EAST POINT COLLEGE OF ENGINEERING & TECHNOLOGY
DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING

A Report on ONE-Day Workshop on "Demonstration on Analog System Lab KIT PRO" organized by Department of Electronics & Communication Engineering, East Point College of Engineering College & Technology, Bengaluru-560049, Karnataka (08-01-2021) in association with EdGate Technologies Pvt Ltd, Bengaluru, a Part of Texas Instruments.

With an objective to acquaint the students with knowledge of Hands on Session on Analog System Lab Kit, which the topic that have not included in the present curriculum, Electronics & Communication Engineering, Department of East Point College of Engineering & Technology, Bengaluru, Karnataka jointly organized a ONE day short term course (workshop) for UG students and for the Staff in the departmental seminar hall of, EPCET on 8th Jan 2021, in Coloration with Edgate Technologies, which is a part Texas Instruments.

The program was inaugurated by Dr. YOGESH G S, HOD, ECE along with an inaugural speech highlighting the importance of these topics for the students and staff. And also gave the importance on regaining the knowledge basics on analog circuits with discrete components towards the PCB board design, for sharing quality technical knowledge and taught the students how the same can be done using the kits.

The resource person Mr. Javad Baig D, Embedded Application Engineer, EdGate Technologies Pvt Ltd, Bengaluru, has first briefed about the "Analog System Design using Texas Instruments Analog System Lab Kit" (ASLK)

ASLK has been developed at Texas Instruments India. This kit is designed for undergraduate engineering students to perform analog lab experiments. The main idea behind ASLK is to provide a cost efficient platform or test bed for students to realize almost any Analog System using general purpose ICs such as OP-Amps and analog multipliers. ASLK comes with three general-purpose operational amplifiers (TL082) and three wide-bandwidth precision analog multipliers (MPY634) from Texas Instruments. We have also included two 12-bit parallel-input multiplying digital-to-analog converters DAC7821, a wide-input. A portion of ASLK is left for general-purpose prototyping which can be used for carrying out mini projects.

The overall session was very impressive in sharing the knowledge regards to analog system design.

1. Learnt about the characteristics and specification of analog ICs used in electronic systems.
2. Learnt how to develop a macro model for an IC based on its terminal characteristics, I/O characteristics, DC-transfer characteristics, frequency response, stability characteristic and sensitivity characteristic.
3. Will be able to make the right choice for an IC for a given application.
4. Will be able to perform basic fault diagnosis of an electronic system.

Details of Workshop session included 14 step-by-step lab exercises

- ➢ Negative Feedback amplifiers
- ➢ Instrumentation amplifier
- ➢ Regenerative feedback system, astable and monostable multivibrator
- ➢ Integrator and differentiator circuits
- ➢ Analog filters
- ➢ Self-Tuned filter
- ➢ Function generator and Voltage-controlled oscillator/FM generator
- ➢ Phase Locked Loop(PLL)
- ➢ Automatic gain control (AGC), Automatic volume control (AVC).
- ➢ DC-DC converter
- ➢ Low dropout (LDO) regulator
- ➢ LDO integrated circuit
- ➢ Digitally-controlled gain stage amplifier
- ➢ Digitally programmable square and triangular wave generator/oscillator.

The session consists of two categories:

Part I – Learning the Basics

Students are exposed to the operation of the basic building blocks of analog systems. Using the general purpose amplifiers and the precision analog multiplier, the student will build gain stages, buffers, instrumentation amplifiers and voltage regulators. These experiments bring several important issues, such as measurement of gain-bandwidth product, slew-rate and saturation limits of operational amplifiers.

Part II – Building Analog Systems

Students are focused on learning about analog systems. Integrators and differentiators are introduced, which are essential for implementing filters that can band-limit a signal prior to the sampling process to avoid aliasing errors.

The event was a successful one. The workshop was relevant to the title and were well-appreciated by the students. After completion of this workshop students have felt encouraged to explore these areas further.