

# Schedule of Seminars and Webinars

## January 2012 - December 2012

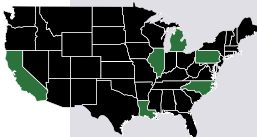
### Automotive • Aerospace • Commercial Vehicle

#### Technical areas *include*:

- Electronics (Communications and Controls)
- Design Processes/
- Engines & Propulsion
- Hybrid & Electric Vehicle Systems
- Green Mobility/Fuels
- Management
- Materials/Chemicals
- Noise/Vibration/Harshness (NVH)
- Quality & Reliability
- Powertrain/Drivetrain
- Safety
- Tests & Testing
- Vehicle Dynamics & Handling

↑ See inside for course  
overviews, dates & locations

#### Convenient Locations!



Seminars held in Michigan, Illinois, California, Pennsylvania & more!



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### REGISTRATION INFORMATION



If you have a disability that may impact your participation in this seminar, please call 2 weeks prior to the start date so that we can address your needs.

Condition of Sale: If you cannot attend, you may send a substitute or transfer to a future offering. The member discount may be adjusted based on the substitute's SAE membership level. A full refund is issued if you notify SAE at least 14 days prior to seminar start date. If canceled less than 14 days prior, the full fee is charged. For \$50, you may process a one-time transfer to a future offering within one year of canceled seminar. Canceling may reduce group discounts. To cancel, transfer or send a substitute, call SAE Customer Service at 1-877-606-7323 or 1-724-776-4970. For the SAE Membership registration rates, member dues must be current at the start of the event.

Note: SAE reserves the right to change instructors or cancel seminars and cannot be held responsible for costs incurred other than the registration fee. Prices subject to change.

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### KEY



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ACTAR APPROVED SEMINARS



WEBINARS

**New** Accessing and Interpreting Heavy Vehicle Event Data Recorders



I.D.# C1022 – [www.sae.org/pdevent/C1022](http://www.sae.org/pdevent/C1022)

May 15-18, 2012 • Oxnard, California

October 23-26, 2012 • Charlotte, North Carolina

What some have called a “black box” is more properly referred to as a Heavy Vehicle Event Data Recorder (HVEDR) as defined by the SAE J2728 HVEDR Recommended Practice. The term HVEDR is used to describe any type of electronic function that has the capability of storing data surrounding a defined event within an electronic control module found on a heavy truck or bus and that communicates on the SAE J1939 or J1587/J1708 data communications protocol. This course highlights the various vehicle systems and triggering events that may provide data useful in a collision investigation. Guided by recognized industry experts, techniques for preservation and interpretation of HVEDR data will be explored. This highly interactive workshop includes in-class instruction, demonstrations and practical hands-on experiences for acquiring and analyzing data from commercial vehicles.

**Instructor: Timothy Cheek and John C. Steiner**

**i** **Registration Information:**  
**Fees – List:** \$1,995; **SAE Members – Classic:** \$1,945;  
**Premium:** \$1,895; **Elite:** \$1,845  
 2.4 CEUs

*“The most thorough and detailed HVEDR course anywhere. Outstanding!”*

**Bryce Anderson**  
 Ph.D. Researcher

Acquiring and Analyzing Data from Sensors and In-Vehicle Networks

I.D.# C0522 – [www.sae.org/pdevent/C0522](http://www.sae.org/pdevent/C0522)

April 24-25, 2012 • Detroit, Michigan

November 1-2, 2012 • Troy, Michigan

After reviewing the traditional approach of acquiring data directly from sensors, the course will focus on the newer approach of obtaining data from the in-vehicle network. Attention is given to the complications of taking data from the in-vehicle network and how to overcome them, current trends and applications, wireless data acquisition (Wi-Fi and cellular), GPS, relevant technical standards, and how to simultaneously acquire network data with direct sensor measurements. Both PC-based and logger (flight recorder) data acquisition will also be covered. In addition, a practical guide for analysis and presentation techniques will be covered along with examples.

**Instructor: Richard Walter**

**i** **Registration Information:**  
**Fees – List:** \$1,315; **SAE Members – Classic:** \$1,184;  
**Premium:** \$1,118; **Elite:** \$1,052  
 1.3 CEUs

*Pierces the cloud of confusion regarding competing automotive networking standards.”*

**Sherman Couch**  
 Director of Engineering  
 Constellation Data Systems, Inc

**New** A Holistic Introduction to Commercial Telematics

I.D.# C0947 – [www.sae.org/pdevent/C0947](http://www.sae.org/pdevent/C0947)

May 8-9, 2012 • Troy, Michigan

This two-day seminar will begin with a review of the origins, technologies, and systems used in creating and operating modern-day telematics systems. The main technologies will be broken down into five categories, all of which are required to operate in unison in order for the system to be successful. A series of practical examples will allow attendees the opportunity to work through each of the functional technologies and implement a simple telematics solution. The seminar will conclude with a discussion of the issues that drive a cost vs. buy decision on the specific elements in the telematics value chain, as well as various applications currently being deployed and the exploration of future applications within the telematics market.

**Instructor: Emad Isaac**

**i** **Registration Information:**  
**Fees – List:** \$1,225; **SAE Members – Classic:** \$1,103;  
**Premium:** \$1,041; **Elite:** \$980  
 1.3 CEUs

Controller Area Network (CAN) for Vehicle Applications

I.D.# C0120 – [www.sae.org/pdevent/C0120](http://www.sae.org/pdevent/C0120)

October 4-5, 2012 • Troy, Michigan

The Controller Area Network has become the standard of choice for most automotive manufacturers. Approved for use as an ISO and EPA diagnostic network, its usage continues to grow. This seminar covers the theory and use of the CAN protocol, and its applications in the automotive industry. Details on how the CAN protocol and other standards (J2411, J2284, J1939, ISO 11898, etc.) complement each other will be presented. Attendees will learn about CAN application layers; the latest J1939, J2284, J2411, and IDB standards, regulations, and implementation requirements; and details of device hardware and software interfaces. Also presented will be demonstrations using system development tools. The SAE standard, J1939 Recommended Practice for a Serial Control and Communications Vehicle Network, is included in the course materials.

**Instructor: Mark Zachos**

**i** **Registration Information:**  
**Fees – List:** \$1,285; **SAE Members – Classic:** \$1,157;  
**Premium:** \$1,092; **Elite:** \$1,028  
 1.3 CEUs

*“CAN is explained in a clear and concise manner. Starting with little or no previous knowledge in CAN, one will leave two days later with a wealth of knowledge on CAN.”*

**Brett Ausburger**  
 VP/Director of Engineering  
 APR, LLC

Also available as a SAE-Learning opportunity –  
[www.sae.org/e-seminars/can](http://www.sae.org/e-seminars/can)

## Control Systems Simplified

I.D.# C0525 – [www.sae.org/pdevent/C0525](http://www.sae.org/pdevent/C0525)

July 19-20, 2012 • Troy, Michigan

This seminar begins by introducing the highly mathematical field of control systems focusing on what the classical control system tools do and how they can be applied to automotive systems. Dynamic systems, time/frequency responses, and stability margins are presented in an easy to understand format. Utilizing Matlab and Simulink, students will learn how simple computer models are generated. Other fundamental techniques in control design such as PID and lead-lag compensators will be presented as well as the basics of embedded control systems. During this interactive seminar, attendees will utilize case studies to develop a simple control design for a closed loop system. And, with the aid of a simple positioning control experiment, students will learn the major components and issues found in many automotive control applications today.

**Instructor: Farhad Bolourchi**



**Registration Information:**

**Fees – List:** \$1,265; **SAE Members – Classic:** \$1,139;

**Premium:** \$1,075; **Elite:** \$1,012

1.3 CEUs

*“A great, concise course that covers the topics effectively.”*

**William Fox**

Manager Controls Group  
Vanner, Inc.

## **New** Electrohydraulic Controls for Mobile Equipment & Vehicles

I.D.# C1011 – [www.sae.org/pdevent/C1011](http://www.sae.org/pdevent/C1011)

May 30-June 1, 2012 • Troy, Michigan

November 14-16, 2012 • Troy, Michigan

As more electronics are used in mobile applications, there is a greater need for engineers, managers, and technicians to understand electrohydraulic technologies. This three-day seminar examines the systems and component level details needed to better understand how the cross-functional disciplines of electrical, mechanical, and fluid power engineering are utilized to offer performance and functional advantages through electrohydraulic technologies. Using a systems engineering block diagram approach, key components covered in this seminar include electromechanical actuation, electronic controllers, networks, valves, and sensors. In each section, examples of existing products are shown and elements of risk are discussed. This course also examines environmental specifications and fluid issues that are specific to electrohydraulics.

**Instructor: David E. Ewel**



**Registration Information:**

**Fees – List:** \$1,545; **SAE Members – Classic:** \$1,391;

**Premium:** \$1,313; **Elite:** \$1,236

2.0 CEUs

## Designing On-Board Diagnostics for Light and Medium Duty Emissions Control Systems

I.D.# C0707 – [www.sae.org/pdevent/C0707](http://www.sae.org/pdevent/C0707)

August 1-3, 2012 • Troy, Michigan

December 12-14, 2012 • Troy, Michigan

This course is designed to provide a fundamental understanding of how and why OBD systems function and the technical features that a diagnostic should have in order to ensure compliant and successful implementation. Fundamental design objectives and features needed to achieve those objectives for generic on-board diagnostics will be covered. The course will also include a review of the California Air Resources OBD II regulation, providing students with a firm foundation for reading and understanding the requirements, including the in-use rate portion of the regulations and how to properly calculate and output the required rate information. Relationships between the regulation and various SAE and ISO recommended practices will be reviewed. The course will also explore the relationship of the OBD system with the underlying control system. Note that because of proprietary considerations, this class does not provide details of algorithm design, algorithm performance, or algorithm application. The class will cover general OBD algorithm designs and the features required to promote sound OBD system design.

**Instructor: John Van Gilder**



**Registration Information:**

**Fees – List:** \$1,655; **SAE Members – Classic:** \$1,490;

**Premium:** \$1,407; **Elite:** \$1,324

2.0 CEUs

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**SAE International™**

P91053

## Embedded Control Systems Design Workshop

I.D.# C0922 – [www.sae.org/pdevent/C0922](http://www.sae.org/pdevent/C0922)

April 25-26, 2012 • Troy, Michigan

This highly interactive and entertaining seminar will help you learn fundamental concepts needed to design, implement, and calibrate a control function using a microcontroller model car. Overviews of engine, transmission, hybrid control functions and related sensors and actuators including electronic control signals will be presented, as well as microcontroller functions, control algorithms and software, and calibration of the system. This embedded control system design seminar will focus on designing an embedded system by teaching each focus area and then showing how all areas connect. The focus areas include control system architecture; control algorithms; sensors and actuators; microcontroller; software; and calibration. The discussion will be based on engine, transmission, and electric drive propulsion system functionality. Participants will be involved in both a lecture format and a 'hands on' lab to design, implement and calibrate a control function using a microcontroller Robocar.

**Instructor: Dennis Bogden**



**Registration Information:**

**Fees – List:** \$1,265; **SAE Members – Classic:** \$1,139;  
**Premium:** \$1,075; **Elite:** \$1,012  
1.3 CEUs

## Fundamentals of Shielding Design for EMC Compliance

I.D.# C0835 – [www.sae.org/pdevent/C0835](http://www.sae.org/pdevent/C0835)

February 17, 2012 • Troy, Michigan  
August 16, 2012 • Norwalk, California

It is important for electronic and hardware engineers to be knowledgeable not only of a product's intended function and performance, but also its ability to perform within electromagnetic compatibility (EMC) limits. This seminar introduces practical shielding theory, design fundamentals, and configurations, including shielding products, common and differential modes, electromagnetic fields, and enclosure shielding. A segment on enclosure testing is presented in conjunction with an aperture attenuation modeling program (which is used to model attenuation characteristics at various frequencies and aperture size prior to expensive FCC/CE compliance or MIL-STD 461 testing). Honeycomb vent panels, plating attenuation comparisons, and galvanic compatibility per MIL-STD 1250 will also be discussed.

**Instructor: Michael J. Oliver**



**Registration Information:**

**Fees – List:** \$725; **SAE Members – Classic:** \$653;  
**Premium:** \$616; **Elite:** \$580  
0.7 CEUs

## Emissions-Related OBD Systems: A Design Overview

I.D.# C0708 – [www.sae.org/pdevent/C0708](http://www.sae.org/pdevent/C0708)

April 24, 2012 • Detroit, Michigan - *Held in conjunction with the SAE 2012 World Congress*

This one day seminar is designed to provide an overview of the fundamental design objectives and the features needed to achieve those objectives for generic on-board diagnostics. The basic structure of an on-board diagnostic will be described along with the system definitions needed for successful implementation. Please note that because of proprietary considerations, this class does not provide details of algorithm design, algorithm performance, or algorithm application. The class will cover general OBD algorithm designs and the features required to promote sound OBD system design. Individuals desiring a more in-depth look at On-Board Diagnostics should consider attending SAE seminar ID# C0707 Designing On-Board Diagnostics for Light and Medium Duty Emissions Control Systems.

**Instructor: John Van Gilder**



**Registration Information:**

**Fees – List:** \$785; **SAE Members – Classic:** \$707;  
**Premium:** \$667; **Elite:** \$628  
0.7 CEUs

## In-Vehicle Networking with LIN and FlexRay Applications

I.D.# C0136 – [www.sae.org/pdevent/C0136](http://www.sae.org/pdevent/C0136)

March 22-23, 2012 • Troy, Michigan

This two-day seminar covers the theory and practices of in-vehicle multiplex networking. Attendees learn about FlexRay and LIN SubBus, and other network standards. Attendees explore the latest OBD II regulations and implementation requirements, along with device hardware and software interfaces. Proprietary applications are discussed and system development tools are demonstrated.

**Instructor: Mark Zachos**



**Registration Information:**

**Fees – List:** \$1,225; **SAE Members – Classic:** \$1,103;  
**Premium:** \$1,041; **Elite:** \$980  
1.3 CEUs



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## Understanding and Using the SAE J2534-1 API to Access Vehicle Networks

I.D.# C0733 – [www.sae.org/pdevent/C0733](http://www.sae.org/pdevent/C0733)

February 24, 2012 • Troy, Michigan

This course is designed to give you an understanding of the J2534-1 API, enabling you to create your own programs that accomplish your vehicle communication needs. In addition to learning how to use each of the J2534-1 functions, you will have the opportunity to write a program that collects messages off of the CAN vehicle bus and another program that reads trouble codes off of a J1850 vehicle. Note that because of the proprietary nature of the information, this class does not provide details on reprogramming algorithms or proprietary data collection. Attendees will receive a copy of the SAE J2534-1 Recommended Practice for Pass-Thru Vehicle Programming.

**Instructor:** Mark Wine



**Registration Information:**

**Fees – List:** \$825; **SAE Members – Classic:** \$743;  
**Premium:** \$701; **Elite:** \$660  
0.7 CEUs

## **New** Vehicle User Interfaces: Principles and Techniques for Design and Development

I.D.# C1114 – [www.sae.org/pdevent/C1114](http://www.sae.org/pdevent/C1114)

April 23, 2012 • Detroit, Michigan - Held in conjunction with the SAE 2012 World Congress

The automotive industry is facing an unprecedented proliferation of vehicle interior interface features and technologies such as controls and displays for infotainment, navigation, smart-phone integration, wireless connectivity, HVAC, lights, etc. that can dramatically increase complexity faced by the driver. Managing the cognitive and physical workloads of the driver and minimizing driver distractibility through key human factors design principles is paramount to the safe, convenient and enjoyable operation of these technologies. Using a combination of lecture, case studies and exercises, this course will provide an overview of principles and techniques for developing intuitive, safe and effective human-machine interfaces, as well as best practices and problems to avoid.

**Instructors:** Michael Tschirhart and John Kosinski



**Registration Information:**

**Fees – List:** \$725; **SAE Members – Classic:** \$653;  
**Premium:** \$616; **Elite:** \$580  
0.7 CEUs

## Design FMEA Update: What's New in J1739 Webinar



I.D.# WB0955 – [www.sae.org/pdevent/WB0955](http://www.sae.org/pdevent/WB0955)

Presented in three, 2-hour sessions, 10:30 a.m. - 12:30 p.m.  
ET – via telephone/internet

April 9, 10 & 12, 2012 • Troy, Michigan

The new J1739 has been revised to address common problems with the application of Design FMEA today. This course is not intended to cover all of the details of completing a Design FMEA. Rather, its focus is on recent changes from the former J1739 FMEA Recommended Practice to the new J1739 FMEA Standard and how those familiar with performing Design FMEA should adjust their approach.

Similarities in content exist between this course and the Process FMEA Update: What's New in J1739 Webinar; however each is uniquely designed to address what's new for each type of analysis.

**Instructor:** Bill Haughey



**Registration Information:**

**Fees – List:** \$515; **SAE Members – Classic:** \$464;  
**Premium:** \$438; **Elite:** \$412  
0.7 CEUs

## Design for Manufacturing & Assembly (DFM/dfa)

I.D.# 92047 – [www.sae.org/pdevent/92047](http://www.sae.org/pdevent/92047)

March 1-2, 2012 • Troy, Michigan

Design for Manufacturing and Assembly (DFM+A), pioneered by Boothroyd and Dewhurst, has been used by many companies around the world to develop creative product designs that use optimal manufacturing and assembly processes. Correctly applied, DFM+A analysis leads to significant reductions in production cost, without compromising product time-to-market goals, functionality, quality, serviceability, or other attributes. In this two-day seminar, you will not only learn the Boothroyd Dewhurst Method, you will actually apply it to your own product design! This seminar will include information on how DFM+A fits in with QFD, concurrent engineering, robust engineering, and other disciplines. In addition, there will be a brief demonstration of computer software tools, which simplify the DFM+A analysis.

Each participant will receive and use the hard-bound authoritative reference textbook, *Product Design for Manufacture and Assembly*, written by Geoffrey Boothroyd, Peter Dewhurst and Winston Knight.

**Instructor:** Kevin Zielinski



**Registration Information:**

**Fees – List:** \$1,395; **SAE Members – Classic:** \$1,256;  
**Premium:** \$1,186; **Elite:** \$1,116  
1.3 CEUs

*"I think the seminar is a great way to help engineers to consider manufacturing during initial design concepts."*

**Cinthia Becks**

Sensor Development Engineer  
ITT Automotive

**KEY**



CERTIFICATE PROGRAM



ACTAR APPROVED SEMINARS



WEBINARS

## Design of Experiments (DOE) for Engineers

I.D.# C0406 – [www.sae.org/pdevent/C0406](http://www.sae.org/pdevent/C0406)

July 12-13, 2012 • Troy, Michigan  
December 3-4, 2012 • Troy, Michigan

See course description on page 29

*"This course helped me to develop a good understanding of the DOE method and to apply it to real-world applications."*

**Usman Asad**  
Senior Research Associate  
University of Windsor

## Design of Experiments (DOE) for Engineers Webinar



I.D.# WB0932 – [www.sae.org/pdevent/WB0932](http://www.sae.org/pdevent/WB0932)  
Presented in six, 2-hour session, 10:30 a.m. – 12:30 p.m. ET – via telephone/internet

February 7, 9, 14, 16, 21 & 23, 2012

See course description on page 30

## Design Reviews for Effective Product Development

I.D.# C0004 – [www.sae.org/pdevent/C0004](http://www.sae.org/pdevent/C0004)

July 18, 2012 • Troy, Michigan  
October 17, 2012 • Troy, Michigan

This seminar describes how formal design reviews can improve products by uncovering potential problems before they are discovered at a later stage of development or application, when the costs of correction are much higher. A broad range of effective techniques for organizing and conducting design reviews will be presented. Specific guidance and tools to assist attendees in structuring design reviews tailored to their own company, specification, or contract requirements will also be provided. Material covered will be applicable to all types of development programs, ranging from components to complete vehicles, and for both OEMs and suppliers.

**Instructor: Angelo Mago**



**Registration Information:**  
**Fees – List:** \$725; **SAE Members – Classic:** \$653;  
**Premium:** \$616; **Elite:** \$580  
0.7 CEUs

*"An energetic instructor who really knows his stuff."*

**Gary A. Walters**  
Design Verification Mgr.  
MTD Products, Inc.

## Failure Modes and Effects Analysis (Product & Process) in Aerospace

I.D.# C0939 – [www.sae.org/pdevent/C0939](http://www.sae.org/pdevent/C0939)

Upcoming open enrollment dates being scheduled. Please check the seminar webpage for future offerings.

This interactive seminar introduces the participant to the analytical process by which potential failure modes, failure effects and causes of failure are identified. The severity, occurrence and probability of detection of a failure mode are used to prioritize which failure modes are most critical. Methodology is introduced for dealing with the effects of failure. The Design FMEA link to manufacturing is explained and amplified in terms of downstream Process FMEA. This course utilizes interactive, in-class Design and Process FMEA generation and analysis in a lively team environment. This course will also detail relevant portions of the SAE Aerospace Recommended Practice for FMEA, ARP 5580 which is included in the course materials.

**Instructor: Jim Breneman**



**Registration Information:**  
**Fees – List:** \$1,225; **SAE Members – Classic:** \$1,103;  
**Premium:** \$1,041; **Elite:** \$980  
1.3 CEUs

## Finite Element Analysis for Design Engineers - Hands-on FEA Workshop

I.D.# 93006 – [www.sae.org/pdevent/93006](http://www.sae.org/pdevent/93006)

May 30-31, 2012 • Troy, Michigan  
October 29-30, 2012 • Troy, Michigan

This seminar provides design engineers with skills necessary for proper use of FEA (Finite Element Analysis) in the design process and to ensure that this powerful tool is implemented in the most efficient and productive way. The seminar offers hands-on exercises focusing on the analysis of FEA errors and proper modeling techniques. Attendees study different types of analyses typically performed by design engineers, discuss common misconceptions and traps in the FEA and review Implementation of Management of FEA in the design environment. The seminar provides opportunities to discuss and exchange FEA experiences. The seminar layout allows for some customization so problems of particular interest to students can be discussed in class.

All topics are illustrated by hands-on examples using FEA software SolidWorks Simulation. The SAE book, *Finite Element Analysis for Design Engineers*, by Paul Kurowski is included in the course materials.

**Instructor: Paul Kurowski**



**Registration Information:**  
**Fees – List:** \$1,325; **SAE Members – Classic:** \$1,193;  
**Premium:** \$1,126; **Elite:** \$1,060  
1.3 CEUs

*"I would recommend this course to everybody involved with FEA. It definitely honed my understanding of FEA and its application skills."*

**Ashraf K. Pindari**  
Analysis Engineer  
Wecast Industries, Inc.

## Fundamentals of Geometric Dimensioning & Tolerancing (GD&T) Webinar



I.D.# WB0933 – [www.sae.org/pdevent/WB0933](http://www.sae.org/pdevent/WB0933)  
Presented in eight, 2-hour sessions, 10:30 a.m. – 12:30 p.m. ET – via telephone/internet

March 13-April 5, 2012 • Troy, Michigan

Geometric dimensioning and tolerancing (GD&T) is used as a symbolic way of showing specific tolerances on drawings. GD&T is a valuable tool that effectively communicates the design intent to manufacturing and inspection. This course introduces participants to the GD&T system, providing a working knowledge of the correct interpretation and application of each symbol, general rules, the datum system, and 'bonus' tolerance and highlighting some of the changes in the updated Y14.5 standard. The material is reinforced with many practice exercises.

**Instructor: John-Paul Belanger**



### Registration Information:

**Fees – List:** \$915; **SAE Members – Classic:** \$824;  
**Premium:** \$778; **Elite:** \$732  
1.6 CEUs

## Geometric Dimensioning & Tolerancing

I.D.# C0133 – [www.sae.org/pdevent/C0133](http://www.sae.org/pdevent/C0133)

June 25-27, 2012 • Troy, Michigan

This in-depth course covers the GD&T system, including why it reduces costs, how to interpret the symbols, and how to apply these tolerances correctly. Participants will learn the basic definitions and rules, the importance of datums, the meaning of each tolerance, and sample ways of gauging geometric tolerances. The class is mainly lecture, with many practice exercises. Participants are encouraged to bring sample parts and/or prints (with or without GD&T already applied) to class for questions. Time is reserved for discussing the application of GD&T to your parts/prints.

