

## College helps engineers entering workforce

A **Valparaiso University** engineering professor and his students are helping out young engineers entering the workforce through a collaborative effort with Infineon Technologies AG.

Dr. Mark Budnik, Jenny professor of emerging technology in Valparaiso's College of Engineering, has been working with Infineon since 2004 on its "Bridging Theory into Practice" series of books and online resources.

"The focus of our work is to bridge the gap between what is taught in undergraduate engineering programs and what those new engineers actually do in the workplace," Dr. Budnik said. "There are some areas undergraduate engineering students regularly struggle with when they get into the real world, and this book helps in that transition."

The book provides a practical, step-by-step guide to practical electronics design in power-intensive automotive and industrial applications, and is being used by those with degrees in mechanical, electrical and computer engineering. In addition to the new book, Infineon has made use of the materials developed by Dr. Budnik and his students in the creation of multiple platforms that connect the global engineering community and help engineers throughout the world apply the theory learned in college to the challenges of real-world design through meaningful collaboration

The second edition of Bridging Theory Into Practice: Fundamentals of Power Semiconductors for Automotive Applications was published early this fall. It includes two new chapters, a new appendix and extensive revisions of existing chapters that Dr. Budnik authored with assistance from recent graduate Megan Mallette of Maryville, Tenn., and a number of Infineon engineers.

One of the new chapters and the appendix introduce new engineers to the field of electric motor control. Much of the revised material focuses on improving the performance of automotive and industrial systems. In both areas, Dr. Budnik said, the demand for energy efficient systems is a critical focus for today's engineers.

"Helping young engineers learn some basic concepts that will aid them in the transition from classroom theory to actual design work is very important in reaching this goal of improving efficiency," Dr. Budnik said.

Earlier this year, Valparaiso's College of Engineering received a grant from Infineon to develop material for a new book in the "Bridging Theory Into Practice" series, which is scheduled for release in 2009 or 2010.

Eight of Valparaiso's undergraduate engineering students have been working with Dr. Budnik and Dr. Eric Johnson, Brandt professor of engineering, along with five Infineon engineers to develop four new chapters. Those chapters will focus on voltage regulation and the digitalization of power supplies, wireless communication and the design and manufacturing of sensitive electronic components.

Dr. Budnik said the students, faculty and staff who worked on the project will be acknowledged in the book, an unusual and valuable opportunity for undergraduate students.

"A student who goes into the workforce or applies for graduate school having their work published in a book really shows a high level of understanding," he said. "It demonstrates that they understand a concept so well that they can communicate it clearly and concisely to another engineer."

Dr. Budnik's research focuses on engineering pedagogy, industry and education collaboration and nanotechnology systems. He worked as an application engineer and manager in the electronics industry before joining the faculty of Valparaiso's College of Engineering in 2006.

Infineon, a global company based in Neubiberg, Germany, offers semiconductor and system solutions addressing three central challenges to modern society: energy efficiency, communications and security.

Valparaiso's College of Engineering recently was ranked 27th in the nation in U.S. News' rankings of engineering schools where the highest degree awarded is a bachelor's or master's degree. It offers majors in civil, computer, electrical and mechanical engineering, as well as a humanitarian engineering minor and a master's in engineering management. The college also offers international engineering programs in Germany and France.