TransEd

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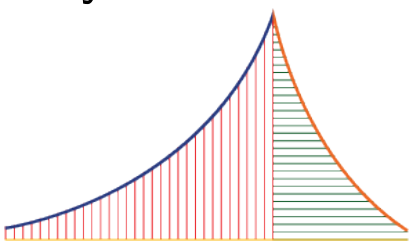
An IIT Hyderabad Company



Dashak: The Decimal Game

- Low cost, one kit per student.
- Programmable using an android phone.
- Covers entire digital electronics curriculum at the college level.
- Consumables fixed, controller varies.
- Can introduce electronics right from primary school!
- 2500 teachers (including arts, english) from nearly 100 schools and colleges across the country have used this kit as part of PMMMNMTT, Ministry of Education, Govt of India.

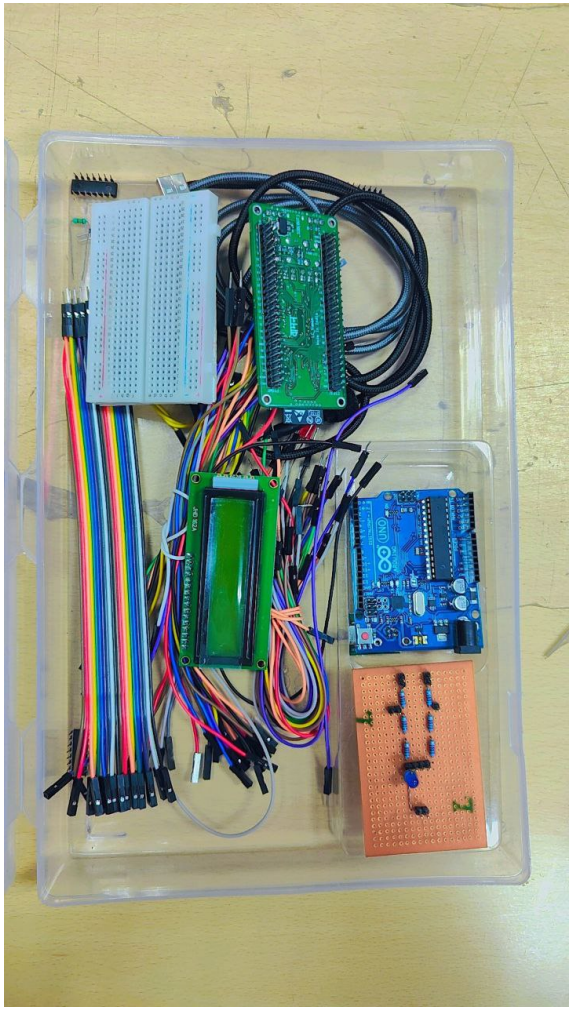


Figure: Dashak

Cost Comparison

Course	Existing		Proposed	
	Item	**Cost**	**Item**	**Cost**
	Laptop	40000	Decimal Game	1000
Digital logic Design Laboratory	IC Trainer Kit 1	3000	Arduino	500
Linear and Digital IC Applications Laboratory	IC Trainer Kit 2	6500		
Microcontrollers Laboratory	8051 lab trainer kit	9500	STM32	500
	LPC1768 ARM Cortex M3 Development Board-Trainer Kit	12000		
IoT Architectures and Protocols Laboratory	IoT Training Kit	8000	ESP32	500
VLSI Design Laboratory	FPGA Training kit	13000	Vaman	5000
Total cost		**92000**		**7500**

Course details from JNTU R22, B.Tech ECE (Representative of lab curriculum in India). Equipment cost from online sources.

Courses

Table: Module 1

S NO	Module Name	Content	Credits	Weeks	Theory/Lab	Platform
1	Installation	Termux, LaTeX, Python Installation	0.5	1	Lab	Android
2	Documentation	Latex Exercises using Neovim	0.5		Lab	Android
3	Digital Design	Combinational and Sequential Logic using the Arduino Framework	2	1	Lab	Arduino board
4	Applied Logic	Porting digital logic to the arduino using Platformio	2	1	Lab	Arduino board
5	Assembly Programming	Introduction to AVR-Assembly, ATMEGA328P peripheral programming, Timers, Memory Management	2	1	Lab	Arduino board
6	Embedded C Programming	Introduction to AVR-GCC	1	1	Lab	Arduino board
7	Internet of Things	Establishing a wireless sensor network using the Vaman-ESP	1	1	Lab	Vaman Board
8	ARM Programming	Simple hardware interfacing using the Vaman-Cortex-M4	2	1	Lab	Vaman Board
9	Verilog Programming	Digital Design using the Vaman-EOS-S3 FPGA	2	1	Lab	Vaman Board
	Total		**13**	**8**		

