

## Motorsports Studies at Indiana State University

**Dr. Randell W. Peters**  
**Indiana State University**

Indiana State University has responded with several motorsports initiatives in support of the governor's call for economic development in this industry sector. Initially, the university has created a motorsports management minor intended to educate students as to how their particular major can be valuable in the motorsports industry. A multidisciplinary approach sets ISU apart from other such motorsports activities at other educational institutions throughout Indiana. Three colleges within Indiana State University, the College of Business, the College of Technology, and the College of Health and Human Performance, have collaboratively created this extremely unique minor. Three of the four core courses, Introduction to Automotive Engines, Introduction to Risk and Insurance, and Marketing Applications in Sport, have had the existing course content modified to include motorsports applicability. The fourth required course, Survey of Motorsports, is the only completely new course specifically created to complete the 21 credit hour minor. The other three elective courses must be chosen from approved motorsports related courses and be from at least two of the collaborating colleges. A motorsports coordinator from each college is responsible for oversight of the elective course requirements of that college. In addition to the motorsports management minor, the university is undertaking many motorsports related initiatives, which includes outreach programs targeting students in grades 4 through 12. A new student organization has been formed with the purpose of conducting business as a complete racing organization, thus appealing to and drawing students from business, communications, technology, safety, and health related fields. Motorsports technology courses are being developed in cooperation with industry experts to ensure correct, timely, and valuable experiences for students. Internships are being secured and developed with industry partners giving ISU graduates a competitive edge in the industry.

### **Background**

The Motorsport Industry Association (MIA) commissioned a study in 2000 for the United Kingdom. The final report is entitled the National Survey of Motorsport Engineering and Services 2000[1]. The research defined motorsports as "an integrated blend of industry and entertainment, supported by risk averse, dynamic, small businesses acting as catalysts for the acceleration of innovation. This is centered on a core of excellence in performance engineering, based round a world class knowledge community." This report discovered a star pattern effect in relation to the jobs spinning from the field of high performance engineering and motorsport. At the nucleus of this star is high performance engineering and motorsport, which encompasses manufacturing as it is approached from the perspective of four-year universities. From this center point, other potential employment opportunities are created or enhanced in such areas as ceramics, biomedical, automotive, electronics, aerospace, materials, tourism, and many others.

In a separate study by the MIA, a cluster development analysis of industry commitment was finished in 2002 with the three-fold purpose to understand the 'cluster' concept and the dynamics of a Motorsport Cluster, the relationship between the sport and the industry, and the industry make up primarily relating to the size of individual businesses. A complex value chain emerged depicting a clear vision of the entire relationship within the motorsport industry. This value chain does not merely depict the obvious relationship between the spectator and participant, but also depicts the motorsport connection for education, engineering, manufacturing, logistics, marketing, management, media, and many others. The study found the industry is primarily made up of Small to Medium Sized Enterprises (SME's). In the Workforce Development Plan of 2003 [2], a third study commissioned by the MIA, clusters were defined as "communities of practice that apply practical and social learning processes, known as "Situated Learning"". Lave and Wenger [3] argue that, "Any complex system of work and learning has roots in, and interdependencies across its history, technology, developing work activity, careers, and the relations between newcomers and old-timers and among co-workers and practitioners." The Motorsport Industry can be characterized as exactly such a complex system of work and learning. Its workforce moves through a community of practice, where there is legitimate periphery role participation (e.g. amateur club racing, voluntary marshals etc.). This community produces people skilled as both "journeymen" and "masters", achieved by both Experiential and Work Based Learning.

*The Beginning* – In response to Indiana Governor Mitch Daniels' motorsports initiative Indiana State University began assembling a group of individuals interested in discussing motorsports and education at ISU. From these initial meetings, it was determined that ISU has significant connections with the motorsports industry and has several faculty members interested and qualified to deliver motorsports curriculum. Guy Faulkner, Chair of the International Motorsport Education Forum and member of the MIA, gave a presentation to this advisory group as to how it could partner with motorsport education in the UK. The advisory group advised ISU to move forward with motorsport studies at ISU. The Dean of the College of Business secured Guy Faulkner's consulting services for six months to help facilitate and expedite a myriad of motorsports initiatives at ISU. Since this initial decision, many initiatives in motorsports are moving forward at the speed of business. Each of those initiatives is addressed separately in more detail.

