

# Report on Faculty Development Program “IoT and Cybersecurity”

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19<sup>th</sup> – 24<sup>th</sup> February 2024



**AICTE Training and Learning Academy (ATAL) Sponsored  
Six Day Faculty Development Program  
on  
“IoT and Cybersecurity”**



## **B.M.S. COLLEGE OF ENGINEERING**

Autonomous Institute, Affiliated to VTU,  
Bull Temple Road, Basavanagudi, Bengaluru, Karnataka 560019

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**Event Details:****Date:** 19/02/2024 – 24/02/2024**Time:** 9:30 AM to 5:00 PM**Mode of delivery:** Offline**Convenor:**

Dr. Nagarathna N, Professor and Head, Dept. of CSE (ICB)

**Coordinator:**

Prof. Krupa K S, Assistant Professor, Dept. of CSE (ICB)



**Resource Persons Details:**

The speakers for the 6-day workshop on “IoT and Cybersecurity” were:



**Mr. Samarth B Bhat** is the technical Director of Reverse Engineering Infosec, Bangalore. He is a security architect with over six years of experience in Information Security, design and development of Application Software. He is a cybersecurity enthusiast and a prominent speaker at various national and international conferences. He has various certifications in his cap such as GIAC Certified Web Application Defender (Analyst Number: 96), SANS Lethal Forensicator coin holder, Qualys Guard Certified Specialist, CEH (Certified Ethical Hacker v6) , NIIT Certified .NET Application Developer, SANS CTF Winner for Network Pen testing, Web App Pen testing.

He has audited 50+ business Web-Applications in the areas of Banking, Finance, Insurance, Trading and e-Commerce. and conducted security audit of Payment Gateway. He is awarded the youngest ethical hackers in India by PREVOYANCE Forensic Technologies, MAHARASTRA and is the youngest Court appointed “COMMISSIONER” (By several trial courts of India) for expert witness in Cyber Forensics Domain. He is appointed as president of INDIAN CYBER ARMY for Karnataka unit and as Cyber security consultant to Indian Air Force unit at Nagpur. He is a firm believer in Emerging Tech and its capacity to change the way humans interact.

	<p><b>Dr. Kiran Manjappa</b> is currently working as Assistant Professor at Department of Information Technology, National Institute of Technology Karnataka (NITK), Surathkal, Karnataka, India. He has completed his P.hD. from NITK, Surathkal the year 2014. His research interests include Internet of Things, Cryptography, Information Security, Network Security, Blockchain, Quantum, Future Internet Architecture Security. He has published more than 20 publications including 10 International Journals, 15 International Conferences, and Book Chapters in IET, Elsevier, Springer, IGI publishers, etc, He is the technical reviewer for various International SCI Indexed Journals of repute like IEEE Computer Society, Elsevier, Springer, etc.</p>
	<p>Dr. Manjunath D R, is currently working as Assistant Professor at BMSCE, Bangalore. He has completed his Ph.D, Post Graduation and Under graduation in Computer Science and Engineering from Visvesvaraya Technological University . He has 11 years of experience in both teaching and industry. He has published many papers in International Journals and presented papers at International Conferences.</p>

## Session wise Details

### Inaugural Session

The Faculty Development Program on IoT and Cybersecurity organized by the Department of CSE(IoT and Cybersecurity including Blockchain Technology), B.M.S. College of Engineering, Bengaluru, in association with AICTE Training and Learning Academy (ATAL), New Delhi was inaugurated on 19<sup>th</sup> February 2024 by **Dr. Muralidhara S**, Principal, B.M.S. College of Engineering, **Dr. Kiran Manjappa**, Assistant Professor at Department of Information Technology, National Institute of Technology Karnataka (NITK), Surathkal, Karnataka, India, and **Dr. Nagarathna N**, Professor and Head, Dept. of CSE(ICB).

