
Tire-Vehicle Dynamics Short Course, Online August 6, 2018

We are pleased to announce the offering of the popular Tire-Vehicle Dynamics **ONLINE** short course. The live lectures will start on August 6 and will run **ONLINE** for 13 days, 2 hours daily starting at 8 AM and ending at 10 AM Eastern Standard Time. The important subjects of Tire Force and Moment Generation Mechanisms and Handling Performance Analysis, Footprint Mechanics, Finite Element Modeling of Tires, Rolling Resistance, Tire Materials, Constitutive Modeling/Response of Compounds, Vehicle Ride Dynamics, and Tire Vibrations will be discussed.

Who Should Attend?

- All engineers who are involved with research, development, design, synthesis, and or analysis of any part of the vehicle or tire will benefit from this course
- Attendees should have completed a bachelor degree in engineering, science, mathematics or similar course work

By attending this course participants will be able to apply and transfer the following knowledge:

- Gain an understanding of the tire force and moment generation mechanisms, tire modeling and how to tune a tire for superior handling performance
- Gain an understanding of the fundamental principles that determine the handling performance of pneumatic-tired vehicles
- Gain an understanding of the fundamental principles that determine the ride performance of pneumatic-tired vehicles
- Gain an understanding of the tire footprint mechanics
- Gain an understanding of the tire rolling resistance and fuel economy properties
- Gain an understanding of how to model the tire using Finite Element
- Gain an understanding of tire material properties and their influence on performance
- Gain an understanding of tire vibration characteristics modeling and evaluation
- Gain an understanding of compound constitutive and durability response

Registration

The registration fee for the course is \$1095.00 for professionals and \$495.00 for students (students must send in a copy of their valid student ID along with the registration form). If you decide to participate partially, please use the registration form to indicate which days and pay \$300 per two days per participant (Day 13 is \$150). **Early bird registration discount will be applied prior to Friday July 27.** The discount is 10% for one participant, 20% for groups of 2-5; 35% for groups of 5-10, and 50% for groups of more than 10 attendees. Once registration is completed, on July 30, the presentation materials in PDF will be emailed. **The lectures will be recorded and will be made available each day as needed.**

If you are interested in attending, please complete the form on **Page 3** and scan and email it back to staheri@vt.edu so a registration confirmation email along with the receipt can be sent back to you.

Program Description and Schedule

Day 1 and 2- Four hours of lectures (Monday August 6 and Tuesday August 7; 8-10 AM)

- **Handling Performance Analysis (Saied Taheri, PhD, Virginia Tech-CenTiRe)**
 - Tire and vehicle modeling and force and moment generation mechanisms
 - Tire design variables affecting vehicle handling performance
 - Subjective evaluation of handling
 - Objective evaluation of handling
 - Correlation of subjective and objective handling performance

Day 3 and 4- Four hours of lectures (Wednesday August 8 and Thursday August 9; 8-10 AM)

- **Tire-Vehicle Ride and Road Profiling (John Ferris, PhD, Virginia Tech)**
 - Road Surfaces Measurement
 - Road Surface Modeling and Validation
 - Ride Quality
 - Quarter Car and Pitch Plane Model

Day 5 and 6- Four hours of lectures (Friday August 10 and Monday August 13; 8-10 AM)

- **Tire Compound Constitutive and Durability Response (Thomas Fleischman, Goodyear Sr. R&D Associate - Retired)**
 - Hyperelastic, Linear, and Nonlinear Viscoelastic Compound Response
 - Compound Property Evolution with Cure and Post-Cure Thermal History
 - Rubber Creep Rupture and Ultimate Properties
 - Rubber Toughness and Fatigue Crack Propagation Resistance

Day 7 and 8- Four hours of lectures (Tuesday August 14 and Wednesday August 15; 8-10 AM)

- **Finite Element Tire Models (Ronald Kennedy, PhD, Former Hankook-Currently CenTiRe)**
 - Tire model development
 - Material representation
 - Contact, friction, loading specification
 - Model selection and solution methodologies
 - Static, steady-state, transient, modal, thermal

Day 9 and 10- Four hours of lectures (Thursday August 16 and Friday August 17; 8-10 AM)

- **Tire Rolling Resistance and Vehicle Fuel Economy (Joe Walter, PhD, University of Akron)**
 - Rolling Friction Mechanisms
 - Influence of Tire Operating Conditions
 - The So-called "Magic Triangle" and Silica
 - Energy Losses: Gas Tank to Tires

Day 11 and 12- Four hours of lectures (Monday August 20 and Tuesday August 21; 8-10 AM)

- **Footprint Mechanics (Jim McIntyre, Bridgestone Americas)**
 - Describing the tire footprint
 - Equipment and methodologies
 - Footprint Physics
 - Shear energy and uneven wear

Day 13- Two hours of lectures (Wednesday August 22; 8-10 AM)

- **Tire Ride Characteristics (Saied Taheri, PhD, Virginia Tech-CenTiRe)**
 - Tire vibration characteristics and modeling

REGISTRATION FORM

If you like to use PAYPAL, please complete the form and send money to staheri@vt.edu.

Please charge my credit card for the Total Tuition Amount:

Please choose from the following choices:

- Full course participation
- Days 1&2
- Days 3&4
- Days 5&6
- Days 7&8
- Days 9&10
- Days 11&12
- Day 13

Number of Participants: _____ Total Tuition Amount: \$_____

AMEX MasterCard Visa Discover CVV# _____

Card Number: _____ Exp. Date: _____

Signature: _____ Date: _____

Billing Name and Address for credit card:

Name: _____ Street: _____

City: _____ State: _____ Zip code _____ Country: _____

Email(s) of attendees: _____
