March 6, 2025

FACULTY OF ENGINEERING
MECHANICAL, AUTOMOTIVE & MATERIALS ENGINEERING

NOTICE RE GRADUATE ASSISTANT (GA) POSITIONS AVAILABLE FOR SUMMER 2025

In accordance with Article 12:01 of the CUPE 4580 Collective Agreement, the Department of Mechanical, Automotive & Materials Engineering invites applications for GA positions for the Summer 2025 term. The total number of Graduate Assistantships allocated to MAME for 2025-2026 (S25, F25, W26) is 240. It is anticipated that 80 GA positions for 140 hours each (maybe be split between courses) will be required for Summer 2025, subject to final budgetary approval and sufficient enrolment.

Expected GA duties

Assistants cannot commence their GA/TA duties until email confirmation of the approval of their contract is received from Human Resources (email titled "Authorization to Commence GA/TA Duties").

GA employees are expected to make themselves available to report for all assigned duties, **both in-person/on-campus and remote/online duties**. Most classes across the University are held face-to-face on campus or have a face-to-face component. Refer to the University's current health and safety regulations.

List of courses that may utilize Graduate Assistants for Summerer 2025 which will run from May 1, 2025 – August 31, 2025:
Students CANNOT serve as the GA for a course they are also registered in.

Course # and Name	Course Description	R=Required / P=Preferred Skills	Projected # of GAs
AUTO-8015-01/ Automotive Body Structures and Components	This course will look at body and chassis types, construction methods and materials including steel, aluminum, magnesium, fiberglass and carbon fibre and the relative merits of each including basic calculations. It will include structural analysis using finite element analysis (FEA) software. The rationale for the use of various materials and their relative merits including cost, weight, manufacturability, and properties will be discussed. The influence on occupant safety, comfort, and vehicle acoustics (NVH), ride and handling, crashworthiness, and durability of different types of vehicle powertrain components, battery packs and vehicle payloads will also be described.	P - Previously GA'd the course	0.5
AUTO-8025-01/ Sensors and Controls for Evs	Connected, autonomous, secure, and electric vehicles require an extensive suite of sensors, software, and controls for safe, efficient, and reliable operation. This course examines advanced driver assist systems, SAE J1939 CAN Bus communications, high voltage interlock loop (HVIL) safety systems, sensors, optics & lighting, image representation, feature extraction, image analysis, image classification, 3D imaging techniques, GPS, radar, lidar 3D range imaging, intelligent and night vision, sensor integration and fusion.	P - Previously GA'd the course	0.5
AUTO-8030-01/ Engineering Project Management, Automotive Lean and Quality Processes	This course will examine the basic principles and tools used in engineering project management through topics such as project scope definition, consideration of time, cost, risk, procurement, and stakeholder management. The course will also review topics associated with the principles of process management used in lean manufacturing (the 5 Lean Principles, House of Value and 6S attributes) and specialized automotive quality processes such as design failure modes and effects analysis (DFMEA), production part approval process (PPAP). and advanced product quality planning (APQP) that are used in the auto industry to ensure on-time delivery of the right product with the right attributes, overall product quality and sound financial management of product development processes. Principles, methods, and best practices (such as life cycle analysis), Poka-Yoke design, design for manufacturability and assembly (DFMA) that are used by industry to reduce waste and operate more efficiently will also be covered.	P - Previously GA'd the course	0.5

