Cyclical Program Review Final Assessment Report and Implementation Plan for the Programs Offered by the Department of Electrical and Computer Engineering

Programs Reviewed:
Bachelor of Applied Science (BASc) in Electrical Engineering (ELEC)
Bachelor of Applied Science (BASc) in Computer Engineering (CMPE)
Both BASc degree programs are also offered with Professional Internship.
Master of Engineering (MEng)
Master of Applied Science (MASc)
Doctor of Philosophy (PhD)

Overview

In accordance with Queen's University Quality Assurance Processes (QUQAP), this final assessment report (FAR) provides a synthesis of the external evaluation, internal responses, and assessment of the above programs. This report identifies the significant strengths of the programs, and opportunities for program improvement.

An implementation plan (IP) is attached that identifies:
- How the recommendations will be implemented
- who will be responsible for acting on and monitoring progress on the recommendations,
- any resource or governance implications resulting from the recommendations, and
- timelines for implementation of the recommendations.

Final Assessment Report: Executive Summary

Summary of Review

1) The Department of Electrical and Computer Engineering (ECE) produced a self-study document that was reviewed by the Dean, Stephen J.R. Smith Faculty of Engineering and Applied Science, the Vice-Provost and Dean, School of Graduate Studies and Postdoctoral Affairs, and the Vice-Provost (Teaching and Learning). The self-study was approved on January 17, 2024.

2) The review team visit took place on February 26-28, 2024. The review team members were:
   i. Dr. Hanan Anis, Professor and Director, School of Engineering Design and Teaching Innovation, NSERC Chair in Entrepreneurial Engineering Design, University of Ottawa
   ii. Dr. Tim Davidson, Professor, Electrical and Computer Engineering, McMaster University
   iii. Dr. Marc Dignam, Professor, Physics, Engineering Physics and Astronomy, Queen's University.
3) The visit included meetings with:
   i. Students (undergraduate and graduate)
   ii. Faculty
   iii. Staff
   iv. Librarian
   v. Department Leadership
   vi. Heads of Cognate Departments
   vii. Dean and Associate Dean, Smith Engineering
   viii. Vice-Provost and Dean, School of Graduate Studies and Postdoctoral Affairs
   ix. Vice-Provost (Teaching and Learning)
4) The review team reported on October 11, 2024. The Department Head, Faculty Dean and the Vice-Provost and Dean, School of Graduate Studies and Postdoctoral Affairs responded to the review team report by September 4, 2025.
5) The Senate Cyclical Program Review Committee considered the review team report, internal responses and a draft Final Assessment Report and Implementation Plan at its meeting on December 4, 2025. The Report and Plan were updated, then approved on January 26, 2026.

The following strengths were noted:
- The programs have a well-earned reputation for excellence. The department is widely regarded as one of the best medium-sized departments in the country. It has a long and ongoing history of excellence in research.
- Faculty members are widely respected for their contributions to both research and teaching.
- The department is helping to enhance students' potential impact over the course of their careers in a broad range of ways, including new subject areas, project-based courses, and internships.
- Many faculty members' research areas lie at the interface between traditional electrical and computer engineering and other disciplines, laying the groundwork for potential development of more multi-disciplinary programs.
- Students are well served by departmental, library and IT services staff. Resources such as the design studio and computer lab are excellent.
- Issues of equity, diversity, inclusion and Indigenization (EDII) are directly incorporated into programs' curricula.

The following opportunities for enhancement were noted:
- Class sizes are much larger than many other ECE programs in Canada, which can detract from the student experience.
- Consider expanding opportunities for broader community engagement, building relationships with organizations in local and regional communities to have them suggest projects that could be tackled by students in the project courses or capstone project.
- Greater encouragement for the department's EDII facilitation committee and committee to support women in engineering to pursue their goals and continue to foster a culture of mutual respect among students.
- Develop guidelines and perhaps peer discussion groups to refine the alignment of assessment methods with the learning outcomes.

Summary of Review Team Recommendations

The reviewers made thirteen recommendations in the following areas. For a full list of the recommendations, please see the Implementation Plan.
- Continuous improvement in curriculum development
- Enhancing student experience
- Improving teaching quality
- Increasing funding for graduate students
- Enhancing the Master of Engineering program
- Enhanced support for PhD candidates
- Clear assessment guidelines in graduate courses
- Reimagining Engineering faculty
- Work-life balance for staff
- Improving capstone projects
- Diversity and inclusion
- Enhancing design courses
- Nurturing a culture of collaboration among faculty members

Status

The academic programs in the Department of Electrical and Computer Engineering have been approved to continue.

