



# Michigan Academy for Green Mobility

Vehicle Electrification Engineering Certificate

Education and Training Provider

Request for Proposals



---

# MICHIGAN ACADEMY FOR GREEN MOBILITY

## 2010 Education and Training Provider Request for Proposals

---

### **BACKGROUND**

Michigan is moving rapidly toward renewable energy and other sustainable technologies to remain economically viable and protect our environment. In response to the rapid growth in this sector, the Michigan Department of Energy, Labor & Economic Growth (DELEG) has partnered with automotive manufacturing industry employers to establish the Michigan Academy for Green Mobility (MAGM). The purpose of MAGM is to ensure the automotive industry has the trained workers it needs to grow and prosper in the emerging green economy. Driven by the needs of the employers, the Academy is administered by a governing board made up of employers, education and training providers, the workforce development system, and state government. It is the role of the governing board to make decisions on behalf of the Academy.

MAGM delivers rapid skill growth in green technology solutions for advanced mobility to meet industry needs. Its objective is to prepare individuals for emerging technologies in vehicle propulsion, component design, manufacturing, and maintenance. The skill development and training requested in this Review for Proposals (RFP) is in direct response to specific knowledge and skill demands of employers in the automotive manufacturing industry as they diversify into advanced technologies that support Michigan's green economy.

As Michigan's automotive industry transitions toward green mobility, there is an increasing demand for individuals with the knowledge, skills, and experience necessary to work on emerging vehicle technologies. There is a need for training to help prepare individuals to move quickly from jobs working on traditional gasoline-based vehicles to advanced propulsion vehicles that use green technologies and applications. DELEG works with automotive manufacturing employers, education and training providers, industry associations, and the workforce system to develop a mechanism for providing that training.

### **The mission of the Academy is to:**

*Provide rapid skill growth in green technology solutions for advanced mobility to meet industry needs.*

**The mission of the Academy drives the following objectives:**

- Prepare individuals for emerging technologies in vehicle propulsion and vehicle component design, manufacturing, and maintenance
- Rapid/accelerated training and re-training
- Training targeted toward:
  - Incumbent and displaced engineers
  - Engineering students
  - Incumbent and displaced technicians
  - Technician program students

MAGM endorses education and training based on the occupations, skills, and knowledge required by employers to design, develop and manufacture the next generation vehicles. The focus is on efficiently and effectively up-skilling the Michigan workforce to prepare them for new jobs in green mobility and retain existing jobs affected by the drive for improved fuel economy and less environmental impact. Education and training institutions provide learning opportunities that are short-term, targeted, innovative, flexible, and have a strong focus on hands-on practical experience. MAGM endorsed education and training meets or exceeds employer defined skill and competency needs, positioning individuals to excel in green mobility jobs.

Partnerships are critical to make the most efficient use of established curriculums, facilities, laboratories, and equipment to provide the automotive industry with the talent necessary to succeed. Collaboration is necessary to create the right mix of theoretical knowledge with practical experience, and build on the strengths of individual organizations in order to provide the highest quality training available in this emerging field.

**REQUIREMENTS**

The following outlines the Education and Training Requirements for the RFP.

*Applicants are encouraged to create innovative partnerships to make the most efficient use of established curriculum, resources, and expertise. Applications that combine coursework and lab experiences from multiple education providers are preferred.*

The purpose of this Education and Training Provider Request for Proposals is to develop and implement a Masters Level Engineering Certificate Program delivered by one or more provider(s) in the area of Vehicle Electrification. The Certificate Program should consist of a menu of courses (nominally equivalent to 12-18 university semester hours) that provide students with the knowledge and practical experience necessary to work with Electric Vehicle (EV) technologies. The selected training provider(s) will work with MAGM to carry out its mission.

It is desirable that the courses selected for the subject Certificate Program be compatible with module concentration building within conventional masters level engineering degrees. Thus upon completion of the Certificate Program, it is anticipated that the provider(s) would provide executable options that permit the Certificate Program courses to be used as building blocks within their conventional masters level engineering degrees. While the primary short term objective of this Certificate Program is to provide incumbent and displaced engineers basic overall knowledge of EV technologies in an automotive system, it is anticipated that these initial Certificate Program courses will also form the “launching” platform for more advanced, in-depth courses in electric vehicle technologies which are compatible with advanced academic study in the area.

The Academy will assist in identifying students for this program. This RFP does not obligate the State of Michigan for the costs associated with the development or delivery of the solicited education and training program. This RFP does not address the future costs associated with the education and training program.

**Training Requested:**

- Vehicle Electrification Engineering Certificate

**Target Audience:**

- Incumbent and displaced engineers transitioning from traditional vehicle design and manufacturing to hybrid electric vehicle (HEV), plug in hybrid electric vehicle (PHEV), and battery electric vehicle (BEV) applications. Education and training for the Vehicle Electrification Engineering Certificate program should be structured for bachelor or master degreed engineers entering HEV, PHEV, BEV and component design and manufacturing.

