Chettinad College of Engineering & Technology, Karur

Department of Electronics and Communication Engineering

News Report

Programme Name: **IR 4.0 Foundation Course - Linux, Python Programming, Data Analysis, and Database Management for AI Development**

Resource Person(s):

Mr.Bharathi Raja, Trainer

Mr.Miral, Trainer

Mr.Jay Rathod, Trainer

Edunet Foundation.

Department Course Coordinator:

1. Mrs.A.Karthikeyani, AP/ECE

Date : 03.02.2025 to 01.03.2025

Venue : DSP & VLSI Laboratory

Number of Participants : 59

Description:

The Department of Electronics and Communication Engineering successfully conducted the **IR 4.0 Foundation Course** from **3rd February 2025 to 1st March 2025**, focusing on **Linux, Python Programming, Data Analysis, and Database Management for AI Development**. This 15-day intensive training program was designed to equip students with essential technical and professional skills relevant to today's technology-driven world.

The course commenced with a comprehensive introduction to Operating Systems under the guidance of the trainers – **Mr. Bharathi Raja, Mr. Miral, and Mr. Jay Rathod** from **Edunet Foundation**. Students gained foundational knowledge of OS architecture, types, and key functionalities, with a particular focus on Linux. They received hands-on experience with Ubuntu, covering Linux installation, terminal operations, file system navigation, user and process management, package handling, networking commands, and automation through shell scripting.

In addition to technical skills, students also benefited from **soft skills sessions** led by **Mr. Miral**, which focused on emotional intelligence, stress management, communication skills, resume building, and professional interactions. These sessions greatly enhanced their confidence and readiness for real-world workplace scenarios.

Subsequently, students were introduced to **Python programming** by **Mr. Jay Rathod**, learning variables, data types, control structures, loops, functions, and modular programming. Building on this, the course progressed to **data analytics**, where students worked with Python libraries such as **Pandas, NumPy, Matplotlib, and Seaborn** to analyze and visualize real-world datasets, gaining insights through practical applications.

The course concluded with a **final assessment**, evaluating the students' proficiency in Linux, Python, and data analytics through hands-on coding exercises and troubleshooting tasks. A **certificate distribution ceremony** was held to mark the successful completion of the course.

The course concluded with a final assessment that evaluated the students' understanding of Linux commands, Python programming, and data analytics through practical coding exercises and troubleshooting tasks. A certificate distribution ceremony marked the successful completion of the course. Overall, the IR 4.0 Foundation Course provided the students with a strong foundation in Linux, Python, and data analytics while enhancing their soft skills, making them better prepared to face the challenges of Industry 4.0 with confidence and technical competence.

Day-wise Summary

Day 1: Introduction to Operating Systems and Linux

On the first day, the students were introduced to the fundamentals of Operating Systems (OS) under the guidance of Bharathi Raja. They learned about the architecture of OS, their types, and the role they play in computing devices. The session covered concepts like process management, memory management, and file systems. They also explored different types of operating systems, including Windows, Linux, and macOS, and understood why Linux is widely used in industry applications.

Day 2: Linux Installation and Basic Commands

On the second day, the students focused on Linux installation and setup, specifically working with Ubuntu. They learned how to create a bootable USB and install Ubuntu step-by-step. After installation, they explored the Linux terminal and executed basic commands like ls, cd, pwd, mkdir, and rm. The session emphasized the importance of the command line and how it provides more control over the system compared to graphical interfaces.

Day 3: File System and Directory Management

On the third day, the students deep-dived into Linux file systems and directory management. They learned about the structure of Linux directories and how to navigate through them efficiently. They practiced creating, renaming, and deleting files and folders using commands like touch, mv, and rm -r. Additionally, they explored file permissions and learned how to modify them using chmod and chown.

Day 4: User Management and Process Control

On the fourth day, the students explored user and group management in Linux. They learned how to create and manage users using commands like useradd, passwd, and usermod. They also explored process management, where they used commands like ps, top, and kill to monitor and manage system processes. These concepts are essential for system administrators to manage multiple users and tasks efficiently.

Day 5: Package Management and Networking in Linux

On the fifth day, the students were introduced to package management in Linux. They learned how to install and update software using package managers like apt and snap. They also explored networking commands such as ping, ifconfig, and netstat, which are used to diagnose network-related issues. The session provided insights into how Linux-based systems manage software and network connections.

