SYMBIOSIS INTERNATIONAL (DEEMED UNIVERSITY)

**(Established under section 3 of the UGC Act 1956)**

**Re-Accredited by NAAC with 'A' Grade (3.58/4): Conferred with UGC Category 1 University Status.**

**Founder: Prof. Dr. S. B. Mujumdar, M.Sc, Ph.D. (Awarded Padma Bhushan and Padma Shri by President of India)**

**Internal Quality Assurance Cell (IQAC)**

# Symbiosis Institute of Digital & Telecom Management (SIDTM)

## Title of the practice

Prevision SIDTM's Annual Telecom Forecast

## The context that required the initiation of the practice

What were the contextual features or challenging issues that needed to be addressed in designing and implementing this practice?

The objective is to create industry neutral forecast which is needed by industries, academicians and researchers for future guidance. The forecast is based upon extensive statistical analysis. It provides the students a platform to understand the linkages between theoretical learning and dynamic industry trends. Through the Prevision research process, the students can understand the effect of macro-economic, technological & regulatory factors on the telecom industry in India as well as the world. The accuracy of prediction is based upon the tools used and input data has been about 80% since its inception. In The entire process of preparing Prevision includes students of SIDTM, Alumni of SIDTM, Industry mentors and faculty in charge of Prevision. The process is streamlined by a consulting firm.

## Objectives of the practice

Annual Telecom Forecast Magazine is in its 18th year, initiated in the year 2003 to provide the industry a neutral and insightful point of view regarding the emerging trends in the telecom sector for the forthcoming year. Prevision encompasses the forecast of various parameters of the telecom industry to identify, highlight and understand significant changes in the telecom ecosystem. Prevision is a culmination of the collective endeavour of SIDTM students, SIDTM faculty and industry experts with 2000 man-hours of effort put in by them. It is the only effort of its kind in the telecom domain being attempted by a B-school, which provides comprehensive coverage over various domains in the telecom sphere. To ensure the quality and accuracy of predictions, the process streamlining for Prevision is supervised by a consulting firm.

## The Practice

The forecast is made about various parameters of the telecom industry with an aim to identify, highlight and understand significant changes in the telecom ecosystem in the telecom sector for the forthcoming year.

Following verticals are covered in Prevision: Global Telecom World Penetration Rate, Technology Roll outs, Regional Analysis Indian Telecom Tele-density, Subscriber Base, Market Dynamics, New Technology Analysis Mobility ARPU, Penetration, Voice & VAS Broadband Penetration, Access, Broadband market analysis Telecom Technologies Core, Access, Transmission analysis and Application Telecom Software Billing, Revenue Assurance, Fraud Management, Security Communication Infrastructure Fixed and Mobile Infrastructure, Green Infrastructure, Active/Passive infrastructure sharing Consumer Electronics Growth and Trend in handheld

electronic and mobile devices Special Feature Digital Transformation. The forecast is well accepted in the industry and academicians. It is extremely important for a higher-level understanding of the industry and managerial decision making. In the process of finalisation of Prevision every year, the SIDTM collates data, analyses it & make predictions, these predictions are reviewed and finalised by the faculty in charge. Every year a special feature is added with all aspects of information and forecast related to that area. The Prevision is completed and presented in the month of September every year. The copy of the same is available on SIDTM website.

**Obstacles faced if any and strategies adopted to overcome them:**

One of the key problems is the lack of adequate and relevant data on the independent variables that influence the predicted values. To overcome this, we refer to multiple informal data sources and draw commonalities and then proceed with the data for analysis. Since the last three years SIDTM students have conducted interactions with subject matter experts from academia and industry. This helps us in identifying qualitative factors and has helped us to improve the accuracy of our predictions

For the past few years SIDTM had limitations of IT resources and statistical packages for data analysis; however, with the setting up of the IBM Lab and use of open-source tools such as R this limitation has been overcome.

