DEPARTMENT OF ELECTRICAL & COMPUTER ENGINEERING

NOTICE RE: GRADUATE ASSISTANT (GA) POSITIONS AVAILABLE FOR FALL 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 Fall 2024 term.

The total number of projected Graduate Assistantship positions for Fall 2024 is 50 GAs for a total of 7,000 hours. All positions are subject to sufficient enrolment and final budgetary approval.

List of courses that may utilize Graduate Assistants for the Fall 2024 term which will run from September 5th, 2024 – December 31st, 2024:

Course # and course name	Course Description	E = Essential Qualifications P = Preferred Qualifications	Projected # of GAs
GENG 8010 Engineering Mathematics TBA	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	8
GENG 8030 Computational Methods and Modeling for Engineering Applications TBA	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	4
ELEC 2141 Circuit Analysis I TBA	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-2141).	P -Previously taken or GA'd the course	6
ELEC 2240 Signals and Systems Dr. A.H. Sakr	Discrete and Continuous-Time Signals and Systems, Discrete and Continuous-Time Linear Time-Invariant Systems, System Analysis in Time Domain, System Analysis in Frequency Domain, Convolution, Differential Equation Models, Fourier series, the Fourier Transform, the Laplace Transform and it's Applications, Sampling of Systems. (Prerequisites: MATH-2780 and MATH-2790) (3 lecture, 1.5 laboratory hours and 1.5 tutorial hours a week.)	E - Strong knowledge of Matlab or Octave. E - Proficiency in frequency-domain analysis tools, such as the Fourier transform.	4
ELEC 3010 Computer-Aided Analysis TBA	Introduction to numerical algorithms; fundamental to scientific computation; equation solving; function approximation; integration; difference and differential equations; special computer techniques; Emphasis is placed on efficient use of computers to optimize speed and accuracy in numerical	P -Previously taken or GA'd the course	3

	computations; extensive digital computer usage for algorithm verification. Labs will introduce MATLAB to solve numerical problems. (Corequisites Prerequisites: MATH-2780 and MATH-2790) (3 lecture, 2 laboratory/tutorial hours or equivalent a week.)ry Differential Equations of any order using Euler, Improved Euler and the fourth-order Runge-Kutta methods. (Corequisites: MATH-2780 and MATH-2790) (3 lecture, 2 laboratory/tutorial hours or equivalent a week.)		
ELEC 3130 Electromechanical Systems Dr. N. Kar	Machinery principles; transformers; AC machinery fundamentals; synchronous generators; synchronous and induction motors; DC machinery fundamentals; DC motors; electromechanical energy conversion; three-phase concepts; special-purpose motors. (Prerequisites: MATH-2780, MATH-2790, ELEC-2250.) (3 lecture, 2 laboratory hours or equivalent a week.)	P -Previously taken or GA'd the course	3
ELEC 3160 Electronics II TBA	Analog amplification; small-signal modeling of analog circuits; differential-amplifier topology; BJT, MOSFET and JFET differential amplifiers; frequency response and time-dependent circuit behavior; feedback and stability; multistage and power amplifiers; active filters and oscillators; use of CAD in modern transistor circuit design. (Prerequisites: MATH-2780, MATH-2790 and ELEC-2260.) (3 lecture, 1.5 laboratory hours and 1 hour tutorial.)	P -Previously taken or GA'd the course	3
ELEC 3300 Digital Logic Design II Dr. M. Khalid	Contemporary digital system design; programmable logic; device architectures; reconfigurable computing; design entry methods; VHDL (Hardware Description Language); Electronic Design Automation (EDA) tools; combinational and sequential logic design, implementation using programmable logic devices. (Prerequisites: MATH-2780, MATH-2790 and ELEC-2170.) (3 lecture, 3 laboratory/tutorial hours or equivalent a week.)	E - Advanced digital system design using VHDL and FPGAs. Prefer students who have taken ELEC 3300 course or it's equivalent in their undergraduate degree.	3
ELEC 8230 System Theory Dr. S. Erfani	Continuous and discrete time systems, state formulation techniques, controlability and observability concepts, and system simulation. Prerequisite: Graduate Student Status. (3 lecture hours a week.)	P -Previously taken or GA'd the course	0.5
ELEC 8550 Computer Arithmetic Dr. H. Wu	This course presents a detailed description of general class of fixed-radix number systems, floating-point representation, algorithms and architectures for sequential and fast computation of multiplication, division and square root extraction, elementary functions, logarithmic and residue number systems, finite field arithmetic operations, error control in arithmetic processors. Course assignments and mini-projects on practical aspects of the course are required. Prerequisite: Graduate Student Status. (3 lecture hours per week.)	P -Previously taken or GA'd the course	2
ELEC 8560 Computer Networks Dr. A.H. Sakr	This course will cover concepts and protocols which enable heterogeneous computer networks to work with each other, including transport (TCP, UDP), network (IP, IPng), routing (RIP, OSPF), network management (SNMP, SNMPv2, RMON), and other important protocols like ARP, ICMP, DNS, BOOTP, DHCP and HTTP. Advanced topics like Mobile IP, real-time and reservation protocols (RTP, RSVP), IP multicast (IGMP, MBONE) and network security will also be examined.	E - Strong knowledge of the OSI/TCP network model. E - Completion of a computer networks course at the undergraduate level.	4

