



Application for Sponsorship of a Capstone Design Project

DG01

Project Sponsor (Company Name): <u>American Hydromech</u>

Information		
Requested:	Technical Contact:	Billing Address/Contact:
Title & Name:	Timothy A. Droste, Sr. Engineer	Timothy A Droste
Address:	American Hydromech 4076 Indian Camp Trail Howell, MI 48855	Same
Phone:	313.300.2946	517.548.3940
Email:	ta.droste@americanhydromech.com	

PROJECT TITLE: (5-10 words)

Electric Motor Driven Vacuum Pump - Benchmark Study

IMPACT OF THIS PROJECT ON YOUR COMPANY *This statement will be printed in the end-ofsemester Design Day Brochure.* – 70 *words or less*

Many road vehicle subsystems are operated by pneumatic actuators, originally developed and integrated in vehicles powered by gasoline engines. The shift to diesel engines has left a void – insufficient engine vacuum to supply controls. These controls are not easily converted from pneumatic to another source of power so diesel equipped vehicles often include vacuum pumps.

This project explores the history, reliability, performance and state of the art of such vacuum pumps, focused on durability. A search of unrelated industries for design features to improve reliability, durability and cost will be conducted, along with empirical work to quantify fundamental performance.

PROJECT CHECKLIST: Ideally, your project should	Enter Yes / No
• Use significant creativity to solve a problem where there are many potential solutions	Yes
• Require the design of a system, or subsystem rather than a single part	Yes
• Require the use of conventional analytical and computational methods rather than specialized equipment and/or software	Yes
• Permit our students to publicly display their results at the end-of-semester Design Day	Yes
• Permit our students to visit to your facilities	Yes



Electric Motor Driven VacuumPump Benchmark Study

BACKGROUND

Many road vehicle subsystems are operated by pneumatic actuators, e.g. HVAC duct doors, parking brake release, service brake boosters, engine controls etc. These devices were developed and integrated in vehicles originally powered by gasoline engines. The shift to diesel engines has left a void – insufficient engine vacuum to supply controls. These controls are not easily converted from pneumatic to another source of power so diesel engine equipped vehicles often include vacuum pumps.

DG01

This project explores the history, reliability, performance and state of the art of vehicle mounted vacuum pumps with a focus on durability. A search of unrelated industries for design features to improve reliability, durability and cost without negatively affecting weight or noise will be conducted, along with empirical work to quantify fundamental performance.

An intellectual property agreement is required. An NDA to protect American Hydromech (AHM) proprietary information is required. Invention(s) and all Intellectual Property developed during this effort will be owned by American Hydromech. With *sponsor prior approval*, the student team has full rights of disclosure to the public during this project.

PROJECT DESCRIPTION

- <u>Establish workplan & team member assignments</u>
- <u>Research Historical applications</u>; literature search to include cross sections of pump and pump drives (some were belt drive) and application details, e.g. subsystems powered, pump performance specs, service intervals/schedule, etc.
- <u>Research Current state of the art</u>; Literature search as above, supported with field study e.g. cross sections of pump and pump drives , photos of pumps in situ, interviews of service professionals vis-a-vis repairs frequency, methods etc.
- **<u>Research Unrelated industries and applications</u>**; Vacuum pumps used in marine, industrial, laboratory, etc. NOTE: search limited to units rated at 10 SCFM or less.
- Hardware Performance experiments
 - i) Acquire industry std test methods (SAE, NFPA, ASTM, etc.) to rate vehicle subsystem pumps of this type
 - ii) Acquire (1) current model pump and conduct limited performance tests
 - (1) Torque draw at room and 200F chamber temp
 - (2) Min pressure (Max vac) attained and time to achieve evacuated volume TBD)
 - (3) Sound Power Rating
- NOTE: mounting adapters, test stand fixtures and load controls will need to be designed and fabricated by the MSU student team. CAD 3D models and 2D shop drawings will be required.
- Summary report that includes recommended alternatives to existing state of the art pump and (a Pugh Chart) to :
 - i) Increase useful life
 - ii) Reduce scheduled maintenance
 - iii) Reduce noise
 - iv) Reduce cost
 - (1) Life of ownership cost
 - (2) Production cost, to include fully accounted vehicle assembly cost
- v) Reduce weight





