Schedule of Seminars and Webinars

June 2011 – December 2011

Automotive · Aerospace · Commercial Vehicle

Technical areas include:
- Aerospace
- Electronics (Communications and Controls)
- Design Processes/Quality & Reliability
- Engines & Propulsion
- Environment/Emissions
- Fuels/Lubricants
- Management
- Materials/Chemicals
- Noise/Vibration/Harshness (NVH)
- Safety
- Systems & Components
- Tests & Testing
- Vehicle Dynamics & Handling

See inside for course overviews, dates & locations

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

To register call or visit Online: www.sae.org/events/training

SAE seminars receive the IACET CEU. For more information, visit www.sae.org/iacet
TABLE OF CONTENTS

AERODYNAMICS........................................ 1
Fundamentals of Commercial Vehicle Aerodynamics

AVIONICS ............................................. 1
Digital Avionics Fiber Optics Technology and Standards for Aerospace
Introduction to AS5553 and Counterfeit Electronic Parts Avoidance Training

COMMUNICATIONS AND CONTROLS
(INCLUDES ELECTRONICS)....................... 2-5
Accessing and Interpreting Heavy Vehicle Event Data Recorders
Acquiring and Analyzing Data from Sensors and In-Vehicle Networks
A Holistic Introduction to Commercial Telematics Controller Area Network (CAN) for Vehicle Applications
System Control Simplified
Designing On-Board Diagnostics for Light and Medium Duty Emissions Control Systems
Electrohydraulic Controls for Mobile Equipment & Vehicles
Embedded Control Systems Design Workshop
Emissions-Related OBD Systems: A Design Overview
Fundamentals of Shielding Design for EMC Compliance
In-Vehicle Networking with LIN and FlexRay Applications
Understanding and Using the SAE J2534-1 API to Access Vehicle Networks

DESIGN PROCESSES ......................... 5-9
Design FMEA Update: What’s New in J1739 Webinar
Design for Manufacturing & Assembly (DFM/DFA)
Design Reviews for Effective Product Development Failure Modes and Effects Analysis (Product & Process) in Aerospace
Finite Element Analysis for Design Engineers - Hands-on FEA Workshop
Fundamentals of Geometric Dimensioning & Tolerancing (GD&T) Webinar
Geometric Dimensioning & Tolerancing Introduction to Design Review Based on Failure Modes (DRBFM) Webinar
Introduction to Failure Modes & Effects Analysis for Product Design & Manufacturing Process Design (Product & Process FMEA)
Mechatronics: Introduction, Modeling and Simulation Model Based Design: Delivering Quality Electronic Products Faster
Process FMEA Update: What’s New in J1739 Webinar
Reverse Engineering: Technology of Reinvention Statistical Tolerancing Design
Tolerance Stack-Up Analysis Tolerance Stack-Up fundamentals Webinar
Vibration Analysis using FEA: A Hands-on Workshop

ENGINES & PROPULSION...................... 10-18
Advanced Diesel Particulate Filtration Systems
Automotive Fuel Cell Systems
Basic Hybrid and Electric Vehicle Safety Webinar
Combustion and Emissions for Engineers
Common Rail Diesel Fuel Injection
Diesel Emissions and Control Technologies
Diesel Engine Technology
Compact Heat Exchangers for Automotive Applications
Diesel Engine Technology Engineering Academy
Displacement on Demand Systems (DoD) Webinar
Diesel Engine Noise Control Webinar
Fabrication of Hybrid Electric Vehicles
Gasoline Direct Injection (GDI) Engines
High Performance Engine Design and Development
Homogeneous Charge Compression Ignition (HCCI) Webinar
Homogeneous Charge Compression Ignition Engines
Hybrid and Electric Vehicle Engineering Academy

