



Collegiate Design Series News

Volume 3, Issue 1 September 2005

Issue Highlights

2006 Event Registrations.....	pg. 1
Endowment memorializes Mankato students.....	pg. 4
2006 Mini Baja Significant Rule Changes.....	pg. 5
Clean Snowmobile 2006	pg. 6
Fundamentals of Aerodynamics Applied to Race Cars - New!	pg. 8
Knightr's Ride Pimped by Student Automotive Club	pg. 9
Texas Tech Team Receives First Annual	pg. 10

**Endowment
memorializes
Mankato
students...pg 4**

2006 Event Registration

Pay Close Attention – The registration process for the 2006 events have changed and there are several things to note:

1) Registration opens on Monday, October 3, 2005 at 10 am Eastern Daylight Time. For **ALL EVENTS**, except Clean Snowmobile the Registration Deadline is December 29, 2005 at 11:59 pm Eastern Daylight Time.

Posted further below will be in detail the event dates, location, registration fees, etc.

THERE IS NO LONGER ANY LATE REGISTRATIONS!!

Please prepare and plan accordingly to register your team before the deadline.

However, if you are having any problems registering your team please contact one of the Collegiate Design Series staff as soon as possible by calling 724/776-4841.

2) The registration for Formula SAE has been changed due to the addition of the second event.

Unlike the procedure for the 2005 event, there are NO reserved slots for any teams into either of the 2006 Formula SAE Competitions.

The procedure to register for either Formula SAE Competition is as followed:

Registration into Formula SAE and Formula SAE West is limited to one (1) vehicle per university per competition depending on available space.

For the first month of registration these events are limited to one entry per university. Teams that register for either competition may not, during the one month period, register for the second competition.

Specifically, from 10:00 am EDT, October 3, 2005 until 9:59 am November 3, 2005, teams may register for either Formula SAE or Formula SAE West, but not both.

After the first month of registration any untaken slots will be available to any team on a first come, first serve basis.

Specifically from 10:00 am EDT, November 3, 2005, until the close of registration at 11:59 pm December 29, 2005 teams may register for both competitions.

AERO DESIGN EAST	
April 20-22, 2006	Marietta, Georgia
Registration fee REGULAR, OPEN & MICRO CLASS	\$350.00
Registration deadline for Regular, Open & Micro class	December 29, 2005
AERO DESIGN WEST	
June 1-3, 2006	Encino, California
Registration fee REGULAR, OPEN & MICRO CLASS	\$350.00
Registration deadline for Regular, Open & Micro class	December 29, 2005
CLEAN SNOWMOBILE CHALLENGE	
March 13 - 18, 2006	Houghton, Michigan
<i>*Registration for CSC is Limited to the First 20 Teams.</i>	
Registration fee	\$500.00
Registration deadline	January 17, 2006
FORMULA SAE	
May 17 - 21, 2006	Romeo, Michigan
<i>*Registration for FSAE is Limited to the First 140 Teams.</i>	
<i>Important Note: From October 3, 2005 until November 3, 2005, Teams may register for either FSAE or FSAE-West but not both. From November 4, 2005 until December 29, 2005, Teams may register for both competitions depending on available space.</i>	
Registration fee	\$600.00
Registration deadline	December 29, 2005
Formula SAE West	
June 14 - 17, 2005	Fontana, California
<i>*Registration for FSAE-West is limited to the first 70 teams.</i>	
<i>Important Note: From October 3, 2005 until November 3, 2005, Teams may register for either FSAE or FSAE-West but not both. From November 4, 2005 until December 29, 2005, Teams may register for both competitions depending on available space.</i>	
Registration fee	\$600.00
Registration deadline	December 29, 2005

