Why GRADUATE STUDIES in ELECTRICAL & COMPUTER ENGINEERING?

As a PhD student in the important field of Electrical and Computer Engineering (ECE), you can play a vital role in future developments in such areas as microchip design, bioelectronics, artificial intelligence, machine vision, IoT, autonomous vehicle & robots, speech and language processing, wireless and optical communications, nanoelectronics, photonics, power electronics and systems, green energy, cybersecurity, supercomputing, software engineering, and thousands of other areas. Almost every aspect of modern life is impacted by electrical and computer engineering.

Graduate students and their work are an important part of an ongoing research process that provides the community with ways of understanding natural, cultural, imaginative, social and technological phenomena. Check out whygradstudies.ca for more reasons to choose graduate studies in engineering.

Why QUEEN’S?

As a PhD student in ECE at Queen’s you are part of one of the most research intensive universities in Canada. Our research program is internationally renowned with a wide range of research activities in all of the major specialization areas of electrical and computer engineering.

Queen’s ECE offers a number of cross-disciplinary opportunities in collaboration with the departments of Mathematics & Statistics, Physics, Computing, Mechanical Engineering, Mining, the School of Kinesiology and Health Studies, as well as the collaborative graduate program in Biomedical Engineering.

Our students come from all over the world. At Queen’s, graduate students from all disciplines learn and discover in a close-knit intellectual community.

Program STRUCTURE

PhD (4 years): 4 courses and seminars, thesis background and proposal exams, and thesis defense.

“Thanks to Queen’s ECE, where my MASc and PhD study paved the way for my rewarding career as a professor. Besides my thesis supervisor, I also collaborated with student and faculty researchers at Queen’s and other universities. I presented my research at companies and government labs to cultivate connections, and I took stints as a visiting researcher at a university and a company in Europe.”

— Tiago Falk, MASc, PhD

RESEARCH Areas

- Communications and Signal Processing
- Computer and Software Engineering
- Microelectronics, Electromagnetics and Photonics
- Power Electronics
- Biomedical and Intelligent Systems

We encourage you to identify an area of research interest and contact a potential supervisor before applying.

Visit the Electrical and Computer Engineering website to read about research groups and faculty profiles. When you find a faculty member with similar research interests to yours, contact him/her and tell them about your interest in graduate work, area of research interest and related experience.

School of Graduate Studies
Create an impact

www.queensu.ca/sgs
### YEAR I

**ACHIEVE YOUR ACADEMIC GOALS**
- Key priorities include your relationship with your supervisor, forming your committee, coursework and comprehensive exams.
- Meet early with your supervisor to set expectations and discuss roles, responsibilities, program requirements, resources, research/occupational goals, timelines, and any required accommodation plans.
- Look to **Student Academic Success Services** and **Expanding Horizons** for supports and workshops.
- Attend the Departmental Speaker Series (ELEC 891).

**MAXIMIZE RESEARCH IMPACT**
- Think about audiences for your research.
- Apply to NSERC, OGS, and other funding.
- Apply for the Graduate **Dean’s Travel Grant for Post-Field Research**.
- Consider targeting your research outputs for innovation ventures: check out **Queen’s Innovation Connector**.

**BUILD SKILLS AND EXPERIENCE**
- Serve on faculty or university committees: talk to the **Graduate Electrical & Computer Engineering (GEC) student society** for tips on getting involved.
- Consider positions in student services, the SGPS, or media outlets like the Queen’s Journal, CFRC, and the SGS Blog. Look in the AMS Club Directory.
- Use Teaching Assistant and Research Assistant positions to develop your skills and experience.

**ENGAGE WITH YOUR COMMUNITY**
- Consider volunteering with different engineering organizations, such as an Engineering Society Design Team.
- Participate in your graduate and professional community through activities such as graduate student outreach programs, organizing conferences, and research groups.

**LAUNCH YOUR CAREER**
- Tune into IEEE messages and publications targeting student members and career building. Learn about the jobs and careers of other ECE graduates.
- Take a **Career Services Workshop** or meet with a career counselor for help.
- Start reading publications like **University Affairs** and the **Chronicle of Higher Education**. Browse non-academic labour market websites.
- Stay on the lookout for special events like School of Graduate Studies Career Week to explore your career pathways.

