Office of the Registrar
FORM 40 REV. 9/06

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

39-09

DEPARTMENT: Mechanical Engineering

EFFECTIVE SESSION: Fall ~~2009~~ 2010

INSTRUCTIONS: Ple

- [ ] 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
- [ ] 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	263	Course Number	
Long Title	Intro to Mechanical Engineering Design, Innovation, & Entrepreneurship		
Short Title	ME Design/Innov/Entrep		

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 [x] Spring

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

CREDIT TYPE
1. Fixed Credit: Cr. Hrs.
2. Variable Credit Range:
Minimum Cr. Hrs
(Check One) To [x] Or [ ]
Maximum Cr. Hrs
3. Equivalent Credit: Yes [ ] 3
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:
4. Credit by Examination
nator Required
al Fees
7. Registration Approval Type
Department [ ] Instructor [ ]
8. Variable Title
9. Remedial
10. Honors
11. Full Time Privilege
12. Off Campus Experience

Instructional Type	Min Per Mtg	Week	Offered	% of Credit Allocated	Delivery Method (Asyn. Or Syn.)	Delivery Medium (Audio, Internet, Live, Text-Based, Video)
Lecture	50	2	16		Syn.	e
Recitation						
Presentation						
Laboratory	110/50	2	16		Syn.	Live
Lab Prep						
tudio						
istance						
Clinic						
Experiential						
Research						
Ind. Study						
Pract/Observ						

Cross-Listed Courses

COURSE DESCRIPTION (INCLUDE REQUISITES):

ME 263 Introduction to Mechanical Engineering Design, Innovation, and Entrepreneurship
Sem. 1, 2, Class 2, Lab 1, cr. 3.
Prerequisite: CGT 163, COM 114, ENGL 106 or 108, ENGR 126, ME 200, ME 270, Mechanical Engineering majors only.
Concurrent Prerequisite: MA 262, ME 290.

The product design process. Development of product design specifications using customer inputs, benchmarking, product/market research and patent review. Concept generation and evaluation using brainstorming, functional decomposition, modeling and decision matrices. Detailed product design including assembly, economic analysis, CAD, and bill of materials. Oral and written design reviews. Key skills developed include teamwork, communication, project planning, innovation, design, and entrepreneurship.

Calumet Department Head	Date	Calumet School Dean	Date	Fort Wayne Chancellor	Date
Fort Wayne Department Head	Date	Fort Wayne School Dean	Date	..grad 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
West Lafayette Department Head 11/27/2009	Date	West Lafayette College/School Dean 3/3/10	Date	West Lafayette Registrar 3/8/10	Date

OFFICE OF THE REGISTRAR

3/18/10

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EFFECTIVE SESSION: Fall 2009

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Long Title: Intro to Mechanical Engineering Design, Innovation, & Entrepreneurship

Short Title: ME Design/Innov/Entrep

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- [ ] Summer
- [x] Fall
- [x] Spring

CAMPUS(ES) INVOLVED

- [ ] Calumet
- [ ] Cont Ed
- [ ] Ft. Wayne
- [ ] Indianapolis
- [ ] N. Central
- [ ] Tech Statewide
- [x] W. Lafayette

CREDIT TYPE

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

COURSE ATTRIBUTES: Check All That Apply

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3. Repeatable
   - Maximum Repeatable Credit:
4. Credit by Examination
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North Central Department Head	Date	North Central Chancellor	Date	Graduate Council Secretary	Date
West Lafayette Department Head	1/27/2009 Date	West Lafayette College/School Dean	3/3/10 Date	West Lafayette Registrar	Date

OFFICE OF THE REGISTRAR

TO: The Faculty of the College of Engineering

FROM: The Faculty of the School of Mechanical Engineering

RE: ME 26300 Prerequisite Changes

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

From:

ME 26300 Introduction to Mechanical Engineering Design, Innovation, and Entrepreneurship
Sem. 1, 2, Class 2, Lab 1, cr. 3
Prerequisite: CGT 16300, ME 20000, ME 27000
Co-requisite: MA 26200, ME 29000

The product design process. Development of product design specifications using customer inputs, benchmarking, product/market research and patent review. Concept generation and evaluation using brainstorming, functional decomposition, modeling and decision matrices. Detailed product design including assembly, economic analysis, CAD, and bill of materials. Oral and written design reviews. Key skills developed include teamwork, communication, project planning, innovation, design, and entrepreneurship.

To: **ME 26300 Introduction to Mechanical Engineering Design, Innovation, and Entrepreneurship**
Sem. 1, 2, Class 2, Lab 1, cr. 3
Prerequisite: CGT 16300, COM 11400, ENGL 10600 or 10800, ENGR 12600, ME 20000, ME 27000, Mechanical Engineering majors only
Concurrent Prerequisite: MA 26200, ME 29000

The product design process. Development of product design specifications using customer inputs, benchmarking, product/market research and patent review. Concept generation and evaluation using brainstorming, functional decomposition, modeling and decision matrices. Detailed product design including assembly, economic analysis, CAD, and bill of materials. Oral and written design reviews. Key skills developed include teamwork, communication, project planning, innovation, design, and entrepreneurship.

Reason: The added prerequisites of COM 11400, ENGL 10600 or 10800 and ENGR 12600 are needed because of an increasing number of requests to admit students into ME without one or more of these First-Year Engineering courses.