Prof. Krupa K S, welcomed the audience and Dr. Nagarathna N, Convener briefed about the entire Faculty Development program schedule including the resource persons, their details, expertise etc. The convener also briefed about the importance of IoT and security concepts in cyber world and its applications. **Dr. Kiran Manjappa**, Chief Guest of the session delivered the keynote address. His talk highlighted on various applications and research areas in IoT and Cybersecurity. Some of the snap shots of the inauguration:





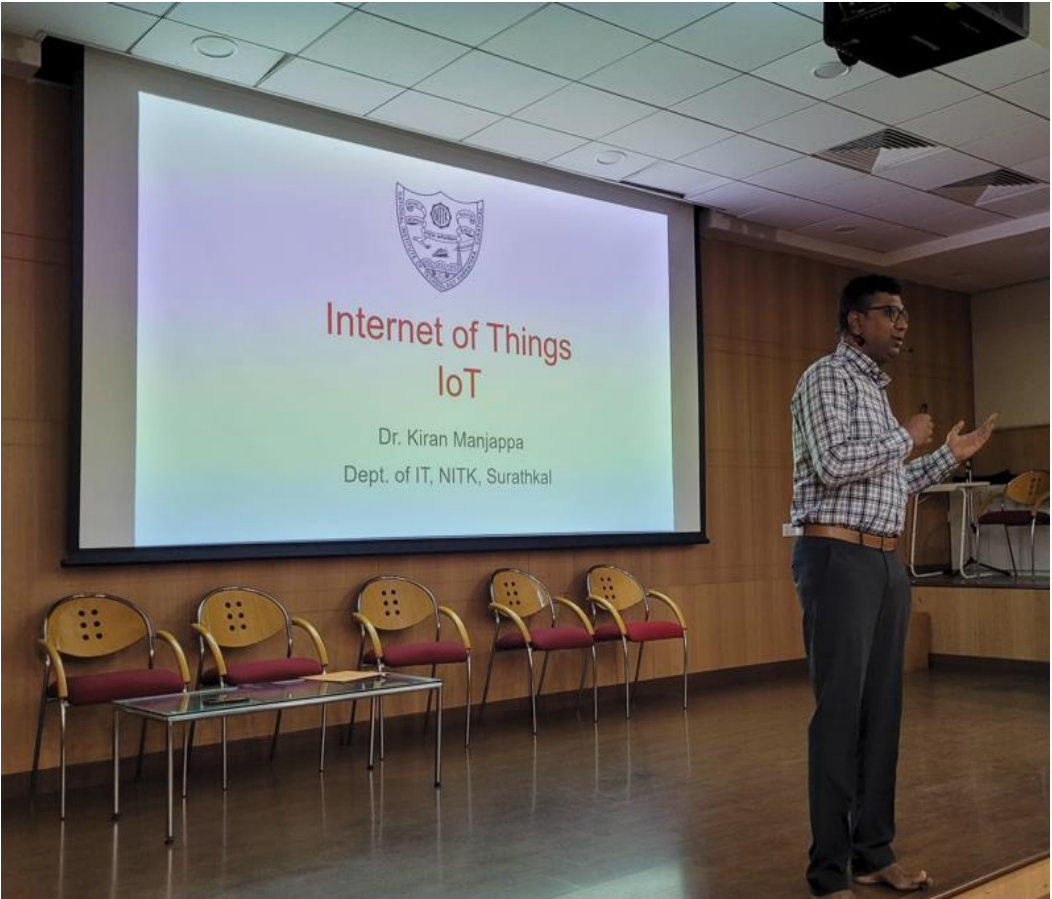
**Date: 19<sup>th</sup> February 2024, Monday**

**Day-1**

**Topics :** Overview of IoT systems, Architecture, IoT simulation using Tinkercad

**Resource Persons:** Dr. Kiran Manjappa, NITK, Surathkal and Team

Session 1 and 2 was addressed by **Mr. Kiran Manjappa** and his team. The session highlighted on importance of IoT systems in our daily life, IoT system architecture and protocols, overview of security needs. Also included hands - on session for IoT and simulation using Tinkercad. The sessions focused on collecting and sending data from sensors and sending to the cloud. Data analysis and visualization of collected sensor data.