### **The Motorsports Management Minor**

After attending multiple motorsports advisory meetings and understanding the collaborative direction that was needed to ensure success, Dr. Joe Harder, representing the College of Business (COB), Dr. Ethan Strigas, representing the College of Health and Human Performance (HHP), and the author, representing the College of Technology (COT), have taken the lead in curriculum development within motorsports at ISU. Stemming from an initial one-hour session they agreed to mutually develop a minor in motorsports management that was suitable for all students on campus. The group realized that nearly every, if not all, major programs on campus can easily be linked to a career opportunity in the motorsports industry. Thus, it was determined the minor should help any particular student determine how their current major might be useful within the motorsports industry. The course work included in the minor was then targeted to give a broad

range of motorsports specific study intentionally crisscrossing known career paths. This multidisciplinary aspect is quite unique within education to this point.

As the minor was developed the group intentionally used existing coursework wherever possible. The reasoning behind utilizing existing coursework is that it creates minimal impact regarding initial faculty workloads, minimizes the initial financial burden on the university, and enhances the opportunity for achieving approval when the university is embracing the concept of program prioritization to reduce program offerings. Regarding initial faculty workloads, it is understood that as more students from diverse majors enroll in existing motorsports related coursework faculty demands will shift and create similar faculty needs as if new courses were initiated. However, the key is that such a shift will occur over time, based on the success of the minor, and not all at once, based on the approval of the minor. With regard to financial burdens, creating a plethora of new coursework is met with the requirement of new faculty to deliver the new or existing coursework, thus adversely affecting the financial prospects of a return on investment of the new program. Additionally, in the university setting, acquiring new tenure-track or special purpose faculty for delivery of a new program would require a minimum of at least 18 months from the time the proposal is approved by the university before the new member is under contract. Thus, with course development considerations, a simple projection would have someone new teaching a new course for the university in 24 months. Such a time-frame is unacceptable when developing a program that must operate at the speed of business for its success.

Based on the studies unveiled in the motorsports advisory group meetings that addressed specific competency gaps, the curriculum group determined a student minoring in motorsports management should include coursework involving motorsports risk and insurance, motorsports marketing, and motorsports technology. Thus, three courses, IMT 132 – Introduction to Automotive Engines, INS 340 – Introduction to Risk and Insurance, and RCSM 420 – Marketing Applications in Sport, were added as core requirements. The courses were modified to include motorsports while continuing to meet the stated outcomes for each course. The curriculum group realized the need for students minoring in motorsports to understand the nature of motorsports as pertaining to the varied venues and the demographics of the spectators. In essence, study what makes motorsports so popular, its evolution, and its continuation. Such course content did not exist at ISU. IMT 330 – Survey of Motorsports was developed to meet the needs identified for the minor. In the spirit of true collaboration, the coordinator for the College of Technology (COT) proposed that the College of Health and Human Performance (HHP) should cross-list and teach the Survey of Motorsports. Thus IMT 330 and RCSM 330 were created with exactly the same syllabus. The advantage of cross-listing means that both colleges, and their respective department chairs, have scheduling control over the courses and thus circumvents numerous difficulties which are often encountered when faculty teach courses across colleges and departments. In further collaboration, IMT 330 is scheduled to be taught by the COT in the fall of each year, and RCSM 330 is scheduled to be taught by the HHP each spring.

Working within the university guidelines regarding minors, and from their own expertise in curriculum development, the curriculum group agreed that a 21 credit hour minor would allow a sufficient knowledge base for non-traditional majors to truly understand the motorsports industry

enough to determine their career path related to the field. With 12 credit hours within a core, the group developed the remaining 9 hours of coursework mindful of the goals of closing the identified competency gaps, engaging students in multiple disciplines, maintaining a strong measure of flexibility allowing students to somewhat customize the minor to meet their own needs, and exposing students to a motorsports industry network steeped with diverse career opportunities. The curriculum group identified courses within their own colleges that were applicable to motorsports and that would meet the goals defined above.

