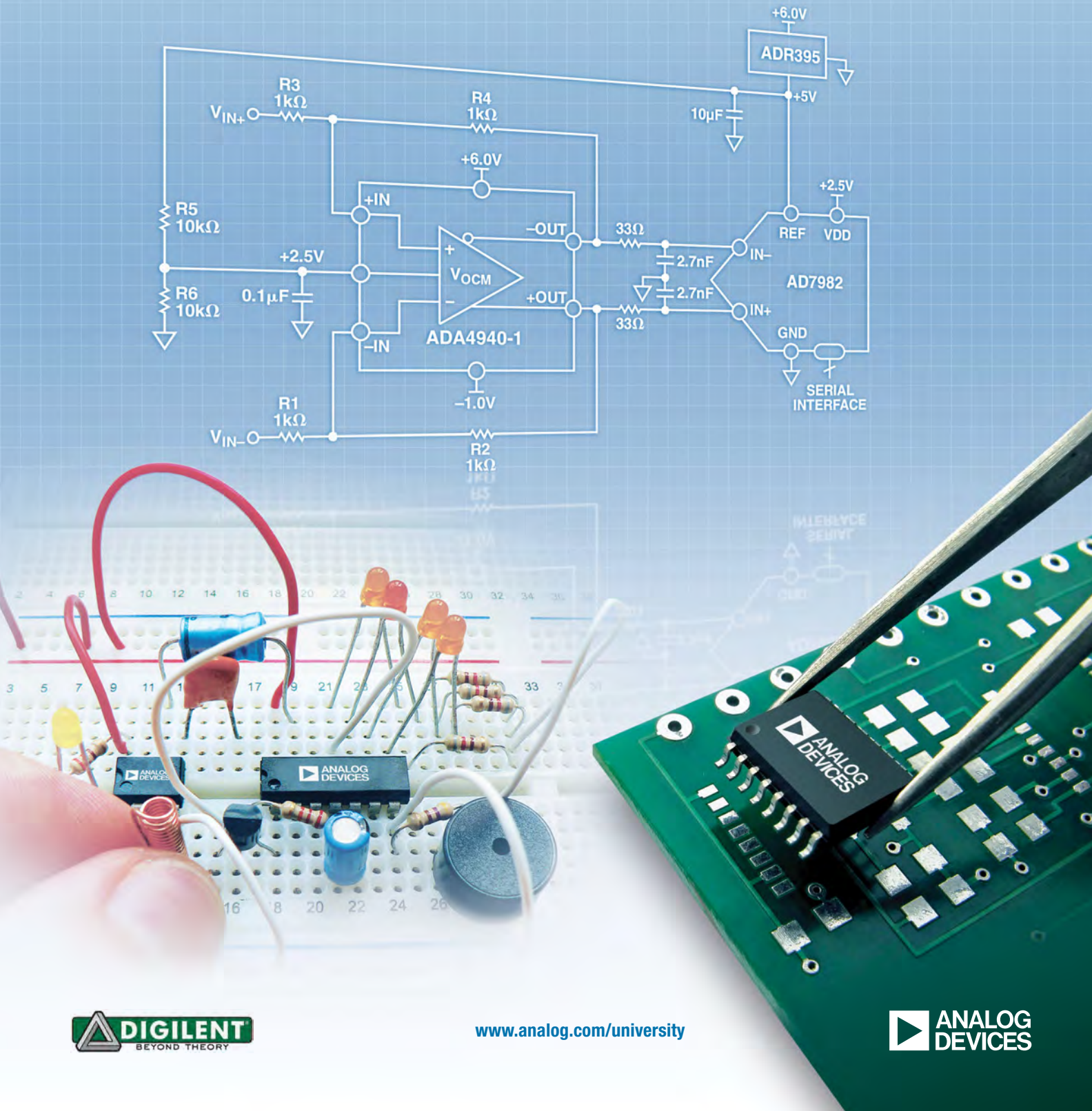
Revolutionizing How Engineering Students Learn Analog Circuit Design

Analog Devices University Program



DIGILENT BEYOND THEORY

www.analog.com/university

ANALOG DEVICES

Analog Devices University Program Overview

The Analog Devices University Program was created with Digilent and leading educational institutions from around the world to create, refine, and deploy a new way of learning to the next generation of analog circuit design engineers. The days of antiquated teaching protocols and hard to find lab time is quickly coming to an end, making way for more flexible and hands-on design techniques that give both professors and students the freedom and creativity to expand the scope of the course materials and explore real-time design scenarios that were not previously possible in a classroom.

By implementing this new "active learning" approach to analog circuit design, engineering students are able to work wherever and whenever they want using their low cost and portable analog hardware development platforms and supporting components. Allowing students to log real-world engineering design experience outside the typical lab and classroom setting, this unique learning experience better prepares young engineers for the type of design challenges they will face once they graduate and pursue their professional careers. It has been shown that students who participate in active learning designed curriculums achieve higher grades, retain more information, and simply enjoy the experience more.

