



Call for Instructors for the Master of Mechanical Engineering (Automotive Option)

The Faculty of Engineering in collaboration with the Centre for Executive and Professional Education *at the University of Windsor* is currently seeking instructors to teach in the Master of Mechanical Engineering (Automotive Option) for the Fall 2018, Winter 2019 and Spring 2019 terms.

Fall, 2018

Contract Dates:	August 23, 2018 – January 3, 2019
Class Dates:	September 6 – December 5, 2018
Exam Period:	December 8 – December 19, 2018
Alternative Exam Day:	December 20, 2018

Program Holidays:

Fall Reading Week	October 6 – 14, 2018
Thanksgiving	October 8, 2018
Christmas Break (closed)	December 22, 2018 – January 2, 2019

Winter, 2019

Contract Dates:	December 18, 2018 – May 2, 2019
Class Dates:	January 3 – April 3, 2019
Exam Period:	April 6 – April 17, 2019
Alternative Exam Day:	April 18, 2019

Program Holidays:

Family Day	February 18, 2019
University Closed	February 22, 2019
Study Week	February 18 – 22, 2019
Good Friday	April 19, 2019

Spring/Summer, 2019

Contract Dates:	
Class Dates:	May 6 – August 2, 2019
Make up Dates:	August 6 (for July 1 classes), August 7 (for May 20 classes), 2019
Exam Period:	August 10 – 19, 2019

Program Holidays:

Victoria Day	May 20, 2019
Reading Week	June 15-23, 2019
Canada Day	July 1, 2019
Civic Holiday	August 5, 2019

We are currently seeking instructors for the courses listed within **Appendix 1**.

Students in this program will primarily be international students who will study and live in Canada for sixteen (16) months. The Master of Mechanical Engineering (Automotive Option) consists of 8 courses.

Classes will meet for twelve weeks and must be taught in 2 hour and 50 minute blocks, one time per week. There is some flexibility in scheduling of the days and time that each class is offered to meet instructor constraints. For more information on how to apply, please see **Appendix 2**. Graduate Assistant support may be provided for class enrolment of over 50 students. Instructors may be required to attend an orientation session which will cover administrative details and other matters such as marking criteria, overall content coordination, and so on.

The Master of Mechanical Engineering (Automotive Option) program is an Executive Education Program and falls under the terms specified in Letter VII of Collective Agreement between the Faculty Association and the Board of Governors of the University of Windsor, 2017 to 2021 (see **Appendix 3**).

**Interested applicants are to submit applications directly to the
Centre for Executive and Professional Education online at: www.uwindsor.ca/cepe**

The deadline for receipt of applications is **Sunday May 13, 2018 11:59PM**

Appendix I: Course, Term

Schedule 1: Listing of available courses, including number of expected sections, and associated terms