In order to meet the goal of engaging students in multiple disciplines, as well as in the spirit of creating a multidisciplinary collaborative minor, it was determined that the remaining 9 credit hours must be divided among at least two colleges. Thus, a maximum of 6 credit hours could come from one college with the remaining 3 hours coming from another one of the three participating colleges. Students could therefore, customize their minor by choosing coursework from a list of electives from the three colleges. Students could take one elective course from all three colleges or two courses from one college and one from another. An internship course is included as an elective from each college (actually several from the COB) encouraging students to include an internship in their minor. The curriculum group strongly considered the inclusion of an internship in the minor as every motorsports industry expert strongly supports the notion. However, the curriculum group realized the immediate lack of an internship network to support a potentially huge student population. The group realized the network was developing with strong support from industry throughout Indiana and beyond, but reasoned that, in the efforts to move at the speed of business, requiring a student to have a motorsports internship sufficient for a 3 hour course credit was impractical at the moment. The group strongly desires to include the internship course as a core requirement in the future, when the course can fully support the students enrolled.

With the minor fully developed as depicted in Table 1, the curriculum group began the approval process. The IMT 330 – Survey of Motorsports course was submitted to the curriculum process first since it was to be offered by the COT. Once approved, RCSM 330 followed a similar chain through the curriculum approval process within the HHP. The minor, housed within the COB, began the approval process shortly after IMT 330 gained approval. This timing was necessary as each proposal started within its home college and moved toward university approval. At each step in the curriculum process, the curriculum group collaboratively presented the proposal. Through the entire curriculum process, the minor was met with much scrutiny and deliberation and due diligence from colleagues that should be bestowed upon any new curriculum proposal, but at each juncture, the motorsports management minor passed unanimously. From that initial meeting of the curriculum group in early in the fall semester of 2005 to the completion of the approval process in October 2006, Indiana State University has proven it can move collaboratively, at the speed of business to deliver university curriculum necessary to build the motorsports industry of tomorrow.

As should be expected, this first step into motorsports has received much attention throughout the university, the State of Indiana, and throughout the nation. As a measure of initial appeal to students, over 53 students have enrolled in the minor, which has yet to complete a single semester since being approved. In addition, it is further proof of the appeal to students in that 31 students enrolled into the first offering of the IMT 330 – Survey of Motorsports course first

offered in the fall of 2006, even though the minor had not yet been approved. The success continues in the spring semester with 17 more students enrolled in the RCSM 330 – Survey of Motorsports section.

Table 1:  
*Motorsports Management Minor at Indiana State University*

Course #	Description
Core Courses	
INS 340	Introduction to Risk and Insurance (COB)
IMT 132	Introduction to Automotive Engines (COT)
RCSM 330	Survey of Motorsport (HHP) or IMT 330 Survey of Motorsport (COT)
RCSM 420	Marketing Applications in Sport (HHP)
Elective Courses (College of Business)*	
ACCT 200	Survey of Accounting
BUS 263	Legal Environment of Business
FIN 200	Survey of Finance
MIS 335	Introduction to Business Web Development
MGT 301	Survey of Management
MKT 301	Introduction to Marketing
Elective Courses (College of Technology)*	
IMT 233	Engine Systems and Controls
IMT 351	Cooperative Industrial Practice
IMT 432	Parts Distribution and Marketing
IMT 433	Service Facility Organization & Management
IMT 461	The Automobile Industry: The First 100 Years (Carries Gen Ed Credit SBS-E)
Elective Courses (College of Health and Human Performance)*	
RCSM 334	Finance for Recreation and Sport Management
RCSM 355	Communications and Media Relations in Sport
RCSM 425	Sport Sponsorship
RCSM 491	Internship in Recreation and Sport Management (rqrd to be motorsports related)

Notes: The motorsports coordinator from the appropriate college may approve course substitutions. No more than one internship type course may be used for credit toward the minor. (\*) = no more than two electives may be counted toward the minor from the same group.

