# *Dear Industrial & Academic Colleagues and Alumni:* 2006

A number of years ago I had the opportunity to hear Caltech Professor Dr. R. David Middlebrook make a presentation at a Frontiers In Education (FIE) conference which has had a major impact on how I think about and teach electronics analysis and design. He introduced a novel and effective way of thinking about how to formulate circuit analysis so that it could be done more efficiently, more coherently, and more practically so as to make it maximally useful for the purposes of design. Not only did he introduce this new paradigm, which he dubbed "Design-Oriented Analysis", but he also brought with it an impressive set of practical techniques and circuit theorems that served to flesh out his ideas for application to real-world design problems.

Dr. Middlebrook developed his techniques over a period of many years as he taught at Caltech and did consulting work at TRW and other companies. While at Caltech he also developed a globally recognized research center for power electronics. Power electronics publications and textbooks are peppered with numerous references to his work as a recognized expert in the field. For years he taught an intensive three day analog design course for industry. He has done his course at numerous leading technology firms both domestically and internationally.

A common remark from those who took his course was "Why didn't I get taught these things in school?" This proved to be so well received that some started calling his course "Technical Therapy". In fact, in 2004 he created a DVD ROM based on his course that he entitled "Technical Therapy for Analog Circuit Designers". I have been using this tool as an adjunct for my teaching of electronics at Seattle Pacific University for the past two years. Although focused in analog circuits, the broader principles can apply to digital and other areas of engineering as well.

As someone who had worked over a decade in the electronics industry, I immediately recognized the value of his approach and give it my enthusiastic endorsement. Later I was able to attend one of his industrial courses and came away from it convinced that his techniques needed to be brought into the teaching of electronics at the college level, which I have been doing now for over ten years. In the fall of 2004 I wrote a 'book review' on his DVD ROM for *The Interface,* the joint IEEE Education Society/ASEE Electrical and Computer Engineering Newsletter.

Since early 2005, Dr. Middlebrook has resumed his short course for industry under the title "Middlebrook's New Structured Analog Design Course," which includes three significant differences from his earlier version.

First, his recent work on feedback analysis incorporates all nonidealities without any assumptions or approximations, in what he calls "A Final Solution" embedded in a commercial circuit simulator.

Second, he describes how his compendium of techniques is useful not only to analog designers, but also to those who deal with someone else's design, such as application, test, and especially system integration engineers.

Third, he believes that his "Design-Oriented Analysis" approach could be the basis for an improved first-level college course in active circuits, which would empower new graduates to be more productive, more quickly, in their real-world careers.

We are aware of the amount of discussion that is presently going on in higher education about the threats to our technological competitiveness and the need to do a better job at the university level of teaching engineering and retaining engineering students. I believe that Middlebrook's methods of his Design-Oriented Analysis paradigm can make a strong positive impact on engineering education, which will have industrial impact. I submit to you the notion that Dr. Middlebrook's course will better equip you in your engineering career. In fact, as I did, you may find the experience to be intellectually liberating.

I can assure my SPU alums who learned something about Middlebrook's methods in my classes, that there is much more to his course than I could include in my classes and his course will significantly expand your vision of what you learned, and add to your repertoire of useful design analysis techniques.

I highly recommend attending this course.

More information about Dr. Middlebrook, his publications and awards, and his courses can be found elsewhere on this website www.ardem.com. Although most of his current courses are in-house at companies, he occasionally conducts a public course for which he offers a substantial discount for educators and students.

Best regards,

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