities in the field of IoT. He discussed at length on the Short Term Training (both Regular Institutes & Online), Formal Courses in illustrious Institutes across the globe including the scholarship information, Job Opportunities for Freshers and Entrepreneurship in IoT with support from Government of India and other sources. With reference to the short term courses and medium-long term formal courses he listed the names of Institutes which offer such courses with the titles of those courses being offered, information on eligibility criteria for selection to such courses, duration of those courses, fee structure, advantage of each course, outcome and scope of such courses, probable dates for application etc. with regard to the job opportunities, he spoke on the contemporary and futuristic scope for IoT skills in Large Enterprises, IoT Start-ups & Tier-2 Companies, Local Opportunities, Entrepreneurship along with the prerequisites which was a great eye-opener for the participants.

Evaluation of the Course

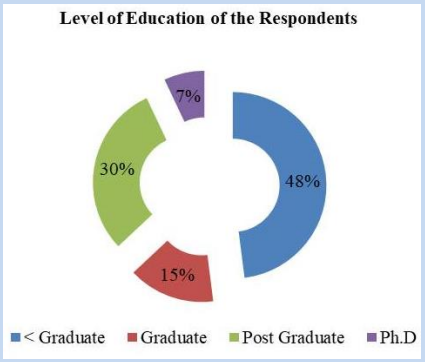
Section – 1: General Information

A semi-structured questionnaire was circulated among the participants of the programme. A total of 138 participants responded and provided their feedback.



Age

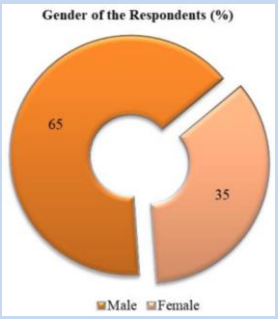
With regard to the age of participants about 75% of them were below the age of 25 years. 10% were between the ages of 26 to 30 years, 6% were between 31 to 35 years of age and 9% of the participants were over 36 years of age.



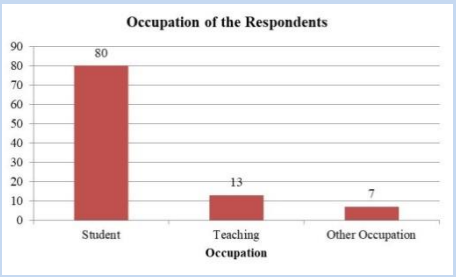
Education of the Respondents

With regard to the level of education of the respondents, 48% were those who were pursuing under graduation programmes or diploma holders, 15% were graduates, 30% were post graduates and 7% have doctoral degrees.

Gender of the Respondents

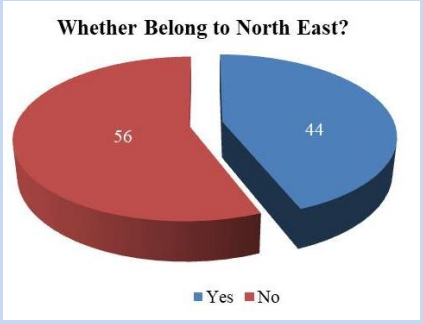


With regard to the gender of the Respondents, it was noted that 65% were male and the rest 35% were female.



Occupation of the Participants

Among the respondents, majority of the participants (80%) were students, whereas, 13% of them were in teaching roles and another 7% of the respondents were engaged in other occupations.



Whether belong to North East

The geographical location of the respondents were studied and was ascertained that among the respondents, 44% of the

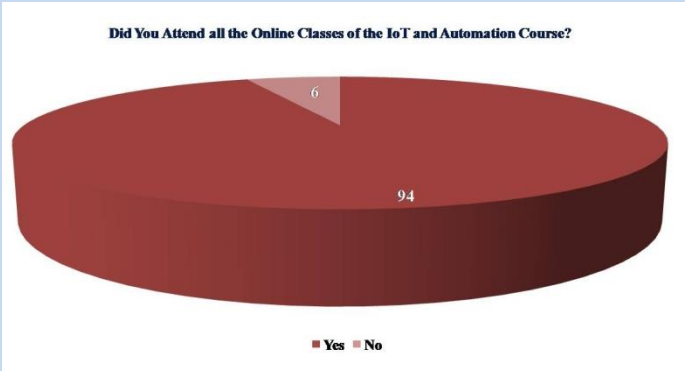
participants belonged to the north-eastern region and the remaining 56% were from other states of the country.

Section – 2: Feedback about the Course

Through a semi-structured questionnaire the summative feedback from the participants were collected through online (Google Forms) which were submitted on through their e-mails. The feedback form was mailed to the participants who were regularly attending the sessions. Based on the responses of the respondents (138 responses) obtained through online mode, the feedback of the participants are presented in the following sections.

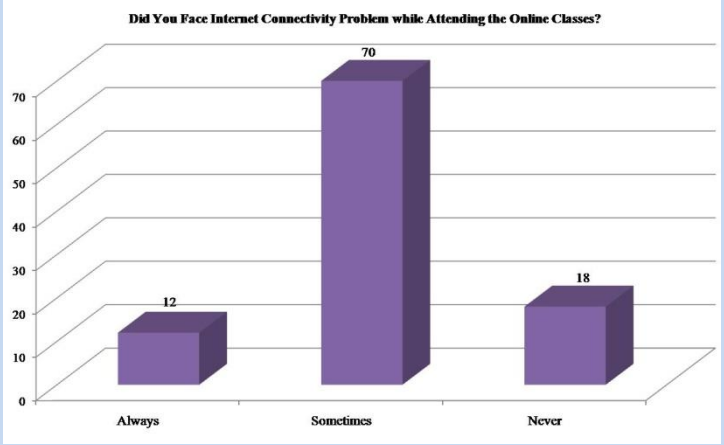
Whether attended all the online sessions of the course?

The participants were requested to indicate whether they attended all the online sessions of the Short-term Certificate Course on Internet of Things and Automation. Based on the responses collected, it was estimated that about 94% of the respondents who provided feedback attended all the online sessions of the Short-term Certificate Course on Internet of Things and Automation. It was also observed that 6% of the respondents of the indicated that they could not attend all the online sessions of this course due to varied reasons. The reasons for not attending all the online sessions are detailed in the subsequent sections. Further, it is pertinent to indicate here that it was mentioned in the guidelines for participants circulated to all the selected candidates prior to the commencement of the course that it was a pre-requisite that the participants have to attend all the sessions of the course for the purpose of obtaining an E-Certificate.



Internet Connectivity Problems while Attending the Online Sessions

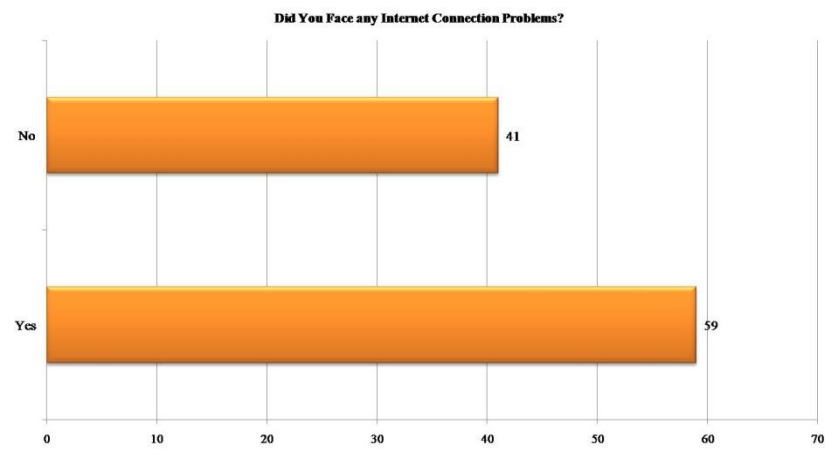
In order to ascertain the reason for not attending all the online classes during the course, the participants were asked to reason out whether they encountered internet connectivity problems while attending the online sessions. To this, a majority of the participants (70%) of them mentioned that they sometimes faced issues related to internet connectivity which obstructed their uninterrupted attendance during the course. However, as mentioned above, 94% of the participants somehow managed to attend all the sessions which manifests their degree of interest and inquisitiveness to learn. It was noted that 12% of the participants always faced internet



connectivity problems while attending the online sessions, particularly among the participants who belong to north-eastern region and those who were attending from far flung rural areas in various states of the country. It is also to be acknowledged that 18% of the participants have revealed that they never incurred any internet related issues during the entire programme.

