



UNIVERSITY OF NEW BRUNSWICK  
DEPARTMENT OF  
ELECTRICAL AND COMPUTER ENGINEERING



Graduate Student Handbook

2023-2024, version 2

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Welcome to graduate studies in the Department of Electrical and Computer Engineering at UNB.

This handbook is intended to answer many of the questions that may arise during the course of your graduate studies at UNB. Should you require additional assistance, please feel free to contact the individuals below.

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Director of Graduate Studies	Professor Brent Petersen	H133	<a href="mailto:brent.petersen@unb.ca">brent.petersen@unb.ca</a>
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## 1. Introduction

This handbook is prepared to inform graduate students of procedures, regulations and guidelines specific to the operation of the Department of Electrical and Computer Engineering (ECE). For more general information you should consult the following:

[UNB Graduate Calendar](#)

[UNB School of Graduate Studies](#)

**NOTE** to all ECE graduate students, postdoctoral students and visiting scholars:

- (i) Please check your UNB email on a daily basis for seminar notices and other important information.
- (ii) All students who expect to receive funding are responsible for providing the following information directly to Financial Services and/or People & Culture (formerly Human Resources) using the [UNB secure file drop](#) link. When sending these documents, send via file drop to [Abigail.Shortall@unb.ca](mailto:Abigail.Shortall@unb.ca) and please name your files as noted below to help speed up the process.

Please ensure when sending the completed TD1 forms and your banking information via Secure File Drop the naming convention is as follows: Last Name, First Name – Document Name, e.g.

**Last Name, First Name – TD1 Federal**

**Last Name, First Name – TD1 Provincial**

**Last Name, First Name – Void Cheque**

**Last Name, First Name – SIN**

- [2023 Federal Personal Tax Credit \(TD1\) Form](#) & [2023 NB Provincial Personal Tax Credit Form](#) (must complete both)
  - a Direct Deposit Authorization Form completed and stamped by your bank or a void cheque
  - if receiving employment income ie. Teaching Assistantship (TA), you must obtain a [Social Insurance Number \(SIN\)](#) from [Service Canada](#) and complete the [service request form](#). Once obtained, please file drop to Financial Services and/or People & Culture (formerly HR).
- (iii) A desk space will be assigned for research-based students by the department in consultation with your supervisor; permission must be obtained from the ECE Department before changing your assigned seating or study area. Desks should be labelled showing your name and supervisor.

## 2. Supervisor(s)

Upon acceptance into the Graduate Program, each research-based student is assigned a supervisor; the assignment is based on the field of research specified by the student as well as the willingness of the assigned faculty member to provide supervision and/or funding. All M.Eng. course-based students are supervised by the Director of Graduate Studies.

Research-based students may request to change their field of research and/or their supervisor by submitting a request in writing to the Director of Graduate Studies. Final approval of the request will rest with the Director of Graduate Studies. ***Please note that a change in supervisors will void any previous funding commitment.***

### 3. Academic Information

#### a. Academic Regulations

Details of academic regulations as applied by the School of Graduate Studies, are outlined in the Graduate Calendar above. You should pay particular attention to the sections on plagiarism. It is the student's responsibility to comply with all regulations.

#### b. Graduate Degrees

The Department offers the following degrees:

Degree	Course Credit Requirements	Time Limits	Residency Requirements
PhD	9* ch	7 years	5 terms
MScE	15 ch	4 years	3 terms
MEng	30 ch	4 years	-

\*Beyond the Master's Degree

#### c. Course Registration Procedures

Registration is completed on-line. If you have questions regarding your program, please confer with your supervisor or the Director of Graduate Studies. The course credit requirements for each degree program are noted in the table above.

Please note that:

- MScE students must register in EE6997 (MScE Thesis) every term (fall, winter, and summer session). No course credit is received for this registration. Late registration will result in an additional \$50 late fee by Financial Services.
- PhD students must register in EE6998 (PhD Thesis) every term (fall, winter, and summer session). No course credit is received for this registration. Late registration will result in an additional \$75 late fee by Financial Services.
- All research-based students should have their course selections approved by their supervisor.
- All ME.EE students should have their course selections checked to ensure they count in the program. When in doubt, check it out, by emailing [ece-grad@unb.ca](mailto:ece-grad@unb.ca). Separate approval is required for online courses, or courses outside of Electrical Engineering. This can also be an email [ece-grad@unb.ca](mailto:ece-grad@unb.ca).
- Not all courses are offered each academic year. A list of courses to be offered will be provided at the beginning of each term.
- Registration in undergraduate 4000-level courses and/or courses outside of Electrical and Computer Engineering must be done with a [Graduate Student Course Change Form](#).
- Registration in an Independent/Directed Studies course must be done with a [Independent/Directed Studies Course form](#). Supervising faculty must provide a description of the independent study work along with grading information.

