Office of the Registrar
FORM 40 REV. 9/06

PURDUE UNIVERSITY
REQUEST FOR ADDITION, EXPIRATION,
OR REVISION OF AN UNDERGRADUATE COURSE
(100-400 LEVEL)

EFD 23-09

DEPARTMENT: Mechanical Engineering
INSTRUCTIONS: Please check the items below which describe the purpose of this request.
EFFECTIVE SESSION: Fall 2009

- [ ] 1. New course with supporting documents
- [ ] 2. Add existing course offered at another campus
- [ ] 3. Expiration of a course
- [ ] 4. Change in course number
- [ ] 5. Change in course title
- [ ] 6. Change in course credit/type
- [ ] 7. Change in course attributes (department head signature only)
- [ ] 8. Change in instructional hours
- [x] 9. Change in course description
- [x] 10. Change in course requisites
- [ ] 11. Change in semesters offered (department head signature only)
- [ ] 12. Transfer from one department to another

PROPOSED:		EXISTING:	
Subject Abbreviation	ME	Subject Abbreviation	
Course Number	455	Course Number	
Long Title	Vehicle Design and Fabrication		
Short Title	Vehicle Des/Fab		

Abbreviated title will be entered by the Office of the Registrar if omitted. (22 CHARACTERS ONLY)

TERMS OFFERED (Check All That Apply):
- [ ] Summer
- [x] Fall
- [ ] Spring

CAMPUS(ES) INVOLVED
- [ ] Calumet
- [ ] Cont Ed
- [ ] Ft. Wayne
- [ ] Indianapolis
- [ ] N. Central
- [ ] Tech Statewide
- [x] W. Lafayette

CREDIT TYPE
1. Fixed Credit: Cr. Hrs.
2. Variable Credit Range:
   Minimum Cr. Hrs
   (Check One) To [x] Or [ ]
   Maximum Cr. Hrs 3
3. Equivalent Credit: Yes [ ] No [ ]
4. Thesis Credit: Yes [ ] No [ ]

COURSE ATTRIBUTES: Check All That Apply
1. Pass/Not Pass Only [ ]
2. Satisfactory/Unsatisfactory Only [ ]
3. Repeatable [ ]
   Maximum Repeatable Credit:
   Credit by Examination [ ]
   Designator Required [ ]
   Special Fees [ ]
7. Registration Approval Type
   Department [ ] Instructor [ ]
8. Variable Title [ ]
9. Remedial [ ]
10. Honors [ ]
11. Full Time Privilege [ ]
12. Off Campus Experience [ ]

Instructional Type	Minutes Per Mtg	Meetings Per Week	Weeks Offered	% of Credit Allocated	Delivery Method (Asyn. Or Syn.)	Delivery Medium (Audio, Internet, Live, Text-Based, Video)
Lecture			6		Syn.	Live
Recitation						
Presentation						
Laboratory						
Prep						
Studio						
Distance						
Clinic						
Experiential						
Research						
Ind. Study						
Pract/Observ						

Cross-Listed Courses

COURSE DESCRIPTION (INCLUDE REQUISITES):

ME 455 Vehicle Design and Fabrication, Sem. 1, Class 3, cr. 3. Prerequisite: Senior standing or consent of instructor.

Open-ended project course to design and build competitive prototype vehicles. Integration of design concept formulation, engineering analysis and testing, and prototype fabrication. Product development activities in a hands-on setting. Design constraints imposed by manufacturing limitations, funding constraints and market competition.

	Date		Date		Date
Calumet Department Head		Calumet School Dean		Fort Wayne Chancellor	
Fort Wayne Department Head		Fort Wayne School Dean		Fort Wayne Undergrad Curriculm Committee	
Indianapolis Department Head		Indianapolis School Dean		Date Approved by Graduate Council	
North Central Department Head		North Central Chancellor		Graduate Council Secretary	
Daniel Hirleman	2/15/2008		3/3/10		3/8/10
Lafayette Department Head	Date	West Lafayette College/School Dean	Date	West Lafayette Registrar	Date

OFFICE OF THE REGISTRAR

3/8/10

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EFFECTIVE SESSION: Fall 2009

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Research						
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Pract/Observ						

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COURSE DESCRIPTION (INCLUDE REQUISITES):

ME 455 Vehicle Design and Fabrication, Sem. 1, Class 3, cr. 3. Prerequisite: Senior standing or consent of instructor.

Open-ended project course to design and build competitive prototype vehicles. Integration of design concept formulation, engineering analysis and testing, and prototype fabrication. Product development activities in a hands-on setting. Design constraints imposed by manufacturing limitations, funding constraints and market competition.