Department of Mechanical Engineering

Application for Sponsorship of a Capstone Design Project

Project Sponsor (Company Name): Lansing School District - Marvin E. Beekinnen

Technical Contact:	Billing Address/Contact:
Clare Jorgensen, PT	
2901 Wabash Rd. Lansing, ME 48910	
517-755-5771	
clare.jorgensen@	
	Clare Jorgensen, PT 2901 Wabash Rd. Lansing, MI 48910 517-255-5771

lansingschools net

PROJECT TITLE: (5-10 words)

Adapted Seating Fore the Course

IMPACT OF THIS PROJECT ON YOUR COMPANY (Using approximately 70 words, describe how this project will positively influence your company through, for example, reduced costs, a new product, higher quality, faster production, a healthier workplace etc.) This statement will be printed in the end-of-semester Design Day Brochure.

See attached page

(Please attach a **one page** summary describing the project. Indicate if a confidentiality and/or intellectual property agreement will be required.)

•	use significant creativity to solve a problem where there are many potential solutions	Yes)	No
•	require the design of a system, or subsystem rather than a single part	Yes	No
•	require the use of conventional analytical and computational methods rather than specialized equipment and/or software	Yes	No
•	permit our students to display their results at the end-of-semester Design Day, which is attended by the public	Yes	No
¢	permit our students to visit to your facilities	Yes	No

Shell Oil Company Children's Humanitarian Project Request

Requested By: Lansing School District Marvin E. Beekman Center 2901 Wabash Rd. Lansing, MI 48910 Technical Contact: Clare Jorgensen, PT 517-755-5771 clare.j orgensen@lansingschools.net

Project Title: Adapted Seating Fore the Course

Impact of this Project:

Ryan is a young adult with spastic quadriplegia cerebral palsy which affects his posture, motor control and mobility. He loves the sport of golf and enjoys riding in the golf cart to watch his family play. Ryan has experienced rapid growth and physical changes over the past three years that has affected safe seating in a golf cart. An adapted, removable support seat to fit in a golf cart will allow Ryan to join his family on the golf outings that he loves.

Project summary: Ryan previously used a car seat on the seat of a golf cart for safe transportation with his family on golf outings. He has outgrown this car seat and has had physical changes that make seating in an open moving vehicle more challenging. Family would need a portable seating system that could accommodate Ryan's postural and balance needs. Commercial seating systems exist but do not accommodate all of Ryan's postural needs or are not easily transported and secured to a golf cart.





Department of Mechanical Engineering

Application for Sponsorship of a Capstone Design Project

Project Sponsor (Company Name): Chrysler

Information	Technical Contact:	Billing Address/Contact:	
Requested:	Jennifer Badgley	Scott Bittinger	
Title & Name:	800 Chrysler Drive	800 Chrysler Drive	
Address:	Auburn Hills, MI 48326	Auburn Hills, MI 48326	
Phone:	(248) 576-5921	(248) 576-2992	
Email:	Jml96@chrysler.com	Ds64@chrysler.com	

PROJECT TITLE: (5-10 words) Minivan/SUV Seat Feature Future Needs

PROJECT CHECKLIST: Ideally, your project should	
• use significant creativity to solve a problem where there are many potential solutions	_Y_
• require the design of a system, or subsystem rather than a single part	_Y_
• require the use of conventional analytical and computational methods rather than specialized equipment and/or software	_Y_
• permit our students to display their results at the end-of-semester Design Day, which is attended the public	by _Y_
• permit our students to visit to your facilities	_Y_

IMPACT OF THIS PROJECT ON YOUR COMPANY (Using approximately 70 words, describe how this project will positively influence your company through, for example, reduced costs, a new product, higher quality, faster production, a healthier workplace etc.) This statement will be printed in the end-of-semester Design Day Brochure.

Chrysler is known for innovation in the minivan market; such as, Stow'n Go, Easy Out Roller, and Swivel'n Go seats (shown below). These innovations have made Chrysler's Dodge Caravan a long time champ of the segment. However, the minivan market has been shrinking in recent years, as the recession has hit young families particularly hard. This has brought a renewed need for innovative ideas for seating features that meet the needs, wants, and desires of young families.

1 page Project Summary DG03

Project Title:

Minivan/SUV Seat Feature Future Needs

Objective:

Design a device that meets the future needs, wants, and desires for seating features of the Minivan/SUV segments.