Hybrid and Electric Vehicles: Current Production, Future Strategies Webinar
Improving Fuel Efficiency with Engine Oils
Inner Combustion Systems: HCCI, DoD, VCT/VVT, DI and VCR
Introduction to Hybrid and Electric Vehicle Battery Systems
Introduction to Hybrid Powertrains Webinar
Introduction to Hydraulic Hybrid Systems for Road Vehicles
Piston Ring Design/Materials
Plug-in Hybrids: Opportunities and Challenges Webinar
Powertrain Selection for Fuel Economy and Acceleration Performance Principles of Electric Systems
Racecar Data Acquisition
Race Engine Calibration for Optimal Performance
Selective Catalytic Reduction for Diesel Engines
The Basics of Internal Combustion Engines
Turbocharging for Fuel Economy and Emissions Webinar
Turbocharging Internal Combustion Engines
Variable Cam and Valve Timing (VCT) & (VVT) Webinar
Variable Compression Ratio (VCR) Webinar

ENVIRONMENT ..................................... 19
Advanced Diesel Particulate Filtration Systems
Catalytic Converters: Design and Durability
Evaporative and Refueling Emission Control
Diesel Emissions and Control Technologies
Exhaust Flow Performance and Pressure Drop of Exhaust Components and Systems

FUELS/FLUIDS................................. 20
Alternative Fuels: Impact on SI and CI Fuel Systems, Distribution and Storage
Fundamentals of Automotive Fuel Delivery Systems
Motor Fuel: Technology, Performance, Testing, and Specifications
Modern Fluids for Crankcase Engines: An Overview

MANAGEMENT & EDUCATION. ...21-24
Aerospace Program Management - It’s More than Scheduling and Delivery
Engineering Project Management
Leading High Performance Teams
Management of Engineering & Technical Professionals
Patent Law for Engineers
Patent Litigation in the U.S.: What You Need to Know Webinar
Principles of Cost and Finance for Engineers
Product Liability and the Engineer
Program and Risk Management
Root Cause Problem Solving: Methods and Tools Webinar
Strategic Leadership
Successfully Working in Virtual Teams
The Role of the Expert Witness in Product Liability Litigation

MANUFACTURING .............................. 25
Sheet Metal Stamping: Robust Formability
Understanding the FAA Aircraft Certification Process

MATERIALS/CHEMICALS.............25-27
Advanced High Strength Steels for Vehicle Weight Reduction
Automotive Coatings: Materials & Applications
Automotive Glazing Materials
Brake Friction Materials: Testing, Quality and Selection
Fundamentals of Metal Fatigue Analysis
Introduction to Metallurgy and Its Practice
Metal Corrosion and Its Prevention
Surface Texture: Specifications and Control

NOISE/VIBRATION/HARSHNESS........... 27-28
Basic Noise Control
Noise/Vibration Control

QUALITY PROCESSES ...................... 28-29
Advanced Product Quality Planning (APQP) Workshop
IAQG Sanctioned Aerospace Auditor Transition Training (AATT)
Understanding AS9100 Rev C Webinar

RELIABILITY MAINTAINABILITY ........... 29-30
Aerospace Product Support: Sustainment Throughout the Life Cycle
Design of Experiments (DOE) for Engineers
Design of Experiments (DOE) for Engineers Webinar
Understanding the FAA Aircraft Certification Process
Weibull-Log Normal Analysis Workshop

SAFETY ...................... 31-32
Accessing and Interpreting Heavy Vehicle Event Data Recorders
Aircraft Cabin Safety and Interior Crashworthiness Fundamentals of Motor Vehicle Fire Investigation
Injuries, Anatomy, Biomechanics & Federal Regulation
Side Impact Occupant Safety and CAE
Vehicle Frontal Crash Occupant Safety and CAE

SYSTEMS & COMPONENTS....................32-39
Automotive Lighting: Design & Technology
Automotive Lighting: LED Applications
Automotive Lighting: Testing & Requirements
A Familiarization of Drivetrain Components
Automotive Powertrain and Battery Cooling
Airflow Systems: A Vehicle Perspective
Applied Hydraulic Brake Systems
Brake Testing for Passenger Cars and Light Trucks
Chassis & Suspension Component Design for Passenger Cars & Light Trucks
Commercial Vehicle Brake Systems
Compact Heat Exchangers for Automotive Applications
Fundamentals of Automotive All-Wheel Drive Systems
Fundamentals of Modern Vehicle Transmissions
Fundamentals of Continuously Variable Transmission Technology Webinar
Fundamentals of Steering Systems
High Performance Brake Systems
Heavy Vehicle Ride Comfort Engineering
Hydraulic Brake Systems for Passenger Cars and Light Trucks
Introduction to Brake Control Systems: ABS, TCS, and ESC
Introduction to Commercial and Off-Road Vehicle Cooling Airflow Systems
Introduction to Gears
Powertrain Control Unit/Transmission Control Unit Technology Webinar
Review of AMT and DCT Technology Applied to Automotive Powertrain Webinar
Safe Handling of High Voltage Battery Systems
Automotive Fuel Cell Systems
The Tire as a Vehicle Component
Threaded Fasteners and the Bolted Joint
Tire and Wheel Safety Issues

