GOVERNMENT COLLEGE OF ENGINEERING, DHARMAPURI

DEGREE/ BRANCH: B.E/ ELECTRONICS AND COMMUNICATION ENGINEERING

DEPARTMENT ACTIVITIES REPORT

EVENT 1

Workshop Title: Aptitude Training Workshop

Organizer : Connect Training solutions

Instructors: Nandhini R, Vinoth S, Radha, Murugan K, Sowmiya

Duration & Date: Three days, 16th to 18th October 2024

Objective: To equip participants with essential aptitude skills required for competitive exams and campus placements. To enhance problem-solving abilities through practical exercises in quantitative and logical reasoning. To improve speed and accuracy in solving aptitude-based questions under time constraints.

Overview:

The Aptitude Training Program is a three-day intensive workshop designed to enhance students' problem-solving abilities and analytical thinking. The training focuses on key aptitude topics essential for competitive exams and campus placements. Through structured sessions, participants develop speed, accuracy, and confidence in tackling various quantitative and logical reasoning problems.

Day 1:

The first day covers fundamental mathematical concepts and logical reasoning techniques. Students will gain insights into essential problem-solving strategies for:

Profit, Loss, and Percentage – Understanding cost price, selling price, discounts, and percentage-based problems.

Ratio and Proportion – Learning direct and inverse proportions, applications in real-world scenarios.

Coding-Decoding & Puzzles – Enhancing logical reasoning skills through pattern recognition and structured problem-solving.

Day 2:

The second day delves deeper into mathematical concepts that require logical application and structured approaches:

Time and Work – Techniques to solve problems involving efficiency, work done by multiple individuals, and pipes & cisterns.

Time, Speed, and Distance – Understanding relative speed, boats & streams, and train-based problems. **Permutation and Combination** – Learning fundamental counting principles, factorial concepts, and probability basics.

The final day focuses on mastering advanced aptitude topics and critical thinking exercises:

Mixtures & Solution and Ages – Solving problems involving concentration mixtures, ratio-based age calculations.

Averages and Arithmetic/Geometric Progression (AP/GP) – Understanding weighted averages, sequences, and series applications.

Blood Relation and Direction Sense – Strengthening logical reasoning skills with family tree problems and directional analysis.



Conclusion: The Aptitude Training Program effectively equips students with problem-solving skills, logical reasoning, and mathematical proficiency for competitive exams and placements. Over three days, participants enhance their speed, accuracy, and analytical thinking through structured sessions. The training builds confidence in tackling real-world assessments and fosters a strategic approach to problem-solving.

Workshop Title: PCB Design workshop

Organizer: ECE Final year students

Instructors: Kameshwaran, Mohana Kumar, Praveen, Priyadarshini, Deepika

Duration & Date: One day, 09/11/2024

Objective: To provide participants with fundamental knowledge and hands-on experience in PCB (Printed Circuit Board) design. The workshop aims to equip students with essential skills required for designing and fabricating PCBs used in various electronic applications.

Overview:

The **One-Day PCB Design Workshop** is a hands-on training session aimed at providing participants with fundamental knowledge of Printed Circuit Board (PCB) design and fabrication. This workshop is designed to help students understand the complete process of PCB development, from schematic design to layout and implementation. Participants will gain practical experience using industry-standard design tools and learn best practices for creating efficient and functional circuit boards.

Key Highlights:

Introduction to PCB Design Principles and Workflow: Overview of Printed Circuit Board (PCB) design, its importance in electronics, and real-world applications. Understanding the step-by-step design process, from schematic creation to final PCB layout.

Hands-on Experience with PCB Design Software: Training in industry-standard PCB design tools such as Eagle. Understanding the user interface, features, and capabilities of PCB design software. Step-by-step guidance on creating a new project, adding components, and configuring settings.

Schematic Creation and Component Placement Techniques: Learning how to create and interpret circuit schematics. Proper selection of electronic components and their placement for optimal circuit performance. Understanding design libraries, footprints, and symbols used in schematic capture.

Understanding Routing, Layers, and Design Constraints: Learning PCB routing techniques such as manual routing, auto routing, and differential pair routing. Understanding the importance of trace width, spacing, and via selection in PCB design. Exploring multi-layer PCBs, ground planes, and power planes for improved performance.

Basics of PCB Fabrication and Industry Standards: Understanding the PCB manufacturing process, including material selection, etching, and solder mask application. Learning about industry standards like IPC guidelines for PCB design and fabrication. Exploring different PCB materials and their impact on performance and cost.

Troubleshooting Common Design Issues:Identifying and fixing common PCB design errors such as incorrect footprints, short circuits, and missing connections.Learning debugging techniques using PCB design software tools.Understanding Design Rule Check (DRC) and Electrical Rule Check (ERC) to ensure error-free PCB designs.

