

## **Overview of Formula Hybrid for Interested Students Make McDermott, April 6, 2009**

Formula Hybrid - The Formula Hybrid (FH) competition provides students with a challenging design experience in rapidly emerging technologies that are pertinent to current global issues. FH is a student design competition organized by the IEEE and SAE (formerly the Society of Automotive Engineers) and supported by the major auto manufacturers and other companies. The objective is for student teams to design, construct, test/develop, and compete with small, open wheel, hybrid racecars. The winner is determined based on two "static events" (design and business case presentation) and three "dynamic events" (unlimited & electric-only acceleration, autocross, and endurance). The first competition was held in spring 2007 and Texas A&M will compete for the first time in May 2009 with FH replacing the very successful Texas A&M FSAE project. For more info see <http://www.formula-hybrid.org/>

Students Needed – Students with knowledge and/or experience in the following technologies or who are interested in learning about these technologies are needed for this project – electrical machines (motors & generators), power electronics, micro-controllers, electronics, controls, real time computing, structures, manufacturing, engines, and vehicle dynamics (suspension & handling). Project success also requires project management, fund raising, and teamwork. Students in the following engineering majors are targeted – mechanical, electrical and computer, engineering technology, and computer science. Other majors are also welcome. The 2010 Texas A&M FH car will be designed during the fall 2009 semester as the project for ENGR 401.503 - Interdisciplinary Design and built and developed during the spring semester in ENGR 402.502 - Interdisciplinary Design II.

Benefits From The TAMU FH Project - This project provides an opportunity to participate in as close to a real industrial design project as you will get in academia. You have a real budget and a schedule with an inflexible delivery date. You have to deal with all of the dollars/schedule/people problems that you will encounter for the rest of your professional career. You must build your design and make it work in the spring; your team mates are depending on you and you cannot BS hardware. This is a great learning experience. The project advisors interview and "hire" (no pay) a project manager, he/she picks his/her staff, and the students run the project. If man hours are charged at competitive engineering rates this is over a \$1,000,000 project and companies are impressed to see that on your resume. The Texas A&M FSAE program has been very successful with three overall wins and six top five finishes in nine years competing against up to 140 university teams each year from all over the world. The 2009 FH car is currently being tested and developed and has demonstrated the quickness and reliability to win Formula Hybrid 2009. The budget for the TAMU 2009 Formula Hybrid competition is over \$30K cash and about \$20K in free and discounted products from sponsors. One of the personal rewards of this project, other than the experience, is that most engineers find it very satisfying to see that the product that they designed and built performs as predicted and designed.

Commitment Required - The cost to you for this experience is that you will put in more work than the typical student in the capstone design course; this project is equivalent to a design class plus a major volunteer extra-curricular activity. A two semester commitment is desired, but not required. Team members develop a very strong sense of responsibility to the team and do whatever is required to be sure that their part of the design/car works. This includes returning to campus immediately after New Year to begin building the racecar before classes start and possibly working through spring break to finish it before Roll Out the following week. Be certain that you are willing to make this commitment before joining the FH team. Many former FSAE team members have stated that the FSAE project was the most rewarding experience of their academic career. As with anything else, what you get out of it is proportional to what you put into it.

How to Get Involved - If you have the prerequisites to take the capstone design course in your department register for ENGR 401.503 in fall 2009 and ENGR 402 in spring 2009. Most engineering departments will allow students to substitute ENGR 401 & 402 for two capstone design courses or one capstone design course and a tech elective depending on degree requirements. For MEEN students ENGR 401 & 402 will be substituted for MEEN 401 & 402. For other majors see your advisor for substitutions. Students who are not registering for ENGR 401 are encouraged to audit or participate in other aspects of the project as volunteers.

All students who would like to participate in the FH design class must fill out an application form providing some info about themselves. Applications must be returned to Ms. Jocelyn Miller in the ME Advising Office (Engineering Physics Building 200) [jd-miller@tamu.edu](mailto:jd-miller@tamu.edu). Forms are available from the ME web site ([www.mengr.tamu.edu](http://www.mengr.tamu.edu) – link to “current students” at top right and look under “undergraduate forms”). If the course is over subscribed or for some reason you do not qualify to be in this course/section your department advisors will register you for the appropriate course in your department that is compatible with your schedule.

I hope that you decide to participate.

**APPLICATION**

**ENGR 401/402.503 -- FORMULA HYBRID PROJECT  
FALL 2009 AND SPRING 2010**

**name:** \_\_\_\_\_

**current address:** \_\_\_\_\_  
\_\_\_\_\_

**home phone:** \_\_\_\_\_ **cell phone:** \_\_\_\_\_

**email:** \_\_\_\_\_

**summer address:** \_\_\_\_\_  
\_\_\_\_\_

**summer phone:** \_\_\_\_\_ **summer email:** \_\_\_\_\_

**taking summer courses? yes / no. If yes, what?** \_\_\_\_\_

**courses for fall 2009:** \_\_\_\_\_  
\_\_\_\_\_ **hours in fall:** \_\_\_\_\_

**courses for spring 2010:** \_\_\_\_\_  
\_\_\_\_\_ **hrs in spring:** \_\_\_\_\_

**Hours per week that you will be working during 2009-10 AY:** \_\_\_\_\_ **hours / week**

**Have you participated in TAMU Formula Hybrid in the past? yes / no**

**If yes, give approximate number of hours.** \_\_\_\_\_

**Why do you want to participate in this project?** \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**Previous experience with related technologies - see list of technologies in the "students needed" paragraph of the "overview". Give specific activities and approximate number of hours.**

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\_\_\_\_\_  
\_\_\_\_\_

**(continued)**

**FORMULA HYBRID APPLICATION (continued)**

**Previous experience with any hands-on activities. Give specific activities (e.g., machine work, welding, electronics, microcontrollers, real time computing, wood working, carpentry, etc.) and approximate number of hours of experience.**

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**Leadership experience (be specific; e.g., what positions of leadership have you held):**

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**Special skills/strengths that you feel that you would bring to this project (be specific)**

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**Work experience - give company name, division, specific duties, and dates.**

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**Have you read the "Overview of Formula Hybrid for Interested Students"?      yes / no**

**Return this application to Jocelyn Miller (jd-miller@tamu.edu) in EPB 200 ASAP.**