Courses	F18 (# of sections)	W19 (# of sections)	S19 (# of sections)
06-85-530-01/02: Fundamentals of Automotive Engineering Overview of primary automotive systems. Engine types and configurations, combustion, emission control, vehicle performance. Powertrain, suspension, frame and chassis. Materials and fabrication issues. Engine and vehicle dissection laboratory. Identification of industry issues and trends.	2	2	-
06-85-500-01: Materials and Manufacturing Methods This course will present the mechanisms associated with elastic, plastic, and creep behaviour of materials and models for material deformation. Mechanical testing of materials to assess basic material properties will be presented. Materials selection for automotive applications will be thoroughly discussed focusing on (i) design analyses for material selection, (ii) mechanical properties of engineering materials (applicable to automotive applications, including metallic, polymeric and composite materials), (iii) processing methods of engineering materials and treatment of such materials. Analytical and numerical modeling of automotive materials during processing and in-field conditions will also be extensively discussed in this course.	1	1	2
06-85-525-01/02: Automotive Applications for Noise, Vibration and Harshness This course introduces the automotive applications and tools for the evaluation of noise, vibration and harshness. It includes reviews of measurement techniques presently used in the automotive industry to measure various aspects of noise, including the concept of sound quality, vibration and the quantification of the term harshness. The course consists of a review of papers which are to be presented to the class. Participants perform critical reviews on the presentations. Course evaluation is based on weekly reports, presentations of reviews of papers and critical reviews by participants	2	1	1
06-85-500-03: Hybrid Power Train Environmental concerns due to fossil fuel combustion and an alarming depletion of fossil fuel reserves are the two primary reasons that have encouraged the development of hybrid electric vehicles (HEVs). HEVs typically integrate an internal combustion engine with an electric motor and a power source to significantly reduce fuel consumption and harmful emissions, partly due to their regenerative capability which can provide a 20% improvement in fuel efficiency. The present commercial success of HEVs due to these advantages is a strong indicator that HEVs are here to stay. The high-voltage electrical system in HEVs plays an important role on the efficiency and performance of these vehicles. The hybrid vehicle electric power system consists of an electric motor, a power electronic converter driven by a control algorithm and a source of electrical energy. A variety of challenges accompany the development and production of optimized and energy efficient electric power systems in terms of motor and power converter selections, their design and control requirements and operational characteristics, battery selection and sizing. This course will deal with these issues by studying and evaluating the design of the hybrid electric power system in order to enhance the performance of HEVs, as well as design considerations for plug-in hybrid and electric vehicles.	1	1	-
06-92-590-27/28: Advanced Body Structures This course will focus on the fundamentals of automotive body structure design and analysis. Functional requirements for durability, NVH and crash safety will be translated to measurable structural design targets. Basic mechanics-based analysis procedures will be used to assess the body structure performance for global bending, torsion, modal frequency, and crashworthiness targets.	2	1	1

Courses cont'd	F18 (# of sections)	W19 (# of sections)	S19 (# of sections)
06-85-500-02/07: Internal Combustion Engines There is much misconception as to what really governs, and ultimately limits, internal combustion engine performance. There are fundamental, theoretical limitations imposed by the laws of thermodynamics and chemical kinetics. There are regulatory limitations imposed by emissions, noise and safety constraints. Finally, there are practical limitations due to manufacturing, service, and disposal capabilities and associated costs. Frequently these constraints are in competition with one another. Making intelligent choices about directions to pursue in new designs and novel approaches to satisfy engine operational requirements, demands a comprehensive understanding of the fundamental operation of the engine system. This course is designed to provide; 1) a fundamental understanding of sources of engine emissions and their after treatment and 2) methods used in engine mathematical modeling. Since the engine's emissions originate from the chemical reaction occurring in the cylinder, the combustion process will take a center stage. The course begins with delineating between heat engines and combustion process in real engines. From this foundation, the course continues with description of different methods for engine exhaust after treatment to reduce the amount of released pollutants. The latter portion of the course deals with a progression of mathematical models used in modeling of real engine flow and combustion processes.	-	2	-
06-85-567- 01/02: Vehicle Thermal Management A study of controlled passenger compartment environment, and automotive thermal management hardware: radiator, heater core, air-conditioning components. Topics include the thermal comfort model of occupants in a vehicle, determination of heating and cooling loads, the practical application of refrigeration in automotive air-conditioning followed by design of equipment and HVAC system, description and design of engine cooling system.	1	1	2
06-85-511-01/02: Bluff Body Aerodynamics Atmospheric boundary layers. Flow around bluff bodies, separation and wakes. Lift and drag, pressure and force coefficients. Streamlined bodies, bluff bodies. Flow over flat plates and walls, rectangular prismatic shapes, circular cylinders. Fluctuating forces and pressures on bluff bodies. Wind tunnel testing, similarity requirements, wind tunnel techniques. Vehicle aerodynamics, drag and lift of passenger cars, cross wind stability, wind tunnel and road testing. Architectural aerodynamics, design wind speed, flow in and around building, wind-induced response of low-rise buildings, tall buildings, and large roof and sports stadium. Aerodynamics of Wind Turbines. (Pre-requisite: Undergraduate level Engineering Mechanics, Fluid Mechanics.)	1	2	2
06-85-500-05: Controls for Electric Vehicles	1	1	-