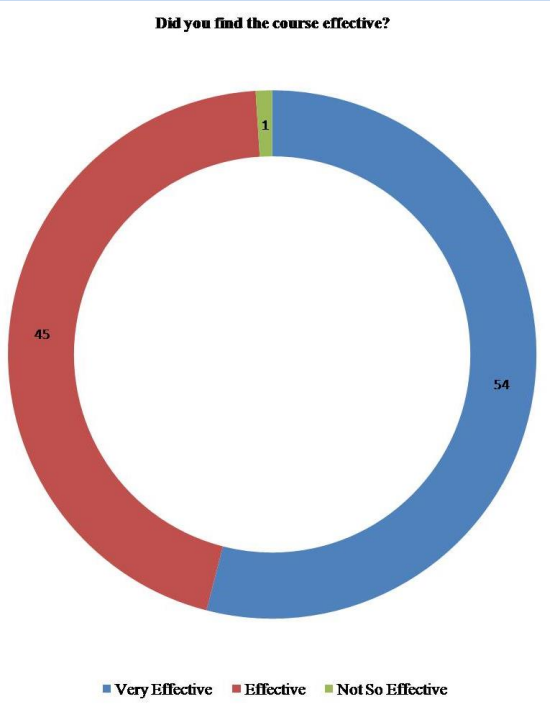
Internet Problems in General

The organisers of the course were curious to find out as to what percentage of the respondents in general faced internet connection problems. Among the respondents 59% of them informed that they faced some sort of internet connection problem while 41% did not face much of internet connectivity issues. The major issue that the participants indicated was that on the first day, the participants had to login much earlier for the inaugural session followed by the technical sessions due to which they exhausted the data they had for the day. The other factors included that the youth of north-eastern region and those attending from rural areas faced much problem than those in the urban and institutional settings. It is also to be noted here that the Resource Persons also sometimes faced internet problems wherein, sometimes, their voice was not audible or their video was not displayed, their presentations became static and had to re-connect at times. However, at the beginning and end of the session, the Resource Persons briefed what was being covered and what has been covered so that the participants were clear about the proceedings of the sessions due to internet connection problems.



Effectiveness of the Course

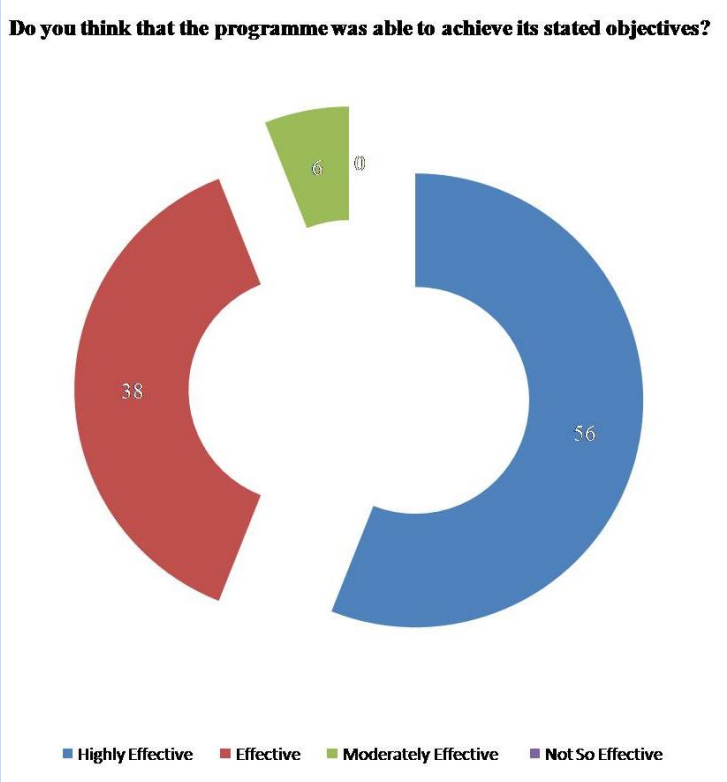
Measuring the effectiveness of the course was the prime objective to obtain the feedback from the participants. When the participants were requested to indicate their opinion on the effectiveness of the Short-term Certificate Course on Internet of Things and Automation, more than half of the participants (54%) of the participants informed that the course was very effective. Further another half of the participants (45%) felt that the course was effective. It was noted that only one percent of the participants mentioned that the course was not so effective. The programme was attended by youth who were pursuing their educational programmes at different levels from ranging from less than



higher secondary schooling, Diploma, Bachelor's Degree, Post Graduation, Ph.D Research Scholars and those who were already on various jobs including in teaching professions from varied disciplines such as science, computer and information technology. The miniscule percentage of participants rating the programme as not so effective may be due to the fact that they may belong to streams other than science and technology who would not have been able to comprehend the basic concepts and relate them to useful applications. Further, due to the varying levels of educational backgrounds of the participants and heterogeneity of fields the participants hailed from, the Resource Persons were very mindful to cater to the informational needs of all the participants uniformly and did not address a particular level or group of participants. As the major objective of the course was to provide basic knowledge on Internet of Things and Automation and to promote interest among those youth who are interested to pursue the field of study, the course might not have been satisfying to each and every one who attended the course. Ultimately when we integrate the responses of the participants on the feedback of the respondents 99% of them indicated that the course was either very effective or effective. Only 1% indicated that the course was not so effective. It is a matter of great satisfaction to the organising institutions that the course was found to be effective overall to 99% of the participants. This demonstrates the success and effectiveness of the course.

Achievement of the Stated Objectives of the Course

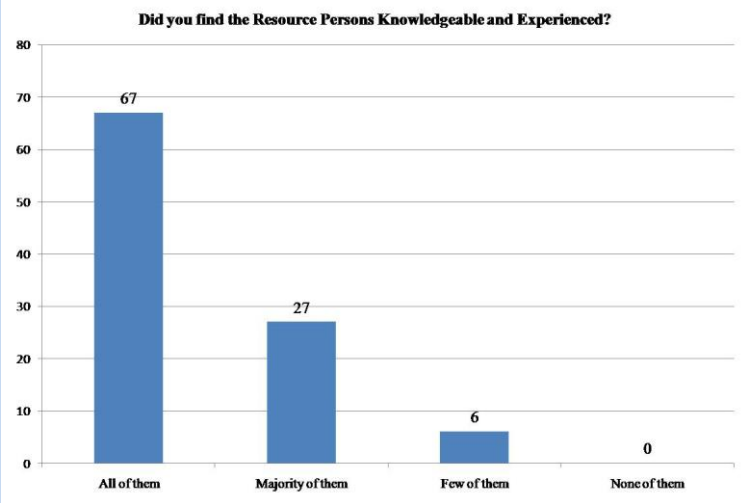
The objectives of the Short-term Certificate Course on Internet of Things and Automation have been clearly delineated in the introductory sections of this report. However, a snapshot of the objectives of the course are articulated here for ready reference. This course aimed at providing an overview of IoT and Automation, the underlying mechanisms of Internet of Things and its Applications, scope of the field for choosing as a career, promoting interest among the youth to pursue this popular field of study, build the capacities and basic skills on IoT and its Applications including programming and protocols besides fostering skills of the youth who are seeking re-entry into the job market to enter into this new field as many have lost their jobs during the pandemic period and looking for sustainable careers to build their careers. To the query "Do you think that the programme was able to achieve its stated objectives", majority of the participants (56%) felt that the course was highly effective in achieving its stated objectives, 38% of the participants felt that the course was effective in achieving its objectives and about a very small group of respondents (6%) felt that the course was moderately effective in achieving its stated objectives. None of the participants mentioned that the course was no so effective in achieving its objectives.



