

A report on the lessons and activities done last fortnight

Day3: Project Workflow creation and GitHub and Git Functionalism

The morning session started at 8:30 after the HOD introduction of the session's anchor (Engr. Bharath). We started with how to create a project workflow, which began with the understanding of PDLC and how each stage can be recorded by the user in the project workflow document, as well as the methodologies and tools needed at each stage in creating respective document or file for each stage, we then created a demo folder which was named after the first four stages of PDLC included as a folder in the parent folder, an excel sheet was created inside the requirement folder which captures what needed to be done and what should be expected after the activities were completed, the analysis stage folder was contained with the charts needed for better understanding using online tools for chart's design, we then move to the inclusion of GitHub and Git for project collaboration, a repository was created in name to the session, we were then taught how to clone the created repository to our local machine with proper theory explanation, as well as the terminal commands needed to make the activities easy, all created files and document were pushed to the repository. This ends the morning session.

The afternoon session, which started after 2 pm, was about how to get our teams' contributions on a collaborative project from the repository, contribute to the project, and verify the difference between the former and later changes in the document.

Day4: Circuit Simulation, Design and PCB Workflow Design Workshop

Two faculty members (Dr. Girish Mishra and Dr. Arvind Kumar) anchored this session. We started by understanding the importance and the need for PCB in an electronics project and how PCB designs are being done in an industry. After that was the explanation of each phase of the PCB design from the schematic design to its conversion into PCB design down to the routing,

where the connection is finalised and the remaining design as per the choice of the designer on the board can be done. We were then shown the practical process of a schematic simulation using the analog-based light switch control, where we created the simulation on TinkerCAD and designed the schematic diagram on EasyEDA along with the conversion into PCB. At the same time, the 3D and 2D results were generated along with the Gerber file and BOM file generation.

During the afternoon session, teams were created, and each team had to design a led blinking circuit simulation on TinkerCAD and the respective Circuit and PCB design on EasyEDA. The Hardware design was to be developed in the Laboratory, and the session anchor verified the output of each team's design.

Day5: Team-wise Analog and digital circuit mini-topic selection and design

Dr. Girish Mishra anchored this session, and lab attendants verified tasks. Each team was to pick a digital and analog circuit design topic, design the simulation on TinkerCAD, confirm its working status, design the circuit on EasyEDA and project the PCB design. Tasks were split in the morning, and each team was divided into two parts, and tasks were exchanged in the afternoon session. Reports were to be provided after the day and submitted in the sheet's tracker.

Day 6,7 & 8: C Basics and Embedded C Workshop

Mr Rajesh Sola anchored the whole 3-Days session, where he explained the basics of Bitwise operators in C, their functions, graphical representation of how they operate with proper and detailed examples of how they can be used for bit manipulation, etc. The instructor gave loads of Hands-on tasks, whereby students couldn't complete some of the tasks in a day as he explained the approach to the issues students might have encountered while solving the tasks during the following day's session. He then moved on to the explanation of the Arduino board and its programming, which included the explanation of its pinout and their respective functions; methods of programming Arduino were explained, which include the IDE usage or VSC interface coding, giving insight on their differences and comparisons along with examples (**LED Blinking, LED turn on and off using Push Button, Turning On LED if resistance is High and Off if resistance is Low, LED Dimming using analog ports, Using serial port, printing the output if we push the push button**), he gave some Arduino mini program to be written by us as they were verified during the following day's session as he added some insights into Arduino programming and using Linux command line

to practice Arduino code compilation, all given tasks from the previous days' session were asked to be submitted on each student's repository ahead of the upcoming week's session.

Day9: Inception of each track chosen by the students

We started the day by explaining the differences between Microcontroller, Arduino, NodeMCU and RaspberryPi, and we were taught the different specifications of these boards. Then, we began by explaining microcontrollers and microprocessors and their respective properties.

After that, the explanation of embedded C programming, its purposes, and the use of its syntaxes were given. We did some examples of LED blinking after installing the tools needed for the session after noon with hands-on activities to be done as a take-home.