TESTS & TESTING ......................... 39
Accelerated Test Methods for Ground and Aerospace Vehicle Development
Practical NVH Signal Processing Methods

VEHICLE DYNAMICS ....................... 40
Advanced Vehicle Dynamics for Passenger Cars and Light Trucks
Applied Vehicle Dynamics
Fundamentals of Heavy Truck Dynamics
Vehicle Dynamics for Passenger Cars and Light Trucks

SCHEDULE BY DATE ................. 42
Fundamentals of Commercial Vehicle Aerodynamics

I.D.# C0919 – www.sae.org/pdevent/C0919

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

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

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

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

Digital Avionics Fiber Optics Technology and Standards for Aerospace

I.D.# C0924 – www.sae.org/pdevent/C0924

September 12, 2011 • Norwalk, California

This comprehensive seminar introduces participants to aerospace fiber optics technology. Additionally, this seminar provides an overview of important standards that are available to them during the system design and development process. This one-day seminar begins with a discussion on the basic physics of light and its application to fiber optics. Following a fundamental overview of fiber optic cable, connector, and transceiver technologies, participants learn about supportability, maintainability, manufacturing quality, and installation concerns, with emphasis given to design interface controls and life cycle cost parameters. Prior lessons learned are summarized with an emphasis on aerospace fiber optic design engineering and support principles. The seminar concludes with an in-depth description of relevant military and aerospace standards along with an example digital fiber optic system design and development methodology case study.

Instructor: Mark Beranek

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

Introduction to AS5553 and Counterfeit Electronic Parts Avoidance Training

I.D.# C0950 – www.sae.org/pdevent/C0950

June 20, 2011 • Norwalk, California

The SAE AS5553 standard was created in response to the significant and increasing volume of counterfeit electronic parts entering the aerospace supply chain and standardizes requirements, practices and methods for counterfeit parts risk mitigation. The resulting document presents solutions to address counterfeit electronic parts issues across a large cross-section of the electronics industry. This comprehensive one-day seminar introduces participants to AS5553 and specifically addresses counterfeit part risk mitigation methods in electronic design and parts management, supplier management, procurement, part verification, material control, and response strategies when suspect or confirmed counterfeit parts are discovered. The latter part of the course will highlight counterfeit detection techniques and part compliance verification methods. Several examples of counterfeit parts will be reviewed in detail. The course will conclude with a hands-on learning exercise in identifying, under a microscope, characteristics that can be found in counterfeit electronic parts. In addition to the seminar handout, a copy of the AS5553-Counterfeit Electronic Parts; Avoidance, Detection, Mitigation, and Disposition standard is provided to each registrant. This comprehensive seminar introduces participants to aerospace fiber optics technology.

Instructor: Phil Zulueta and Katherine Whittington

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

AERODYNAMICS

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

**I.D. # C1022 – www.sae.org/pdevent/C1022**

**December 12-15, 2011 • Norwalk, California**

Recent advances in commercial vehicle equipment have increased the potential for incident-related data to be recorded surrounding a collision event. 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

**Registration Information:**
- Fees – List: $1,995; SAE Members – Classic: $1,945; Premium: $1,696; Elite: $1,845
- 2.6 CEUs

### New A Holistic Introduction to Commercial Telematics

**I.D. # C0947 – www.sae.org/pdevent/C0947**

**November 14-15, 2011 • 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. This will include automotive technologies necessary to gain access to vehicle operating data, wireless technologies to establish communications, navigation technologies to introduce location, antennas that enable wireless, and data management to manage and make data useful. 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. Attendees are encouraged to bring a laptop computer with a dual-boot Linux operating system installed.