Cumulatively, 94% of the participants felt that the course was either highly effective or effective in achieving the stated objectives. This once again corroborates that overall effectiveness and success of the course.

Quality of Resource Persons

While RGNIYD and the collaborating Institutions viz., NIT Tiruchirapalli and NIT Jalandhar including the Industry partner M/s. Neoware Technology Solutions Private Limited were very particular about the content delivery by the Resource Persons of high repute, RGNIYD in consultation with the collaborating institutions very carefully chose the Resource Persons of the course from the respective institutions. The content delivery during the technical sessions of this short-term certificate course was done by the teaching faculty from NIT Trichy, NIT Jalandhar and experts from the industry partner M/s. Neoware Technology Solutions Private Limited. However it was felt imperative for the organisers to obtain the ratings on the quality and effectiveness of the resource persons from the participants. Therefore, the participants were asked to provide the opinion on the extent of knowledge in the subject and the level of experience demonstrated by the resource persons through their lectures.

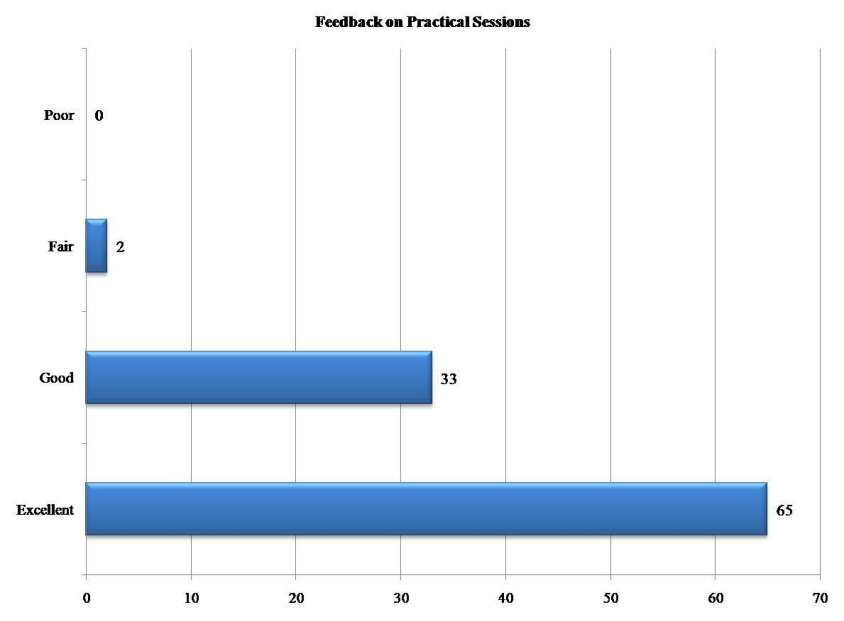


Responding to this information sought, majority of the participants (67%) rated that all the resource persons were highly knowledgeable and experienced and 27% of the respondents mentioned that majority of the resource persons were knowledgeable and experienced. About 6% of the respondents pointed out that few of the resource persons were highly knowledgeable and experienced. However not a single participant mentioned that none of the resource person was knowledgeable and experienced.

Feedback on Practical Sessions

RGNIYD has been organising a series of technical training programmes and this present Course on Internet of Things and Automation being the fifth one in the series after Cyber Security, Artificial Intelligence and Machine Learning, Recent Advances in Data Sciences and Cloud Computing, the present course was very different from the earlier four courses. The distinction is that this course had practical sessions slated for one full day facilitated by the industry experts which provided a rare opportunity for the participants to exercise their learning and skills in a practical way. The fifth day of the course was fully practical in nature. Information on the materials required for practical work were circulated to the selected participants well in advance before the commencement of the course with details of the availability/sources of procurement including online, the pricing of the products and accessories etc. On the final day, online practical demonstration was done the industry

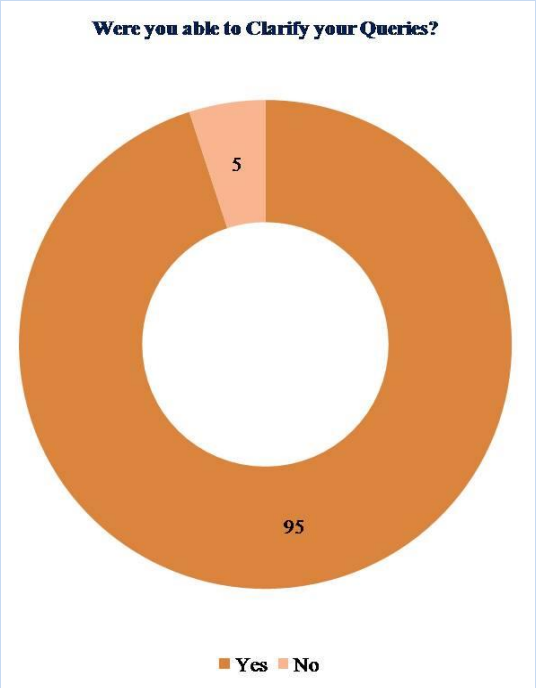
experts from M/s. Neoware Technology Solutions Private Limited, Chennai. As the demonstration was being conducted online, the participants were tutored online by co-facilitators from M/s. Neoware Technology Solutions. The participants were required to work on rasberry pi running with push coding with micropython, connecting other components with resberry pi via usb, connecting relay to control the AC bulbs, building in bluetooth module with the Pi pico, operating bulbs from phome through bluetooth controlled by the rasberry with the power for the bulbs from wall socket, resistors for intro LED setup and LEDs for introduction setup.



The participants were required to provide feedback on the practical sessions on the feedback form. The responses of the participants on the practical sessions have been consolidated and are graphically presented. Majority of the participants (65%) felt that the practical sessions were excellent, 33% of them found the practical classes good and 2% of the participants felt that the practical sessions were fair. None of the participants rated the practical sessions as poor. Collectively, 98% of the respondents felt that the practical classes as excellent and good. The remaining 2% of the respondents who rated the practical sessions as fair may be due to the reason that they did not have technical background or maybe they were not following the practical sessions and did not engage themselves in the hands on training sessions by following the methodical steps using the suggested material for practical work.

Clarification of Queries by the Resource Persons

As mentioned in the earlier sections, the course had participants with varying levels of education, experience and fields of study. Therefore, the Resource Persons were oriented before embarking on their sessions to cater to the wide-spread informational needs of the participants taking into consideration these disparities. The resource persons allocated a minimum of fifteen minutes for question and answer sessions towards the end of their sessions, while few Resource Persons even spent more than half an hour for clarifying the doubts and questions raised by the participants.

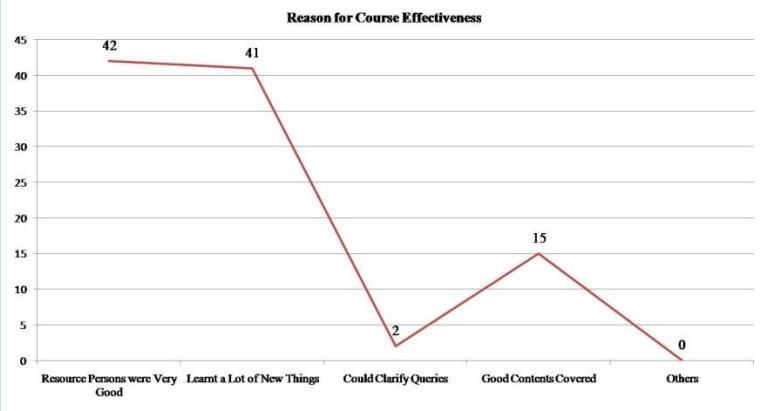


Therefore, good amount of attention was paid for addressing the queries of the participants which were raised directly or in the chat window.