Impact on Chrysler:

Chrysler is known for innovation in the minivan market; such as, Stow'n Go, Easy Out Roller, and Swivel'n Go seats (shown below). These innovations have made Chrysler's Dodge Caravan a long time champ of the segment. However, the minivan market has been shrinking in recent years, as the recession has hit young families particularly hard. This has brought a renewed need for innovative ideas for seating features that meet the needs, wants, and desires of young families.





Scope:

- 1. Identify the future expectations of the Minivan/SUV market
- 2. Brainstorm innovative ways to meet these expectations
- 3. Determine which of these features should be executed based on level of innovation and customer desirability
- 4. Take the chosen feature(s) through the design process
- 5. Build a Prototype

Available Resources:

- 1. Project Mule: 2011 Dodge Durango Seating System or 2010 Dodge Minivan
- 2. A2MAC website for benchmarking data
- 3. Misc. Seating Components as needed





Application for Sponsorship of a Capstone Design Project

Project Sponsor (Company Name): <u>Dow Chemical Company</u>

Information		
Requested:	Technical Contact:	Billing Address/Contact:
Title & Name:	Adam Alderman, Production Engineer	Brian Santhany
Address:	Dow Water and Process Solutions 5400 Dewey Hill Rd Edina, MN 55439	The Dow Chemical Company Engineering Solutions - Mechanical Engineering General Mechanical TRN (Agitators and Mixers SME) Michigan Operations 1400 Building, Office 113 Midland, MI 48667
Phone:	952-914-1041	989-636-3220
Email:	ajalderman@dow.com	BSanthany@dow.com

PROJECT TITLE: (5-10 words)

Exterior Insulation Panel Product

IMPACT OF THIS PROJECT ON YOUR COMPANY (Using approximately 70 words, describe how this project will positively influence your company through, for example, reduced costs, a new product, higher quality, faster production, a healthier workplace etc.) This statement will be printed in the end-of-semester Design Day Brochure.

(Please attach a **one page** summary describing the project. Indicate if a confidentiality and/or intellectual property agreement will be required.)

•	use significant creativity to solve a problem where there are many potential solutions	Yes	No
•	require the design of a system, or subsystem rather than a single part	Yes	No
•	require the use of conventional analytical and computational methods rather than specialized equipment and/or software	Yes	No
•	permit our students to display their results at the end-of-semester Design Day, which is attended by the public	Yes	No
•	permit our students to visit to your facilities	Yes	No

Exterior Insulation Panel Product Sponsor: Dow Chemical Corp Project Description

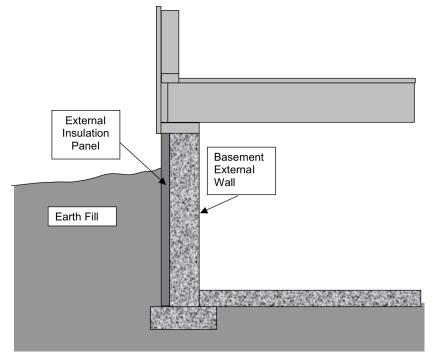
Background:

As the IECC 2009 is adopted by many states for their residential energy code, as advocated by the US DOE, virtually all homes in colder climates will require either interior or exterior basement or foundation insulation.

Concept:

Exterior foam based insulation systems must extend from the top of the footing to the wood mud sill on top of the basement or foundation wall. The portion that extends above grade is problematic, as exposed insulation at this location is subject to UV deterioration as well as physical damage and potentially insect or rodent damage. Codes require this exposed portion to be protected. However, few effective products exist for this application, requiring instead designers to develop composite construction details using wood, metal or masonry protection layers, or to select applied coatings. There is a need for foam products that have bonded or integral protective layers such that the UV and physical damage protection is integral to the product. Dow, in the past manufactured foam roof insulation with a bonded cement top layer acting as roof ballast. This same or a similar concept could be developed for use in the exterior basement insulation application. This project would explore the thermal, moisture and construction detailing considerations of such a foam product with the integral protections described above.

The project team will formulate panel concepts, build a prototype and test that prototype for mechanical, moisture and thermal performance.



