ENGINEERING OF ELECTRIFIED VEHICULAR SYSTEMS

The certificate program will have an interdisciplinary curriculum rich in addressing both fundamental and emerging areas of the field. The curriculum will rely solely on regularly offered courses of existing graduate programs of the CECS and other colleges. This will assure (i) depth and breadth of the curriculum, (ii) consistent opportunity of timely completion of the program, (iii) implementation of the program not requiring any additional investment. The program will have no require or core courses and present minimal barriers for credit transfer between the program and the existing engineering graduate degree programs.

The certificate can be completed entirely on campus, entirely online, or through a combination of on-campus and online courses.

Graduate Certificate in Engineering of Electrified Vehicular Systems. This certificate program provides fundamental principles of vehicle electrification, with emphasis on application of these principles to emerging automotive technologies. It covers such topics as automotive powertrain, vehicle electronics, battery technology, electric and hybrid drives. Only courses completed with grade B or better will be counted toward the certificate. A minimum certificate grade point average of 3.0 is required to obtain the certificate. The program requires 12 credit hours, which can be selected from the following courses:

Coursework Requirements

Code	Title	Credit Hours
Select 12 credits from the following:		
AENG/ME 547	Automotive Powertrains I	3
AENG 553	Structural Design and CAE Analysis for Electric Vehicle Batteries	3
or ME 553	Structural Design and CAE Analysis for Electric Vehicle Batteries	
AENG/ME 562	Energy Management of Electrified Vehicles	3
AENG 576	Battery Systems, Modeling, and Control	3
or ME 576	Battery Sys Modeling & Ctrl	
AENG 650	Analysis and Design for Vehicle Crashworthiness	3
ME 559	Battery Materials, Manufacturing and Recycling	3
ME 570	Powertrain NVH of Electrified Vehicles	3
ME 592	Fundamentals of Fuel Cells	3
ECE 510	Vehicle Electronics I	3
ECE 515	Vehicle Electronics II	3
ECE 530	Energy Storage Systems	3
ECE 532	Auto Sensors and Actuators	3
ECE 533	Active Automotive Safety Sys	3
ECE 5462	Elec Aspects of Hybrid Vehicle	3
ECE 5463	Fundamentals of Electric Vehicles	3
ECE 646	Adv Elec Drive Transportation	3

Double-counting (application of the earned credits toward both the proposed certificate degree and MSE programs of the University of Michigan – Dearborn) will be allowed provided the following conditions are met.

- Any number of credits earned by a student in one of the MSE programs of the University of Michigan – Dearborn can also be applied toward the certificate program if
  - The course is in the approved curriculum of the certificate program
  - Grade B or better is earned in the course
  - Completion of the course occurred not more than 5 years before the date of application for double-counting
  - The student applying for double-counting has completed at least 6 credits in the graduate degree program
- Any number of credits earned by a student in the proposed certificate program can be applied toward any MSE program offered by the Department of Mechanical Engineering (currently, MSE in Mechanical Engineering, MSE in Automotive Engineering, MSE in Bioengineering) and future such programs if
  - The course is in the approved curriculum of the graduate program
  - Grade B or better is earned in the course
  - Completion of the course occurred not more than 5 years before the date of application for double-counting.