**Impact of the practice:**

The Prevision is very successful in terms of its acceptance from industry and academicians. SIDTM has contributed to knowledge generation and dissemination. The Prevision team is headed by Prof. Giri Hallur and the team was asked to make presentations on this by reputed industry organisations.

This activity helps students to stay updated with latest industry happenings and statistical tools.

SIDTM publishes more than 500 copies to be distributed to all. Apart from this, it is available on the website of SIDTM. The accuracy of prediction made in Prevision is improving every year. The accuracy of predictions and acceptance from academicians and industry indicates its success over a period of 13 years.

**Resources required:**

IT and analytics software packages, faculty, alumni students with required skill sets, budgetary support.

**Author:**

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# Symbiosis Institute of Technology (SIT)

## Title of the Practice

Creative Thinking Skill Approach through Problem-Based Learning: Pedagogy and Practice in the Engineering Classroom

## Objective of the Practice

Project-Based Learning (PBL) is "a teaching and learning model that focuses on the central concepts and principles of a discipline, involves students in problem-solving and other meaningful tasks, allows students to work autonomously to construct their own learning, and culminates in realistic, student-generated products" (Thomas, et al., 1999).

Presently the focus in Engineering Education is on teaching basics of technology (from text books). Only a few institutions/ universities can offer their student knowledge pertinent to the needs of industry as a part of the curriculum. There is a real challenge as how to impart knowledge which will have a perfect blend of learning the basics, testing their applicability so as to produce globally acceptable Engineers.

- The prime objective of the practice is to give students an opportunity for active learning.
- To design and offer effective mini projects in order to accomplish the course outcomes
- Aiming for an overall transformation in the quality of teaching learning process

## The Context

In the regular practice of teaching-learning, the teacher is compelled for tutelage, which is to be avoided in problem-based learning. Ample amount of time is required to be spared for designing the activities and providing all the necessary resources to students. The facilitator has to mediate only when prompted for and the urge for providing them direct solutions has to be controlled on the faculty's part. It is essential that the students get to brainstorm and find their path to the solution. The problem has to be designed such that, students get introduced with new contexts/ learn to use a tool/ get introduced to a methodology (preferably hands-on) while on the path of achieving their final target solution.

To start with there was a necessity of training the trainers. The trainers were trained with following objectives in consideration.

- To increase teachers' understanding of how facts are distinguished, ideas based on facts are generated, and appropriately defined learning issues are generated by learners going through a PBL case.
- To increase teachers' understanding of how students utilize resources to generate "learning needs" that are relevant to the case and their group's ideas.

- To increase teachers' awareness of how students gauge their limit of understanding from a PBL case.
- To increase participant understanding of the inquiry-based, student-centric learning approach utilized in the problem-based learning program.

**The Practice**

A faculty from SIT registered for the online course offered by University of Aalborg University "An introductory course on PBL in Higher Education". After the online training an FDP was arranged targeting the above referred. The faculty of SIT then started practicing PBL for various courses for different levels

**Dossier1: Problem Based Learning week**

The first week of the academic semester was converted into a week full of PBL activities instead of regular classes for students of second year Civil Engineering. Few activities were planned to introduce students to new concepts allied with the course structure of the semester, and based upon the basic sciences knowledge they acquired either from high-school or engineering diploma courses.

