New Course Request

Check Appropriate Boxes: Undergraduate credit [ ] Graduate credit [ ] Professional credit [ ]

1. School/Division: School of Engineering & Technology
2. Academic Subject Code: MSTE

3. Course Number: 350
4. Instructor: Pete Hykon

5. Course Title: Computer Aided Design & Manufacturing
   Recommended Abbreviation (Optional): CAD-CAM

6. First time this course is to be offered (Semester/Year): Fall 2009

7. Credit Hours: Fixed at: 3 or Variable from: 0 to: 0

8. Is this course to be graded S-F (only)? Yes [ ] No [X]

9. Is variable title approval being requested? Yes [X] No [ ]

10. Course description (not to exceed 50 words) for Bulletin publication:
    P: MSTE 297 or permission of instructor. This course studies modeling and analysis techniques to aid design in the Motorsports Industry.

11. Lecture Contact Hours: Fixed at: 3 or Variable from: 0 to: 0

12. Non-Lecture Contact Hours: Fixed at: 0 or Variable from: 0 to: 0

13. Estimated enrollment: 25 of which 0 percent are expected to be graduate students.

14. Frequency of scheduling: yearly
   Will this course be required for majors? Yes [X]

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 [X]

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.

Submitted by: [Signature]
Date: 10/22/07

Chairman, Department
Date: 10-22-07

Dean of Graduate School (when required)
Date: 10-22-07

Chancellor/Vice-President
Date: 10-22-07

University Enrollment Services

After School Division approved, 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.

UPS 774

University Enrollment Services Final Word: Chancellor/Vice-President, School Division, Vice-President, Department Division, Fiscal, University Enrollment Services Advance/White
**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.

- **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
- **10.** Change in course requisites
- **11.** Change in semesters offered (department head signature only)
- **12.** Transfer from one department to another

**Proposed:**

- **Subject Abbreviation:** MSRE
- **Course Number:** 350
- **Long Title:** Computer Aided Design & Manufacturing
- **Short Title:** CAD-CAM

**Existing:**

- **Subject Abbreviation:**
- **Course Number:**
- **Long Title:**
- **Short Title:**

**Terms Offered:**

- **Check All That Apply:**
  - Summer
  - Fall
  - Spring

**Campus (ES) Involved:**

- Calumet
- Cont Ed
- Tech Statewide
- Ft. Wayne
- W. Lafayette
- Indianapolis

**Credit Type:**

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

**Course Attributes:**

- 1. Pass/Not Pass Only
- 2. Satisfactory/Unsatisfactory Only
- 3. Repeatable
- 4. Maximum Repeatable Credit:
- 5. Designator Required
- 6. Special Fees
- 7. Registration Approval Type
- 8. Variable Title
- 9. Remedial
- 10. Honors
- 11. Full Time Privilege
- 12. Off Campus Experience

**Course Description (Include Requisites):**

P: MSRE 297 or permission of instructor. This course studies modeling and analysis techniques to aid design in the Motorsports Industry.

**Signature:**

- Calumet Department Head
- Calumet School Dean
- Fort Wayne Department Head
- Fort Wayne School Dean
- Indianapolis Department Head
- Indianapolis School Dean
- North Central Department Head
- North Central Chancellor
- West Lafayette Department Head
- West Lafayette College/School Dean
- West Lafayette Registrar

**Date:**

- 10-28-08

**Office of the Registrar**
PURDUE SCHOOL OF ENGINEERING & TECHNOLOGY
OUTCOMES AND ASSESSMENT DATA SHEET

This is an internal document to identify and record expected outcomes and
anticipated assessment strategies for all courses taught within the School of Engineering
and Technology. Submission of this form, as noted below, is required and must
accompany all new course and course change requests. Copies of this form should also be
retained within the department and kept on file with the outline or syllabus for each course.

Course Number: MSTE 350    Course Title: Computer Aided Design & Manufacturing

Procedure:

First, identify all instructional outcomes expected for this course, and then select all ABET
outcomes which are consistent with those anticipated objectives from TABLE 1 below.

<table>
<thead>
<tr>
<th>TABLE 1 - ABET OUTCOMES</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGINEERING - EAC Criteria #3</td>
</tr>
<tr>
<td>An ability to apply knowledge of mathematics, science, and engineering</td>
</tr>
<tr>
<td>An ability to design and conduct experiments as well as to analyze and interpret data.</td>
</tr>
<tr>
<td>An ability to design a system, component, or process to meet desired needs.</td>
</tr>
<tr>
<td>An ability to function on multi-disciplinary teams.</td>
</tr>
<tr>
<td>An ability to identify, formulate and solve engineering problems.</td>
</tr>
<tr>
<td>An understanding of professional and ethical responsibility.</td>
</tr>
<tr>
<td>An ability to communicate effectively.</td>
</tr>
<tr>
<td>The broad education necessary to understand the impact of engineering solutions in global societal context.</td>
</tr>
<tr>
<td>A recognition of the need for and ability to engage in life-long learning.</td>
</tr>
<tr>
<td>A knowledge of contemporary issues.</td>
</tr>
<tr>
<td>An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.</td>
</tr>
</tbody>
</table>

Subsets for each of the six IUPUI Principles of Undergraduate Learning (PUL) are given on
the reverse side in TABLE 2. Using a number corresponding to each ABET outcome
identified from TABLE 1 above to select a column, place a "+" or "X" mark in the applicable
TABLE 2 row(s) cell for each PUL. Courses will often address multiple ABET outcomes
and ABET outcomes frequently will overlap more than one PUL subset. Thus, it is
expected completed data sheets may contain marks in several cells thereby indicating the
course simultaneously satisfies multiple Principles of Undergraduate Learning while
fulfilling its intended ABET objective(s).