Practical Session on Designing and Simulating a PCB Circuit: Hands-on exercise where participants design a simple PCB circuit from scratch. Simulating the designed PCB to verify circuit functionality before fabrication. Exporting Gerber files and preparing the design for manufacturing. Discussion on real-world PCB design challenges and solutions.





Conclusion:

The **One-Day PCB Design Workshop** provided participants with essential skills in PCB design, from schematic creation to layout and fabrication. Through hands-on training, students gained practical experience in component placement, routing, and troubleshooting. This workshop laid a strong foundation for further exploration in electronics and embedded systems, equipping students with the confidence todesign and implement their own PCB circuits for real-world applications.

Internship: 8051 Microcontroller

Organizer: Vector India private Ltd

Duration & Date: 1 month, July 15th – August 15th, 2024

Objective: To gain in-depth knowledge and hands-on experience in 8051 Microcontroller programming and applications. This internship will help learners develop practical skills in embedded systems, enabling them to write efficient code, interface various peripherals, and design real-time projects. By the end of the program, participants will have the confidence to work with 8051-based systems and apply their knowledge to real-world embedded solutions.

Overview: The One-Month Internship at Vector India Pvt. Ltd. is designed to provide hands-on experience in 8051 Microcontroller programming and embedded systems development. This program offers an in-depth understanding of 8051 architecture, instruction set, and real-world applications through practical training sessions. Participants will learn to write and debug Embedded C programs, interface peripherals, and implement various microcontroller-based functionalities.

Key Highlights:

Comprehensive Understanding of 8051 Microcontroller

- Detailed study of **8051 architecture**, instruction set, memory organization, and internal peripherals.
- Understanding the role of registers, ports, and special function registers (SFRs) in microcontroller operations.

Embedded C Programming & Debugging

- Writing efficient **Embedded C programs** for 8051-based applications.
- Learning debugging techniques using **software simulators and hardware tools** to identify and fix errors in microcontroller programs.

Peripheral Interfacing & Hardware Control

- Hands-on experience with LEDs, LCD displays, keypads, motors, buzzers, and sensors.
- Implementing real-time hardware control by integrating external devices with the 8051 microcontroller.

Timers, Counters, and Interrupts

- Learning how to configure and use **timers and counters** for generating delays, pulse width modulation (PWM), and frequency measurement.
- Implementing **interrupt-driven programming** for efficient real-time system responses.

Serial Communication & Data Transfer

- Understanding communication protocols such as **UART, SPI, and I2C** to enable data exchange between microcontrollers and other devices.
- Practical implementation of **serial communication** for data logging and peripheral interaction.

Industry-Oriented Training & Exposure

- Learning **best practices** in embedded system design, including power optimization and efficient coding techniques.
- Exposure to industry-standard tools and workflows, preparing participants for careers in **embedded systems and IoT development**.



Final day of Interns

Conclusion:

The One-Month Internship at Vector India Pvt. Ltd. equipped participants with hands-on experience in 8051 Microcontroller programming and embedded systems. Through practical training, they gained skills in Embedded C, peripheral interfacing, timers, interrupts, and serial communication, enabling them to develop real-world applications.

This internship provided a strong foundation for careers in embedded systems and IoT, preparing students with industry-relevant knowledge and problem-solving skills for future advancements in the field.

Internship: Basic Auto CAD, python for Data science, Embedded System using PIC Microcontroller and PCB design.

Organizer: Sunshiv Electronics Solutions

Instructor: Mr. Sundaramoorthy, Founder Sunshiv Electronics Solutions

Duration & Date: 1 month, July 15th – August 15th, 2024

Objective: To gain hands-on experience in AutoCAD, PCB Design using Eagle, Python for Data Science, and Embedded Systems with PIC Microcontroller. This one-month internship at Sunshiv Electronics Solutions will help learners develop practical skills in circuit design, PCB layout, programming, and data analysis. By the end of the program, participants will be able to design schematics, create PCB layouts, analyze data using Python, and develop embedded applications, preparing them for real-world industry challenges.

Overview: The One-Month Internship at Sunshiv Electronics Solutions provides handson training in AutoCAD, PCB Design (Eagle), Python for Data Science, and Embedded Systems with PIC Microcontroller. Participants will learn to create circuit schematics, design PCB layouts, analyze data using Python, and develop embedded applications.

With a strong focus on practical learning and real-world applications, this internship equips students with essential electronics, programming, and data analysis skills, preparing them for industry challenges.

Key Highlights:

AutoCAD for 2D Drawing

- Learn the fundamentals of **AutoCAD for 2D drafting and design**.
- Understand essential tools like **line**, **arc**, **circle**, **and polyline commands** for creating technical drawings.
- Gain hands-on experience in **dimensioning**, **layering**, **and annotation** to produce precise 2D schematics.