**Instructor: John-Paul Belanger or John Stolter**



### Registration Information:

**Fees – List:** \$1,605; **SAE Members – Classic:** \$1,445;  
**Premium:** \$1,364; **Elite:** \$1,284  
2.0 CEUs

*"SAE always has top notch instructors with real world experience which give their students the best information possible, that in itself is priceless."*

**Kevin Schneider**  
Project Engineer  
FTE Automotive

## Introduction to Design Review Based on Failure Modes (DRBFM) Webinar



I.D.# WB1047 – [www.sae.org/pdevent/WB1047](http://www.sae.org/pdevent/WB1047)  
Presented in three, 2-hour sessions – via telephone/internet

February 27, 29 & March 2, 2012 – 11:30 a.m. - 1:30 p.m. ET

June 4, 5 & 7, 2012 – 10:30 a.m. - 12:30 p.m. ET

December 10, 11 & 13, 2012 – 11:30 a.m. - 1:30 p.m. ET

Design Review Based on Failure Modes (DRBFM) is a methodology focused on change management and continuous improvement. It centers on early prevention and engineering knowledge, eliminating time spent debating ranking systems, waiting for lead engineers to document and list their concerns, identifying what types of concerns are open for discussion and resolution, and brainstorming without any actionable closure.

This DRBFM Webinar will provide roles and responsibilities of management, design engineers, manufacturing engineers, facilitators and technical experts. Those interested in DRBFM will benefit from understanding the rationale behind this methodology and learn to guide teams through the paradigm shifts and mindset that are needed.

**Instructor: Bill Haughey**



### Registration Information:

**Fees – List:** \$575; **SAE Members – Classic:** \$518;  
**Premium:** \$489; **Elite:** \$460  
0.6 CEUs

## Introduction to Failure Modes & Effects Analysis for Product Design & Manufacturing Process Design (Product & Process FMEA)

I.D.# 92002 – [www.sae.org/pdevent/92002](http://www.sae.org/pdevent/92002)

Upcoming open enrollment dates being scheduled. Please check the seminar webpage for future offerings.

Designed to assist individuals responsible for design and development activities in the completion of a Design FMEA and Process FMEA, this course introduces participants to the analytical process in which potential failure modes, failure effects, and causes of failure are identified. Criticality and risk analysis concepts for dealing with the effects of failure will be covered. Analysis is used to identify corrective actions and controls necessary to eliminate failure modes or minimize the effect of failure. Attendees will also receive the SAE Standard for FMEA, J1739, which is covered in the course materials. Please note this seminar combines course material covered in ID# 90034, Introduction to Failure Mode & Effects Analysis for Product Design (Design FMEA) and ID# 90033, Introduction to Failure Mode & Effects Analysis for Manufacturing Processes, Assembly Processes & Service (Process FMEA).

**Instructor: E. Harold Vannoy**



### Registration Information:

**Fees – List:** \$1,285; **SAE Members – Classic:** \$1,157;  
**Premium:** \$1,092; **Elite:** \$1,028  
1.3 CEUs

*"Great program! Forced me to re-orient my methodology."*

**Dhiraj Tiwari**  
Senior Design Engineer  
Stryker Medical

### KEY



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ACTAR APPROVED SEMINARS



WEBINARS

## Mechatronics: Introduction, Modeling and Simulation

I.D.# C0949 – [www.sae.org/pdevent/C0949](http://www.sae.org/pdevent/C0949)

May 15-16, 2012 • Troy, Michigan

While progress is being made in lowering the barriers between traditional engineering disciplines and formal education programs, this seminar is designed to provide engineers with mechanical or electrical engineering backgrounds the knowledge to effectively interact with colleagues from the other discipline in an efficient and productive manner. This two day seminar is designed for the engineer with little or no mechatronics systems experience and will begin with an introduction to mechatronics principles and components, including sensors, actuators, control strategies, and instrumentation. The instructor will then guide the participants through the analysis, synthesis and design of mechatronics systems through the use of modeling and simulation tools. Emphasis will be given to a unified energy flow approach to model mechatronics systems that are comprised of multidisciplinary components. A key element of this seminar is the use of computer simulation exercises to enhance and reinforce the learning experience. The instructor will conduct modeling and simulation exercises for this class using commercial vehicle and automotive mechatronics systems examples. Attendees desiring a more direct hands-on learning experience are encouraged to bring a personal laptop computer with the demonstration version of the 20-sim modeling simulation software installed prior to arrival (available at <http://www.20sim.com/downloads/download-form>.) The text, *Mechatronic Modeling and Simulation Using Bond Graphs*, authored by Shuvra Das is included with the seminar.

**Instructor: Shuvra Das**



### Registration Information:

**Fees – List:** \$1,345; **SAE Members – Classic:** \$1,211;

**Premium:** \$1,143; **Elite:** \$1,076

1.3 CEUs

## Model Based Design: Delivering Quality Electronic Products Faster

I.D.# C0806 – [www.sae.org/pdevent/C0806](http://www.sae.org/pdevent/C0806)

June 14-15, 2012 • Troy, Michigan

This two-day course will provide you with math-based tools to greatly accelerate electronic product development, and to simultaneously deliver a more robust design. Participants will learn the basic theory of finite state machines with a heavy emphasis on simple, real-world examples. Through a series of hands-on learning modules, attendees will gain the understanding and experience to build an executable spec simulation environment. Tools and techniques will be provided so that the attendees can bring these skills back to work and implement the process immediately. Companies which use the executable spec methodology will soon dominate the market for mobile mechatronics.

**Instructor: Peter J. Schubert**



### Registration Information:

**Fees – List:** \$1,365; **SAE Members – Classic:** \$1,299;

**Premium:** \$1,160; **Elite:** \$1,092

1.3 CEUs

## Process FMEA Update: What's New in J1739 Webinar



I.D.# WB0956 – [www.sae.org/pdevent/WB0956](http://www.sae.org/pdevent/WB0956)

*Presented in three, 2-hour sessions, 11:30 a.m. - 1:30 p.m. ET – via telephone/internet*

April 16, 17 & 19, 2012

The new J1739 has been revised to address common problems with the application of Process FMEA today. Such problems include the time spent debating ranking systems, potential problems hidden in the Risk Priority Number, false starts and rework of FMEA because of a lack of understanding of process functions, and a lack of emphasis on prevention controls or early detection of product defects. This course is not intended to cover all of the details of completing a Process FMEA. Rather, its focus is on recent updates to the J1739 standard and how those familiar with performing Process FMEA should adjust their approach. Similarities in content exist between this course and the Design FMEA Update: What's New in J1739 Webinar, however each is uniquely designed to address what's new for each type of analysis.

**Instructor: Bill Haughey**



### Registration Information:

**Fees – List:** \$515; **SAE Members – Classic:** \$464;

**Premium:** \$438; **Elite:** \$412

0.7 CEUs

## Root Cause Problem Solving: Methods and Tools Webinar



I.D.# WB0931 – [www.sae.org/pdevent/WB0931](http://www.sae.org/pdevent/WB0931)

*Presented in four, 2-hour sessions – via telephone/internet*

November 7, 9, 14 & 16, 2012 - 11:30 a.m. – 1:30 p.m. ET

To combat development issues and adopt a fresh approach, teams can use the methods and tools of Root Cause Problem Solving to first view problems as opportunities for improvement, identify root causes and implement solutions to prevent recurrence. Benefits include improved quality and customer satisfaction, reduced operation costs, and greater employee knowledge of work processes. This proven 8-step approach to problem solving will help improve operational and financial performance by identifying causes and implementing solutions to significant or recurring problems. This approach to problem solving is used by many major automotive manufacturers.

**Instructor: Murray Sittsamer**



### Registration Information:

**Fees – List:** \$585; **SAE Members – Classic:** \$527;

**Premium:** \$497; **Elite:** \$468

0.8 CEUs

## Statistical Tolerance Design

I.D.# 88033 – [www.sae.org/pdevent/88033](http://www.sae.org/pdevent/88033)

July 16, 2012 • Troy, Michigan

This seminar will include a review of statistical theory and present statistical methods, which are used to better select and/or analyze Tolerance Stack-ups. The Probability (RMS) Method, the Monte Carlo Simulation Technique and tolerance optimization techniques will be discussed along with guidelines on which method(s) to use in given situations. Attendees will also view a demonstration of a microcomputer Monte Carlo Simulation program that analyzes the effects of form and assembly variation on the quality of a finished product. This seminar will provide an overview of Design of Experiments (DOE) methods, which enable effective analysis of critical product dimensions and tolerances. Note: Participants should bring a scientific calculator for several in-class exercises.

**Instructor: Kevin Zielinski**



**Registration Information:**

**Fees – List:** \$775; **SAE Members – Classic:** \$698;  
**Premium:** \$659; **Elite:** \$620  
0.7 CEUs

## Tolerance Stack-Up Analysis

I.D.# C0022 – [www.sae.org/pdevent/C0022](http://www.sae.org/pdevent/C0022)

June 28-29, 2012 • Troy, Michigan

November 19-20, 2012 • Troy, Michigan

This course is designed to help product design personnel create tolerance stacks for parts and assemblies that use Geometric Dimensioning & Tolerancing. The course begins with a quick review of Y14.5 concepts, and then introduces the benefits and uses of a tolerance stack spreadsheet. Participants then learn detailed procedures for performing tolerance stacks on parts and assemblies, beginning with coordinate tolerances and moving on to geometric tolerances. The course will eliminate confusion over how to include the bonus and shift in a tolerance stack: for example, when using tolerance of position with the MMC modifier. The simple, manual spreadsheet method used throughout the course produces a straightforward documentation trail that is easily interpreted, and readily adaptable to any company's electronic spreadsheet program. Results can be quickly and easily checked, and revisions can be made with ease. Students receive extensive practice at creating stacks, and should bring a calculator or laptop computer equipped with MS Excel for the numerous student exercises.

Each attendee will receive a copy of the "Tolerance Stack Analysis Using GD&T" textbook and an Excel template for generating stacks.

**Instructor: John-Paul Belanger or John Stolter**



**Registration Information:**

**Fees – List:** \$1,295; **SAE Members – Classic:** \$1,166;  
**Premium:** \$1,101; **Elite:** \$1,036  
1.3 CEUs

*"Great content, good instructor, well done."*

**Michael Habel**

Technical Expert/Six Sigma Master Black Belt  
Ford Motor Co.

## Tolerance Stack-up Fundamentals Webinar



I.D.# C0842 – [www.sae.org/pdevent/C0842](http://www.sae.org/pdevent/C0842)

*Presented in four, 90-minute sessions, 11:30 a.m. - 1:00 p.m. ET – via telephone/internet*

January 17, 19, 24 & 26, 2012 – 10:30 a.m. - 12:00 p.m. ET

April 14, 16, 21 & 23, 2012 – 11:30 a.m. - 1:00 p.m. ET

Analysis of tolerance stacks varies widely. This webinar introduces the basic tools to create a common methodology for tolerance stack-ups, and ensure seamless documentation. Participants will create 1-D tolerance stacks for parts and assemblies that use geometric dimensioning and tolerancing using a tolerance stack spreadsheet. This simple, manual spreadsheet method produces an easily interpreted and checked documentation trail, and is easily adaptable to common electronic spreadsheet programs. Multiple examples will be provided to assist engineers in applying tolerance stack-up fundamentals to Y14.5 issues.

**Instructor: John-Paul Belanger**



**Registration Information:**

**Fees – List:** \$585; **SAE Members – Classic:** \$527;  
**Premium:** \$497; **Elite:** \$468  
0.6 CEUs

## Vibration Analysis using FEA: A Hands-on Workshop

I.D.# C0830 – [www.sae.org/pdevent/C0830](http://www.sae.org/pdevent/C0830)

April 2-3, 2012 • Troy, Michigan

Progress in the commercial FEA software and in computing hardware has now made it practical to use advanced types as an everyday design tool of design engineers. In addition, competitive pressures and quality requirements demand a more in-depth understanding of product behavior under real life loading conditions. This seminar introduces one of the advanced types of FEA: vibration analysis. By considering time dependent loads and inertial effects, vibration analysis allows for a more in-depth product simulation thus reducing product development cost and time. The course reviews basic concepts of vibration analysis and illustrates how they are implemented in FEA to simulate product behavior. The most common types of vibration analysis such as modal, time response, frequency response and random vibrations are covered. Participants will have the opportunity to practice skills learned utilizing the commercial FEA software SolidWorks Simulation.

**Instructor: Paul Kurowski**



**Registration Information:**

**Fees – List:** \$1,315; **SAE Members – Classic:** \$1,184;  
**Premium:** \$1,118; **Elite:** \$1,052  
1.3 CEUs

**KEY**



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ACTAR APPROVED SEMINARS



WEBINARS

## Advanced Diesel Particulate Filtration Systems



I.D.# C0502 – [www.sae.org/pdevent/C0502](http://www.sae.org/pdevent/C0502)

April 26-27, 2012 • Detroit, Michigan - *Held in conjunction with the SAE 2012 World Congress*

November 29-30, 2012 • Troy, Michigan

This seminar covers many DPF (diesel particulate filtration)-related topics using fundamentals from various branches of applied sciences such as porous media, filtration and materials sciences and will provide the student with both a theoretical as well as an applications-oriented approach to enhance the design and reliability of aftertreatment platforms. Structure, geometry, composition, performance, applications and optimizations of DPFs are some of the main topics covered in this advanced level seminar. Computer simulation techniques for analysis and optimization of DPF performance are also demonstrated.

**Instructor: Athanasios Konstandopoulos and Mansour Masoudi**



**Registration Information:**

**Fees – List:** \$1,275; **SAE Members – Classic:** \$1,148;  
**Premium:** \$1,084; **Elite:** \$1,020  
1.3 CEUs

*“Excellent coverage of an emerging technology by a real expert in the area.”*

**Henry Gysling**  
Technology Director  
Air Flow Catalyst Systems

## Common Rail Diesel Fuel Injection



I.D.# C0920 – [www.sae.org/pdevent/C0920](http://www.sae.org/pdevent/C0920)

April 27, 2012 • Detroit, Michigan – *Held in conjunction with the SAE 2012 World Congress*

September 10, 2012 • Troy, Michigan

This one-day seminar will begin with a review of the basic principles of diesel engines and fuel injection systems. Diesel and alternative fuels will be discussed, followed by current and emerging diesel engine applications. The majority of the day will be dedicated to the common rail system itself, beginning with a comprehensive overview of the complete system. The instructor will then introduce the main subsystems, including hydraulics and controls. Finally, the subsystems will then be broken down into their respective components.

**Instructor: Vincent Piacenti**



**Registration Information:**

**Fees – List:** \$725; **SAE Members – Classic:** \$653;  
**Premium:** \$616; **Elite:** \$580  
0.7 CEUs

*“Great broad, yet basic, overview course of the diesel common rail fuel system.”*

**Glenn Guire**  
Senior Engineer  
L-3 Combat Propulsion Systems

## Combustion and Emissions for Engineers

I.D.# 97011 – [www.sae.org/pdevent/97011](http://www.sae.org/pdevent/97011)

April 2-4, 2012 • Troy, Michigan

To effectively contribute to emission control strategies and design and develop emission control systems and components, a good understanding of the physical and mathematical principles of the combustion process is necessary. This seminar will bring issues related to combustion and emissions “down to earth,” relying less on mathematical terms and more on physical explanations and analogies.

**Instructor: Bruce Chehroudi**



**Registration Information:**

**Fees – List:** \$1,595; **SAE Members – Classic:** \$1,436;  
**Premium:** \$1,356; **Elite:** \$1,276  
2.0 CEUs

*“[This course] is an excellent overview of the internal combustion engine’s underlying chemistry.”*

**Steven Cagle**  
Engineer  
Synerject

## Compact Heat Exchangers for Automotive Applications

I.D.# 97002 – [www.sae.org/pdevent/97002](http://www.sae.org/pdevent/97002)

November 15-16, 2012 • Troy, Michigan

Rapid advances have been made in the range of available designs and operational parameters as well as in the fundamental understanding of compact heat exchangers (CHEs). Since the majority of modern heat exchangers used for heating and cooling systems for vehicular applications are CHEs, keeping up to date with these advances is essential. This seminar will help you understand and be able to apply comprehensive information about the intricacies of CHE design, performance, operating problems and state-of-the-art-technology for car and truck applications.

**Instructor: Joseph Borghese**



**Registration Information:**

**Fees – List:** \$1,225; **SAE Members – Classic:** \$1,103;  
**Premium:** \$1,041; **Elite:** \$980  
1.3 CEUs

*“Every engineer involved in automotive heat exchanger design needs to be exposed to this course if possible at the early stage in their career.”*

**Dr-Ing Dele Josiah Ajele**  
PE Engineering Manager  
Dura-Lite Heat Transfer Products, Ltd.

## Diesel Engine Technology



I.D.# 93014 – [www.sae.org/pdevent/93014](http://www.sae.org/pdevent/93014)

March 12-13, 2012 • Troy, Michigan

August 6-7, 2012 • Troy, Michigan

October 1-2, 2012 • Rosemont, Illinois– *Held in conjunction with the SAE 2012 Commercial Vehicle Engineering Congress*

This course will explain the fundamental technology of diesel engines starting with a short but thorough introduction of the diesel combustion cycle, and continue with aspects of engine design, emission control design, and more. An overview of developing technologies for the future with a comprehensive section on exhaust aftertreatment is also included. The text, *Diesel Emissions and Their Control*, authored by Magdi Khair and W. Addy Majewski is included with the seminar.

**Instructor: Magdi Khair**



**Registration Information:**

**Fees – List:** \$1,475; **SAE Members – Classic:** \$1,328;  
**Premium:** \$1,254; **Elite:** \$1,180  
1.3 CEUs

*“I have been in the industry 3 months. I will be going back to work with a lot more knowledge thanks to the course and great instructor.”*

**Kimberly Remaly**

Mechanical Development Engineer  
International Truck & Engine Corporation

Also available as a SAE-Learning opportunity –  
[www.sae.org/e-seminars/det](http://www.sae.org/e-seminars/det)

## Diesel Engine Technology Engineering Academy



I.D.# ACAD03 – [www.sae.org/pdevent/ACAD03](http://www.sae.org/pdevent/ACAD03)

June 4-8, 2012 • Troy, Michigan

October 22-26, 2012 • Europe

This Academy covers the diesel engine engineering principles and practices necessary to effectively understand a modern diesel engine. Types of engines addressed include naturally aspirated, turbocharged, pre-chamber, open chamber, light duty, and heavy duty. It is an intensive learning experience comprised of lecture and structured practical sessions, including a team-solved case study problem. Evening sessions are included.

**Instructor(s):** Magdi Khair, Ewa Bardasz, André Boehman, Bernard Challen, Philip Dingle, Michael Levin, and Helmut Tschöeke



**Registration Information:**

**Fees – List:** \$3,345; **SAE Members – Classic:** \$3,011;  
**Premium:** \$2,843; **Elite:** \$2,676  
4.0 CEUs

*“Impressive! Well worth the investment. A comprehensive introduction to the modern diesel engine.”*

**Jason Lee Jirovsky**

Design Engineer  
John Deere Power Systems

## **New** Displacement on Demand Systems (DoD) Webinar



I.D.# WB1010 – [www.sae.org/pdevent/WB1010](http://www.sae.org/pdevent/WB1010)

*Presented in two, 2-hour sessions; 10:30 a.m. – 12:30 p.m. – via telephone/internet*

January 11 & 13, 2012

This webinar focuses on the significance, technology and application of Displacement on Demand (DoD) Systems in automotive applications. It will cover the theoretical improvements to engine system performance and efficiency, the historical mechanisms to implement DoD systems, the modern approach to DoD systems, and the practical results. You will gain an appreciation for the DoD System – its application to the automotive marketplace and its significance as it applies to improvements in all facets of an automotive powertrain. You will learn the fundamental science and implementation technology of the various DoD systems and move to the emerging technologies in DoD system design and operation that can significantly improve operational efficiencies. The course will cover how the Engine Control Module (ECM) uses information related to the operational status to implement real-time running efficiency of the engine and effects changes in the operation of the engine through the control systems that manage its operation. With this understanding, you will be able to derive your own set of improvement criteria that could be made to address the limitations of current engine technology.

**Instructor: W. Mark McVea**



**Registration Information:**

**Fees – List:** \$395; **SAE Members – Classic:** \$356;  
**Premium:** \$336; **Elite:** \$316  
.4 CEUs

### Part of the Engine Technology Webinar Series

Displacement on Demand (DoD) Webinar – [www.sae.org/pdevent/WB1010](http://www.sae.org/pdevent/WB1010)

Variable Cam and Valve Timing (VCT) & (VVT) Webinar –  
[www.sae.org/pdevent/WB1011](http://www.sae.org/pdevent/WB1011) - see description on page 15

Variable Compression Ratio (VCR) Webinar –  
[www.sae.org/pdevent/WB1012](http://www.sae.org/pdevent/WB1012) - see description on page 16

Homogeneous Charge Compression Ignition (HCCI) Webinar – [www.sae.org/pdevent/WB1013](http://www.sae.org/pdevent/WB1013) - see description on page 12

## Interested in having one of these seminars at your company?

If so, please call SAE's Corporate Learning Solutions hotline at 1-724-772-8529, or complete the online form at [www.sae.org/corplearning](http://www.sae.org/corplearning)

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ACTAR APPROVED SEMINARS



WEBINARS

**New Diesel Engine Noise Control Webinar**



I.D.# WB1041 – [www.sae.org/pdevent/WB1041](http://www.sae.org/pdevent/WB1041)  
 Presented in two, 2-hour session, 11:30 a.m. – via telephone/internet  
 January 10 & 12, 2012 – 10:30 a.m. – 12:30 p.m. ET  
 July 31 & August 2, 2012 – 11:30 a.m. – 1:30 p.m. ET  
 See course description on page 27

**New Gasoline Direct Injection (GDI) Engines**

I.D.# C1009 – [www.sae.org/pdevent/C1009](http://www.sae.org/pdevent/C1009)  
 April 23-25, 2012 • Detroit, Michigan - Held in conjunction with the SAE 2012 World Congress  
 October 29-31, 2012 • Troy, Michigan

The quest for more efficient, smarter, and environmentally cleaner liquid-fueled spark ignition (SI) reciprocating engines is more alive and intense now than ever before. GDI SI engines have overcome many of the original limitations and are now becoming commonplace. This seminar will provide a comprehensive overview of GDI engines. Mixture preparation and the combustion process, with an emphasis on strategies for both homogenous and stratified charge operation and control, including issues related to the direct injection of gasoline into the combustion chamber, and fuel injection system requirements for optimal spray characteristics will be explored. Emission of pollutants, fuel economy and effects of some key design and operating parameters will also be covered. The seminar concludes with an overview of a select list of production and prototype GDI engines.

**Instructor: Bruce Chehroudi**

**i Registration Information:**  
**Fees – List:** \$1,595; **SAE Members – Classic:** \$1,436;  
**Premium:** \$1,356; **Elite:** \$1,276  
 2.0 CEUs

*“It covers every possible attendee, from the one that wants only an overview to the one that needs the most deep detail of GDI engine. Worth the trip I made from Greece.”*

**Savvas Savvakis**  
 PhD Researcher  
 Aristotle University of Thessaloniki

See information on the SAE Diesel Engine Technology Certificate on page 16.

**High Performance Engine Design and Development**

I.D.# C0725 – [www.sae.org/pdevent/C0725](http://www.sae.org/pdevent/C0725)  
 Upcoming open enrollment dates being scheduled. Please check the seminar webpage for future offerings.

This course will help you determine how to design a championship-winning racing engine including many of the key calculations that support the pursuit of power. The course begins with a review of the major advances in engine design, then explores the design of the engine’s primary systems and structures. It will explore how combustion works and how to analyze the major parameters involved in burning different fuels; and the design and optimization of inlet and exhaust systems. The day concludes with a discussion and opportunities to continue design exercises that will allow attendees to put into practice several of the key concepts learned throughout the seminar. Detailed course notes and illustrations are provided along with example calculations to enable the attendee to calculate the key parameters required in the design and development of racing engines.

**Instructor: Geoff Goddard**

**i Registration Information:**  
**Fees – List:** \$725; **SAE Members – Classic:** \$653;  
**Premium:** \$616; **Elite:** \$580  
 0.7 CEUs

**New Homogeneous Charge Compression Ignition (HCCI) Webinar**



I.D.# WB1013 – [www.sae.org/pdevent/WB1013](http://www.sae.org/pdevent/WB1013)  
 Presented in three, 2-hour sessions; 10:30 a.m. – 12:30 p.m. ET – via telephone/internet  
 February 6, 8 & 10, 2012

The objective of this Webinar is to describe the significance, technology and application of HCCI, as it applies to improvements in all facets of an automotive powertrain. This Webinar will provide an overview and historical perspective of HCCI technologies, a hardware review, and an explanation of the differences between gasoline and diesel based HCCI, as well as the chemistry. HCCI control and Kinetics of HCCI combustion will be covered. This webinar will expose you to the emerging technologies in HCCI design and operation that can significantly improve operational efficiencies. The fundamental science and implementation technology of the various HCCI systems will be presented.

