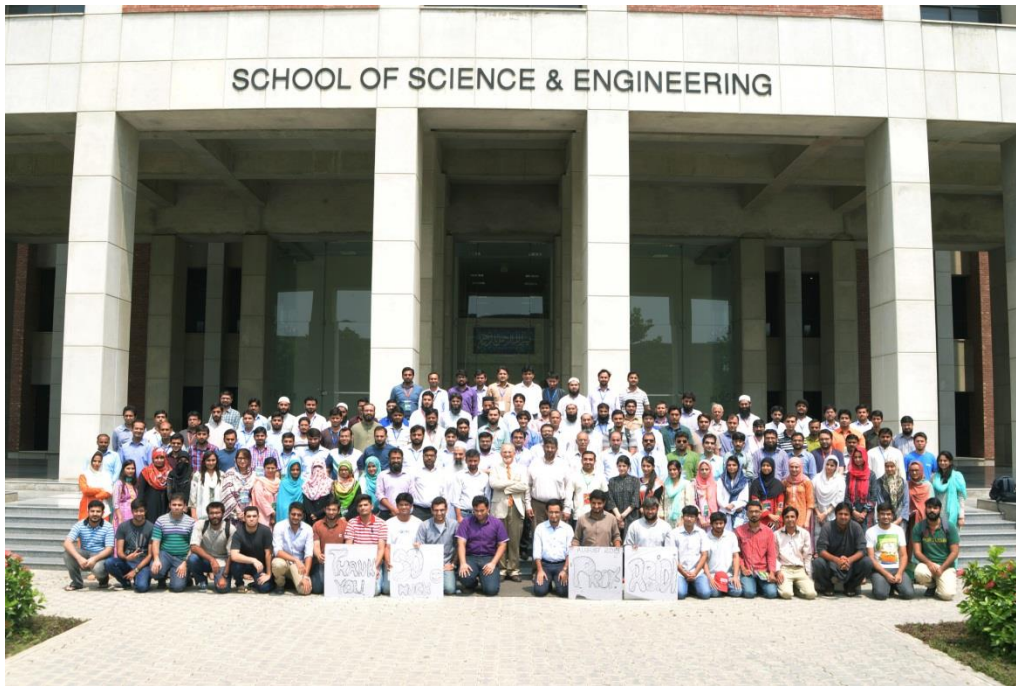


# Teaching the Teachers Workshop VI (Feedback Control Systems)

**August 24-28, 2015**



Organized by:

**Department of Electrical Engineering, LUMS**

Sponsored by:

**Higher Education Commission of Pakistan  
IEEE Control Systems Society**

Lead Instructors

**Professor Dr. Asad Ali Bidi**

Distinguished Chancellor Professor, University of California Los Angeles

**Dr. Abubakr Muhammad**

Associate Professor, SBASEE, LUMS

## **Objective of the Workshop:**

Teaching the Teachers Workshop is a concepts workshop, which is organized every year at LUMS. These workshops are led by Professor Asad A. Abidi, Distinguished Chancellor's Professor at the Electrical Engineering Department, University of California, Los Angeles, USA. Since 2010, five workshops (Basic Circuit Theory in 2010, Analog Electronic Circuits & Semiconductor Devices in 2011, Electronic Circuits for Instrumentation & Measurement in 2012, Fundamentals of Power Electronic Converters in 2013, and Magnetic Circuits for RF in 2014) have been organized. The workshops are unparalleled events, where university instructors in EE and industry practitioners are given intensive training on a semester long undergraduate course on a foundational topic of EE. These workshops have attracted a large number of audience/participants from various academic institutions and practicing engineers from the industry.

## **Teaching the Teachers workshop VI (Feedback Control Systems)**

This year, the sixth workshop of "Teaching the Teachers" Workshop series was organized on "Feed Back and Control Systems" from Aug 24 to Aug 28, 2015. To revisit the concepts, to be extensively used in the next four days of the workshop, a concepts refresher session, led by Dr. Tariq Jadoon (Associate Professor, LUMS) on August 24, 2015, was also held.

This year's workshop focused on (a) developing a solid foundation and connection between circuits & systems and feedback control and (b) introducing the audience to motivational examples of control systems from the areas of agriculture and irrigation (instead of conventional examples from aerospace industry, automotive and industrial manufacturing). After the refresher session, Professor Abidi conducted 4 sessions (7 hours of teaching) per day, with breaks for refreshment and lunch, focusing on the feedback concepts from a circuit designer's perspective and Dr. Muhammad delivered 5 lectures on control engineering for water and agriculture. To consolidate concepts, covered during the teaching sessions, participants were also given an opportunity to carry out discussions in small groups on the topics covered during the day. On the last day of the workshop, a working demonstration of feedback control in amplifiers by National Instruments was also presented.

## **Workshop Topics**

The topics covered in the workshop include:

- Linear Feedback Amplifiers
- Stability
- Nyquist Theorem
- Dual circuit Feedback
- Phase Domain and Mixed Domain Feedback
- Phase locked loop
- Loop Gain
- Multiple Feedback Loops

## **Participants**

The workshop was attended by 171 participants (157 formally registered) out of which 98 were external participants, which is a record high over the last six years; it includes 90 faculty members, including Heads of Departments, Associate Professors, Assistant Professors and Lecturers from NUST, UET Lahore, UET Taxila, IIU, Bahria University, Air University, FAST-NU, COMSATS, PAF-KIET, BUIITEMS, and other national institutes. Keen interest from industry was also observed with 8 members attending all 5 days of the workshop. These participants were affiliated with major organizations such as SUPARCO, Askari Cement, KRL and some leading government research organizations. In addition to participants from academia and industry, this workshop was also attended by 59 LUMS SBASSE students and 14 LUMS EE Faculty members.

## **Closing Ceremony**

The closing ceremony of the workshop was held on August 28<sup>th</sup>, 2015 at SBASSE auditorium 10-301. Guests of honor were Prof. Asad A. Abidi, Dr. Sohail Naqvi (VC LUMS), and Dr. Shahid Masud (Chair EE). Prof Naqvi presented a shield to Prof. Asad A. Abidi in the honor of his immense contribution towards the uplift of Electrical Engineering Education in Pakistan. Certificates of Participation were also awarded to the workshop participants by Dr. Shahid Masud.

## **Outcome of the Workshop:**

These workshops are career transforming events. A rise in the number of Pakistani EE students pursuing graduate studies in the areas of circuits and systems, power electronics and microelectronics is the manifestation of the positive effect, these workshops have created. Through these workshops, Professor Abidi, has trained a generation of EE instructors with a passion to inspire students. Moreover, to spread the knowledge further, similar workshops have also been organized by the attendees of these workshops at other academic institutions. Last but not the least, these workshops have acted as an enabler in establishing a strong research base in Pakistan in the area of circuits and systems.