In order to maintain the collaborative nature of this minor, three motorsports program coordinators, one from each college, have been identified. These coordinators will serve to administer and facilitate the necessary interaction required. Should students have questions or concerns, they may seek advice from the appropriate coordinator. Although the minor is housed in the College of Business (COB), the courses are delivered through three colleges. The bank of electives offered by each college is the responsibility of the respective coordinators. It is envisioned the coordinator can approve other courses within the respective college to serve as electives.

This collaborative Motorsports Management Minor is but one piece of the comprehensive package of motorsports initiatives coming forth from Indiana State University.

## **Internship Opportunities**

Internship opportunities are absolutely necessary for the success of the motorsports initiatives at Indiana State University. This fact is derived from the motorsports advisory committee and is revisited at every motorsports related engagement. The curriculum group, other university faculty, and university administrators have been working diligently with the motorsports industry to develop partnerships creating opportunities for both internships and careers for motorsports students. Many opportunities have been presented and are actively being pursued. Three internship opportunities are explored here in greater detail.

*Internship at the Texas Motor Speedway* – Through an alumna of the Automotive Technology Management Program, four ISU motorsports students, one faculty member, and one foundation member, were given the opportunity to intern at the Texas Motor Speedway. The intensive three-day, four night experience was made possible by Chevrolet and thus centered on Chevrolet's involvement at this particular NASCAR event. The management team from Chevrolet was responsible for several marketing events spanning all three racing events. Throughout the weekend, as temporary Team Chevy employees, the students took part in a variety of marketing activities at the speedway. They had the opportunity to blast 300 T-shirts to the nearly 70,000 race fans, utilizing two air-cannons while taking a lap on the track showing off the new 2007 Silverado truck. For the truck race, the ISU team participated in driver introductions by driving professional drivers around the track before race time. For the Busch and Nextel Cup races the ISU team helped manage the driver introduction event. The team was able to tour the pits and suites, distribute promotional items to fans and even spend some time in the winner's circle. The ISU team also participated in driver appearances scheduled at the Chevrolet hospitality area, and worked with Team Chevy NASCAR drivers such as Kevin Harvick, Clint Bowyer, Denny Hamlin, Jeff Burton and Martin Truex, Jr.

Each day began promptly at 7 a.m. and finished when all the tasks were accomplished. The ISU team worked alongside the Chevy management team every step of the way. Upon arrival, the Chevy team introduced themselves and educated the ISU team with the plans for the weekend. On the final day, the ISU team individually selected one person from Chevrolet marketing staff to shadow on a more in-depth basis, as a way of getting a better feel for what a future career in that area would entail. The Chevy team engaged the students in every aspect of the process. This type of opportunity is exactly what students need, to make decisions pertaining to what they're going to do with rest of their lives. Through this experience, the students were able to experience many different careers, as well as experience crisis management. Students made many contacts and connections with people in an industry they are interested in providing a clear connection to their possible futures. In the future, ISU is planning on working again with Chevy, improving the intern experience for both parties involved. It is a primary goal of both parties to develop a policy on internships that will pave the way for future motorsports programs to partner with Chevrolet in other motorsports venues.

*The SEMA Experience* – Two Indiana State University students and motorsports management minors recently served as interns at the 2006 Specialty Equipment Market Association (SEMA) Show in Las Vegas. The SEMA Intern Program provides valuable learning experiences for college students from a dozen universities around the nation who hope to test their classroom knowledge in a real-world setting. The intern experience is designed to open the students' eyes to a whole new world of opportunities in motorsports. The students were placed with four companies based on the students' interests. The students augmented the companies' presence at the show taking on various assigned responsibilities for each company. In addition, the students attended a networking session meeting with industry executives. Throughout the event, interns were able to gain an awareness of the diversity and depth of the automotive aftermarket in addition to gaining a better understanding of SEMA and its role in the industry. They also had the opportunity to experience firsthand what is required to plan, design and implement an automotive tradeshow of this magnitude.

SEMA is known as the premier automotive specialty products trade event. It draws the industry's brightest minds and hottest products, typically attracting more than 100,000 industry representatives from more than 100 countries. The tradeshow specializes in showcasing the very latest products for the aftermarket in automotive, truck, SUV, marine and RV applications.

