Enterprise Team: Aerospace Enterprise  
Current Industry Partners: Air Force Research Laboratory, ABSL, Raytheon, SAIC, Windriver  
Faculty Advisor: Dr. L. Brad King

Goals & Objectives: The Aerospace Enterprise was established to provide hands-on aerospace education and experience to Michigan Tech undergraduate students. Its objective is to design and fly several Michigan Tech student-built spacecraft. In pursuit of this objective, emphasis will be placed on space mission design and analysis, vehicle integration, systems engineering, and comprehensive ground-testing and qualification. The final launch and flight phases represent a capstone to the design process. The team placed 3rd in the Nanosat-3 and Nanosat-5 competitions, which are national competitions sponsored by the Air Force Research Laboratory’s Space Vehicles Directorate (AFRL/VS), the Air Force Office of Scientific Research (AFOSR), and the American Institute for Aeronautics and Astronautics (AIAA). Other projects include a high altitude autonomous research platform (HAARP), CanSat development, a zero-gravity research team, and ion space propulsion research and development.

Enterprise Team: Automotive Computing Enterprise  
Current Industry Partners: General Motors  
Faculty Advisor: Dr. John Lukowski

Goals/Objectives – ACE’s mission is to develop innovations in human-vehicle interactions by exploiting the computing power and capabilities of the automobile. Using a 2007 Chevrolet Suburban as a test platform, the team’s recent projects have included voice recognition software integration, and development of a customizable LCD instrument panel and Driver Information Center (DIC).

Enterprise Team: Alternative Fuels Group  
Current Industry Partners: U.S. Department of Energy, John Deere  
Faculty Advisor: Dr. Jason Keith

Goals/Objectives – In the spring of 2002, a group of students involved with AIChE’s Chem-E Car competition returned with a first-place victory from the AIChE regional conference. The team members had bigger visions for the Chem-E Car: to develop a more efficient power source, such as a hydrogen fuel cell, and to machine a better vehicle with improved vehicle dynamics. From this vision, the Alternative Fuels Group was formed. AFG provides opportunities for young professionals in multiple academic disciplines to research and develop alternative fuels. Projects, research, and development are done in conjunction with industry sponsors to give viable solutions to real-world energy problems. Current projects focus on hydrogen fuel cell research, and include: 1. Fuel cell integration into a John Deere E-Gator, and 2. Feasibility of a hydrogen fueled motor pool on Michigan Tech’s campus.
Enterprise Team: Aqua Terra Tech
Current Industry Partners: NSF, Thrivent Lutheran Foundation
Faculty Advisor: Dr. John Gierke

Goals/Objectives - Aqua Terra Tech (ATT) is an interdisciplinary group of undergraduate students committed to the research, design, and promotion of sustainability in water resources for the mutual benefit of the environment and quality of life. Using the University’s Enterprise Program as a conduit, members develop professional skills in technical practice, communication, teamwork, and leadership. With an appreciation for diversity, global perspective, and service, ATT strives to meet the needs of the future. Current projects include geophysical fieldwork completed in the fall to help characterize a brine layer in the western Keweenaw and prepare for future fieldwork to be conducted in Ecuador. Other projects include Project Agua, which aims to design a gravity-powered water distribution system for the small village of San Nicolas, Nicaragua, and a newly created watershed team that aims to partner with a local high school.

Enterprise Team: Blue Marble Security
Current Industry Partners: 3M, General Dynamics Land Systems, GE Aviation, Superior Diesel
Faculty Advisor: Mr. Glen Archer

Goals & Objectives: Blue Marble Security is a virtual company of undergraduate students focused on developing security solutions for people in their homes, for local governments for the protection of their communities, for industries to protect their workers and their infrastructure, and for international markets to stimulate broad-based implementation of effective security solutions. The enterprise has developed a culture that fosters high professional standards, creativity, productivity, and a burning desire to learn. Blue Marble Security’s main business thrusts continue to be focused on industry sponsored R&D and commercial product development. Several projects are completed each year over a wide variety of technological specialties including security, the environment, and industrial process control. The word security, for BMS, is defined by the provision of technological support to a nation’s defense, corporate economy, and the personal well-being of all its people. BMS strives to improve an individual’s safety, security, and health through the use of resourceful creativity. With this experience, BMS graduates are ready for the world’s most challenging careers.