**Prerequisites:**

- Bachelor Degree in Engineering

**Learning Objectives:**

- Vehicle Electrification Engineering Certificate should expose engineers to a broad range of EV skill areas. The certificate should include a set of core coursework that provides the base knowledge necessary for working on EV technologies as well as opportunities to obtain more in-depth knowledge and experience in specific skill areas. The Vehicle Electrification Engineering Certificate program should include courses that cover all or a subset of the following key skill areas defined by employer needs:
  - Overview of HEV, PHEV, BEV systems
  - High voltage battery systems
  - HEV, PHEV, BEV battery controls
  - Software for HEV, PHEV, BEV control systems

- Battery controls testing
- DC/DC converters
- Vehicle charging interface/infrastructure
- Regenerative braking
- Power electronic circuitry for electric drive systems
- Motor control electronic hardware
- Thermal system management and control
- Systems and integration
- High voltage electric distribution systems
- Safety working with high voltage systems

*Applicants are encouraged to be innovative in their program design and delivery to meet the employer driven needs. Individual courses may focus on one or multiple skill areas and course design is at the discretion of the applicant.*

**Training Delivery:**

- Method of Delivery:
  - Training should include at least 1 hour of lab/practical experience for every three hours of classroom style learning (as applicable)
  - Training should include team-based, hands on learning opportunities
- Delivery Timeframe:
  - Program delivery outside of normal business hours (Monday through Friday, 8:00 a.m. – 5:00 p.m.) is preferred
  - No more than half of the training should be conducted during normal business hours (Monday through Friday, 8:00 a.m. – 5:00 p.m.)

**Student Assessment:**

- Students should be evaluated through a combination of tests and practical projects.

**Credit:**

- Education and training resulting in graduate level credits is required
- The Vehicle Electrification Engineering Certificate should consist of 12 – 18 credit hours (approximately half the credit hours required for a master’s degree)
- All credits earned through the Vehicle Electrification Engineering Certificate should be accepted toward a master’s degree program

- Proposed Vehicle Electrification Engineering Certificate programs should accept transfer credits from other MAGM endorsed courses. A minimum of 20 percent of the proposed program's credit hours is preferred
  - *Partnerships that combine coursework and lab experiences from multiple education providers are preferred*
  - *Example: University A (applicant) offers a certificate program that includes 3 courses from University A, 2 courses from University B, and lab experiences at Community College C. Credits are articulated across all partners involved and a certificate is conferred by University A*

## **APPLICATION REQUIREMENTS**

### **Eligibility:**

- Eligible applicants are education and training providers with a significant presence in the State of Michigan including but not limited to universities, community colleges, private training providers, and industry associations.
- Proposals may be submitted by a single institution or in partnership with multiple institutions. Cross-institutional partnerships are encouraged to create the right mix of theoretical knowledge with practical experience and make the most efficient use of established curriculums, facilities, laboratories, and equipment. If the proposal is submitted in partnership, a lead agency must be identified to serve as the applicant.

### **Pre-Bid Webinar:**

A Pre-Bid Webinar will be held to answer questions related to the RFP. The Webinar is scheduled for 10:00 a.m. Wednesday, July 28, 2010. We request questions be submitted in writing to [MiSA@michigan.gov](mailto:MiSA@michigan.gov) prior to the Webinar for responses to be provided during the Webinar. Please visit the Michigan Skills Alliances Web site at [www.michigan.gov/rsa](http://www.michigan.gov/rsa) for information regarding this Webinar.

All PowerPoints, questions, and answers will be posted to the Michigan Skills Alliances Web site at [www.michigan.gov/rsa](http://www.michigan.gov/rsa) by 5:00 p.m., Wednesday, August 4, 2010.

### **Proposals:**

Proposals must be filled out electronically using ATTACHMENT A: Michigan Academy for Green Mobility Application. Proposals received in other formats will not be considered.

This RFP does not require proposals to be submitted by a specific deadline. DELEG will accept proposals and MAGM will endorse training providers throughout the year. Submit proposals electronically to Mr. Matthew Shields at [shieldsm1@michigan.gov](mailto:shieldsm1@michigan.gov). Hard copies may also be sent to:

Mr. Matthew Shields, Workforce Development Specialist  
Regional & Sectoral Strategies Division  
Bureau of Workforce Transformation  
Department of Energy, Labor & Economic Growth  
Victor Office Center  
201 N. Washington Square, 3<sup>rd</sup> Floor  
Lansing, Michigan 48913

**Review Process:**

Proposals received by DELEG are evaluated by a committee consisting of MAGM employers and workforce development representatives. The committee reviews proposals and recommends endorsement of education and training programs that most closely meet the needs identified by industry employers using the following criteria:

To be considered, the proposal must:

- a. Align with the vision and objectives of MAGM
- b. Confer credits (through either the applicant or a partner organization)

**Evaluation:**

- Certificate Program/Course Content: 40 Points
  - Weighted toward alignment with industry needs
- Certificate Program/Course Delivery: 25 Points
- Student Assessment: 10 Points
- Knowledge, Experience, and Expertise of Provider: 5 Points
- Partnerships: 5 Points
- Reciprocity of Credits: 15 Points
  - Provisional endorsement may be given while reciprocity agreements are in process

All proposals are considered and must be open to negotiation and/or modification. The review committee has the option to recommend changes to applicant’s proposals prior to recommending endorsement. The MAGM Governing Board has final approval of all education and training endorsed by the Academy.

**Notification:**

Successful applicants will be notified of MAGM endorsement within 60 days of proposal submission. This information will also be posted on the Michigan Regional Skills Alliances website at [www.michigan.gov/rsa](http://www.michigan.gov/rsa).

**Reporting Requirements:**

Upon completion of the program, the selected education and training provider(s) must report the following information to the MAGM Governing Board:

- Number of students enrolled
- Education level of enrolled students
- Engineering discipline of enrolled students
- Demographic information of enrolled students (in aggregate)
- Number of students completing the program
- Education level of students completing the program
- Engineering discipline of students completing the program
- Student assessment results including practical project results