

PURDUE UNIVERSITY  
REQUEST FOR ADDITION, EXPIRATION,  
OR REVISION OF A GRADUATE COURSE  
(500-600 LEVEL)

EPD 46-10

DEPARTMENT Mechanical Engineering EFFECTIVE SESSION Fall 2009 2011 (2012/10)

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

<input type="checkbox"/> 1. New course with supporting documents (complete proposal form)	<input type="checkbox"/> 7. Change in course attributes
<input type="checkbox"/> 2. Add existing course offered at another campus	<input checked="" type="checkbox"/> 8. Change in instructional hours
<input type="checkbox"/> 3. Expiration of a course	<input checked="" type="checkbox"/> 9. Change in course description
<input type="checkbox"/> 4. Change in course number	<input checked="" type="checkbox"/> 10. Change in course requisites
<input type="checkbox"/> 5. Change in course title	<input type="checkbox"/> 11. Change in semesters offered
<input type="checkbox"/> 6. Change in course credit/type	<input type="checkbox"/> 12. Transfer from one department to another

PROPOSED: Subject Abbreviation ME Course Number 54000 Long Title Internal Combustion Engines Short Title Int. Combustion Engine

EXISTING: Subject Abbreviation \_\_\_\_\_ Course Number \_\_\_\_\_

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

TERMS OFFERED  
Check All That Apply:  Summer  Fall  Spring

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

CREDIT TYPE

1. Fixed Credit: Cr. Hrs. 3

2. Variable Credit Range: Minimum Cr. Hrs. \_\_\_\_\_ To  Or  Maximum Cr. Hrs. \_\_\_\_\_

3. Equivalent Credit: Yes  No

4. Thesis Credit: Yes  No

COURSE ATTRIBUTES: Check All That Apply

1. Pass/Not Pass Only  7. Registration Approval Type Department  Instructor

2. Satisfactory/Unsatisfactory Only  8. Variable Title

3. Repeatable  9. Remedial

Maximum Repeatable Credit:  10. Honors

4. Credit by Examination  11. Full Time Privilege

5. Designator Required  12. Off Campus Experience

6. Special Fees

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	75	2	16		Syn	Live
Recitation						
Presentation						
Laboratory						
Lab Prep						
Studio						
Distance						
Clinic						
Experiential						
Research						
Ind. Study						
Pract/Observ						

Cross-listed Courses  
 RECEIVED  
 2011 AUG 18 AM 10:05  
 THE REGISTRAR

COURSE DESCRIPTION (INCLUDE REQUISITES):  
**ME 540 Internal Combustion Engines**  
 Sem. 2 (alternate years), Class 3, cr. 3.  
 Prerequisites: ME 30000, ME 31500, ME 44000, or consent of instructor.

Spark-ignition and compression-ignition engine processes. Study of the fundamentals of turbulence, boundary layers, liquid atomization, sprays, combustion, and pollutant formation as applied to engines. Engine aftertreatment. Modeling of engine flows, sprays, combustion, and pollutants. Offered in alternate years.

Calumet Department Head _____ Date _____	Calumet School Dean _____ Date _____	Calumet Undergrad Curriculum Committee _____ Date _____
Fort Wayne Department Head _____ Date _____	Fort Wayne School Dean _____ Date _____	Fort Wayne Chancellor _____ Date _____
Indianapolis Department Head _____ Date _____	Indianapolis School Dean _____ Date _____	<i>X.R. Cipra</i> 4/6/2011 Undergrad Curriculum Committee _____ Date _____
North Central Department Head _____ Date _____	North Central Chancellor _____ Date _____	Date Approved by Graduate Council _____
<i>Edmund Horvath</i> 8/12/10 West Lafayette Department Head _____ Date _____	<i>Michael P. Pappas</i> 4/6/11 West Lafayette College/School Dean _____ Date _____	<i>Tim R. Rupp</i> 8/16/11 Graduate Council Secretary _____ Date _____
Graduate Area Committee Convener _____ Date _____	<i>Phillip E. Fox</i> 8/22/11 Graduate Dean _____ Date _____	<i>Sandra Schaff</i> 8/22/11 West Lafayette Registrar _____ Date _____



**TO:** The Faculty of the College of Engineering

**FROM:** The Faculty of the School of Mechanical Engineering

**RE:** ME 54000 Prerequisite Changes and Correction in Course Description

The Faculty of the School of Mechanical Engineering has approved the following prerequisite and course description changes. This action is now submitted to the Engineering Faculty with a recommendation for approval.

**From:**

**ME 54000 Internal Combustion Engines**  
Sem. 2 (alternate years), Class 2, Lab 1, cr. 3  
Prerequisite: ME 31500

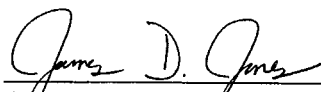
Performance of internal combustion engines in relation to the fundamentals of thermodynamics, fluid mechanics, and heat transfer in the engine intake, cylinder, and exhaust systems. Spark-ignition and compression-ignition engine processes. Fundamental physics of turbulence, boundary layer effects, atomization and structure of sprays, premixed and non-premixed combustion and pollutants. Modeling of engine processes. Hands-on experience through laboratory experiments. Offered in alternate years. Not available to students with credit in M E 44000.