Enterprise Team: Board Sport Technologies
Current Industry Partners: Altair Engineering
Faculty Advisor: Dr. Ibrahim Miskioglu

Goals & Objectives: The BoardSport Technologies Enterprise (BST) strives to produce new, refined, and attractive boards by making them lighter, stronger, and with innovative materials. BST consists of three teams: Wake Team, Snow Team, and Park Team. Each team operates as a separate entity and is responsible for its own management, operation, and productivity. The Wake Team primarily focuses on wake-related sports (wakeboarding, wakeskating, etc.), the Snow Team focuses on snow sports (snowboarding, skiing, etc.), and the Park Team creates terrain park features (boxes, rails, etc.) for ski areas. This year, the Snow Team made significant improvements to the snowboard assembly process by building a router table and new cassette, and by heating the snowboard press. The Wake Team is in the process of building its own wakeboard press, and the Park Team is reaching out to ski resorts around the area to supply them with park obstacles. Additionally, the team is now utilizing Altair’s Hyperworks software in their design and analysis phases, and has developed a finite element analysis of a wake board traversing through the water (fluid-solid interaction). The end product is a tutorial/module that will be used in Altair’s Hyperworks training.
**Enterprise Team:** Cin/Optic Media  
**Current Industry Partners:** CCISD/Lake Superior Stewardship Initiative, Michigan Tech - University Marketing & Communications, Michigan Tech Fund – Annual Giving  
**Faculty Advisor:** Dr. Erin Smith  

**Goals & Objectives:** As an Enterprise team led and managed by students, Cin/Optic Media’s goal is to provide professional and valuable video production services, while also designing fresh and innovative implementations of professional video technologies. By balancing the creative and technical aspects of video, the primary goal is to focus on clients’ needs and expectations, while developing artistically engineered products. By capitalizing on creative and technical strengths, concomitantly fortifying relationships with businesses (local or global), video technology corporations, talent, and audiences, Cin/Optic Media stands to broaden Michigan Tech students’ education in the media industry through real-world business experience.

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**Enterprise Team:** Clean Snowmobile Challenge Enterprise  
**Current Industry Partners:** ArcelorMittal USA, 3M, Chrysler LLC, Cummins, DENSO North America Foundation, Ford, General Motors  
**Faculty Advisor:** Dr. Jason Blough  

**Goals/Objectives** - The overall team goal is to design and build a snowmobile that achieves reduced emissions and noise characteristics, while keeping performance equal to or better than the performance of stock snowmobiles. This year the team successfully fitted a turbocharged, flex fuel compatible, four-stroke engine into a completely redesigned chassis, which utilizes student-designed front and rear suspensions, as well as new intake and exhaust systems. In 2008, the team won the Best Performance Award while taking fourth place overall. In 2009, Michigan Tech placed 2nd overall, with awards for lowest in-service emissions, quietest snowmobile, most practical snowmobile, and most sportsmanlike winner. The competition is hosted annually at Michigan Tech’s Keweenaw Research Center.

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**Enterprise Team:** Consumer Product Manufacturing  
**Current Industry Partners:** 3M, Keweenaw Brewing Company  
**Faculty Advisor:** Dr. Tony Rogers  

**Goals/Objectives** – CPM aims to empower students with the entrepreneurial, technical, and professional skills to conceive, develop, and market successful products in a company setting. Skills learned in manufacturing disposable consumer products will be readily applicable to other types of products and commodities. In addition, all majors are welcome to contribute to the team and its goals. The team’s most recent projects have involved automation of a beverage dispensing and canning line, as well as the development of a thermally formed optical film for automotive applications.
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Enterprise Team: EcoCAR Enterprise
Current Industry Partners: ArcelorMittal USA, 3M, Chrysler LLC, DENSO North America Foundation, Ford, General Motors
Event headline sponsors - U.S. Department of Energy, General Motors
Faculty Advisor: Dr. John Beard

Goals/Objectives - The EcoCAR challenge is a three-year vehicle competition pertaining to fuel economy and emissions. In year one, the team designs the vehicle and utilizes various modeling software for testing. In year two, the team receives a 2009 Saturn Vue to build their mule vehicle from the previous year’s design. In the final year of competition, the EcoCAR team must improve its design to be showroom quality. Michigan Tech is one of 17 teams selected from among 150 applicants, and the only Michigan university participating in EcoCAR.

