RESEARCH & DEVELOPMENT CELL

Report on

A Six-Day Faculty Development Programme on

"Emerging Trends in AI, ML, Cyber Security, and Quantum Computing for Embedded and IoT Systems"

The Research and Development Cell (R&D) and Intellectual Property Rights Cell (IPR) of Aditya College of Engineering, Madanapalle, has organized the Six day Virtual Faculty Development Program (FDP) on **" Emerging Trends in AI, ML, Cyber Security, and Quantum Computing for Embedded and IoT Systems"** from **08.12.2025 to 13.12.2025** in association with the Department of Electronics and Communication Engineering

1.Introduction:.

A Six-Day Virtual Faculty Development Programme (FDP) on "**Emerging Trends in AI, ML, Cyber Security, and Quantum Computing for Embedded and IoT Systems**" was conducted from 08th to 13th December 2025 during evening sessions (6:00 PM–8:00 PM) with the objective of enhancing faculty knowledge in cutting-edge technologies. The FDP focused on contemporary topics such as cyber security awareness, AI-driven hardware security, digital twins, IoT sensor fusion, and edge AI, delivered by eminent academicians and industry experts from reputed institutions. The programme provided valuable insights into emerging research areas and practical applications, promoted interdisciplinary learning, and strengthened the alignment between academic teaching, research, and industry needs.

2.Objectives of the FDP:

The primary objectives of the programme were:

- To create awareness among faculty members about emerging trends in cyber crimes and cyber security, with emphasis on cyber security awareness and digital forensics.
- To enable participants to identify future research and development opportunities in the domains of cyber security, digital forensics, and related interdisciplinary areas.
- To equip participants with fundamental knowledge of AI and Machine Learning techniques for hardware security, particularly for detecting side-channel attacks in embedded systems.
- To familiarize faculty with the concept and applications of Digital Twins integrated with Machine Learning for system simulation, testing, and performance optimization.

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- To develop competency among participants in applying AI and ML techniques for IoT sensor fusion, enabling efficient processing and interpretation of data from heterogeneous sensor networks.
- To enhance participants' understanding of deploying AI and ML models on embedded and IoT edge devices, promoting intelligent, secure, and real-time embedded system design.

.3.FDP Sessions Overview:

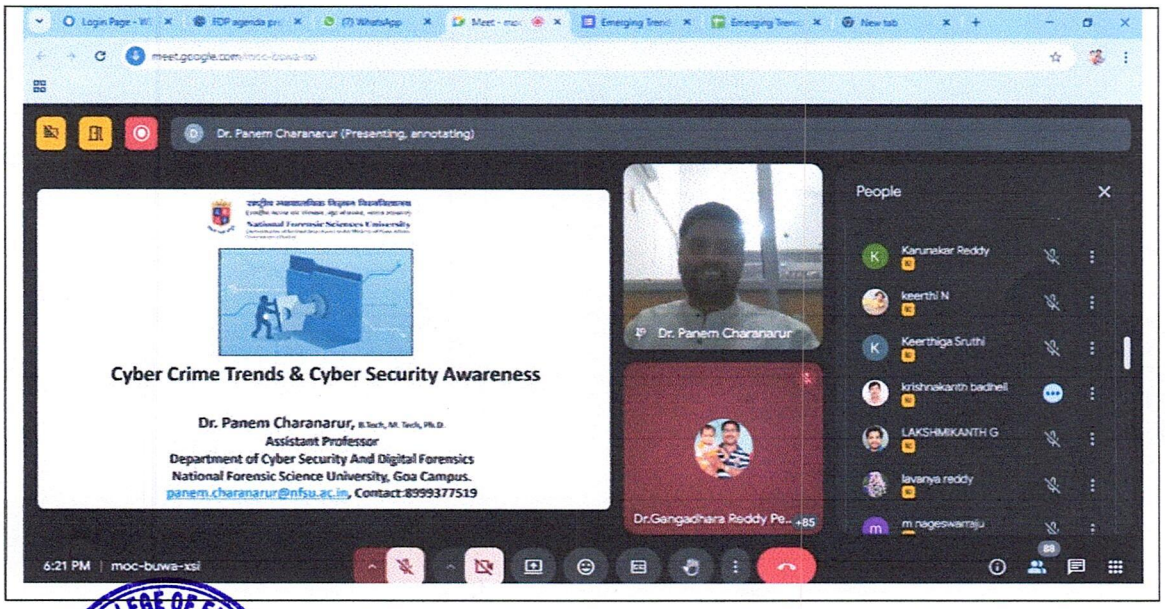
The programme consisted of six sessions delivered by resource persons, as detailed below:

Session 1: Cyber Crimes and Trends, Cyber Security Awareness.