Course # and Name	Course Description	R=Required / P=Preferred Skills	Projected # of GAs
AUTO-8040-01/ Vehicle Propulsion	This course will provide an examination of propulsion systems such as clean burning IC engine propulsion, electric vehicle (EV) propulsion (battery, hybrid, plug-in hybrid) and fuel cell electric vehicle propulsion. Topics will include combustion processes and pollution prevention for IC engines, and chemical and material properties and processes for electric propulsion along with key performance metrics. Charging systems and their integration with, and influence on, the electric power grid and potential future developments will be reviewed.	P - Previously GA'd the course	0.5
AUTO-8050-01/ Vehicle Energy and Thermal anagement	This course will examine control of the passenger compartment environment, occupant comfort and powertrain thermal management for different types of propulsion (i.e. internal combustion engines, battery electric engines, hybrid, and hydrogen fuel cells) along with energy management topics as it relates to vehicle energy and thermal management. Software will be introduced to aid with system and component sizing and performance calculations.	P - Previously GA'd the course	0.5
AUTO-8060-01/ Powertrain Systems	This course will provide an in-depth examination of vehicle electric drive systems including e-motors and motor controllers operating at different voltage levels, various types of batteries, (cell formats and chemistries and new concepts such as solid state batteries) and performance metrics including cruise and acceleration, range calculations and influences on each component using representative software to model E-motor materials, magnet design, gearboxes, EV powertrain component manufacturing processes, on-board safety and safety in energy storage for EV and hydrogen as well as component manufacturing, will also be discussed.	P - Previously GA'd the course	0.5
AUTO-8070-01/ Manufacturing and Robotics Fundamentals	This course introduces the basics of robotically assisted manufacturing by examining the modeling, design, planning, and control of robot and manufacturing systems. Global robotic specifications (GRS) will be introduced at a high level. In addition, students will learn to develop multi robots work-cell construction as an introduction to dexterous manipulation (DM) using an advanced DM work-cell design.	P - Previously GA'd the course	0.5
ELEC-4100-60/ Industrial Control Systems	This course provides the fundamentals of industrial Control Systems (ICS). The subject covers in-depth principles of Distributed Control Systems (DCS), Supervisory Control and Data Acquisition (SCADA), and Programmable Logic Controllers (PLC). Students will undertake project work to design an industrial process automation solution.	P - Previously GA'd the course	0.5
ELEC-4490-60/ Sensors and Visions Systems	Basics of sensors and transducers; sensor characteristics and applications; fundamentals of pressure, temperature, displacement and position sensors; accelerometer physics, strain gauges, and torque sensors; machine vision; image processing, image enhancement, edge and corner detectors; image segmentation techniques; image feature extraction and matching; colour models and processing; object recognition and classification; discussion on camera parameters and calibration; stereo vision, 3D range imaging techniques.	P - Previously taken or GA'd the course	0.5
GENG-4210-01/ Engineering & Society	The technology-society relationship in a historical context; the nature of technological change and its consequences; the engineer's role in the control of technology and sustainable development; the responsibility of engineers for health and safety in the workplace, including OHSA, WHMIS. The development of the engineering profession; professional registration and the code of ethics; the duties and responsibilities of engineers; the engineer and the law.	R - Familiarity with Canadian law and Ontario as well Professional Engineer licensing requirements. P - Previously taken or GA'd the course	5.5
GENG-4600-60/ Introduction to Robotics	This course is an introduction to robotics modeling, dynamics, and control of robotic manipulators and industrial motion control. Students study Kinematics and Dynamics of Machines and will be exposed to principles of the geometry of motion, Uniform and non-uniform motion, linkage, gears, cams. Students will be exposed to the operation, programming and applications of a typical industrial robot using the actual and simulation tools. Hands-on activities will include manual teach programming, testing with simulation software and programming of advance movements.	P - Previously taken or GA'd the course	0.5