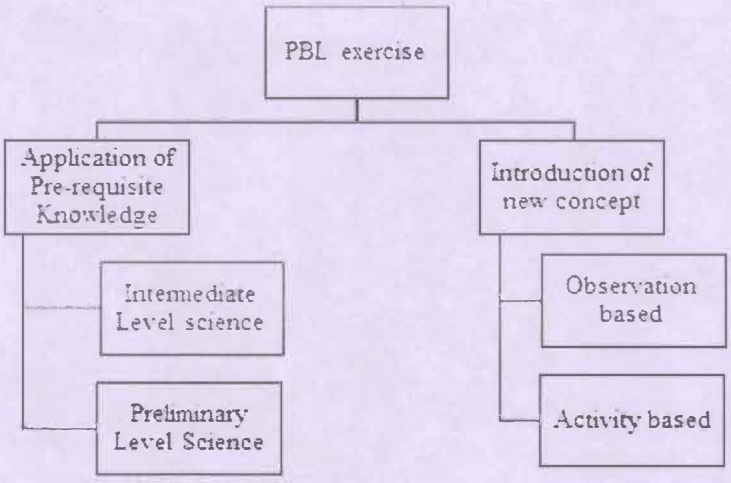


***Figure1: PBL activity division***

**Dossier 2: Offering Complete course by Project Based Learning: Across disciplines**

to the Department of Electronics and Telecommunication Engineering in complete project-based learning pattern. In these courses of "Town and country planning" and "Integrated water resources management" the faculties conducted weekly meetings and briefed students about key concepts associated with the subject and applications in-tune with the branch. The students were divided in to a group of 4 to 5. They came up with ideas where their knowledge can be

applied to planning of a neighbourhood or management of water resources. Students submitted the project reports and exhibited the models they prepared for. They were evaluated on the basis of the theme of the mini project, activities carried out throughout the semester as a group towards completion of the project, demonstration and exhibition of their model and PowerPoint presentation. Students wrote reflection sheets to describe their experience of leaning through PBL.

**Dossier 3: Mini projects to execute via Project Based Learning**

The approach of problem-based learning was used partially in the course Analog Circuit Design in a gradual and step by step manner. The main objective was to emphasize concept building and understanding of the core fundamentals and the learning by doing methodology. The main challenge was that the entire pedagogy had to be designed to equip them for the conventional end semester examination along with the objectives mentioned above.

The initial part of the course was started in the conventional manner and then using the lab sessions the software simulations problem-based learning was introduced gradually. It helped the students in the lab as well as better understanding of theoretical concepts.

It was then followed by assigning them projects that were carefully designed based on their learning of the core fundamentals, the practical learnings in the labs (hardware and simulations in lab sessions). Along with the regular hardware-based labs they also learnt the simulation of the circuits using simulation software's like LT spice, Easy EDA and KiCad (links for these software's already given to them on the google classroom). Use of these software's was also a big takeaway for them.

**Evidence of Success**

**Dossier 1:**

Students used to muse after reading the problem statements and later get into action mode due to the intriguing tasks assigned.

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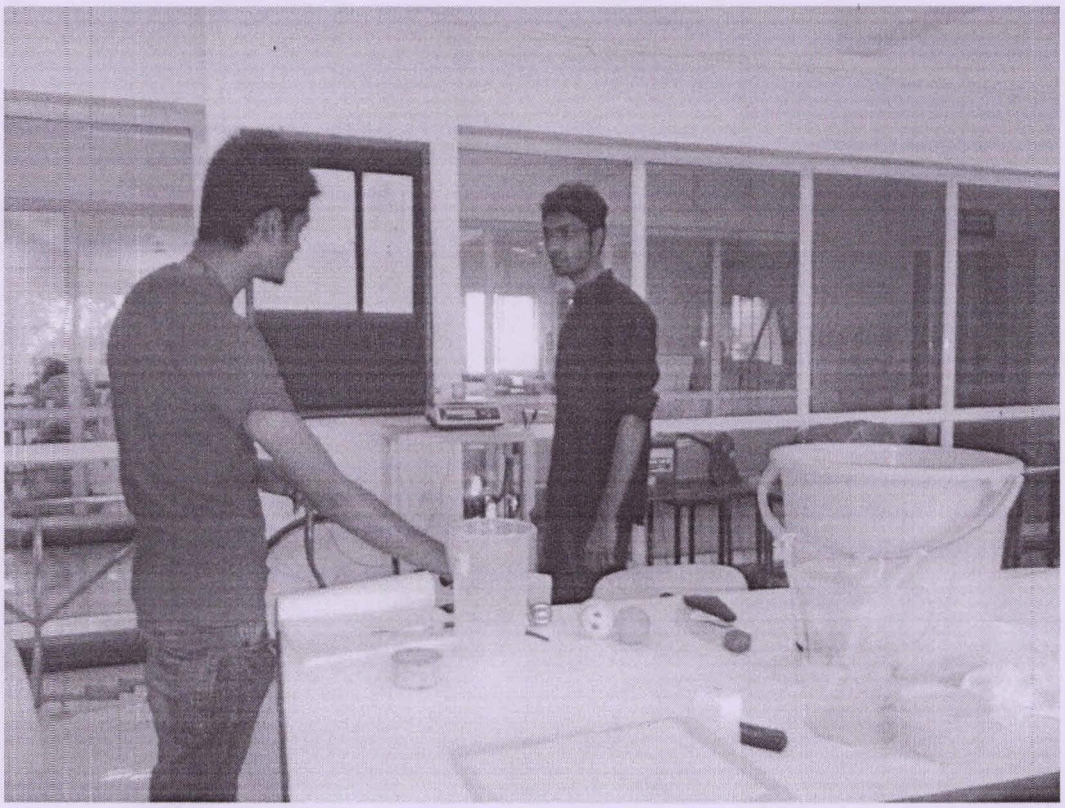