Enterprise Team: ETEC – Efficiency through Engineering & Construction
Current Industry Partners: Sweetwater Cafe
Faculty Advisor: Ms. Lynn Artman, P.E.

Goals/Objectives – ETEC’s mission is to work with communities to implement efficient and sustainable design into new and existing construction projects. Past projects have included: energy audits, design of a storage building for the Michigan Tech Crew Club, design of covered bike racks for the campus, and the design of a home for the local Habitat for Humanity group. ETEC also maintains a focus on LEED and green building design, and received 2nd place in the 2007 West Michigan Green Builders Design Competition. This year, the team has been working with a local café to recommend efficiency improvements to the HVAC system.

Enterprise Team: Forestry and Environmental Resource Management
Current Industry Partners: STIHL
Faculty Advisor: Mr. Jim Rivard

Goals/Objectives - FERM offers the Forestry and Environmental Resource Management (FERM™) program as an innovative, hands-on opportunity in undergraduate applied ecology and forestry education. This residency-type, forestry enterprise program provides valuable experience as multi-level teams of students plan, implement, and oversee actual conservation-oriented management on portions of the School's 5,500 acre forest. In this one-of-a-kind program students gain real-world experience as they learn and realize the lasting impacts that their investments of time and energy have for themselves, the School, the community, and the lands.
Enterprise Team: FIRST Robotics Enterprise  
**Current Industry Partners:** BAE Systems, Chrysler LLC, General Motors, Superior Graphics, ThermoAnalytics Inc.  
**Faculty Advisor:** Dr. Barbara Lograsso

**Goals/Objectives** – The mission of FRE is to link grade school, high school, college, and the professional world through robotic education. FRE stimulates students’ interests in the fields of science and technology by participating in the annual FIRST Robotics competition, FIRST Tech Challenge, and FIRST Lego League. Teamwork, leadership, and professionalism are emphasized throughout every aspect of the enterprise. Members of FRE mentor three local FIRST Robotics teams: one in Houghton, one in Chassell, and one in Calumet. Through the activities on these teams, FRE members seek to transform the futures of high school students and college mentors alike—furthering the mission of the enterprise and the fields of science and technology as a whole.

Enterprise Team: Formula SAE  
**Current Industry Partners:** ArcelorMittal USA, 3M, Chrysler LLC, DENSO North America Foundation, Ford, General Motors  
**Faculty Advisors:** Mr. Sam Johnson, Dr. Jeff Naber, Mr. Robert Whipple, and Mr. Jeremy Worm

**Goals/Objectives** - Formula SAE is a student competition where each year over one hundred teams from universities around the world build a formula-style race car to compete in both static and dynamic events at the annual Formula SAE world competition held in Michigan. The concept is to build an affordable race car geared towards the weekend autocrosser, where the static engineering innovations and dynamic racing capabilities are judged and ranked. Michigan Tech has a long history of top performing cars. Each year Formula SAE pushes the racing envelope to develop cutting-edge innovations that will create the future of racing!

Enterprise Team: Green Campus Enterprise  
**Current Industry Partners:** Michigan Tech  
**Faculty Advisor:** Dr. Chris Wojick

**Goals/Objectives** – As the newest enterprise team on campus, the goal of the Green Campus Enterprise is to develop the analytical tools and knowledge necessary to support sustainability decision making and, in concert with other groups, design and implement projects to improve the sustainability of the Michigan Tech campus.

Enterprise Team: Husky Game Development  
**Current Industry Partners:** Michigan Tech  
**Faculty Advisor:** Dr. Robert Pastel

**Goals & Objectives:** Husky Game Development is an enterprise in the computer science department that primarily focuses on video game development. Ranging from research to video game implementation, Husky Games applies everything learned from courses to real-life experience.
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**Enterprise Team:** IT Oxygen
**Current Industry Partners:** Dow Foundation, Marquette General Health System
**Faculty Advisor:** Mr. Robert Maatta

**Goals/Objectives** – IT Oxygen is a student-run Enterprise Team that focuses on emerging technologies, and their applications in business, organizational, and academic settings. Team members collaborate to problem-solve technology and communication problems. IT Oxygen takes on one-day, semester-length, and long-term projects. The team’s areas of expertise include programming languages, software development and testing, peer-to-peer networking, database development, and multimedia platforms. IT Oxygen is one of the most culturally and cross-disciplinary diverse groups on the Michigan Tech campus, drawing from multiple fields of study among Team members who come from Africa, Europe, Malaysia, and the United States.