Mini Baja East	
April 12 - 15, 2006	Auburn, Alabama
Registration fee	\$500.00
Registration deadline	December 29, 2005
Briggs & Stratton Engine Order Fee	\$130.00
ENGINE ORDER DEADLINE	December 29, 2005
Mini Baja Midwest	
May 24-27, 2006	Madison, Wisconsin
*Registration for Midwest Mini Baja is Limited to the First 140 Teams.	
Registration fee	\$500.00
Registration deadline	December 29, 2005
Briggs & Stratton Engine Order Fee	\$130.00
ENGINE ORDER DEADLINE	December 29, 2005
Mini Baja West	
May 4-7, 2006	Portland, Oregon
Registration fee	\$500.00
Registration deadline	December 29, 2005
Briggs & Stratton Engine Order Fee	\$130.00
ENGINE ORDER DEADLINE	December 29, 2005
SUPERMILEAGE	
June 8 - 10, 2006	Marshall, Michigan
Registration fee	\$250.00
Registration deadline	December 29, 2005
Briggs & Stratton Engine Order Fee	No Charge
ENGINE ORDER DEADLINE	December 29, 2005

Don't forget to:

- Renew your membership
- Update your contact information in MySAE
- Read the newsletter
- Utilize the SAE competition forums

REGISTRATION OPENS!!!

October 3, 2005

10:00 AM Eastern Standard Time

Endowment memorializes Mankato students

Finding a way to adequately honor the lives of the three Minnesota State University–Mankato students who died in a van accident while en route to May’s Formula SAE competition in Detroit was I’m sure a difficult, if not impossible, task. After a great deal of consultation with the students’ parents and university officials, MSU–Mankato and the MSU Foundation recently established the Wes Loutsch, Jamie Schlachter, and Chad Wilson Memorial Endowment.

The endowment will provide funds that Automotive & Manufacturing Engineering Technology students can use to design and build vehicles for competition. Through this endowment, these students will forever play a part in the success of future MSU–Mankato vehicle-design teams.

“Much thought went into how to properly memorialize these dedicated students,” said John Frey, Dean of the College of Science, Engineering, and Technology. “We considered a wide range of suggestions, but the memorial endowment rose to the top of everyone’s list.”

Loutsch, Schlachter, and Wilson were part of a 16-student design team that worked for more than nine months designing its best-possible single-seat racecar. In those thousands of hours, the students, many of whom were strangers at the beginning of the project, became an extremely close-knit group. Their dedication was evident as they continued to work after the campus cleared out following graduation.

The Formula SAE competition was the culmination of that work, and the Mankato students were on the minds of all who competed. In a show of support, the MSU–Mankato decal was placed on all of the vehicles in the competition.

Support continues to flow in from fellow students, FSAE competitors, alumni, and SAE representatives.

“We continue to mourn the loss of these fine students, but family members and friends should be comforted that this new endowment will be a lasting and appropriate legacy to them,” said Minnesota State University–Mankato President Richard Davenport.

The endowment, which will help students compete nationally, was established thanks to financial gifts donated in the students’ memory.

Those who wish to contribute to the Wes Loutsch, Jamie Schlachter, and Chad Wilson Memorial Endowment may make checks payable to the MSU Foundation, referencing the “LSW Memorial,” and send them to the attention of Joann Jaqua, 121 Alumni Foundation Building, Minnesota State University–Mankato, Mankato, MN, 56001.

2006 Mini Baja Significant Rule Changes

For the 2006 Mini Baja Competitions the rules have gone through a significant change after some of the events in the past year. The following four areas have had the largest changes:

1.) Transponders

2.) Roll Cage System

3.) General Safety

4.) Cost Report Requirements

1.) **Transponders:** A new section has been added to the rules to mandate that all Baja cars competing in the North American competition are required to have an AMBX260 transponder mounted to the front of the car. This transponder is the primary scoring system for any dynamic event running a close loop course. It is going to be the responsibility of the teams to provide the transponders at the competition.

2.) **Roll Cage System:** The roll cage requirements have been completely revised for the 2006 competitions.

- Starting with the objective, of the cage to provide a 3D space for the driver. The driver is required to have 6 inches of head clearance to any roll cage member and 3 inches of clearance between the driver's body and the outside of the roll cage.
- The minimal requirements of the frame members have changed.
- The Rear Roll Hoop now has a required width it must meet at a certain distance above the seat.
- The side impact members have new requirements for there position in relation to the seat.
- The Fore/Aft bracing must be triangulated with no member exceeding 40in between attachment points and any bent tube can not exceed 32in between joints.
- Note any frame that shows signs of cracks or fatigue can be removed from competition.

