Purdue University
Request for Addition, Expiration, or Revision of an Undergraduate Course (100-400 Level)

Department: Motorsports Engineering  Effective Session: Fall 2009

Instructions: Please check the items below which describe the purpose of this request.

- New course with supporting documents
- Add existing course offered at another campus
- Expiration of a course
- Change in course number
- Change in course title
- Change in course credit type

Proposed:

- Subject Abbreviation: MSTE
- Course Number: 472
- Long Title: Vehicle Dynamics
- Short Title: Vehicle Dynamics

Existing:

- Subject Abbreviation: [Blank]
- Course Number: [Blank]
- Long Title: [Blank]
- Short Title: [Blank]

Terms Offered: Check All That Apply

- Summer
- Fall
- Spring
- [Blank] Calumet
- [Blank] N. Central
- [Blank] Con Ed
- [Blank] Tech Statewide
- [Blank] Ft. Wayne
- [Blank] W. Lafayette
- [Blank] Indianapolis

Credit Type

1. Fixed Credit Cr. Hrs: 3

2. Variable Credit Range:
   - Minimum Cr. Hrs: [Blank]
   - (Check One): [Blank] Or [Blank]
   - Maximum Cr. Hrs: [Blank]

3. Equivalent Credit: Yes [ ] No [ ]

4. Thesis Credit: Yes [ ] No [ ]

Credit Type:

1. Pass/Not Pass Only
2. Satisfactory/Unsatisfactory Only
3. Repeatable
4. Maximum Repeatable Credit: [Blank]

Course Attributes: Check All That Apply

1. Registration Approval: [ ] Department
2. [ ] Instructor
3. Variable Title
4. Remedial
5. Credit by Examination
6. [ ] Honors
7. Designator Required
8. [ ] Full Time Privilege
9. [ ] Off Campus Experience

Instructional Type

- Lecture
- Recitation
- Presentation
- Laboratory
- Lab Prep
- Studio
- Distance
- Clinic
- Experiential
- Research
- Ind. Study
- Pract/Obsrv

Minutes Per Mtg

- Lecture: 75
- Recitation: [Blank]
- Presentation: [Blank]
- Laboratory: 120
- Lab Prep: [Blank]
- Studio: [Blank]
- Distance: [Blank]
- Clinic: [Blank]
- Experiential: [Blank]
- Research: [Blank]
- Ind. Study: [Blank]
- Pract/Obsrv: [Blank]

Meetings Per Week

- Lecture: 1
- Recitation: [Blank]
- Presentation: [Blank]
- Laboratory: 1
- Lab Prep: [Blank]
- Studio: [Blank]
- Distance: [Blank]
- Clinic: [Blank]
- Experiential: [Blank]
- Research: [Blank]
- Ind. Study: [Blank]
- Pract/Obsrv: [Blank]

% of Credit Offering: [Blank]

Delivery Method: [Blank]

Delivery Medium (Audio, Internet, Live, Text-Based, Video): [Blank]

Cross-Listed Courses

Course Description (Include Requisites):

P: MSTE 210 or ME 274 or equivalent or permission of instructor. This course provides a study of vehicular chassis, suspension, and aerodynamic systems with a focus on high performance.

Calumet Department Head: Date
Calumet School Dean: Date

Fort Wayne Department Head: Date
Fort Wayne School Dean: Date

Indianapolis Department Head: Date
Indianapolis School Dean: Date

North Central Department Head: Date
North Central Chancellor: Date

West Lafayette Department Head: Date
West Lafayette College/School Dean: Date
West Lafayette Registrar: Date

Office of the Registrar
New Course Request

1. School/Division: School of Engineering & Technology
2. Academic Subject Code: MSTE
3. Course Number: 472
4. Instructor: Pete Hytton
5. Course Title: Vehicle Dynamics

Recommended Abbreviation (Optional) (Limited to 32 Characters including spaces)

6. First time this course is to be offered (Semester/Year): Fall 2009
7. Credit Hours: Fixed at 3 or Variable from _____ to _____
8. Is this course to be graded S-F (only)? Yes 
9. Is variable title approval being requested? Yes 
10. Course description (not to exceed 50 words) for Bulletin publication:

P: MSTE 210 or ME 274 equivalent or permission of instructor. This course provides a study of vehicle chassis, suspension, and aerodynamic systems with a focus on high performance.

11. Lecture Contact Hours: Fixed at 3 or Variable from _____ to _____
12. Non-Lecture Contact Hours: Fixed at _____ or Variable from _____ to _____
13. Estimated enrollment: 25 of which 0 percent are expected to be graduate students.
14. Frequency of scheduling: yearly
15. Justification for new course: Part of the already approved BS in Motorsports Engineering

16. Are the necessary reading materials currently available in the appropriate library? Yes

17. Please append a complete outline of the proposed course, and indicate instructor (if known), textbooks, and other materials.