- **Date & Time:** 08.12.2025, 6.00–8.00 PM
- **Resource Person: Dr. Charan Panem**, Assistant Professor, Department of Cyber Security and Digital Forensics, National Forensic Science University (NFSU), Goa Campus.
- **Focus Area:** Evolving landscape of cyber crimes and the growing importance of cyber security awareness in today's digitally connected world.

Session Highlights:

* Overview of recent cyber crime trends and real-world attack scenarios.
* Discussion on common cyber threats such as phishing, ransom ware, and identity theft.
* Importance of cyber hygiene, safe online practices, and awareness strategies.
* Role of cyber security professionals in protecting digital infrastructure.

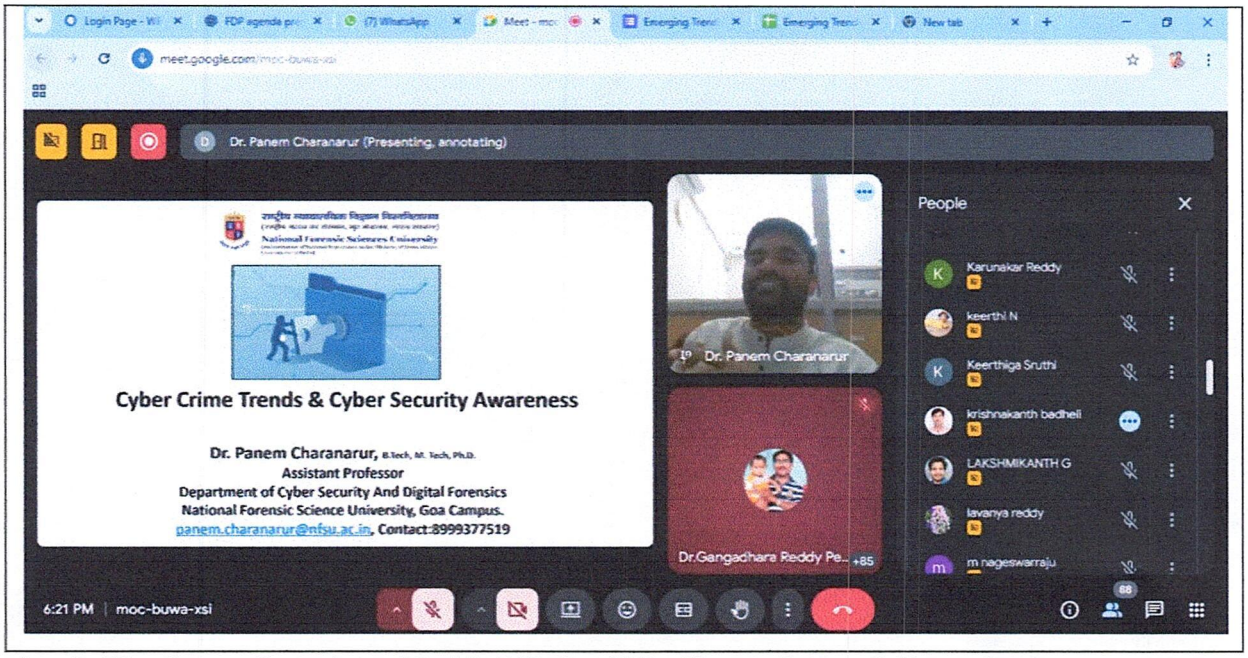


Session 2: Future Research and Development Areas in Cyber Security and Digital Forensics.

- **Date & Time:** 09.12.2025, 6.00–8.00 PM
- **Resource Person: Dr. Charan Panem,** Assistant Professor, Department of Cyber Security and Digital Forensics, National Forensic Science University (NFSU), Goa Campus.
- **Focus Area:** emphasized emerging research challenges and innovation opportunities in cyber security and digital forensics.