Technical Consultant:

DG04

Tim Mrozowski, A.I.A., LEED ® AP, Professor Construction Management School of Planning, Design & Construction Michigan State University 115 Human Ecology Building Michigan State University East Lansing, MI (517) 353-0781 mrozowsk@egr.msu.edu





Department of Mechanical Engineering

Application for Sponsorship of a Capstone Design Project

Project Sponsor (Company Name): <u>Dow Chemical Company</u>

Information		
Requested:	Technical Contact:	Billing Address/Contact:
Title & Name:	Matt Rokosz	Brian Santhany
Address:	The Dow Chemical Company	The Dow Chemical Company
	Water & Process Solutions	Engineering Solutions - Mechanical
	Cation/CMMC/Special Resins/Throx	Engineering
	Run Plant Engineer	General Mechanical TRN (Agitators and
	Michigan Operations	Mixers SME)
	400 Building, Office 113	Michigan Operations
	Midland, MI 48667	1400 Building, Office 113
		Midland, MI 48667
Phone:	989-633-1245	989-636-3220
Email:	mcrokosz@dow.com	BSanthany@dow.com

PROJECT TITLE: (5-10 words)

Interior Insulation Panel Product

IMPACT OF THIS PROJECT ON YOUR COMPANY (Using approximately 70 words, describe how this project will positively influence your company through, for example, reduced costs, a new product, higher quality, faster production, a healthier workplace etc.) This statement will be printed in the end-of-semester Design Day Brochure.

(Please attach a **one page** summary describing the project. Indicate if a confidentiality and/or intellectual property agreement will be required.)

•	use significant creativity to solve a problem where there are many potential solutions	Yes	No
•	require the design of a system, or subsystem rather than a single part	Yes	No
•	require the use of conventional analytical and computational methods rather than specialized equipment and/or software	Yes	No
•	permit our students to display their results at the end-of-semester Design Day, which is attended by the public	Yes	No
•	permit our students to visit to your facilities	Yes	No

Interior Insulation Panel Product Sponsor: Dow Chemical Corp Project Description

DG05

Background:

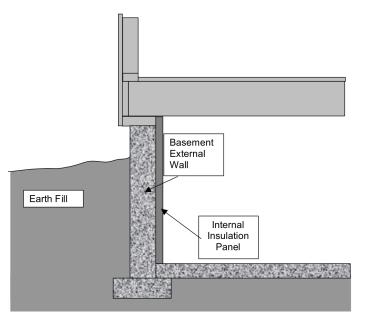
As the IECC 2009 is adopted by many states for their residential energy code, as advocated by the US DOE, virtually all homes in colder climates will require either interior or exterior basement or foundation insulation.

Concept:

Due to the requirements of IECC 2009, if external insulation is not used, interior insulation applications must be used to prevent energy loss. Owners will combine the insulation with stud wall or furring applications to support finish materials such as drywall. Insulation typically consists of fiberglass blankets or insulating foam or a combination. Wood in contact with concrete or masonry must be treated for decay resistance. Foam generally is required by codes to be covered by materials such as drywall or wood because most foams generate smoke in a heat/fire situation. There are some existing manufactured products that may incorporate foils or other protective layers to resist heat and smoke, however most are not acceptable to consumers as a final product due to aesthetic reasons.

Moisture, heat flow, smoke and fire are the considerations that apply from a mechanical engineering perspective. Construction detailing of what usually is a composite assembly of materials is the architectural consideration. Acceptable appearance to consumers is the consideration for foam boards with integral resistance to smoke development and combustion.

So some questions for interior applications could be: are there durable foam products that can be developed that do not require protection from heat and fire, that are also aesthetically pleasing? Are there combination systems incorporating both some exterior insulation from the footing to grade with insulation shifted to upper portion of basement? What are the implications on construction details?



The project team will resolve the questions herein, formulate panel concepts, build a prototype and test that prototype for mechanical, moisture and thermal performance.

Technical Consultant:

Tim Mrozowski, A.I.A., LEED ® AP, Professor Construction Management School of Planning, Design & Construction Michigan State University 115 Human Ecology Building Michigan State University East Lansing, MI (517) 353-0781 mrozowsk@egr.msu.edu







Application for Sponsorship of a Capstone Design Project

Project Sponsor (Company Name): Ford Motor Company_

Information		
Requested:	Technical Contact:	Billing Address/Contact:
Title & Name:	Scott Bohr, Evap Technical Specialist	
Address:	20000 Rotunda Dr. Dearborn, MI. 48129	20000 Rotunda Dr. Dearborn, MI. 48124
Phone:	313-805-5837	
Email:	sbohr@ford.com	