As part of the feedback, the participants were informed to provide information whether their queries were attended to and clarified? In response, vast majority of the participants (95%) revealed that their questions were addressed and were clarified. However 5% of the participants mentioned that their queries were not clarified. The reason may be due to the fact that the Resource Person may not have addressed the queries that do not fall in their range or scope of their subject. Further, very rudimentary or fundamental questions may not have been addressed which may have been posed by beginners or participants belonging to low educational backgrounds as those concepts were being repeated as part of introduction in various lectures. Further, pertinent and queries of significance to each session were definitely clarified. However, questions which were less sensible may not have carried attention.

Specific Attributes for the Effectiveness of the Course

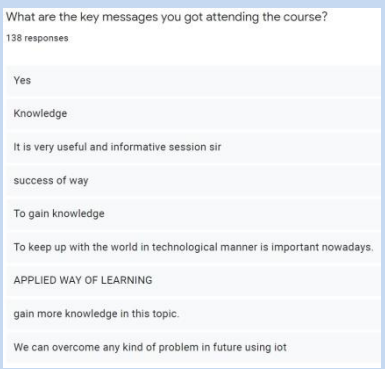
In order to further probe into the specific reasons and special features that attributed to the effectiveness of the Short-term Certificate Course on Internet of Things and Automation, the participants were requested to pin-point the exact reason which made the course effective. The responses of the participants have been aggregated and classified which are provided as a graphical representation for having a bird's-eye-view. From the graph, it is observed that 42% of the respondents attributed that the Resource Persons were very good which was found to be the primary reason for high degree of effectiveness of the course. This was followed by 41% of the participants remarking that they learnt a lot of new things which contributed to the effectiveness of the course. About 15% of the participants felt that the course was effective due to the fact that good amount of content was covered, while, 2% of the respondents felt that their specific queries were clarified during the courses which made them feel that the course was effective.



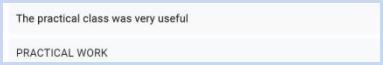
Participants' Key Messages on Attending the IoT Course

The participants of the course were informed to provide the key takeaway from attending the Short-term Certificate Course on Internet of Things and Automation. Responding to this, the participants provided various responses which have been consolidated and are presented below:

- Acquisition of knowledge
- Attending the Course enabled gain more insights on the subject
- The Course provided application oriented learning

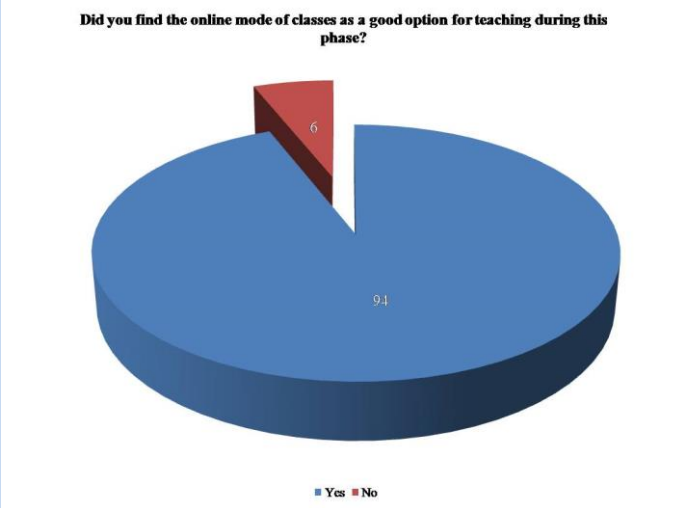


- The practical classes were very useful
- Practical work was very interesting
- The Course was instrumental in providing conceptual and practical knowledge to address futuristic problems using Internet of Things
- The Course enabled to keep abreast with the technological advancements
- The Course was very useful and informative
- The Course was successful



Participants' Opinion on Online Mode of Teaching and Learning

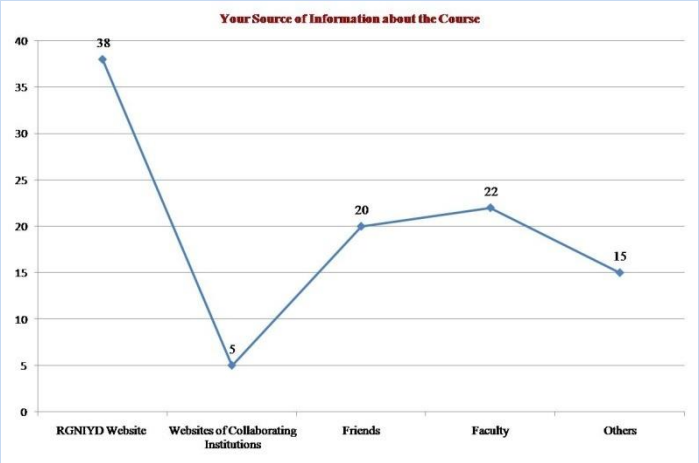
The feedback form also attempted to study the perceptions of the participants as to whether the online mode of teaching and learning was a good option or not, particularly during this second phase COVID-19 pandemic. For the query on whether the participant find the online mode of classes as a good option for teaching during this pandemic phase, the consolidated responses of the participants revealed that a vast majority of 94% ascribed that online method of teaching and learning was the only best mode while the entire world is shut with no or limited opportunities for education and skill upgradation. On the other hand, a small section of the participants constituting only 6% of the entire respondents felt that the online mode of teaching and learning was not effective. Attempting on the content analysis of the responses of the participants, it was uncovered that this small segment of the respondents felt that direct method of teaching and learning was much effective, keeping in view the limitations of internet connectivity problems. Further, the most modern technical tools and software have enabled to transcend these barriers. Those who were well-versed and acquainted with internet technology ascribed this as a good method of teaching and learning whereas, those who were not much conversant with the online technology felt this mode as not much satisfying. However, these technological advancements have become much handy for adapted teaching and learning during these difficult times overcoming the barriers of social distance and other related factors. RGNIYD felt that in order to contain the pandemic in an effective way and at the same time to serve the youth of the nation by promoting education and skill development, exploiting the time and technology has become prime. The Ministry of Youth Affairs and Sports and the feedback of the Secretary (Youth Affairs) and the Joint Secretary (Youth Affairs) during the inaugural session of this course reiterated that RGNIYD has overcome these barriers of physical distance and is utilizing most effective methods of teaching and skill development, rather, at a very low cost which is catering to the educational and training needs of the much deprived youth who are socially and economically disadvantaged.



Source of Information about the Course

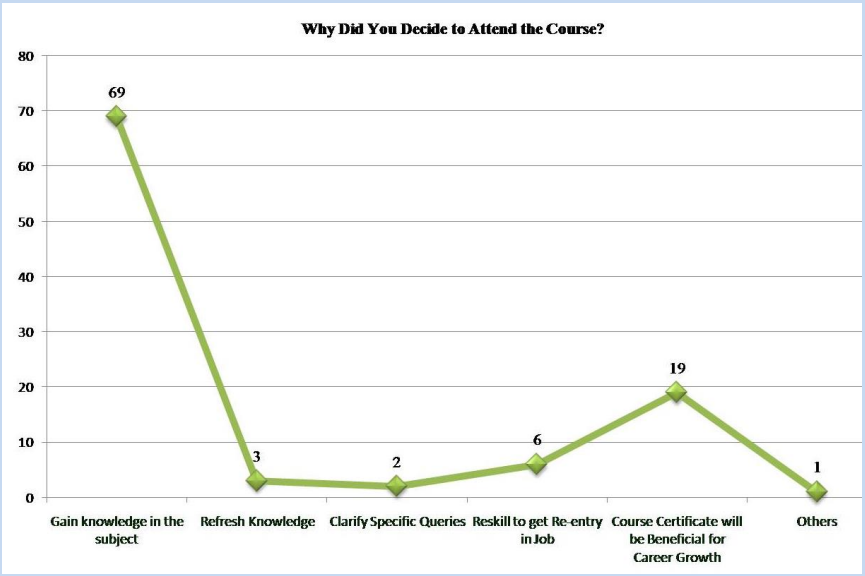
With regard to the source of information about the Short-term Certificate Course on Internet of Things, the participants were probed on how they came to know about the course. To this

required information on the feedback form, the participants responded that most of them (38%) learnt about the conduct of the course from the website of RGNIYD, while 22% of the participants were informed about the course by their faculty members. Another 20% of the participants mentioned that they came to know about this course through their friends, while 5% of the participants acquired information on the course through the Website of NIT Tiruchirapalli, NIT Jalandhar and Neoware Technology Solutions. Remaining 15% of the participants said that they were informed about the course by their college, NCC Officers and Instagram sources. It is noted that RGNIYD's website was the predominant source of information about the course. Therefore, it is highly imperative that frequent updation of RGNIYD's website is required as the number of viewers have significantly increased besides RGNIYD's website being a one-stop source of visibility of RGNIYD's programmes and activities having a wider reach and impact on youth through the information provided on the website.