Session Highlights:

* Identification of current research gaps in cyber security and digital forensics.
* Emerging areas such as AI-driven forensics and cyber threat intelligence.
* Opportunities for interdisciplinary research and funded projects.
* Guidance for faculty members to initiate research and publications.



Session 3: Hardware Security with AI: ML for Side-Channel Attack Detection.

- **Date & Time:** 10.12.2025, 6.00–8.00 PM
- **Resource Person: Dr. Sangeetha V,** Associate Professor,Department of Computer Science and Engineering, MS Ramaiah Institute of Technology, Bangalore.
- **Focus Area:** application of AI and Machine Learning techniques to enhance hardware security in embedded systems.

Session Highlights:

* Introduction to side-channel attacks and their impact on hardware security.
* Use of ML algorithms for detecting and mitigating hardware vulnerabilities.
* Case studies on AI-enabled hardware protection mechanisms.
* Relevance of secure embedded system design in modern electronics.

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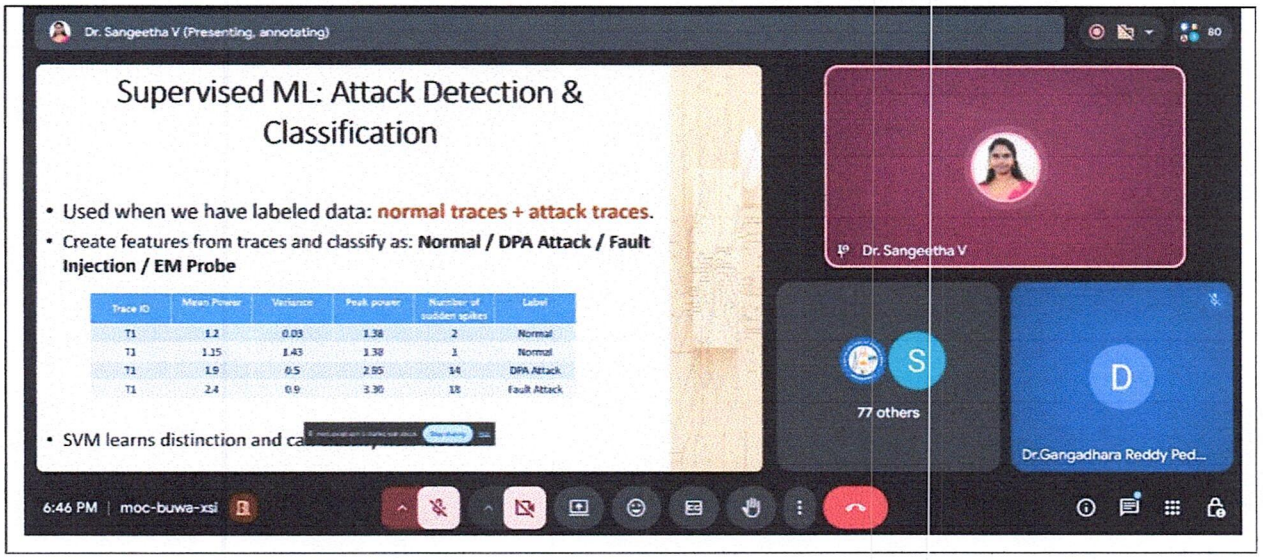
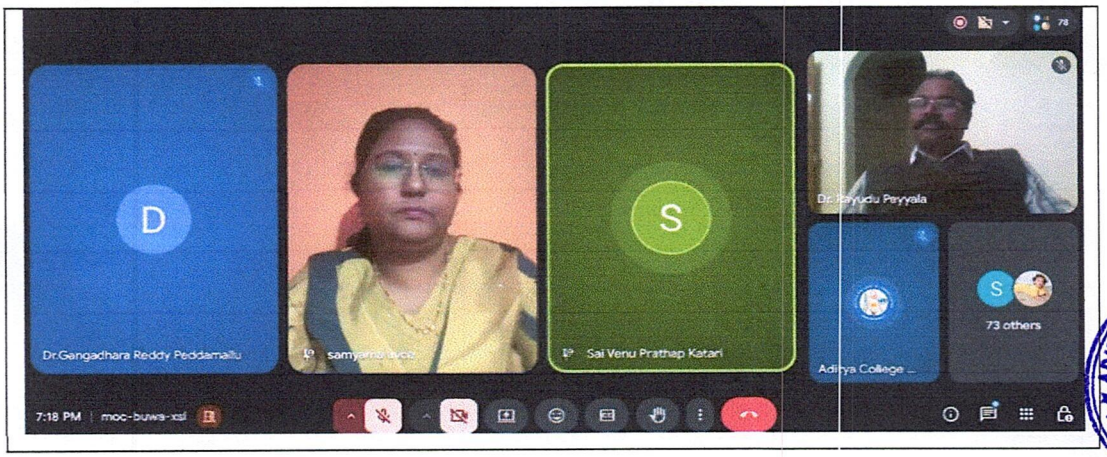