**Date: 20<sup>th</sup> December 2024, Tuesday**

## Day-2

### Topics:

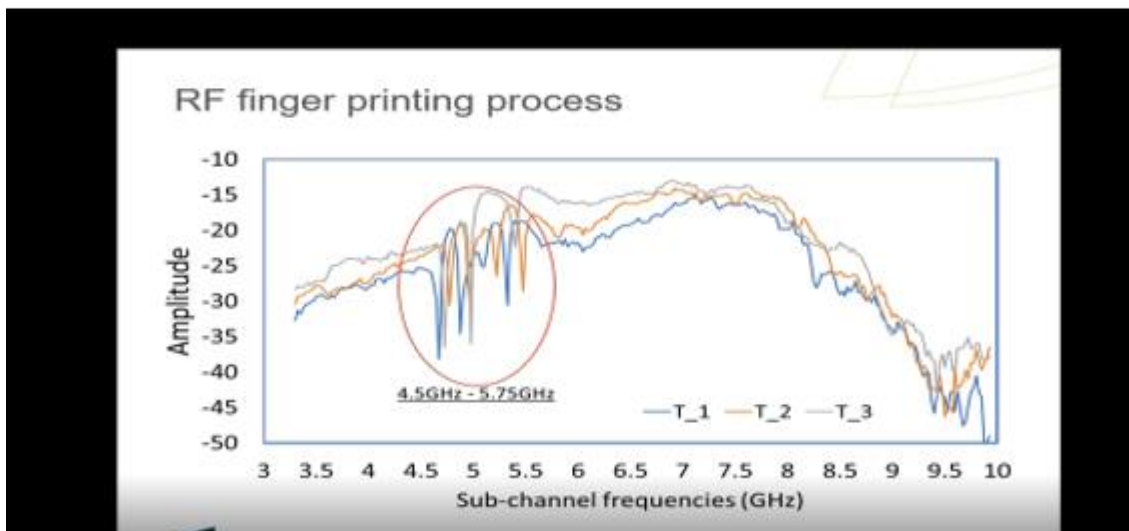
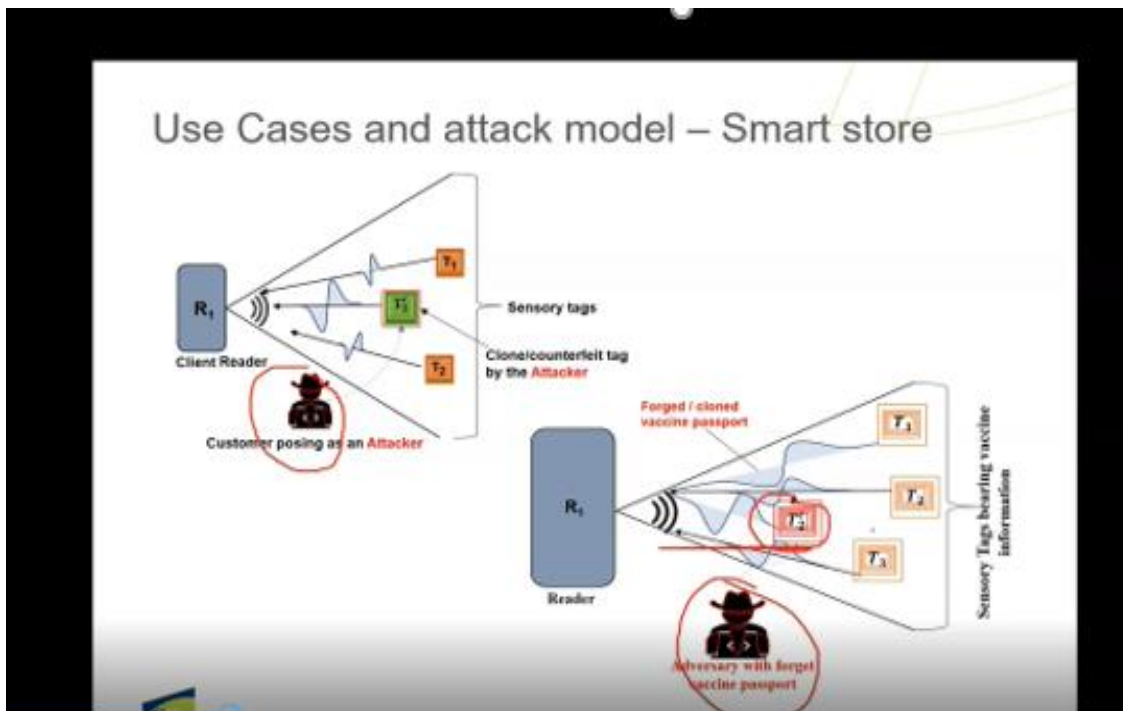
- Controlling the IoT device and data using mobile app
- Hardware based mini projects
- Developing smart attendance system
- Reflection journal discussion