***Figure 2: Students working together on two different problem statements***

Key learnings and take-aways from the experience were that, the entire week acted as a team building exercise. A very good connect could be developed between teachers and students and the students could apply their basic knowledge of physics, chemistry, mathematics, and geometry to solve the problems. Figure3: A sample activity provided to students.

**Dossier 2:**

The entire course was executed such that the students get to do hands-on sensor system design/ circuit design for addressing problem statements having application to Town and Country planning. It focussed on smart infrastructure and effective engineered solutions. The evaluation was done on the basis of a project exhibition wherein students displayed working models of the technology chosen for application. The students learnt to make the model from scratch, learning from mistakes and retrying to reach success. In the process, they brainstormed with the faculty to ascertain that their concept is efficient for application in a civil engineering perspective

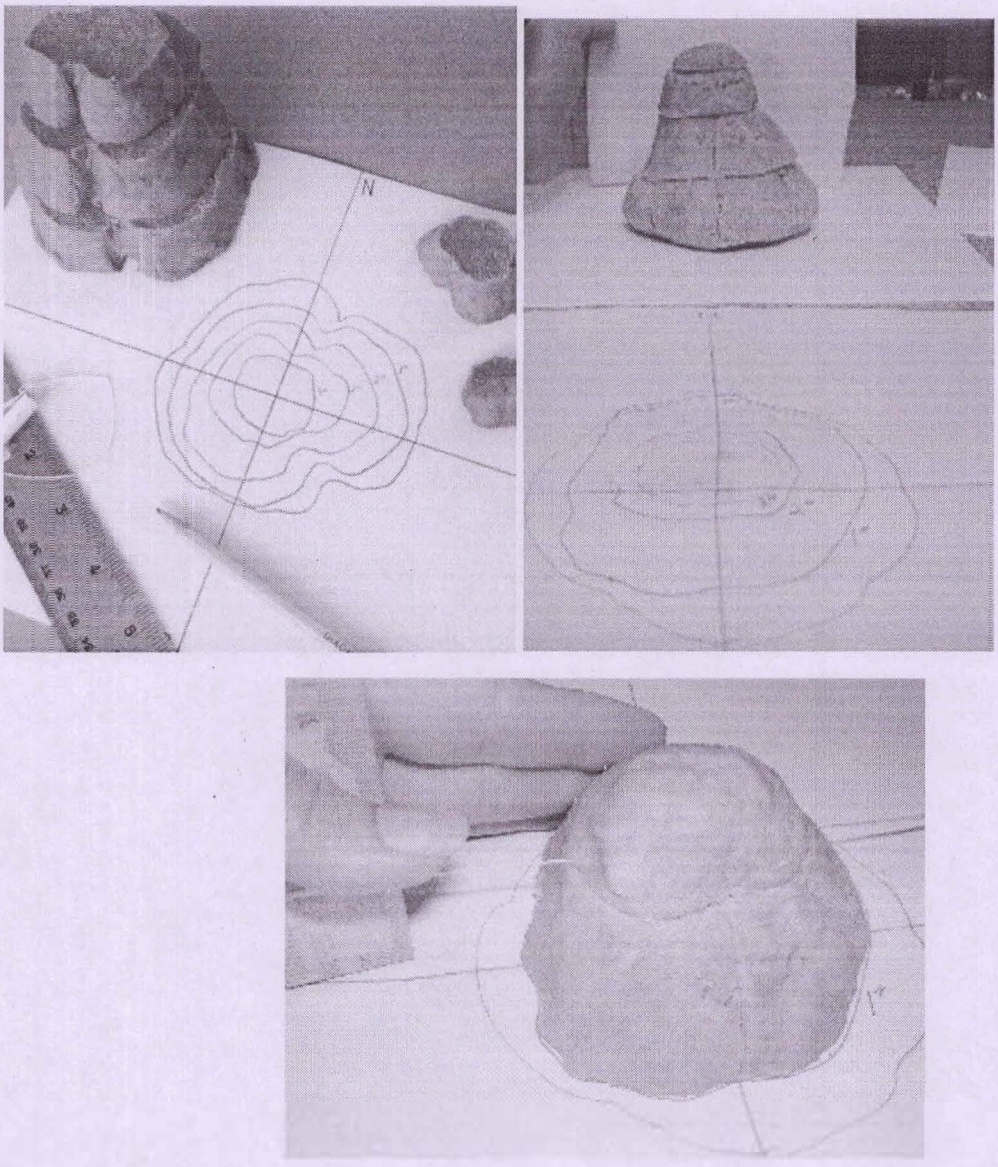

*Figure 4 and 5: Students displaying their project during semester end exhibition*