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GENG-4800-60/ Capstone Mechatronics / Biomedical	Team based design project satisfying the "CAPSTONE DESIGN PROJECT REQUIREMENTS", available from the Bachelor of Engineering, Mechatronics Stream Engineering. Gives the student significant design experience and builds on the knowledge and skills acquired in earlier course work. This course provides an exposure to teamwork so as to emulate a typical professional design environment. Computers are to be used both in the execution of the design methodology and the management of the design project	P - Previously GA'd the course preferred	0.5
GENG-8050-40/ Data Analytics and Decision Making	This course introduces fundamental concepts of data analytics and their application in decision making. The emphasis is on the utilization of practical analytics tools in a complex engineering management environment. Topics covered may include: development and validation of decision-making models, data-based decisionmaking skills, decision variables and constraints identification, sensitivity analysis, optimization and predictive analysis. Students in this class will learn how to make evidence-based management decisions and develop recommendations based on data.	P - Previously GA'd the course preferred	0.5
INDE-3020-01/ Health, Safety and HF	Fundamentals of manufacturing safety and health are studied to provide manufacturing engineers with the knowledge to effectively incorporate design solutions for health and safety considerations in the workplace. Human capabilities and limitations in the industrial workplace are also assessed and taken into account when implementing design solutions. Topics will include: machine guards, confined space protocol, accident losses, prevention, liabilities and the Workplace Safety and Insurance Board by-laws, the Ontario Occupational Safety and Health Act, and related standards and codes. Also addressed are ergonomic issues such as the design of the workplace and environment, design of display and control systems and human factors in expanding technology.	P - Previously taken and passed Health, Safety and Human Factors (0691-302) course or equivelent	1
INDE-3110-01/ CAD/CAM	This courses focuses on CAD/CAM from theory to practice. Basic and generic design principles and tools are introduced and the course material is complemented with significant hands on practice and engineering applications. Students will learn modelling strategies, and advanced computer aided engineering design, analysis, manufacturing and measurement tools. Topics include: Solid modelling, GD & T, tolerance stack ups, assembly modelling and mechanism analysis, process planning, CNC code generation, tool path optimization and principles of measurement.	R - CAD Expertise in Solidworks, and ideally some CAM expertise P - Previously taken or GA'd the course.	1
INDE-3270-01/ Product Quality and Reliability	Impact of quality on manufacturing processes and product design. Methods and theories of statistical process control. Control charts for attributes and for variables. Process capability analysis and six-sigma method. Acceptance sampling and sampling standards. Reliability engineering and various failure models. Failure modes and effects analysis (FMEA). Taguchi method. Product design and quality function deployment (QFD). ISO 9000/ QS 9000 standards. Total Quality Management (TQM) method.	R - knowledge of statistics and experience with Quality issues required	1
INDE-3910-01/ Supply Chain Eng	This course explores the basic concepts of managing the flow of materials in a typical enterprise supply chain. This includes the design and operation of manufacturing and warehousing facilities. Students will examine a complete overview of material and information flow, from internal and external suppliers, to and from the enterprise. Topics covered include: basic elements of the supply chain; planning and managing inventories in supply chains; just-in-time; enterprise resource planning; demand and aggregate planning; the analysis of logistics capabilities and transportation issues; and interrelationships among customer service. The impact of e-commerce on supply chain management is also included. The students have the opportunity to explore and use SAP and other software packages.	R - Knowledge of Operational Research and supply chain mangement required.	1
INDE-8210-01/ Industrial Exp. & appl Stats	Distributions of functions of variables, estimations and tests of hypotheses, power of tests, non-parametric tests, sampling techniques, analysis of variance, randomized blocks. Latin squares and factorial experiments.	R - knowledge of statistics and experience with Quality issues required	1