**Instructor: W. Mark McVea**

**i Registration Information:**  
**Fees – List:** \$515; **SAE Members – Classic:** \$464;  
**Premium:** \$438; **Elite:** \$412  
 0.6 CEUs

**Part of the Engine Technology Webinar Series**

- Displacement on Demand (DoD) Webinar – [www.sae.org/pdevent/WB1010](http://www.sae.org/pdevent/WB1010) - see description on page 11
- Variable Cam and Valve Timing (VCT) & (VVT) Webinar – [www.sae.org/pdevent/WB1011](http://www.sae.org/pdevent/WB1011) - see description on page 15
- Variable Compression Ratio (VCR) Webinar – [www.sae.org/pdevent/WB1012](http://www.sae.org/pdevent/WB1012) - see description on page 16
- Homogeneous Charge Compression Ignition (HCCI) Webinar

## Improving Fuel Efficiency with Engine Oils

I.D.# C0914 – [www.sae.org/pdevent/C0914](http://www.sae.org/pdevent/C0914)

March 19-20, 2012 • Troy, Michigan

This seminar will highlight the role of lubricants in improving fuel efficiency and provide strategies for selecting the best oil for a given application. The course begins with a brief overview of the fuel consumption regulations and global perspective of passenger car lubricants and diesel oil specifications in North America, Europe and Asia. Limitations and advantages of various methods to measure fuel consumption in a variety of bench tests, dyno tests and actual vehicles will be presented.

**Instructor:** Ewa Bardasz



**Registration Information:**

**Fees – List:** \$1,225; **SAE Members – Classic:** \$1,103;

**Premium:** \$1,041; **Elite:** \$980

1.3 CEUs

## Internal Combustion Systems: HCCI, DoD, VCT/VVT, DI and VCR

I.D.# C0613 – [www.sae.org/pdevent/C0613](http://www.sae.org/pdevent/C0613)

March 28-30, 2012 • Troy, Michigan

October 8-10, 2012 • Troy, Michigan

This seminar will expose you to the emerging technologies in engine design and operation that can significantly improve operational efficiencies. The fundamental science and implementation technology of the various internal combustion engine systems will be presented. Attendees will learn how the Engine Control Module (ECM) uses information related to the operational status to implement real-time running efficiency of the engine. You will also learn how the ECM effects changes in the operation of the engine through the control systems that manage its operation. With this understanding, you will be able to derive your own set of improvement criteria that could be made to address the limitations of current engine technology.

**Instructor:** W. Mark McVea



**Registration Information:**

**Fees – List:** \$1,545; **SAE Members – Classic:** \$1,391;

**Premium:** \$1,313; **Elite:** \$1,236

2.0 CEUs

## Introduction to Commercial and Off-Road Vehicle Cooling Airflow Systems

I.D.# C0738 – [www.sae.org/pdevent/C0738](http://www.sae.org/pdevent/C0738)

March 12-13, 2012 • Troy, Michigan

September 24-25, 2012 • Troy, Michigan

See course description on page 33

*“Nice mix of theory and practical applications.”*

**Ryan Schott**  
Senior Engineer  
John Deere

## **New** High-Performance Differentials, Axles, & Drivelines

I.D.# C1113 – [www.sae.org/pdevent/C1113](http://www.sae.org/pdevent/C1113)

Upcoming open enrollment dates being scheduled. Please check the seminar webpage for future offerings.

This comprehensive seminar introduces participants to the function and interfaces of axles and their individual components. As we modify cars for street performance or all out race applications, it is important to know the trade-offs in the drivetrain system. The theory and practice of axle systems is introduced along with a hands-on style approach to repairing and modifying axles for high performance applications. For this hands-on approach, actual hardware will be reviewed in an informal setting.

**Instructor:** Joseph Palazzolo



**Registration Information:**

**Fees – List:** \$1,250; **SAE Members – Classic:** \$1,125;

**Premium:** \$1,062; **Elite:** \$1,000

1.3 CEUs

## Piston Ring Design/Materials

I.D.# 86009 – [www.sae.org/pdevent/86009](http://www.sae.org/pdevent/86009)

October 1-2, 2012 • Troy, Michigan

The purpose of this course is to provide an overview of the factors in the cylinder kit assembly of natural gas, gasoline, and diesel engines that affect oil consumption, ring and cylinder bore wear, and blow-by. This course includes background and the evolution of designs and materials currently employed in modern engines as well as providing an overview of computer models, designs, and material systems that can be utilized to optimize the performance of new engines. An overview of the trends in materials and designs employed in U.S., European and Japanese engines will be presented.

**Instructor:** Harold E. McCormick



**Registration Information:**

**Fees – List:** \$1,225; **SAE Members – Classic:** \$1,103;

**Premium:** \$1,041; **Elite:** \$980

1.3 CEUs

*“A very widespread background into piston/ring design and materials.”*

**Tyson Stewart**  
Associate Engineer  
Ricardo, Inc.

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[www.sae.org/corplearning](http://www.sae.org/corplearning)

## Powertrain Selection for Fuel Economy and Acceleration Performance



I.D.# C0243 – [www.sae.org/pdevent/C0243](http://www.sae.org/pdevent/C0243)

April 26-27, 2012 • Detroit, Michigan - Held in conjunction with the SAE 2012 World Congress

This seminar provides this fundamental understanding of the range of factors which influence vehicle performance through the development of mathematical models that describe the relevant physics and through the hands-on application of automotive test equipment. Attendees will also be introduced to software used to predict vehicle performance. The course begins with a discussion of the road load forces that act on the automobile (aerodynamic, rolling resistance, and gravitational) followed by a review of pertinent engine characteristics. This background information is then used to show how appropriate gear ratios for a vehicle transmission are selected and to develop models for predicting acceleration performance and fuel economy. The models form the basis for the computer software used to predict vehicle performance. Participants will also use an in-vehicle accelerometer, GPS fifth-wheel, and an OBDII scanner to measure vehicle performance.

**Instructors:** Craig J. Hoff & Gregory Davis



**Registration Information:**

**Fees – List:** \$1,265; **SAE Members – Classic:** \$1,139;  
**Premium:** \$1,075; **Elite:** \$1,012  
1.3 CEUs

*“Very good introductory course on the parameters that effect vehicle performance and fuel economy and how to optimize them.”*

**Brian Mace**  
Senior Engineer  
Honda R&D Americas, Inc.

## Race Engine Calibration for Optimal Performance

I.D.# C0602 – [www.sae.org/pdevent/C0602](http://www.sae.org/pdevent/C0602)

Upcoming open enrollment dates being scheduled. Please check the seminar webpage for future offerings.

This course provides a practical introduction to ECMs, including the uses for the various sensors. It also covers the specific methods used to incorporate the various sensor signals into the ECM’s control systems for the fuel injection rate, fuel injection timing, and ignition timing. Background information will include an understanding of the desired air/fuel ratio and optimum ignition timing. While examples are tailored around the application of the ECM to Formula SAE race engines, this course is useful for improving any engineer’s understanding of the functions of the ECM for other types of race engines as well as production engines.

**Instructor:** Ronald D. Matthews



**Registration Information:**

**Fees – List:** \$725; **SAE Members – Classic:** \$653;  
**Premium:** \$616; **Elite:** \$580  
0.7 CEUs

*“Excellent instructor and study material.”*

**Robert Steeneck**  
Engine Calibration Engineer (Retired)  
Ford Motor Co. Truck Engine Engineering

Also available as a SAE-Learning opportunity – [www.sae.org/e-seminars/raceenginecalibration](http://www.sae.org/e-seminars/raceenginecalibration)

## Racecar Data Acquisition and Analysis

I.D.# C0829 – [www.sae.org/pdevent/C0829](http://www.sae.org/pdevent/C0829)

Upcoming open enrollment dates being scheduled. Please check the seminar webpage for future offerings.

This two day seminar covers the latest available technologies and teaches the participants how to analyze the data logging system’s output and convert this knowledge into a key advantage on the racetrack. The seminar begins with a general introduction into data acquisition and measurement technology. The participants will then learn how to analyze the driver activities and use this analysis to improve driver performance. Vehicle performance analysis is extensively covered with an emphasis on vehicle balance, stability, wheel loads and weight transfer, aerodynamics and shock absorbers. The seminar concludes with the application of simulation software within the data logging environment. Numerous practical examples will be provided and the participants will receive detailed course notes and illustrations.

**Instructor:** Jörg Segers



**Registration Information:**

**Fees – List:** \$1,305; **SAE Members – Classic:** \$1,175;  
**Premium:** \$1,109; **Elite:** 1,044  
1.3 CEUs

## Selective Catalytic Reduction for Diesel Engines



I.D.# C0913 – [www.sae.org/pdevent/C0913](http://www.sae.org/pdevent/C0913)

May 7-8, 2012 • Troy, Michigan  
September 17-18, 2012 • Troy, Michigan  
November 12-13, 2012 • Norwalk, California

This seminar will begin with an explanation of NOx formation in diesel engines and in-cylinder methods for reducing these emissions. The aftertreatment systems for NOx reduction will be explained and the advantages and disadvantages of these emission reduction technologies will be discussed. In this two-day seminar, the primary focus is on urea SCR and its technology will be fully examined. The important chemical reactions and methods for improving SCR performance by encouraging desirable reactions and avoiding undesirable reactions are explained. Additionally, the components and control of a urea SCR system are detailed and the necessary sensors for its control are described. The SAE paper Laboratory Testing of Urea-SCR Formulations to Meet Tier 2 Bin 5 Emissions is included in the course materials.

**Instructor:** Magdi Khair



**Registration Information:**

**Fees – List:** \$1,245; **SAE Members – Classic:** \$1,121;  
**Premium:** \$1,058; **Elite:** \$996  
1.3 CEUs

## The Basics of Internal Combustion Engines



I.D.# C0103 – [www.sae.org/pdevent/C0103](http://www.sae.org/pdevent/C0103)

March 8-9, 2012 • Troy, Michigan  
October 11-12, 2012 • Troy, Michigan

In your profession, an educated understanding of internal combustion engines is required, not optional. This two-day technology survey seminar covers the most relevant topics - ranging from the chemistry of combustion to the kinematics of internal components of the modern internal combustion engine - for maximum comprehension. Attendees will gain a practical, hands-on approach to the basics of the most common designs of internal combustion engines, as they apply to the gaseous cycles, thermodynamics and heat transfer to the major components, and the design theories that embody these concepts.

**Instructor: W. Mark McVea**



**Registration Information:**

**Fees – List:** \$1,245; **SAE Members – Classic:** \$1,121;  
**Premium:** \$1,058; **Elite:** \$996  
1.3 CEUs

*“The course is well-designed and expertly taught. It far exceeded my expectations and is a great introduction to internal combustion engines.”*

**Matt Jackson**

Manager

Southwest Research Institute

Also available as a SAE-Learning opportunity –  
[www.sae.org/e-seminars/icengines](http://www.sae.org/e-seminars/icengines)

## **New** Turbocharging for Fuel Economy and Emissions Webinar



I.D.# WB1018 – [www.sae.org/pdevent/WB1018](http://www.sae.org/pdevent/WB1018)

Presented in two, 2-hour sessions – via telephone/internet

May 30 & June 1, 2012 - 10:30 a.m. – 12:30 p.m. ET  
October 30 & November 1, 2012 - 11:30 a.m. – 1:30 p.m. ET

This webinar will explore turbocharging for gasoline and diesel (heavy and light duty) engines, including the fundamentals of turbocharging, design features, performance measures, and matching and selection criteria. It will discuss the interaction between turbocharging and engine systems and the impact on performance, fuel economy and emissions. Developments in turbocharging technology such as variable geometry mechanisms, two-stage and sequential (series & parallel) turbocharging, EGR including low pressure loop, high pressure loop and mixed mode systems and novel turbocharging systems will be described using figures and data.

**Instructor: S. M. Shahed and Arjun D. Tuteja**



**Registration Information:**

**Fees – List:** \$395; **SAE Members – Classic:** \$356;  
**Premium:** \$336; **Elite:** \$316  
0.4 CEUs

*“A great introduction to the basics of turbo operation and how to select an appropriate turbocharger based on engine characteristics.”*

**Andrew Giallonardo**

Program Engineer

Environment Canada

## Turbocharging Internal Combustion Engines



I.D.# C0314 – [www.sae.org/pdevent/C0314](http://www.sae.org/pdevent/C0314)

March 21-23, 2012 • Troy, Michigan  
July 18-20, 2012 • Troy, Michigan

This seminar covers the basic concepts of turbocharging of gasoline and diesel engines (light and heavy duty), including turbocharger matching and charge air and EGR cooling, as well as associated controls. The limitations and future possibilities of today’s systems will be covered, as well as details on how emerging technologies will impact engine/vehicle performance. The seminar’s primary focus is on the turbocharger-engine interface (subjects such as matching, benefits, limitations, and new technologies) rather than detailed turbocharger aerodynamics and design. Advanced technologies such as variable geometry and multi-stage turbocharging, high and low pressure loop EGR systems, assisted turbocharging and turbo compounding are discussed. Students will have the opportunity to perform hands-on exercises to gain an appreciation of parametric effects in a wide range of engines.

**Instructor: Arjun D. Tuteja and S. M. Shahed**



**Registration Information:**

**Fees – List:** \$1,645; **SAE Members – Classic:** \$1,481;  
**Premium:** \$1,398; **Elite:** \$1,316  
2.0 CEUs

## Variable Cam and Valve Timing (VCT) & (VVT) Webinar



I.D.# WB1011 – [www.sae.org/pdevent/WB1011](http://www.sae.org/pdevent/WB1011)

Presented in three, 2-hour sessions, 10:30 a.m. – 12:30 p.m. ET – via telephone/internet

January 16, 18 & 20, 2012

This webinar will discuss the general theory and potential system benefit of varying valve timing and compare the differences between Variable Cam Timing (VCT) and Variable Valve Timing (VVT). It will cover the historical mechanisms to implement VCT and VVT systems, compared to the modern approaches. If you have a practical understanding of internal combustion technology and systems, you will gain an appreciation for VCT and VVT - its application to the automotive marketplace and its significance as it applies to improvements in the engine and overall powertrain operations.

**Instructor: W. Mark McVea**



**Registration Information:**

**Fees – List:** \$515; **SAE Members – Classic:** \$464;  
**Premium:** \$438; **Elite:** \$412  
0.6 CEUs

### Part of the Engine Technology Webinar Series

Displacement on Demand (DoD) Webinar –  
[www.sae.org/pdevent/WB1010](http://www.sae.org/pdevent/WB1010) - see description on page 11

Variable Cam and Valve Timing (VCT) & (VVT) Webinar –  
[www.sae.org/pdevent/WB1011](http://www.sae.org/pdevent/WB1011)

Variable Compression Ratio (VCR) Webinar – [www.sae.org/pdevent/WB1012](http://www.sae.org/pdevent/WB1012)  
- see description on page 16

Homogeneous Charge Compression Ignition (HCCI) Webinar –  
[www.sae.org/pdevent/WB1013](http://www.sae.org/pdevent/WB1013) - see description on page 12

**New** Variable Compression Ratio (VCR) Webinar



I.D.# WB1012 – [www.sae.org/pdevent/WB1012](http://www.sae.org/pdevent/WB1012)  
Presented in two, 2-hour sessions, 10:30 a.m. – 12:30 p.m. ET – via telephone/internet

January 31 & February 2, 2012

The objective of this webinar is to describe all the significance, technology and application of Variable Compression Ratio (VCR) as it applies to improvements in all facets of an automotive powertrain. The webinar will present the theoretical improvements to engine system performance and efficiency and the historical and modern approaches to VCR systems. An overview of direct injection of gasoline and diesel fuels will be presented, including the historical perspective of DI technologies. Participants with a practical understanding of internal combustion technology and systems will gain an appreciation for VCR and its application to the automotive marketplace. This webinar will expose you to the emerging technologies in VCR operation that can significantly improve operational efficiencies.

**Instructor:** W. Mark McVea

**i** **Registration Information:**  
**Fees – List:** \$395; **SAE Members – Classic:** \$356;  
**Premium:** \$336; **Elite:** \$316  
0.4 CEUs

**Part of the Engine Technology Webinar Series**

Displacement on Demand (DoD) Webinar – [www.sae.org/pdevent/WB1010](http://www.sae.org/pdevent/WB1010) - see description on page 11

Variable Cam and Valve Timing (VCT) & (VVT) Webinar – [www.sae.org/pdevent/WB1011](http://www.sae.org/pdevent/WB1011) - see description on page 15

Variable Compression Ratio (VCR) Webinar – [www.sae.org/pdevent/WB1012](http://www.sae.org/pdevent/WB1012)

Homogeneous Charge Compression Ignition (HCCI) Webinar – [www.sae.org/pdevent/WB1013](http://www.sae.org/pdevent/WB1013) - see description on page 12

**SAE Diesel Technology Certificate Program**

SEMINARS

This five-course package is designed to equip engineers with a solid understanding of diesel engines, emissions and after treatment strategies, and related components including fuel injection, and air management. The program design requires completion of courses that address these areas and then allows for further depth in after treatment technologies through a menu of electives.

Completing the Diesel Technology Certificate equates to eight graduate credits towards the SAE/Kettering University 20-credit Certificate in Automotive Systems and Kettering's 40-credit M.S. in Mechanical Engineering. Visit [www.sae.org/collegetcredit](http://www.sae.org/collegetcredit) for more information..

For the complete list of required and elective courses and additional information on enrolling in this or any SAE certificate program, visit [www.sae.org/certificate](http://www.sae.org/certificate).



**Automotive Fuel Cell Systems**

I.D.# C0112 – [www.sae.org/pdevent/C0112](http://www.sae.org/pdevent/C0112)

Upcoming open enrollment dates being scheduled. Please check the seminar webpage for future offerings.

Fuel cell technology promises to revolutionize the automotive industry, offering tremendous potential to increase efficiency and reduce emissions for many types of vehicles. This course will provide a detailed understanding of the processes, subsystems and vehicle characteristics relating to fuel cell systems for automotive applications. The course starts with the principles of fuel cells and electrochemical conversion of hydrogen. Each of the supporting subsystems needed for operation of the fuel cell stack is developed to determine the overall fuel cell system efficiency. Vehicle system integration, performance and fuel economy are then related to fuel cell system characteristics. Attendees will receive the text *Fuel Cell Systems Explained*, written by J. Larminie and A. Dicks.

**Instructor:** Douglas J. Nelson

**i** **Registration Information:**  
**Fees – List:** \$1,695; **SAE Members – Classic:** \$1,526;  
**Premium:** \$1,441; **Elite:** \$1,356  
2.0 CEUs

*“Everything and anything you would want to know about automotive fuel cell application.”*

**John Wehrly**  
Mechanical Engineer  
U.S. Environmental Protection Agency

**Fundamentals of Hybrid Electric Vehicles**

I.D.# C0511 – [www.sae.org/pdevent/C0511](http://www.sae.org/pdevent/C0511)

Upcoming open enrollment dates being scheduled. Please check the seminar webpage for future offerings.

This three-day seminar will cover the fundamentals of HEV (hybrid electric vehicles). In an easy-to-understand format, the course will explain the engineering philosophy of HEVs, the component selection and design, modeling, and control of HEVs. Some existing HEV models such as the Toyota Prius, Honda Civic, Mercury Mariner, Saturn VUE and Camry will be used as case studies.

**Instructor:** Abul Masrur and Chris Mi

**i** **Registration Information:**  
**Fees – List:** \$1,645; **SAE Members – Classic:** \$1,481;  
**Premium:** \$1,398; **Elite:** \$1,316  
2.0 CEUs

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WEBINARS

**New** Hybrid and Electric Vehicle Engineering Academy

I.D.# ACAD06 – [www.sae.org/pdevent/ACAD06](http://www.sae.org/pdevent/ACAD06)

May 14-18, 2012 • Troy, Michigan  
December 3-7, 2012 • Troy, Michigan

The Hybrid and Electric Vehicle Engineering Academy covers hybrid and electric vehicle engineering concepts, theory, and applications relevant to HEV, PHEV, EREV, and BEV for the passenger car industry. While the theory and concepts readily apply to the commercial vehicle industry as well, the examples and applications used will apply primarily to the passenger car industry.

**Instructor(s):** Saeed Siavoshani, Mark A. Benvenuto, Rich Byczek, Alexandra Cattelan, G. Abbas Nazri, Tom O'Hara, Gregory Plett, Mark Schumack, Robert Spotnitz, Tom Stoltz, David Turner

**i** **Registration Information:**  
**Fees – List:** \$3,345; **SAE Members – Classic:** \$3,011;  
**Premium:** \$2,843; **Elite:** \$2,676  
4.0 CEUs

Basic Hybrid and Electric Vehicle Safety Webinar



I.D.# C0904 – [www.sae.org/pdevent/C0904](http://www.sae.org/pdevent/C0904)  
*Presented in one, 2-hour session – 11:30 a.m. – 1:30 p.m. ET – via telephone/internet*  
May 24, 2012

This 120-minute webinar reviews safety concerns and precautions related to high-voltage circuits present in hybrid, plug-in hybrid, electric, and fuel cell hybrid vehicles. HV circuits are discussed in general to provide an understanding of “where the risk lies”. The effects of electrical current on the human body are summarized and existing protective measures, along with the standards that govern such measures, are described. Specific issues related to vehicle development, service, and operation are explained, along with onboard fault detection systems used to protect individuals from electrical injury. A general understanding of electrical and mechanical engineering is helpful, but is not required.

**Instructor:** Jack Rosebro

**i** **Registration Information:**  
**Fees – List:** \$245; **SAE Members – Classic:** \$221;  
**Premium:** \$208; **Elite:** \$196  
0.2 CEUs

**Part of the Hybrid Technology Webinar series:**

- Introduction to Hybrid Powertrains Webinar – [www.sae.org/pdevent/C0903](http://www.sae.org/pdevent/C0903) - see description on page 19
- Basic Hybrid and Electric Vehicle Safety Webinar – [www.sae.org/pdevent/C0904](http://www.sae.org/pdevent/C0904)
- Plug-In Hybrids: Opportunities and Challenges Webinar – [www.sae.org/pdevent/C0905](http://www.sae.org/pdevent/C0905) - see description on page 17
- Hybrid and Electric Vehicles: Current Production, Future Strategies – [www.sae.org/pdevent/C0906](http://www.sae.org/pdevent/C0906) - see description on page 17

Hybrid and Electric Vehicles: Current Production, Future Strategies Webinar



I.D.# C0906 – [www.sae.org/pdevent/C0906](http://www.sae.org/pdevent/C0906)  
*Presented in one, 2-hour session, 11:30 a.m. – 1:30 p.m. ET – via telephone/internet*  
May 31, 2012

This two-hour webinar will highlight the passenger, light-duty, and heavy-duty hybrid and electric vehicles that are currently in production, offered for sale, or planned for near-term production. Asian, European, and North American manufacturers of hybrid and electric vehicles will be reviewed. Tier 1 suppliers of major hybrid and electric vehicle components will be covered as well.

**Instructor:** Jack Rosebro

**i** **Registration Information:**  
**Fees – List:** \$245; **SAE Members – Classic:** \$221;  
**Premium:** \$208; **Elite:** \$196  
.2 CEUs

**Part of the Hybrid Technology Webinar series:**

- Introduction to Hybrid Powertrains Webinar – [www.sae.org/pdevent/C0903](http://www.sae.org/pdevent/C0903) - see description on page 19
- Basic Hybrid and Electric Vehicle Safety Webinar – [www.sae.org/pdevent/C0904](http://www.sae.org/pdevent/C0904) - see description on page 17
- Plug-In Hybrids: Opportunities and Challenges Webinar – [www.sae.org/pdevent/C0905](http://www.sae.org/pdevent/C0905) - see description on page 19
- Hybrid and Electric Vehicles: Current Production, Future Strategies – [www.sae.org/pdevent/C0906](http://www.sae.org/pdevent/C0906)

Introduction to Hybrid and Electric Vehicle Battery Systems

I.D.# C0626 – [www.sae.org/pdevent/C0626](http://www.sae.org/pdevent/C0626)  
April 25-26, 2012 • Detroit, Michigan - *Held in conjunction with the SAE 2012 World Congress*  
August 8-9, 2012 • Troy, Michigan  
November 12-13, 2012 • Norwalk, California

This seminar will introduce participants to the concepts of hybrid vehicles, their missions and the role of batteries in fulfilling those requirements. Battery topics including limitations, trends in hybrid development, customer wants and needs, battery system development timelines, comparison of electrochemistries and safety will be examined. Current offerings, cost factors, pack design considerations and testing will also be reviewed. Students will have an opportunity to perform a battery pack analysis exercise using a real world application and are requested to bring a calculator to class.