James D. Jones

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 #11

Date 12/14/09

Chairman ECC R. Cipra

ME 26300
INTRODUCTION TO MECHANICAL ENGINEERING DESIGN, INNOVATION, AND ENTREPRENEURSHIP

Course Outcomes [Related ME Program Outcomes in brackets]

1. Instill the philosophy that *real engineering design problems* are *open-ended* and *multifaceted.* [A5, A6, A7, B8]
2. Teach a *systemic design methodology.* [A5, A7, B6]
3. Provide guidance in *applying engineering principles* to open-ended problems. [A2, A3, A5, A7]
4. Develop the ability to *mathematically model* and *analyze* engineering systems. [A3, A7]
5. Sharpen skills in *leadership, teamwork, communication, project planning, innovation, design* and *entrepreneurship.* [B1, B2, B3, B4, B5, B6, C1, C2, C4, C5, C6]
6. Instill a philosophy of *professional* and *ethical behavior.* [C3]
7. Provide a *foundation* for the rest of the mechanical engineering curriculum and future careers. [C6]

Phase I: Problem Definition (4.5 wks)

1. Problem Statement
2. Customer Survey
3. Competitive Product Study (Benchmarking)
4. Market Survey
5. Patent/Periodical Search
6. House of Quality
7. Problem Definition
8. Preliminary Design Review

Phase II: Concept Generation and Evaluation (4.5 wks)

1. Functional Decomposition
2. Brainstorming
3. Preliminary Evaluations
   - Feasibility Judgement
   - Technology Readiness Assessment
   - Decision Matrix
4. Concept Selection
5. Engineering Modeling of Concepts
6. Comparison with Benchmarks
7. Preliminary Design Review

Phase III: Product Design (6 wks)

1. Selection Design
2. Bill of Materials
3. Assembly/Parts Drawings
4. Performance Analysis
5. Assembly Analysis
6. Economic Analysis
7. Critical Design Review

Example Projects

1. Personal Transportation Systems.
2. Assistive Devices in Multi-Level Apartments
3. Personal Exercise Machines
4. Portable, Adjustable Basketball Goals
5. Roof Pack Loading Devices
6. Hitch/Receiver Mounting Accessories

COURSE NUMBER: ME 26300

COURSE TITLE: Introduction to Mechanical Engineering Design, Innovation, and Entrepreneurship

REQUIRED COURSE OR ELECTIVE COURSE: Required

TERMS OFFERED: Fall and Spring

TEXTBOOK/REQUIRED MATERIAL: David G. Ullman, *The Mechanical Design Process*, 3rd ed, McGraw-Hill, 2003

PRE-REQUISITIES: ME 20000 Thermo. I, ME 27000 Basic Mech. I, CGT 16300 Intro. to Graphics for Manufacturing

CO-REQUISITIES: MA 26200 Linear Algebra and Differential Equations, ME 29000 Global Engineering Professional Seminar

COORDINATING FACULTY: G.B. King

COURSE DESCRIPTION: The product design process. Development of product design specifications using customer inputs, benchmarking, product/ market research and patent review. Concept generation and evaluation using brainstorming, functional decomposition, modeling and decision matrices. Detailed product design including assembly, economic analysis, CAD, and bill of materials. Oral and written design reviews. Key skills developed include leadership, teamwork, communication, project planning, innovation, design, and entrepreneurship.

COURSE OUTCOMES [Related ME Program Outcomes in brackets]:

1. Instill the *philosophy* that real engineering design problems are open-ended and multifaceted. [A5, A6, A7, B8]
2. Teach a *systematic design methodology*. [A5, A7, B6]
3. Providence *guidance* in applying engineering principles to open-ended problems. [A2, A3, A5, A7]
4. Develop the ability to *mathematically model* and *analyze* engineering systems. [A3, A7]
5. Foster key skills in *leadership, teamwork, communication, project planning, innovation, design* and *entrepreneurship*. [B1, B2, B3, B4, B5, B6, C1, C2, C4, C5, C6]
6. Instill a philosophy of *professional* and *ethical behavior*. [C3]
7. Provide a *foundation* for the rest of the mechanical engineering curriculum and future careers. [C6]

ASSESSMENTS TOOLS:

1. Weekly deliverables.
2. 5-6 unannounced quizzes.
3. Two 1-hour exams.
4. Design notebook.
5. Three technical group presentations (2 progress presentations + 1 comprehensive final presentation).
6. Three 10-page technical group reports + appendices (2 progress reports + 1 final comprehensive report).
7. Self and peer evaluations.
8. Instructor evaluations.

RELATED ME PROGRAM OUTCOMES:

A2. Engineering fundamentals
A3. Analytical skills
A5. Open-ended design problem solving skills
A6. Multidiscip. within and beyond engineering
A7. Integ. of analy./prob solv./design skills
B1. Leadership
B2. Teamwork
B3. Communication
B4. Decision-making
B5. Recognize and manage change
B6. Work effect. in diverse/multicult. envir.
B8. Synthesize engrng/societ/bus. persp.
C1. Innovative
C2. Strong work ethic
C3. Globally/social/ethic./intell./tech. resp.
C4. Adaptable in a changing environment
C5. Entrepreneurial and intrapreneurial
C6. Curious and persistent lifelong learners

PROFESSIONAL COMPONENT:

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

NATURE OF DESIGN CONTENT: ME 26300 is a true exposure to the multi-faceted and open-ended nature of design problems. Students experience design by doing, but are also taught the latest design theories and techniques in lectures. The focus of the course is how to design, not just experience trying to design.

COMPUTER USAGE: Students use spreadsheets, 3-D solid modeling software in the analysis and digital representation of their product design.

COURSE STRUCTURE/SCHEDULE:

1. Lecture - 2 days per week at 50 minutes.
2. Laboratory - 2 days per week at 110 and 50 minutes.

PREPARED BY: G.B. King

REVISION DATE: April 1, 2007