Course # and Name	Course Description	R=Required / P=Preferred Skills	Projected # of GAs
INDE-8360-01/MECH-8290-09 Computer-Aided Design (CAD)	This course in CAD/CAM/CAE is directed towards students preparing to work as technical professionals and mechanical designers in industry. This course is based on from theory to practice and discusses important integration issues and approaches. The lectures present basic and generic principles and tools; this is supplemented with significant hands-on practice and engineering applications. Much of the learning will result from "hands-on" experience operating CAD software and learning the machining tools and a bit of programming (CAM) as well.	R - Familiar with CAD software such as Solid works or NX required	1
INDE-8420-01/ Supply Chain Management and Logistics	This course covers the major issues associated with the management of Supply Chain and Logistics, covering both technical and managerial issues with emphasis on the analytical decision support methods and tools. Topics include supply chain network design, inventory models and theories, transportation and logistics planning, outsourcing and pricing, and case study.	R - Knowledge of Operational Research and supply chain mangement required.	1
INDE-8900-22/MECH-8290-17 Additive Manufacturing	3D Printing, or additive manufacturing (AM), has captured the world's imagination. Complex component designs in the aerospace and medical industries, jewelry designs, fashion, archeological artifact reconstructions have all shown to be exciting growth areas for AM solutions. However, it is perceived that intricate designs can be 'done in one' using a one-button fabrication process, but the reality is not so optimistic. This course will introduce you to the AM process family, the workflow, materials, and system infrastructure requirements. Design for Additive Manufacturing and process planning elements will be covered. This course is designed to introduce several AM processes, providing a basic scientific understanding of the possibilities and limitations. Students will be exposed to several slicer software tools. Students should have CAD skills.	R - CAD skills, CURA / Slicer software skills, powder bed fusion & stereolithography experience, GD & T & some machining / manufacturing knowledge required. P - Knowledge of Insight / Prusa slicer software skills preferred. P - Previously taken or GA'd the course	0.5
MATL-8802-01/ Phase Transformations	Phenomenological treatment of transformation processes; diffusion controlled and diffusionless (martensitic) transformations; application of thermodynamic and phenomenological rate laws to transformations: nucleation, recrystallization, precipitation, spinoidal decomposition, ordering, eutectoid decomposition, etc. (3 lecture hours a week.)	P - Previously taken or GA'd the course.	0.5
MATL-8890-06/MECH-8290-06 Failure Analysis	Failure analysis consists of the investigation of the physical features and rationalization of causes of engineering component failure. A failure analysis is often performed with the general objective to avoid recurrence of similar engineering failures. Brittle fracture and fracture under alternating loading conditions (fatigue) are usually the most serious type of failure and will be studied in this course in detail. Understanding of why a component failed involves the use of engineering principles and analytical tools. For this reason, the course starts with an introduction to the fundamental equations of fracture mechanics and continues with explanation of failure mechanisms and concludes with methods of selecting materials that are strong and tough.	P - Previously taken or GA'd the course.	0.5
MATL-8890-22/MECH-8290-82 Corrosion & Preventions	The course is to provide graduate students in Faculty of Engineering with a comprehensive understanding of corrosion principles and prevention in general and automobile as example. The course firstly covers introduction to corrosion principals, forms of corrosion, corrosion properties of materials, and corrosion prevention. Special emphasis is also placed on topics about build-up of the corrosive environment, corrosion of special areas in motor vehicles, and corrosion prevention through engineering design and coating processes. Students will be able to appreciate automotive corrosion mechanism, evaluate corrosion properties of materials and coatings, and particularly conduct a 'good' structure design for automotive corrosion prevention. Coating technologies (printing and plating) will be presented for the purpose of battling the corrosion for automobile.	P - Previously taken or GA'd the course.	0.5
MECH-3215-01/ Mechanical Vibrations	Free, damped, and forced vibration of single and multi-degree of freedom systems with discrete masses. Exact and approximate methods of solution. Vibration isolation, vibration transducers, use of computers in vibration analysis. (Prerequisite: MECH-2210 and Semester 6 or higher standing.) (3 lecture, 2 tutorial hours a week.)	P - Previously taken this course or similar vibrations course preferred	1.5