3.) General Safety:

- The requirements of roll cage padding have changed and all joints must be visible for inspection (free of padding).
- The definition and requirements of head restraints have changed.
- The firewall must now cover the area between the lower and upper LC of the Rear roll hoop.
- The requirements of the body panels have changed. Teams can no longer use fabric or other material that allows objects to enter the cockpit.
- Two fire extinguishers are now required for all teams. One mounted in the car and the second must be the same to put into the car incase the first one is used.
- Fuel Tanks can only be vented using a check valve mounted in the cap. Teams can no longer use vent lines. The splash shield definition has been reworded to make it clearer.
- The definition of single shear rod end/tie rods has been reworded to make it clearer.

2006 Mini Baja Significant Rule Changes, continued

- Drivers are required to wear a SFI rated long sleeve shirt or jacket
- Teams will now have point penalties for coming to tech inspection not prepared.

4.) Cost Reports:

Each team is only required to submit a single cost report for all the events they are attending. This cost report must be submitted electronically using the excel template supplied on the SAE Baja Website, along with a PDF file with all the supporting documentation. The new excel template has been modified to allow teams to put special items used for each race on a specified sheet for that event. For example if a team uses one set of tires for the East Event and a different for Midwest then they would put the tires on the corresponding event sheet.

Clean Snowmobile 2006

The Keweenaw Research Center of Michigan Tech will again host the SAE Clean Snowmobile Challenge. It is important to keep the Challenge “fresh” by making changes to give the students project goals that are pertinent to the snowmobile market.

In 2003, the competition moved from Wyoming to Michigan. We concentrated on organizing the sponsors and the community to make the event successful in Michigan. Few changes were made to the original rules and the control sled was a Polaris 2-stroke. We labeled 2003, “the move to Michigan.” In 2004, the control sled was changed to an Arctic Cat 660 4-stroke for the first time and we labeled this year “raising the bar.” In 2005, the control sled was back to a 2-stroke, one that proved to be clean, quiet and comfortable, a Ski-Doo GSX Sport 600. We labeled this year “the return of the 2-stroke.”

We make changes to the competition each year to keep the competition fresh and to present new engineering challenges. In 2006 there are several changes to the competition. This year will be labeled “beat the standards.” To earn points in emissions this year, you must design a sled that meets the 2012 emissions standard just as the manufacturers will have to. To earn points in noise, you will have to pass the Snowmobile Industry noise test, just as the manufacturers have to. In addition, a subjective noise test has been added which represents the public’s perception of the sound quality associated with snowmobiles which is still a major concern in many communities including the U.P of Michigan. A separate category has been added for a “zero emissions” snowmobile. These entries will be judged separately, although they may compete along side IC engine designs during some events. Universities wishing to enter a snowmobile in the zero

emissions category may do so in addition to entering in the IC engine category. Bio-diesel fuel will be allowed this year. The emissions standards are "fuel neutral" so the emissions test will be the same.



Please read through the rules completely and designate someone from your team to monitor the CSC Forum on the SAE website for updates and changes.

Here is a bulleted list of the major changes. The official rules will be posted shortly by SAE.

1. There will be no control sled.
2. Passing emissions will be achieving the 2012 EPA emissions standard which is a tradeoff between (HC + NO_x) and CO. Refer to the US Environmental Protection Agency Final Ruling, 40 CFR, Part 1051 dated November 8, 2002.
3. The objective part of noise testing will be according to the SAE J192 standard (not the sound power method).
4. The subjective part of noise testing will be by Sound Quality Jury testing.
5. A zero emission category will be allowed for battery powered sleds. A separate award will be issued for the best zero emission snowmobile. Some events will be different for zero emissions snowmobiles.
6. Schools may enter one sled each in the zero emissions and another in the IC engine category.
7. Three fuel choices are available E10, E85, and B10 (bio-diesel).
8. Traction studs will be allowed.
9. A kill switch and a tether cutoff are both required.
10. The TICA will be updated.

