DEPARTMENT OF ELECTRICAL & COMPUTER ENGINEERING

NOTICE RE: GRADUATE ASSISTANT (GA) POSITIONS AVAILABLE FOR SUMMER 2024

In accordance with Article 12:01 of the CUPE 4580 Collective Agreement the Department of Electrical & Computer Engineering invites applications for GA positions for the Summer 2024 term.

The total number of projected Graduate Assistantship positions for Summer 2024 is 84 GAs for a total of 11,760 hours. All positions are subject to sufficient enrolment and final budgetary approval.

List of courses that may utilize Graduate Assistants for the Summer 2024 term which will run from May 1, 2024 – August 31st, 2024:

Course # and course name	Course Description	E = Essential Qualifications P = Preferred Qualifications	Projected # of GAs
GENG 1202 Introductory Electrical and Computer Engineering TBD	This course introduces the fundamentals of electrical and computer engineering, including introductory selected topics on circuit elements and analysis, semiconductor devices, optical devices, sensors, electric motors, operational amplifiers, and logic gates. (Open only to students in Engineering)	E - must be familiar with all circuit lab equipment and tools and all electrical components. This includes but not limited to Oscilloscopes, DC power supplies, function generators, Multimeters, Resistors, Capacitors, OpAmps and instrumentational amplifiers, DC motors, Sensors, RF systems, Solar cells, etc. E - Must be physically available for the entire duration of the term from May to August. E - Must not have any scheduling conflict with any of the timeslots associated with this course. P - Previously taken or GA'd the course	7
GENG 2340 Electrical and Computer Fundamentals Dr. Caniggia Viana	Basic components of electric circuits; circuit laws and theorems; circuit analysis techniques; energy-storage elements; transient response of first and second-order circuits. (3 lecture, 3.0 laboratory/tutorial hours a week.) (Credit cannot be obtained for both GENG-2340 and ELEC-2140).	P - Previously taken or GA'd the course	6
GENG 8010 Engineering Mathematics TBD	The course will cover topics in advanced modern engineering mathematics not addressed in earlier courses and considered to be crucial for more advanced engineering courses at the graduate level. These topics include matrix and numerical analysis, advanced topics in calculus and their application to engineering design problems, and optimization. In particular tools for computer-based system modelling, analysis and engineering design will be addressed. (Open to Masters of Engineering students, excluding students in the MEng Auto Program. Open to engineering MaSc/PhD students on permission of the department/faculty as a qualifying course only. Will not count for credit towards MASc/PhD degree.)	P - Previously taken or GA'd the course	11