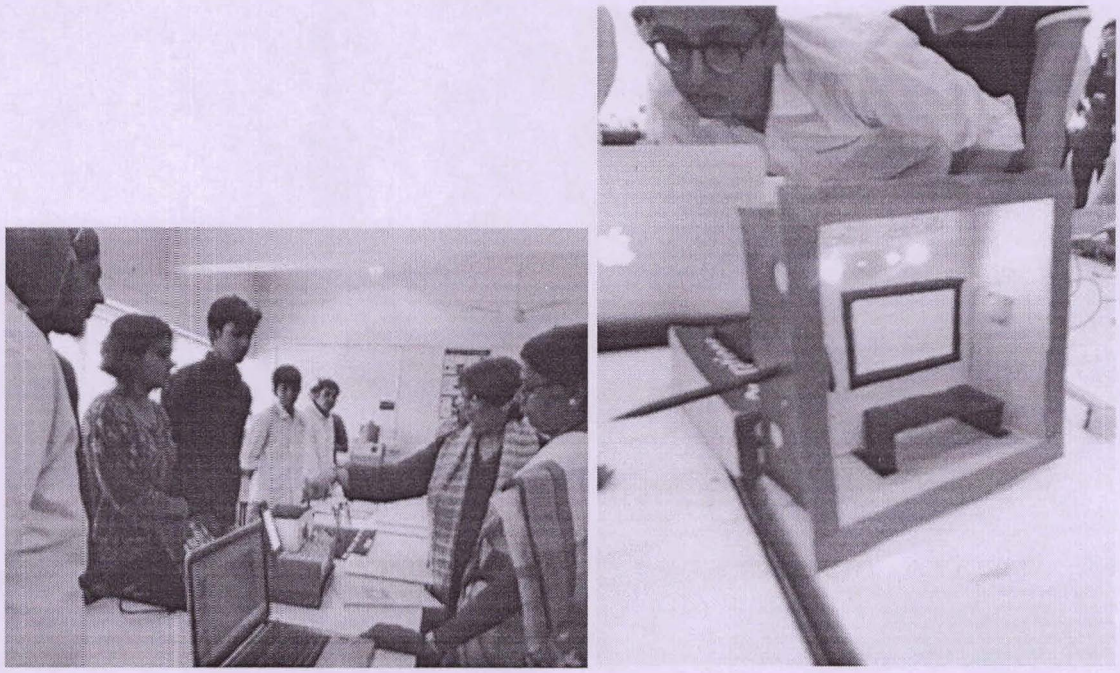

*Figure 6: Reflection sheets by students*

**Dossier 3:** Offering mini projects to execute via Project Based Learning:

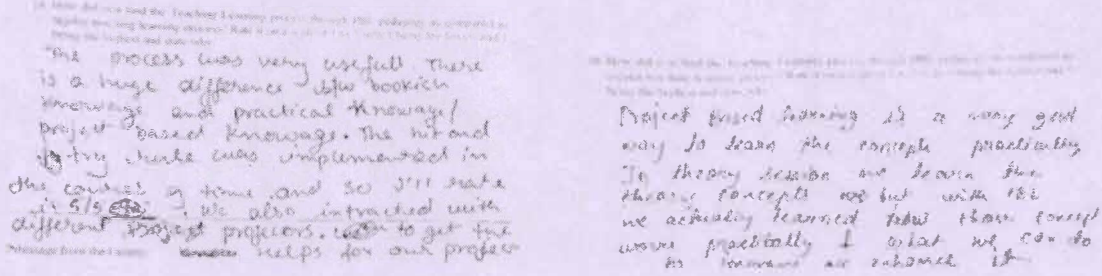


*Figure 7: Screenshot of the google classroom posts for the software links*

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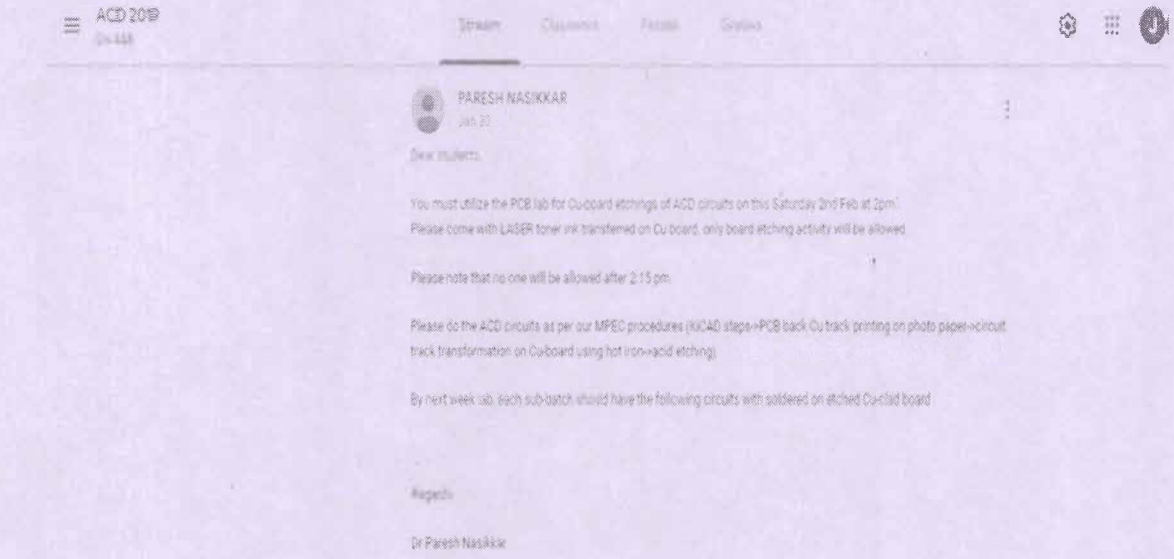


ACD 20

Stream Classwork People Grades

PARESH NASIKKAR

Jan 31

Dear students,

You must utilize the PCB lab for Cu-board etchings of ACD circuits on this Saturday 2nd Feb at 2pm.
Please come with LASER toner ink transferred on Cu board, only board etching activity will be allowed.

