



Industry Partnerships Enrich Programs

- **Lawrence Tech partnering with industry leaders**
- **Working engineers share real-world insight**
- **Tools give students hands-on lab experience**

Lawrence Technological University (Southfield, MI) is partnering with industry-leading companies to help define its core curriculum offerings for two graduate academic programs – Master of Science (M.S.) in Automotive Engineering and Master of Science in Mechatronic Systems Engineering, a new degree program established in 2006. These partnerships give students first-hand insight into modern-day solutions that are being embraced by manufacturing industries around the globe. dSPACE Inc. is one of these companies helping to prepare tomorrow’s engineers for today’s challenges.

Lawrence Technological University (Lawrence Tech) is equipping its engineering students with the methodologies, disciplines and tools necessary to succeed in the rapidly evolving field of Automotive Controls and Engineering of Mechatronic Systems for various industries by going straight to the source – the industry leaders who are defining the technologies of the

leaders to leverage real-world insight and guidance for its Master of Science (M.S.) in Mechatronic Systems Engineering and Master of Science in Automotive Engineering graduate programs. In addition to providing advice on current industry trends and needs, the university’s academic partners frequently serve as guest lecturers in the classroom. This provides an ideal opportunity for students to learn about design and manufacturing issues first hand, from experienced engineers working in the field.

“With the involvement of our academic partners, we’re exceeding our own expectations (for these programs),” said Dr. Suresh Bansal, Director of the M.S. Automotive Engineering program and Automotive Engineering Institute at Lawrence Tech. “Partnering with industry leaders brings a whole new element to the learning experience. This is a new concept for American academic institutions and the educational possibilities are invaluable.”



▲ Lawrence Tech professors meet with dSPACE employees to discuss academic partnership opportunities. Pictured left to right are: dSPACE Inc. senior applications engineers Donald Saldano and Shahriar Kamal; Lawrence Tech professor Dr. Suresh Bansal, Lawrence Tech lecturer Dr. Joseph Asik; and dSPACE Inc. technical specialist Bob Gruszczynski.

future. The university (based in Southfield, Michigan, USA) has adopted a novel approach to balancing text book theories with hands-on application experience by partnering with working industry professionals. Lawrence Tech has established academic partnerships with dSPACE, major automotive OEMs and other industry

Four-Wheel Drive Chassis Dynamometer

Outside of the classroom, Lawrence Tech students are exploring innovative automotive engineering solutions through the university’s recently acquired four-wheel drive vehicle chassis dynamometer. The dynamometer is equipped with individual wheel torque electronic controls. This unique feature enables power distribution to be applied independently to each wheel, which in turn makes it possible to incorporate a much broader and diverse range of testing scenarios. The dynamometer has capabilities in such areas as: vehicle traction control; turnability and ride stability; acceleration and braking; all-wheel driveline system

performance; diagnostic testing; noise and vibration systems; safety systems; fuel efficiency improvement; and emissions testing. The dynamometer is being used actively for class projects and industry research.

M.S. in Automotive Engineering

Graduate students pursuing a master’s of science in automotive engineering are eligible to enroll in Lawrence Tech’s new, two-course series on Automotive Control Systems. The specialized program focuses on developing and applying modern controls for complex vehicle systems. Dr. Bansal, who directs the program, said his students are incorporating modeling, rapid prototyping, hardware-in-the-loop simulation and other advanced concepts to design control systems for dynamic vehicle behaviors, such as traction control, stability control, steering, driveline systems and intelligent cruise control. dSPACE Senior Applications Engineer Don Saldano frequently serves as a field instructor for the automotive control systems program. He said dSPACE tools are used for project implementations in a real-time laboratory environment. “We’re exposing students to the technical solutions of the future,” Saldano said. “We’re sharing strategies, tools and techniques for achieving resolutions. We’re letting them know what’s out there in terms of new capabilities.”

M.S. in Mechatronic Systems Engineering

As the use of mechatronics is becoming commonplace across the global manufacturing landscape, the need for mechatronic systems engineers is at an all-time



▲ Lawrence Tech’s four-wheel drive chassis dynamometer gives students an optimum platform for exploring innovative automotive engineering solutions.

is the only university in the State of Michigan and one of a few universities in the United States offering a graduate-level degree in this field. “Industries understand that we need mechatronics – not today, but yesterday,” said Dr. Vladimir Vantsevich, director of the M.S. Mechatronics Systems Engineering program and Mechanical Engineering Department at Lawrence Tech . “Mechatronics degree programs are popular in Europe and Asia, but there are very few in the United States. We are proud to offer such a program

“Partnering with industry leaders brings a whole new element to the learning experience.”

Dr. Suresh Bansal, M.S. Automotive Engineering program director, Lawrence Tech



▲ Student engineers enrolled in Lawrence Tech’s Automotive Control Systems-1 course listen to final project presentations given by their fellow classmates.

high. In response to the industry’s growing demand for such specialized expertise, the university launched a new master’s degree program in mechatronic systems engineering in the fall of 2006. Lawrence Tech

here at Lawrence Tech.” The core curriculum for this graduate-level program was designed with the direct input of the university’s academic partners, and covers all aspects of the synergistic design of mechatronic systems.

Through in-kind donations of equipment, software and other tools, Lawrence Tech recently established a state-of-the-art mechatronics laboratory to support its program. This is where students are taking methodologies learned in the classroom and applying them to hands-on engineering projects. Dr. Vantsevich noted that practicing engineers from various industries are actively enrolling in the mechatronics graduate program. All classes are scheduled during evening hours to accommodate working professionals. Scholarships are available for some prospective students.

For more information, visit www.ltu.edu/engineering/mechanical/mechatronics.asp