We look forward to seeing you all March 13th -18th, 2006 in the Keweenaw.

Welcome back to school and good luck to all.

Fundamentals of Aerodynamics Applied to Race Cars - New!

For racers and enthusiasts seeking to refine their competitive edge, understanding the powers of airflow can provide tremendous styling, performance and safety advantages. This seminar provides a basic foundation in vehicle aerodynamics as it applies to racing or performance vehicles. The powers of lift and drag are emphasized, particularly the drag coefficient. These are illustrated through wing lift and drag curves, basic equations and principles, various forms of drag making up overall drag, and atmospheric charts. Also covered are wind tunnel designs, mass flow rates and Reynolds number (Re) for wind tunnel model testing, inlet/radiator/cooling design insight, computational fluid dynamics (CFD), coast down testing, and many "do's and don'ts" of automotive design.

Concepts are accentuated by several math examples along with numerous pictorial and verbal examples. In addition to a detailed set of learning materials, attendees will receive a copy of the acclaimed textbook, *New Directions in Race Car Aerodynamics, Designing for Speed* by Joseph Katz.

The instructor's 17 years of aerospace experience also provides insight into the origin of various aerodynamic advantages. Plenty of time is allotted for Q&A and the instructor is available long after the seminar to answer aerodynamic and/or design questions.

Who Should Attend?

This seminar is designed for race car owners/drivers, racing or performance enthusiasts, mechanics and, students. No specific technical background is required although a fundamental working knowledge of algebra is helpful. For performance or design engineers who desire in-depth, highly technical coverage of aerodynamics, SAE's Seminar, C0510 Introduction to Road Vehicle Aerodynamics is offered.

Register online for the seminar! Two options available:

September 27, 2005 (8:30 a.m. - 4:30 p.m.) - Troy, Michigan

November 30, 2005 (8:30 a.m. - 4:30 p.m.) - Orlando, Florida

http://www.sae.org/servlets/pdEvent?PAGE=getPDEventInfo&OBJECT_TYPE=PDEventInfo&EVT_NAME=C0515&COMMON_SUCCESS=TRUE

Knighthro's Ride Pimped by Student Automotive Club

By Tyler King

Knighthro, UCF's mascot, will take to the football field this fall in a new set of wheels courtesy of a team of six automotive engineering students.

Knighthro's new ride includes a gold paint job with black flames, strobes in the front and rear lights and an air horn. The vehicle reaches a top-speed of 35 miles per hour. Most importantly, the car is roomy enough for Knighthro to drive comfortably with his sword.

"The only need that it probably doesn't fill for Knighthro is date night," Linda Gooch, head of UCF cheerleading, said.

Knighthro's old car was an "off-the-shelf go-kart that just had some stickers slapped on it," Eric Anderson, project leader and current graduate student, said.

According to Anderson, the car was purchased nearly ten years ago when Knighthro had a much smaller costume and was accommodating at the time. The old car did not fit Knighthro anymore and was constantly breaking down. For the past two football seasons the SAE Mini-Baja cars have been pulling Knighthro around at various events.

"It was time to give Knighthro a fresh look for his ride," Anderson said. "Something that would be more noticeable."

Proposed by the Alumni Association three years ago, the new vehicle was designed and built by six UCF students in the automotive engineering department. The car, reminiscent of a Jeep, was showcased Aug. 20 at the Football Fan Day.

"The new car was built by a Mechanical Engineering Senior Design team," Anderson said. "The project was proposed by the Alumni Association and offered to SAE (Society of Automotive Engineers) to be used as a senior design project." Six students, all who have graduated since completing the project, worked on the intensive project.

According to Anderson, the team started meeting with Gooch and JoAnne Puglisi of the Alumni Association to get preliminary design requirements in August 2004. The students then went through three months of designing. Production began in December and continued through the Spring semester. The car was road worthy by March and completed in early April.