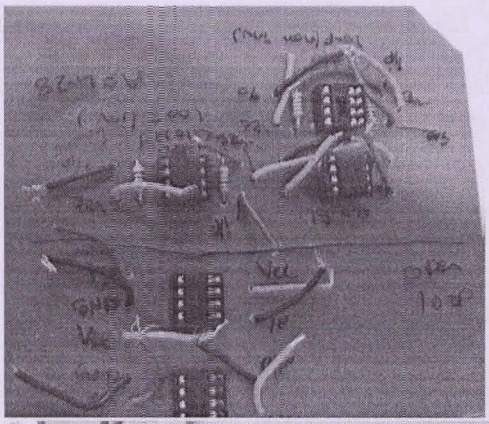
Please note that no one will be allowed after 2:15 pm.

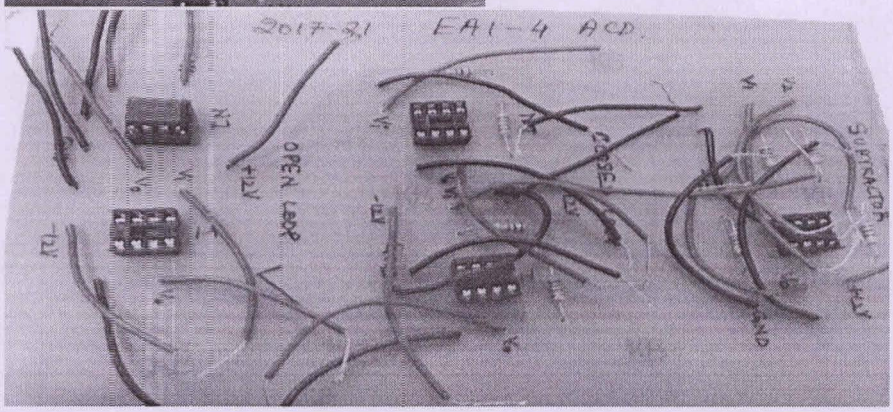
Please do the ACD circuits as per our MPEC procedures (KiCAD steps->PCB back Cu track printing on photo paper->circuit track transformation on Cuboard using hot iron->acid etching).

By next week lab, each sub-batch should have the following circuits with soldered on etched Cu-clad board.

