

Request for Graduate Course Addition - Page 2

College: CITE

Department/Division: ENGINEERING

Alpha Designator/Number: ME-515

Provide complete information regarding the new course addition for each topic listed below. Before routing this form, a complete syllabus also must be attached addressing the items listed on the first page of this form.

1. FACULTY: Identify by name the faculty in your department/division who may teach this course.

Asad Salem, Gang Chen

2. DUPLICATION: If a question of possible duplication occurs, attach a copy of the correspondence sent to the appropriate department(s) describing the proposal. Enter "**Not Applicable**" if not applicable.

Not Applicable

3. REQUIRED COURSE: If this course will be required by another department(s), identify it/them by name. Enter "**Not Applicable**" if not applicable.

None

4. AGREEMENTS: If there are any agreements required to provide clinical experiences, attach the details and the signed agreement. Enter "**Not Applicable**" if not applicable.

Not Applicable

5. ADDITIONAL RESOURCE REQUIREMENTS: If your department requires additional faculty, equipment, or specialized materials to teach this course, attach an estimate of the time and money required to secure these items. (Note: Approval of this form does not imply approval for additional resources.) Enter "**Not Applicable**" if not applicable.

None

6. COURSE OBJECTIVES: (May be submitted as a separate document)

Please refer to the attached syllabus

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7. COURSE OUTLINE (May be submitted as a separate document)

Please refer to the attached Syllabus

8. SAMPLE TEXT(S) WITH AUTHOR(S) AND PUBLICATION DATES (May be submitted as a separate document)

Road Vehicle Dynamics, SAE Publishing 2009, Rao Dukkipati,

9. EXAMPLE OF INSTRUCTIONAL METHODS (Lecture, lab, internship)

Lecture

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10. EXAMPLE EVALUATION METHODS (CHAPTER, MIDTERM, FINAL, PROJECTS, ETC.)

Mid-term exams 45%

Assignments : 25%

Final Exam: 30%

11. ADDITIONAL GRADUATE REQUIREMENTS IF LISTED AS AN UNDERGRADUATE/GRADUATE COURSE

None

12. PROVIDE COMPLETE BIBLIOGRAPHY (May be submitted as a separate document)

Vehicle Dynamics, Theory and Application, Springer, 2009 Jazar, Reza N.

Fundamentals of Vehicle Dynamics, SAE Publishing, 1992, Thomas D. Gillespie

References: vehicle dynamics paper series, SAE, 2000-2014

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Please insert in the text box below your course summary information for the Graduate Council agenda. Please enter the information exactly in this way (including headings):

Department:

Course Number and Title:

Catalog Description:

Prerequisites:

First Term Offered:

Credit Hours:

Department: Weisberg Division of Engineering

Course Number and Title: ME515 vehicle Dynamics

Catalog Description:

Deals with ground vehicle stability and control. Contribution of tire lateral force, stiffness, and aligning torque to stability. Effects of suspension geometry, chassis stiffness, and roll stiffness.

Prerequisite: Graduate status

First Term Offered: Fall 2015

Credit Hours: 3

Marshall University Syllabus

Course Title/Number	Vehicle Dynamics / ME515
Semester/Year	Fall / 2015
Days/Time	MWF / 2:00 – 2:50 pm
Location	Weisberg Engineering Lab 101 Classroom
Instructor	Gang Chen
Office	Weisberg Engineering Lab Room 109c Division of Engineering College of Information Technology and Engineering Marshall University Huntington, WV 25755
Phone	304-696-3204
E-Mail	chenga@marshall.edu
Office/Hours	MWF: 12:00-2:00pm For those of you who will not be able to meet the instructor during the assigned office hours, you are welcome to come and ask instructor by appointment or at an appropriate time.
University Policies	By enrolling in this course, you agree to the University Policies listed below. Please read the full text of each policy by going to www.marshall.edu/academic-affairs and clicking on “Marshall University Policies.” Or, you can access the policies directly by going to www.marshall.edu/academic-affairs/policies/ . Academic Dishonesty/Excused Absence Policy for Undergraduates/Computing Services Acceptable Use/Inclement Weather/Dead Week/Students with Disabilities/Academic Forgiveness/Academic Probation and Suspension/Academic Rights and Responsibilities of Students/Affirmative Action/Sexual Harassment

Catalog Course Description

Deals with ground vehicle stability and control. Contribution of tire lateral force, stiffness, and aligning torque to stability. Effects of suspension geometry, chassis stiffness, and roll stiffness.
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Table: How each student learning outcomes will be practiced and assessed in the course.