The final product thrilled the team but there were a few hurdles along the way.

"The most difficult part of this project was taking all the desires of Knighthro, the cheerleading program, the alumni and the senior design project and getting them all to fit into a project that could be accomplished in two semesters."

Despite the concessions and compromises Anderson and his team feel they delivered the best possible product. The team even managed to come in under budget using less than \$5,000 of their \$6,000 to \$8,000 initial estimate.

"That is mostly because everything on the car is hand-built from the tube-chassis to the fiberglass body," Anderson said.

As was reported by UCF News and Information, Matt Brennan, Team Knighthro member, test drove the car and found it easy to operate. The car will provide a "big boost for school spirit," he said.

The project was a great collaborative success for the Alumni Association, Athletic Department and the students of the build team.

Anderson said: "Without Joanne Puglisi this project would never have happened. Her insight from a customer and engineering point of view was invaluable. Everyone else we worked with help out tremendously. We can't wait to see Knighthro tear onto the football field at the first game."

Texas Tech Team Receives First Annual William R. "Bill" Adam Formula SAE® Grant for Rookie Teams

Warrendale, PA (August 18, 2005) – Students from the Formula SAE team from Texas Tech University are the very first recipients of the William R. "Bill" Adam Formula SAE® (FSAE) Grant for Rookie Teams. The \$500 grant, designated to be used toward the development of the vehicle or to help support travel expenses to the competition, was awarded to the team prior to this year's event, held May 18-22, 2005, at the Pontiac Silverdome in Pontiac, Michigan, USA.

This grant honors William R. "Bill" Adam's contribution to FSAE and his lifelong dedication to mentoring young engineers. A 35-year member of SAE and long time supporter of FSAE, Bill was an engineer in the automotive industry for more than 40 years working on vehicle development, testing and correlation. He was a co-patent developer of integrated Manifold-Muffler-Catalyst design and had seven years experience with exhaust development and exhaust pass-by noise levels. Adam's widow, Pat, reviews the grant applications and selects the winning rookie team, defined as a team that has never competed or has not competed in FSAE in the last 5 years.

"Being a first year team, we don't have the luxury of contacts or knowledge of vendors that teams with a history have..." said Jason Leeth, captain of Texas Tech's FSAE team, in his grant application. He also said that travel for the 11-man team was under-funded.



Other members of the 2005 team included: Joey Sanders, Michael Myhre, Travis Ansohn, Hieu Nguyen, Peter Miller, Carlos Gutierrez, Taylor Huey, Chris Goebel, Thom Bellion, Ryan Ward, Marco Fornari, Matthew Bryant, Jonathan Clayton, Sean Ofield, David Lynn, Rob Hutchinson, Matt White, Zach White, Bryan Beachy, Colin Niesen, Jeremy Niesen, Trilok Shetti and Chuck Morton.

Formula SAE is one of the featured events in the SAE's Collegiate Design Series, in which students are challenged to conceive, design, fabricate and compete with small formula-style race cars. Points are awarded for static events (presentation, design, and cost analysis) and dynamic events (acceleration, skid-pad, autocross, fuel economy, and endurance). The competitions are held currently in Australia, Brazil, Japan, the United Kingdom and the United States.

The Texas Tech team made it to the 2005 FSAE and collected points in all the competition events except Endurance/Economy, where the car finally failed. The team placed 89th overall.

Competition Public Forums:

Forums are available for the following Collegiate Design Series competitions:

Aero Design – http://forums.sae.org/access/dispatch.cgi/aerodesign_pf

Clean Snowmobile - http://forums.sae.org/access/dispatch.cgi/CLEAN_SNOWMOBILE

Formula SAE - <http://www.formulasae.org/forums/formula/dispatch.cgi>

Mini Baja - http://forums.sae.org/access/dispatch.cgi/minibaja_pf

Supermileage - http://forums.sae.org/access/dispatch.cgi/supermileage_pf

Organizers will post official announcements. Students and Faculty Advisors are encouraged to post questions, comments, and general information about the events.