*Performance Racing Industry Trade Show* – Due in part to its involvement with the MIA, Indiana State University committed to a 10'x10' booth space at the Performance Racing Industry (PRI) Trade Show at the Orange County Convention Center in Orlando, Florida. A total of 13 university representatives including seven students, two faculty, three administrators, and two distinguished guests, made the trip. The seven students set up and manned the booth. They worked in two hour shifts staggered to ensure two students were present at all times. Their tasks included greeting people and delivering the message as to how ISU was working with industry to deliver education specific to the motorsports industry. Additionally, they engaged people in dialogue regarding Team Sycamore Racing and its true potential for providing a unique experience encompassing multiple aspects of the industry. When not in the booth, students were assigned to make contacts with certain companies manufacturing products necessary for promoting and operating Team Sycamore Racing. Students made many contacts and are charged with following up on those contacts. Many, many new avenues for internships, sponsorships, donations, and partnerships have been a direct result of the students' involvement at PRI. The cost of attending the event is far outweighed by the experiences learned by the students as well as the bevy of industry contacts made at the show. Over 3800 booths and 45,000 buyers were brought together over a three day show.

## **Student Organizations**

*Team Sycamore Racing* – Team Sycamore Racing (TSR) is a new student organization specifically targeting motorsports. TSR's agenda is to operate as a complete drag racing organization providing true internship experiences for some of its high profile positions. This multidisciplinary student operated organization is currently comprised of a Chief Executive Officer (CEO), Vice-President (VP), Administrative Assistant to the CEO & VP (AA), Chief Financial Officer (CFO), and Chief Marketing Officer (CMO). Students campaigned and were elected to these positions by the student members of TSR following a rigorous election process.

These student officials will be guided by the author who serves as the faculty advisor of record. This initial team is currently busy securing funding to secure a dragster capable of running under NHRA rules in the supercomp and bracket racing series, achieving ¼ mile elapsed times of 8.7 seconds with speeds in excess of 150 mph. Additionally, the elected team is writing position descriptions for crew chiefs, drivers, and the engineering teams. TSR's intentions are to successfully campaign and market the vehicle.

Significant investment has been received from GM Performance Parts in the form of 2 complete LS-2 engines and one LS-7 (received December 5, 2006). Chevrolet has pledged 10 Ecotech engines to augment the Automotive Technology Management Program, power the dragster and enhance our motorsports initiatives. In addition, GM Raytheon has delivered, in November 2006, 18 complete 2.8 V-6 Turbocharged SAAB engines. These engines will serve well in the Automotive Technology Management Program and the upcoming motorsports curriculum. University facilities, such as three engine dynamometers and a chassis dynamometer stand ready to test results from modifications to the engines involving both engineering and manufacturing technologies.

In addition to the engine donations, GM Performance Parts delivered a display engine to Performance Racing International (PRI) Trade Show in Orlando, FL for use in the ISU booth. Students from TSR manned a booth at PRI explaining the current motorsports initiatives at Indiana State University such as the new motorsports management minor, the relationship with the Motorsports Knowledge Exchange, Motorsports International Association, and the Indiana Motorsports Association.

Hoosier Tire has verbally committed to supply the tires for the racing vehicle. A formal sponsorship document is currently being articulated. Additional funding for the racing chassis, has been sought (latter part of November) from GMAC Insurance, Chevrolet, and ACDelco, with enthusiastic words of encouragement, but no additional commitment at this time.

Team Sycamore Racing will take its organization to high schools providing interactive sessions from current college students to potential college students. Utilizing the attraction and overall appeal of the dragster package, and the multidisciplinary approach to the process, and the lure of motorsports internships, high school administrators will find our TSR Organization a valuable asset in increasing the number of high school graduates going on to college. High school students of various initial interests can be drawn in to higher education once they see the applicability to potential career opportunities.

The message of TSR including operating a complete motorsports organization, from managing and manufacturing parts, building and operating a vehicle, marketing sponsors product, and showcasing programs such as manufacturing technology at ISU needs to be professionally developed and implemented to realize the full potential of the recruiting effect TSR can have.