**Instructor:** Emad Isaac

**Registration Information:**
- Fees – List: $1,155; SAE Members – Classic: $1,040; Premium: $982; Elite: $924
- 1.3 CEUs

### Acquiring and Analyzing Data from Sensors and In-Vehicle Networks

**I.D. # C0522 – www.sae.org/pdevent/C0522**

**June 23-24, 2011 • 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

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

### Controller Area Network (CAN) for Vehicle Applications

**I.D. # C0120 – www.sae.org/pdevent/C0120**

**September 26-27, 2011 • 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

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

Also available as a SAE-Learning opportunity – www.sae.org/e-seminars/can
Control Systems Simplified

I.D. # C0525 – www.sae.org/pdevent/C0525

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

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

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

I.D. # C0707 – www.sae.org/pdevent/C0707

July 25-27, 2011 • 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: $1,605; SAE Members – Classic: $1,445; Premium: $1,313; Elite: $1,236
2.0 CEUs

Electrohydraulic Controls for Mobile Equipment & Vehicles

I.D. # C1011 – www.sae.org/pdevent/C1011

August 3-5, 2011 • Troy, Michigan
December 14-16, 2011 • Troy, Michigan

As more electronics are used in mobile applications, there is a greater need for engineers, managers, and technicians to understand electro-hydraulic 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
Embedded Control Systems Design Workshop

I.D.# C0922 – www.sae.org/pdevent/C0922

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

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:
- 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

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

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:
- SAE Members – Classic: $667;
- Premium: $616;
- Elite: $580

0.7 CEUs

In-Vehicle Networking with LIN and FlexRay Applications

I.D.# C0136 – www.sae.org/pdevent/C0136

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

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:
- SAE Members – Classic: $1,103;
- Premium: $1,041;
- Elite: $980

1.3 CEUs

Emissions-Related OBD Systems: A Design Overview

I.D.# C0708 – www.sae.org/pdevent/C0708

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

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:
- SAE Members – Classic: $707;
- Premium: $667;
- Elite: $628

0.7 CEUs

Communications and Controls (Includes Electronics)
Understanding and Using the SAE J2534-1 API to Access Vehicle Networks

I.D.# C0733 – www.sae.org/pdevent/C0733

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

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

Design FMEA Update: What’s New in J1739 Webinar

I.D.# WB0955 – www.sae.org/pdevent/WB0955

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

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

The new J1739 has been revised to address common problems with the application of Design 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 product and process functions, and a lack of emphasis on prevention controls or early detection of problems. 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

August 1-2, 2011 • 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

To register, go to: www.sae.org/events/training or call 1-877-606-7323 (U.S. & Canada) or 1-724-776-4970
Design Reviews for Effective Product Development

I.D.# C0004 – www.sae.org/pdevent/C0004

October 4, 2011 • 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

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

I.D.# 93006 – www.sae.org/pdevent/93006

November 21-22, 2011 • 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. However, acquired skills are not software specific and no prior exposure to any FEA software is required. 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

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

I.D.# C0939 – www.sae.org/pdevent/C0939

June 21-22, 2011 • Norwalk, California

This interactive Failure Modes and Effects Analysis (FMEA) product and process seminar introduces the participant to the analytical process by which potential failure modes, failure effects and causes of failure are identified. Engaging in a systematic method of studying failure can improve future outcomes. 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 is based on “learning by doing” with 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: $1,125; SAE Members – Classic: $1,103; Premium: $1,041; Elite: $980
1.3 CEUs

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

I.D.# WB0933 – www.sae.org/pdevent/WB0933

Presented in eight, 2-hour sessions, 2:00. – 4:00 p.m. ET – via telephone/internet

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

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. It is governed by the technical standard ASME Y14.5M-1994, which was updated earlier this year. 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

June 20-22, 2011 • Troy, Michigan
December 7-9, 2011 • 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 gaging 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

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

I.D.# WB1047 – www.sae.org/pdevent/WB1047

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

June 7, 8 & 9, 2011
September 26, 28 & 30

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 Webinar will explain all phases of the DRBFM methodology and provides details on how to accomplish the specific steps.