Session 4: Digital Twins and ML: Creating Virtual Models for System Simulation, Testing, and Optimization.

- **Date & Time:** 11.12.2025, 6.00–8.00 PM
- **Resource Person: Dr. Samyama Gunjal G** H, Associate Professor, Department of Computer Science and Engineering, University Visvesvaraya College of Engineering (UVCE), Bangalore.
- **Focus Area: Integration of Digital Twin technology with Machine Learning for intelligent system modelling.**

Session Highlights:

* Concept and architecture of Digital Twins.
* Role of ML in predictive analysis and system optimization.
* Applications of Digital Twins in engineering and IoT systems.
* Benefits of virtual testing and performance enhancement.



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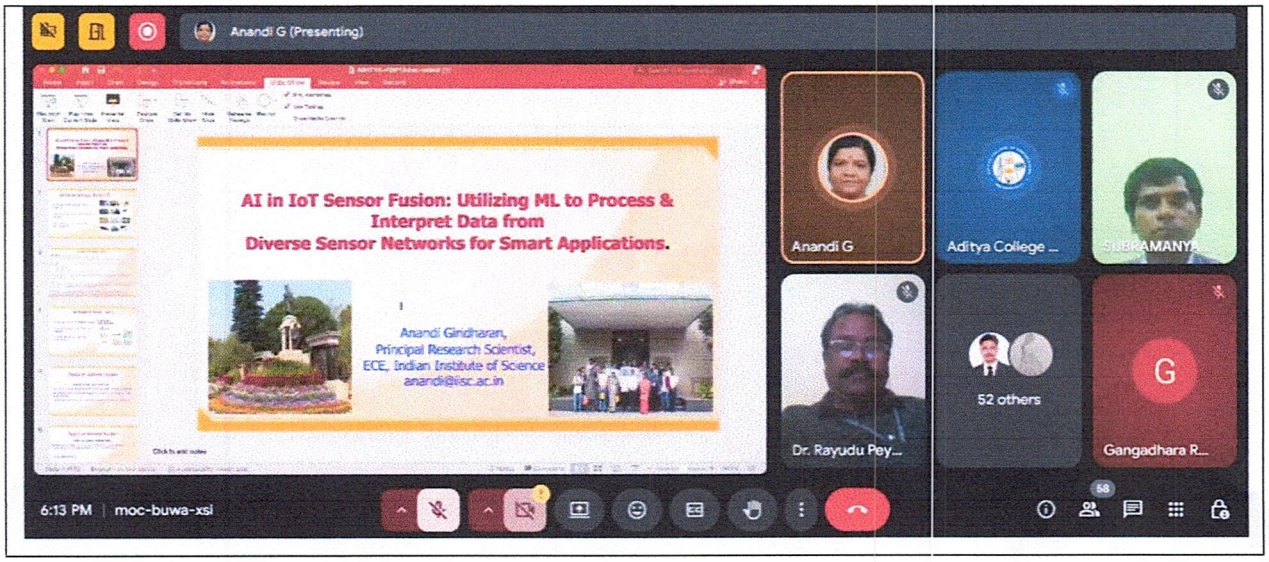
Session 5: AI in IoT Sensor Fusion: Using ML for Processing and Interpreting Data from Diverse Sensor Networks.