**Instructor:** Erik Spek

**i** **Registration Information:**  
**Fees – List:** \$1,265; **SAE Members – Classic:** \$1,139;  
**Premium:** \$1,075; **Elite:** \$1,012  
1.3 CEUs


**New** Hybrid Vehicle Systems Integration

I.D.# C1125 – [www.sae.org/pdevent/C1125](http://www.sae.org/pdevent/C1125)

February 20, 2012 • San Diego, California - *Held in conjunction with the SAE 2012 Hybrid Vehicle Technologies Symposium*  
 April 27, 2012 • Detroit, Michigan - *Held in conjunction with the SAE 2012 World Congress*  
 July 16, 2012 • Troy, Michigan  
 November 14, 2012 • Troy, Michigan

Integration of hybrid electric components into a vehicle can be significantly complex. Detailed modeling, analysis, design and development are required to optimize the tradeoffs and balances between energy management, torque management, vehicle performance, vehicle drivability and vehicle safety. Management of component and system controls architecture and software integration is an increasingly involved and convoluted task. This seminar will address: how to establish essential vehicle requirements; development considerations for various vehicle systems and production/certification requirements. A strong focus will be placed on understanding the balances and tradeoffs associated with a hybrid electric system.

**Instructor:** Alexandra Cattelan

 **Registration Information:**  
**Fees – List:** \$725; **SAE Members – Classic:** \$653;  
**Premium:** \$616; **Elite:** \$580  
 0.7 CEUs


**New** Introduction to NVH Aspects of Hybrid and Electric Vehicles

I.D.# C1128 – [www.sae.org/pdevent/C1128](http://www.sae.org/pdevent/C1128)

April 24, 2012 • Detroit, Michigan - *Held in conjunction with the SAE 2012 World Congress*  
 August 24, 2012 • Troy, Michigan  
 November 7 2012 • Troy, Michigan

This seminar introduces participants to basic NVH principles and unique NVH challenges encountered in the development of HEV, ReEV, and EV including engine start/stop behavior, electric motor whine, driveline NVH, body structure, influence of noise from accessories, and sound quality development, as well as potential countermeasures.

**Instructor:** Kiran Govindswamy

 **Registration Information:**  
**Fees – List:** \$725; **SAE Members – Classic:** \$653;  
**Premium:** \$616; **Elite:** \$580  
 0.7 CEUs

Introduction to Hydraulic Hybrid Systems for Road Vehicles

I.D.# C0833 – [www.sae.org/pdevent/C0833](http://www.sae.org/pdevent/C0833)

February 15-16, 2012 • Troy, Michigan  
 September 20-21, 2012 • Troy, Michigan

In this two-day seminar, hydraulic hybrid vehicle systems and their potential will be examined using model based evaluations. This will include an evaluation and comparison of hybrid configurations as well as the introduction of components used in these hydraulic hybrid systems. Also provided will be details on how hydraulic systems are designed and integrated into vehicles, including interactions with braking systems and various other vehicle systems. Recent developments in hydraulic machines and an update on the component technology needed to implement these solutions will also be presented.

**Instructor:** Simon J. Baseley

 **Registration Information:**  
**Fees – List:** \$1,225; **SAE Members – Classic:** \$1,103;  
**Premium:** \$1,041; **Elite:** \$980  
 1.3 CEUs

*“This is an outstanding course summarizing an emerging technology with a view to the future.”*

**Ron Huston**

Professor

University of Cincinnati


**New** Safe Handling of High Voltage Battery Systems

I.D.# C1019 – [www.sae.org/pdevent/C1019](http://www.sae.org/pdevent/C1019)

April 27, 2012 • Detroit, Michigan - *Held in conjunction with the SAE 2012 World Congress*  
 August 10, 2012 • Troy, Michigan  
 November 14, 2012 • Norwalk, California

This seminar will introduce participants to the risks encountered in handling high voltage battery systems and their component parts. With the understanding of these risks, the seminar will then address how to raise risk awareness and then methods of dealing with those risks. The outcome of this seminar should be improved avoidance of personal injury, reduced risk of reputation loss and product liability actions and reduced risk of loss of property and time. Students will have an opportunity to participate in a real world battery handling case study scenario in which they will identify solutions for potential risk situations.

**Instructor:** Erik J. Spek

 **Registration Information:**  
**Fees – List:** \$725; **SAE Members – Classic:** \$653;  
**Premium:** \$616; **Elite:** \$580  
 0.7 CEUs

## Introduction to Hybrid Powertrains Webinar



I.D.# C0903 – [www.sae.org/pdevent/C0903](http://www.sae.org/pdevent/C0903)  
Presented in one, 2-hour session, 11:30 a.m. – 1:30 p.m. ET – via telephone/internet

May 22, 2012

Although hybrid powertrains have been on the market for little more than a decade, hybridization has quickly become one of the most successful alternative powertrains available today. Some OEMs estimate that up to 80% of their light-duty vehicles will require some level of hybridization to meet upcoming CAFE regulations in the United States. Additional market drivers, such as California's greenhouse gas legislation (now adopted or in process in 20 US states and two Canadian provinces) and a possible global agreement on greenhouse gas production at the end of 2009 may help to accelerate the process. Basic information on hybrids is scattered among information sources, and is often difficult to synthesize. In this two-hour webinar, energy storage systems, inverters, motor-generators, and DC-DC converters are explained, as well as design considerations for both light-duty and heavy-duty vehicle powertrains and developing trends such as plug-in, flywheel and hydraulic hybrids.

Instructor: Jack Rosebro



**Registration Information:**  
**Fees – List:** \$245; **SAE Members – Classic:** \$221;  
**Premium:** \$208; **Elite:** \$196  
0.2 CEUs

*"This course is a good method to learn the very basics of hybrid vehicle architecture."*

**Brad Brodie**

Senior Engineer, Thermal Systems R&D  
DENSO

*Introduction to Hybrid Powertrains Webinar and Plug-In Hybrids: Opportunities and Challenges Webinar are part of the Hybrid Technology Webinar series:*

Introduction to Hybrid Powertrains Webinar – [www.sae.org/pdevent/C0903](http://www.sae.org/pdevent/C0903)

Basic Hybrid and Electric Vehicle Safety Webinar – [www.sae.org/pdevent/C0904](http://www.sae.org/pdevent/C0904) - see description on page 17

Plug-In Hybrids: Opportunities and Challenges Webinar – [www.sae.org/pdevent/C0905](http://www.sae.org/pdevent/C0905)

Hybrid and Electric Vehicles: Current Production, Future Strategies – [www.sae.org/pdevent/C0906](http://www.sae.org/pdevent/C0906) - see description on page 17

## Plug-in Hybrids: Opportunities and Challenges Webinar



I.D.# C0905 – [www.sae.org/pdevent/C0905](http://www.sae.org/pdevent/C0905)  
Presented in one, 2-hour session, 11:30 a.m. – 1:30 p.m. ET – via telephone/internet

May 29, 2012

The path to commercialization of plug-in hybrids is likely to require complex interactions between OEMs, battery manufacturers, electric utilities, and government, yet the plug-in hybrid is a still-developing technology. How do plug-in hybrids (PHEVs) differ from conventional hybrids? What are the advantages and challenges for vehicle manufacturers, public utilities, energy and environmental concerns, and end-users? What is the current state of plug-in hybrid development? Those unfamiliar with PHEV or vehicle-to-grid (V2G) technology, yet whose job will be impacted by plug-in hybrid vehicles in the future, will benefit from this two-hour webinar.

Instructor: Jack Rosebro



**Registration Information:**  
**Fees – List:** \$245; **SAE Members – Classic:** \$221;  
**Premium:** \$208; **Elite:** \$196  
0.2 CEUs

## **New** Plug-In Vehicle Conductive Charging, SAE J1772 Explained Webinar

I.D.# WB1046 – [www.sae.org/pdevent/WB1046](http://www.sae.org/pdevent/WB1046)  
Presented in one, 90-minute & one, 2-hour session – via telephone/internet

March 6-8, 2012 - check website for session times

August 8-10, 2012 - check website for session times

November 6-8, 2012 - check website for session times

This course will uncover the details behind the SAE J1772 conductive charging interface. It will discuss overall plug-in vehicle charge strategy, electrical safety strategy, electrical and physical interface requirements and control strategy. Included in the course is background related to the National Electrical Code, third party listing requirements and necessary EMC and regulatory compliance. Upon completion of the webinar, the student will have enhanced knowledge of the properties of the Control Pilot and Proximity circuits and the necessary vehicle and Electric Vehicle Supply Equipment (EVSE) control responses necessary for SAE J1772 compliance job will be impacted by plug-in hybrid vehicles in the future, will benefit from this two-hour webinar.

Instructor: Gery J. Kissel



**Registration Information:**  
**Fees – List:** \$385; **SAE Members – Classic:** \$347;  
**Premium:** \$327; **Elite:** \$308  
0.3 CEUs

### KEY



CERTIFICATE PROGRAM



ACTAR APPROVED SEMINARS



WEBINARS

## Principles of Electric Drives Webinar



I.D.# WB0941 – [www.sae.org/pdevent/WB0941](http://www.sae.org/pdevent/WB0941)  
Presented in four, 2-hour session, – via telephone/internet

Upcoming open enrollment dates are being scheduled. Please check the webinar webpage for future offerings.

Industry professionals who are looking for a general understanding of the structure and components of vehicular electric drives will benefit from this course, which will cover theory, design, operation, and diagnostics of all major components used in electric drives (battery packs, inverters, motor-generators, DC-DC converters, and charging apparatus) as applied to all forms of vehicles, including charge-sustaining hybrids, plug-in hybrids, fuel cell hybrids, and battery electric vehicles. Battery chemistry, charging systems, power conversion, switching techniques, and traction motor construction will be discussed in detail.

**Instructor: Jack Rosebro**



**Registration Information:**

**Fees – List:** \$585; **SAE Members – Classic:** \$527;  
**Premium:** \$497; **Elite:** \$468  
0.8 CEUs

*“Jack Rosebro has excellent background and insight into electric drive technology and takes great care to answer questions thoroughly.”*

**Kevin Walsh**  
Staff Engineer  
Fisker Automotive Inc.

## **New** Selecting the Optimal Battery Chemistry for HEV, PHEV, and EV Applications

I.D.# C1133 – [www.sae.org/pdevent/C1133](http://www.sae.org/pdevent/C1133)

March 6-7, 2012 • Troy, Michigan  
September 6-7, 2012 • Troy, Michigan

This course will cover advantages and disadvantages of various battery chemistries for different transportation applications, such as mild hybrids, extended range and plug-in, as well as full electric vehicles. Fundamentals of battery chemistries from materials science and engineering perspectives will be discussed. Potentials and limitations of various battery components, i.e. positive electrodes, negative electrodes, different classes of electrolytes, various engineering and science aspects of binders and conductive diluents, as well as current collectors will also be covered. Cell designs for different battery chemistries, as well as potential new battery designs on hybrid electrodes necessary to meet different vehicle performances will also be covered.

**Instructor: G. Abbas Nazri**



**Registration Information:**

**Fees – List:** \$1,225; **SAE Members – Classic:** \$1,103;  
**Premium:** \$1,041; **Elite:** \$980  
1.3 CEUs

## Advanced Diesel Particulate Filtration Systems



I.D.# C0502 – [www.sae.org/pdevent/C0502](http://www.sae.org/pdevent/C0502)

April 26-27, 2012 • Detroit, Michigan - Held in conjunction with the SAE 2012 World Congress  
November 29-30, 2012 • Troy, Michigan

**See course description on page 10.**

*“Excellent coverage of an emerging technology by a real expert in the area.”*

**Henry Gysling**  
Technology Director  
Air Flow Catalyst Systems

## Alternative Fuels: Impact on SI and CI Fuel Systems, Distribution and Storage

I.D.# C0729 – [www.sae.org/pdevent/C0729](http://www.sae.org/pdevent/C0729)

May 15-16, 2012 • Troy, Michigan

This course is a primer for those professionals who desire to learn how new fuel and fuel blends could potentially impact the operation and reliability of engines powered by oxygenated gasoline, desulfurized diesel fuel and biodiesel fuel blends. Attendees will learn the basics about fuel chemistries, material compatibility and how the increased susceptibility to water and microorganisms can affect equipment operation and reliability.

**Instructor: Ed English & Howard Chesneau**



**Registration Information:**

**Fees – List:** \$1,225; **SAE Members – Classic:** \$1,103;  
**Premium:** \$1,041; **Elite:** \$980  
1.3 CEUs

## Designing On-Board Diagnostics for Light and Medium Duty Emissions Control Systems

I.D.# C0707 – [www.sae.org/pdevent/C0707](http://www.sae.org/pdevent/C0707)

August 1-3, 2012 • Troy, Michigan  
December 12-14, 2012 • Troy, Michigan

**See course description on page 3.**

## Emissions-Related OBD Systems: A Design Overview

I.D.# C0708 – [www.sae.org/pdevent/C0708](http://www.sae.org/pdevent/C0708)

April 24, 2012 • Detroit, Michigan - Held in conjunction with the SAE 2012 World Congress

**See course description on page 4.**

## Evaporative and Refueling Emission Control

I.D.# C0928 – [www.sae.org/pdevent/C0928](http://www.sae.org/pdevent/C0928)

June 28-29, 2012 • Troy, Michigan  
December 17-18, 2012 • Troy, Michigan

This comprehensive seminar introduces the participants to the principles of gasoline evaporative fuel vapor generation from the vehicle fuel tank, fuel vapor storage in activated carbon canisters, and fuel vapor desorption and consumption in engine combustion. The seminar begins with an analysis of gasoline and gasoline/ethanol blends and estimation of their vapor pressures and vapor generation. In-depth analysis of various vapor generations as a function of fuel properties and ambient conditions will be presented. Activated carbon canister design, OBD II leak detection, hydrocarbon permeation, and CARB and EPA evaporative test procedures will also be covered. Participants will have the opportunity to apply the knowledge gained by designing a sample evaporative and refueling emissions control system in class. Participants are asked to bring a calculator for use in classroom exercises.

**Instructor: Sam Reddy**



**Registration Information:**  
**Fees – List:** \$1,225; **SAE Members – Classic:** \$1,103;  
**Premium:** \$1,041; **Elite:** \$980  
1.3 CEUs

## Exhaust Flow Performance and Pressure Drop of Exhaust Components and Systems



I.D.# C0235 – [www.sae.org/pdevent/C0235](http://www.sae.org/pdevent/C0235)

April 23, 2012 • Detroit, Michigan - *Held in conjunction with the SAE 2012 World Congress*  
October 26, 2012 • Troy, Michigan

This course will help you to understand the motion of exhaust flow in both gasoline and diesel emission control components including flow-through and wall-flow devices such as catalytic converters, NOx adsorbers, diesel oxidation catalysts, diesel particulate filters as well as flow through the overall exhaust system. Discussions will also cover: flow recirculation in inlet cones, flow maldistribution and its effect on conversion efficiency in flow throughs, non-uniform particulate deposit in diesel filters, and roots of non-uniformity in flow distribution due to exhaust system design such as bends.

**Instructor: Mansour Masoudi**



**Registration Information:**  
**Fees – List:** \$725; **SAE Members – Classic:** \$653;  
**Premium:** \$616; **Elite:** \$580  
0.7 CEUs

*“Class material supports practical applications and real world case studies. Instructor kept the course interesting!”*

**Steven Dropps**

Technical Lead EGR, Air, Intake, Exhaust System Design  
John Deere

## Fundamentals of Automotive Fuel Delivery Systems

I.D.# C0303 – [www.sae.org/pdevent/C0303](http://www.sae.org/pdevent/C0303)

May 17-18, 2012 • Troy, Michigan  
November 5-6, 2012 • Troy, Michigan

This course provides a basic yet thorough examination of technical issues involved in automotive gasoline and diesel fuel delivery. Participants will acquire a fundamental understanding of the current technology and requirement guidelines and apply some of the principles through an in-class project and exercises. Examples of frequently encountered technical issues of fuel delivery systems shall also be discussed. The course is designed to encourage discussion, insights, and possible solutions into the engineering problems encountered in the gasoline and diesel fuel delivery systems and components.

**Instructor: Dr. Xiaojian Tao**



**Registration Information:**  
**Fees – List:** \$1,225; **SAE Members – Classic:** \$1,103;  
**Premium:** \$1,041; **Elite:** \$980  
1.3 CEUs

## Motor Fuel: Technology, Performance, Testing, and Specifications

I.D.# 98003 – [www.sae.org/pdevent/98003](http://www.sae.org/pdevent/98003)

June 20-22, 2012 • Troy, Michigan

This three-day seminar will review the fundamentals of motor fuels, combustion and motor power generation. The primary content of the course provides a basic introduction to the technology, performance, evaluation, and specifications of current gasoline, diesel, and turbine fuels. The first day of the course begins with a brief review of the evolution of motor fuel through 100 years of performance and specification.

**Instructor: Kenneth Kipers**



**Registration Information:**  
**Fees – List:** \$1,645; **SAE Members – Classic:** \$1,481;  
**Premium:** \$1,398; **Elite:** \$1,316  
2.0 CEUs

*“Excellent seminar to relate motor fuels to vehicle performance, fuel economy and emissions.”*

**Andy Vaichekaskas**

Engineer, Vehicle Emissions  
Mitsubishi R&D of America

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1-724-772-8529 • [corplearn@sae.org](mailto:corplearn@sae.org)**

## Modern Fluids for Crankcase Engines: An Overview

I.D.# C0704 – [www.sae.org/pdevent/C0704](http://www.sae.org/pdevent/C0704)

August 13-14, 2012 • Troy, Michigan

This comprehensive seminar covers the latest developments in lubricating fluids technologies and explores the relationships between lubricating fluids and emissions, after-treatment devices, bio-fuels, and fuel economy. Fundamentals of crankcase lubrication, including the properties and performance requirements of global base stocks and lubricants will be covered. The seminar will further explore the need for lubricating systems to possess thermal and oxidative stability sufficient to withstand the rigors of low-heat-rejection, high performance diesel engines or other modern engines equipped with various emission control devices. Case studies will be utilized to demonstrate the existence of overlapping phenomena aimed at extending oil life and protecting key mechanical components.

**Instructor:** Ewa Bardasz



### Registration Information:

**Fees – List:** \$1,285; **SAE Members – Classic:** \$1,157;  
**Premium:** \$1,092; **Elite:** \$1,028  
1.3 CEUs

## Selective Catalytic Reduction for Diesel Engines



I.D.# C0913 – [www.sae.org/pdevent/C0913](http://www.sae.org/pdevent/C0913)

September 17-18, 2012 • Troy, Michigan

November 12-13, 2012 • Norwalk, California

See course description on page 14.

## SAE General Management and Leadership Certificate Program

SEMINARS

SAE has developed this certificate program that focuses on four core management and leadership competencies: management capability, team leadership, project management, and finance.

Upon completing all four courses, a certificate is awarded, recognizing completion of the General Management and Leadership Certificate Program.

The following courses are required:

- Managing Engineering & Technical Professionals
- Engineering Project Management
- Principles of Cost and Finance for Engineers
- Leading High Performance Teams or Successfully Working in Virtual Teams

For more information on the certificate program, visit  
[www.sae.org/contedu/certificate.htm](http://www.sae.org/contedu/certificate.htm)

**SAE International**

## Aerospace Program Management - It's More than Scheduling and Delivery

I.D.# C0818 – [www.sae.org/pdevent/C0818](http://www.sae.org/pdevent/C0818)

Upcoming open enrollment dates being scheduled. Please check the seminar webpage for future offerings.

This seminar is intended to introduce basic program management skills and techniques to first-line and mid-level leaders to help them comfortably and confidently assume their role and to aid in assuring program success. Areas of special concentration will include: role of project management, communication, interpersonal skills, schedule management, interfacing with other units, Task Scoping (Estimating, Pricing, Financial Measures, etc.), project management software use, compliance reporting, risk management and more. This seminar will include lecture, dialog, and case-study approaches. Active participation of the class attendees will ensure a dynamic baseline for learning and honing valuable skills.

**Instructor:** Drexel L. Rutledge



### Registration Information:

**Fees – List:** \$1,545; **SAE Members – Classic:** \$1,391;  
**Premium:** \$1,313; **Elite:** \$1,236  
2.0 CEUs

## Engineering Project Management



I.D.# 99003 – [www.sae.org/pdevent/99003](http://www.sae.org/pdevent/99003)

April 24-25, 2012 • Detroit, Michigan - Held in conjunction with the SAE 2012 World Congress

July 31-August 1, 2012 • Troy, Michigan

December 12-13, 2012 • Troy, Michigan

Project Management and Advanced Product Quality Planning (APQP) are two critical techniques used in product development in the mobility industry today. This seminar will bring these techniques together in an easy to understand format that goes beyond the typical concept of constructing timelines and project planning, by exploring not only the AIAG APQP process, but also specific aspects of PM processes. Students will gain a solid foundation in the essential principles of Project Management and APQP.

Students will immediately apply learned skills by taking a sample project through all phases of the Project Plan using actual industry documents. Realistic issues, problems and time constraints are introduced throughout the exercise to stimulate actual project concerns. The workshop is structured so that students must operate in teams and the time constraints allow students to see firsthand the effects of improper delegation of work assignments.

Attendees will receive a copy of the book, *PMBOK® 4 - Project Management Body of Knowledge* (4th edition) by the Project Management Institute (PMI).

**Instructor:** Angelo E. Mago



### Registration Information:

**Fees – List:** \$1,390; **SAE Members – Classic:** \$1,251;  
**Premium:** \$1,182; **Elite:** \$1,112  
1.3 CEUs

*"You leave with the satisfaction of learning/reinforcing new tasks and methods that can be used at the office immediately."*

**Richard Fanco**

Engineering Program Manager  
AM General Corporation

## Leading High Performance Teams



I.D.# C0410 – [www.sae.org/pdevent/C0410](http://www.sae.org/pdevent/C0410)

April 26-27, 2012 • Detroit, Michigan - *Held in conjunction with the SAE 2012 World Congress*

August 23-24, 2012 • Troy, Michigan

This course addresses teamwork and other “soft-side” factors that largely determine whether product development programs are successfully completed on schedule. The content is relevant for both OEMs and suppliers.

**Instructor: Joseph Doyle**



**Registration Information:**

**Fees – List:** \$1,225; **SAE Members – Classic:** \$1,103;

**Premium:** \$1,041; **Elite:** \$980

1.3 CEUs

*“Fountain of crucial concepts amid essential leadership techniques.”*

**D. Stern**

Vice President

Engineering Workhorse Custom Chassis

## Managing Engineering & Technical Professionals



I.D.# C0608 – [www.sae.org/pdevent/C0608](http://www.sae.org/pdevent/C0608)

April 25-27, 2012 • Detroit, Michigan - *Held in conjunction with the SAE 2012 World Congress*

July 23-25, 2012 • Troy, Michigan

November 7-9, 2012 • Troy, Michigan

Providing leadership for engineers is uniquely challenging, and the transition from working engineer to first-line technical supervisor is one of the most difficult career challenges that an engineer may face. First-time engineering supervisors and mid-level managers who wish to sharpen their skills and learn new techniques for guiding, coaching, and motivating working engineers, technicians, and designers will find this seminar valuable. A mix of lecture and attention-grabbing exercises are used to develop intense and lasting learning results.

**Instructor: Eric Timmis**



**Registration Information:**

**Fees – List:** \$1,645; **SAE Members – Classic:** \$1,481;

**Premium:** \$1,398; **Elite:** \$1,316

2.0 CEUs

*“This is the best possible way to invest 3 days in making an engineer into a manager.”*

**Steven M. Parrish**

Communications Lead Engineer  
General Dynamics/Land Systems

## Patent Law for Engineers



I.D.# 88007 – [www.sae.org/pdevent/88007](http://www.sae.org/pdevent/88007)

April 23, 2012 • Detroit, Michigan - *Held in conjunction with the SAE 2012 World Congress*

November 12, 2012 • Troy, Michigan

This information-packed seminar focuses on the intricacies of patents, patent infringement litigation and patent licensing. Attendees will explore the important subjects of obtaining U.S. and foreign patents, maintaining U.S. and foreign patent rights, enforcing patent rights, defending against patent rights asserted by competitors, and licensing patent rights for revenue. After this seminar, you will effectively understand patents and ways to protect your company’s valuable inventions. Your new knowledge will help your company maintain and enhance its position in the marketplace.