- Write and defend your thesis proposal.
- Embark on your substantive research.
- Set up regular meetings with your supervisor to discuss progress and obstacles to timely completion.
- Find your way through the academic process with help from **Expanding Horizons** professional development workshops, and the **SGS Habitat**.
- If an industry internship is of interest, consult your supervisor. Seek experiential/professional development opportunities.

**YEAR II**

**PRESENT YOUR WORK**
- Present your work at **IEEE** and other research conferences as often as possible.
- Expand your research audience through social media.
- Consider publishing elements of your research in (e.g., IEEE, ACM) journals. Learn from the Expanding Horizons publishing workshop.

**YEAR III**

**ACHIEVE YOUR ACADEMIC GOALS**
- Continue to meet regularly with your supervisor, review research progress, and write your dissertation. Check out the **SGS writing camps**, such as **Dissertation Boot Camp**.
- Use conference presentations to create, discuss, and explore ways to disseminate research findings. Learn from the Expanding Horizons publishing workshop.
- Begin discussion of potential thesis defense examiners.

**MAXIMIZE RESEARCH IMPACT**
- Continue to present at conferences.
- Consider participating in the **3 Minute Thesis (3MT) competition**.
- Consider patent filing, e.g., through **Partnerships and Innovations**.
- Set up a meeting with the School of Graduate Studies for a **Grad Chat** to discuss your research interests.

**BUILD SKILLS AND EXPERIENCE**
- Find opportunities for extra training through **CTI**, Expanding Horizons, Mitacs, or other sources to boost your skills. Investigate internships from **Mitacs** and other sources.
- Take part in the various international, multidisciplinary opportunities, and collaborate with other departments, such as Mechanical, Math and Eng., **Mining Engineering**, School of Computing, and ECE at **RMC**.

**ENGAGE WITH YOUR COMMUNITY**
- Do some targeted networking with people working in careers of interest, through **Queen’s Connects** on LinkedIn, the Queen’s **Alumni Association**, professional associations, and at conferences. Get help from a Career Services workshop.

**LAUNCH YOUR CAREER**
- Participate in hiring committees and attend job talks. Research academic careers of interest. Craft your **CV** and job application materials.
- Start focusing on non-academic areas of interest. Research organizations of interest and start putting together your industry resume and begin your job search plan.

**YEAR IV & TRANSITIONING**

**ACHIEVE YOUR ACADEMIC GOALS**
- Plan date of thesis submission for examination.
- Present your research to ECE graduate students and faculty at or conferences and work with supervisor to prepare for defence.
- Review submission and examination guidelines.
- Secure necessary oral defence accommodations.
- Discuss career pathways, references letters, and publication options with your supervisor.

**MAXIMIZE RESEARCH IMPACT**
- Continue to attend conferences and connect with scholars in your field and with community partners.
- Contact the Queen’s **Media Centre** for guidance on speaking to news outlets about your work. List yourself on the **Faculty of Engineering and Applied Science research website**.

**BUILD SKILLS AND EXPERIENCE**
- Practice articulating the skills you have been developing in settings outside the university, such as casual conversation, networking, and interviews. Get help from a Career Services workshop.
- Prepare for work or studies in a multi-cultural environment by taking the Intercultural Awareness Training Certificate hosted by QIC.

**ENGAGE WITH YOUR COMMUNITY**
- Join professional associations like the **Institute of Electrical and Electronics Engineers (IEEE)**.
- Join groups on LinkedIn reflecting specific careers or topics of interest.

**LAUNCH YOUR CAREER**
- Build connections with faculty outside of your department. Pursue interviews for faculty positions and apply for post-doc fellowships and positions.
- Apply to jobs or make plans for other adventures. Get help from Career Services with job searching, resumes, and interviews.
- If considering jobs abroad, research possible immigration regulations. If you are an international student interested in staying in Canada, consider speaking with an **International Student Advisor**.