Reasons for Attending the Course

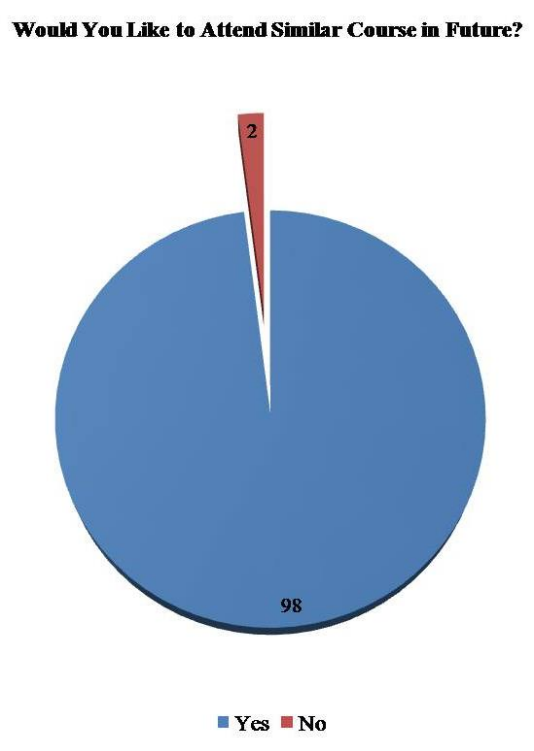
The most significant information from the participant regarding the reason for attending the Short-term Certificate Course on Internet of Things and Automation was collected as part of the feedback. Various reasons for attending the course were cited by the respondents which have been classified based on their response. Among the participants a large proportion (69%) responded that they participated in the course in order to gain knowledge in the subject. As most of the participants were student youth pursuing their studies presently, 19% among the participants mentioned that their participation in the course and the course certificate will be beneficial for their career growth which will enhance the value of their CV. This was followed by a special category of target group of the online technical courses being offered by RGNIYD which constitutes the young people who have lost their jobs during the lockdown period and as a consequence of downsizing due to the COVID-19 pandemic. As job melting is one of the serious and alarming consequence caused by the Corona Virus, particularly, among the youth in India, RGNIYD has been organising these types of technical



courses to re-skill, upskill and build the functional capacities of the youth to seek fresh jobs or re-enter into the job market. Accordingly, 6% of the participants have indicated that they participated in the present course to re-skill themselves to qualify to seek re-entry into the world of work. While a small group of participants constituting 3% of all the participants have indicated that they attended the course to refresh their knowledge and another 2% of the participants attended the course to get their specific queries clarified by the experts in the field. The remaining 1% of the participants had various other unquoted reasons for participation in the course.

Interest to Participate in Similar Courses in Future

In order to elicit the opinion among the participants as to whether they will be willing to participate in similar programmes or attend advanced programmes in future, almost all the participants (98%) expressed their willingness to participate in the future programmes to be organised by RGNIYD. The highlight of these programmes being organised by RGNIYD is that the courses are conducted on the most trending thematic areas having high potential for job absorption and are conducted free of cost. The other significant factor is that these courses are conducted as a Institution-Industry Partnership Programme in collaboration with the premier technological institutions and leading industry in the field. The course certificate is being jointly provided by all the collaborating institutions and partnering industry. Moreover, the mode of the course is online which has come to the highest advantage of the youth that they can participate in the course with the help of their mobile phone wherever they are without any additional cost. Particularly, during the lockdown period when mobility is restricted, the course is being offered during convenient timings. Further, the sessions are being facilitated by the best experts in the country and abroad due to which they can have good interactions during the sessions with the resource persons and develop professional contacts for career advancement and obtain academic guidance. Therefore, due to these advantageous reasons, the participants feel that the courses offered by RGNIYD are of great value and do not want to miss out such courses in the future too.



Copy of the Certificate

Rajiv Gandhi National Institute of Youth Development (RGNIYD)
(Institution of National Importance by the Act of Parliament No.35/2012)
Ministry of Youth Affairs and Sports, Govt. of India, Sriperumbudur, Tamil Nadu
in collaboration with
National Institute of Technology (NIT), Jalandhar
National Institute of Technology (NIT), Tiruchirappalli
Neoware Technology Solutions , Chennai

Sl.No.1445/811

CERTIFICATE

This certificate is awarded to

PALANIVEL

for successfully completing the online Certificate Course in

"Internet of Things and Automation" (An Industry & Institute Partnership Programme),

organised by Rajiv Gandhi National Institute of Youth Development (RGNIYD), Sriperumbudur, Tamil Nadu, in collaboration with National Institute of Technology (NIT), Jalandhar, National Institute of Technology (NIT), Tiruchirappalli and the Neoware Technology Solutions, Chennai, through online from March 15-19, 2021.

19-03-2021

SRIPERUMBUDUR, TAMIL NADU

Prof. Sibnath Deb
Director, RGNIYD

Prof. Lalit Kumar Awasthi
Director, NIT, Jalandhar

Dr. S. Muthukumaran
Dean, R&C, NIT, Tiruchirapalli

Shri. Rajaraman Srinivasan
Co-Founder & CEO
Neoware Technology Solutions, Chennai

Profiles of Resource Persons

Dr. (Mr.) RamadossBalakrishnan

Professor (HAG)
Department of Computer Applications,
National Institute of Technology,
Tiruchirappalli, Tamil Nadu

Dr. (Mr.) B. Ramadoss received his M.Tech degree in Computer science and Engineering in 1995 from the Indian Institute of Technology, Delhi and pursued Ph.D. in Applied Mathematics in 1983 from Indian Institute of Technology, Bombay. Currently, he is working as a Professor (HAG) Computer Applications at National Institute of Technology, Tiruchirappalli. He has over 43 years of teaching & research experience. He has taught at Sharja College (Affiliated to University of Houston, Clear Lake, Houston, USA and has been the Dean Faculty of Engineering and Technology, Head of Department of Computer Science and Visiting Faculty, Department of Computer Science at the Indian Institute of Technology, Bombay.

He has guided more than 15 Ph.D Research Scholars and is a Ph.D Examiner for various leading technological universities and institutions across the country. He has published over 80 research publications in SCI / SCIE / Scopus and reputed International Conferences. He has written research articles which have been published in over 45 Refereed Research Journals and published over 55 Refereed Conference Papers. Besides he has also authored 3 three books to his credit.

His areas of specialization lies in Software Testing Methodologies, Security and Privacy in Big Data and Cloud, Data Mining, Machine Learning, Deep Learning and Computer Vision. His research interests include Security and Privacy in Big Data and Cloud, Software Testing; Information Retrieval. He is a recipient of Best Teacher (Computer Applications) Award at National Institute of Technology, Tiruchirappalli.

He served as Member of the Board of Studies Member and as Academic Council Member in many reputed Universities/Institutions in India such as Anna University, Chennai, Bharathiar University etc. He has visited US, Singapore, Thailand, and Sharjah on a teaching assignment. He is a Senior Member of IEEE, Life Member of ISTE, New Delhi, Life Member of Computer Society of India.

Shri.Rajaraman Srinivasan

Co-Founder & CEO
Neoware Technology Solutions Private Limited
Chennai

Mr. Rajaraman Srinivasan is the Co-Founder & CEO – Neoware Technology Solutions and rolls out the vision and executes strategies of the organization and offers specialized services to leading clients on Artificial Intelligence, Data, Cloud& Strategic Advisory.