Analog Devices University Program Benefits

Low Cost of Participation

For less than the cost of a textbook ($99 to $199) students can discover and explore the real-world design challenges of analog circuit design with their own hardware development platform.

Independent Learning

Students are encouraged to work independently or within groups outside the classroom setting to facilitate quicker adoption of course materials through self-teaching and personal exploration and experience.

Less Dependence on Limited University Resources

Forget the days of those hard to find open lab slots and limited access to expensive oscilloscopes, arbitrary waveform generators, power supplies, logic analyzers, pattern generators, etc. These new hardware development platforms enable students to perform lab quality experiments virtually anywhere and at any time.

Design Resources for Students

Since this program is supported by leading technology and education companies, a wealth of design and educational help is available online. These resources include open-source technical support documentation, exercises, lab projects, and instructional videos.

Course Materials for Educators

Unlike traditional textbooks, these learning tools are easily upgradeable as the technology evolves. Professors and students alike can simply download the latest tools and be up and running in no time. Since the teaching materials are updated continuously, educators can be assured that the information they are using is the most current.

Listen to What the Experts Have to Say …

"Active learning—learning by doing—helps engineering students to understand the process of breaking down larger problems into smaller, more easily solved parts without losing the overall understanding of the complete system. The two new analog design kits from Digilent and Analog Devices set up quickly and generate lots of data, making any desktop a 24×7 design studio for engineering students. I believe that students who own design kits and build circuits frequently learn better, retain more, and enjoy the experience."

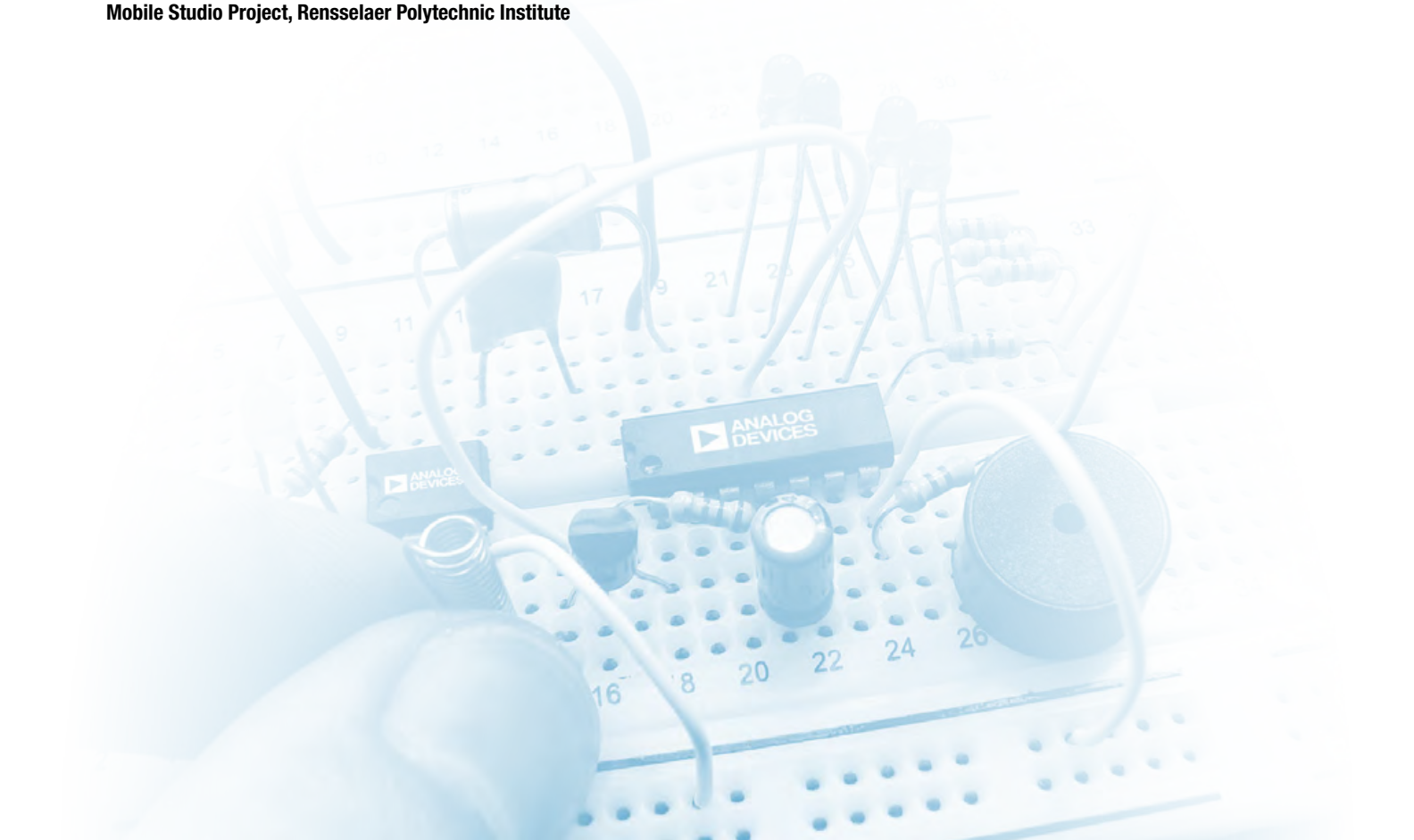
John Robertson, professor, Department of Engineering Technology, College of Technology and Innovation, Arizona State University