PCB Design Using Eagle

- Hands-on experience in **schematic creation**, **component placement**, **and routing** using Eagle software.
- Learn about multi-layer PCB design, signal integrity, and manufacturing considerations.

Python for Data Science

- Introduction to **Python programming for data analysis and visualization**.
- Hands-on training with **NumPy**, **Pandas**, and **Matplotlib** for handling and processing datasets.

Embedded Systems with PIC Microcontroller

• Learn the **architecture and programming** of PIC microcontrollers using Embedded C.

- Interface **LEDs**, **LCDs**, **sensors**, **motors**, **and other peripherals** to develop realtime applications.
- Understand the use of **timers**, **interrupts**, **and serial communication** for efficient embedded solutions.

Hands-on Project Development

- Apply the acquired knowledge to **design and develop real-world projects**.
- Work on **PCB-based circuits, embedded system applications, and data** science-driven solutions.
- Gain experience in **debugging**, **troubleshooting**, and optimizing designs.

Industry-Oriented Training

- Exposure to **best practices in PCB design, embedded development, and data analytics**.
- Learn about **industry standards**, **debugging techniques**, **and optimization methods** used in professional environments.
- Understand the **workflow of an electronics and embedded systems company**, preparing students for future careers.

Practical Exposure and Skill Development

- Hands-on learning approach to enhance **technical skills and problem-solving abilities**.
- **Mentorship from industry experts** to guide students through real-world projects and challenges.
- Strengthen **core electronics, programming, and analytical skills**, ensuring career readiness in multiple domains.







Conclusion: The One-Month Internship at Sunshiv Electronics Solutions provided hands-on training in AutoCAD for 2D drawing, PCB design, Python for Data Science, and Embedded Systems with PIC Microcontroller. Participants gained practical skills in circuit design, programming, and data analysis, preparing them for industry challenges.

This internship served as a strong foundation for careers in electronics, embedded systems, and data science, equipping students with essential technical expertise and problem-solving skills.

Event title: Inauguration Function

Organizer: Final year students

Duration & Date: 1 Day, 22nd November 2024

Objective: To inspire and engage students in hands-on technical activities by organizing a series of competitions focused on electronics and circuit design. This event aims to enhance practical skills, problem-solving abilities, and technical knowledge while fostering creativity, teamwork, and innovation in the field of Electronics and Communication Engineering (ECE).

Overview: The One-Day Inauguration Function of the ECE Department is a technical event designed to engage students in hands-on learning and skill-based competitions. The event features various contests such as Soldering & Component Assembling, Electronic Component Identification, Technical Quiz, PCB Designing, Paper Presentation, Circuit Debugging, and Circuit Making.

These activities help students enhance their practical knowledge, problem-solving skills, and creativity in electronics and circuit design. The event encourages teamwork, innovation, and technical excellence, providing a great platform for students to showcase their talents.

Key Highlights:

Soldering Contest & Component Assembling

- Test hands-on soldering skills by assembling electronic circuits.
- Learn proper soldering techniques, component placement, and circuit connectivity.
- Enhance precision and attention to detail in practical electronics work.

Electronic Component Identification & Classification

- Identify and classify various electronic components such as resistors, capacitors, diodes, and ICs.
- Understand component specifications, functions, and real-world applications.
- Improve the ability to quickly recognize and use the right components in circuit design.

Technical Pick & Talk

- Develop spontaneous speaking skills on various electronics and technology-related topics.
- Improve confidence, articulation, and technical communication.
- Encourage students to express innovative ideas and opinions effectively.

Technical Quiz

• Test knowledge in electronics, communication systems, microcontrollers, and emerging technologies.

- Engage in a competitive yet fun learning environment to reinforce technical concepts.
- Encourage teamwork and quick thinking through multiple rounds of problemsolving questions.

PCB Designing

- Learn the fundamentals of printed circuit board (PCB) design using industrystandard software.
- Gain hands-on experience in schematic design, layout creation, and circuit simulation.
- Understand the importance of PCB fabrication and its role in real-world electronics applications.

Paper Presentation

- Provide a platform for students to present their research and innovative ideas.
- Enhance presentation skills, technical writing, and knowledge-sharing abilities.
- Encourage discussions on recent advancements in electronics and communication engineering.

Circuit Debugging & Circuit Making

- Develop troubleshooting skills by identifying and fixing faults in electronic circuits.
- Learn systematic debugging techniques to analyze and resolve circuit malfunctions.
- Apply knowledge of circuit design to build and test functional electronic projects.







Conclusion: The One-Day Inauguration Function of the ECE Department successfully provided students with a platform to enhance their technical skills, creativity, and problem-solving abilities. Through various competitions like soldering, PCB designing, circuit debugging, and technical quizzes, participants gained hands-on experience and industry-relevant knowledge.