**Instructor: Russell E. Levine or David Callahan**



**Registration Information:**

**Fees – List:** \$725; **SAE Members – Classic:** \$653;

**Premium:** \$616; **Elite:** \$580

0.7 CEUs

*“Excellent introductory training in patent law for all engineers. A ‘must do’ for all engineers.”*

**John Allen**

Manager, Intellectual Property  
Honeywell

## Patent Litigation in the U.S.: What You Need to Know Webinar



I.D.# WB0940 – [www.sae.org/pdevent/WB0940](http://www.sae.org/pdevent/WB0940)

*Presented in two, 2-hour sessions, 11:30 a.m. – 1:30 p.m. ET – via telephone/internet*

May 21 & 23, 2012

This webinar will tell you what you need to know about U.S. patent litigation and will provide in-depth insights into the practical realities of patent disputes in the U.S. You will learn what’s involved in a patent case, including the issues that the patent owner has to prove, e.g. infringement, and the issues the accused infringer has to prove, e.g., invalidity. You will increase your awareness of the role of the judge and the jury in patent cases and you will hear about the increasing use of alternative dispute resolution mechanisms, such as mediation, to resolve patent disputes. Among other topics, this course also will increase your appreciation for the time it typically takes to go from the filing of a case to trial, and the fees and expenses associated with the case.

**Instructor: Russell E. Levine**



**Registration Information:**

**Fees – List:** \$395; **SAE Members – Classic:** \$356;

**Premium:** \$336; **Elite:** \$316

0.4 CEUs

**KEY**



CERTIFICATE PROGRAM



ACTAR APPROVED SEMINARS



WEBINARS

## Principles of Cost and Finance for Engineers



I.D.# C0828 – [www.sae.org/pdevent/C0828](http://www.sae.org/pdevent/C0828)

April 2-4, 2012 • Troy, Michigan  
October 24-26, 2012 • Troy, Michigan

In today's corporate environment of shrinking budgets, required structural cost reductions, sharing of global designs/services, and pricing pressures, it is critical that engineers possess a working knowledge of engineering economics principles. To fully understand the economic viability of engineering decisions, engineers need to find the appropriate balance between design alternatives, resulting costs, and impact on their enterprise. This seminar introduces participants to the cost, finance and economic concepts and their applications to products and services. This three-day course provides you with practical information normally obtained through university level economics and business management courses and will help you to maximize efficiencies from both an engineering and economics perspective.

**Instructor: James Masiak**



**Registration Information:**

**Fees – List:** \$1,545; **SAE Members – Classic:** \$1,391;  
**Premium:** \$1,313; **Elite:** \$1,236  
2.0 CEUs

## Product Liability and the Engineer



I.D.# 82001 – [www.sae.org/pdevent/82001](http://www.sae.org/pdevent/82001)

April 24-25, 2012 • Detroit, Michigan - *Held in conjunction with the SAE 2012 World Congress*  
December 6-7, 2012 • Troy, Michigan

In the past few decades, product liability law has dramatically changed the manufacturer's outlook in the design and manufacture of product. The concept of safety and reliability has been altered from a purely engineering/manufacturing concept to a legal/manufacturing approach. This new approach requires an understanding of legal concepts as related to the manufacturing and design process. The engineer's role has shifted to include a safety audit analysis to minimize the existence of a product defect and/or to defend the product in a way that is responsive to the legal concerns. An overnight assignment will be made by the instructor. It will consist of problems drawn from actual cases and a group project that examines the design, instructions, and warnings of a product.

**Instructor: Charles F. Seyboldt**



**Registration Information:**

**Fees – List:** \$1,225; **SAE Members – Classic:** \$1,103;  
**Premium:** \$1,041; **Elite:** \$980  
1.0 CEUs

*"The instructors enthusiastically present the subject with great knowledge and detail."*

**Allen F. VanDerStuyf**  
Manager, Component Systems  
Electro-Wire Products

## Program and Risk Management



I.D.# C0409 – [www.sae.org/pdevent/C0409](http://www.sae.org/pdevent/C0409)

February 23-24, 2012 • Troy, Michigan  
September 10-11, 2012 • Troy, Michigan

This course presents a proven eight-step method for program planning and control, including: definition of customers' requirements, roles of the program team, determination and flowcharting of program tasks, scheduling and costing, quality aspects of critical tasks, and risk management. Easy to grasp, each of the eight steps evolve from common-sense questions that should be answered for any program, regardless of size or complexity. With shortened development cycles and greater reliance on information in programs, this course emphasizes the value of communication within a program team, between the team and functional areas, and between the team and the program customer. Since the appropriateness of communication vehicles vary depending on purpose and audience, alternative modes of communication and change control are discussed.

**Instructor: Murray Sittsamer**



**Registration Information:**

**Fees – List:** \$1,265; **SAE Members – Classic:** \$1,139;  
**Premium:** \$1,075; **Elite:** \$1,012  
1.3 CEUs

*"The clarity and thoroughness of the subject was excellent. The instructor made it relevant and timely to our company's efforts."*

**William Sacherek**  
Benchmarking Manager  
The Boeing Company

## Strategic Leadership

I.D.# C0620 – [www.sae.org/pdevent/C0620](http://www.sae.org/pdevent/C0620)

April 23-25, 2012 • Detroit, Michigan - *Held in conjunction with the SAE 2012 World Congress*

Each segment of this three day course is designed to impart simple, but powerful lessons that will equip participants to more fully engage in strategic discussions, ask pertinent questions, facilitate critical decisions and shape high performing organizations. In addition, the course provides students with a personal leadership profile that illustrates their strengths and potential limitations. Participative exercises assist emerging executives with practical and effective methods of gaining organizational credibility and avoiding common errors in strategic leadership.

**Instructor: Joseph Doyle**



**Registration Information:**

**Fees – List:** \$1,585; **SAE Members – Classic:** \$1,427;  
**Premium:** \$1,347; **Elite:** \$1,268  
2.0 CEUs

*"This was an excellent seminar at preparing engineering professionals and technical specialists for future/current leadership roles within the company/organization."*

**Steve Rodia**  
Technical Specialist - Project Leader  
Honda Manufacturing of Alabama

## The Role of the Expert Witness in Product Liability Litigation



I.D.# 92054 – [www.sae.org/pdevent/92054](http://www.sae.org/pdevent/92054)

June 7-8, 2012 • Troy, Michigan

December 4-5, 2012 • Troy, Michigan

According to the Federal Rules of Evidence, an expert witness is anyone who can assist the trier of fact (the jury) in understanding any issue in dispute at trial. The witness' ability to give this assistance can be derived from any specialized training, education, background, or experience. To be effective in providing this assistance, however, requires that the expert witness understand the true role that he or she is to play both before and at the trial. This seminar will address the critical issues that every person who may be, has been, or is, an expert witness must understand to assist both the attorney and the product manufacturer, regardless of which side the expert serves.

**Instructor: Charles F. Seyboldt**



### Registration Information:

**Fees – List:** \$1,225; **SAE Members – Classic:** \$1,103;  
**Premium:** \$1,041; **Elite:** \$980  
1.0 CEUs

*"I think this course should be attended by all engineering managers and their bosses. It is critical that they understand these aspects of the legal system."*

**F.C. Kucklick**  
President  
F.C. Kucklick, Inc.

## SAE Professional and Legal Issues Certificate Program

SEMINARS

SAE has developed this certificate program that focuses on some of the core legal and risk management issues critical for engineers to master in successfully designing and deploying products from a safety and liability perspective. Courses address patent law, product liability, risk management, and expert witness testimony.

Upon completing all four courses, a certificate is awarded, recognizing completion of the Professional and Legal Issues Certificate Program.

The following courses are required:

- Patent Law for Engineers
- Product Liability and the Engineer
- The Role of the Expert Witness in Product Liability Litigation
- Program and Risk Management

For more information on the certificate program, visit  
[www.sae.org/contedu/certificate.htm](http://www.sae.org/contedu/certificate.htm)

**SAE International**

## Advanced High Strength Steels for Vehicle Weight Reduction

I.D.# C0916 – [www.sae.org/pdevent/C0916](http://www.sae.org/pdevent/C0916)

April 23-24, 2012 • Detroit, Michigan - Held in conjunction with the SAE 2012 World Congress

November 13-14, 2012 • Troy, Michigan

This seminar will focus on identifying appropriate applications of AHSS (advanced high strength steels) in the body and chassis for vehicle weight reduction. Recent steel applications will be presented, including factors which contributed to the appropriateness of using Advanced High Strength Steel versus mild steels or Conventional High Strength Steels (CHSS). Advantages of AHSS, as well as obstacles that may impede its use will be covered. Relative performance of alternate materials for weight reduction, particularly aluminum alloys, will be explored. A number of examples from industry will be presented to demonstrate the types of analyses which will have to be performed to lead to successful applications of AHSS. Extensive reference will be made to advanced analysis and testing methods without going into the details of the methodology. Finally, a future roadmap of AHSS applications will be presented.

**Instructor: Paul E. Geck and Richard J. Cover**



### Registration Information:

**Fees – List:** \$1,225; **SAE Members – Classic:** \$1,103;  
**Premium:** \$1,041; **Elite:** \$980  
1.3 CEUs

## Automotive Glazing Materials



I.D.# 99002 – [www.sae.org/pdevent/99002](http://www.sae.org/pdevent/99002)

May 7-8, 2012 • Troy, Michigan

Automotive glazing materials affect the total automotive system. This seminar presents an overview of different automotive glazing materials and covers a wide range of topics including history, manufacturing, testing, and safety. The chemical, physical, and design issues related to various glazing materials (annealed, laminated, tempered, glass-plastic, and plastic) are covered in depth. Attendees will receive a copy of SAE Standard J673 Automotive Safety Glasses as part of the course material.

**Instructor: Siegfried H. Herliczek**



### Registration Information:

**Fees – List:** \$1,255; **SAE Members – Classic:** \$1,130;  
**Premium:** \$1,067; **Elite:** \$1,004  
1.3 CEUs

*"Excellent overview of glass manufacturing and applications for automotive use."*

**John Sweeney**  
Product Design Engineer  
PPG Industries

### KEY



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WEBINARS


**New** Brake Friction Materials: Testing, Quality and Selection

I.D.# C1020 – [www.sae.org/pdevent/C1020](http://www.sae.org/pdevent/C1020)

October 5, 2012 • San Diego, California– *Held in conjunction with SAE 2012 Brake Colloquium and Exhibition - 30th Annual*

The choice of brake friction materials varies per application, but each must have the appropriate coefficient of friction and be able to disperse large amounts of heat without adversely effecting braking performance. This seminar will provide an introduction to brake lining raw materials and formulation, manufacturing, quality control and testing. The course covers the critical elements that must be reviewed before arriving at a lining selection decision. Different classes of friction material and their use will be defined.

**Instructor: Mohammad Vakili**

	<b>Registration Information:</b>
	<b>Fees – List:</b> \$725; <b>SAE Members – Classic:</b> \$653; <b>Premium:</b> \$616; <b>Elite:</b> \$580
	0.65 CEUs

Fundamentals of Metal Fatigue Analysis

I.D.# 94024 – [www.sae.org/pdevent/94024](http://www.sae.org/pdevent/94024)


April 25-27, 2012 • Detroit, Michigan - *Held in conjunction with the SAE 2012 World Congress*

July 25-27, 2012 • Troy, Michigan

December 3-5, 2012 • Troy, Michigan

Two methods of metal fatigue analysis will be covered in this seminar. The stress-life approach is used for high cycle or very long life fatigue problems where loads have fairly constant amplitude. Applications of this method include engine components, gears and shafts. The strain life approach is used for cases involving low cycle fatigue where loads may have a variable amplitude. Applications of this method include suspension and chassis components. Other key topics to be addressed include residual stress, shot peening, cycle counting methods and environmental effects. Extensive use of example problems and case studies will be used. The overall objective of the course is for participants to gain an understanding of the phenomenon of metal fatigue and most importantly learn what methods are available to predict and prevent failures.

**Instructor: Jess J. Comer**

	<b>Registration Information:</b>
	<b>Fees – List:</b> \$1,645; <b>SAE Members – Classic:</b> \$1,481; <b>Premium:</b> \$1,398; <b>Elite:</b> \$1,316
	2.0 CEUs

*“Very good coverage of material from authoritative instructor. Course notes will now become my primary reference for all future problems that I encounter on this topic.”*

**Eugene F. Renzi**  
Senior Design Analysis Engineer  
Metaldyne Corporation

**New** Surface Texture: Specification and Control


I.D.# C1110 – [www.sae.org/pdevent/C1110](http://www.sae.org/pdevent/C1110)

April 23, 2012 • Detroit, Michigan - *Held in conjunction with the SAE 2012 World Congress*

October 1, 2012 • Troy, Michigan

Every moving component on a vehicle or engine is influenced by surface texture in one or more of the following ways: vibration, sealing, adhesion, traction, emissions, safety, durability, wear/failure analysis. Many of the industry’s top warranty issues (leaks, noise, vibration, etc.) are a direct result of surface texture implications. Rather than focus on the theories of surface texture, this course will focus on concept applications, and give attendees tools they can immediately use to solve automotive problems such as cylinder bores and emissions control, crankshafts, camshafts and early engine failures, brakes and NVH, wheel bearings and vibration, gaskets and sealing, bearings and durability, pistons and durability, and shaft straightness and vibration.

**Instructor: Mark Malburg**

	<b>Registration Information:</b>
	<b>Fees – List:</b> \$725; <b>SAE Members – Classic:</b> \$653; <b>Premium:</b> \$616; <b>Elite:</b> \$580
	0.7 CEUs

Threaded Fasteners and the Bolted Joint

I.D.# 95030 – [www.sae.org/pdevent/95030](http://www.sae.org/pdevent/95030)


April 23-24, 2012 • Detroit, Michigan - *Held in conjunction with the SAE 2012 World Congress*

July 23-24, 2012 • Troy, Michigan

November 1-2, 2012 • Troy, Michigan

This seminar introduces participants to all aspects of threaded fasteners including nomenclature, geometric considerations, metallurgy, material properties, applied stresses, and considerations for fatigue, corrosion, brittle fracture and temperature. Methods are developed for the analysis and design of bolted joints under axial and shear loads. Other topics include assembly practice and methods to control preload.

**Instructor: Jess J. Comer**

	<b>Registration Information:</b>
	<b>Fees – List:</b> \$1,315; <b>SAE Members – Classic:</b> \$1,184; <b>Premium:</b> \$1,118; <b>Elite:</b> \$1,052
	1.3 CEUs

*“Excellent Instructor - very receptive to others’ experiences and inputs.”*

**Cheryl Fry**  
Research Engineer  
Daimler Chrysler Corporation

**New** Introduction to NVH Aspects of Hybrid and Electric Vehicles

I.D.# C1128 – [www.sae.org/pdevent/C1128](http://www.sae.org/pdevent/C1128)

April 24, 2012 • Detroit, Michigan - *Held in conjunction with the SAE 2012 World Congress*

August 24, 2012 • Troy, Michigan

November 7 2012 • Troy, Michigan

This seminar introduces participants to basic NVH principles and unique NVH challenges encountered in the development of HEV, ReEV, and EV including engine start/stop behavior, electric motor whine, driveline NVH, body structure, influence of noise from accessories, and sound quality development, as well as potential countermeasures.

**Instructor:** Kiran Govindswamy

**i** **Registration Information:**  
**Fees – List:** \$725; **SAE Members – Classic:** \$653;  
**Premium:** \$616; **Elite:** \$580  
 0.7 CEUs

Brake Noise Problem Resolution

I.D.# C0831 – [www.sae.org/pdevent/C0831](http://www.sae.org/pdevent/C0831)

August 27, 2012 • Troy, Michigan

October 4, 2012 • San Diego, California– *Held in conjunction with SAE 2012 Brake Colloquium and Exhibition - 30th Annual*

Brake noise is one of the highest ranked complaints of car owners. Grunts, groans, squeaks, and squeals are common descriptions of the annoying problem which brake engineers spend many hours trying to resolve. Consumer expectations and the high cost of warranty repairs are pushing the optimization of brake NVH performance. This course will provide you with an overview of the various damping mechanisms and tools for analyzing and reducing brake noise. A significant component of this course is the inclusion of case studies which will demonstrate how brake noise squeal issues have been successfully resolved.

**Instructor:** Eric Denys

**i** **Registration Information:**  
**Fees – List:** \$725; **SAE Members – Classic:** \$653;  
**Premium:** \$616; **Elite:** \$580  
 0.7 CEUs

**New** Diesel Engine Noise Control Webinar



I.D.# WB1041 – [www.sae.org/pdevent/WB1041](http://www.sae.org/pdevent/WB1041)

*Presented in two, 2-hour session – via telephone/internet*

January 10 & 12, 2012 - 10:30 a.m. – 12:30 p.m. ET

July 31 & August 2, 2012 - 11:30 a.m. – 1:30 p.m. ET

This webinar provides an in-depth overview of diesel engine noise including combustion and mechanical noise sources. In addition, the instructor will discuss a system approach to automotive integration including combining sub-systems and components to achieve overall vehicle noise and vibration goals.

**Instructor:** Thomas Reinhart

**i** **Registration Information:**  
**Fees – List:** \$395; **SAE Members – Classic:** \$356;  
**Premium:** \$336; **Elite:** \$316  
 0.4 CEUs

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P10140

**New** IAQG Sanctioned Aerospace Auditor Transition Training (AATT)

I.D.# C1034 – [www.sae.org/pdevent/C1034](http://www.sae.org/pdevent/C1034)

March 5-8, 2012 • Norwalk, California  
 June 11-14, 2012 • Warrendale, Pennsylvania

SAE International is pleased to be a recognized training provider of the classroom component of the IAQG-Sanctioned Aerospace Auditor Transition Training (AATT). This four-day course is the instructor-led classroom component of the AS9100 IAQG-Sanctioned training and includes how to audit to the AS9100 series standards using the process-based approach of AS9101D. Along with the training in this instructor-led component, there is a continual evaluation of each participant, paying particular attention to his/her active participation, role play, and case study exercises. The fourth day includes an online final examination and interview.

This course is certified by RABQSA International and meets the classroom training requirements of the IAQG Sanctioned Aerospace Auditor Transition Training for AS9100:2009. Successfully completing the AATT program and the awarding of the Certificate of Successful Completion satisfies the training requirements for auditors to update their AA, AEA and AIEA certification.

**i** **Registration Information:**  
**Fees – List:** \$2,195; **SAE Members – Classic:** \$2,145;  
**Premium:** \$2,095; **Elite:** \$2,045  
 2.6 CEUs

Understanding AS9100 Rev C Webinar 

I.D.# WB0958 – [www.sae.org/pdevent/WB0958](http://www.sae.org/pdevent/WB0958)

*Presented in one, 2-hour session – via telephone/internet*

February 3, 2012 - 11:30 a.m. – 1:30 p.m. ET  
 March 30, 2012 - 10:30 a.m. – 12:30 p.m. ET  
 May 11, 2012 - 11:30 a.m. – 1:30 p.m. ET  
 August 3, 2012 - 10:30 a.m. – 12:30 p.m. ET  
 October 26, 2012 - 11:30 a.m. – 1:30 p.m. ET

This webinar will provide participants with first-hand explanations and insight regarding the changes found in AS9100:2009 (Rev C). The instructor will begin with an explanation of the overall revision objectives followed by the design specification criteria that each change was required to meet in order to be considered. Because AS9100 incorporates the requirements of ISO 9001:2008, participants will also gain valuable insight into the ISO 9001:2008 amendment. The instructor will guide participants through the implementation timeline so that each participant acquires understanding and insight into how AS9100 Rev C will impact their organization and their efforts to obtain certification.

**Instructor: L.L. ‘Buddy’ Cressionnie**

**i** **Registration Information:**  
**Fees – List:** \$245; **SAE Members – Classic:** \$221;  
**Premium:** \$208; **Elite:** \$196  
 0.2 CEUs

*“This webinar was awesome, informative & easily accessible! I definitely am looking forward to my next experience!”*

**Vicki Watson**  
 Quality Engineer  
 PECO Manufacturing, Inc.



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**SAE International**  
P111480

**New** Implementing AS9100: Understanding and Transitioning to the New Requirements

I.D.# C1119 – [www.sae.org/pdevent/C1119](http://www.sae.org/pdevent/C1119)

April 2-3, 2012 • Norwalk, California  
 July 19-20, 2012 • Warrendale, Pennsylvania  
 November 8-9, 2012 • Troy, Michigan

This seminar includes an in-depth review of changes in AS9100 Rev. C: *Quality Management Systems - Requirements for Aviation, Space and Defense Organizations* and the intent of the revised requirements. Included is a detailed discussion of the standard, with special emphasis on the process approach, project planning, risk management, configuration management, and work transfer. Additionally, AS9101 Rev D: *Quality Management Systems Audit Requirements for Aviation, Space, and Defense Organizations* and AS9104-1: *Requirements for Aviation, Space, and Defense Quality Management System Certification Programs* will be examined so that individuals responsible for AS9100 Rev. C implementation understand the system and audit requirements and the immediate influence these changes will have on their certificate transition..

**Instructor: L. L. “Buddy” Cressionnie**

**i** **Registration Information:**  
**Fees – List:** \$1,285; **SAE Members – Classic:** \$1,157;  
**Premium:** \$1,092; **Elite:** \$1,028  
 1.3 CEUs


**New** AS9100C Internal Auditor Training

I.D.# C1120 – [www.sae.org/pdevent/C1120](http://www.sae.org/pdevent/C1120)

January 11-13, 2012 • Warrendale, Pennsylvania  
August 13-15, 2012 • Norwalk, California  
October 15-17, 2012 • Troy, Michigan

This three-day internal auditor training program is designed to provide potential and existing internal auditors with the knowledge necessary to understand and successfully audit an organization against AS9100 Rev C: *Quality Management Systems - Requirements for Aviation, Space and Defense Organizations*. Additionally, attendees will participate in a detailed examination of the requirements of AS9101 Rev D: *Quality Management Systems Audit Requirements for Aviation, Space, and Defense Organizations*. An overview of AS9101D *Quality Management Systems Audit Requirements for Aviation, Space, and Defense Organization* will also be provided to identify the effect this standard has on the way internal audits should be conducted. Case studies and classroom exercises will also be presented in this class to provide participants the comprehensive knowledge and practical skills necessary to be an effective internal auditor.

**Instructor:** Paul J. Kunder

 **Registration Information:**  
**Fees – List:** \$1,545; **SAE Members – Classic:** \$1,391;  
**Premium:** \$1,313; **Elite:** \$1,236  
2.0 CEUs


**New** ARP4754A and the Guidelines for Development of Civil Aircraft and Systems

I.D.# C1118 – [www.sae.org/pdevent/C1118](http://www.sae.org/pdevent/C1118)

January 9-10, 2012 • Warrendale, Pennsylvania  
April 2-3, 2012 • Norwalk, California

This seminar provides attendees with an in-depth presentation of the guidelines introduced in the revised recommended practice for aircraft and systems development as well as the critical concepts used in aircraft and systems development processes for certification. The aircraft/systems development process and its interactions with the safety, hardware development and software development processes will be discussed along with the incorporated changes, with special emphasis on new material and development concepts. Additionally, the relationship and key interactions between the aircraft/system guidance material established in ARP4754A and the guidance material in DO-254 for hardware and DO-178B for software will be reviewed to ensure attendees gain insight into the expectations being established for aircraft certification..

**Instructor:** Eric M. Peterson

 **Registration Information:**  
**Fees – List:** \$1,215; **SAE Members – Classic:** \$1,094;  
**Premium:** \$1,033; **Elite:** \$972  
1.3 CEUs

**New** Aerospace Product Support: Sustainment Throughout the Life Cycle

I.D.# C0945 – [www.sae.org/pdevent/C0945](http://www.sae.org/pdevent/C0945)

Upcoming open enrollment dates being scheduled. Please check the seminar webpage for future offerings.

This two day seminar is intended to introduce participants to the various approaches, technologies, and tools available to support a product throughout the product's total life-cycle in the most efficient manner possible. Major topics presented and discussed during this seminar include The Elements of Logistics, Performance Based Logistics, Product Support Integration, and regulatory requirements. Collectively, the information presented in this seminar will equip attendees with the skills and techniques needed to help them comfortably and confidently develop the best tailored support package, satisfying the needs of both the customer and the provider.

**Instructor:** Drex Rutledge

 **Registration Information:**  
**Fees – List:** \$1,225; **SAE Members – Classic:** \$1,103;  
**Premium:** \$1,041; **Elite:** \$980  
1.3 CEUs


Design of Experiments (DOE) for Engineers

I.D.# C0406 – [www.sae.org/pdevent/C0406](http://www.sae.org/pdevent/C0406)

July 12-13, 2012 • Troy, Michigan  
December 3-4, 2012, 2012 • Troy, Michigan

This seminar utilizes hands-on activities to help you learn the criteria for running a DOE, the requirements and pre-work necessary prior to DOE execution, and how to select the appropriate designed experiment type to run. You will experience setting up, running, and analyzing the results of simple-to-intermediate complexity, Full Factorial, Partial Factorial, and Response Surface experiments utilizing manual methods as well as a hands-on computer tool that facilitates experimental design and data analysis. You will also receive an overview of Robust DOE, including the Taguchi DOE Method. Each attendee will receive a 30 day Minitab™ Product Demo for use in the class. While some computers will be available, attendees are encouraged to bring a laptop computer and/or a calculator to the seminar to provide additional hands-on time.