Day 6: Shell Scripting and Automation

On the sixth day, the students learned about shell scripting and how to automate tasks using the Bash shell. They wrote basic shell scripts using loops and conditional statements, making the system perform repetitive tasks automatically. They also practiced scheduling tasks using cron jobs, which are commonly used in server management and automation.

Day 7: Hands-on Linux Practice and Troubleshooting

On the seventh day, the students applied all the concepts they learned throughout the week. They worked on practical exercises such as configuring users, managing permissions, troubleshooting network issues, and writing shell scripts. This hands-on experience helped them reinforce their understanding of Linux systems.

Day 8: OS Systems Assessment

On the eighth day, the students had an assessment on OS systems to evaluate their knowledge of Linux and operating system concepts. The assessment included both theoretical and practical questions, where they had to execute Linux commands, manage users, and troubleshoot system-related tasks. This assessment helped them identify their strengths and areas for improvement.

Day 9: Emotional Control and Interaction Skills

On the ninth day, the students attended a soft skills training session under Miral, focusing on emotional control and interaction skills. They learned about the importance of emotional intelligence in professional and personal life. The session also covered techniques for handling stress, managing emotions, and improving communication skills. They participated in activities and discussions that helped them understand how to express themselves confidently in different situations.

Day 10: Introduction to Python Programming

On the tenth day, the students started learning Python programming under Jay Rathod. The session covered the basics of Python, including its syntax, variables, data types, and operators. They learned how to write and execute Python programs using IDLE and Jupyter Notebook. Hands-on exercises were provided to help them practice basic Python coding.

Day 11: Control Flow, Loops, and Functions in Python

On the eleventh day, the students explored control flow statements like if-else, for loops, and while loops. They also learned about functions, how to define them, and the importance of modular programming. Writing custom functions helped them understand code reusability and efficiency. These topics laid a strong foundation for more advanced Python applications.

Day 12: Resume Building and Professional Interaction

On the twelfth day, the students attended another soft skills session under Miral, where they learned about resume building, body language, and recruiter interaction. The session guided them on how to structure a professional resume, highlight key skills, and make a strong impression in interviews. They also practiced effective communication techniques, including positive body language and engaging with recruiters.

Day 13: Introduction to Data Analytics

On the thirteenth day, the students began learning about data analytics under Jay Rathod. They explored the basics of data science, data types, and data collection methods. The session introduced them to Pandas and NumPy, two essential Python libraries for handling data. They practiced loading and analysing datasets using Pandas.

Day 14: Hands-on Data Analysis with Python

On the fourteenth day, the students applied their knowledge of data analytics by writing Python code to clean, filter, and analyse datasets. They also used Matplotlib and Seaborn to create data visualizations such as bar charts, histograms, and scatter plots. Additionally, they performed basic statistical analysis on datasets to extract meaningful insights.

Day 15: Final Assessment – Python and Data Analytics

On the fifteenth and final day, the students had their final assessment, which tested their knowledge of Python programming and data analytics. The assessment included practical coding tasks where they had to clean, analyze, and visualize datasets using Pandas and Matplotlib. After completing the assessment, they received feedback on their performance and discussed areas for improvement. The session concluded with a certificate distribution ceremony, marking the successful completion of the course.

Training Outcomes

By the end of the IR 4.0 Foundation Course, the students were able to:

- Understand and operate within a Linux-based environment, managing files, users, processes, packages, and networks.
- Develop automation scripts using shell scripting for efficient task handling.
- Build a strong foundation in Python programming, including writing modular and efficient code.
- Analyze, manipulate, and visualize datasets using popular data science libraries like Pandas, NumPy, Matplotlib, and Seaborn.
- Apply statistical techniques to gain insights from real-world data.
- Improve communication, emotional intelligence, and professional readiness through targeted soft skills training.
- Demonstrate their learning through practical assessments, preparing them for real-world Industry 4.0 challenges.

Mapping of IR 4.0 Foundation Course with Sustainable Development Goals (SDGs)

- Ensuring Quality and Inclusive Education (SDG 4 & SDG 5)
- Promoting Decent Work and Industry Innovation (SDG 8 & SDG 9)
- Reducing Inequalities and Encouraging Responsible Technology Use (SDG 10 & SDG 12)
- Strengthening Partnerships for Sustainable Development (SDG 17)

Event Photos :