PROJECT TITLE: (5-10 words) Ford GTDI Evaporative System Design Project

PROJECT CHECKLIST: Ideally, your project should	
• use significant creativity to solve a problem where there are many potential solutions	_Y_
• require the design of a system, or subsystem rather than a single part	_Y_
• require the use of conventional analytical and computational methods rather than specialized equipment and/or software	_Y_
• permit our students to display their results at the end-of-semester Design Day, which is attended the public	by _Y_
• permit our students to visit to your facilities	_Y_

IMPACT OF THIS PROJECT ON YOUR COMPANY (Using approximately 70 words, describe how this project will positively influence your company through, for example, reduced costs, a new product, higher quality, faster production, a healthier workplace etc.) This statement will be printed in the end-of-semester Design Day Brochure.

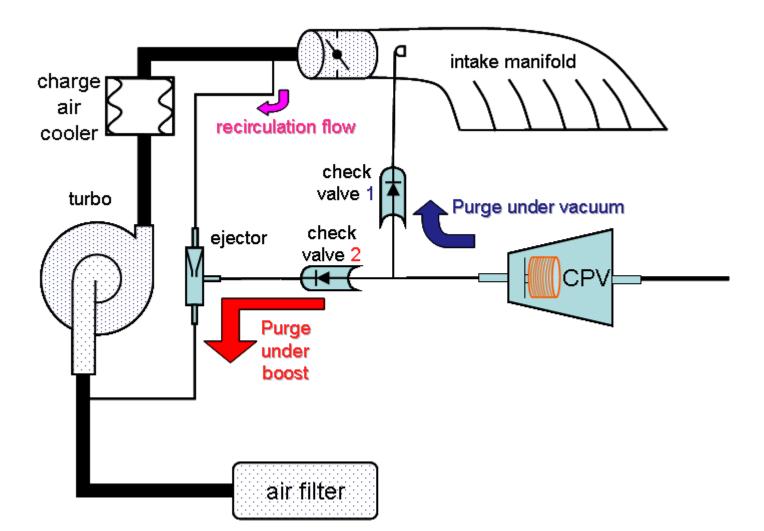
A vacuum is needed for the evaporative emissions system of a vehicle to purge off a carbon canister. A GTDI engine utilizes turbochargers to increase the intake pressure to a positive value which cannot be utilized by the emissions system. Valves and special components are therefore needed to redirect the flow path to enable the engine vacuum to be utilized. Currently these valves and special components are separate parts and are utilized similarly across many vehicle models. Consolidating the separate special emission components will reduce costs, complexity, potential leak paths from line connections, and provide increased flexibility for packaging in the vehicle.

Please attach a 1 page Project Summary to be distributed publicly to students and faculty advisors when they choose projects. Indicate if a confidentiality and/or intellectual property agreement will be required.

DG06 1 page Project Summary

The system design objectives are as follows;

- Design and optimize dual path evaporative under hood system.
 - Maximize flow over desired operating range
 - Minimize restriction, weight, number of connections
 - Choose compatible materials for surrounding environment
 - Provide possible CAD scenarios for the design
- Execute flow analysis to provide tunable parameters to optimize flow performance.







Department of Mechanical Engineering

Application for Sponsorship of a Capstone Design Project

Project Sponsor (Company Name): Ford Motor Company_

Information		
Requested:	Technical Contact:	Billing Address/Contact:
Title & Name:	Randy Pearce, PTI Fuel System Team Leader	
Address:	20000 Rotunda Dr. Dearborn, MI. 48129	20000 Rotunda Dr. Dearborn, MI. 48124
Phone:	313-805-3666	
Email:	rpearce@ford.com	

PROJECT TITLE: (5-10 words)

HEV EVAPORATIVE EMISSIONS SYSTEM

PROJECT CHECKLIST: Ideally, your project should	Yes or No
• use significant creativity to solve a problem where there are many potential solutions	_Y_
• require the design of a system, or subsystem rather than a single part	_Y_
• require the use of conventional analytical and computational methods rather than specialized equipment and/or software	_Y_
• permit our students to display their results at the end-of-semester Design Day, which is attended to the public	ру _Ү_
• permit our students to visit to your facilities	_Y_