Formerly he has been the Chief Technology Officer for AI & Analytics at the Cognizant Technology Solutions and has headed the 2 billion dollar project through which he gained rich experience of over 20 years in the Analytics & Information Management area including Strategy, Products & Platform Vision, New Businesses, Architecture & Road-map definition, Large DW Program Management. At Cognizant Technology Solutions he also held the responsibility of incubating new ideas, conducting market research and the technology solution in all strategic opportunities and initiatives. He led the Big Decisions' vision, roadmap, execution at CTS and contributed a market successful Intelligence platform which generated over $50Mn+ revenues in 4 years.

At CTS, he has spearheaded Enterprise Information Architecture, Global Delivery, architected & implemented the 1st Hosted-DWBI program using SaaS model. He has handled BI Reference Architecture & Roadmap definition, DWBI technology consulting, Dimensional Modeling, ETCL for various verticals such as Pharma, Retail, Hospitality, Investment Banking, Auto, Insurance sectors.

He was instrumental in offering New Solutions definition, Program Management, Effort Estimation & Planning, Resource planning, Risk Management for leading clients such as Reliance, Philips, Amex, Bayer, Duty Free Shops, CCC, General Motors, Wyndham Hotels, Essar Telecom, Pepsi etc.

He also served as the Associate Consultant at the Informix Software Inc. discharging specialized roles on Data Warehouse implementations for large Indian corporate houses including Pepsi India and Godrej GE.

He was also in the mainstream academics and has also taught at the Department of Information Technology SASTRA University.

Dr.G.R.Gangadharan
Associate Professor
Department of Computer Applications
National Institute of Technology
Tiruchirapalli-15

Dr. G. R. Gangadharan is currently the Associate Professor in the National Institute of Technology (NIT), Tiruchirappalli. Previously he was associated with the Institute for Development and Research in Banking Technology (IDRBT), Hyderabad as an Associate Professor, he was a Researcher at IBM Research, India besides serving as a Researcher, at Novay (Telematica Institute), Enschede, Netherlands.

He received his Ph.D. degree in Information and Communication Technology from the University of Trento, Trento, Italy and European University Association. He pursued Postdoc Research at Politecnico di Milano, Milan, Italy and continued another Postdoc Research in the University of Trento, Trento, Italy. With over one and a half decades of teaching, research and consultancy, he has guided five Ph.D scholars and has undertaken major research and development projects of international acclaim such as Next Generation Smart Data Centers - Netherlands Organisation for Scientific Research (NWO) through Government of Netherlands, Data Security in Cloud Services through IBM International Shared University Research (SUR), United States of America, Security Architecture for Banking Cloud Services under IBM India University Relations. He has published more than 30 publications in Refereed Research Journals.

He has delivered invited academic lectures in Italy, Canada, Austria, Italy, Germany, Denmark, Switzerland, and widely in India. He is a Senior Member of professional bodies such as Institute of Electrical and Electronic Engineers (IEEE) and Association for Computing Machinery (ACM).

Dr.Kunwar Pal
Assistant Professor
Department of CSE,
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Dr.Kunwar Pal is presently the Assistant Professor in the Department of Computer Science & Engineering at the Dr. B R Ambedkar National Institute of Technology, Jalandhar, Punjab.

He pursued his M.E in Computer Science & Engineering from the Punjab Engineering College, Chandigarh and obtained Ph. D in Computer Science &Engineering from the Malaviya National Institute of Technology Jaipur.

He has published several Journal Publications, Conference Publications besides contributing for Book and Chapter Publications.

Dr.Samayveer Singh
Assistant Professor
Department of CSE,
NIT, Jalandhar

Dr Samayveer Singh is presently the Assistant Professor in the Department of Computer Science & Engineering at National Institute of Technology, Jalandhar, Punjab. He completed his B.Tech from Uttar Pradesh Technical University, Lucknow, and pursued M. Tech in Computer Science and Engineering at National Institute of Technology, Jalandhar where he bagged a Gold medal for his Best Performance in Master of Technology. Later he pursued his PhD in Computer Engineering from the University of Delhi.

His research interests include Wireless sensor networks - energy efficient techniques, heterogeneous network models, optimization techniques for sensor deployment; Steganography - image data hiding, text steganography, reversible data hiding.

He has published over 35 research articles in various internationally refereed Journals besides publishing over 15 Conference publications. He has contributed various chapters in more than 10 internationally published books besides co-authoring which have been published by John Wiley & Sons, Springer- Singapore, Germany, Heidelberg, LAP LAMBERT, Saarbrücken, Germany etc.

He has obtained a Patent for his research work on Method for hiding private information.

He is an active member of various professional bodies such as the Lifetime Member of Indian Society for Technical Education, Lifetime Member of Computer Society of India, Lifetime Member of International Association of Engineers, Member of IETE and a Member of Vibha India.

Dr. Nisha Chaurasia
Assistant Professor
Department of Information Technology
NIT, Jalandhar

Dr. Nisha Chaurasia is presently an Assistant Professor in the Department of Information & Technology at the Dr B R Ambedkar National Institute of Technology, Jalandhar, Punjab. Prior to this assignment she taught at the Jaypee Institute of Information Technology, Noida and at the Maulana Azad National Institute of Technology, Bhopal.

She pursued her B.E in Information Technology specializing in Cloud Computing Data Mining and M. Tech in Computer Science and Engineering with specialization on Data Mining from the Madhav Institute of Technology & Science, Gwalior and obtained her Ph.D in Information Technology on Server Consolidation in Cloud Computing from the Atal Bihari Vajpayee - Indian Institute of Information Technology and Management, Gwalior.

She has specialized training in Deployed OpenStack Cloud, Dreamweaver, DB2 and Trivoli by IBM, Big Data Research, Cloud Computing, Educational Resources Planning System, Industrial &Information Systems, Digital Forensics and NS-3 from globally reputed organisations.

Her research interests include Cloud Computing, Data Mining and High Performance Computing.

She has published several research articles in internationally reputed journals besides publishing her works as publications in many international conferences. She has also published books and chapters in various publications brought out by Springer and Taylor and Francis.

She has rendered project guidance to many B.Tech and M.Tech students besides coordinating various research projects including the project titled Interfacing Ad Hoc Mobile Networks with IP Mobile System under the UK India Educational Research Initiative (UKIERI). She has organised international conferences on Cloud of Things and Soft Computing.

Short-term Certificate Course
On

Internet of Things and Automation

(An Industry & Institute Partnership Program)

(March 15 – 19, 2021)

ORGANISED
BY

RAJIV GANDHI NATIONAL INSTITUTE OF YOUTH DEVELOPMENT
Institution of National Importance by the Act of Parliament No.35/12
Ministry of Youth Affairs and Sports, Government of India, Sriperumbudur – 602 105

IN ASSOCIATION WITH

NATIONAL INSTITUTE OF TECHNOLOGY, JALANDHAR Institute of National Importance under the Act of Parliament – 2007 Ministry of Human Resource Development, Government of India Jalandhar, Punjab - 144 011	**NATIONAL INSTITUTE OF TECHNOLOGY, TRICHY** Institute of National Importance under the Act of Parliament – 2007 Ministry of Human Resource Development, Government of India Trichirapalli-620015	**NEOWARE TECHNOLOGY SOLUTIONS PRIVATE LIMITED** Chennai (Industry Partner)

Programme Schedule

Day 1: March 15, 2021 (Monday) **Mode of Program: Virtual**

Time 11.00 – 11.30	**Inaugural Function**	**Minute to Minute Program**
Welcome address and Program Briefing by Prof. Sibnath Deb, Director, RGNIYD, MYAS, GoI		3 minutes
Introduction to the Program and Its Objectives byProf. S. K. Sinha, NIT, Jalandhar		3 minutes
Address byProf.Lalit Kumar Awasthi, Director, NIT, Jalandhar		4 minutes

