

**ME 484, Automotive Engineering– Vehicle Dynamics**  
**CRN 41243, Fall 2006, TR 1:00 ~ 2:47 PM, 200 DHE**

**Instructor :** Yin-ping (Daniel) Chang, Assistant Professor, 132 DHE, (248) 370-2209, [ychang@oakland.edu](mailto:ychang@oakland.edu) , Office hours : TR 3:00 ~ 4:20 PM or by appointment.

**Textbook :** “Fundamentals of Vehicle Dynamics,” Thomas D. Gillespie, 1992, SAE.

**References :** “Theory of Ground Vehicles,” J. Y. Wong, 3<sup>rd</sup> ed., 2001, John Wiley & Sons.  
“Tyres, Suspension and Handling,” John C. Dixon, 2<sup>nd</sup> ed., 1996, SAE.  
“Automotive Handbook,” BOSCH GmbH.  
“CarSimEd,” CarSim Educational Version.  
“ArcSim,” TruckSim Educational Version.

**Prerequisites :** ME 221 and ME 321, or equivalent courses.

**HW Policy :** The HW/Lab is due at the beginning of the class on the due date. **NO LATE HW/Lab WILL BE ACCEPTED!!** Any questions about the grading should be addressed to the instructor, not the TA, within one week after it’s been returned.

**Exam and Grading Policy :** The final course grade will be a weighted average of :

6 HW assignments	70%
Final Project (including 15 mins. presentations)	30%

>90--4, >80--3, >70--2, >60--1. This serves as a guideline only and may be changed based on class performance. (Again, any questions about the grading of exams should also be addressed to the instructor, not the TA, within one week after it’s been returned.)

**Vehicle Ride Subjective Evaluation Sign Up :** A vehicle ride subjective evaluation will be scheduled. 3 students form a team and sign up a schedule with Prof. Chang to do a one-hour subjective evaluation in the field or parking lot. Every team needs to prepare two cars for the evaluation, one is new and one is old, comparably. Details will be announced in the class.

**Objectives :** To develop an understanding of the fundamentals of vehicle and tire dynamics. Mathematical and analytical modeling and industry application of ground vehicle performance, handling, ride characteristics, and tire mechanics.

**CLASS ATTENDANCE IS STRONGLY RECOMMENDED**

## TENTATIVE LECTURE SCHEDULE

<u>Week</u>	<u>Materials</u>
1	Introduction
2	Subjective Evaluation
3	Gradeability, traction, CG, weight distribution
4	Road Loads, aerodynamic drag, rolling resistance
5	Braking –
6	<u><i>CarSim</i></u>
7	Engine & Transmission – Transmission Ratio
8	Acceleration – Vehicle Performance Prediction
9	Fuel Economy
10	Vehicle Handling Characteristics I
11	Vehicle Handling Characteristics II
12	Steering – Steering Angle
13	Tire Dynamics I
14	Tire Dynamics II
15	Final Project Presentations

**Academic Conduct :** students are expected to read, understand, and comply with the Academic Conduct Policy of Oakland University, found in the Undergraduate and Graduate Catalogs. Violations will be taken before the Academic Conduct Committee. Students found guilty of academic misconduct in this course will receive a grade of 0.0 in addition to any penalties imposed by the Academic Conduct Committee.

**HELP ME HELP YOU!!**