**Instructor:** Kevin Zielinski

 **Registration Information:**  
**Fees – List:** \$1,265; **SAE Members – Classic:** \$1,139;  
**Premium:** \$1,075; **Elite:** \$1,012  
1.3 CEUs

*"This course helped me to develop a good understanding of the DOE method and to apply it to real-world applications."*

**Usman Asad**  
Senior Research Associate  
University of Windsor

## Design of Experiments (DOE) for Engineers Webinar



I.D.# WB0932 – [www.sae.org/pdevent/WB0932](http://www.sae.org/pdevent/WB0932)  
Presented in six, 2-hour session, 10:30 a.m. – 12:30 p.m. ET – via telephone/internet

February 7, 9, 14, 16, 21 & 23, 2012

This competency-based webinar utilizes a blend of reading, discussion and hands-on to help you learn the requirements and pre-work necessary prior to DOE execution, how to select the appropriate designed experiment to run, DOE execution, and analysis of DOE results. You will experience setting up, running, and analyzing simple-to-intermediate complexity Full Factorial and Partial Factorial experiments both by hand and using computer software. You will also set-up and analyze Robust/Taguchi and Response Surface experiments utilizing computer software. Each participant will receive a 30 day Minitab™ product trial copy for use in the webinar. Due to the nature of the webinar format, each participant will be expected to dedicate approximately one hour to complete “homework” and/or short reading assignments in preparation for each session.

**Instructor: Kevin Zielinski**



**Registration Information:**

**Fees – List:** \$915; **SAE Members – Classic:** \$824;

**Premium:** \$778; **Elite:** \$732

1.2 CEUs

## Understanding the FAA Aircraft Certification Process

I.D.# C0821 – [www.sae.org/pdevent/C0821](http://www.sae.org/pdevent/C0821)

February 15-16, 2012 • Warrendale, Pennsylvania

August 15-16, 2012 • Norwalk, California

November 19-20, 2012 • Troy, Michigan

This course will provide an overview of the Federal Aviation Administration (FAA) organizational structure, its policies, guidelines and requirements leading to Type and Supplemental Type airworthiness approvals. It will also cover the rule-making process and rules applicable to aircraft parts and products. The course will define the roles and responsibilities of the Aircraft Certification Office (ACO), Manufacturing Inspection District Office (MIDO), Flight Standards District Office (FSDO), and the Aircraft Evaluation Group (AEG). Type and Supplemental Type Certification (TC and STC) processes, and Change Product Rule for alterations and modifications to previously type certified aircraft will be discussed. FAA rule-making process will be examined including review of FAA Orders, Notices, Advisory Circulars and other guidance material.

**Instructor: Ken Farsi**



**Registration Information:**

**Fees – List:** \$1,225; **SAE Members – Classic:** \$1,103;

**Premium:** \$1,041; **Elite:** \$980

1.3 CEUs

## Weibull-Log Normal Analysis Workshop

I.D.# 86034 – [www.sae.org/pdevent/86034](http://www.sae.org/pdevent/86034)

February 8-10, 2012 • Norwalk, California

April 23-25, 2012 • Detroit, Michigan - Held in conjunction with the SAE 2012 World Congress

September 24-26, 2012 • Troy, Michigan

RMS (Reliability-Maintainability-Safety-Supportability) engineering is emerging as the newest discipline in product development due to new credible, accurate, quantitative methods. Weibull Analysis is foremost among these new tools. New and advanced Weibull techniques are a significant improvement over the original Weibull approach. This workshop presents special methods developed for these data problems, such as Weibayes, with actual case studies in addition to the latest techniques in SuperSMITH® Weibull for risk forecasts with renewal and optimal component replacement. Class work is used to reinforce key concepts, lectures are based on actual case studies, and personal computers and hands-on experiments are used to analyze dozens of Weibull & Log Normal problems. Students will be fully capable of performing basic and advanced RMS Engineering analysis with their own software on completion of the workshop.

Attendees will receive the entire SuperSMITH® package - a complete self-study course and combined software package containing: SuperSMITH® Weibull, SuperSMITH® Visual, The New Weibull HandbookO- 5th Edition and the PlayTIME™ Tutorial Booklet. A \$960 value!

**Optional Weibull Introduction**

To accelerate your learning in this Workshop, you may want to complete the SAE Fast Track, Introduction to Weibull Engineering [www.sae.org/fasttracks/weibull](http://www.sae.org/fasttracks/weibull). This highly recommended overview of Weibull engineering can improve your retention prior to taking the workshop or provide a great review afterwards.

**Instructor: Wes Fulton**



**Registration Information:**

**Fees – List:** \$1,985; **SAE Members – Classic:** \$1,787;

**Premium:** \$1,687; **Elite:** \$1,588

2.0 CEUs

*“Every engineer should attend this course within the first year of graduation.”*

**Evan Nixon**

Application Engineer  
Koyo Corporation of USA

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## A Familiarization of Drivetrain Components



I.D.# 98024 – [www.sae.org/pdevent/98024](http://www.sae.org/pdevent/98024)

February 27, 2012 • Troy, Michigan

August 28, 2012 • Troy, Michigan

In this seminar, you will be exposed to various methods that can be used to accomplish the goal of an efficient, robust and quiet running drivetrain. Designed to help you visualize both individual components and the entire drivetrain system this seminar focuses on the terms, functions, nomenclature, operating characteristics and effect on vehicle performance for each of the drivetrain components. Attendees will receive an introduction to the various components of the drivetrain, including the clutch or torque converter, manual or automatic transmission, driveshaft, axle, wheel ends, and brakes. The course also provides insight into: the structure and function of each component; vehicle integration; and related noise, vibration and harshness issues. You will be equipped to evaluate the space requirements, mounting needs, clearances required, and effect on vehicle response for each component.

**Instructor: Joseph Palazzolo**



**Registration Information:**

**Fees – List:** \$845; **SAE Members – Classic:** \$761;

**Premium:** \$718; **Elite:** \$676

0.7 CEUs

*“Excellent overview of the entire drivetrain, but includes some detail and practical insight instead of being too broad and overgeneralized.”*

**Scott A. Van Luvender**  
Applications Engineer  
Acadia Polymers

Also available as a SAe-Learning opportunity –  
[www.sae.org/e-seminars/drivetraincomponents](http://www.sae.org/e-seminars/drivetraincomponents)

## Fundamentals of Automotive All-Wheel Drive Systems

I.D.# C0305 – [www.sae.org/pdevent/C0305](http://www.sae.org/pdevent/C0305)

February 29, 2012 • Troy, Michigan

August 30, 2012 • Troy, Michigan

See course description on page 40.

*“The course content exceeded my expectations and left me much more confident in my understanding of driveline systems.”*

**Mark Schulte**  
Senior Sales Engineer  
Stoneridge, Inc.

Also available as a SAe-Learning opportunity –  
[www.sae.org/e-seminars/awdsystems](http://www.sae.org/e-seminars/awdsystems)

## Automotive Powertrain and Battery Cooling Airflow Systems: A Vehicle Perspective

I.D.# C0616 – [www.sae.org/pdevent/C0616](http://www.sae.org/pdevent/C0616)

April 23-24, 2012 • Detroit, Michigan - Held in conjunction with the SAE 2012 World Congress

This seminar provides attendees with a vehicle-level perspective of powertrain and battery cooling airflow systems, including the unique challenges of hybrid and electric vehicles. Special emphasis will be placed on the numerous battery integration issues and thermal management characteristics. Attendees will also learn about cooling airflow (fan & ram), fan design parameters, grille openings, thermal recirculation, system resistance, cooling drag, powertrain heat rejection, and battery thermal characteristics and heat generation rate. Case studies will be used to reinforce concepts and attendees should bring a calculator for these in-class activities.

**Instructor: Jack Williams**



**Registration Information:**

**Fees – List:** \$1,305; **SAE Members – Classic:** \$1,175;

**Premium:** \$1,109; **Elite:** \$1,044

1.3 CEUs

*“Very knowledgeable instructor and good balance between theory and practice.”*

**Thomas Laninger**  
Engineering Manager  
Behr America

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**KEY**



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WEBINARS

## Fundamentals of Modern Vehicle Transmissions



I.D.# 99018 – [www.sae.org/pdevent/99018](http://www.sae.org/pdevent/99018)

April 23-25, 2012 • Detroit, Michigan - *Held in conjunction with the SAE 2012 World Congress*

August 15-17, 2012 • Troy, Michigan

Starting with a look at the transmission's primary function -- to couple the engine to the driveline and provide torque ratios between the two -- this updated and expanded seminar covers the latest transmission systems designed to achieve the most efficient engine operation. Current designs, the components and sub-systems used, their functional modes, how they operate, and the inter-relationships will be discussed. A manual transmission display will be used to explain ratios and how they function within the driveline. Automatic transmission design will illustrate the concept of automatic control and hydro-mechanic decision theory and implementation. Attendees will have the opportunity to supplement these theoretical concepts with practical, "hands-on" experience using the various transmission models and components provided.

**Instructor: W. Mark McVea**



**Registration Information:**

**Fees – List:** 1,565; **SAE Members – Classic:** \$1,409;

**Premium:** \$1,330; **Elite:** \$1,252

2.0 CEUs

*"I develop many of the chassis components that mate with the transmission. This course helped me to fully understand the components and functionality of the different types of transmissions."*

**Jeremy Ling**  
Product Engineer  
Honda of America Manufacturing

Also available as a SAE-Learning opportunity –  
[www.sae.org/e-seminars/fmvtrans](http://www.sae.org/e-seminars/fmvtrans)

## Fundamentals of Continuously Variable Transmission Technology Webinar



I.D.# WB1002 – [www.sae.org/pdevent/WB1002](http://www.sae.org/pdevent/WB1002)

*Presented in two, 2-hour sessions, 10:30 a.m. – 12:30 p.m. ET – via telephone/internet*

September 19-21, 2012

This webinar will highlight the various mainstream CVT technologies as they apply to automotive applications - fundamental operational principals, the reliance on friction as the primary means to transmit power, and the specific characteristics of the common fluids used in these types of transmissions. This webinar will provide those with a basic understanding of automotive transmission operation and components the fundamentals of continuously variable transmission technology, its application to the automotive marketplace, and the significance of this technology as it applies to improvements in powertrain efficiency and affectivity. You will also receive insights into the various types of CVT systems, review their relative differences from a 'theory of operation' point of view, and as a function of their core components.

**Instructor: W. Mark McVea**



**Registration Information:**

**Fees – List:** \$395; **SAE Members – Classic:** \$356;

**Premium:** \$336; **Elite:** \$316

.4 CEUs

**Part of the SAE Transmission Technology Webinar Series**

Powertrain Control Unit/Transmission Control Unit Technology Webinar – [www.sae.org/pdevent/WB1001](http://www.sae.org/pdevent/WB1001) - see description on page 33

Fundamentals of Continuously Variable Transmission Technology Webinar – [www.sae.org/pdevent/WB1002](http://www.sae.org/pdevent/WB1002)

Review of AMT and DCT Technology Applied to Automotive Powertrain Webinar – [www.sae.org/pdevent/WB1003](http://www.sae.org/pdevent/WB1003) - see description on page 34

## **New** High-Performance Differentials, Axles, & Drivelines

I.D.# C1113 – [www.sae.org/pdevent/C1113](http://www.sae.org/pdevent/C1113)

Upcoming open enrollment dates being scheduled. Please check the seminar webpage for future offerings.

See course description on page 13.



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## Introduction to Commercial and Off-Road Vehicle Cooling Airflow Systems

I.D.# C0738 – [www.sae.org/pdevent/C0738](http://www.sae.org/pdevent/C0738)

March 12-13, 2012 • Troy, Michigan

September 24-25, 2012 • Troy, Michigan

The goal of this two-day seminar is to introduce engineers and managers to the basic principles of cooling airflow systems for commercial and off-road vehicles. Participants will learn about vehicle/product constraints, integration issues, cooling airflow, system resistance, fans, shrouds, radiators, coolers, estimating heat rejection, thermal accumulation, air recirculation, system performance, and underhood airflow. Basic concepts will be reinforced with in-class discussion of case studies.

**Instructor: Jack Williams**



### Registration Information:

**Fees – List:** \$1,305; **SAE Members – Classic:** \$1,175;

**Premium:** \$1,109; **Elite:** \$1,044

1.3 CEUs

*“Nice mix of theory and practical applications.”*

**Ryan Schott**  
Senior Engineer  
John Deere

## Introduction to Gears

I.D.# C0822 – [www.sae.org/pdevent/C0822](http://www.sae.org/pdevent/C0822)

August 14, 2012 • Troy, Michigan

This seminar is designed to provide gear novices with a general understanding of gear nomenclature, geometry, and arrangements. Starting with the basic definition of gears, conjugate motion and the “Laws of Gearing”, you will gain a solid understanding of gearing and the fundamentals of rotary motion transfer through gear-trains. Gear classifications, tooth forms and geometry, and very high-level application considerations, manufacturing processes, and inspection techniques will be covered.

Attendees will receive a copy of the book, *Gear Design Simplified*, by Franklin D. Jones & Henry H. Ryffel.

**Instructor: W. Mark McVea**



### Registration Information:

**Fees – List:** \$755; **SAE Members – Classic:** \$680;

**Premium:** \$642; **Elite:** \$604

0.7 CEUs

## **New** Powertrain Control Unit/ Transmission Control Unit Technology Webinar



I.D.# WB1001 – [www.sae.org/pdevent/WB1001](http://www.sae.org/pdevent/WB1001)

Presented in two, 2-hour sessions, 10:30 a.m. – 12:30 p.m. ET – via telephone/internet

September 5 & 7, 2012

This webinar will focus on the basic functionality and configurations, high-level architecture, and block diagram type logic of modern automatic transmission powertrain control systems for enhanced vehicle operation, improved powertrain efficiency/reduced vehicle emissions, smooth transition from one speed ratio to another, and when powertrain system optimization relies on precise ratio selection. The course will also present a high-level description of the connectivity between the various control units, their architecture and the powertrain configurations with which they are matched. This connectivity will serve as the basis for a functional development of the shift strategy analysis and implementation requirements used by the system architecture. For each of the main powertrain configurations, the participant will be presented with an operational summary for that particular hardware and then shown how the PCU/TCU must be modeled to optimize function. This is not intended as a deep-dive into the various aspects of programming and/or network communication.

**Instructor: W. Mark McVea**



### Registration Information:

**Fees – List:** \$395; **SAE Members – Classic:** \$356;

**Premium:** \$336; **Elite:** \$316

0.4 CEUs

### Part of the SAE Transmission Technology Webinar Series

Powertrain Control Unit/Transmission Control Unit Technology Webinar – [www.sae.org/pdevent/WB1001](http://www.sae.org/pdevent/WB1001)

Fundamentals of Continuously Variable Transmission Technology Webinar – [www.sae.org/pdevent/WB1002](http://www.sae.org/pdevent/WB1002) - see description on page 32

Review of AMT and DCT Technology Applied to Automotive Powertrain Webinar – [www.sae.org/pdevent/WB1003](http://www.sae.org/pdevent/WB1003) - see description on page 34

## KEY



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WEBINARS

**New** Review of AMT and DCT Technology Applied to Automotive Powertrain Webinar 

I.D.# WB1003 – [www.sae.org/pdevent/WB1003](http://www.sae.org/pdevent/WB1003)  
 Presented in three, 2-hour sessions, 10:30 a.m. – 12:30 p.m. ET – via telephone/internet  
 October 1, 2 & 4, 2012

In this webinar, you will receive thorough coverage of the various and common AMT systems, their basic functionality, unique components, configurations, and the underlying theory of operation. It is designed to also place dual-clutch technology within the proper context of automotive powertrain designs and products. You will receive insight into the various limitations of current technology, the impact on vehicle operation and efficiencies of each, and the means employed to correct and enhance AMT operation. The course will also review the fundamentals of dual-clutch technology, its application, and the significance of this technology as it applies to improvements in all facets of an automotive powertrain. It will explore the versatility and operator satisfaction that vehicles equipped with dual-clutch systems can provide. It will conclude with a review of the combined effect of each of these advanced technologies on the overall operator satisfaction with all measures of vehicle performance.

Instructor: W. Mark McVea

 **Registration Information:**  
**Fees – List:** \$515; **SAE Members – Classic:** \$464;  
**Premium:** \$438; **Elite:** \$412  
 0.6 CEUs

Part of the SAE Transmission Technology Webinar Series

Powertrain Control Unit/Transmission Control Unit Technology Webinar – [www.sae.org/pdevent/WB1001](http://www.sae.org/pdevent/WB1001) - see description on page 33

Fundamentals of Continuously Variable Transmission Technology Webinar – [www.sae.org/pdevent/WB1002](http://www.sae.org/pdevent/WB1002) - see description on page 32

Review of AMT and DCT Technology Applied to Automotive Powertrain Webinar – [www.sae.org/pdevent/WB1003](http://www.sae.org/pdevent/WB1003)

Powertrain Selection for Fuel Economy and Acceleration Performance 

I.D.# C0243 – [www.sae.org/pdevent/C0243](http://www.sae.org/pdevent/C0243)  
 April 26-27, 2012 • Detroit, Michigan - Held in conjunction with the SAE 2012 World Congress

See course description on page 14.

*“Very good introductory course on the parameters that effect vehicle performance and fuel economy and how to optimize them.”*

**Brian Mace**  
 Senior Engineer  
 Honda R&D Americas, Inc.

Threaded Fasteners and the Bolted Joint

I.D.# 95030 – [www.sae.org/pdevent/95030](http://www.sae.org/pdevent/95030)


April 23-24, 2012 • Detroit, Michigan - Held in conjunction with the SAE 2012 World Congress

July 23-24, 2012 • Troy, Michigan

November 1-2, 2012 • Troy, Michigan

This seminar introduces participants to all aspects of threaded fasteners including nomenclature, geometric considerations, metallurgy, material properties, applied stresses, and considerations for fatigue, corrosion, brittle fracture and temperature. Methods are developed for the analysis and design of bolted joints under axial and shear loads. Other topics include assembly practice and methods to control preload.

Instructor: Jess J. Comer

 **Registration Information:**  
**Fees – List:** \$1,315; **SAE Members – Classic:** \$1,184;  
**Premium:** \$1,118; **Elite:** \$1,052  
 1.3 CEUs

*“Excellent Instructor - very receptive to others’ experiences and inputs.”*

**Cheryl Fry**  
 Research Engineer  
 Daimler Chrysler Corporation

**Fundamentals of Drivetrain Systems Certificate Program**

SAE has developed a certificate program that offers a package of four courses which address the most salient fundamental topics, concepts, and practices within the drivetrain systems defined body of knowledge.

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- Powertrain Selection for Fuel Economy & Acceleration Performance
- Fundamentals of Modern Vehicle Transmissions OR Fundamentals of Truck & Off-Highway Transmission Systems
- The Basics of Internal Combustion Engines OR Diesel Engine Technology

For more information on the certificate program, visit

[www.sae.org/contedu/certificate.htm](http://www.sae.org/contedu/certificate.htm)

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## **New** Aircraft Cabin Safety and Interior Crashworthiness

I.D.# C0926 – [www.sae.org/pdevent/C0926](http://www.sae.org/pdevent/C0926)

February 13-14, 2012 • Warrendale, Pennsylvania  
August 13-14, 2012 • Norwalk, California

This two day seminar will begin with a discussion of Commercial off the Shelf (COTS) test requirements. The instructor will then guide participants through the various cabin interior emergency provisions and their requirements such as supplemental passenger oxygen, emergency equipment, seats, flammability, emergency exits, emergency lighting and escape path markings, and various other cabin interior systems. Additionally, DO-160 environmental, cooling and ventilation requirements will be discussed to provide participants a comprehensive introduction to cabin interior safety and crashworthiness requirements as specified in the CFR Part 25 Airworthiness Standards.

**Instructor: Ken Farsi**



### Registration Information:

**Fees – List:** \$1,225; **SAE Members – Classic:** \$1,103;  
**Premium:** \$1,041; **Elite:** \$980  
1.3 CEUs

## Fundamentals of Motor Vehicle Fire Investigation

I.D.# C0915 – [www.sae.org/pdevent/C0915](http://www.sae.org/pdevent/C0915)

March 26-28, 2012 • Phoenix, Arizona

In many cases, the goal is to determine the cause and origin of the fire. In this highly interactive, hands-on course, participants will acquire a working knowledge of fire science and be able to use this knowledge to assess possible ignition mechanisms, evaluate burn patterns, and analyze fire spread. This seminar will also explore the interpretation and limitations of the physical evidence from a fire scene. The approach to collecting and retaining important physical evidence, and laboratory techniques to examine this evidence, will also be described. As an in-class project, participants will have the opportunity to inspect several burned vehicles, predict cause and origin and compare findings to the actual cause and origin of the fire, as shown in burn test videos.

**Instructor: Jeff Colwell**



### Registration Information:

**Fees – List:** \$1,595; **SAE Members – Classic:** \$1,436;  
**Premium:** \$1,356; **Elite:** \$1,276  
1.65 CEUs

*“A state-of-the-art presentation of the technological realities of post-fire vehicle inspection. Essential knowledge for the professional fire investigator.”*

**Darby A. Gray**  
Principle Engineer

## Injuries, Anatomy, Biomechanics & Federal Regulation



I.D.# 85049 – [www.sae.org/pdevent/85049](http://www.sae.org/pdevent/85049)

January 23-25, 2012 • Norwalk, California  
November 7-9, 2012 • Troy, Michigan

Safety continues to be one of the most important factors in motor vehicle design, manufacture and marketing. This seminar provides a comprehensive overview of these critical automotive safety considerations: injury and anatomy; human tolerance and biomechanics; occupant protection; testing; and federal legislation. The knowledge shared at this seminar will enable attendees to be more aware of safety considerations and to better understand and interact with safety experts.

**Instructor: Jeffrey A. Pike**



### Registration Information:

**Fees – List:** \$1,545; **SAE Members – Classic:** \$1,391;  
**Premium:** \$1,313; **Elite:** \$1,236  
2.0 CEUs

*“This is an excellent course. I highly recommend it for anyone working in biomechanics, vehicle occupant safety, or with government regulations or standards.”*

**Ron Huston**

Professor  
University of Cincinnati

## Side Impact Occupant Safety and CAE



I.D.# C0717 – [www.sae.org/pdevent/C0717](http://www.sae.org/pdevent/C0717)

May 9-10, 2012 • Troy, Michigan

This seminar is designed to familiarize participants with the engineering principles behind vehicle and restraint designs for occupant safety. Students will learn the mechanics of side crashes and how vehicle structures, restraint systems, and interiors affect occupant safety. Students will also be exposed to system, subsystem and component level CAE and testing tools used in the simulation of side impacts. Accident crash statistics, biomechanics, government regulations and public domain frontal safety tests will also be covered. A combination of hands-on activities, including computer simulations, discussion, and lecture are used throughout the course.

**Instructor(s): Stephen Kang and Zhibing Deng**



### Registration Information:

**Fees – List:** \$1,315; **SAE Members – Classic:** \$1,184;  
**Premium:** \$1,118; **Elite:** \$1,052  
1.3 CEUs

## Tire and Wheel Safety Issues



I.D.# C0102 – [www.sae.org/pdevent/C0102](http://www.sae.org/pdevent/C0102)

May 30, 2012 • Troy, Michigan  
December 6, 2012 • Troy, Michigan

One of the most important safety critical components on cars, trucks, and aircraft is the pneumatic tire. This seminar covers these facets of tire safety phenomena. Engineering fundamentals are discussed and illustrated with numerous practical examples and case studies of current public interest. *The Pneumatic Tire*, a 700-page E-book on CD, edited by Joseph Walter and Alan Gent is included in the course material.

**Instructor: Joseph D. Walter**



### Registration Information:

**Fees – List:** \$725; **SAE Members – Classic:** \$653;  
**Premium:** \$616; **Elite:** \$580  
0.7 CEUs

*"The best I've attended. Exceptional instructor that combined knowledge of subject, easy teaching style and encouragement of group involvement."*

**E. F. Mallard**  
President

Forensic Engineering, Inc.