Address by Prof. Mini Shaji Thomas, Director, NIT, Tiruchirapalli		4 minutes
Address by Shri Rajaraman Srinivasan Co-Founder &CEO-Neoware Technology Soluations		4 minutes
Address byShri. Asit Singh, IRS Joint Secretary (Youth Affairs), MoYAS		4 minutes
Presidential Address byMs. Usha Sharma, IAS Secretary (Youth Affairs), MoYAS, Government of India		6 minutes
Vote of thanks byProf.K.S.Ravichandran, Registrar, RGNIYD		2 minutes
Technical Sessions		
11:30 am – 1.00 pm	An Overview of IOT & Automation	Prof.B.Ramadoss Professor (HAG)-Retd. Department of Computer Applications National Institute of Technology Tiruchirapalli-15
Lunch Break		
Time	**Title of the Session**	**Resource Person**
2:00 pm - 3:30 pm.	Data Deluge – Introduction to Internet of Things, Its Evolution and Future	Shri. Rajaraman Srinivasan Co-Founder & CEO – Neoware Technology Solutions
Day 2: March 16, 2021(Tuesday)		
10.00 am – 11:15 am	IOT applications in Home security system	Prof.B.Ramadoss Professor (HAG)-(Retd.) Department of Computer Applications National Institute of Technology Tiruchirapalli-15
11.15 am – 12.30 pm	Applications of IoT – Industries & Use Cases	Shri. Rajaraman Srinivasan Co-Founder & CEO – Neoware Technology Solutions
Lunch Break		
2:30 pm – 4:00 pm	IoT enabled WSNs for agriculture applications	Dr.Samayveer Singh Department of CSE, NIT, Jalandhar
Day 3: March 17, 2021 (Wednesday)		
10.00 am – 11:30 am	Smart Health Monitoring System using IoT – PART-1	Dr.G.R.Gangadharan Associate Professor Department of Computer Applications National Institute of Technology Tiruchirapalli-15

11:45 am - 1:15 pm	Technology Architecture for IoT and Adjacent Technologies	Shri. Rajaraman Srinivasan Co-Founder & CEO – Neoware Technology Solutions
Lunch Break		
2:30 pm – 4:00 pm	Internet of Things Security: Challenges and Opportunities	Dr.Kunwar Pal Department of CSE, NIT, Jalandhar
Day 4: March 18, 2021 (Thursday)		
10.00 am – 11:30 am	Smart Health Monitoring System Using IoT – PART-2	Dr. G. R. Gangadharan Associate Professor Department of Computer Applications National Institute of Technology Tiruchirapalli-15
11:45 am - 1:15 pm	Connected Nature of IoT: Its Applications and Examples	Shri. Rajaraman Srinivasan Co-Founder & CEO – Neoware Technology Solutions
Lunch Break		
2:30 pm – 4:00 pm	IOT and its industrial applications	Dr. Nisha Chaurasia Department of Information Technology NIT, Jalandhar
Day 5: March 19, 2021 (Friday)		
10.00 am – 11:30 am	Hands on session-1	Neoware Technology Solutions
11:45 am – 12.30 pm	Hands on session -2	Neoware Technology Solutions
Lunch Break		
2:00 pm – 3.15 pm	Hands on session -3	Neoware Technology Solutions
3.15 pm - 3.20 pm	Online Feedback	
3.20 pm - 4.00 pm	**Valedictory Program** ▪ Prof.K.S.Ravichandran, Registrar, RGNIYD ▪ Shri. Rajaraman Srinivasan, Co-Founder & CEO, Neoware Technology Solutions, Chennai	

Annexure - 1

Consolidated Attendance of Participants (Eligible for issue of Certificate)

S. No.	Name and Address of the Participant
1	Saravanan
2	Odyuomhathung
3	VakaAswini Reddy Andhra Pradesh
4	Aashiq Hussain sheirgojri Jammu and Kashmir
5	AbhigyanDeka Assam
6	Abhishek Kumar Dubey Uttar Pradesh
7	Abishek. P Tamil Nadu
8	Sumitkumar Bihar
9	Aditya Kumar Bihar
10	Aditya Soni
11	Ajay Haryana
12	Ajith Kumar S
13	Akash paul Assam
14	Akash thakur Assam
15	Alen Peter yimchunger
16	AmanPriyadarshi Bihar
17	Amarnath Reddy
18	Ananda Murugan P Tamil Nadu
19	AngellaRajak Manipur
20	Anji .Rebell
21	Antony Mariya Michael Raj M Tamil Nadu
22	Anuj Chandra Uttar Pradesh
23	Anupam Uttar Pradesh
24	Aojungshi
25	ArkadeepKashyap

	Assam
26	ARUN JUSTIN Kerala
27	AsemVikash Meitei Manipur
28	Shelke Ashok Prakash Maharashtra
29	Aurobind G Puducherry
30	AvaveiVeikho Manipur
31	Avinash Kumar Mishra Tamil Nadu
32	Bajrangsingh Rajasthan
33	Balaji M Tamil Nadu
34	Balakrishnan Tamil Nadu
35	BandaruGangadri Andhra Pradesh
36	BapiJamatia Tripura
37	Begum Sahiba Manipur
38	BevaraRaviteja Andhra Pradesh
39	Bevarabhanuchandranaidu Andhra Pradesh
40	Bharath S Tamil Nadu
41	E Bharathikavi Tamil Nadu
42	Bhukya Sunil Telangana
43	Bina SuaihiamchungRiamei Manipur
44	Biplob Chanda Assam
45	Bishal Das Assam
46	BolisettyHarikasai Andhra Pradesh
47	ButharajuChandana
48	C V Shankar Andhra Pradesh
49	Cadet Roshan Kumar
50	Chandankumar Jharkhand

51	Chanesh Kumar Channu Bihar
52	Choro Kadena
53	Suhail Ahmed Assam
54	KhangreiyuiHaorei Manipur
55	Deepraj Das Assam
56	G. Densing Daniel Tamil Nadu
57	Dipdarshan Borah Assam
58	Dipika R Tamil Nadu
59	Divya V Tamil Nadu
60	Dr AsemBimola Devi Manipur
61	DR. LeimapokpamDorendro Singh Manipur
62	Poongothai Tamil Nadu
63	E Ravichandran Tamil Nadu
64	S Emimal Tamil Nadu
65	G K Karthik Tamil Nadu
66	GummallaBalaji Reddy Andhra Pradesh
67	Gabriel Anand Kumar Tamil Nadu
68	GadiliGreeshma Andhra Pradesh
69	Gaurav Saha Assam
70	Girish GhanashamPatil Maharashtra
71	Gokul R Tamil Nadu
72	Gokulan M Tamil Nadu
73	GovindRathore Madhya Pradesh
74	Gurmeet Singh New Delhi
75	Harishkumar M Tamil Nadu

76	Hemavathi d Tamil Nadu
77	Shankar kumar Chaudhary Bihar
78	Dr OinamIbopishak Singh Manipur
79	K.IsaacSundarsingh Tamil Nadu
80	JagadeswariBotcha Andhra Pradesh
81	Jasmita Tamil Nadu
82	Jayalakshmi Tamil Nadu
83	Jintu Barhoi Assam
84	k zeelan
85	K.Pradeep Kumar
86	kadummibang
87	KangjambaKhuman Manipur
88	Karthik.S Puducherry
89	R kaviyaPriya Tamil Nadu
90	KeishamYoihenbiChanu Manipur
91	KhaidemOshinikumar Manipur
92	Khangreiyuihaorei Manipur
93	KoukuntlaKomal Reddy Telangana
94	Kowsalya S Tamil Nadu
95	LakavathJayachander Telangana
96	Lama Norbu
97	LephrojiPfozhe
98	Lhikhro Mero
99	Lily Chindeinuam Manipur
100	KhaidemLinthoinganbiChanu Manipur
101	Livito L shohe Nagaland
102	lobsamgzimbakee
103	lokho choro
104	M. Vignesh