**To:**

**ME 54000 Internal Combustion Engines**  
Sem. 2 (alternate years), Class 3, cr. 3  
Prerequisite: ME 30000, ME 31500, ME 44000, or consent of instructor

Spark-ignition and compression-ignition engine processes. Study of the fundamentals of turbulence, boundary layers, liquid atomization, sprays, combustion, and pollutant formation as applied to engines. Engine aftertreatment. Modeling of engine flows, sprays, combustion, and pollutants. Offered in alternate years.

**Reason:** When we first offered the course ME54000 it was piggybacked on ME44000. ME54000 students took the ME44000 lectures, and had to do some additional work. The last three times we offered it, we did not follow this model. The syllabus for ME54000 is different from that for ME44000, and the lectures are at different times. ME54000 requires ME44000 or an equivalent course, or the permission of the instructor, as prerequisites. Also, there is no lab component with ME 54000 due to the emphasis on fundamental principles and advanced analytical modeling techniques. As such, ME 54000 is an excellent companion course to the more hands-on ME 44000 experience.



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

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

ECC Minutes

#8

Date

12/14/10

Chairman ECC

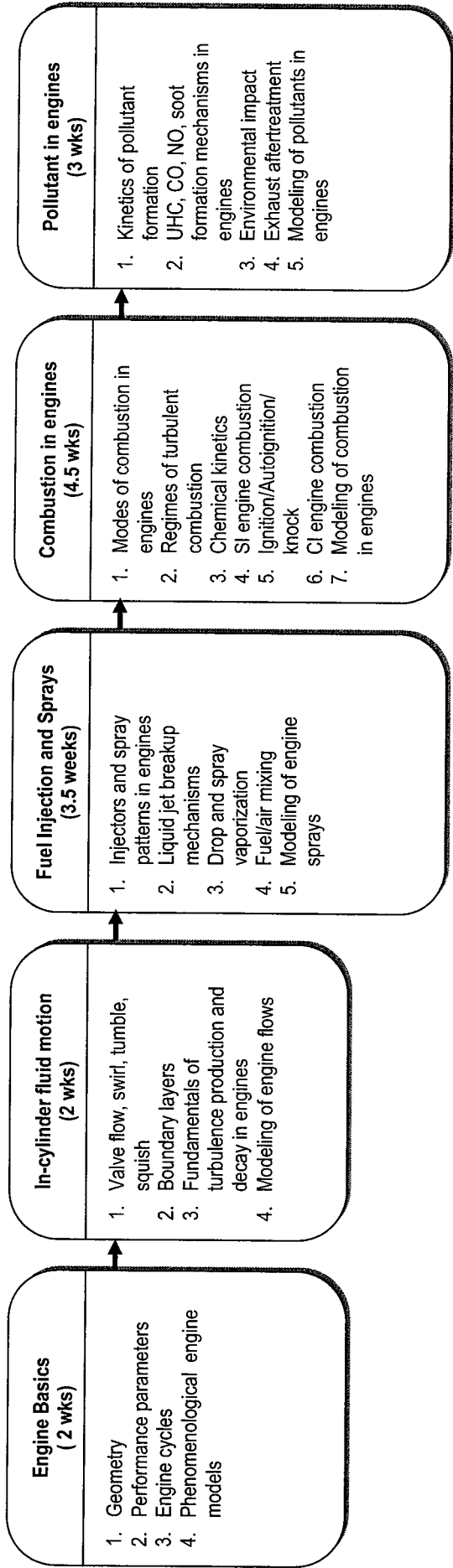
R. Cipra



**ME 5400  
INTERNAL COMBUSTION ENGINES**

**Course Outcomes**

1. Study the fundamentals of turbulence, boundary layers, liquid atomization, sprays, combustion, and pollutant formation as applied to internal combustion engines.
2. Study the modeling of engine flows, sprays, combustion, and pollutant formation in internal combustion engines.