"I like the flexibility of the Analog Devices and Digilent design kits. I don't need to maintain and staff the traditional large lab for my engineering students. Instead, students complete experiments after class where and when they want with the analog design kit they purchased at the beginning of the semester. We provide help in the traditional way, as well as online help videos that give students assistance when they need it—no matter what time of day or night."

Kathleen Meehan, associate professor, Electrical and Computer Engineering, Virginia Polytechnic Institute and State University

"If I get an idea at home for my electronics instrumentation class, I plug in my Mobile Studio I/O board to my laptop and build a circuit activity, record a lecture, and I'm done. I don't have to wait until I get to school. The students can carry out their experiments anywhere; I can do my work anywhere. We call this hands-on approach to teaching the Mobile Studio Pedagogy. With the introduction of the Analog Discovery/Explorer boards, it is possible for every engineering student to have their own personal mobile electronics lab. The Analog Devices based design platforms provide lab-like functionality and cost between $99 to $199, making them affordable for every student. This method of teaching is much closer to the way engineers do their jobs and gives students a better understanding of the entire design process as compared to a traditional classroom setting. This is the direction engineering education is going."

Kenneth Connor, professor, Department of Electrical, Computer, and Systems Engineering, Director of the Mobile Studio Project, Rensselaer Polytechnic Institute



Hardware Development Platforms

Analog Discovery Design Kit

Entry level student learning platform (student pricing from $99)

Analog Inputs

- AD9648 dual, 14-bit, 105 MSPS, 1.8 V dual analog-to-digital converter
- 2-channel differential (1 MΩ, 24 pF), ±20 V max
- 250 μV to 5 V/division with variable gain settings
- 50 MSPS, 5 MHz bandwidth, up to 16k points/channel record length

Analog Outputs

- AD9717 dual, 14-bit, 125 MSPS, low power digital-to-analog converter
- 2-channel, single-ended, arbitrary waves up to ±4 V
- 50 MSPS, 5 MHz bandwidth, up to 16k samples/channel
- Standard and user-defined waveforms
- Sweeps, envelopes, AM and FM modulation

Power Supplies

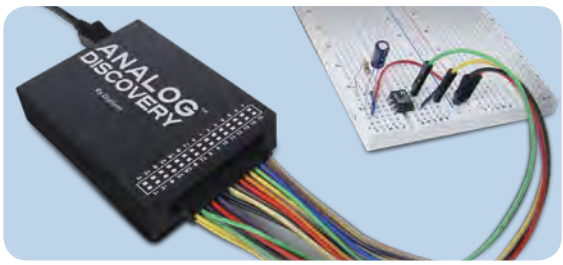
- 2 fixed +4.5 V (+50 mA) and –4.5 V (+50 mA)

Digital I/O

- 16 signals shared between logic analyzer, pattern generator, and discrete I/O devices
- 100 MSPS, buffer size is 4k transitions per pin
- Crosstriggering with scope channels

Software

- Waveforms™ software: full-featured GUI for all instruments
- Virtual Instrument Software Architecture (VISA) compatible
- Windows® XP® or newer
- Linux® and OS X® versions soon



Kit Includes

- Analog Discovery module
- USB cable
- Probes

Optional Accessories

- Analog parts kit
- Pmods™
- Solderless breadboard
- Digital multimeter

Analog Explorer Kit

Complete, all-in-one hardware platform (student pricing from $199)

Analog Inputs

- AD9648 dual, 14-bit, 125 MSPS, 1.8 V dual analog-to-digital converter
- 4-channel, single-ended (1 MΩ, 15 pF) ±20 V max
- 250 μV to 5 V/division with variable gain settings
- 20 MHz bandwidth, up to 16k points/channel record length

Analog Outputs

- AD9717 dual, 14-bit, 125 MSPS, low power digital-to-analog converter
- 2-channel, single-ended, arbitrary waves up to ±10 V
- 20 MHz analog bandwidth, up to 16k samples/channel
- Standard and user-defined waveforms
- Sweeps, envelopes, AM and FM modulation