Course # and Name	Course Description	R=Required / P=Preferred Skills	Projected # of GAs
MECH-3217-01/ Applied Thermodynamics	Ideal gas mixtures and psychrometrics. Reacting mixtures and combustion. Power cycles, refrigeration and heat pump cycles.	P - Previously taken or GA'd the course is preferred.	5
MECH-3220-01/ Fluid Mechanics II	Navier-Stokes equations and some exact solutions, external flows boundary layer over a flat plate, drag forces; turbulent flows in pipes and mixing length theory, flow measurement, compressible flows and introduction to potential flows.	R - Previously taken a course in Fluid Mechanics, Experience working in the lab, running experiments and equipment and good communication skills are required	0.5
MECH-3221-01/ Control Theory I	Control system concepts, linear modelling and analysis of response and stability of physical systems, complex variables and Laplace transforms, frequency, and transient response analysis and performance specifications. (Prerequisites: 62-215 and 62-216.) (3 lecture hours, 1 tutorial hour a week.)	R - Familiarity with electrical, mechanical, fluid dynamics and kinematics modeling; Familiarity with control theory concepts (state-space systems, Laplace transform, bode plots, PID controllers, stability, accuracy, vibration), familiarity with MATLAB and SIMULIN required. P - Previously taken or GA's this course or similar course preferred	4.5
MECH-3228-01/ Heat Transfer	Introduction to the three heat transfer modes: conduction, convection, and radiation. Application of heat exchange equipment.	R - Proficiency with the three modes of heat transfer: conduction, convection, and radiation and must be familiar with COMSOL Multiphysics is required. P - Previously taken or GA's the course is preferred.	4.5
MECH-3430-01/ Automotive Engineering Fundamentals	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.	R - Must have hands on experience with internal combustion engines, including their disassembly. Basic understanding and knowledge of all major systems in automotive engineering, including ICEs, electric propulsion, manual/automatic transmissions, steering, suspension, brakes, body, and chassis. P - Previously taken MECH-8030 or MECH-3430, or GA'd either course in the past. P - Previously taken or been a GA for the course is strong asset.	2
MECH-3670-01/ Aerospace Engineering Fundamentals	History of flight and aircraft evolution. Aircraft operating principles. Airfoil and wing aerodynamics. Aerospace propulsion systems (turbojets, turbofans, turboprops, and rockets). Lab on performance estimation and measurement for a turbojet engine. Aircraft design. Weight estimation. Aircraft systems. Aircraft materials and structures. Governance of aviation in North America. Design studies of aircraft or spacecraft and/or components thereof.	R - Experience in aerodynamics at the graduate level preferred; strong background in undergraduate aerodynamics and thermodynamics required.	0.5
MECH-3830-01/ Materials & Their Properties	The relationship of the engineering properties of materials to their atomic structure, bonding, crystal structure, imperfections and microstructure. The processing of materials to produce required structure and properties. Includes consideration of crystal structure determination, phase diagrams, diffusion, phase transformations, solidification, heat treatment and deformation. The laboratory is a term-long project designed to familiarize students with the use of materials-related equipment commonly found in industrial and research laboratories.	R – Engineering Materials background is essential. Knowledge of XRD, SEM analyses and revealing microstructures through metallography sample preparation are also required. P - Previously taken the course is preferred	0.5
MECH-4200-01/ Mechanical Capstone Design	Student design teams, operating within a "company" environment, utilize the broad range of their undergraduate experience in interdisciplinary projects selected to promote interaction between the mechanical, automotive, and materials programs. Design methodologies and team interaction simulate future professional practice. Project milestones include: a design proposal with cost analysis and scheduling, construction and commissioning of the designed appartus, and a final report and presentation having both global and detail completeness.	P - Previously taken or GA'd the course is preferred	4

Course # and Name	Course Description	R=Required / P=Preferred Skills	Projected # of GAs
MECH-4212-01/ Mechatronics	Review of electromechanical components. Practical application of microcontrollers in electromechanical systems. Use of infrared sensors, photoresistors, operational amplifiers, timers, servomotors, and analog/digital converters in mechatronics systems. A hands-on, laboratory-based course.	R - Familiar with sensors, actuators and microcontroller programming required. P - Previously taken or GA'd this course preferred	1
MECH-4221-01/ Machine Design II	Gearing and gear trains: spur, helical, worm, and bevel gears. Clutches, brakes, couplings, flywheels. Chain and belt drives. Design of shafting. Student-developed software to support mechanical design.	Required - Mechanical Engineering UG degree with experience in machine dynamics, FEA and the design of brakes, clutches, ball bearings, roller bearings, flat belts, v-belts, timing belts, chains, compression and extension springs, bevel, helical, and spur gears. P - Previously taken or GA'd this course preferred	4
MECH-4240-06/MECH-4850 Welding Engineering	Design and qualification of arc welding procedures to met the requirements of the ASME Boiler and Pressure Vessel Code. Arc welding processes, weld discontinuities, mechanical and non-destructive testing. Welding metallurgy, base and filler metal classification. Control of hydrogen-assisted cracking, preheat and postweld heat treatment. Fabrication issues. Canadian and international welding codes.	P - Previously taken or GA'd this course preferred	0.5
MECH-4240-61/ Biomedical Instrumentation	This course will expose students to various principles, concepts, and instruments utilized in Biomedical Engineering Technology fields. This course will include topics such as medical device certification, Biomedical Engineer Technology certification, the analysis of various medical devices and the evolution of the Biomedical Engineering Technology industry. The students will be engaged in working on various assignments to develop an understanding of Biomedical instruments and certification related activities.	P - Previously taken or GA'd this course preferred	0.5
MECH-4255-01/ Environmental Effects/Control of Noise	Physical properties of sound and noise, measurement of noise, noise control, hearing characteristics and environmental effects of noise.	R - Must have taken the undergraduate noise course or equivalent graduate noise class. There is a lab component so experience with sound acquisition equipment is essential. P - Previously taken or GA'd this course is preferred.	2
MECH-4258-01/ Computational Fluid Dynamics - CFD	Fundamentals of finite volume methods for problem solving in fluid flow and heat transfer, using CFD computer programs.	P - previously taken or GA'd the course preferred	0.5
MECH-4259-01/ Computer Aided Engineering - CAE	Three-dimensional graphics; fundamentals of finite element methods for problem solving in heat transfer, solids, and trusses using finite element computer programs.	R - Proficient with CATIA software is essential. P - Previously taken or GA'd this course preferred	4.5
MECH-4440-06/ Advanced Vehicle Dynamics	This senior undergraduate course will focus on vehicle dynamics objective and subjective evaluation, highlighting their importance in the automotive product development cycle. Students will be introduced to vehicle modeling software and conduct offline simulations in combination with objective and subjective evaluations as they learn to address vehicle design objectives. Industry guest lectures and local facility tours are also integral to the course content. (Integrated lecture/lab 3 hours per week; prerequisite MECH-4463 Vehicle Dynamics)	R: Must have taken vehicle dynamics course(s); experience with vehicle dynamics modeling/simulation software P: Experience/knowledge of CarRealTime software	0.5
MECH-4467-01/ 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.	R - Extensive experience in programming with FlowMaster software and Substantial knowledge in Radiator and A/C design and analysis projects required. P - previously taken or GA'd the course preferred	0.5