Course	Description	Status	Value
	Emphasis will be on broad coverage, as well as hands-on programming experiences. Local area networks, performance of queueing, multiple access schemes, IEEE802 standards, wireless LANs and wireless personal area networks will also be covered. Prerequisite: Graduate Student Status. (3 lecture hours per week.)		
ELEC 8600 Reconfigurable Computing TBA	History and evolution of reconfigurable computing (RC) systems; FPGA-based and multi-FPGA systems, CAD mapping tools, run-time reconfiguration, study of recent RC systems from academia and industry targeting a wide range of applications. Literature review and paper presentation on specific topics is also required. The course may require a mix of project and assignments. Prerequisite: Graduate Student Status. (3 lecture hours per week.)	P -Previously taken or GA'd the course	0.5
ELEC 8900-14 Special Topics: Secure Electronic Commerce Dr. S. Erfani	Cryptography review, cryptographic protocols, secure electronic transactions, public key certificates and infrastructures, authentication and authorization certificates, secure credential services and role-based authorization, mobile code security, security of agent-based systems, electronic payment systems, intellectual property protection, secure time-stamping and notarization, Web service architectures and standards; security and digital rights management in e-business environments.	P -Previously taken or GA'd the course	1.5
ELEC 8900-30 Special Topics: Adv. Energy Storage Systems Dr. B. Balasingam	This is a graduate level course designed to provide in depth knowledge in energy storage systems, particularly, batteries. This course will introduce important battery management problems, such as, battery fuel gauging, optimal charging, and cell balancing, and introduce engineering approaches to solve them. This course offers hands on experience in battery management through programming examples supported by realistic data. (3 lecture hours a week.)	E - Already taken this course for credit. E - Proficiency with Matlab and Latex.	4
ELEC 8900-110 Special Topics: Connected Autonomous Vehicles Dr. N. Zhang	This course introduces the fundamentals of connected vehicle and automated vehicle technology. The course will cover the following topics: perception, deep learning, vehicular communication, access, routing, intelligent computing, performance analysis, cybersecurity, and some emerging topics. (3 lecture hours per week.)	P -Previously taken or GA'd the course	3
ELEC 8900-115 Special topics: Design of AC Machines TBA	This course is specifically offered to the graduate students with the basic knowledge on electric machines to cover the most important concepts on design of AC electric machines. Step-by-step procedure to electromagnetically design of AC electric machines e.g., induction machines and Permanent Magnet (PM) machines, is covered in the course by discussing about the principles of magnetic circuits, field distribution and losses in rotating machines.	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.

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 expected to be held face-to-face on campus or have a face-to-face component. Refer to the current health and safety regulations at https://www.uwindsor.ca/humanresources/safety

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 Fall term period (September 5th to December 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, July 12th, 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: June 28th, 2023