<b>COURSE NUMBER:</b> ME 54000		<b>COURSE TITLE:</b> Internal Combustion Engines	
<b>REQUIRED COURSE OR ELECTIVE COURSE:</b> Elective		<b>TERMS OFFERED:</b> Spring (Alternate Years)	
<b>TEXTBOOK/REQUIRED MATERIAL:</b> Heywood, J.B., Internal Combustion Engine Fundamentals, McGraw-Hill, New York, 1988.		<b>PRE-REQUISITES:</b> ME 30000, ME 31500, ME 44000, or consent of instructor.	
<b>COORDINATING FACULTY:</b> J. Abraham		<b>COURSE OUTCOMES:</b> 1. Study the fundamentals of turbulence, boundary layers, liquid atomization, sprays, combustion, and pollutant formation as applied to internal combustion engines. 2. Study the modeling of engine flows, sprays, combustion, and pollutant formation in internal combustion engines.	
<b>ASSESSMENTS TOOLS:</b> 1. Six homework assignments. 2. One mid-term oral exam. 3. Final project and oral presentation. 4. Comprehensive end-of-semester oral examination.		<b>RELATED ME PROGRAM OUTCOMES:</b> N/A	
<b>PROFESSIONAL COMPONENT:</b> 1. Engineering Topics: Engineering Science – 2.4 credits (80%) Engineering Design – 0.6 credits (20%)			
<b>NATURE OF DESIGN CONTENT:</b> N/A			
<b>COMPUTER USAGE:</b> EES, Matlab, cycle analysis software			
<b>COURSE STRUCTURE/SCHEDULE:</b> Lecture – 2 days per week at 75 minutes.			
<b>PREPARED BY:</b> J. Abraham		<b>REVISION DATE:</b> November 19, 2009	





ME 54000

**Fellure, Debra S.**

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**From:** Jones, James D.  
**Sent:** Thursday, June 02, 2011 10:03 AM  
**To:** Fellure, Debra S.  
**Cc:** Kendig, Helen M.  
**Subject:** RE: ME 54000

Yes, the lab is being removed. This will be a purely lecture course.

Jim

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James D. Jones  
Associate Professor and Associate Head  
585 Purdue Mall  
School of Mechanical Engineering  
West Lafayette, IN 47907-2088  
Ph: (765)494-5691  
Fax: (765)494-0539  
Email: [jonesjd@purdue.edu](mailto:jonesjd@purdue.edu)

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**From:** Fellure, Debra S. [<mailto:dfellure@purdue.edu>]  
**Sent:** Wednesday, June 01, 2011 4:44 PM  
**To:** 'jonesjd@purdue.edu'  
**Subject:** FW: ME 54000

Dr. Jones,

Before I send this off to Dr. Pope and the Registrar for approval, I want to make sure I'm clear on Question #2 in red below.

Thank you,  
Debbie

*Debra S. Fellure*  
The Graduate School  
Purdue University  
Young Hall, Room 160  
155 S. Grant St.  
West Lafayette, IN 47907-2114  
765-494-6963  
[dfellure@purdue.edu](mailto:dfellure@purdue.edu)

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**From:** Jones, James D.  
**Sent:** Thursday, May 26, 2011 2:10 PM  
**To:** Fellure, Debra S.  
**Cc:** Kendig, Helen M.  
**Subject:** FW: ME 54000

Debbie:

Thanks for the email. I have responded to your questions below. Let me know if you need anything else.

Jlm

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 James D. Jones  
 Associate Professor and Associate Head  
 585 Purdue Mall  
 School of Mechanical Engineering  
 West Lafayette, IN 47907-2088  
 Ph: (765)494-5691  
 Fax: (765)494-0539  
 Email: [jonesjd@purdue.edu](mailto:jonesjd@purdue.edu)

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**From:** Fellure, Debra S. [<mailto:dfellure@purdue.edu>]  
**Sent:** Thursday, May 26, 2011 1:36 PM  
**To:** 'jonesjd@purdue.edu'  
**Subject:** ME 54000

Dear Dr. Jones,

I have attached the Original Form 40G for ME 54000. We have a few questions regarding the following items:

1. Credit Type is marked as 3 Fixed Credit: Cr. Hrs. The INSTRUCTIONS area is not checked for (#6) Change in course credit/type. Please clarify if this is a change.  
 The course went from 2 lec/1 lab to 3 cr Lec. If this requires #6 to be checked, then that would be needed.

2. Instructional Type is marked as 75 Minutes Per Meeting, 2 times per week for 16 Weeks Offered, Syn as Delivery Method, and Live Delivery Medium (Audio, Internet, Live, Text-Based, Video). The INSTRUCTIONS area is not checked for (#8) Change in instructional hours. Please clarify if this is a change.  
 In the past we have offered this in the T/Th format since there were 2 lecture hours. Now that it is 3 crs all lecture, we may offer it t/th or MWF. I regularly make this change for lots of courses because faculty request it. We put ME 540 in the T/Th 75 min format because historically it was taught as a T/Tu class. Does this answer your questions? The Detailed Course Information (Course Catalog) on the Registrar's web site indicates Schedule Types: Laboratory, Lecture. I want to make sure the lab is being removed?

3. Terms Offered is marked as Spring. The INSTRUCTIONS area is not checked for (# 11) Change in semesters offered. Please clarify if this is a change.  
 ME 540 was offer in spring (alt. sem) in the past. We wil continue to offer it in spring. This has not changed.

If necessary, I will make any updates with your permission to the Form 40G.

Thank you,  
 Debbie

*Debra S. Fellure*  
 The Graduate School  
 Purdue University  
 Young Hall, Room 160  
 155 S. Grant St.  
 West Lafayette, IN 47907-2114