GENG 8030 Computational Methods & Modeling for Engineering Applications TBD	This course covers the basics of computational analysis for real-world engineering applications. Students will learn the fundamentals of programming and modeling with MATLAB. Topics include: Computational Methods, Model Building, for Engineering Projects, Hardware for Real-time Testing, Data Acquisition from Sensors. Students will complete a real-world project in the areas of their interests.	P - Previously taken or GA'd the course	8
ELEC 3030 Physical Electronics Dr. Sazzadur Chowdhury	This course covers crystal structures. properties of semiconductor materials. Schrodinger wave equation. energy band theory. intrinsic and extrinsic semiconductors. charge carriers in semiconductors. thermal equilibrium carrier concentrations. carrier transport mechanisms. non-equilibrium excess carriers in semiconductors, Metal-Oxide-Semiconductor Field-Effect Transistors (MOSFET), and Bipolar Junction Transistors (BJT). (Prerequisites: MATH-2780 and MATH-2790) (3 lecture, 2 laboratory/tutorial hours or equivalent a week.)	P - Previously taken or GA'd the course	4
ELEC 3240 Control Systems I TBD	Transfer function and state-space model for linear time-invariant systems; linearization of nonlinear systems; controllability and observability; transient performance; stability; tracking performance; Proportional-Integral-Derivative (PID) control design; frequency response and root locus (Prerequisites: MATH-2780, MATH-2790, ELEC-3130.) (3 lecture, 1.5 laboratory hours and 1.5 tutorial hours a week.)	P - Previously taken or GA'd the course	4
ELEC 3270 Microprocessors Dr. Roberto Muscedere	Microprocessor systems (8 and 16 bit) and architecture; data representations, arithmetic units; memory structures; complex instruction set; accumulator, index, and memory reference instructions; addressing modes; stacks, subroutines, and other instructions; interrupts and timing; interfacing I/O devices and data converters; software development systems and assemblers; code implementation on microcontrollers. (Prerequisites: MATH-2780, MATH-2790, ELEC-2170, ELEC-3160 and ELEC-3300.) (3 lecture, 3 laboratory/tutorial hours or equivalent a week.)	P - Previously taken or GA'd the course	4
ELEC 3290 Analog Communications Dr. Esam Abdel-Raheem	Analog communication systems; information measure; signals and noise; Fourier transform and spectra; bandwidth of signals; analog modulation and demodulation systems; AM, FM, TV transmitters and receivers, detector circuits. (Prerequisites: MATH-2780, MATH-2790 and ELEC-3160.) (3 lecture, 1.5 laboratory hours and 1.5 tutorial hours a week.)	P - Previously taken or GA'd the course	4
ELEC 4000B Capstone Design Project Dr. Roberto Muscedere	Team based design project satisfying the "CAPSTONE DESIGN PROJECT REQUIREMENTS", available from the Department of Electrical and Computer Engineering. Gives the student significant design experience and builds on the knowledge and skills acquired in earlier course work. 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. (Prerequisites: completion of all Electrical Engineering courses from 1st year, 2nd year and 3rd year.) (6 laboratory hours per week; that must be	P - Previously taken or GA'd the course	5

	completed over two consecutive winter and summer terms.) 2 semester course.		
ELEC 4320 EM Waves & Radiating Systems Dr. Rashid Rashidzadeh	Maxwell equations; time varying potentials; time harmonic fields; electromagnetic wave propagation; wave polarization; power and Poynting vector; transmission lines; Smith chart; rectangular waveguides; waveguide current and mode excitation; dipole antenna; small loop antennas; antenna characteristics; antenna arrays. (Prerequisites: completion of all Electrical Engineering courses from 1st year, 2nd year and 3rd year.) (3 lecture, 2 tutorial hours a week.)	P - Previously taken or GA'd the course	5
ELEC 4330 / ELEC 8900-42 Digital Integrated Circuit Design (Cross-Listed) Dr. Chunhong Chen	Physics and modelling of MOSFETs; fabrication and layout of CMOS integrated circuits; the CMOS inverter: analysis and design; switching properties of MOSFETs; static logic gates; transmission gate logic circuits; dynamic logic circuit concepts; CMOS dynamic logic families; CMOS differential logic families; design methodologies and CAD tools; deep-submicron implementations. (Prerequisites: completion of all Electrical Engineering courses from 1st year, 2nd year and 3rd year.) (3 lecture, 2 laboratory/tutorial hours or equivalent a week.)	P - Previously taken or GA'd the course	1
ELEC 4390 / ELEC 8900-49 Multimedia Systems (Cross-Listed) Dr. Hon K. Kwan	Multimedia signals: Audio fundamentals; the Human visual system and perception; multimedia data acquisition. Multimedia signal compression: Transforms and subband decomposition; text representation; digital text, audio, image, and video compression. Multimedia signal processing: Digital audio, image, and video processing. Multimedia systems. (Prerequisites: completion of all Electrical Engineering courses from 1st year, 2nd year and 3rd year) (3 lecture, 2 laboratory/tutorial hours or equivalent a week.)	E – Previously taken ELEC 4390 or ELEC 8900-49 with a minimum grade of 85% P – Previously GA'd the course	2.5
ELEC 4470 / ELEC 8900-70 Computer Networks Security (Cross-Listed) Dr. Shervin Erfani	Introduction to computer networks security; cryptography; public-key and secret key encryption; encryption algorithms; network security mechanisms and techniques; security protocols; authentication and network security services; traditional and emerging Information Technology (IT) security; cyber-security. (Prerequisites: completion of all Electrical Engineering courses from 1st year, 2nd year and 3rd year.) (3 lecture, 2 laboratory/tutorial hours or equivalent a week.)	P - Previously taken or GA'd the course	14
ELEC 4480 Digital Computer Architecture TBD	Computer Organization and architecture (32 bit); computer abstraction; reduced instruction set; high level to assembler level language translation; pipelinable instruction set architectures; speculation and branch prediction; instruction level parallelism; memory hierarchies, and virtual memory; secondary storage and I/O; multithreading, multicore, multiple CPU, and clustering; Graphics Processing Unit (GPU). (Prerequisites: completion of all Electrical Engineering courses from 1st year, 2nd year and 3rd year.) (3 lecture, 3 laboratory/tutorial hours a week.) Credit	P - Previously taken or GA'd the course	1
ELEC 4600/ELEC 8900-51 Power Systems II	Advanced analytical tools; analysis of abnormal operation, numerical methods, stability and control; transient stability and voltage stability; control and monitoring of power	P - Previously taken or GA'd the course	3