	Tamil Nadu
105	M.sujanyadav
106	Madhusmeeta Das Assam
107	Mahesh PrabhakarSamant New Delhi
108	Maheswari S Tamil Nadu
109	MaibamMisita Manipur
110	MajjaraLasya
111	MallelabhuvaneswariBhuvana
112	Man Bahadur Kami Sikkim
113	Manisha Sinha Bihar
114	Manjushree Ghosh
115	Meghali Das Assam
116	MhathungOdyuo
117	NgashepamMilleni Devi Manipur
118	Mohammad Adfar Jammu and Kashmir
119	Mohammed Kawuser Tamil Nadu
120	Mohan Krishna
121	MohitKhare Uttar Pradesh
122	Moumita Das Tripura
123	Uday Pal, PGT CS Tripura
124	C. Lalmuankimi Mizoram
125	MuditShanker Pandey New Delhi
126	Munavath Praveen Telangana
127	Munna Kumar Bihar
128	Murali M Tamil Nadu
129	NamanTyagi Uttar Pradesh
130	Nanditadhar
131	Nanditasahu Rajasthan
132	NasidAhamed

133	Nayan Deep Laskar Assam
134	NengneithemTouthang Manipur
135	NilutpalGogoi Assam
136	Nirakar Pradhan Orissa
137	Nirmal Kumar Jena Orissa
138	Nisha Bharti Bihar
139	Nisha Sikia Assam
140	MudireddyNithin Reddy Telangana
141	KhaidemOshinikumar Manipur
142	P Anji
143	PalanivelK Puducherry
144	PangerkumzukLongkumer Nagaland
145	Parbez Ahmed Mazumder Assam
146	PattupogulaNarasimhulu Andhra Pradesh
147	Paul Immanuel C D Tamil Nadu
148	PfutsuvieloLadu
149	Phakazip R. Shimray Assam
150	Phebe Evangeline S Karnataka
151	PhyobemoHumtsoe
152	Plabita Borah Assam
153	Poojitha Reddy
154	Pradeep
155	Raja pradeepkumar E Tamil Nadu
156	Pradhap M Tamil Nadu
157	PragyaMaroti Bihar
158	Pranav Chandra himanshu
159	Prashant Chaudhary
160	Prashant Kukreti Uttarakhand

161	Prashant Kumar
162	PrastutiMazumdar Assam
163	BanothPrathyusha Telangana
164	Praveen M Puducherry
165	PriyangshuDebnath Assam
166	Puja Goala Assam
167	R. Swathi Puducherry
168	RachunguangliuPamei Manipur
169	Shingate Rahul Chandrakant Maharashtra
170	Ramdinthara Mizoram
171	Rashmi KumariRajora New Delhi
172	Ravi Ganeshan P
173	Ravi Maurya Uttar Pradesh
174	Ravi Raj New Delhi
175	Ravichandran E Tamil Nadu
176	Reeya Hazarika Assam
177	RenieSwetha F Tamil Nadu
178	ReshuKashyap Chhattisgarh
179	R. Ramkumar Tamil Nadu
180	Rimpi Rani Bauah
181	RingchamdinliuNgaomei Manipur
182	Rishi Raj Chaudhary New Delhi
183	Rishi Chaudhary
184	Rishu Raj
185	Rohit Singh Bihar
186	Ruth PratigyaSanate Manipur
187	Sai Chetan Gajulapalli Andhra Pradesh

188	Sandhiya.S Puducherry
189	Sangita Hazarika
190	Sanjeeta Rani Nagaland
191	D Santhosh Reddy Andhra Pradesh
192	SarangChettri
193	Sarmistha Bora Assam
194	S B S Yadav New Delhi
195	Shahoto S Yimchunger Nagaland
196	Shankar kumar Chaudhary Bihar
197	Shatendra Ram
198	Shivam Nagar Madhya Pradesh
199	Shivani Devi Haryana
200	Shreesh Kumar Sharma Uttar Pradesh
201	ShuhoYhobu
202	ShuvamDebnath Assam
203	Sinduja R Tamil Nadu
204	Siprasilva Odisha
205	Siprasilva Dash Orissa
206	SM Saravanakumar Tamil Nadu
207	SnehasriDatta Assam
208	SoumenBhattacharjee Assam
209	Sourabh Joshi New Delhi
210	MadathanapalliSravan Andhra Pradesh
211	Srestha Biswas Tripura
212	Phakazip R. Shimray Assam
213	Subodh Kumar Bihar
214	Sudesh

215	Sudiptakanoo Assam
216	Suganya Devi U Tamil Nadu
217	SumitGahatraj West Bengal
218	Sundaramoorthy K Puducherry
219	Sunil Kumar Nagaland
220	Suresh S Tamil Nadu
221	Suvendhar N Tamil Nadu
222	SweetaLaishram Manipur
223	Sweta Chaudhary Bihar
224	Tajuddin
225	Tama Saha Tripura
226	SamireddySai Tejesh Andhra Pradesh
227	Tesenlo Stephen Magh Assam
228	Thandu Jnana Yasaswini Telangana
229	Thazaba Po
230	SougaijamThoujalKhuman Manipur
231	Thsapimong C. Sangtam Nagaland
232	TilokPandit Assam
233	TrisaSarania Assam
234	Tsalamo j humtsoe
235	Uday Pal, PGT CS Tripura
236	A. Uma Shankar kumar Andhra Pradesh
237	Vishnu Priya T Tamil Nadu
238	Vendimew S
239	Venkat Sai
240	Senjam Victoria Devi Manipur
241	Vinodhini A Tamil Nadu

242	Vishal Melvin Rex M Tamil Nadu
243	Vishnu Kumar Rajasthan
244	Aradadi Sandhya Rani Puducherry
245	YumnamRameshchandra Singh Manipur

Annexure – 2

Name of the State and Number of Participants who were Provided Certificates

S. No.	Name of the State	No. of Participants
1	Andhra Pradesh	15
2	Assam	32
3	Bihar	13
4	Chhattisgarh	1
5	Jammu & Kashmir	2
6	Jharkhand	1
7	Karnataka	1
8	Kerala	1
9	Madhya Pradesh	2
10	Maharashtra	3
11	Manipur	26
12	Mizoram	2
13	Nagaland	6
14	New Delhi	8
15	Odisha	4
16	Puducherry	8
17	Punjab	2
18	Rajasthan	3
19	Sikkim	1
20	Tamil Nadu	43
21	Telangana	7
22	Tripura	6
23	Uttar Pradesh	7
24	Uttarakhand	1
25	West Bengal	1
26	Not Registered	49
Total		**245**

Name of the North-Eastern State and Number of Participants who were Provided Certificates

S. No.	Name of the State	No. of Participants
1	Assam	32
2	Manipur	26
3	Mizoram	2
4	Nagaland	6
5	Sikkim	1
6	Tripura	6
Total		**73**

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Ministry of Youth Affairs and Sports, Govt. of India
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in affiliation with

National Institute of Technology, Tiruchirappalli

National Institute of Technology, Jalandhar

Neoware Technology Solutions , Chennai

Prof.Sibnath Deb
Director, RGNIYD
Sriperumbudur, TN

Dr. Mini Shaji Thomas
Director, NIT
Tiruchirappalli, TN

Prof. Lalit Kumar Awasthi
Director, NITJ
Jalandhar, Punjab

Shri. Rajaraman Srinivasan
Co-Founder & CEO
NTS, Chennai

Resource Persons

Prof. B.Ramadoss
Professor (HAG)-Retd, NIT, Tiruchirapalli

Dr. Sanayveer Singh
Assistant Professor, NIT, Jalandhar

Dr G R Gangadharan
Associate Professor, NIT, Tiruchirapalli

Dr Kunwar Pal
Assistant Professor, NIT, Jalandhar

Dr Nisha Chaurasia
Assistant Professor, NIT, Jalandhar

Who can apply ?
Diploma in Computer Science / Technology, Engineering & Science Graduates / Post Graduates from Computer Science, Mathematics, Statistics, Physical Sciences or equivalent.

Note :
No Registration Fee. E-certificate will be issued to all the participants subject to attendance of all the sessions.

DATE : March 15 - 19, 2021

For Registration : Please visit www.rgniyd.gov.in

email.rgniyd@gmail.com **www.rgniyd.gov.in**