Dates monitoring reports due:	August 2027 & February 2030
Date of next review:	2031-2032 academic year
Prepared by Vice-Provost (Teaching and Learning)	October 2025
Revised by Academic Unit & Faculty Dean	January 2026
Approved by the Senate Cyclical Program Review Committee:	January 26, 2026

Implementation Plan

Recommendation 1 – Continuous Improvement in Curriculum Development

Establish a structured continuous improvement process for curriculum development based on stakeholder feedback, ensuring alignment with industry needs, student feedback, and instructor engagement. Consider forming an external advisory board to provide regular industry input and develop a plan to address any identified shortcomings.

Planned Action(s)	Deans' Contributions to Plan, where appropriate:	Person(s) Responsible for Leading Implementation	Resource and/or Governance Implications	Timeline and Milestones
ECE Corporate Advisory Board to meet twice per year to input into program-level curricular issues. Biannual UG student townhalls between the student body and Head/UG Chairs have been in place since 2018: Departmental curriculum committee already has student members (since 2005).	Plan endorsed by Faculty Dean and Vice-Provost and Dean (SGSPA). Consistent with the Faculty's approach to the CEAB continual improvement process.	Department Head	Administrative support for meetings.	Already implemented: bi-annual meetings to be continued.

Faculty members and undergraduate curriculum committee to review learning outcome data for their courses from PowerBI.		Undergraduate Curriculum Committee		Annually

Recommendation 2 – Enhancing Student Experience

Implement a transparent mechanism for students to improve their experiences each term, emphasizing the impact of their feedback on course enhancements and overall student experience. The existing "town hall" meetings help to build rapport with the students, but effecting genuine enhancements to the student experience, and improvements in the curriculum (as in point 1), requires a deeper engagement.

Planned Action(s)	Deans' Contributions to Plan, where appropriate:	Person(s) Responsible for Leading Implementation	Resource and/or Governance Implications	Timeline and Milestones
Engineering Mental Health Stewards (EMHS) Program. Biannual meetings between Undergraduate Chairs (Electrical Engineering and Computer Engineering) and student representatives from the ECE Undergraduate Club to discuss undergraduate student experiences, feedback, and improvement opportunities.	Plan endorsed by both Deans. Consistent with CEAB continual improvement process and Reimagining Engineering Education (REE) initiative.	Smith Engineering, Associate Dean Academic Department Head, UG and Graduate Chairs	Administrative support from Smith Engineering Administrative support from existing support staff.	Operational since 2023-2024 Timeline: The first meeting will take place in April 2026 and will continue to be held every

Biannual UG student townhalls between the student body and Head/UG Chairs have been in place since 2018. There have already been ongoing conversations between the ECE Graduate Chair and the Graduate ECE Student Council President about the ECE graduate programs, and that the PhD Student Representative is regularly attending the ECE Graduate Studies Academic Advisory Committee (GSAC) meetings and providing their comments and suggestions for the ECE graduate programs. A meeting between the Graduate Chair and student representatives from the Graduate ECE Student Council is being planned for to discuss graduate student experiences, feedback, and suggestions for enhancement. Annual meetings between department head and representatives of both student bodies to address student experience issues and strategic directions. An annual meeting between the Department Head and student representatives from Graduate ECE Student Council is being planned for April/May of each year to address student experience issues and strategic directions.				April and December. Meeting planned for January 2026 Meeting in April/May, annually.

Recommendation 3: Improving Teaching Quality

Address concerns that the students expressed about their learning experiences in some courses by coming together to provide support for instructors to enhance their teaching skills, ensuring consistency in teaching standards across all courses at both undergraduate and graduate levels.

Planned Action(s)	Deans' Contributions to Plan, where appropriate:	Person(s) Responsible for Leading Implementation	Resource and/or Governance Implications	Timeline and Milestones
Modernize established practice of student feedback delivery in classes. Also see above re biannual feedback meetings. UG program chairs to meeting adjunct instructors before start of each term to familiarize with teaching standards, policies and expectations. Faculty to access workshops and teaching supports on instructional development provided through REE initiative.	Plan endorsed by the Faculty Dean. VP & Dean, SGSPA, encourages department to consider whether similar initiatives could also be implemented at the graduate level.	Department Head & Program Chairs. Faculty members to access training and supports.	Administrative support, faculty members' time.	Implementation to begin 2025-26 academic year and continue thereafter.

Recommendation 4 – Increased Funding for Graduate Students

Increase minimum funding for graduate students, particularly international master's students, to support their academic pursuits and ensure financial stability.