### Resource Persons: Dr. Kiran Manjappa, NITK, Surathkal and Team

Day 2 sessions was addressed by Dr. Kiran Manjappa and Team. The session addressed the Cyber security of distributed systems like Internet of Things (IOT) and its real-world applications. He discussed the working mechanism of sensor tags and their types, based on IoT system design. Sir explained various tools for time series data collection and IoT data visualization. Various visualization tools were demonstrated. He explained the different attack model and discussed the use cases on smart home, by plotting the RF signal of three tags including the clone tag. He explained the RF finger printing security framework and different boosting frameworks. A smart sprinkler case study was discussed. Various project areas were discussed in the session.

Sir, also discussed about research work at NITK Suratkal through the Reflection journal discussion activity.







**Date: 21<sup>st</sup> February 2024, Wednesday**

**Day-3**

**Topics:**

- Introduction to ethical hacking and cyber security
- Windows security bypassing, Linux security bypassing
- Trojan attacks, how to be anonymous
- Status identification of system
- Line of defense
- Cryptography demo with AES
- Firewall and antivirus demonstration
- Honeypot deployment

**Resource Persons:**

- **Mr. Samarth B Bhat, Technical Director, Reverse Engineering Infosec, Bangalore.**

**Mr. Samarth B Bhat** started the session by discussing the Crux of Cybersecurity. He discussed various aspects of ethical hacking and security parameters. He also discussed on Trojan attacks, how to be anonymous Status identification of system?

The speaker discussed Cybersecurity infrastructure, working principles of biometrics in the banking domain, digital wallets, etc., and how the adoption of Blockchain technology in cybersecurity will provide solutions to the current issues. Relating to it, the speaker also discussed Windows security bypassing, Linux security bypassing, Social Engineering attacks, WIFI attacks, and Password cracking techniques with hands on.



**Date: 22<sup>nd</sup> February 2024, Thursday**

**Day-4**

**Topic: Industrial Visit to ITI Limited**

**ITI Bhavan, Dooravaninagar, Bangalore, Karnataka - 560016.**

**About the Industry:**

ITI Limited, earlier known as Indian Telephone Industries Limited, is a central public sector undertaking in India. It is under the ownership of Department of Telecommunications, Ministry of Communications, Government of India. It was founded in 1948 as a departmental factory, incorporated as a public company in 1950 and today has six manufacturing facilities at Bangalore, Naini, Mankapur, Raebareli, Palakkad and Srinagar which produce a range of switching, transmission, access and subscriber premises equipment. It is headquartered at Bangalore. It has multi-locational electronic assembly and mechanical manufacturing facilities, countrywide marketing and in-house R&D for absorption of technology. It produces Information and Communication Technology (ICT) equipment such as network management systems, encryption and networking for internet connectivity, and secure communications networks and equipment for the defense.



Experience at the Industrial visit: The visit has provided the participants with practical exposure and a valuable learning on how 5G communication is supported by base station and remote unit in cell towers, the methods of how - PCB boards are manufactured, encrypted data is transmitted in army and how 3D printing is done.