*Depending on final enrolment, multiple sections of courses may be offered.
(Number in brackets indicates how many total students require the course this term.)
Subject to Change.*

Appendix 2: Application Procedure

Interested applicants must provide:

- 1) A statement of interest in teaching in the program that specifies the particular course or courses the applicant wishes to be considered for. This statement should detail how the applicant meets the stated qualifications. (See attachment re: Instructor Selection Criteria)
- 2) An indication of the willingness of the instructor to teach one or both sections (if offered).
- 3) A copy of their CV.
- 4) Prior quantitative and qualitative student assessments of teaching capabilities and/or client testimonials are particularly welcome.
- 5) New applicants who have not previously taught the course for which they are applying should provide a tentative overview/instructional plan for the course they are applying for. (This need not be as detailed as a course outline). This overview would specify a proposed structure for the course including topics to be covered and teaching methods to be employed, 2) how various teaching methods will be incorporated, and, 3) proposed methods to determine grades.
- 6) Instructors who have previously taught the course for which they are applying should:
 - (i) Include their most recent course outline; and
 - (ii) Indicate what changes they propose to the original course structure. These changes should take into account student reactions and feedback.

Interested applicants will submit applications directly to The Centre for Executive and Professional Education online at:

<http://www.uwindsor.ca/cepe/instructor-recruitment>

We thank all applicants in advance for their interest in the University of Windsor, however, only those under consideration will be contacted.

Appendix 3: Letter VII – Executive Education Programs from the Collective Agreement between the Faculty association and the Board of Governors of the University of Windsor (July 1 2017 – June 30, 2021)

LETTER VII -- EXECUTIVE EDUCATION PROGRAMS
from
COLLECTIVE AGREEMENT BETWEEN THE FACULTY ASSOCIATION
AND THE BOARD OF GOVERNORS
OF THE UNIVERSITY OF WINDSOR
2017 -- 2021

1. The University may operate Executive Education Programs in Business and Engineering approved by Senate and that are made up of credit courses not assignable as part of the normal workload of the member under Article 5, where the tuition fees and instructor stipends are market driven.
2. The programs are designed to meet the specific needs of professionals and business people seeking opportunities to acquire new knowledge and skills so as to enable them to improve or shift their careers and not compete with the University's academic programs.
3. With the agreement of the Faculty Association the University may operate Executive Education Programs in other fields. In such cases, Executive Education Program proposals shall be approved by the council of the contributing AAU(s) and shall be referred to the Faculty Association prior to final approval by the appropriate Senate committee.
4. Should the Faculty Association not agree to a University proposal to operate an Executive Education Program in a field other than Business and Engineering the matter may be referred to arbitration for determination of whether or not the program proposed by the University meets the criteria for Executive Education Programs referred to in this Letter VIII paragraph 2. The arbitrator shall be drawn from the panel of five (5) arbitrators referred to in clause [39:14 \(b\)](#). The University shall pay the fees and expenses of the arbitrator
5. Executive Education Programs may be delivered at various locations using diverse delivery mechanisms, including alternative learning technologies and team teaching, and at times convenient to the students including teaching evenings, weekends and in intensive periods.
6. The Board of Management is responsible for the Executive Education Programs. It has the responsibility for the business aspects of the program and it is accountable to the University's Board of Governors.
7. The Board of Management is composed of the Provost, Deans of participating Faculties, and three (3) to five (5) representatives from business, industry, and professional organizations. In addition, there shall be one (1) faculty member representing each Executive Education Program.
8. Except as otherwise provided in this Letter VIII, the Board of Management sets the terms and conditions of employment of the instructors. The Executive Education Program's day-to-day operations are conducted by an Executive Director who reports to the Provost and is a member of the Academic Advisory Council.
9. Instructors are sought in accordance with procedures agreed by the appropriate AAU(s) and may include advertising, both externally and internally in the appropriate AAU(s), and by direct solicitation. Those appointed will have relevant experience and qualifications. The appointments are agreed, in accordance with the policies of the Board of Management, by the Dean following recommendation by the AAU appointments committee in the Faculty that is responsible for the academic aspects of the program.
10. Once appointed, instructors are members of the bargaining unit. Stipends are paid per course or per part of a course, and like the fees paid by students, are market driven. The stipends are negotiated on an individual basis and are determined by the Provost, in accordance with the policies set by the Board of Management.
11. The parties acknowledge that the Executive Education Programs inure to the benefit of the University and to the members of the Faculty Association as these programs provide additional revenue to the University, additional employment opportunities to the members of the Association, and serve to further enhance the reputation of the University as an innovative institution concerned with meeting the diverse needs of our community and providing excellence in teaching, research and service. The University thus attracts increased numbers of students. The additional revenues allow the University to support faculty research and academic programs.
12. The clauses of this Agreement listed below and the terms and conditions set by the Board of Management referred to in paragraph 8 above, apply to those persons appointed to teach in Executive Education Programs. In the case of a conflict between the clauses of this Agreement listed below and the terms and conditions set by the Board of Management, the clauses of this agreement listed below shall apply: 1:01, 2:01, 3:01, [3:03, 4:01](#) – 4:05, [10:02, 10:03](#) (as to religious beliefs, doctrines and practices), [10:04, 10:05, 11:01](#), 30:01–30:08, 32:01, 32:02, [38:01–38:07](#), [39:01–39:16](#), [50:01, 50:02, 51:01, 51:02, 53:01, 53:02, 58:01](#), 61:01(a).

