

## SAWE 77<sup>th</sup> International Conference on Mass Properties Engineering

May 5-10, 2018  
Sheraton DFW Airport Hotel  
Irving, Texas



The time is now fast approaching for the 77th SAWE (Society of Allied Weight Engineers) International Conference. The Conference will be held on May 5-10 at the Sheraton DFW Airport Hotel in Irving, Texas. **As part of the conference there will be an 8 hour seminar entitled "Mass Properties and Automotive Lateral Dynamics" on May 5th.** This seminar will be essentially the same in subject matter as that previously held in May of 2017.

However, **for 2018 the seminar structure has undergone substantial revision.** Much effort has gone into clarifying and streamlining the subject material while increasing the substance thereof. **Also, a considerable effort has now been made to direct the subject material in a way that renders it particularly relevant to the needs of SAE (Society of Automotive Engineers) Student Formula Competition Team members.** For more detail on the subject matter see the attached seminar description.

The seminar cost for undergraduate students is an extremely economical \$50 US. For those requiring a room at the Sheraton DFW Airport Hotel (located at 4440 West John Carpenter Freeway, Irving, Texas 75063) reservations may be made by phone (972-929-8400) or over the internet ([www.sheratondfwairport.com](http://www.sheratondfwairport.com)). Prospective attendees should register via the [www.sawe.org](http://www.sawe.org) website

# MASS PROPERTIES & AUTOMOTIVE LATERAL DYNAMICS



*Instructor: Brian Paul Wiegand – SAWE Member – Retired*

The course objective is to enable the student to make reasonably accurate maximum lateral acceleration, rollover lateral acceleration, directional stability, and steering responsiveness determinations in the course of vehicle design. In route to attaining that objective, the student will also become acquainted with such things as the calculation of roll resistance, suspension roll center location, sprung mass roll axis inclination, sprung mass roll inertia, sprung mass roll moment arm, sprung mass roll angle under lateral acceleration, vehicle roll gain, vehicle dynamic index in yaw, transient center of rotation location, and transient yaw inertia. There will also be considerable time spent on “Ackermann Steering Geometry” relationships and the behavior of tires under lateral load.

The seminar achieves its objective through a classical engineering approach that emphasizes determining vehicle lateral performance through simple models and simulations which are easy to comprehend and apply. Mass properties will play a major role as attendees will become acquainted with the principles of “weight accounting,” mass properties manipulation, and mass properties optimization.

This seminar is very important for anyone engaged in vehicle design, in particular those designing with an emphasis on performance, and some special effort has been expended to make it particularly relevant for those involved in the SAE Student Formula Design Competition. However, no one completing this course will walk away without having acquired some degree of enlightenment; as well as a Certificate of Achievement and a print-out of the course Vu-Graphs, plus electronic (flash drive) copies of the SAWE Paper #3528 (“Mass Properties & Maximum Lateral Acceleration”) and the seminar’s “Maximum Lateral Acceleration Estimation Spreadsheet” (MS-Excel). All of this is to be obtained for the very economical price of \$50 per undergraduate student.