Courses

Table: Module 2

S NO	Module Name	Content	Credits	Duration (in weeks)	Platform	Theory/Lab
1	Python Programming	Numpy for vector/matrix operations	2	1	Termux	Theory+Lab
2	C Programming	Using pointer arrays for vector/matrix operations	2	1	Termux	Lab
3	Data Structures	Pointers and lists for vector/matrix operations	4	2	Termux	Lab
4	Math Computing on hardware	Inter chip communication on the Vaman board for vector/matrix operations	4	4	Vaman	Lab
	Total		**12**	**8**		

Books:POMPSC

POMPS comprises the mathematical fundamentals of AI (in fact, all engineering), while C is now an integral component of all engineering systems (Industrial AI). All the following books are based on high school mathematics.

- P(*Python*):Matrices in Geometry
- O:*Optimization* in School Mathematics
- M:*Matrices* in Geometry
- P(*Probability*):Random Variables through Simulations
- S:*Signal Processing* in High School
- C(*Circuits*):Digital Design through Arduino

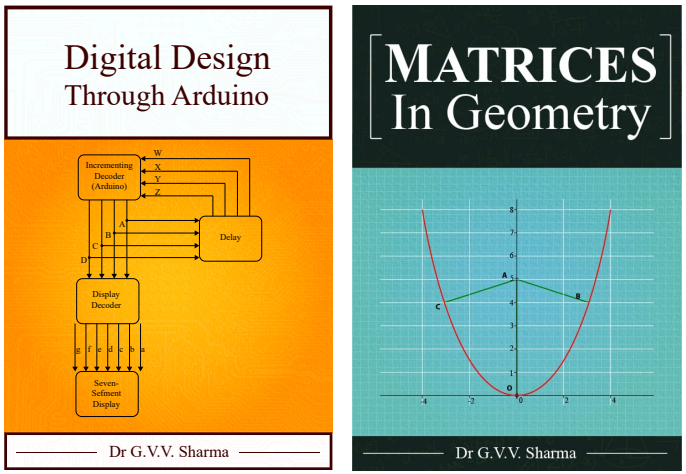


Figure: POMPSC

Future Wireless Communications Certificate Program

- Based on POMPSC.
- Training manpower for the 5G/6G project at IITH, spearheaded by WiSiG.
- Hardware support by Optimus Logic.
- Revenue: ₹1 crore plus from Aug 2022 - Aug 2024
- Duration: 2 months
- 250 participants so far, 50 absorbed in the project
- Can be scaled to 500 students.
- Useful for Semiconductor as well as Telecom industry.

Partners

Academic (Input)

- IIT Hyderabad
- IIIT Bangalore

Industry (Output)

- WiSiG, Hyderabad
- Optimus Logic, Bangalore

Problem

Colleges

- Poor quality, outdated equipments
- Limited resources, exorbitant costs
- Students share resources, poor learning outcomes.

Schools

- Poor adoption of electronics. Tech limited to IT.
- Only elite schools can afford laptops. Budget schools fall behind in pedagogy.
- Lack of competent IT teachers even in elite schools.
- Zero coding culture.

Industry

- Chatgpt will replace testers and low level coders. Semiconductor?
- Can chatgpt test real hardware? Simulations don't count in electronics and robotics.
- Ok, software is automated. What about machines?
- Reskilling? What is that?

Transactional Education: All engineering is practice

- Based on the fractal academic program at IITH
- Designed by Prof. U B Desai, Prof. Sumohana Chennappayya and Dr. G V V Sharma.
- Completely hands on. Allows faster delivery of content.
- TransEd can reduce learning time by 50%

Team

G V V Sharma

Faculty in the EE Dept at IITH

22 years experience in teaching and research.

Currently running the FWC certificiate program at IITH.

Leading the SatCom 6G team at IITH.