Regards,

Dr Paresh Nasikkar





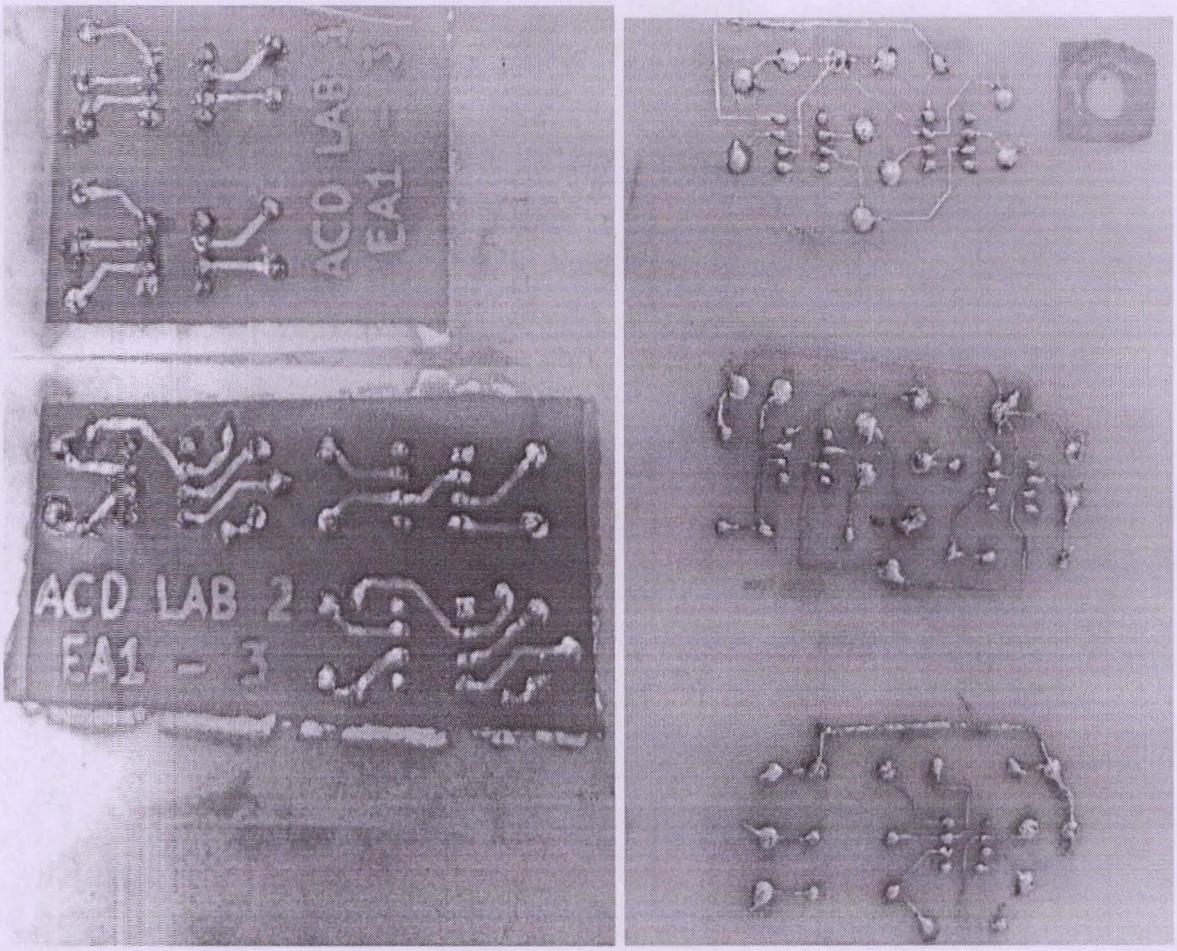



*Figure 8 : Project displays*

Key learnings and take-aways of the session was that students got an exposure to Simulation Software's like LT Spice and KiCad. They could practically design and make a PCB in laboratory using processes like etching and masking while making PCB's in the lab along with circuits building using IC 741 and IC 555.

**Problems Encountered and Resources required:**

The prime requirement of this pedagogy is to have a supporting assessment pattern. This could be starting the course with a diagnostic assessment which shall help to set the bar. There can be formative assessment through the semester, ending with summative assessment. In such a way, the students would be able to focus more on the quality of their project and learn the key concepts while completing the task at hand.

Whilst delivering the entire course using the project-based learning methodology, the most crucial part was to align it with the regular end-semester exams assessment. This was overcome by taking students into confidence and discussing and jotting down the key points that they learnt throughout the process. They were provided with standard notes for reference, thereby enabling them to read different terminologies. It was easier for them to compile the information, since they had experienced it through their project.

**Notes**

Notes for each of the activities

**Dossier 1:**

Students were asked to submit a report of their work after completion of the activity. For enhancing their report writing skills, they were not forced for immediate submission by the provision of an indulgent deadline. This way, they brainstormed and submitted a rather well drafted report. The final successful outcome in the activities was not expected from the students; however, their thought process and involvement were judged.

**Dossier 2:**

Students were inspired to take up projects of innovative nature, in-line with the course outcome. They actively participated in the activities and kept enquiring about their technical concerns at every possible stage. They determinedly worked on their project by learning all the necessary course outcomes while finding their way to the desired solution.

**Dossier 3:**

List of the projects was created and assigned to the students in group of four.

**Author:**

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