Planned Action(s)	Deans' Contributions to Plan, where appropriate:	Person(s) Responsible for Leading Implementation	Resource and/or Governance Implications	Timeline and Milestones
Increase minimum stipend for graduate students. Minimum stipend to increase annually at the rate of 2%. Conduct comprehensive review of graduate stipend levels every 4 years.	Faculty Dean: this is consistent with changes to minimum funding packages being made across the Faculty. Plan endorsed by both Deans.	Department Head	Faculty supervisors will pay for the increased funding packages from research grant accounts.	Completed 2024-25 Committee recommendations Fall 2027. Departmental approval Spring 2028. Implementation Sep 2028.

Recommendation 5 – Master of Engineering Program Enhancement

Enhance the Master of Engineering program through internships, developing specialized course streams, and utilizing increased revenues to support funding for research students.

Planned Action(s)	Deans' Contributions to Plan, where appropriate:	Person(s) Responsible for Leading Implementation	Resource and/or Governance Implications	Timeline and Milestones

Review of the MEng stream structure introduced in 2023.	Faculty Dean: Endorsed the plan. The plan is consistent with work across the Faculty to enhance the professional master's program under the leadership of the Assoc. Dean Graduate studies. The work is supported by the Faculty Business officer and Executive Director of operations to ensure the plan is aligned with available resources. Vice-Provost and Dean, SGSPA: the plan is reasonable given the fiscal limitations faced by the university. The SGSPA and Career Services are considering ways to support departments and programs in the development and expansion of internship opportunities. As the department plans, they are encouraged to be in contact with the SGSPA.	Department Head or delegate.	minimal	2027-2028
When possible, create an MEng co-ordinator position. This position would facilitate industrial internship opportunities and enable student enrolment to double. This is not possible in Queen's current financial circumstances.		Department Head or delegate.	The position would need human resources and budget approval from Smith Engineering.	Not possible to set a timeline: contingent on financial improvements across the whole university.
Utilization of revenues to support funding for research students will not be possible for several years while Queen's is in a fiscal deficit.		Department Head or delegate.	Action contingent on financial improvements across the whole university.	Not possible to set a timeline: contingent on financial improvements across the whole university.

Recommendation 6 – Enhanced Support for PhD Candidates

Re-instate regular meetings between the PhD advisory committee and the candidate that continue beyond the comprehensive exam. The discussions at these meetings would provide ongoing support on technical and non-technical issues, and guidance on the potential impact of the research. As such, they would facilitate timely completion of the candidate's studies.

Planned Action(s)	Deans' Contributions to Plan, where appropriate:	Person(s) Responsible for Leading Implementation	Resource and/or Governance Implications	Timeline and Milestones
Develop and implement new process to collect and evaluate PhD student progress reports. Each PhD student to complete a report each term. Supervisor to comment on each report. A web-based tool has been developed to record the progress for the PhD students and to provide feedback by the Supervisor each term, and by the PhD Advisory Committee once per year. This is intended to improve the time to completion of PhD students. The system is fully functional since Fall 2025 Full PhD advisory committee members to review PhD report annually between completion of comprehensive exams and thesis defence.	Plan endorsed by both Deans. Expected to improve time-to-completion rates and foster greater engagement from supervisory committees.	Graduate Chair	Software tool development (completed).	New process implemented December 2024. Annually

Recommendation 7 – Clear Assessment Guidelines in Graduate Courses

Develop clear assessments and rubrics in graduate courses, aligning Program Learning Outcomes (PLOs) with Course Learning Outcomes (CLOs) to enhance the evaluation process.

Planned Action(s)	Deans' Contributions to Plan, where appropriate:	Person(s) Responsible for Leading Implementation.	Resource and/or Governance Implications	Timeline and Milestones
Establish departmental assessment guidelines for graduate courses. Develop guidelines for graduate course outlines stipulating the inclusion of a detailed breakdown of assessment components, weighting, evaluation criteria and expectations for satisfactory performance.	Plan endorsed by both Deans. Recommend engaging the expertise of the Centre for Teaching & Learning in this work.	Graduate Chair with Departmental Graduate Studies Academic Advisory Committee (GSAC)	Minimal	By Spring 2026: Develop flexible guidelines (and templates). Implement guidelines in selected graduate courses. Long-term: Implement the guidelines for all graduate courses. Regularly review and refine them.

Recommendation 8 – Reimagination of Engineering Faculty

Utilize generous donations to reimagine the Electrical and Computer Engineering (ECE) department, focusing on multidisciplinary growth and collaboration with other departments and faculties.