Course # and Name	Course Description	R=Required / P=Preferred Skills	Projected # of GAs
MECH-4469-01/ Sustainable Propulsion	This course devThis course develops a fundamental understanding of the theory and practice of sustainable propulsion systems for automotive applications. A concise review of energy sources suitable for automotive applications will be introduced, with a focus on the impact of fuel energy density on its real-world applications. Critical concepts and issues of advanced clean combustion strategies will be studied along with their applications in modern internal combustion engines, including fuel properties, lean-burn stoichiometry, fuel injection systems, combustion systems, turbocharging, and other aspects of engine design and performance evaluation. The development trend of future propulsion systems will be discussed, including powertrain electrification, fuel cell systems, battery motor systems, smart hybridization, and the application of carbon-neutral renewable fuels.	R - Fundamental understanding of transportation energy utilization, energy transitions, and internal combustion engines. Experience with engine control and emission equipment, setting up and running engine experiments. P - Previously taken or GA'd the course preferred.	0.5
MECH-4671-01/ Aerodynamics and Performance	Aerodynamics and Performance Analysis of aircraft configurations. Viscous and compressibility effects. Maneuvering loads and load factors; implications of maneuverability on thrust requirements. Aircraft stability and control.	R - Previously taken MECH-4671 with familiarity in Aircraft dynamics, equations of motion, modeling, and stability analysis, Familiarity with Fluid Mechanics, Aerodynamics concepts including subsonic incompressible flows, viscous flows, and boundary layers as well as working knowledge of Xfoil and AVL software by Mark Drela, and AeroConsole by Dr. Rahimi are required	0.5
MECH-4672-01/ Flight Dynamics and Control of Unmaned Arial Vehicles (UAV)	Flight Dynamics and Control of Unmanned Arial Vehicles (UAV) Flight dynamics modeling for fixed-wing and rotor aircraft. Low-Reynolds number considerations applicable to unmanned aerial vehicles (UAVs). Control theory and state-space control schemes. State-space controller design for UAVs. Lab(s) involving virtual and/or physical UAV model control.	R - Familiarity with aircraft and UAV dynamics and kinematics control concept, MATLAB and SIMULINK, estimation theory and filtering (Kalman Filter)	0.5
MECH-4820-01/MATL 8890-05 Ceramic Materials	Uses of traditional and advanced ceramics. Monolithic and composite ceramics. Comparison of ceramics with metals and alloys. Processing: raw material preparation, forming techniques, theory and practice of sintering, quality control. Properties: modulus of rupture, creep, corrosion, erosion, and electrical, magnetic and optical properties.	P - Previously taken or GA'd this course preferred	0.5
MECH-8240-01/ Applied Finite Element Analysis	This course focuses on the modeling aspects of the finite element method using three well known commercial Finite Element Analysis (FEA) software packages known as DYNA, IDEAS and ANSYS. A variety of stress analysis problems in two and three dimensions are studied and the accuracy of the simulations are assessed through comparison with available theoretical and experimental results. Both static and dynamic situations are covered. The students are expected to prepare a final report summarizing their work and an oral presentation	P - Previously taken or GA'd the course	1
MECH-8290-26/ Introduction to Nano Engineering	The course covers backgrounds, principles, manufacturing, implementation, and applications of nanoengineering. The students will review the fundamentals of micro/nano-electromechanical devices, micro/nano-fabrication, nanoelectronics, nanomaterials, nanostructures, nanofluidics, and emerging applications of nanoengineering.	p- Familiarity with MEMS/NEMS, Micro/Nano-fluidics p- Previously taken or GA'd the course	0.5
MECH-8290-44/ Vehicle Dynamics	An introduction to the development of mathematical models of vehicle motion. Simple models that are suited for algebraic manipulation, allowing qualitative characterization of vehicle behaviors, and more complex models, intended for numerical simulation, for precise quantitative predictions will be covered using Altair MotionView® Software. The effects of linear vs nonlinear models will be discussed. The course begins with an introduction to tire modelling, and proceeds to cover longitudinal, lateral, and vertical dynamics. Vehicle accelerating performance, stability and ride quality will be discussed, along with vehicle response to driver and road inputs.	R - familiar with multibody dynamic concept P - Previously taken or GA'd the course, Mechanical Engineering background	0.5