Course Student Learning Outcomes	How students will practice each outcome in this Course	How student achievement of each outcome will be assessed in this Course	Program outcomes
Students will be able to understand the basic concepts of Vehicle Dynamics	Lectures, In-class discussions, in-class excises, homeworks	Questions in class, the evaluations of homework and examination	a2,e2

		problems.	
Students will be able to solve for Tire Behavior: Longitudinal, Vertical, and Lateral	Lectures, In-class discussions, in-class excises, homeworks	Questions in class, the evaluations of homework and examination problems.	a2,e2
Students will be able to solve for Longitudinal Vehicle Dynamics	Lectures, In-class discussions, in-class excises, homeworks	Questions in class, the evaluations of homework and examination problems.	a2,e2
Students will be able to Ride and Suspension dynamics	Lectures, In-class discussions, in-class excises, homeworks	Questions in class, the evaluations of homework and examination problems.	a2,e2
Students will be able to solve for Cornering, Steering, and Handling	Lectures, In-class discussions, in-class excises, homeworks	Questions in class, the evaluations of homework and examination problems.	a2,e2
Students will be able to solve for Rollover Modeling, Analysis, and Prevention	Lectures, In-class discussions, in-class excises, homeworks	Questions in class, the evaluations of homework and examination problems.	a2,e2
Students will be able to solve Three-Dimensional Multibody Mechanics Models for Vehicle Dynamics	Lectures, In-class discussions, in-class excises, homeworks	Questions in class, the evaluations of homework and examination problems.	a2,e2

Objective:

After taking this course, students should be able to

- Understand tire behavior.
- Calculate the limits of acceleration and braking
- Understand and characterize handling dynamics
- Calculate suspension dynamics

Required Texts, Additional Reading, and Other Materials

<p>Road Vehicle Dynamics, SAE Publishing 2009, Rao Dukkipati, Vehicle Dynamics, Theory and Application, Springer, 2009 Jazar, Reza N. Fundamentals of Vehicle Dynamics, SAE Publishing, 1992, Thomas D. Gillespie References: vehicle dynamics paper series, SAE, 2000-2014</p>
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Course Requirements / Due Dates

Course Requirements : Attendance/Homework /Examinations

TEST SCHEDULE:

- Hourly Exam #1
- Hourly Exam #2
- Hourly Exam #3
- Final Exam (two hours)

Homework due Dates:

- ❖ Homework will regularly be assigned either during the class time or by e-mail/blackboard.
- ❖ Checking your e-mail is required on a daily-basis for information regarding homework assignment. Homework must be submitted before the starting time of class on the assignment date.
- ❖ Late homework is acceptable for an excused absence. For unexcused delay submission, there will be a 20% late penalty for each day it is late--starting with a 20% penalty on the first day if it is not turned in at the beginning of class. After 5 days, it will not be accepted at all.
- ❖ No late homework will be accepted after the final day of classes for the semester.
- ❖ You are expected to provide your homework on engineering papers - not a Xerox copy.
- ❖ Homework must be neat, readable, and must conform to acceptable Standards of Engineering Computation.

Grading Policy

Exams:

Three exams and a final exam will be given during the course of the semester. Exams will be closed book and closed notes. No makeup exams will be given with the exception of unusual circumstances (institutional excuse, severe injuries, family emergencies, group activities etc.).

Grading Policy:

Homework and Attendance	25% (attendance 10%)
Exam 1	15%
Exam 2	15%
Exam 3	15%
Final Exam	30%

Total	100%

Letter Grade Scale:

90-100-----	A
80- 89 -----	B
70-79 -----	C
60-69 -----	D
0-59 -----	F

The instructor does reserve the right to slightly curve or scale the grades based on class groupings/performance.

Attendance Policy

The attendance policy will follow University's excused absence policy.

You are expected to attend all classes. However, the instructor accepts your absence for one session provided that an advance notice will be given, unless this is an excused absence such as institutional excuse, severe injuries, family emergencies, group activities etc.

Course Schedule:

LECTURE SUBJECT Schedule & TEXT REFERENCE

1. Introduction of Vehicle Dynamics
2. Tire Behavior: Longitudinal, Vertical, and Lateral
3. Longitudinal Vehicle Dynamics
4. Ride and Suspension dynamics
5. Cornering, Steering, and Handling:
6. Rollover Modeling, Analysis, and Prevention
- 7 Three-Dimensional Multibody Mechanics Models for Vehicle Dynamics

** The instructor reserves the right to slightly change the topics and their order to achieve the maximum benefit of the course learning outcomes.*