Program fosters university training and research in five key automotive areas

Graduate Automotive Technology Education (GATE) Program

Challenge

U.S. universities are being called upon to supply the next generation of engineers who will be knowledgeable in developing and commercializing advanced automotive technologies. However, most universities are not able to offer students the required multi-disciplinary instructional programs focused on cutting-edge automotive technologies.

GATE students from the Ohio State University explore a hybrid electric vehicle.

Program Description

The U.S. Department of Energy (DOE) established the Graduate Automotive Technology Education (GATE) Program to provide a new generation of engineers and scientists with knowledge and skills in advanced automotive technologies. Ten GATE Centers were established at nine universities. Five key technology areas were identified for the GATE Program: fuel cells, hybrid electric vehicle drivetrains and control systems, lightweight materials, direct-injection engines, and advanced energy storage. Each GATE Center received funding from DOE for student fellowships and curriculum development.

Accomplishments

Each GATE Center has established a graduate engineering education program offering new courses that place an emphasis on the Center's technology specialty. Most GATE Centers have industrial advisory boards that help the universities respond to critical research needs and become self-supporting. Additional industry contributions include providing internships for students, sharing research facilities and equipment, awarding research contracts, and providing fellowships.

Other accomplishments include:

Ohio State University assembled a consortium of 11 automotive companies to sponsor research on advanced propulsion systems. The State of Ohio Board of Regents awarded additional funding to the GATE Center for development of research facilities. Two students completed their M.S. theses and are now employed by Allison Transmission and Delphi Chassis Systems.

Pennsylvania State University graduated three GATE fellows and three GATE students who are now either working in the automotive industry or pursuing further educational opportunities. The Center leveraged the DOE investment to obtain funding from the National Science Foundation to develop Web-based educational software on hybrid and electric vehicles aimed at grade school and high school students.

University of California, Davis developed a fuel cell vehicle model as its primary research tool. Research in the fuel cell modeling program is supported by eighteen companies and two government agencies.

University of Tennessee research is focused on characterizing diesel engine particulates and development of a hybrid electric vehicle drivetrain test bed. One GATE fellow is now working for Ford Motor Company.

Contact

Nancy Garland
Manager, GATE Program
202-586-5673
202-586-9811 fax
nancy.garland@ee.doe.gov

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http://www.ott.doe.gov/success.html

Benefits

The GATE Program develops a new workforce of talented, trained individuals who will be instrumental in building our country's future automotive industry. It also establishes a solid foundation of research knowledge and engineering experience that contribute to the accelerated development of technologies necessary for the cost-effective manufacture of highly fuel-efficient, low-emissions vehicles.

Future Activities

The GATE Program will continue to support fellowships for graduate students seeking to obtain knowledge and skills in critical advanced automotive technologies. The Program is pursuing increased industry participation, both with respect to direct involvement in student activities and advisory roles on university boards.

Partners in Success

- Michigan Technological University
- Ohio State University
- Pennsylvania State University
- University of California, Davis
- University of Maryland
- University of Michigan–Dearborn
- University of Tennessee
- Virginia Polytechnic Institute and State University
- West Virginia University