Calumet Department Head	Date	Calumet School Dean	Date	Fort Wayne Chancellor	Date
Fort Wayne Department Head	Date	Fort Wayne School Dean	Date	Undergrad Curriculm Committee	Date
Indianapolis Department Head	Date	Indianapolis School Dean	Date	Date Approved by Graduate Council	
North Central Department Head	Date	North Central Chancellor	Date	Graduate Council Secretary	Date
David Hirleman 2/15/2008			3/3/10		
West Lafayette Department Head	Date	West Lafayette College/School Dean	Date	West Lafayette Registrar	Date

OFFICE OF THE REGISTRAR

TO: The Engineering Faculty

FROM: The Faculty of the School of Mechanical Engineering

RE: Change in Course Description, ME 455 Vehicle Design and Fabrication

The Faculty of the School of Mechanical Engineering has approved the following change in ME 455. This action is now submitted to the Engineering Faculty with a recommendation for approval.

FROM:

ME 455 Vehicle Design and Fabrication
Sem. 1, Class 3, cr. 3
Prerequisite: Senior standing or consent of instructor

> Open-ended project course to design and build competitive prototype vehicles. The integration of design concept formulation, engineering analysis and testing, and fabrication within the constraints imposed by manufacturing, funding, and market competition. Typically offered Fall.

TO:

ME 455 Vehicle Design and Fabrication
Sem. 1, Class 3, cr. 3
Prerequisite: Senior standing or consent of instructor

> Open-ended project course to design and build competitive prototype vehicles. Integration of design concept formulation, engineering analysis and testing, and prototype fabrication. Product development activities in a hands-on setting. Design constraints imposed by manufacturing limitations, funding constraints and market competition.

Reason: This course provides students with the opportunity to apply their technical skills to the design and fabrication of competitive prototype vehicles (e.g., mini baja, SAE formula, sunraycer, etc.). Students continue their design process in their senior design experience in ME 463. The updated course description better describes the current course practice.

James D. Jones

James D. Jones, Associate Head/Professor
School of Mechanical Engineering

APPROVED FOR THE FACULTY
OF THE SCHOOLS OF ENGINEERING
BY THE ENGINEERING
CURRICULUM COMMITTEE

ECC Minutes #11

Date 12/14/09

Chairman ECC R. Cipra

ME 455
VEHICLE DESIGN AND FABRICATION

Course Outcomes [Related ME Program Outcomes in brackets]

1. Apply the *design process* to the design of a vehicle (Mini-Baja or Formula SAE).
2. Apply *engineering fundamentals* to evaluate the design of a vehicle. [B1, D1]
3. Apply *team-work skills* to management of the Mini-Baja or Formula SAE teams. [B2, C2]
4. Learn the effect of design choices by *building and testing* students' designs. [C1, E1]

Design Process (3 wks)

1. Problem Definition
2. Conceptual Design
3. Detail Design
4. Prototype Fabrication
5. Testing
6. Redesign

Team Management (2 wks)

1. Budgeting/Sponsorship
2. Group Dynamics
3. Recruiting new team members
4. Training new team members
5. Mentoring future leaders
6. Motivating/leading teams
7. Logistics

Engineering Fundamentals Applications (5 wks)

1. Stress analysis (Frame/suspension)
2. Kinematics/Kinetics (Suspension)
3. Machine Elements (Power train)
4. Electro-mechanical (Fuel-Spark Management)
5. Design for X (safety, maintenance, aesthetics)

Fabrication Techniques (5 wks)

1. Machine Tools (Lathe, Mill)
2. CNC Machines
3. Welding
4. Heat-Treatment

COURSE NUMBER: ME 455

COURSE TITLE: Vehicle Design and Fabrication

REQUIRED COURSE OR ELECTIVE COURSE: Elective

TERMS OFFERED: Fall

TEXTBOOK/REQUIRED MATERIAL: None

PRE-REQUISITES: Permission of Instructor

COORDINATING FACULTY: J. Starkey

COURSE DESCRIPTION: Open-ended project course to design and build competitive prototype vehicles. Integration of design concept formulation, engineering analysis and testing, and prototype fabrication. Product development activities in a hands-on setting. Design constraints imposed by manufacturing limitations, funding constraints and market competition.

COURSE OUTCOMES:

1. Apply the *design process* to the design of a vehicle (Mini-Baja or Formula SAE). [F1]
2. Apply *engineering fundamentals* to evaluate the design of a vehicle. [B1, D1]
3. Apply *teamwork skills* to management of the Mini-Baja or Formula SAE teams. {B2, C2]
4. Learn the effect of design choices by *building and testing* students' designs. [C1, E1]

ASSESSMENTS TOOLS:

1. Written and oral progress report.
2. Written and oral final report.
3. Fabrication/prototype evaluation.

RELATED ME PROGRAM OUTCOMES:

B1. Leadership
B2. Teamwork
C1. Innovative
C2. Strong Work Ethic

PROFESSIONAL COMPONENT:

1. Engineering Topics: Engineering Design – 3 credits (100%)

NATURE OF DESIGN CONTENT: Fabrication of prototype designs is an extensive part of the course, especially when taken in the spring semester.

COMPUTER USAGE: As needed by the designs. May require CAD program or Finite Elements. Spreadsheets and math solvers (e.g., Matlab) are usually required.

COURSE STRUCTURE/SCHEDULE:

PREPARED BY: J. Starkey

DATE: Dec. 12, 2008