Hybrid Electric Vehicle Technology and Applications

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This presentation provides a holistic view of “Mobility” as an output and “Energy” as an input to the “Process Model” and establishes an “Application and Technology Roadmap” for next generation vehicles including Hybrid Electric Vehicles, Plug-in Hybrid Electric Vehicles and Electric Vehicles. It addresses various renewable and non-renewable energy source options and application requirements for civilian and military vehicles. Vehicle requirements for performance, fuel economy, emissions, reliability, and cost of ownership etc. are addressed for each of the vehicle applications including some unique requirements for military vehicles. Various Technology Drivers and a spectrum of various hybrid electric technologies, fuel cell and other technology options are presented for passenger cars, light trucks, commercial trucks, and military vehicles.

Speaker Bio:
Dr. Bansal is founder of the Hybrid Electric Vehicle Technology Center. He is actively pursuing Hybrid Electric Vehicle Technology (HEV) Research, Consulting and Professional Development, delivering several courses related to major vehicle systems and subsystems.

He served as College Professor and Director of the Master of Science in Automotive Engineering Program at Lawrence Technological University (LTU) for (12) years. He was a keynote speaker at 2006 IEEE Conference on HEV Applications for Civilian and Military Vehicles. He has extensive knowledge in HEV Battery Technology and has delivered an in-depth Multi-Module Professional Development Course on HEV Batteries to US
Military Engineers at Tank Automotive Research and Development Engineering Center (TARDEC) in Warren, MI. This course covers all aspects of Core Battery Technology, Battery Manufacturing, Battery Interaction with the HEV and its subsystems, Management of State of Charge and State of Health to avoid Thermal Runaway Condition, Thermal Management, Controls, and Reliability of this Complex System. He also has extensive team of Subject Matter Experts covering all other technologies for HEV applications including Engine Technology with Gasoline, Diesel and Alternative Fuels, Transmission and Drive-line Technology, Electric Motors and Generators for Electric Drive, Power Electronics, Control Systems, Regenerative Braking, Heating and Air-Conditioning System Technology.

Prior to joining LTU, he gained over 20 years of Engineering and Management experience at Ford Motor Company. He held positions as Director in Ford Brazil and Argentina Operations for Corporate Quality, Process Improvement and Information Systems. He was also Chief Engineer for Axles, Drive trains, Steering and Suspension for Ford North America and other Global Operations. He has over 10 years experience in Manual and Automatic Transmission Engineering with special focus on Gear Technology and Noise Vibration Technology. Prior to Joining Ford Motor Company, he gained fourteen years of valuable experience in design of Mechanical Drive trains for Special Purpose Machines as well as design of Manufacturing Systems for Automotive Industry.

He holds two U.S. Patents in Mechanical Drive Systems. One of these is on a Multi-speed Axle Drive System and the other is on Transfer Drive System.

*All students, faculty, and anyone interested are welcome.*