Power Supplies

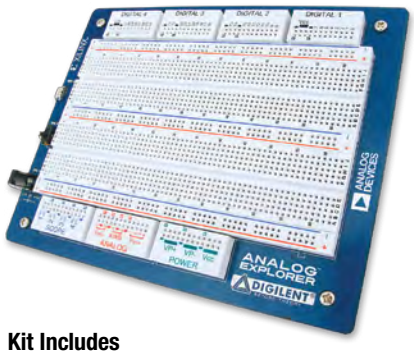
- Triple output (two adjustable, one selectable)
- Programmable supply, up to ±12 V, ±1.5 A, full voltage and current control
- Fixed 3.3 V or 5.0 V (±1.5 A)

Digital I/O

- 16 signals shared between logic analyzer, pattern generator, and discrete I/O devices
- 100 MSPS, buffer size is 4k transitions per pin
- Crosstriggering with scope channels

Software

- Waveforms software: full-featured GUI for all instruments
- Virtual Instrument Software Architecture (VISA) compatible
- Windows XP or newer
- Linux and OS X versions soon



Kit Includes

- Analog Explorer board (with integrated solderless breadboard)
- USB cable
- 12 V dc external power supply

Optional Accessories

- Analog parts kit
- Pmods
- Digital multimeter

Who We Are …

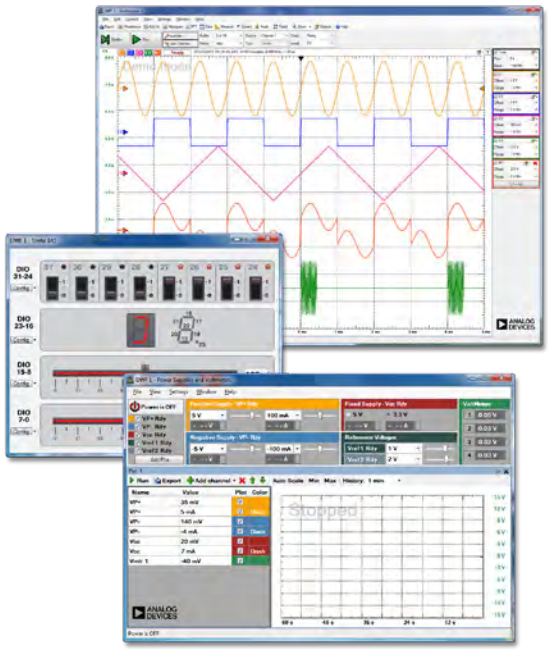
Analog Devices, Inc.

Innovation, performance, and excellence are the cultural pillars on which Analog Devices has built one of the longest standing, highest growth companies within the technology sector. Acknowledged industry-wide as the world leader in data conversion and signal conditioning technologies, Analog Devices is as passionate about educating our next generation of young circuit design engineers as it is about pioneering the next technological breakthrough. Analog Devices serves over 60,000 customers, representing virtually all types of electronic equipment and maintains a network of design centers and manufacturing facilities worldwide. For more information, go to *www.analog.com*.

Digilent Inc.

Digilent Inc. is a leading electrical engineering products company serving students, universities, and OEMs worldwide with technology-based educational design tools. Based in Pullman, Washington, USA, Digilent designs, manufactures, and distributes its electronic design tools on a worldwide basis. Since its founding in 2000, Digilent products can now be found in over 1500 universities in more than 70 countries throughout the world. As a multinational company with offices in the US, Taiwan, China, and Romania, Digilent is able to provide low-cost, expert quality solutions for a variety of customer needs. In addition to its own products, Digilent has OEM design and manufacturing services for leading technology companies, including Xilinx, Analog Devices, and others. *www.digilentinc.com/analog*

Online Design Tools for Students



Free, Full-Featured Software for Analog Discovery and Analog Explorer

- Real-time FFT, real-time X-Y plots, complex math functions, and dozens of measurements available on all scope channels
- AWG includes swept inputs with envelopes, AM/FM modulation, and many other advanced features
- All signals are ESD and short-circuit protected—any signal or supply can be connected to any other signal or supply without any damage
- Real-time Bode plot function, links to PC audio system, instrument cross-triggering, data set import and export, and multiple output formats for reports
- Instrument configurations can be saved and restored—great for setting up labs

Online Course Materials for Educators

Circuits I/II and Electronics I/II

- Online texts and tutorials created and reviewed by senior engineering staff members at Analog Devices and Digilent to ensure the most current and highest quality educational materials possible
- Hundreds of exercises (homework problems)
- Approximately 30 design projects suitable for university-level courses
- Complete video lecture series, plus other targeted videos in support of design projects and special topics
- Complete Microsoft PowerPoint® lecture notes to accompany text materials
- Guidance documents for instructors

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