## Vehicle Frontal Crash Occupant Safety and CAE



I.D.# C0621 – [www.sae.org/pdevent/C0621](http://www.sae.org/pdevent/C0621)

March 13-14, 2012 • Troy, Michigan  
September 27-28, 2012 • Troy, Michigan

This seminar covers the mechanics of frontal crashes and how vehicle structures, vehicle restraint systems, and vehicle interiors affect occupant safety. It also describes details of how CAE tools work in the simulation of frontal crashes. The goal of the course is to familiarize participants with engineering principles behind vehicle and restraint designs for occupant safety. Accident crash statistics, biomechanics, government regulations and public domain frontal safety tests will be reviewed briefly. Students will also be exposed to Madymo, one of the major occupant CAE tools. The basic inner workings of the tool, such as rigid body dynamics, joints, contact, airbag and seatbelt modeling, and modeling techniques will be shared with the class. The class also offers participants opportunities to do hands-on computer analysis as well as simplified hands-on crash tests, where students can learn first-hand how vehicle pulses and restraint design affect occupant response.

**Instructor: Stephen Kang**



### Registration Information:

**Fees – List:** \$1,265; **SAE Members – Classic:** \$1,139;  
**Premium:** \$1,075; **Elite:** \$1,012  
1.3 CEUs

*"The course and the instructor were magnificent. Absolutely indispensable training for any accident reconstructionist wanting an understanding of vehicle safety systems."*

**Sal Fariello**

Accident Reconstructionist  
Eastern Forensic Science Group

## **New** Accessing and Interpreting Heavy Vehicle Event Data Recorders



I.D.# C1022 – [www.sae.org/pdevent/C1022](http://www.sae.org/pdevent/C1022)

May 15-18, 2012 • Oxnard, California  
October 23-26, 2012 • Charlotte, North Carolina

See course description on page 2.

*"The most thorough and detailed HVEDR course anywhere. Outstanding!"*

**Bryce Anderson**  
Ph.D. Researcher

## **New** Vehicle User Interfaces: Principles and Techniques for Design and Development

I.D.# C1114 – [www.sae.org/pdevent/C1114](http://www.sae.org/pdevent/C1114)

April 23, 2012 • Detroit, Michigan - Held in conjunction with the SAE 2012 World Congress

The automotive industry is facing an unprecedented proliferation of vehicle interior interface features and technologies such as controls and displays for infotainment, navigation, smart-phone integration, wireless connectivity, HVAC, lights, etc. that can dramatically increase complexity faced by the driver. Managing the cognitive and physical workloads of the driver and minimizing driver distractibility through key human factors design principles is paramount to the safe, convenient and enjoyable operation of these technologies. Using a combination of lecture, case studies and exercises, this course will provide an overview of principles and techniques for developing intuitive, safe and effective human-machine interfaces, as well as best practices and problems to avoid.

**Instructors: Michael Tschirhart and John Kosinski**



### Registration Information:

**Fees – List:** \$725; **SAE Members – Classic:** \$653;  
**Premium:** \$616; **Elite:** \$580  
0.7 CEUs

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## Accelerated Test Methods for Ground and Aerospace Vehicle Development

I.D.# C0316 – [www.sae.org/pdevent/C0316](http://www.sae.org/pdevent/C0316)

April 23-24, 2012 • Detroit, Michigan - *Held in conjunction with the SAE 2012 World Congress*

July 30-31, 2012 • Troy, Michigan

December 6-7, 2012 • Troy, Michigan

This course covers the benefits, limitations, processes, and applications of several proven accelerated test methods including accelerated reliability, step stress, FSLT (Full System Life Test), FMVTA® (Failure Mode Verification Testing), HALT (Highly Accelerated Life Testing), and HASS (Highly Accelerated Stress Screening). A combination of hands-on exercises, team activities, discussion, and lecture are used throughout the course. Participants will also receive a copy of the instructor's book, *Accelerated Testing and Validation Management*, which includes numerous hands-on exercises and a CD with analytical spreadsheets. Attendees are requested to bring a calculator to the seminar.

**Instructor: Alexander (Alex) J. Porter**



**Registration Information:**

**Fees – List:** \$1,295; **SAE Members – Classic:** \$1,166;  
**Premium:** \$1,101; **Elite:** \$1,036  
1.3 CEUs

*"I found this seminar comprehensive and useful. Many items unexpectedly helped me in other areas."*

**Steve Johns**  
Validation Engineer  
PPG

Also available as a SAE-Learning opportunity –  
[www.sae.org/e-seminars/atm](http://www.sae.org/e-seminars/atm)

## **New** Brake Testing for Passenger Cars and Light Trucks

I.D.# C1050 – [www.sae.org/pdevent/C1050](http://www.sae.org/pdevent/C1050)

May 31-June 1, 2012 • Troy, Michigan

October 4-5, 2012 • San Diego, California– *Held in conjunction with SAE 2012 Brake Colloquium and Exhibition - 30th Annual*

This data-driven and test standard-driven seminar provides details of the different elements required to successfully manage, execute, and understand brake test results related to passenger cars and light duty trucks. To better understand brake testing, the course provides a "brake testing toolbox" with key definitions, calculations, and descriptions of typical test sections, control methods, and brake applications used in different vehicle and laboratory testing. Attendees will gain practical experience through hands-on exercises and short workshops. Each test module includes detailed explanations and examples of test setup, inertia calculations, test conditions, main test sequence, results assessment, and best testing practices.

**Instructor: Carlos Agudelo**



**Registration Information:**

**Fees – List:** \$1,225; **SAE Members – Classic:** \$1,103;  
**Premium:** \$1,041; **Elite:** \$980  
1.3 CEUs

## Practical NVH Signal Processing Methods

I.D.# C0431 – [www.sae.org/pdevent/C0431](http://www.sae.org/pdevent/C0431)

Upcoming open enrollment dates being scheduled. Please check the seminar webpage for future offerings.

This seminar will help you to understand the foundation common to all NVH data acquisition equipment including digitizing, windows, aliasing, averaging techniques, and common analysis functions such as the power spectrum, transfer function and coherence. Fundamental concepts such as filtering, modulation, convolution, and correlation, as well as specialized techniques used in rotating machinery such as adaptive re-sampling and order tracking, will be covered. The seminar will also cover multi-input multi-output (MIMO) signal processing, array based solutions for force identification, source and path characterization and data visualization. Brief introductions to emerging concepts will also be explored and computer demonstrations, physical experiments and case studies will be used to illustrate applied, real-world problems.

**Instructor: Michael F. Albright**



**Registration Information:**

**Fees – List:** \$1,225; **SAE Members – Classic:** \$1,103;  
**Premium:** \$1,041; **Elite:** \$980  
1.3 CEUs

*"The instructor is an expert! His knowledge and presentation skills are top notch."*

**Bryan Underwood**  
NVH Senior Project Engineer  
Detroit Diesel



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## Advanced Vehicle Dynamics for Passenger Cars and Light Trucks



I.D.# C0415 – [www.sae.org/pdevent/C0415](http://www.sae.org/pdevent/C0415)

June 12-14, 2012 • Troy, Michigan  
October 8-10, 2012 • Troy, Michigan

This seminar goes beyond the basics of passenger car and light truck vehicle dynamics by applying advanced theory, physical tests and CAE to the assessment of ride, braking, steering and handling performance. Hands-on workshops using CARSIM™ vehicle dynamics simulation software will help reinforce the material. Significant time will also be dedicated to the use of design of experiments (DOE) as a tool to assist in the analysis and optimization of chassis systems for multiple vehicle responses.

**Instructor(s):** Richard Lundstrom and Timothy Drotar



**Registration Information:**

**Fees – List:** \$1,595; **SAE Members – Classic:** \$1,436;  
**Premium:** \$1,356; **Elite:** \$1,276  
2.0 CEUs

## **New** Applied Hydraulic Brake Systems

I.D.# C0817 – [www.sae.org/pdevent/C0817](http://www.sae.org/pdevent/C0817)

October 11-12, 2012 • East Liberty, Ohio

This course is designed to expose participants to the basic analysis and theory of brake system performance for key braking conditions. Participants will review principles in a classroom environment and then reinforce these concepts by actually performing the maneuvers from the driver's seat in a test track environment. In-vehicle data will be collected enabling the participants to compare predicted and actual performances and highlight potential sources of variance, using industry standard practices. The course is not designed to train performance drivers, but rather to build the bridge between analysis and theory and actual performance in real driving conditions. Exercises from FMVSS135 and popular magazine and manufacturer evaluations will be used to develop the bridge between theory and practice. This class is conducted at the Transportation Research Center Proving Grounds in East Liberty, Ohio. Driving exercises are conducted using specially-prepared vehicles on closed tracks including straight-line and oval configurations..

**Instructor:** Thomas J. Hall



**Registration Information:**

**Fees – List:** \$1,895; **SAE Members – Classic:** \$1,845;  
**Premium:** \$1,795; **Elite:** \$1,745  
1.3 CEUs

## Applied Vehicle Dynamics



I.D.# C0414 – [www.sae.org/pdevent/C0414](http://www.sae.org/pdevent/C0414)

May 21-23, 2012 • Greer, South Carolina

This course offers twelve modules devoted to the key fundamental principles associated with longitudinal and lateral vehicle dynamics. Each focused classroom session is paired with an on-track exercise to immediately reinforce these concepts with a dedicated behind-the-wheel driving session, effectively illustrating these principles in the real world.

Note that unlike most driving schools, this course is not designed to train performance drivers. Rather, the exercises on days one and two build the bridge between vehicle dynamics theory and practical application by providing a rich academic underpinning and then reinforcing it with highly focused and relevant driving experiences.

Significant technical skill-building is provided on day three, with increased instructor supervised track time to further absorb the principles learned on days one and two. If your job description does require performance driving skills, the dynamic exercises on day three will lay a solid foundation on which you can independently refine your own skills.

**Instructor:** James Walker, Jr.



**Registration Information:**

**Fees – List:** \$2,295; **SAE Members – Classic:** \$2,245;  
**Premium:** \$2,195; **Elite:** \$2,145  
2.4 CEUs

*“You will never have a full understanding of vehicle dynamics without this course as a base. While the screeching tires and smoke add to the effect, the experience “sticks” in your head.”*

**Shad Tisdale**

Research Engineer - Tire Mechanics  
Cooper Tire & Rubber Company

## Chassis & Suspension Component Design for Passenger Cars & Light Trucks



I.D.# 95025 – [www.sae.org/pdevent/95025](http://www.sae.org/pdevent/95025)

February 29-March 2, 2012 • Troy, Michigan

Just as the chassis and suspension system provides an ideal framework for the automobile, this popular SAE seminar provides an informative framework for those involved in the design of these important systems. Emphasizing the fundamental principles that underlie rational development and design of suspension components and structures, this course covers the concepts, theories, designs and applications of automotive suspension systems.

**Instructor:** Pinhas Barak



**Registration Information:**

**Fees – List:** \$1,545; **SAE Members – Classic:** \$1,391;  
**Premium:** \$1,313; **Elite:** \$1,236  
2.0 CEUs

*“Good presentation, content was informative and interesting, and I can apply it to my job.”*

**Paul Dedrich**

Senior Product Engineer  
DMI

## Commercial Vehicle Braking Systems



I.D.# C0233 – [www.sae.org/pdevent/C0233](http://www.sae.org/pdevent/C0233)

June 20-22, 2012 • Troy, Michigan  
November 28-30, 2012 • Troy, Michigan

Increased public pressure to improve commercial truck safety and new stopping distance regulations have intensified the need to better understand the factors influencing heavy vehicle braking performance. To assist individuals and their organizations in preparing for these new truck braking standards, this seminar focuses attendees on understanding medium-duty hydraulic brake systems and heavy-duty air brake systems and how both systems' performance can be predicted, maintained and optimized. The function and application of the major brake system components will be explained and attendees will discover how brakes, tires and roadways interact as a system. Federal braking regulations for both hydraulic and air brake vehicles will also be covered. Attendees will receive the text, *Commercial Vehicle Braking Systems: Air Brakes, ABS and Beyond*, written by Leonard C. Buckman.

**Instructor: Paul Johnston**

**i** **Registration Information:**  
**Fees – List:** \$1,595; **SAE Members – Classic:** \$1,436;  
**Premium:** \$1,356; **Elite:** \$1,276  
 2.0 CEUs

*“An excellent course which provides a comprehensive overview of braking systems for Commercial Vehicles.”*

**Earl Brown**  
Commercial Vehicle Sales Manager  
TMD Friction

Also available as an SAE-Learning opportunity –  
[www.sae.org/e-seminars/cvbs](http://www.sae.org/e-seminars/cvbs)

## Fundamentals of Commercial Vehicle Aerodynamics

I.D.# C0919 – [www.sae.org/pdevent/C0919](http://www.sae.org/pdevent/C0919)

February 13-14, 2012 • Troy, Michigan

This seminar will detail the fundamentals of aerodynamics and the tools (wind tunnels, track testing, and airflow visualization) used in the design of commercial vehicles. Testing of scale models, measurement methods, and data interpretation will be covered, as well as the influence of crosswinds and interpretation of surface pressures. Attendees will receive a copy of the SAE J1252: Wind Tunnel Test Procedure for Trucks and Buses.

**Instructor: Jack Williams**

**i** **Registration Information:**  
**Fees – List:** \$1,285; **SAE Members – Classic:** \$1,157;  
**Premium:** \$1,092; **Elite:** \$1,028  
 1.3 CEUs

## Fundamentals of Steering Systems



I.D.# C0716 – [www.sae.org/pdevent/C0716](http://www.sae.org/pdevent/C0716)

March 19-20, 2012 • Troy, Michigan  
August 16-17, 2012 • Troy, Michigan

In this interactive seminar, participants will analyze the steering system, from the steering wheel to the road wheel. The seminar will cover the anatomy and architecture of the lower steering system, its effect on vehicle response, and how a force at the contact patch is translated to a torque in the steering wheel. The anatomy and architecture of the upper steering system, including the topic of non-uniformity and the role of the upper steering in the occupant protection system will also be explored. Students will have the opportunity to participate in exercises throughout the seminar, culminating in a final project where they will calculate an assist curve for both a HPS and an EPAS system.

**Instructor: Timothy Drotar**

**i** **Registration Information:**  
**Fees – List:** \$1,225; **SAE Members – Classic:** \$1,103;  
**Premium:** \$1,041; **Elite:** \$980  
 1.3 CEUs

*“Very informative class on everything that goes into designing a steering system from the ground up.”*

**Cory C. Cousineau**  
Development Engineer  
EMP-Engineered Machined Products, Inc.

## Fundamentals of Heavy Truck Dynamics



I.D.# C0837 – [www.sae.org/pdevent/C0837](http://www.sae.org/pdevent/C0837)

July 16-18, 2012 • Troy, Michigan  
December 10-12, 2012 • Troy, Michigan

This seminar provides a comprehensive introduction to the fundamentals of heavy truck dynamics. It covers all of the critical subsystems that must be considered by designers and decision makers in determining the effect of various components on heavy truck dynamics. This seminar begins where the tires meet the ground, progressing up through the various components and bringing together the theory and practice of heavy truck dynamics. A series of case studies related to truck ride engineering will provide an opportunity for attendees to demonstrate their knowledge gained and introduces them to some of the newer technologies related to evaluating and improving heavy truck ride dynamics.

**Instructor: Mehdi Ahmadian**

**i** **Registration Information:**  
**Fees – List:** \$1,545; **SAE Members – Classic:** \$1,391;  
**Premium:** \$1,313; **Elite:** \$1,236  
 2.0 CEUs

*“This course offered excellent information and insight into Heavy Trucks and their sub-systems.”*

**Enrique Bonugli**  
Test Engineer  
Biodynamic Research Corporation

### KEY



CERTIFICATE PROGRAM



ACTAR APPROVED SEMINARS



WEBINARS

## Fundamentals of Automotive All-Wheel Drive Systems

I.D.# C0305 – [www.sae.org/pdevent/C0305](http://www.sae.org/pdevent/C0305)

February 29, 2012 • Troy, Michigan  
August 30, 2012 • Troy, Michigan

This seminar provides an introduction to the fundamental concepts and evolution of passenger car and light truck 4x4/all-wheel drive (AWD) systems including the nomenclature utilized to describe these systems. Basic power transfer unit and transfer case design parameters, component application to system function, the future of AWD systems, and emerging technologies that may enable future systems are covered. This course is an excellent follow-up to the "A Familiarization of Drivetrain Components" seminar (which is designed for those who have limited experience with the total drivetrain).

**Instructor: Joseph Palazzolo**



**Registration Information:**

**Fees – List:** \$725; **SAE Members – Classic:** \$653;  
**Premium:** \$616; **Elite:** \$580  
0.7 CEUs

*"The course content exceeded my expectations and left me much more confident in my understanding of driveline systems."*

**Mark Schulte**  
Senior Sales Engineer  
Stoneridge, Inc.

Also available as a SAE-Learning opportunity –  
[www.sae.org/e-seminars/awdsystems](http://www.sae.org/e-seminars/awdsystems)

## High-Performance Brake Systems



I.D.# C0718 – [www.sae.org/pdevent/C0718](http://www.sae.org/pdevent/C0718)

Upcoming open enrollment dates being scheduled. Please check the seminar webpage for future offerings.

The seminar begins with a concise analysis of brake system design factors relevant to all types and categories of high-performance vehicles. The second portion of the seminar dives into the details of brake system component design. Based upon the principles learned earlier in the day, attendees will quickly realize that just as with proper system design, brake system component design is an exercise in managing engineering trade-offs. As a result, the material presented will not disclose what components to choose as much as how to choose them. Day two of the seminar concludes with a design exercise that will allow attendees to put into practice several of the key concepts learned throughout the seminar.

**Instructor: James Walker, Jr.**



**Registration Information:**

**Fees – List:** \$1,255; **SAE Members – Classic:** \$1,130;  
**Premium:** \$1,067; **Elite:** \$1,004  
1.3 CEUs

*"Interesting, realistic and factual!"*

**Alejandro J. Nunez-Del Rio**  
Design Engineer  
General Motors

## Heavy Vehicle Ride Comfort Engineering



I.D.# C0948 – [www.sae.org/pdevent/C0948](http://www.sae.org/pdevent/C0948)

December 13, 2012 • Troy, Michigan

This one-day seminar provides a comprehensive evaluation of heavy vehicle ride comfort engineering, balancing fundamental concepts with contemporary issues. This seminar begins with the fundamentals of ride comfort engineering, covering the elements that impact operator comfort and fatigue in heavy vehicles, particularly heavy trucks. This will include vehicle components that influence vibrations being transmitted to the operator such as cab and seat suspensions, cab layout, and sleeper arrangement. Additionally, this seminar includes an evaluation of the impact vibrations have on the human body and motor skills as they pertain to vehicle operation. This seminar concludes with two case studies that highlight some of the new technologies that can assist the attendee in evaluating and improving truck ride dynamics. Please note: Individuals that have attended the Fundamentals of Heavy Truck Dynamics seminar should be aware there is considerable overlap in the content presented in this seminar.

**Instructor: Mehdi Ahmadian**



**Registration Information:**

**Fees – List:** \$725; **SAE Members – Classic:** \$653;  
**Premium:** \$616; **Elite:** \$580  
0.7 CEUs

## Hydraulic Brake Systems for Passenger Cars and Light Trucks



I.D.# C0509 – [www.sae.org/pdevent/C0509](http://www.sae.org/pdevent/C0509)

March 7-9, 2012 • Troy, Michigan  
September 5-7, 2012 • Troy, Michigan

This course will analyze automotive braking from a system's perspective, emphasizing legal requirements as well as performance expectations such as pedal feel, stopping distance, fade and thermal management. Calculations necessary to predict brake balance and key system sizing variables that contribute to performance will be discussed. Major components of a brake system, including calipers, boosters, master cylinders, drum brakes, and park brakes will be presented in detail highlighting the many design variations. An overview of the chassis control components and operating principles will be presented with an emphasis on ABS, traction control and stability control.

**Instructor: Thomas J. Hall**



**Registration Information:**

**Fees – List:** \$1,545; **SAE Members – Classic:** \$1,391;  
**Premium:** \$1,313; **Elite:** \$1,236  
2.0 CEUs

*"This was an excellent overview of the topic, but it dealt with enough specifics to give me a good knowledge base to help me do my job better."*

**Alan S. Halvorson**  
Project Engineer  
Harley-Davidson Motor Company

## Introduction to Brake Control Systems: ABS, TCS, and ESC



I.D.# C0315 – [www.sae.org/pdevent/C0315](http://www.sae.org/pdevent/C0315)  
August 2-3, 2012 • Troy, Michigan

This comprehensive seminar introduces participants to the system-level design considerations, vehicle interface requirements, and inevitable performance compromises that must be addressed when implementing these technologies. Following an in-depth study of system electronics, hydraulic hardware, and sensor requirements, the participants learn about the control strategies employed by anti-lock brakes (ABS), dynamic rear proportioning (DRP), traction control (TCS), and electronic stability control (ESC) with strong emphasis placed on vehicle dynamic response. The seminar concludes with a study of unique applications, a look forward to advanced brake control system integration, and an overview of Federal Motor Vehicle Safety Standard 126.

**Instructor: James Walker, Jr.**

<b>i</b>	<b>Registration Information:</b>
	<b>Fees – List:</b> \$1,225; <b>SAE Members – Classic:</b> \$1,103;
	<b>Premium:</b> \$1,041; <b>Elite:</b> \$980
	1.3 CEUs

*“Outstanding! I was completely impressed with the instructor and his ease in explaining difficult material in a timely and entertaining manner.”*

**Christopher Thibeault**  
Market Development Engineer  
ST Microelectronics

Also available as a SAE-Learning opportunity –  
[www.sae.org/e-seminars/brakecontrolsystems](http://www.sae.org/e-seminars/brakecontrolsystems)

## Applied Brake Controls: ABS, TCS, and ESC



I.D.# 99006 – [www.sae.org/pdevent/99006](http://www.sae.org/pdevent/99006)  
April 12-13, 2012 • Brimley, Michigan

Experience the vehicle dynamic enhancements afforded by anti-lock brakes (ABS), traction control (TCS), and electronic stability control (ESC) with this highly interactive two-day seminar. Designed to get you out of the classroom and on to the test track, a total of six 60-minute structured learning experiences behind the wheel will vividly illustrate the benefits, limitations, and ultimate compromises that must be made when designing and implementing modern brake control systems. Detailed course notes and illustrations are provided for on-the-job reference. In order to cover all content and provide effective driving exercises, this course requires eight hours of instructional contact per day versus SAE’s normal 6.5 per day

**Instructor: James Walker, Jr.**

<b>i</b>	<b>Registration Information:</b>
	<b>Fees – List:</b> \$1,225; <b>SAE Members – Classic:</b> \$1,103;
	<b>Premium:</b> \$1,041; <b>Elite:</b> \$980
	1.3 CEUs

*“Great learning experience. Perfect mix of theoretical and practical activities.”*

**Rodrigo Gonzalez**  
Armor Holdings  
ST Microelectronics

## The Tire as a Vehicle Component



I.D.# C0101 – [www.sae.org/pdevent/C0101](http://www.sae.org/pdevent/C0101)  
May 29, 2012 • Troy, Michigan  
December 5, 2012 • Troy, Michigan

The principal functions of the pneumatic tire are to generate driving, braking, and cornering forces while safely carrying the vehicle load and providing adequate levels of ride comfort. This seminar explains how tire forces and moments are generated under different operating and service conditions and, in turn, demonstrates how these forces and moments influence various vehicle responses such as braking, handling, ride, and high-speed performance. The content focuses on the fundamentals of tire behavior in automobiles, trucks, and farm tractors, but also includes experimental and empirical results, when necessary. The Pneumatic Tire, a 700-page E-book on CD, edited by Joseph Walter and Alan Gent is included in the course material.

**Instructor: Joseph D. Walter**

<b>i</b>	<b>Registration Information:</b>
	<b>Fees – List:</b> \$725; <b>SAE Members – Classic:</b> \$653;
	<b>Premium:</b> \$616; <b>Elite:</b> \$580
	0.7 CEUs

## Vehicle Dynamics for Passenger Cars and Light Trucks



I.D.# 99020 – [www.sae.org/pdevent/99020](http://www.sae.org/pdevent/99020)  
April 25-26, 2012 • Detroit, Michigan - Held in conjunction with the SAE 2012 World Congress  
September 12-14, 2012 • Troy, Michigan

This seminar will present an introduction to Vehicle Dynamics from a vehicle system perspective. The theory and applications are associated with the interaction and performance balance between the powertrain, brakes, steering, suspensions and wheel and tire vehicle subsystems. The role that vehicle dynamics can and should play in effective automotive chassis development and the information and technology flow from vehicle system to subsystem to piece-part is integrated into the presentation. Vehicle system dynamic performance in the areas of drive-off, braking, directional control and rollover is emphasized. The dynamics of the powertrain, brakes, steering, suspension and wheel and tire subsystems and their interactions are examined along with the important role of structure and structural parameters related to vehicle dynamics. Physical experiments, applicable to vehicle dynamics are also introduced. Attendees will receive the *Bosch Automotive Handbook* and *The Automotive Chassis: Engineering Principle* by Reimpell, Stoll and Betzler.