**Date: 23<sup>rd</sup> February 2024, Friday**

**Day-5**

**Topic:**

- Introduction to OWASP attacks
- Analyzing request and response of web traffic
- Man in the middle attack, Introduction to web application firewall
- Introduction to IOT security
- Hardware used in IoT security (rtl Sdr, hackrf, bladerf, Usp) )
- Introduction to firmware security and hardware security
- Reverse a signal and protocol with demonstration
- Introduction to digital forensics
- Tools and techniques used in forensics

**Resource Persons:**

- **Mr. Samarth B Bhat, Technical Director, Reverse Engineering Infosec, Bangalore.**

Mr. Samarth B Bhat discussed the above-mentioned topics over the hands-on sessions.



**Date: 24<sup>th</sup> February 2024, Saturday**

**Day-6**

**Topic:**

- AI in Cybersecurity
- Password and Passkey
- Case Studies
- Research Directions
- Teaching Learning Pedagogy
- Stress Management

**Resource Persons:**

- **Dr. Manjunath D R, Assistant Professor, Dept. of CSE, B.M.S.C. E**

Day 6 sessions were presented by **Dr. Manjunath D R**, Assistant Professor, Dept. of CSE, B.M.S. College of Engineering. Sir presented sessions on the role of AI in Cybersecurity, the usage of Password and Passkey, Case Studies on AI related cyberthreats, Pros and cons of ChatGPT. He also interacted with the participants about Teaching Learning Pedagogy, Stress Management and strategies to overcome it.





Session was followed by Valedictory session. **Dr. Nagarathna N** , Professor and Head, Dept. of CSE(ICB) presented the vote of thanks and concluding remarks of the session.



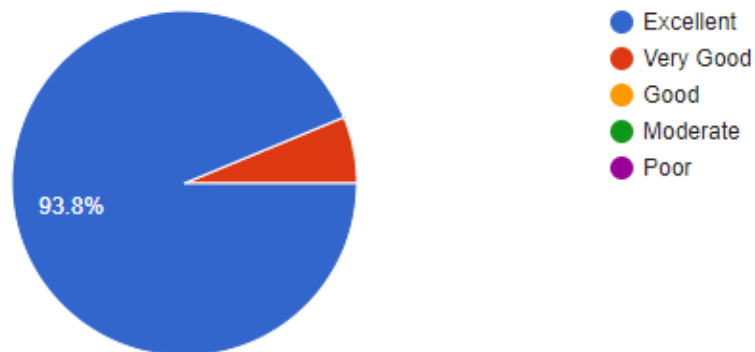
**Feedback Analysis:**

The overall feedback from the FDP was good. The total Satisfactory Ratio of the FDP was 93.85. Participants actively took part in all the sessions and interacted with resource persons. The six-day sessions addressed various topics in IoT, Cybersecurity, Ethical Hacking, Cyber Forensics, AI in Cybersecurity, working principles of IoT and security protocols, various applications, and research directions in IoT and Cybersecurity.

**Feedback from the participants on the entire FDP**

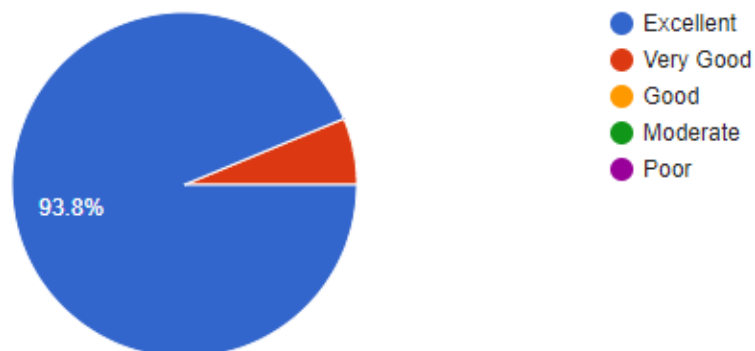
How was the FDP organized?