Cross-listed TBD	systems; dynamics and control of multi-machine systems; symmetrical faults; symmetrical components; unsymmetrical faults; power system protection and relaying; economic dispatch; optimal power flow; numerical simulation tools in power systems. (Prerequisites: 88-450 and completion of all Electrical Engineering courses from 1st year, 2nd year and 3rd year.) (3 lecture, 2 laboratory/tutorial hours or equivalent a week.)		
ELEC 8540 Automotive Sensor Systems Dr. Jonathan Wu	This course describes topics on 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. The students will apply their theoretical knowledge to solve a practical problem by completing a course mini-project. Prerequisite: Graduate Student Status. (3 lecture hours per week.)	P - Previously taken or GA'd the course	2
ELEC 8900-56 Special Topics: Automotive Mechatronics TBD	Overview of automotive powertrain mechatronics; sensors and actuators embedded in advanced IC engine powertrain systems; advanced spark ignition engine operation and electronic control; advanced compression ignition engine operation and electronic control; E-motor operation and control; energy storage and charging systems.	P - Previously taken or GA'd the course	0.5
ELEC 8900-82 Special Topics: Energy Conversion and Management in Electric Vehicles TBD	This course will cover various energy conversion modes such as AC/DC, DC/DC, AC/AC, Electro-Mechanical, ElectroThermal, etc. that take place in an electric vehicle. The course will focus more on state-of-the-art electric vehicle power electronics, energy storage technologies and their controls. It will also focus on operation, modeling and design of power electronic converters, control methods for e-drives, energy management strategies including battery packs, sensors, passive components, etc. It will explain challenges towards efficiency and reliability improvement of such systems, practical solutions and sample hardware implementations in electric vehicles. The knowledge can also be applied to various industrial applications where such energy conversion takes place.	P - Previously taken or GA'd the course	2

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

Expected GA 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 current health and safety regulations.

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").

Eligibility requirements:

Successful applicants must be available to attend at the specified time of the course/lab/exams and to report for all assigned duties, which may include both in-person/on-campus and remote/online duties.

GA appointments will be offered to qualified applicants in accordance with the criteria specified in Article 12:03 of the CUPE4580 Collective Agreement.

To be eligible for a Graduate Assistantship you must be a **registered fulltime graduate student**:

- must be registered for the term of work at the time of hiring
- must maintain **fulltime** registration throughout the term and must be in good standing in the degree program

GA appointments cannot exceed **140 hours total for the Summer term period (May 1st to August 31st).** Refer to Articles 12, 13, and 14 of the CUPE 4580 Collective Agreement for eligibility details.

Required Essential Qualifications:
Successful applicants must meet all essential qualifications identified in the course table above.

Application forms are available from the following webpage: Employment | Electrical and Computer Engineering (ECE) (uwindsor.ca)
Complete applications form along with a copy of your unofficial transcript must be submitted via email to Danielle Gauthier, Graduate Secretary at gradece@uwindsor.ca
For any questions please contact: Danielle Gauthier

Deadline for receiving applications: Friday, March 22nd, 2024

Note that Graduate Assistants must apply each term by the application deadline, in accordance with Article 13:

"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.

Date posted: March 11th, 2024