The event fostered innovation, teamwork, and a passion for electronics, making it a valuable learning experience for all attendees.

An Industrial Visit to Radio Astronomy Centre, Udhagamandalam

An industrial visit to *Radio Astronomy Centre, National Centre for Radio Astrophysics, Udhagamandalam – 643 001* was organized by the Department of Electronics and Communication Engineering, Government College of Engineering Dharmapuri on 22.03.2025. Fifty Students along with Two Faculty Members visited the *Radio Astronomy Centre, Udhagamandalam.*

The Students along with faculty members were assembled in the ECE seminar hall and given a briefing of rules and guidelines to be followed inside the Astronomy Centre.

The students were shown a video show on the radio telescope and basics of radio astronomy. After the Video show, the students were allowed to visit the telescope site and also to know the rotation of the telescope.

About the Radio Astronomy Centre:

The Radio Astronomy Centre (RAC) is purely a research organization engaged in research & training Ph.D students in the field of Radio Astrophysics. The radio telescope is a 530-metre (1,740 ft) long and 30-metre (98 ft) wide cylindrical parabolic antenna. It operates at a frequency of 326.5 MHz with a maximum bandwidth of 15 MHz at the front end. The telescope can be operated in either total power or correlation mode. In each mode, 12 beams are formed; beam 1 is the southernmost beam and beam 12 is the northernmost. These 12-beam systems are useful in sky survey observations.









The history of Ooty Radio Telescope (ORT), it's functioning and operation of the telescope was briefly explained in *Radio Astronomy Centre, Ooty* from 11.30 am to 12.30 pm. The main aim of industrial visits is to give exposure to the students about the practical working environment with theoretical learning. This Industrial visit provided to the students a good opportunity to achieve full awareness about working and functionality of Radio Telescope. The students were taken for a sight-seeing in the nearby places until 06.30 pm. After the completion of dinner by 09.00 pm, the students were stayed in Hotel. Next day Morning 10.00 am started to GCE Dharmapuri and reached the hostel premises around 10.00 pm.

An Industrial Visit to KERALA ELECTRICAL & ALIED ENGINEERING Co..Ltd..

An industrial visit toKERALA ELECTRICAL & ALIED ENGINEERING Co..Ltd..Kerala was organized by the Department of Electronics and Communication Engineering, Government College of Engineering Dharmapuri on 07.04.2025. Forty nine Students along with Three Faculty Members visited the KERALA ELECTRICAL & ALIED ENGINEERING Co..Ltd..Kerala.

The Students along with faculty members were assembled in the ECE seminar hall and given a briefing of rules and guidelines to be followed inside the KEL.

About the INDUSTRY:

The Mission OfKerala Electrical & Allied Engineering Company Was Established in 1964 in the state of Kerala, India.KEL owns five production units for the development of a number of equipment for Indian Army. Indian Air Force, Indian Space Research Organization and many other space research institutions. The Kerala Electrical & Allied Engineering Company is a multifaceted company fully owned by the State Government. Throughits four production facilities, located in various districts of the State, this ISO 9001: 2000 complaint company provides basic engineering services / products besides executing projects of national significance of high profile clients like the various defense establishments. The company's all-India marketing network with regional offices in all metro cities cater to major and various defense establishments besides the general market clients.institutional clients like the State Electricity Boards, Indian Railwaysand various defence establishments besides the general market clients.

Thinks we learnt:

We learnt about the functions, interior parts and manufacturing of transformers.

The transformers have two interior parts called i).core ii).coil

The first process is the manufacturing of core which is similar to the heart for living of the transformer. Material selection plays an important role as they are using Silicon material for the manufacturing. They are manufacturing the core because the coil should fit into this core.

The second process is the manufacturing of coil winding. These windings are made up of copper material, which are designed to optimize thermal, electrical and mechanical stress. Spiral, Helical and continuous disc winding with multiple copper conductors are used.

The next is called assembly section where the core and coil is assembled and the section where the space utilization, compactness of the transformer is determined.

The next step is the addition of oil into the designed transformer. Pure oil is used in transformers because even a microscope level of waste may cause harmful effects in transformer.

Tank & Final Assembly: After ensuring that the active part is fully dry and moisture free, it is lowered inside a suitably designed and fabricated.

Tank fabrication &sand blasting: Sand blasting is the efffectful technique which helps in removal of the corrosion due to moisture in environment, influence of various gases, rust flakes.

Painting: Painting increases the service life and gives the aesthetic look.

Drying/Ovening: Here core and coil assembly is dried through a very efficient drying oven which ensures extraction of moisture to zero level. After drying process,winding,clamping and connection are checked and tightened before lowering into tank. Filtered and degassed oil is then filled into the tank under vacuum filter plants. Thus required insulation is achieved.

Ready to Dispatch: During final assembly all pipe work, bushings and radiators are fitted to the transformer.