18. If this course overlaps with existing courses, please explain with which courses it overlaps and whether this overlap is necessary, desirable, or unimportant.

19. A copy of every new course proposal must be submitted to departments, schools, or divisions in which there may be overlap of the new course with existing courses or areas of strong concern, with instructions that they send comments directly to the originating Curriculum Committee. Please append a list of departments, schools, or divisions thus consulted.

Approved by:

[Signature]

[Name]

Date: 3-17-09

[Department Chair/Division Director]

[Signature]

[Name]

Date

[Dean of Graduate School (when required)]

[Signature]

[Name]

Date

University Enrolment Services

After School Division approval, forward the last copy (without attachments) to University Enrollment Services for initial processing, and the remaining four copies and attachments to the Campus Chancellor or Vice-President.
MSTE 472 – Vehicle Dynamics (co-listed with MET 472)

**Description:** Study of vehicle chassis, suspension, and aerodynamic systems

**Class Times:** Tuesdays & Thursdays 3:00-4:15

**Prerequisites:** MET 213 or MSTE 210 or equivalent or permission of instructor

**Instructor:** Pete Hylton  
Phone: 317-274-7192  
email: phylon@iupui.edu  
office: ET209G


**Grading:**
- Homework/Individual Projects: 200 points
- Final Exam: 100 points
- Team Project: 200 points  
Total 500 points

**Minimum Scale:** 90-100 = A, 80-90 = B, 70-80 = C, 60-70 = D, 0-60 = F  
+/- will be given

**Tentative Course Schedule:**

<table>
<thead>
<tr>
<th>Date</th>
<th>Topic</th>
<th>Topic</th>
<th>Ch</th>
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<tbody>
<tr>
<td>1/8</td>
<td>Intro, Velocity/Acceleration, G-G Diagram</td>
<td>Ch 1</td>
<td></td>
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<tr>
<td>1/10</td>
<td>Tire Behavior, Slip Angle, Camber, Friction Circle</td>
<td>Ch 2</td>
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<tr>
<td>1/15</td>
<td>Continuation &amp; Lab Time</td>
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<tr>
<td>1/17</td>
<td>Vehicle Axis Systems</td>
<td>Ch 4</td>
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<td>1/22</td>
<td>Continuation &amp; Lab Time</td>
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<tr>
<td>1/24</td>
<td>Aero Dynamics, Wind Tunnel, Flow Visualization</td>
<td>Ch 3 &amp; 15</td>
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<td>1/29</td>
<td>Lab Time</td>
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<tr>
<td>1/31</td>
<td>More Aero</td>
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<td>2/12</td>
<td>Lab Time</td>
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<td>2/14</td>
<td>Dynamics Review</td>
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<td>2/19 6:00 pm</td>
<td>Preliminary Design Review</td>
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<td>2/21</td>
<td>Springs &amp; Dampers</td>
<td>Ch 21 &amp; 22</td>
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<td>2/26</td>
<td>Continuation &amp; Lab Time</td>
<td>Ch 5</td>
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<td>2/28</td>
<td>Stability &amp; Control</td>
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<td>3/4</td>
<td>Continuation &amp; Lab Time</td>
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<td>More Springs &amp; Dampers, Transient Stability &amp; Control</td>
<td>Ch 6</td>
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<td>3/11</td>
<td>Spring Break</td>
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<td>3/13</td>
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<td>Continuation &amp; Lab Time</td>
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<td>Force-Moment Analysis</td>
<td>Ch 8</td>
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<td>G-G Diagram</td>
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<td>Continuation &amp; Lab Time</td>
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<td>4/3</td>
<td>Design Process</td>
<td>Ch 10</td>
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<td>Racecar Design &amp; Development</td>
<td>Ch 11 &amp; 12</td>
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<td>Continuation &amp; Lab Time</td>
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<td>4/17</td>
<td>Chassis Set-up, Suspension Geometry</td>
<td>Ch 12 &amp; 17</td>
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<td>4/22</td>
<td>Continuation &amp; Lab Time</td>
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<tr>
<td>4/24</td>
<td>Review</td>
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Course Outcomes:

1. Demonstrate an appropriate mastery of the knowledge, techniques, skills and modern tools necessary for analysis of vehicle dynamics and design of vehicle systems.
2. Apply current knowledge and adapt to emerging applications appropriate to the topic of vehicle dynamics.
3. Conduct, analyze and interpret experiments and apply experimental results to improve processes.
4. Apply creativity in the design of systems, components or processes appropriate to program objectives.
5. Function effectively on teams.
6. Identify, analyze and solve technical problems
7. Communicate effectively.