



Electronica 19 of Electronics & Telecommunication Department

Date: 15/08/19

Vision

- To serve basic needs of rural society by imparting technical education training to electronics and communication engineering students.



HOD Desk



Mission

- M1- To provide excellent teaching and lifelong learning environment.
- M2- to contribute in the ethical, social and economic development of society by imparting updated technical education.
- M3- to develop institute industry interaction to produce competent professionals and promising entrepreneurs in the field of electronics and telecommunication

THE ELECTRONICS AND TELECOMMUNICATION DEPARTMENT NEWSLETTER IS A PLATFORM FOR SHARING EDUCATIONAL INFORMATION, ACTIVITIES AND RELATED EVENTS. I HOPE THAT THE NEWSLETTER WILL PROVIDE USEFUL AND RELEVANT INFORMATION. IT IS THE INTENT OF THE DEPARTMENT TO MAKE IT SEMI-ANNUAL PUBLICATION TO KEEP IN TOUCH WITH THE DEPARTMENTAL ACTIVITIES AND ACHIEVEMENTS.



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Departmental Laboratories Department is having well equipped laboratories to have hands on practices of students.



Student Performance

**1. BHAKARE SWATI
RAMCHANDRA=94.59**

**2. KALE ABHISHEK
SHAM=94.47**

**3. KATHARE RAJNANDINI
RAHUL=93.18**

Student Activities

**1. Visit under
Environmental studies**





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Student Activities 2. Visit to PLGP Iatur for competition



4. Swacchata Abhiyan



3. Project Competition Participation





Technical Articles

1. The shining future of India's PCBA industry

By: Nikhil Waghmare



The Shining Future of India's PCBA Industry

India has the potential to become a \$100-billion global manufacturing and export hub for printed circuit board assembly (PCBA) alongside mobile phone manufacturing by 2025-26.

India has witnessed unprecedented growth in electronics manufacturing in the past few years due to a number of strong policy initiatives by the Government of India. The flagship program of "Make in India" coupled with "Responsible Growth" is expected to further accelerate the industry. Building Printed Circuit Board Assembly (PCBA) manufacturing capabilities will be the key to India's position as a leading electronics manufacturing hub for the world. PCBAs in a Printed Circuit Board (PCB) with all components mounted and soldered must have the functionality of one designed

for. All electronic devices derive their functionality and intelligence from the PCBAs. Investing in PCBAs is not only critical for maintaining strong manufacturing capabilities but also fundamental to India's focus on reducing its trade deficit and dependence on China. As per report, India has the potential to become a \$100 billion global manufacturing and export hub for printed circuit board assembly (PCBA) manufacturing by 2025-26. The low key electronic products segment that are expected to witness growing consumer adoption in the forthcoming

years are mobile phones, tablets, notebooks and desktop computers. Smart TVs, audio devices, video and music streaming devices and consumer appliances (washing machines, refrigerators, AC and fans) are expected to reach a \$27.1 billion share in the E&T electronic global electronics market by 2025-26, the report said. The prospect of becoming the global electronics manufacturing hub cannot be realized unless the government provides support to mitigate the challenges faced by the PCBAs industry. It support of 5 per cent on exports of PCBAs can be provided, by 2025-26, etc.

2. Cybersecurity By: Abhijeet Kale

Cybersecurity in the context of the Semiconductor Industry

Due to its pervasive nature and relatively weak security, IoT devices present an extremely valuable target for the attackers, and hence there is a strong need to protect these devices.

We have witnessed over one trillion semiconductors' sales for the first time [1] in the last decade. The semiconductor industry has also seen the growth of customized application specific integrated circuits (ASICs) & field programmable gate arrays (FPGAs). Internet of Things (IoT) is one of the important contributors to this growth, where the forecast [2] is of having 41.6 billion connected devices generating 79.4 zettabytes (ZB) of data in 2025. The nature and

relatively weak security, IoT devices present an extremely valuable target for the attackers, and hence there is a strong need to protect these devices. Contrary to popular belief that cybersecurity refers to software security only, to design an overall secure system, software security alone is not sufficient. There are many aspects of security that need to be enforced at the hardware level. In a secure design, each module involved must be secured, but it cannot be done in isolation. There is a need for a trusted security handshake between different modules. Insecure

internal interfaces could lead to system-level exploits such as Bleeding Bit [3], where malicious advertising packets (BLE broadcast messages) overflow the firmware stack, allowing an attacker to gain control of the chip. As segments like automobile, medical and infrastructure start using IoT more and more, security breaches could have serious consequences, such as heavy financial damage, loss of human life, and even threat to national security.



Technical Articles

3. Smart DACs

By: Swati Bhakare

Demystifying Medical Alarm Designs With Smart DACs

Medical alarm designs require expertise in hardware, software, acoustics and in-depth understanding of the regulatory requirements. The DAC53701 smart DAC provides a simple way to implement the alarm with configurable in-built waveforms triggered by a GPI.

Medical alarms are a critical part of most medical devices used in intensive care units (ICU), such as multiparameter patient monitors, neonatal warmers and incubators, anesthesia delivery systems, dialysis machines, infusion pumps, ventilators, and surgical equipment. A patient's health and wellbeing often depend on the proper functionality of medical devices and medical alarms play an important role in alerting the

caregiver when a failure event occurs. All medical devices need single-fault protection. A single-fault condition in medical equipment refers to the presence of a single independent abnormal condition. During a single-fault condition, a medical device must provide basic safety from physical hazards and minimum functionality, known as essential performance. While basic safety is usually obtained through isolation and leakage control, the alarm function is a key contributor to the essential

performance for most therapeutic and all critical-care medical devices. The DAC53701 smart DAC provides integrated medical alarm functions compatible with the IEC 60601-1-8 standard, such as different alarm priorities, pulse frequency, and burst patterns with configurable timings, thus simplifying the design and shortening the development time.

4. PGIA

By: Chendke Rinkal

A New Variation of the Classic Instrumentation Amplifier (PGIA) Offers More Design Flexibility

As useful and versatile as instrumentation amplifiers (IAs) are when it comes to interfacing to a transducer, there are constraints that hamper the design of variable gain IAs or programmable gain instrumentation amplifiers (PGIAs), also referred to as software programmable gain amplifiers (SPGAs) in some literature. The need for such PGIAs arises because of the often-encountered case of adapting the circuit to a wide range of sensors or environmental conditions.

With a fixed gain, the system designer may have to contend with suboptimal SNR, which could compromise precision. Many of the techniques that are useful in creating an accurate and stable PGIA are discussed in my

article, "Programmable Gain Instrumentation Amplifiers: Finding One that Works for You," which points out the possible pitfalls of such a design and presents a comprehensive survey of available solutions and techniques. In this article, I will present another tool and methodology to facilitate such

work and I will go through the design steps that allow one to quickly home-in on the external component values needed to create a precise PGIA using a newly released instrumentation amplifier.