**Instructor: Richard Lundstrom**

<b>i</b>	<b>Registration Information:</b>
	<b>Fees – List:</b> \$1,715; <b>SAE Members – Classic:</b> \$1,544;
	<b>Premium:</b> \$1,458; <b>Elite:</b> \$1,372
	2.0 CEUs

Also available as a SAE-Learning opportunity –  
[www.sae.org/e-seminars/vehicledynamics](http://www.sae.org/e-seminars/vehicledynamics)

# PROFESSIONAL DEVELOPMENT SCHEDULE FOR JAN - DEC 2012

## Seminars, Academies, & Webinars

(Courses are added throughout the year, please check online for the most current schedule at [www.sae.org/pdevent/bydate/](http://www.sae.org/pdevent/bydate/))

### Norwalk, CA—Cerritos College

Jan 23-25 Injuries, Anatomy, Biomechanics & Federal Regulation—I.D.# 85049

### Warrendale, PA—SAE World Headquarters

Jan 9-10 ARP4754A and the Guidelines for Development of Civil Aircraft and Systems—I.D.# C1118

Jan 11-13 AS9100C Internal Auditor Training—I.D.# C1120

### Webinar—via telephone/internet

Jan 10-12 Diesel Engine Noise Control Webinar—I.D.# WB1041

Jan 11-13 Displacement on Demand Systems (DoD) Webinar—I.D.# WB1010

Jan 16-20 Variable Cam and Valve Timing (VCT) & (VVT) Webinar WB1011

Jan 17-26 Tolerance Stack-up Fundamentals Webinar—I.D.# C0842

Jan 31-Feb 2 Variable Compression Ratio (VCR) Webinar—I.D.# WB1012

### Norwalk, CA—Cerritos College

Feb 8-10 Weibull-Log Normal Analysis Workshop—I.D.# 86034

### Troy, MI—SAE Automotive Headquarters

Feb 13-14 Fundamentals of and Improvements in Commercial Vehicle Aerodynamic Drag—I.D.# C0919

Feb 15-16 Introduction to Hydraulic Hybrid Systems for Road Vehicles—I.D.# C0833

Feb 16-17 Sheet Metal Stamping: Robust Formability—I.D.# C0713

Feb 17 Fundamentals of Shielding Design for EMC Compliance—I.D.# C0835

Feb 23-24 Program and Risk Management—I.D.# C0409

Feb 24 Understanding and Using the SAE J2534-1 API to Access Vehicle Networks—I.D.# C0733

Feb 27 A Familiarization of Drivetrain Components—I.D.# 98024

Feb 29 Fundamentals of All-Wheel Drive Systems—I.D.# C0305 USA

Feb 29-Mar 2 Chassis & Suspension Component Design for Passenger Cars & Light Trucks—I.D.# 95025

### Warrendale, PA—SAE World Headquarters

Feb 13-14 Aircraft Cabin Safety and Interior Crashworthiness—I.D.# C0926

Feb 15-16 Understanding the FAA Aircraft Certification Process—I.D.# C0821

### San Diego, CA—Town and Country Resort & Conference Center (held in conjunction with the SAE 2012 Hybrid Vehicle Technologies Symposium)

Feb 20 Hybrid Vehicle Systems Integration—I.D.# C1125

### Webinar—via telephone/internet

Feb 3 Understanding AS9100 Rev C Webinar—I.D.# WB0958

Feb 6-10 Homogeneous Charge Compression Ignition (HCCI) Webinar—I.D.# WB1013

Feb 7-23 Design of Experiments (DOE) for Engineers Webinar—I.D.# WB0932

Feb 27- Mar 2 Introduction to Design Review Based on Failure Modes (DRBFM) Webinar—I.D.# WB1047

### Norwalk, CA—Cerritos College

Mar 5-8 IAQG Sanctioned Aerospace Auditor Transition Training (AATT)—I.D.# C1034

### Troy, MI—SAE Automotive Headquarters

Mar 1-2 Design for Manufacturing & Assembly (DFM/DFA) —I.D.# 92047

Mar 6-7 Selecting the Optimal Battery Chemistry for HEV, PHEV, and EV Applications—I.D.# C1133

Mar 7-9 Hydraulic Brake Systems for Passenger Cars & Light Trucks—I.D.# C0509

Mar 8-9 The Basics of Internal Combustion Engines—I.D.# C0103

Mar 12-13 Diesel Engine Technology—I.D.# 93014

Mar 12-13 Introduction to Commercial and Off-Road Vehicle Cooling Airflow Systems—I.D.# C0738

Mar 13-14 Vehicle Frontal Crash Occupant Safety and CAE—I.D.# C0621

Mar 19-20 Fundamentals of Steering Systems—I.D.# C0716

Mar 19-20 Improving Fuel Efficiency with Engine Oils—I.D.# C0914

Mar 21-23 Turbocharging Internal Combustion Engines—I.D.# C0314

Mar 22-23 In-Vehicle Networking with LIN and FlexRay Applications—I.D.# C0136

Mar 28-30 Internal Combustion Systems: HCCI, DoD, VCT/VVT, DI and VCR—I.D.# C0613

### Phoenix, AZ—Exponent, Inc.

Mar 26-28 Fundamentals of Motor Vehicle Fire Investigation—I.D.# C0915

### Webinar—via telephone/internet

Mar 6-8 Plug-In Vehicle Conductive Charging, SAE J1772 Explained Webinar—I.D.# WB1046

Mar 13-5 Fundamentals of Geometric Dimensioning & Tolerancing (GD&T) Webinar—I.D.# WB0933

Mar 30 Understanding AS9100 Rev C Webinar—I.D.# WB0958

### Norwalk, CA—Cerritos College

Apr 2-3 ARP4754A and the Guidelines for Development of Civil Aircraft and Systems—I.D.# C1118

Apr 2-3 Implementing AS9100C: Understanding and Transitioning to the New Requirements—I.D.# C1119

### Troy, MI—SAE Automotive Headquarters

Apr 2-4 Vibration Analysis using FEA: A Hands-on Workshop—I.D.# C0830

Apr 2-4 Principles of Cost and Finance for Engineers—I.D.# C0828

Apr 2-4 Combustion & Emissions for Engineers—I.D.# 97011

Apr 25-26 Embedded Control Systems Design Workshop—I.D.# C0922

### Brimley, MI—Continental's Brimley Development Center

Apr 12-13 Applied Brake Controls: ABS, TCS, and ESC—I.D.# C0610

### Detroit, MI—Detroit Marriot at the Renaissance Center (held in conjunction with the SAE 2012 World Congress)

Apr 23 Vehicle User Interfaces: Principles and Techniques for Design and Development—I.D.# C1114

Apr 23 Surface Texture: Specification and Control—I.D.# C1110

Apr 23 Exhaust Flow Performance and Pressure Drop of Exhaust Components and System—I.D.# C0235

Apr 23 Patent Law for Engineers—I.D.# 88007

Apr 23-24 Advanced High Strength Steels for Vehicle Weight Reduction—I.D.# C0916

Apr 23-24 Accelerated Test Methods for Ground and Aerospace Vehicle Development—I.D.# C0316

Apr 23-24 Threaded Fasteners and the Bolted Joint—I.D.# 95030

Apr 23-24 Automotive Powertrain and Battery Cooling Airflow Systems: A Vehicle Perspective—I.D.# C0616

Apr 23-25 Strategic Leadership—I.D.# C0620

Apr 23-25 Weibull-Log Normal Analysis Workshop—I.D.# 86034

Apr 23-25 Vehicle Dynamics for Passenger Cars and Light Trucks—I.D.# 99020

Apr 23-25 Fundamentals of Modern Vehicle Transmissions—I.D.# 99018

Apr 23-25 Gasoline Direct Injection (GDI) Engines—I.D.# 1009

Apr 24 Introduction to NVH Aspects of Hybrid and Electric Vehicles—I.D.# C1128

Apr 24 Emissions-Related OBD Systems: A Design Overview—I.D.# C0708

- Apr 24-25 Acquiring and Analyzing Data from Sensors and In-Vehicle Networks—I.D.# C0522
- Apr 24-25 Product Liability & the Engineer—I.D.# 82001
- Apr 24-25 Engineering Project Management—I.D.# 99003
- Apr 25-26 Introduction to Hybrid and Electric Vehicle Battery Systems—I.D.# C0626
- Apr 25-27 Managing Engineering and Technical Professionals—I.D.# C0608
- Apr 25-27 Fundamentals of Metal Fatigue Analysis—I.D.# 94024
- Apr 26-27 Advanced Diesel Particulate Filtration Systems—I.D.# C0502
- Apr 26-27 Powertrain Selection for Fuel Economy and Acceleration Performance—I.D.# C0243
- Apr 26-27 Leading High Performance Teams—I.D.# C0410
- Apr 27 Safe Handling of High Voltage Battery Systems—I.D.# C1019
- Apr 27 Hybrid Vehicle Systems Integration—I.D.# C1125
- Apr 27 Common Rail Diesel Fuel Injection—I.D.# C0920
- Webinar—via telephone/internet**
- Apr 9-12 Design FMEA Update: What's New in J1739 Webinar—I.D.# WB0955
- Apr 16-19 Process FMEA Update: What's New in J1739 Webinar—I.D.# WB0956
- Troy, MI—SAE Automotive Headquarters**
- May 7-8 Automotive Glazing Materials—I.D.# 99002
- May 7-8 Selective Catalytic Reduction for Diesel Engines—I.D.# C0913
- May 8-9 A Holistic Introduction to Commercial Telematics—I.D.# C0947
- May 9-10 Side Impact Occupant Safety and CAE—I.D.# C0717
- May 14-18 Hybrid and Electric Vehicle Engineering Academy—I.D.# ACAD06
- May 15-16 Alternative Fuels: Impact on SI and CI Fuel Systems, Distribution, and Storage—I.D.# C0729
- May 15-16 Mechatronics: Introduction, Modeling and Simulation—I.D.# C0949
- May 17-18 Fundamentals of Automotive Fuel Delivery Systems—I.D.# C0303
- May 29 The Tire as a Vehicle Component—I.D.# C0101
- May 30 Tire & Wheel Safety Issues—I.D.# C0102
- May 30-31 Finite Element Analysis for Design Engineers-Hands-On FEA Workshop—I.D.# 93006
- May 30-Jun 1 Electrohydraulic Controls for Mobile Equipment & Vehicles—I.D.# C1011
- May 31-Jun 1 Brake Testing for Passenger Cars and Light Trucks—I.D.# C1050
- Oxnard, CA—Ventura County Fire Department Fleet Maintenance Facility**
- May 15-18 Accessing and Interpreting Heavy Vehicle Event Data Recorders—I.D.# C1022
- Greer, SC—BMW Performance Center**
- May 21-23 Applied Vehicle Dynamics—I.D.# C0414
- Webinar—via telephone/internet**
- May 11 Understanding AS9100 Rev C Webinar—I.D.# WB0958
- May 21-23 Patent Litigation in the U.S.: What You Need to Know Webinar—I.D.# WB0940
- May 22 Introduction to Hybrid Powertrains Webinar—I.D.# C0903
- May 24 Basic Hybrid and Electric Vehicle Safety Webinar—I.D.# C0904
- May 29 Plug-in Hybrids: Opportunities and Challenges Webinar—I.D.# C0905
- May 30-Jun 1 Turbocharging for Fuel Economy and Emissions Webinar—I.D.# WB1018
- May 31 Hybrid and Electric Vehicles: Current Production, Future Strategies Webinar—I.D.# C0906
- Troy, MI—SAE Automotive Headquarters**
- Jun 4-8 Diesel Engine Technology Engineering Academy—I.D.# ACAD03
- Jun 7-8 The Role of the Expert Witness in Product Liability Litigation—I.D.# 92054
- Jun 12-14 Advanced Vehicle Dynamics for Passenger Cars and Light Trucks—I.D.# C0415
- Jun 14-15 Model-Based Design: Delivering Quality Electronic Products Faster—I.D.# C0806
- Jun 20-22 Motor Fuel: Technology, Performance, Testing, and Specifications—I.D.# 98003
- Jun 20-22 Commercial Vehicle Braking Systems—I.D.# C0233
- Jun 25-27 Geometric Dimensioning & Tolerancing—I.D.# C0133
- Jun 28-29 Tolerance Stack-Up Analysis—I.D.# C0022
- Jun 28-29 Evaporative and Refueling Emission Control—I.D.# C0928
- Warrendale, PA—SAE World Headquarters**
- Jun 11-14 IAQG Sanctioned Aerospace Auditor Transition Training (AATT)—I.D.# C1034
- Webinar—via telephone/internet**
- Jun 4-7 Introduction to Design Review Based on Failure Modes (DRBFM) Webinar—I.D.# WB1047
- Troy, MI—SAE Automotive Headquarters**
- Jul 12-13 Design of Experiments for Engineers—I.D.# C0406
- Jul 16 Statistical Tolerance Design—I.D.# 88033
- Jul 16 Hybrid Vehicle Systems Integration—I.D.# C1125
- Jul 18 Design Reviews for Effective Product Development—I.D.# C0004
- Jul 16-18 Fundamentals of Heavy Truck Dynamics—I.D.# C0837
- Jul 18-20 Turbocharging Internal Combustion Engines—I.D.# C0314
- Jul 19-20 Control Systems Simplified—I.D.# C0525
- Jul 23-24 Threaded Fasteners and the Bolted Joint—I.D.# 95030
- Jul 23-25 Managing Engineering and Technical Professionals—I.D.# C0608
- Jul 25-27 Fundamentals of Metal Fatigue Analysis—I.D.# 94024
- Jul 30-31 Accelerated Test Methods for Ground and Aerospace Vehicle Development—I.D.# C0316
- Jul 31-Aug 1 Engineering Project Management—I.D.# 99003
- Warrendale, PA—SAE World Headquarters**
- Jul 19-20 Implementing AS9100C: Understanding and Transitioning to the New Requirements—I.D.# C1119
- Webinar—via telephone/internet**
- Jul 31-Aug 2 Diesel Engine Noise Control Webinar—I.D.# WB1041
- Norwalk, CA—Cerritos College**
- Aug 13-14 Aircraft Cabin Safety and Interior Crashworthiness—I.D.# C0926
- Aug 13-14 AS9100C Internal Auditor Training—I.D.# C1120
- Aug 15-16 Understanding the FAA Aircraft Certification Process—I.D.# C0821
- Aug 16 Fundamentals of Shielding Design for EMC Compliance—I.D.# C0835
- Troy, MI—SAE Automotive Headquarters**
- Aug 1-3 Designing On-Board Diagnostics for Light and Medium Duty Emissions Control System—I.D.# C0707
- Aug 2-3 Introduction to Brake Control Systems: ABS, TCS, and ESC—I.D.# C0315
- Aug 6-7 Sheet Metal Stamping: Robust Formability—I.D.# C0713
- Aug 6-7 Diesel Engine Technology—I.D.# 93014
- Aug 8-9 Introduction to Hybrid and Electric Vehicle Battery Systems—I.D.# C0626
- Aug 10 Safe Handling of High Voltage Battery Systems—I.D.# C1019
- Aug 13-14 Modern Fluids for Crankcase Engines: An Overview—I.D.# C0704
- Aug 14 Introduction to Gears—I.D.# C0822
- Aug 15-17 Fundamentals of Modern Vehicle Transmissions—I.D.# 99018
- Aug 16-17 Fundamentals of Steering Systems—I.D.# C0716
- Aug 23-24 Leading High Performance Teams—I.D.# C0410
- Aug 24 Introduction to NVH Aspects of Hybrid and Electric Vehicles—I.D.# C1128
- Aug 27 Brake Noise Problem Resolution—I.D.# C0831
- Aug 28 A Familiarization of Drivetrain Components—I.D.# 98024
- Aug 30 Fundamentals of All-Wheel Drive Systems—I.D.# C0305
- Webinar—via telephone/internet**
- Aug 3 Understanding AS9100 Rev C Webinar—I.D.# WB0958
- Aug 8-10 Plug-In Vehicle Conductive Charging, SAE J1772 Explained Webinar—I.D.# WB1046
- Aug 14-23 Tolerance Stack-up Fundamentals Webinar—I.D.# C0842

## PROFESSIONAL DEVELOPMENT SCHEDULE FOR JAN - DEC 2012 (CONT'D)

### **Troy, MI—SAE Automotive Headquarters**

- Sep 5-7 Hydraulic Brake Systems for Passenger Cars & Light Trucks—  
I.D.# C0509
- Sep 6-7 Selecting the Optimal Battery Chemistry for HEV, PHEV, and  
EV Applications—I.D.# C1133
- Sep 10 Common Rail Diesel Fuel Injection—I.D.# C0920
- Sep 10-11 Program and Risk Management—I.D.# C0409
- Sep 12-14 Vehicle Dynamics for Passenger Cars and Light Trucks—I.D.#  
99020
- Sep 17-18 Selective Catalytic Reduction for Diesel Engines—I.D.# C0913
- Sep 20-21 Introduction to Hydraulic Hybrid Systems for Road Vehicles—  
I.D.# C0833
- Sep 24-25 Introduction to Commercial and Off-Road Vehicle Cooling  
Airflow Systems—I.D.# C0738
- Sep 24-26 Weibull-Log Normal Analysis Workshop—I.D.# 86034
- Sep 27-28 Vehicle Frontal Crash Occupant Safety and CAE—I.D.# C0621

### **Webinar—via telephone/internet**

- Sep 5-7 Powertrain Control Unit/Transmission Control Unit Technology  
Webinar—I.D.# WB1001
- Sep 19-21 Fundamentals of Continuously Variable Transmission  
Technology Webinar—I.D.# WB1002

### **Rosemont, IL—Donald E. Stephens Convention Center (held in conjunction with the SAE 2012 Commercial Vehicle Engineering Congress)**

- Oct 1-2 Diesel Engine Technology—I.D.# 93014

### **Troy, MI—SAE Automotive Headquarters**

- Oct 1-1 Surface Texture: Specification and Control—I.D.# C1110
- Oct 1-2 Piston Ring Design/Materials—I.D.# 86009
- Oct 4-5 Controller Area Network (CAN) for Vehicle Applications—I.D.#  
C0120
- Oct 8-10 Advanced Vehicle Dynamics for Passenger Cars and Light  
Trucks—I.D.# C0415
- Oct 8-10 Internal Combustion Systems: HCCI, DoD, VCT/VVT, DI and  
VCR—I.D.# C0613
- Oct 11-12 The Basics of Internal Combustion Engines—I.D.# C0103
- Oct 15-17 AS9100C Internal Auditor Training—I.D.# C1120
- Oct 17 Design Reviews for Effective Product Development—I.D.# C0004
- Oct 24-26 Principles of Cost and Finance for Engineers—I.D.# C0828
- Oct 26 Exhaust Flow Performance and Pressure Drop of Exhaust  
Components and System—I.D.# C0235
- Oct 29-30 Finite Element Analysis for Design Engineers—Hands-On FEA  
Workshop—I.D.# 93006
- Oct 29-31 Gasoline Direct Injection (GDI) Engines—I.D.# C1009

### **San Diego, CA—Town and Country Resort & Conference Center (held in conjunction with the SAE 2012 Brake Colloquium & Exhibition – 30th Annual)**

- Oct 4 Brake Noise Problem Resolution—I.D.# C0831
- Oct 4-5 Brake Testing for Passenger Cars and Light Trucks—I.D.# C1050
- Oct 5 Brake Friction Materials: Testing, Quality and Selection—I.D.#  
C1020

### **Charlotte, NC—Charlotte Mecklenburg Police Training Academy**

- Oct 23-26 Accessing and Interpreting Heavy Vehicle Event Data  
Recorders—I.D.# C1022

### **East Liberty, OH—Transportation Research Center**

- Oct 11-12 Applied Hydraulic Brake Systems—I.D.# C0817

### **Webinar—via telephone/internet**

- Oct 1-4 Review of AMT and DCT Technology Applied to Automotive  
Powertrain Webinar—I.D.# WB1003
- Oct 26 Understanding AS9100 Rev C Webinar—I.D.# WB0958
- Oct 30-Nov 1 Turbocharging for Fuel Economy and Emissions Webinar—I.D.#  
WB1018

### **Troy, MI—SAE Automotive Headquarters**

- Nov 1-2 Acquiring and Analyzing Data from Sensors and In-Vehicle  
Networks—I.D.# C0522
- Nov 1-2 Threaded Fasteners and the Bolted Joint—I.D.# 95030
- Nov 5-6 Fundamentals of Automotive Fuel Delivery Systems—I.D.# C0303
- Nov 7 Introduction to NVH Aspects of Hybrid and Electric Vehicles—  
I.D.# C1128
- Nov 7-9 Injuries, Anatomy, Biomechanics & Federal Regulation—I.D.# 85049
- Nov 7-9 Managing Engineering and Technical Professionals—I.D.# C0608
- Nov 8-9 Implementing AS9100C: Understanding and Transitioning to  
the New Requirements—I.D.# C1119
- Nov 13-14 Advanced High Strength Steels for Vehicle Weight Reduction—  
I.D.# C0916
- Nov 14 Hybrid Vehicle Systems Integration—I.D.# C1125
- Nov 14-16 Electrohydraulic Controls for Mobile Equipment & Vehicles—  
I.D.# C1011
- Nov 15-16 Compact Heat Exchangers for Automotive Applications—I.D.#  
97002
- Nov 19-20 Understanding the FAA Aircraft Certification Process—  
I.D.#C0821
- Nov 19-20 Tolerance Stack-Up Analysis—I.D.# C0022
- Nov 28-30 Commercial Vehicle Braking Systems—I.D.# C0233
- Nov 29-30 Advanced Diesel Particulate Filtration Systems—I.D.# C0502

### **Norwalk, CA—Cerritos College**

- Nov 12 Patent Law for Engineers—I.D.# 88007
- Nov 12-13 Introduction to Hybrid and Electric Vehicle Battery Systems—  
I.D.# C0626
- Nov 12-13 Selective Catalytic Reduction for Diesel Engines—I.D.# C0913
- Nov 14 Safe Handling of High Voltage Battery Systems—I.D.# C1019

### **Webinar—via telephone/internet**

- Nov 6-8 Plug-In Vehicle Conductive Charging, SAE J1772 Explained  
Webinar—I.D.# WB1046
- Nov 7-16 Root Cause Problem Solving: Methods and Tools Webinar—  
I.D.# WB0931

### **Troy, MI—SAE Automotive Headquarters**

- Dec 3-7 Hybrid and Electric Vehicle Engineering Academy—I.D.# ACAD06
- Dec 3-4 Design of Experiments for Engineers—I.D.# C0406
- Dec 3-5 Fundamentals of Metal Fatigue Analysis—I.D.# 94024
- Dec 4-5 The Role of the Expert Witness in Product Liability Litigation—  
I.D.# 92054
- Dec 5 The Tire as a Vehicle Component—I.D.# C0101
- Dec 6 Tire & Wheel Safety Issues—I.D.# C0102
- Dec 6-7 Product Liability & the Engineer—I.D.# 82001
- Dec 6-7 Accelerated Test Methods for Ground and Aerospace Vehicle  
Development—I.D.# C0316
- Dec 10-12 Fundamentals of Heavy Truck Dynamics—I.D.# C0837
- Dec 12-13 Engineering Project Management—I.D.# 99003
- Dec 12-14 Designing On-Board Diagnostics for Light and Medium Duty  
Emissions Control Systems—I.D.# C0707
- Dec 13 Heavy Vehicle Ride Comfort Engineering—I.D.# C0948
- Dec 17-18 Evaporative and Refueling Emission Control—I.D.# C0928

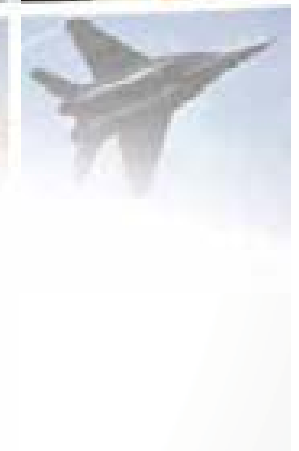
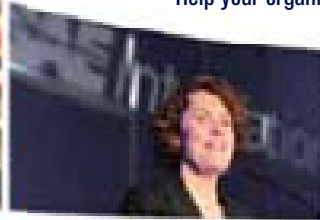
### **Webinar—via telephone/internet**

- Dec 10-13 Introduction to Design Review Based on Failure Modes  
(DRBFM) Webinar—I.D.# WB1047

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