After completing TABLE 2, briefly define or explain how the course outcomes or objectives
will be evaluated within the context of the departmental assessment program in the space
below:

Students will be evaluated via individual assignments, and individual project and an exam.

Submitted By: Pete Hylton             Date: 10/3/08
### TABLE 2 - MATRIX OF EXPECTED COURSE OUTCOMES

(Suggestion - while completing Table 2, place a copy of the ABET outcomes from Table 1 along side for easy cross referencing.)

<table>
<thead>
<tr>
<th>PRINCIPLES OF UNDERGRADUATE LEARNING</th>
<th>ENGINEERING OUTCOMES - EAC CRITERIA #3: item (a) to (k)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a) - Express ideas and facts effectively in written formats</td>
<td>a  b  c  d  e  f  g  h  i  j  k</td>
</tr>
<tr>
<td>(b) - Comprehend, interpret, and analyze texts</td>
<td></td>
</tr>
<tr>
<td>(c) - Communicate orally in one-on-one and group settings</td>
<td></td>
</tr>
<tr>
<td>(d) - Solve problems that are quantitative in nature</td>
<td></td>
</tr>
<tr>
<td>(e) - Make efficient use of information resources and technology for personal and professional needs</td>
<td></td>
</tr>
<tr>
<td>(f) - Analyze complex issues and make informed decisions</td>
<td></td>
</tr>
<tr>
<td>(g) - Synthesize information in order to arrive at reasoned conclusions</td>
<td></td>
</tr>
<tr>
<td>(h) - Evaluate the logic, validity, and relevance of data</td>
<td></td>
</tr>
<tr>
<td>(i) - Solve challenging problems</td>
<td></td>
</tr>
<tr>
<td>(j) - Use knowledge and understanding to generate and explore new questions</td>
<td></td>
</tr>
<tr>
<td>(k) - Apply knowledge to enhance personal lives</td>
<td></td>
</tr>
<tr>
<td>(l) - Apply knowledge to meet professional standards and competencies</td>
<td></td>
</tr>
<tr>
<td>(m) - Apply knowledge to further the goals of society</td>
<td></td>
</tr>
<tr>
<td>(n) - Demonstrate substantial knowledge and understanding of at least one field of study</td>
<td></td>
</tr>
<tr>
<td>(o) - Compare and contrast approaches to knowledge in different disciplines</td>
<td></td>
</tr>
<tr>
<td>(p) - Modify their approach to an issue or problem based on the contexts and requirements of particular situations</td>
<td></td>
</tr>
<tr>
<td>(q) - Compare and contrast the range of diversity and universality in human history, societies, and ways of life</td>
<td></td>
</tr>
<tr>
<td>(r) - Analyze and understand the interconnectedness of global and local concerns</td>
<td></td>
</tr>
<tr>
<td>(s) - Operate with civility in a complex social world</td>
<td></td>
</tr>
<tr>
<td>(t) - Make informed and principles choices regarding conflicting situations in their personal and public lives and to foresee the consequences of these choices</td>
<td></td>
</tr>
<tr>
<td>(u) - Recognize the importance of aesthetics in their personal lives and to society</td>
<td></td>
</tr>
</tbody>
</table>
MSTE 350 – Computer Aided Design & Manufacturing

Description: This course provides the basis for the computer aided engineering and analysis skills needed in the Motorsports Industry. The ability to visualize and conceptualize a real part in the physical world and produce graphical representations of it in 2D and 3D in Pro-E or an equivalent is a primary objective. Further skills to be developed include the ability to produce large assemblies of such parts with appropriate tolerancing, free form surfacing, casting shapes and casting machining, 2D drawings for use in 3D sheet metal fabrication including shrink and stretch, use of 3D models to facilitate Finite Element Analysis, Conversion of CAD model to programming of CAM machining.

Prerequisite: MSTE 297

Scheduled Class Meetings: Two 75 minute class meetings per week

Instructor: tbd
Text: tbd

Grading: Homework 200
          Project 200
          Final Exam 100  total = 500

Grading Scale: 90-100 = A, 80-90 = B, 70-80 = C, 60-70 = D, 0-60 = F

Late work: Reports, presentations, and homework need to be on time. Severe late penalties will apply.

Tentative Course Schedule:

Week 1: Introduction
Week 2: Representations in 2D and 3D
Week 3: Representations in 2D and 3D
Week 4: Assemblies
Week 5: Assemblies
Week 6: Tolerancing
Week 7: Free form surfacing
Week 8: Casting shapes
Week 9: Casting machining
Week 10: Drawings for use in 3D sheet metal fabrication
Week 11: Finite Element Analysis
Week 12: Finite Element Analysis
Week 13: Programming of CAM machining.
Week 14: Programming of CAM machining.
Week 15: Final Projects

Outcomes:
1. Apply knowledge of mathematics, science, and engineering to problems involving the design and manufacturing of components and systems.
2. Design a system, component, or process to meet desired needs.
3. Identify, formulate, and solve engineering problems involving the design and manufacturing of components and systems.
4. Use the techniques, skill, and modern engineering tools necessary for engineering practice.