*Student Chapter of SAE* – Indiana State University is proud of its longstanding affiliation with the Society of Automotive Engineers. For more than 30 years the ISU student chapter of SAE has maintained an effective student body providing external opportunities for educational intervention in support of the Automotive Technology Management, Mechanical Engineering



Technology and Manufacturing Technology programs within the College of Technology. From attending state chapter meetings and the annual SAE World Congress, participating in supermileage competitions and in the mini-baja series, to building and demonstrating a single engine hovercraft, the SAE student members have been actively involved in experiential learning activities. The chapter is clearly focused on automotive engineering and now is working closely with Team Sycamore Racing. With the help of SAE, TSR will be able to realize their goals much more expeditiously than first conceived.

## **K-12 Outreach**

Indiana State University is developing outreach programs targeting two specific age groups. The intent of the outreach is to engage young students early to encourage them to stay in high-school, graduate, and continue their education in college. In addition, by working with industry, ISU develops partnerships, thereby creating a network of internships and career opportunities for students studying at ISU. The outreach efforts are hoped to increase awareness and ultimately actual enrollment for the entire university.

*Race Camp* – A Race Camp designed for 9-14 year olds is being developed by Dick Dixon. Dick is well connected with the motorsports industry and, in January 2007, joined the ISU team. This race camp is partnering with the motorsports industry to introduce young “campers” to the excitement of motorsports, showcasing the need for higher education to achieve excellence. Panther Racing is currently developing an educational package designed especially for this age group and will be offering it to this first race camp as a pilot program. This 3 hour package will be a part of a two day excursion in which campers will visit the Indianapolis Motor Speedway and several enterprises throughout Indiana. The week long race camp experience will engage students in active learning. Several well known motorsports speakers will visit the campers at the university. Other activities planned include attending area racing events including at least one of the on track testing sessions planned for the Motorsports Summer Honors.

*Summer Honors* – Summer Honors has been a tradition at ISU for more than 25 years. This program is designed to attract sophomore and junior level high school students to participate in educationally intensive programming in a particular area of interest. Participants in this two week program are provided room and board on campus, 4 hours of intensive education daily, followed by 4 hours of experiential learning and active involvement specific to the area of interest. Upon successful completion of the course, receiving at least a grade of B, and subsequently enrolling at ISU within two years, the student receives two college credit hours and receives an \$1100 scholarship per year, which is renewable for 4-years. With a current projection of a mere \$800 investment this incredible package is available to students currently meeting the enrollment requirements of ISU. Over the years approximately 10% of the students completing a Summer Honors course enroll at ISU. Within the College of Technology the Aviation Summer Honors program has maintained a high level of success.

*Motorsports Summer Honors* – The new Motorsports Summer Honors program is currently being developed and will be initiated in the summer of 2007. This program, capped at 100 participants, will engage students in two full weeks of intensive education specific to manufacturing, automotive technology, and management in motorsports. As with the existing

Summer Honors program, Motorsports Summer Honors is targeted at attracting some of the best and brightest scholars available throughout the United States. Traditionally, 25 – 30% of the participants in the Summer Honors program come from outside Indiana and ISU's reduced tuition coverage areas in Illinois.

Mr. Phillip Cochrane, this author, and, if needed, Dr's. Joe Harder and Ethan Strigas, will deliver the Motorsports Summer Honors (MSH) program to up to 100 participants. A racing engineer, such as Scot Elkins (the Technical Director for the Champ Car World Series), will engage students for a few hours in a highly technical engineering module designed to showcase the necessity of engineering and mathematics within motorsports. Students will take a trip to various racing enterprises such as C&R Racing to see first hand how racing components are manufactured, and ARC (the Automotive Research Center) to experience motorsports research in aerodynamics. During this trip, students will also visit the Indianapolis Motors Speedway where they will engage in career oriented discussions with motorsports professionals outside of engineering, manufacturing and research. Before returning to campus, students will visit racing operations, thus permitting exposure to the many aspects and career opportunities within the motorsports industry.