32 responses



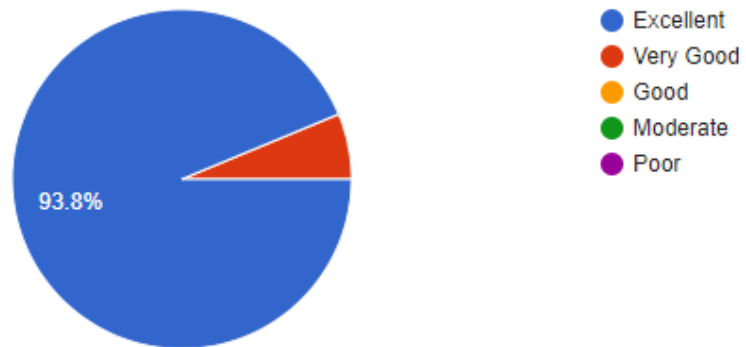
Did the FDP deliver the contents upto your expectations?

32 responses



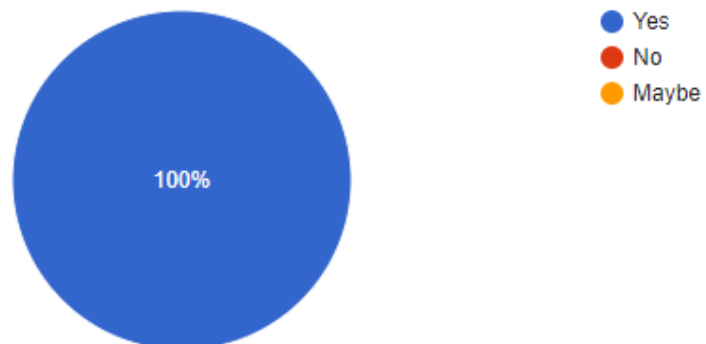
## Overall organization of the FDP

32 responses



## Were the sessions useful?

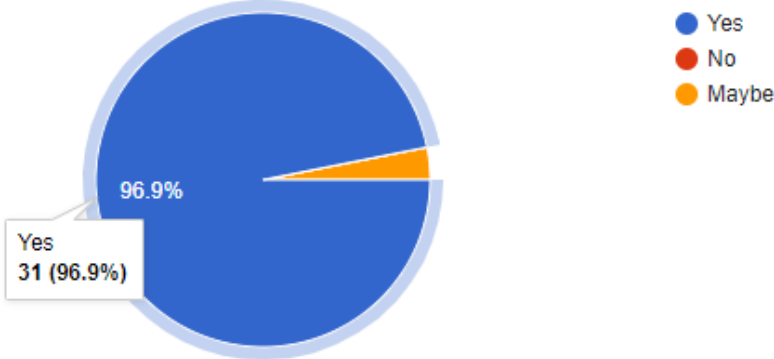
32 responses





Are you likely to participate in one of our events in the future?

32 responses

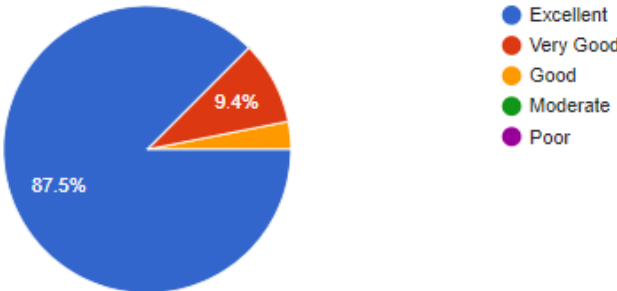


Resource Person - Dr. Kiran M and Team, NITK, Suratkal

Did the speaker communicated the content effectively?

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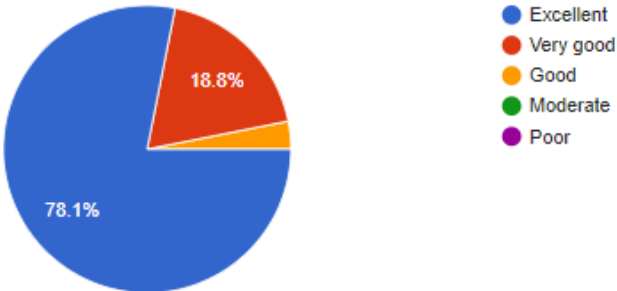
32 responses



How do you rate the expertise of the speaker on topic delivered?