Planned Action(s)	Deans' Contributions to Plan, where appropriate:	Person(s) Responsible for Leading Implementation	Resource and/or Governance Implications	Timeline and Milestones

Continue development of plans for better integration of problem-based learning into courses.
 	
Investigate how to better integrate
   i)   AI technology
   ii)   research
into courses and programs.
 	
January 2026: Several new AI-related courses have now been approved to be included in the list of technical electives for our students (from the School of Computing). These include Health AI: Image-Guided Interventions; Health AI: Data and Algorithms; Health AI: 2D and 3D Image.
	Faculty Dean: the overarching principles of incorporating problem-based learning, integrating AI technology and research, and multi-course collaboration in the ECE programs are endorsed. The details of the plan will be further vetted by the REE guiding team and Associate Dean interdisciplinary studies.
	
	Vice-Provost and Dean, SGSPA: Agreed with action plan. Suggests the department also considers how graduate programs can promote
		Department Head, Program Chairs, ECE AI/Generative AI in Teaching and Learning Working Group.
		
		Also involved: REE guiding team, departmental and faculty curriculum committees, faculty and staff. Associate Deans (Academic and Interdisciplinary Studies).
			Annual requests for REE funding (Smith Engineering).	Changes to take place for the 2026-2027 year.

				2027-2028 academic year
The course ELEC 279 has been completely revamped to focus on the use of GenAI for coding.

A new course ELEC 385 (Quantum computing) will be offered starting in the 2027–2028 academic year for the CE direct entry stream. | multi-disciplinarity/trans-disciplinarity and foster collaboration with other departments and faculties. | | | |

Recommendation 9 – Work-Life Balance for Staff

Address staff feedback by promoting work-life balance through flexible work arrangements, such as working from home a few times per week, in line with industry standards.

Planned Action(s)	Deans' Contributions to Plan, where appropriate:	Person(s) Responsible for Leading Implementation	Resource and/or Governance Implications	Timeline and Milestones
We have implemented a remote work agreement of one day per week and work with staff members to provide flexibility for remote work on non-scheduled days when unexpected personal demands arise.	The Deans endorsed the plan.	Department Head and Department Manager	None	Completed

Recommendation 10 – Improving Capstone Projects

Enhance capstone courses by ensuring faculty continuity, incorporating more hardware-based projects, standardizing project requirements, improving project quality, and introducing industry/community-based projects for a comprehensive student experience.

N.B., the Department and Faculty Dean endorsed only some parts of this recommendation. Reasons are included in the Final Assessment Report. On the recommendation to improve capstone projects: ECE feels projects are strong, and standardization can limit creativity.

Planned Action(s)	Deans' Contributions to Plan, where appropriate:	Person(s) Responsible for Leading Implementation.	Resource and/or Governance Implications	Timeline and Milestones
Provide enhanced mentorship that fosters creativity while maintaining rigorous academic standards. To support higher quality work, the 490/98 Project Funding Certificate was implemented in Jan 2025 to allow additional funding requests. Corporate Relations is developing an industry/community project intake process and website (Summer 2025 — ongoing), which ECE will integrate into Fall 2026 delivery.	The Deans endorsed the action plan. The Faculty Dean noted the plan is reasonable in terms of expectations for improvement given the reality of existing constraints.	Department Head ECE Program Associate	Faculty and staff time. Modest funding for hardware-based projects may be needed.	Completed January 2025. Fall 2026

Planned Action(s)		Person(s) Responsible for Leading Implementation		Timeline and Milestones
Explore options for implementing regular feedback mechanisms to better support students throughout projects. Enable students to reuse returned components from past projects.		Program Associate		Sep 2025
Develop a comprehensive industry outreach plan to create partnerships and meaningful project opportunities.		Program Associate		Collaboration with instructors Fall 2025. Build industry network by Fall 2026.

Recommendation 11 – Diversity and Inclusion Efforts

Increase efforts to attract diverse students by collaborating with central admissions to ensure a more diverse student population, as well as taking measures to ensure that students from minority groups feel included within the program, and, more generally, within the student community as a whole. In addition, integrate Equity, Diversity, and Inclusion (EDI) principles into the curriculum seamlessly.

N.B.: Already in progress. The Department has already integrated I-EDIAA principles into multiple courses and is actively supporting inclusive curriculum practices. Faculty are encouraged and supported in embedding diverse perspectives into teaching.