The curriculum is designed to deliver a multidisciplinary motorsports related program. Designed around radio-controlled high-end racing vehicles the students will be immersed in many aspects of racing operations. Divided into teams students will learn the multitude of decisions required to be made daily within the industry. As individuals, students will compete for positions on a team. As teams the students will compete to win five separate races. As individuals, the students will be exposed to resume writing, writing sponsorship packages, presenting to industry, vehicle engineering with regard to suspension and propulsion, financial planning, budgeting, marketing, and advertising.

The students will present sponsor packages to local industry members. The business members will "provide" funding to the teams based on the team's performance and the total allotted for each business member to disperse. As in the industry, the teams will be limited to the amount of funding they are able to amass as well as be committed to fulfilling obligations to sponsors. It is hoped that business members will also take part in the sponsorship fulfillment process thus encouraging business member interaction with student teams. The students will be encouraged to develop sponsorship proposals including vehicle signage and will be encouraged to develop and participate in on-campus sponsorship activities.

The racing chassis, the various motors, suspension components, and gearing will all come with a "hefty" price tag as will participating in events. Thus students will have to make sound decisions based on financial and personnel resources within the team. To ensure no "ringer" drivers adversely affect outcomes and also to ensure maximum participation, the team will be required to utilize a different driver for each event. Many manufacturing processes such as welding, casting, and machining will be discussed and many will be implemented throughout the building of the project vehicles. Paying attention to the integration of motors, gear ratios, tire combination, suspension setups and combining that knowledge into the decision making process allowing for costs, it is hoped the students will be able to intertwine basic engineering and financial management skills as they work together preparing for the competitions.

Five separate race tracks will be utilized. Three tracks will be developed on campus: a drag race, an asphalt oval, and a hard surface road course. Two tracks will be utilized from an off campus facility: an all-terrain vehicle truck track and an indoor carpet high-speed oval. These races will take place over the last days of the program. The exact days will be determined by the actual local race track schedules. It is anticipated that students will attend both a drag race and a sprint car race from local tracks partnering with ISU. Track winners and series winners will be determined by a point system similar to current racing structures. It is anticipated that significant “prize” packages will be made available to the winning teams, thereby promoting the competitiveness inherent to the industry.

## **Motorsports Curriculum Development**

*Curriculum Development in the College of Technology* – The faculty within the College of Technology seek to develop motorsports courses targeted at developing a certificate or minor in motorsports manufacturing technology. With existing programs in Manufacturing Technology, Automotive Technology Management, and Mechanical Engineering Technology, many motorsports relevant pieces currently exist. However, it is clear when talking to our advisory boards of the respective programs, including the advisory panel of the motorsports management initiative, that a significant gap exists with respect to the motorsports specific areas of aerodynamics, chassis systems, racing engines, and the integrated data acquisition, assessment, and management of these systems. Faculty and industry experts such as Scot Elkins, technical director for Champ Car World Series, agree that education within these four areas is essential for motorsports bound graduates of the Manufacturing Technology, Automotive Technology Management, and Mechanical Engineering Technology BS degree programs. Thus, an option, certificate, or stand-alone minor encompassing these identified areas is a desirable outcome in addition to the four courses reflected in this curriculum development process.

Four synergistic motorsports manufacturing technology courses are initially proposed utilizing existing facilities with some new motorsports relevant technology. The proposed curriculum will transcend the existing programs of Manufacturing Technology, Automotive Technology Management, and Mechanical Engineering Technology: (I) motorsports aerodynamics; (II) motorsports chassis systems; (III) motorsports engines; and (IV) motorsports data acquisition. Additionally, several existing courses will require substantial content changes to meet the needs of the motorsports industry. The use of expensive specialized instructional equipment in modern facilities near a concentrated motorsports environment as can be found throughout Indiana will enhance the level of expertise and subsequent demand of and for graduates.

Nine key areas for improvement in new graduates - termed "competency gaps" as identified by SME and verified by similar motorsports research studies regarding workforce development in the US and UK - are anticipated to be incorporated in the curriculum development process: both written and oral communication skills, teamwork, project management, engineering fundamentals, quality principles, problem solving, international perspectives, and motorsports business knowledge skills. The proposed curriculum development is essentially interdisciplinary, applicable to Manufacturing Technology, Automotive Technology Management, and Mechanical

Engineering Technology, which are motorsports environments that are represented in our advisory board, throughout Indiana, and around the globe.