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**Enterprise Team:** Innovative Castings Enterprise
**Current Industry Partners:** ArcelorMittal USA, Chrysler LLC, Winset Inc.
**Faculty Advisor:** Dr. Mark Plichta

**Goals & Objectives:** ICE strives to be a leader in providing products and services through quality research and engineering. As a growing company with a state of the art foundry, ICE seeks to expand these facilities further to encompass a wider range of solidification processes. ICE is currently exploring and developing processes in Die Casting, Investment Casting and Continuous Casting. This year, ICE and the PrISM Enterprise officially merged to create a new Enterprise, Advanced Metalworks Enterprise.

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**Enterprise Team:** Integrated Microsystems Enterprise
**Current Industry Partners:** General Dynamics Land Systems, V.I.O. Inc.
**Faculty Advisor:** Dr. Paul Bergstrom

**Goals/Objectives** - The Integrated Microsystems Enterprise (IME) is a team of undergraduate students investigating and applying microsystem technologies to real-world engineered systems. IME allows students to operate a virtual, goal-oriented company with measurable deliverables. IME members routinely work in collaboration with other organizations, graduate students, faculty, and staff members. Integrated Microsystems is actively engaged in a wide spectrum of projects, providing learning opportunities for students in any major. Current projects include the Data Acquisition Cube (DAC), Roadbed Assessment Transmitter (RAT), Tank Simulator, Dr. Jindong Tan’s Wearable Body Sensor Network, and working with V.I.O. Inc.

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Enterprise Team: International Business Ventures
Current Industry Partners: Heyer America, McAlister Trust
Faculty Advisors: Dr. Michael Neuman, Ms. Anne Warrington, Dr. Robert Warrington

Goals & Objectives: The International Business Ventures (IBV) Enterprise offers a unique opportunity for students to learn how best to work cooperatively with other classmates, as well as students and businesses worldwide, to develop and bring to market new products for which a need has been identified. Currently, the enterprise is working on two projects: an infant heart monitor to be used in underprivileged areas and a low-cost ventilator to be used in pandemic situations. IBV uses the expertise of its group members to achieve the following goals: product conceptualization, business plan and product development, and sustainability.

Enterprise Team: Mini-Baja SAE
Current Industry Partners: ArcelorMittal USA, 3M, Chrysler LLC, DENSO North America Foundation, Ford, General Motors
Faculty Advisor: Dr. Brett Hamlin

Goals/Objectives - Michigan Tech’s long-standing tradition in Baja SAE dates back to the first competition in 1981. Tech pioneered the Winter Baja Invitational, and continues to host and organize it annually. Each year, the team designs and builds a completely new vehicle which is then entered into one or more of the national SAE Baja events. In 2008, Blizzard Baja earned second place overall, based on strong performances in the three national competitions. This year, the team is poised to win the 2009 Mike Schmidt Memorial Iron Team Award, with 8th place and 2nd place finishes in the first two competitions.

Enterprise Team: Nanotech Innovations
Current Industry Partners: NSF
Faculty Advisor: Dr. John Jaszczak

Goals & Objectives: Nanotech Innovations is a team of undergraduate students working to further the field of nanotechnology both at Michigan Tech and across the country. The group works under an interdisciplinary team of advisors whose fields of study range from physics to social sciences. The team is comprised of students from many different academic fields and actively participates in educational outreach programs designed to educate both college and precollege students about nanotechnology. In addition to education outreach, Nanotech Innovations develops educational tools that are used for nanotechnology education across the country. These projects include developing a scanning probe microscope with Lego Mindstorm kits and the designing and building of a small-scale scanning tunneling microscope for use in middle and high schools.

Enterprise Team: Noise, Vibration, Harshness (NVH) Enterprise
Current Industry Partners: General Dynamics Land Systems, Volvo Construction Equipment
Faculty Advisor: Dr. Mohan Rao

Goals/Objectives – The NVH enterprise has been working for industry sponsors since 2005 and is directed toward education, training, and entrepreneurship in the areas of noise and vibration. The emphasis is on learning modern concepts and experimental and numerical tools needed to solve real-world problems in industry. Currently, the team is working in two large-scale projects. One is to reduce noise levels produced by an electric-powered vehicle used for the military. The second is to design a motorized system to aid in the calibration of an Acoustic Doppler Current Profiler, which measures the velocity of water in rivers and streams.
Enterprise Team: Pavement Design, Construction and Materials  
**Current Industry Partners:** Thompson Scholars Program  
**Faculty Advisor:** Dr. George Dewey