**WHAT WILL I LEARN?**
- A graduate degree in Electrical and Computer Engineering can equip you with valuable and versatile skills, such as:
  - Knowledge and technical skills
  - Effective communication skills in multiple forms for diverse audiences
  - Information management: prioritize, organize and synthesize large amounts of information
  - Time management: Meet deadlines and manage responsibilities despite competing demands
  - Project management: develop ideas, gather information, analyze data, critically appraise findings, draw and act on conclusions
  - Creativity and innovation
  - Perseverance
  - Independence and experience as a collaborative worker
  - Awareness, an understanding of sound ethical practices, social responsibility, responsible research and cultural sensitivity
  - Professionalism in all aspects of work, research, and interactions
  - Leadership: initiative and vision leading people and discussion

**WHERE CAN I GO?**
- A PhD in Electrical and Computer Engineering can take your career in many directions. In Canada, less than 40% of all PhDs will work in post-secondary education.
- Graduates from the PhD program have found careers with:
  - Universities as professors
  - Tech companies, such as Qualcomm, Ciena, Microsoft, Google, IBM, Cisco Systems, General Dynamics, Nvidia, Intel, Amazon, and Samsung
  - Startups in all sectors, such as wearable devices, intelligent apps
  - Services such as financial, pension, actuarial, intellectual properties
- Taking time to explore career options, build experience, and make connections can help you have a smooth transition to the world of work after graduation.

*This map is intended to provide suggestions for activities and careers, but everyone’s abilities, experiences, and constraints are different. Build your own Grad Map using our online My Grad Map tool.*

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**DOCTOR OF PHILOSOPHY (PhD)**

**Electrical & Computer Engineering**

**PhD Map**

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Visit careers.queensu.ca/gradmaps for the online version with links!
Graduate Studies FAQs

How do I use this map?
Whether you are considering or have embarked on graduate studies at Queen's, use this map to plan for success in five overlapping areas of your career and academic life. The map helps you explore possibilities, set goals and track your individual accomplishments. Everyone’s journey is different – the guide offers options for finding your way at Queen’s and setting the foundation for your future. To make your own customized map, use the online My Grad Map tool.

Where can I get help?
Queen’s provides you with a broad range of support services from your first point of contact with the university through to graduation. Ranging from help with academics and careers, to physical, emotional, or spiritual resources – our welcoming environment offers the programs and services you need to be successful, both academically and personally. Check out the SGS Habitat for available resources.

What is the community like?
At Queen’s, graduate students from all disciplines learn and discover in a close-knit intellectual community. You will find friends, peers and support among the graduate students enrolled in Queen’s more than 130 graduate programs within 50+ departments & research centres. With the world’s best scholars, prize-winning professional development opportunities, excellent funding packages and life in the affordable, historic waterfront city of Kingston, Queen’s offers a wonderful environment for graduate studies. Queen’s is an integral part of the Kingston community, with the campus nestled in the core of the city, only a 10-minute walk to downtown with its shopping, dining and waterfront. For more about Kingston’s history and culture, see Queen’s University’s Discover Kingston page.

Application FAQs

What do I need to know to APPLY?

ACADEMIC REQUIREMENTS
• Master of Applied Science or Master of Science.
• Grades Required: minimum cumulative average of 75% or B from Canadian or US Universities, or 80% for international students.

ADDITIONAL REQUIREMENTS
• Statement of Interest/Statement of Research.
• Curriculum Vitae.
• English Proficiency Requirements as listed on the ECE graduate website.

KEY DATES & DEADLINES
• Application due: January 31 (international), March 1 (domestic).
• Notification of acceptance: usually before the end of April for international students, end of May for domestic students.

Before you start your application, please review the Graduate studies application process.

What about FUNDING?
Minimum funding guarantee for PhD students is $23,000 (domestic) and $30,000 (international) per year throughout years 1-4. Students are usually funded through a combination of research assistantships, teaching assistantships, and/or scholarships. Funding for international students offsets their higher tuition fees.

You are encouraged to apply for external funding from OGS, NSERC and other sources. Queen’s will automatically issue a one time $10,000 award to incoming PhD students who have won federal government tri-council awards. For more information, see the School of Graduate Studies’ information on awards and scholarships.

Queens University
DEPARTMENT OF ELECTRICAL AND COMPUTER ENGINEERING

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