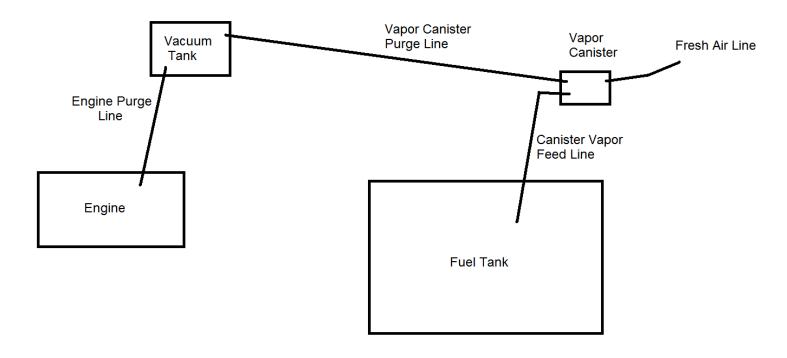
IMPACT OF THIS PROJECT ON YOUR COMPANY (Using approximately 70 words, describe how this project will positively influence your company through, for example, reduced costs, a new product, higher quality, faster production, a healthier workplace etc.) This statement will be printed in the end-of-semester Design Day Brochure.

The function of the evaporative emissions system on an HEV is the same as that of a standard vehicle. The evaporative emissions system requires vacuum for specific required functions. Typically this is achieved by engine vacuum, but with HEV's the engine vacuum is not always readily available. To provide readily available vacuum, a vacuum reservoir is proposed which will provide the low pressure for the evaporative emissions system. The vacuum reservoir system will reduce costs and increase reliability due to replacing a vacuum pump which is currently used in the system.

DG0/ 1 page Project Summary

Objectives of the project are as follows;

- Design and optimize EVAP system for hybrid vehicle using a vacuum reservoir to store a negative pressure.
 - Design system so that engine pulls a vacuum in the reservoir, stores the vacuum during operation. System uses stored vacuum during vehicle off condition to pull vacuum on entire EVAP system.
 - Includes use of valves with existing emissions components
 - Determine pressure of vacuum tank that is sufficient to pull complete amount of vacuum from fuel tank at min/max barometric pressures and at min/max fuel levels
- Provide system design and algorithm of operation
- Execute flow analysis to provide tunable parameters to optimize performance.







Department of Mechanical Engineering

Application for Sponsorship of a Capstone Design Project

Project Sponsor (Company Name): General Motors

Information		
Requested:	Technical Contact:	Billing Address/Contact:
Title & Name:	Andrew J. Herman	Matthew Ply
Address:	GM Technical Center	GM Technical Center
	30001 Van Dyke	30001 Van Dyke
	Warren, MI 48090	Warren, MI 48090
	Mail Code: 480-210-427	
	Workstation: 4AG27	
Phone:	(586) 907-0023	(586) 907-0914
Email:	Andrew.Herman@gm.com	Matthew.M.Ply@gm.com

PROJECT TITLE: (5-10 words)

Best Case Battery Cell Module Structure Rigidity

IMPACT OF THIS PROJECT ON YOUR COMPANY (Using approximately 70 words, describe how this project will positively influence your company through, for example, reduced costs, a new product, higher quality, faster production, a healthier workplace etc.) This statement will be printed in the end-of-semester Design Day Brochure.

The improvement of the Battery Cell Module Structure to a more rigid body will create a higher quality product for possible implementation into a future Chevrolet Volt model year vehicle while also improving the long term life of the battery pack as a whole due to the more rigid module design. This project will also give mechanical engineering students to gain exposure and experience in new technologies GM is currently implementing in its vehicles such as the Chevrolet Volt and other electric and hybrid technologies.

•	use significant creativity to solve a problem where there are many potential solutions	Yes	No
•	require the design of a system, or subsystem rather than a single part	Yes	No
•	require the use of conventional analytical and computational methods rather than specialized equipment and/or software	Yes	No
•	permit our students to display their results at the end-of-semester Design Day, which is attended by the public	Yes	No
•	permit our students to visit to your facilities	Yes	No

Project Title: Best Case Battery Cell Module Structure Rigidity

Project Description:

A topic under development right now is research into how many cell structures (cells, endplates, repeaters, etc.) stacked together in a lithium-ion battery pack will result in the most rigid body possible. GM is using 96 cells connected in series to supply the Chevrolet Volt with enough electricity to run for up to 40 miles without a single drop of gasoline. These 96 cells are currently divided up into four modules based on the location in the pack as well as the rigidity of each individual module.