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32 responses

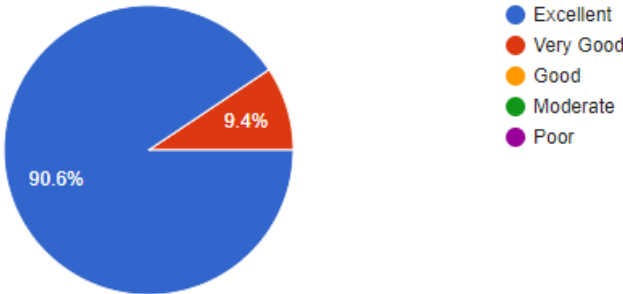


**Resource Person - Mr. Samarth Bhat, Reverse Engineering Infosys**

Did the speaker communicated the content effectively?

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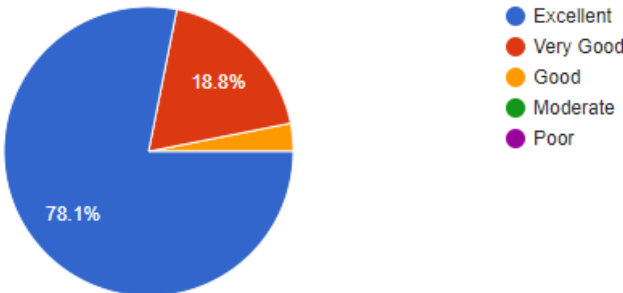
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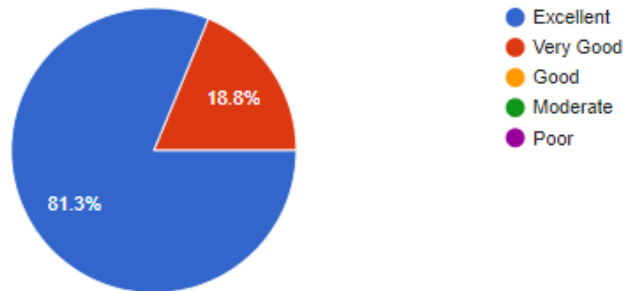


**Resource Person - Dr. Manjunath D. R, B.M.S.C.E**

Did the speaker communicated the content effectively?

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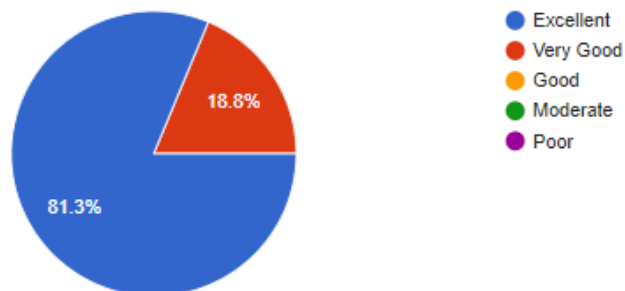
32 responses



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32 responses

**EVENT OUTCOMES:**

The FDP enabled the participants to:

1. Understand the concepts of IoT and Cybersecurity.
2. Discuss application and research perspectives in the field of IoT and Cybersecurity.
3. Develop security and network models in technology domain to safeguard the public data at all levels of organization.
4. Apply life skills and stress management techniques for work life balance.

**CO – PO MAPPING**

COs	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 8	PO 10	PO 11	PO 12	PS O1	PS O2	PS O3	PS O4
<b>1</b>	3	3	2	2	3	2	-	2	-	1	-	2	2	1	-	3
<b>2</b>	3	3	2	2	3	1	-	-	-	-	-	2	2	1	-	3
<b>3</b>	3	3	3	2	3	2	-	-	-	-	-	2	3	2	-	3
<b>4</b>	3	3	2	2	3	2	-	2	-	1	-	2	-	-	-	-