- **Date & Time:** 12.12.2025, 6.00–8.00 PM
- **Resource Person:** Prof. Anandi Giridharan, Principal Research Scientist, Department of Electronics and Communication Engineering, Indian Institute of Science (IISc), Bangalore.
- **Focus Area: AI-based sensor fusion techniques for effective data analysis in IoT environments.**

Session Highlights:

* Fundamentals of IoT sensor fusion.
* ML techniques for processing heterogeneous sensor data.
* Real-time data interpretation and decision-making.
* Applications in smart systems, healthcare, and industrial IoT.



Session 6: ML for Embedded Systems and IoT: Bringing AI Capabilities to Edge Devices.

- **Date & Time:** 13.12.2025, 6.00–8.00 PM.
- **Resource Person: Ms. Supriya Kamthania,**Senior Cloud Developer,Hewlett Packard Enterprise (HPE), Bangalore.
- **Focus Area: practical aspects of deploying AI and ML models on embedded and IoT edge devices.**

Session Highlights:

* Challenges of running ML models on resource-constrained devices.
* Edge AI concepts and deployment strategies.

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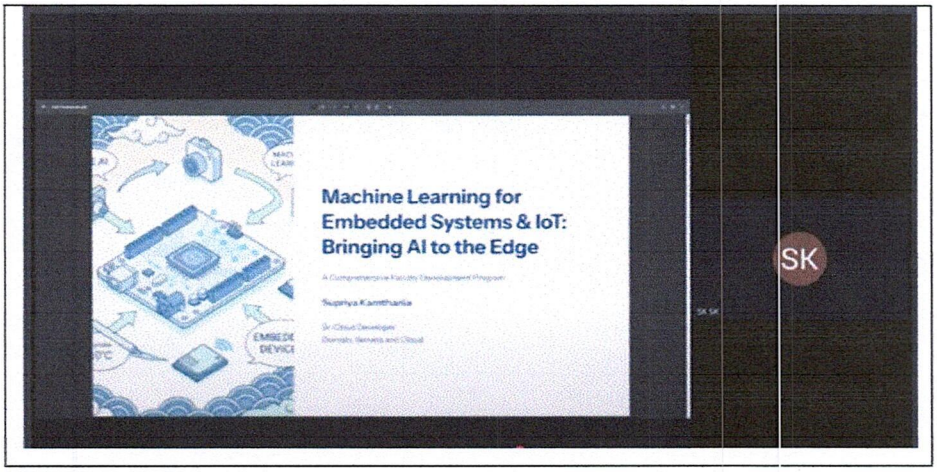
* Industry use cases of AI-enabled embedded systems.

* Bridging academia and industry requirements in IoT solutions.



4.Outcomes of the FDP:

The FDP resulted in the following key outcomes:

- At the end of the FDP, participants will be able to understand and analyze emerging cyber crime trends and cyber security practices, and effectively disseminate cyber awareness among students and academic communities.
- Participants will be able to identify and explore contemporary research problems and future R&D opportunities in the areas of cyber security and digital forensics.
- Participants will be able to apply AI and Machine Learning techniques for enhancing hardware security, particularly in the detection of side-channel attacks in embedded systems.
- Participants will be able to explain and utilize Digital Twin concepts integrated with Machine Learning for system modelling, simulation, testing, and optimization.
- Participants will be able to implement AI and ML-based sensor fusion techniques in IoT systems for efficient processing and interpretation of data from diverse sensor sources.
- Participants will be able to relate and adopt ML deployment strategies for embedded and IoT edge devices, strengthening industry-oriented teaching, research, and practical applications.

5.Feedback Summary:

A Google feedback form consisting of ten questions was circulated to the participants, and responses were received from 151 members. The overall feedback reflected high satisfaction with the FDP content, its relevance to FDP, and the effectiveness of deliveryThe feedback received from participants of the Six-Day Online FDP on **"Emerging Trends in AI, ML, Cyber Security, and Quantum Computing for Embedded and IoT Systems"** was highly positive and encouraging. The

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overall response reflected a high level of satisfaction with the content quality, resource persons, relevance of topics, and organization of the programme.

Participants appreciated the well-structured sessions that effectively covered both theoretical foundations and practical insights in emerging technologies. The sessions on Cyber Security awareness and future research directions were found to be highly relevant and informative, especially in the current digital environment. The AI and ML-focused sessions, including hardware security, digital twins, IoT sensor fusion, and edge AI, were acknowledged for their contemporary relevance and industry alignments.