To help develop some of the content, Scot Elkins, has been secured by ISU to deliver a course on Motorsports Technology in the spring semesters of 2007 and 2008. This course will involve aerodynamics, chassis design, and data-acquisition relative to open-wheeled racing. Mr. Elkins graduated from the Manufacturing Technology program at ISU. He is therefore very familiar with the current structure of the university. He is also been involved with racing as an engineer for more than 10 years. Thus, he is quite capable of understanding motorsports manufacturing and technology. His invaluable involvement with the program will no doubt lead to more industry participation as our programs evolve. Mr. Elkins' plans for the course include bringing in a Champ Car World Series racing vehicle for teaching purposes and ultimately donating significant chassis, suspension, electronics, and body parts to the university for use in future courses.

*Curriculum Development across Campus* – Developing the right curriculum at the right time for the right audience is of course crucial for the successful implementation of the motorsports program. ISU has invested significantly in Guy Faulkner, acquiring his services from the UK initially for 6-months to be completed in March 07. As further evidence to ISU's commitment to motorsports education, Mr. Faulkner's services have just been retained for another two years allowing him to more fully develop motorsports studies.

Mr. Faulkner has thus far been very successful in reaching out to the motorsports industry with a message that Indiana State University wants to partner with industry to deliver coursework the industry feels is necessary. This very simple approach of asking the industry for what it wants and then building it, instead of the more traditional educational approach of building a program then selling it, has been admirably received by the motorsports professionals that have been contacted. Thus, it is realized that this method of "asking first" tends to receive ample support from industry contacts. With this ever mindful, the curriculum development process is approached differently. It is realized that industry partners desire the inclusion of curriculum content regarding aerodynamics, chassis, engines, and data-acquisition systems into our motorsports initiatives. Additionally, through workforce development research accomplished in the UK by Mr. Faulkner, and similar studies promulgated by the Society of Manufacturing Engineers, the following identified competency gaps will be addressed in the development process: both written and oral communication skills, teamwork, project management, engineering fundamentals, quality principles, problem solving, international perspectives, and motorsports business knowledge skills. However, faculty have yet to determine the depth or breadth of each of the content areas in relation to the competency gaps as they apply to engineering, manufacturing, technology, management, safety, marketing and other career opportunities.

## **Conclusion**

Automotive Racing, in all forms, is enjoying a robust market within the entertainment industry, and, as such, has captured the attention of junior high and high school students and their parents. Education specific to motorsports is still in its infancy. As educational programs emerge within

this motorsports realm, national attention is virtually guaranteed. Though, with this national attention comes the burden of “getting it right the first time.” Very few four-year universities create programs developing students specifically for a single purpose or position. Generally, this level of specificity is relegated to high school programs and community college systems. Thus, when developing a four-year program in motorsports studies it is essential the program develop students to function admirably in a variety of challenging and demanding positions within the field of motorsports and to allow those same students the strength in educational grounding allowing them to be equally successful in endeavors outside the field of motorsports.

Guy Faulkner, a visiting fellow for the UK, has been working diligently with Indiana State University faculty from the College of Business (COB), College of Health and Human Performance (HHP), the College of Technology (COT) to create an international center for motorsports studies. As previously stated, the core within the motorport industry is motorsports engineering, technology, and manufacturing. At Indiana State University, this core is or will be reflected within existing programs in mechanical engineering technology, automotive technology management, and manufacturing technology. Other career clusters, working in concert with the core, incorporate marketing, finance, risk and insurance, management, and many others to comprise the multifaceted motorsports opportunities currently being explored, developed and implemented at Indiana State University. Curriculum development and other supporting endeavors will continue to progress at the speed of business as ISU responds responsibly to the needs of the motorsports industry. For the latest information on motorsports activities at ISU visit the website at [www.indstate.edu/motorsports](http://www.indstate.edu/motorsports).

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