- 13.** Where the Faculty Association contests the interpretation and applicability of the terms and conditions set by the Board of Management and the University disagrees with the Faculty Association such disagreement shall be determined by arbitration. The arbitrator shall be drawn from the panel of five (5) arbitrators referred to in clause [39:14 \(b\)](#). The University shall pay the fees and expenses of the arbitrator.
- 14.** The University will pay a levy of five percent (5%) of the total gross stipends or fees paid to the instructors in the Executive Education Programs to the fund entitled "The Subsidy Plan for Retiree Health Benefits".

Appendix 4: Master of Mechanical Engineering (Automotive Option) Instructor Selection Criteria

Overview

The Master of Mechanical Engineering (Automotive Option) is an Executive Education Program that is offered through the Centre for Executive and Professional Education. The long-term success of this program is dependent on the reactions of students, which is directly related to the quality of instruction in the program. The overall goal of this hiring process is to select excellent instructors.

Qualifications

Instructors selected for this program will be expected to demonstrate:

- Appropriate educational qualifications as normally evidenced by a relevant Ph.D., Master's Degree and/or equivalent professional qualifications where appropriate (including a Professional Engineer designation)
- Except in exceptional circumstances, applicants should possess a proven track record of excellence in teaching at the graduate level. This would be evidenced by one or more of the following:
 - 1) Course evaluations from credit and non-credit courses,
 - 2) Qualitative student assessments,
 - 3) Client testimonials
- Appropriate subject matter knowledge/expertise. This should be evidenced by one or more of:
 - 1) Publications (refereed articles, textbooks, articles in professional journals, etc.),
 - 2) Work experience,
 - 3) Consulting experiences.
- Preference will be given to candidates who have some successful history of teaching international students and/or to a primarily international audience. This should be evidenced through either:
 - 1) A demonstrated history of international instruction, and/or,
 - 2) Successful experiences in similar or equivalent programs.
- Preference will be given to those qualified applicants who indicate an interest in teaching more than one section of the same course in one term.
- An expressed willingness to utilize non-traditional methods for student assessments.
- A willingness to learn and incorporate Blackboard into courses.
- A willingness to adapt their teaching methods and procedures to meet the unique needs of our students.