The resource persons were highly rated for their subject expertise, clarity of presentation, and ability to connect concepts with real-world applications. Participants highlighted that the FDP helped them enhance their technical knowledge, identify new research areas, and improve teaching methodologies.

Overall, the FDP successfully met its stated objectives by upgrading faculty knowledge, promoting research orientation, and strengthening interdisciplinary understanding. Participants expressed interest in attending similar FDPs in the future and recommended conducting hands-on or advanced-level follow-up programmes on related emerging technologies.

Report Prepared by:Mr.K.Balachandra, Co-Convener

CONVENER

PRINCIPAL
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NEWS CLIPS

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ఆదిత్యలో జాతీయస్థాయి ఆన్‌లైన్ ఫ్యాకల్టీ డెవలప్‌మెంట్ ప్రోగ్రాం

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ABN ఆంధ్రజ్యోతి

'మేధోసంపత్తి హక్కుల సెల్'పై సదస్సు

జాతీయ సదస్సు పోస్టర్లను ఆవిష్కరిస్తున్న కళాశాల యాజమాన్యం

మదనపల్లె టౌన్, డిసెంబరు 10(ఆంధ్రజ్యోతి): 'మేధోసంపత్తి హక్కుల సెల్' అంశంపై ఆన్‌లైన్ ఫ్యాకల్టీ డెవలప్‌మెంట్ ప్రోగ్రామ్ నిర్వహిస్తున్నామని కళాశాల డైరెక్టర్ రామలింగారెడ్డి పేర్కొన్నారు. జేఎన్‌టీయూ అనంతపురం పరిధిలోని ఆదిత్య ఇంజనీరింగ్ కళాశాలలో మూడు రోజుల పాటు జాతీయ సదస్సు నిర్వహించనున్నట్లు తెలిపారు. కళాశాలలో నిర్వహించిన పోస్టర్ల ఆవిష్కరణలో డైరెక్టర్ మాట్లాడుతూ 'మేధోసంపత్తి హక్కుల సెల్' అంశంపై ఆన్‌లైన్ ఫ్యాకల్టీ డెవలప్‌మెంట్ ప్రోగ్రామ్ నిర్వహిస్తున్నామన్నారు. ఈ సదస్సు అధ్యాపకులకు ఎంతో ఉపయోగపడుతుందని, సద్వినియోగం చేసుకోవాలని పిలుపునిచ్చారు. కార్యక్రమంలో కరస్పాండెంట్ రామ్మోహన్‌రెడ్డి, ప్రెసిడెంట్ నాగమల్లారెడ్డి, ప్రిన్సిపాల్ పి.రాయుడు తదితరులు పాల్గొన్నారు.

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అధ్యాపకులకు గూగుల్ మీట్ ద్వారా శిక్షణ

మదనపల్లె విద్య, న్యూస్‌టుడే : స్థానిక ఆదిత్య ఇంజినీరింగ్ కళాశాలలో గురువారం నుంచి అధ్యాపకులకు గూగుల్ మీద్ ద్వారా శిక్షణ నిర్వహిస్తున్నట్లు కళాశాల డైరెక్టర్ డాక్టర్ రామలింగారెడ్డి తెలిపారు. కళాశాలలో మేధోసంపత్తి సెల్, ఎలక్ట్రానిక్స్ కమ్యూనికేషన్ ఇంజినీరింగ్ విభాగం సంయుక్త ఆధ్వర్యంలో జరిగే ఈ కార్యక్రమంలో 'ఎమర్జింగ్ ట్రెండ్స్ ఇన్ ఏఐ, మిషన్ లెర్నింగ్, సైబర్ సెక్యూరిటీ, క్యాంటమ్ కంప్యూటింగ్ ఫర్ ఎంబైడెడ్ అండ్ ఐఓటీ సిస్టం' అనే అంశంపై అధ్యాపకులకు గూగుల్ మీట్ ద్వారా శిక్షణ ఉంటుందన్నారు. ఉదయం 11 నుంచి మధ్యాహ్నం 1 గంట వరకు, సాయంత్రం 6 నుంచి 8 గంటల వరకు ఆన్‌లైన్ ద్వారా ఇచ్చే శిక్షణను అధ్యాపకులు సద్వినియోగం చేసుకోవాలన్నారు. ఈ మేరకు గోడపత్రాలు ఆవిష్కరించారు. కార్యక్రమంలో కరస్పాండెంట్ రామ్మోహన్‌రెడ్డి, అధ్యక్షుడు నాగమల్లారెడ్డి, ప్రిన్సిపల్ డాక్టర్ పి.రాయుడు, అధ్యాపకులు పాల్గొన్నారు.