Course # and Name	Course Description	R=Required / P=Preferred Skills	Projected # of GAs
MMCE-8820-01/ MMCE-Introduction to Materials Engineering and Chemistry	**An introduction to topics in materials science and solid-state chemistry are discussed with an emphasis on the relationship between the material structure and its physical, optical, and electrical properties. The topics covered include solid-state materials, crystalline materials, amorphous materials, metals, magnetic materials, polymers, semiconductors, microelectronics, and nanomaterials. The use of these materials in applications is discussed**	**P - Previously taken or GA'd the course**	**0.5**

Refer to the timetable (www.uwindsor.ca/registrar/timetable-information) for class and exam hours and location.

Eligibility requirements:
GA appointments shall be offered in accordance with the criteria specified in Article 12:03 of the Collective Agreement. Note that the number of G.A. positions for each course is determined by the enrolment in the course, instructor requests and laboratory requirements. In addition, previous experience of applicants in courses posted will be taken into consideration. Students must maintain fulltime registration throughout the term and must be in good standing in the degree program in order to hold a Graduate Assistantship. Students who meet the Phase I tuition refund deadline are therefore not eligible to hold a GA. A full graduate assistantship requires an average of 10 hours per week for a maximum of 140 hours per semester. Refer to Articles 12, 13, and 14 of the Collective Agreement for eligibility details.

All Graduate Assistants must meet the specific requirements related to the duties listed with the course(s) above.

"With respect to those students who have applied for and been accepted for Assistantships, the Assistant will not be paid for any shortfall of hours at the end of their respective program, provided the University has satisfied its obligation to post available positions each term in writing and on the AAU website and to offer the minimum terms of support in accordance with Article 13:01 (a) & (b) and provided that the Assistant has applied in writing or via e-mail by the application deadline for each term until they have received the minimum terms of support in accordance with Article 13:01 (a) & (b)."

In pursuit of the University of Windsor's Employment Equity Plan, members from the designated groups (Women, Aboriginal Peoples, Visible Minorities, Persons with Disabilities, and Members of Sexual Minorities) are encouraged to apply.

Online applications, submitted through Qualtrics link -
https://uwindsor.ca1.qualtrics.com/jfe/form/SV_5tnxeupB2JpKMWG

Ms. A. Haskell,
MAME Department, Room 2166 CEI

Deadline for completing the online application –8:30am – Monday, March 17, 2025

Dr. Minaker
Head