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: $515; SAE Members – Classic: $464;
Premium: $438; Elite: $412
0.6 CEUs

Many SAE Instructors are available to help your company solve specific engineering problems by providing consulting services.
To explore how our instructors can work with your company as consultants, contact

SAE Corporate Learning Solutions
1-724-772-8529 • corplearn@sae.org
Mechatronics: Introduction, Modeling and Simulation

I.D.# C0949 – www.sae.org/pdevent/C0949
October 27-28, 2011 • 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

Process FMEA Update: What’s New in J1739 Webinar

I.D.# WB0956 – www.sae.org/pdevent/WB0956

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

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

Model Based Design: Delivering Quality Electronic Products Faster

I.D.# C0806 – www.sae.org/pdevent/C0806
June 6-7, 2011 • 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

Reverse Engineering: Technology of Reinvention

I.D.# C0559 – www.sae.org/pdevent/C0559

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

This course focuses on the application of modern technologies used to decode the design details and manufacturing processes of an existing part in the absence of the original design data. It emphasizes the real-life practice of reverse engineering in the aerospace industry from both scientific and legal points of view. Attendees will learn the applicability and limitations of reverse engineering through case studies and hands-on exercises. Various measurement instruments, ranging from traditional micrometers to computer-aided laser probes, will be compared for their merits and shortcomings. The statistics of dimensional measurements and the acceptable tolerance of variations, with emphasis on industrial standards in real-life practice will be discussed. Material identification, manufacturing process verification and the system compatibility of the subject part to be reverse engineered will be covered in substantial detail. In addition, the materials specifications will be exemplified as useful supporting documents for substantiation data.

Note: Participants should bring a calculator for in-class exercises.

Instructor: Wego Wang

Registration Information:
Fees – List: $1,225; SAE Members – Classic: $1,103;
Premium: $1,041; Elite: $980
1.3 CEUs
Statistical Tolerance Design
I.D.# 88033 – www.sae.org/pdevent/88033

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

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

November 10-11, 2011 • Troy, Michigan

This course is designed to help product design personnel create tolerance stacks for parts and assemblies that use Geometric Dimensioning & Tolerancing. Those who will benefit most are designers and engineers who are responsible for creating the GD&T callouts for engineering drawings and product models, and who want to be more confident in how the assigned geometric tolerances interact and stack up. 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 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

Tolerance Stack-up Fundamentals Webinar
I.D.# C0842 – www.sae.org/pdevent/C0842

Presented in four, 90-minute sessions, 11:30 a.m. - 1:00 p.m. ET – via telephone/internet
August 2, 4, 9 & 11, 2011

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
.8 CEUs

Vibration Analysis using FEA: A Hands-on Workshop
I.D.# C0830 – www.sae.org/pdevent/C0830

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

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: $1,265; SAE Members – Classic: $1,139; Premium: $1,075; Elite: $1,012
1.3 CEUs
Advanced Diesel Particulate Filtration Systems

I.D.# C0502 – www.sae.org/pdevent/C0502
November 7-8, 2011 • 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: $1,225; SAE Members – Classic: $1,103;
Premium: $1,041; Elite: $980
1.3 CEUs

Automotive Fuel Cell Systems

I.D.# C0112 – www.sae.org/pdevent/C0112
August 10-12, 2011 • Troy, Michigan

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

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

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

Basic Hybrid and Electric Vehicle Safety Webinar

I.D.# C0904 – www.sae.org/pdevent/C0904
Presented in one, 2-hour session – 11:30 a.m. – 1:30 p.m. ET – via telephone/internet
July 28, 2011

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

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 - see description on page 15
Basic Hybrid and Electric Vehicle Safety Webinar – www.sae.org/pdevent/ C0904
Plug-In Hybrids: Opportunities and Challenges Webinar – www.sae.org/ pdevent/C0905 - see description on page 15

Combustion and Emissions for Engineers

I.D.# 97011 – www.sae.org/pdevent/97011
July 18-20, 2011 • Troy, Michigan

Public awareness regarding pollutants and their adverse health effects has created an urgent need for engineers to better understand the combustion process as well as the pollutants formed as by-products of that process. 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: $1,545; SAE Members – Classic: $1,391;
Premium: $1,313; Elite: $1,236
2.0 CEUs