Date : 11/12/2025 EditionName : ANDHRA PRADESH(ANNAMAYYA) PageNo :

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Feedback Summary Report

This feedback summary report is prepared based on responses collected through a Google Form from participants of the Six-Day Faculty Development Programme on "**Emerging technologies in AI, ML, Cyber Security, and Embedded & IoT Systems**" from 08th Dec2025 to 13th Dec2025

1. **Feedback Data Overview**

Total number of responses received: 162

2. **Categorization of Feedback Questions**

- Content Quality and Relevance
- Resource Person Expertise
- Organization and Time Management
- Usefulness for Teaching and Research
- Overall Satisfaction

3. **Quantitative Analysis**

Parameter	**Excellent(%)**	**Good (%)**	**Fair (%)**
How would you rate the overall quality of the FDP?	85.4	13.3	1.3
How relevant were the FDP topics to your teaching/research area?	88.2	10.2	1.6
Is the objectives of the FDP were clearly defined and achieved?	90.2	8.8	1.0
How satisfied are you with the overall organization of the FDP?	85.5	13.5	1.0

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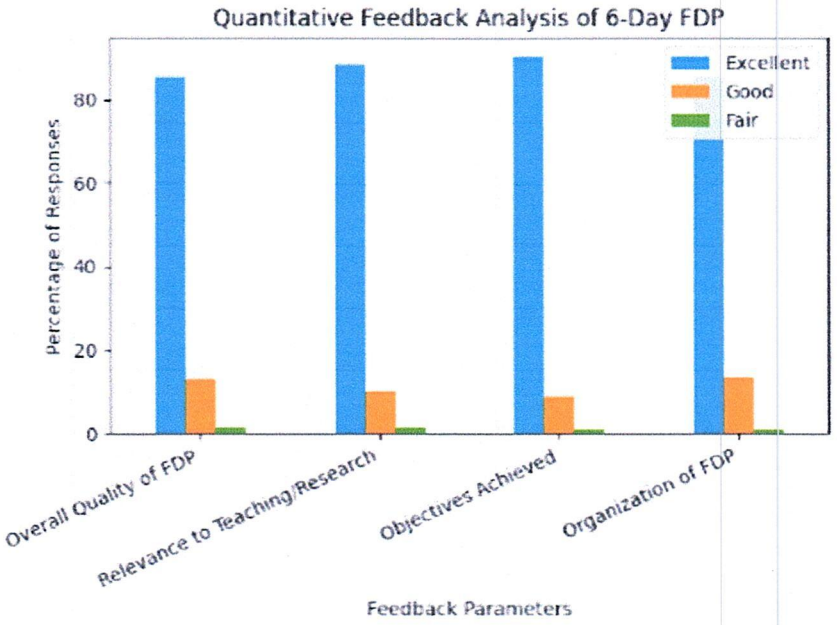
4. **Graphical Representation**



5. **Qualitative Analysis**

Qualitative feedback indicates that participants appreciated the extended six-day format, which allowed in-depth coverage of advanced topics. Recurrent themes included improved research orientation, industry relevance, and clarity of sessions. Suggestions focused on incorporating more hands-on activities.

6. **Overall Feedback Summary**

The overall feedback reflects a high level of satisfaction with the six-day FDP. Participants rated the programme highly in terms of content quality, delivery, and relevance. The six-day FDP significantly enhanced learning outcomes.

7. **Conclusion and Action Taken**

Conclusion: The FDP successfully met its objectives of faculty upskilling and research enhancement.
Action Taken: Based on feedback, future FDPs will include hands-on sessions, tool-based demonstrations, and advanced-level follow-up programmes.

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