Currently, Module 1 in the Volt battery pack has a 30 Hz. torsion mode, but a different combination or number of cell structures in this module may result in a better torsional rigidity. This project would allow the students to work with parts for a current automotive battery pack in production while also giving them exposure to the new direction GM, as well as the rest of the automotive industry, is heading to in terms of electrically-driven vehicles as well as hybrid technologies. Furthermore, the students involved in the project will also be able to visit GM's Battery Systems Lab at the GM Technical Center in Warren, MI and see where current and future batteries are being developed and tested for implementation into production vehicles.





Department of Mechanical Engineering

Application for Sponsorship of a Capstone Design Project

Project Sponsor (Company Name):		Heartwood School
Information Requested:	Technical Contact:	Billing Address/Contact:
Title & Name:	Joanne Janicki	
Address:	Heartwood School	
	625 Hagadorn Rd.	
	Mason, MI 48854	
Phone:	(517) 244-1419 / (517) 676-5730 /	
Email:	jjanicki@inghamisd.org	

PROJECT TITLE: (5-10 words)

Sensory Garden Bridge

PROJECT CHECKLIST: Ideally, your project should	
• use significant creativity to solve a problem where there are many potential solutions	s _Y_
• require the design of a system, or subsystem rather than a single part	_Y_
• require the use of conventional analytical and computational methods rather than specialized equipment and/or software	_Y_
• permit our students to display their results at the end-of-semester Design Day, which is attended by the public	n _Y_
• permit our students to visit to your facilities	_Y_

IMPACT OF THIS PROJECT ON YOUR COMPANY (Using approximately 70 words, describe how this project will positively influence your company through, for example, reduced costs, a new product, higher quality, faster production, a healthier workplace etc.) This statement will be printed in the end-of-semester Design Day Brochure.

This project will enhance the educational day of the physically and cognitively impaired student. Through seeing, smelling, listening, feeling and tasting, students' awareness is heightened and they enjoy positive learning experiences. Increased balance and physical abilities will also bring new independence for fuller participation and involvement in family and school life. By navigating across a structure into the garden, our students will learn skills that will help them integrate into the larger community.

Please attach a 1 page Project Summary to be distributed publicly to students and faculty advisors when they choose projects. Indicate if a confidentiality and/or intellectual property agreement will be required.





Capstone Design Project Proposal ME 481 Mechanical Engineering Design Projects

Project Sponsor (Company Name): <u>Heartwood School</u>

Name of Professional Advisor: Joanne Janicki

Project Title: <u>Sensory Garden Bridge</u>

Address: 625 Hagadorn Rd. Mason, MI 48854

Phone/Fax/Email: (517) 244-1419 / (517) 676-5730 / jjanicki@inghamisd.org

PROJECT DESCRIPTION

Heartwood School is a center based school servicing students with cognitive impairments, severe physical impairments, autism spectrum disorders and traumatic brain injuries. At Heartwood, we are developing a sensory garden to allow students to experience an enhanced opportunity for learning about nature within their individual abilities. Most gardens offer visual appeal, but a sensory garden is designed to stimulate all five senses. People with disabilities such as visual impairment, physical or cognitive impairments, can enjoy nature in a safe, tactile environment. Heartwood School also utilizes the MOVE (Mobility Opportunities Via Education) International curriculum. Move is a research based program shown to improve functional mobility skills which empowers children with severe disabilities. The project that we envision is a small structure (bridge or platform type device) at the entrance of the garden that will incorporate sensory stimulation. When the students step or wheel onto the bridge there could be sounds created such as chimes, visual stimulation that pops up or tactile features. The bridge could also challenge the students' perceptual and physical skills by having moveable components that shift side to side. The bridge will offer challenges to the balance, yet be safe and accessible for our students. This structure would fit in a four foot by six foot space.

IMPACT OF THIS PROJECT ON YOUR COMPANY

This project will enhance the educational day of the physically and cognitively impaired student. Through seeing, smelling, listening, feeling and tasting, students' awareness is heightened and they enjoy positive learning experiences. Increased balance and physical abilities will also bring new independence for fuller participation and involvement in family and school life. By navigating across a structure into the garden, our students will learn skills that will help them integrate into the larger community.