Planned Action(s)	Deans' Contributions to Plan, where appropriate:	Person(s) Responsible for Leading Implementation	Resource and/or Governance Implications	Timeline and Milestones

Encourage and support faculty in adopting inclusive curriculum and classroom practices. This includes integrating diverse perspectives and highlighting contributions of engineers from underrepresented groups in course content. Periodically review and update course content and delivery to reflect evolving best practices in equity, diversity and inclusion. Faculty members to review learning outcome data annually for their courses from PowerBI. Collaborate with the Centre for Teaching and Learning and Queen's Human Rights and Equity Office to provide faculty development workshops focused on inclusive pedagogy and addressing unconscious bias. Encourage faculty members to participate in inclusivity workshops. (Email sent out every semester, i.e. 2 times per year, September and January). Sustain and expand collaborations with student organizations including the ECE Club and the Graduate ECE Student Council to support and promote student-led initiatives that foster inclusivity and belonging.	Both Deans endorsed the plans. The VP & Dean SGSPA noted that SGSPA may be well positioned to provide guidance and support on recruitment at the graduate level.	Department Head, UG and grad chairs, faculty, student representatives.	Existing resources will be leveraged.	Annual review of course learning outcome data. E-mail sent twice per year, September and January.

Department supporting annual culture events. (e.g. Persian New Year Potluck, Chinese New Year Celebration). First ECE night. Jan 7, 2025. The plan is to make it an annual event. A social gathering that involves student, faculty and staff.				Annually
Request that admissions take into account the Department's demographic recruitment objectives in its direct entry programs. ECE department head or delegate to meet with Queen's Registrar's Admissions Office annually to discuss diversity issues.				Annually, every May.
Women in Engineering meeting once a year chaired by ECE faculty member to review best inclusive practice. (every September since 2025).				September 2025 and annually thereafter.

Recommendation 12 – Enhancing Design Courses

Design courses necessitate substantial funding and resources to ensure relevance and deliver a distinctive hands-on learning experience for students. While students expressed satisfaction with APSC101 and 103 design courses, concerns were raised about the quality of ECE 290. Students highlighted issues such as project quality, insufficient emphasis on hands-on learning, and the lack of relevance in certain modules. Despite the commendable effort to incorporate more ECE-related content, improvements are needed to elevate the quality of ECE 290 to match the standards set by first-year design courses. This presents an opportunity for the department to enhance the course by addressing these concerns and refining the curriculum to meet student expectations and academic standards effectively.

Planned Action(s)	Deans' Contributions to Plan, where appropriate:	Person(s) Responsible for Leading Implementation	Resource and/or Governance Implications	Timeline and Milestones
Annual consideration of refinements to course content and delivery based on student feedback and continual improvement process. Course instructors to consult teaching team for first-year design/project courses and the Engineering teaching and learning team.	Both Deans endorsed the plan.	ELEC 290 instructors	none	Annually

Recommendation 13 – Nurture a culture of collaboration among the faculty members
An overarching suggestion, rather than a formal recommendation, is that we believe that there is benefit to nurturing a culture in which colleagues genuinely invest in each other's success. This is especially important given the number of recently hired faculty members. One way to nurture these efforts might be to invest in the success of each other's PhD students by arranging supervisory committee meetings that are focused on enriching the student's perspectives on their problem, rather than merely assessing progress. These discussions may even incubate future collaborations between members of the supervisory committee. (This point is implicit in point 6 above.)
A second opportunity might be to invest in the success of the students in each other's courses by having colleagues who teach related courses come together once a term, or once a year, to discuss how they, as a group, can enrich the student experience in this set of courses. The discussions might also consider how they can best prepare those students for successful careers in that area. The

discussions might be more fruitful if each faculty member was a part of more than one discussion group. These gatherings need not be formal procedural meetings. In fact, in the beginning they might be more successful if they were not. The idea is that they would enable each instructor, and each of the overlapping groups of instructors, to reflect on how they can contribute to enhancing the learning environment for their students. (This point is implicit in points 1, 2, 3, and 7 above.)

A third opportunity might be for the department members to come together once a year to discuss longer term goals, and steps to move toward them. If this gathering were to be arranged in a loosely structured way, or were to be combined with a social event, it may provide opportunities for the informal conversations that spark so many of the activities that can enrich a department's culture.

Planned Action(s)	Deans' Contributions to Plan, where appropriate:	Person(s) Responsible for Leading Implementation	Resource and/or Governance Implications	Timeline and Milestones
Building on existing successes, encourage proposal of new initiatives under REE framework to strengthen culture of mutual investment and innovation. Hold an annual day-long faculty retreat dedicated to sharing ideas and building teamwork.	The Deans endorsed the plan.	ECE Working Group Lead on REE.	Minimal	Ongoing Annually