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NI myDAQ Circuits Curriculum Resources

Overview

NI myDAQ and NI Multisim are an ideal addition to a circuit theory course allowing students to quickly move from paper and pencil problems, to software simulation, and hardware prototyping outside the classroom and lab.

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Introductory Circuits

NI myDAQ is equipped with 8 plug and play instruments making it ideal for reinforcing introductory circuits concepts. The following resources may be referenced as a starting point for your course. They include both NI myDAQ tailored materials as well as a collection most frequently referenced circuits and NI Multisim based documents.

Texas Instruments

Texas Instrument Circuit Experiments for NI myDAQ Home

This supplement to the myDAQ tool was created in an effort to introduce you to some electronics theory and circuits as well as provide a practical method of getting to know the capabilities of the myDAQ tool. In this kit you will find all you need to study, build, and test some preselected circuits that typify some of the basic elements of electronics used in many applications from cell phones to MP3 players to automotive control systems.

[Getting started with Texas Instrument Circuit Experiments for NI myDAQ](#)

[Experiment 1: Filters](#)

[Experiment 2: R-2R Resistive DAC](#)

[Experiment 3: Triangle Wave Generator](#)

[Experiment 4: PWM Generator](#)

[Experiment 5: Light Detector Circuit](#)

[Experiment 6: Audio](#)

Texas Instruments Integrated Circuits (ICs) in NI myDAQ

The [hardware system diagram and list of Texas Instruments IC's in the NI myDAQ](#) depict how TI data converters, amplifiers, and interface and power management circuits were used in the design of NI myDAQ.

Electric Circuits Using NI myDAQ by Professor Ed Doering

Designed as a resource for both instructors and students, this collection of examples, exercises, and homework problems provides a solid foundation for any myDAQ based circuits course. Professor Ed Doering from Rose-Hulman Institute of Technology combines a careful balance of theory, simulation, and discovery into more than 60 short screen cast videos that demonstrate how hardware can be used outside the lab to bring circuit theory to life.

[Link to: Electric Circuits using NI myDAQ](#)

NI myDAQ Publications by NTSPress

Now with NI myDAQ you can assign hardware homework consisting of specific circuits, as well as encourage students to independently explore circuits on their own time. Our vision at NTS Press encompasses a full set of curriculum materials making hands-on project-based learning both practicable and affordable. Our long term goal is integrating hardware devices, such as NI myDAQ, with learning materials throughout the curriculum, beginning with introductory courses in the freshman and sophomore years.

- [Barry Paton: Tinker, Learn Labs](#)
- [Bharathwaj Muthuswamy: Chaos from NI myDAQ](#)
- [Ed Doering: NI myDAQ and Multisim Problems for Circuits by Ulaby & Maharbiz](#)

Circuits Mini-Experiments

Example Course Syllabus - This course syllabus combines both a traditional teaching approach with hands-on experimentation. Students complete paper and pencil problems reinforced with short breadboarded hands-on exercises.

1. **Circuits Measurements** - Students learn the fundamentals of measurements and how to use myDAQ instruments.
 - Voltage
 - Current
 - Resistance
2. **Resistor Networks** - Students discover the relationships between resistors wired in series versus parallel.
 - Series
 - Parallel
 - Series & Parallel
3. **Diode Properties and Applications** - Students apply basic diode principals to convert AC to DC voltage.
 - IV Curve
 - Rectifiers
 - Application: Power Supply
4. **Operational Amplifier Circuits** - Students explore the properties of operational amplifiers and their application.
 - Noninverting amplifier
 - Inverting amplifier
 - Integrator circuit
 - Application: Active RC filter

NI Multisim Reference Circuits & Curriculum

Practical Teaching Ideas with NI Multisim by Tracy Shields

Practical Teaching Ideas is a collection of laboratories assignments with build instructions for simulating circuits in NI Multisim and then prototyping them on NI ELVIS. Many of these simple circuits can be adapted for lower frequencies, voltages, and currents for use with NI myDAQ as the instrumentation platform. The labs cover common introductory and advanced concepts in electrical engineering from basic DC circuit analysis using Multimeters, which can be done with NI myDAQ, to sophisticated measurements that require more advanced measurement platforms such as NI ELVIS.

Circuits Resources

- [Introduction to NI myDAQ Instruments](#)
- [Introduction to NI Multisim](#)

Recommended Textbooks

- [Circuits by Fawwaz Ulaby and Michel Maharbiz \(~\\$100 USD\)](#)
- [Basic Engineering Circuit Analysis, J. David Irwin and R. Mark Nelms \(~\\$187 USD\)](#)
- [Electric Circuits, James W. Nilsson and Susan Riedel \(~\\$172 USD\)](#)

Downloads

[diode_experiments.docx](#)

[example_syllabus.docx](#)

[resistor_experiments.docx](#)

[amplifier_experiments.docx](#)

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