**Goals/Objectives** - The PDCM Enterprise mimics a full-service, pavement design, construction, and materials firm where students occupy roles found in a real-life company. The “firm” has three divisions including design, construction, and material development, with a particular emphasis on asphalt pavements. Students develop hands-on expertise with real-world projects requiring them to meet schedules, develop budgets, design projects, experiment with materials, and provide actual products and services. The level of responsibility increases as students progress from sophomore interns to senior project leaders and possibly graduate project managers. Students report on activities at an annual corporate meeting with the advisory board. Projects bring the team together and provide the context for planning, goal setting, budgeting, teaming, leadership development, and organizational learning, as well as technical and business competence. Projects have a large enough scope and nature to challenge the students to reach levels of organizational and personal competence that they cannot have considered possible.

Enterprise Team: PrlSM (Program in Integrated Sustainable Manufacturing)  
**Current Industry Partners:** ArcelorMittal USA, Chrysler LLC  
**Faculty Advisor:** Dr. Mark Plichta

**Goals/Objectives** – PrlSM’s goal is to use integrated product/process realization methods to develop products which satisfy a demonstrated market need and can be sold at a price greater than their manufacturing cost. Additionally, PrlSM investigates process/manufacturing related opportunities brought forth by industry partners. This year, PrlSM and the Innovative Castings Enterprise officially merged to create a new Enterprise, Advanced Metalworks Enterprise.

Enterprise Team: Professional Communications Arts Enterprise  
**Current Industry Partners:** Keystone Healthcare Management, Marquette General Health System, Michigan Tech/JRVP Library  
**Faculty Advisor:** Dr. Ann Brady, Dr. Erin Smith

**Goals & Objectives**: PCAE is Michigan Tech’s Communication, Design, and Media Enterprise. The long-term goals are to identify and to establish professional partnerships with communication or design sponsors in order to prepare student team members for internships, co-ops, careers, or scholarship in communication and design fields. Areas of expertise include writing, documentation, media development, organizational communication, and design research, theory, and production. This year, the team
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Enterprise Team: Supermileage Systems Enterprise
Current Industry Partners: Robert Bosch LLC
Faculty Advisor: Rick Berkey

Goals/Objectives - Supermileage Systems Enterprise (SSE) is a group of students interested in automotive systems development and working as a design team. The current SSE mission is to design and build a competitive, super-high-mileage car that will challenge other engineering schools at the annual SAE Supermileage Competition held at the Eaton Proving Grounds in Marshall, MI. In 2008, the team competed for the first time, achieving 457 mpg and 11th place overall!

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Enterprise Team: U2Explore
Current Industry Partners: MRPA Foundation/Access to Recreation Initiative
Faculty Advisor: Dr. John Beard

Goals/Objectives - The purpose of the U2Explore Enterprise is to design and fabricate mechanical systems to provide universal accessibility to nature, with minimal intrusion on the natural environment. Rather than altering the environment, it is our intent to expand trail-use opportunities by applying technologies where they can be used to reduce the level of difficulty, thereby accommodating the needs of the largest number of users. We plan to provide a suite of components that will more readily avail the existing trail system to persons with a range of impairments – visual, mobility, and cognitive. The primary goal of team in the first year is to design, fabricate and design and build a vehicle(s) for Michigan Tech’s Tech Trails to insure the walking trails are accessible on a year-round basis for those with mobility impairment without modification of the trails. The enterprise team will design the vehicle suitable for traversing the existing trails while minimizing vehicular impact. The projects for years two and three will be primarily based on results of surveys given to the disabled community to improve on this vehicle as well as identify opportunities for new assistive devices for additional outdoor activities.

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Enterprise Team: Wireless Communication
Current Industry Partners: Boston Scientific, CPRM/MTEC SmartZone, Patrick Eddy
Faculty Advisor: Kit Cischke

Goals/Objectives – WCE is a student-led virtual company focused on wireless, optical, and biomedical technology. Recent R&D efforts have also involved projects in renewable energy. We work as a think-tank for companies looking to push their product lines to a higher level. We also work as entrepreneurs, taking our own ideas to a level where they can be useful for industry and consumers alike. We are always looking for Sponsors to challenge us with projects.