**d. Graduate Credit for Technical Electives**

Graduate students are allowed to receive 3ch for a number of ECE 4000-level technical elective courses provided they did not previously credit the course towards an undergraduate program. Although these courses may be listed as 4 ch courses on your transcript, they will only be valued as 3 ch when calculating the total number of credit hours earned towards your graduate degree.

It should be noted that:

- MEng students may receive graduate credit for up to four 4000-level ECE technical elective courses.
- MScE students may receive graduate credit for up to two 4000-level ECE technical elective courses.
- PhD students may receive graduate credit for up to one 4000-level ECE technical elective courses

**e. Thesis Proposals**

Research-based graduate students (MScE and PhD) are required to develop a thesis proposal that is both submitted as a written document and presented as a seminar. Details of the requirements are provided below.

1. The proposal document should be submitted along with the [Graduate Thesis Proposal Submission form](#) to The Graduate Program Assistant at [ece-grad@unb.ca](mailto:ece-grad@unb.ca) after it has been approved by your supervisor(s) (preferably within nine months of registration). It should be typed, single-sided, double spaced with 1" margins, using a 12 point font size (fonts associated with subscripts, superscripts and those appearing in equations or diagrams should never be smaller than 8 points); MScE proposals must not exceed 8 pages, whereas PhD proposals should be restricted to 14 or fewer pages, not including title page, table of contents, references etc. Appendices are not encouraged. Please note that any equations, tables, figures, etc. that are pertinent to understanding your document should be included in the body of the text. PhD proposals may be deferred until successful completion of the PhD qualifying exams.
2. Once the proposal document has been approved by the graduate committee (usually 10-14 days), the proposal must be presented as a short seminar. The seminar will consist of a 15 minute presentation followed by a short question and answer session.
3. Both the proposal document and seminar presentation must provide sufficient technical detail to enable the examining committee to judge the merit of the proposed work. The proposal should include:
  - (i) Evidence of an in-depth investigation of the relevant background material.
  - (ii) A clear formulation of the problem(s) that your research will address.
  - (iii) A thorough discussion of the approach(es) you will be taking, including analytical and/or experimental techniques, methods of verification and expected significance of the work.
  - (iv) Sufficient technical information to enable the examining committee to judge the merit of the proposed work.

In some cases, preliminary results which support the validity of your proposed methodology may be useful. Your supervisor may advise you in this regard. In addition to the formatting and

content requirements, the evaluation will take into account the clarity, legibility and organization of the presentation. Proposal documents and/or presentations that do not adequately address these issues will be rejected and the student will be required to resubmit or reschedule.

Once the proposal document has been approved by the graduate committee (approximately 2 weeks), the proposal must be presented as a short seminar (normally scheduled with two proposals per session). The seminar will consist of a 15 minute presentation followed by a short question and answer session. Successful completion of the proposal presentation will also satisfy the requirement that all research-based students successfully present (at least) one seminar during their program of study.

**f. PhD Qualifying Examinations**

PhD candidates are required to successfully complete three PhD qualifying examinations (two oral and one written). Additional information regarding the oral and written exams is provided below.

Oral Examinations

The oral examinations are used to assess the background knowledge of the candidate in selected areas of Electrical Engineering. Candidates may choose to be examined in any two of the following areas: Communications, Control, Digital, Electromagnetics, Electronics, Power, and Signal Processing. Topics lists in each of the chosen areas are available from the Graduate Program Assistant.

Oral qualifying examination sessions are typically scheduled once per year (usually in April or May).

**Candidates are required to attempt both exams during their first year registered as a PhD student.** To assist in preparation, it is highly recommended that candidates attend relevant third- and fourth- year undergraduate courses as listed on the Topics Lists or any other relevant course given the candidate's examination topics. If the candidate does not pass a qualifying exam, it will be mandatory to re-take the exam again in the next upcoming session. The Graduate Program Assistant should be notified within the first month of the candidate's program on the two desired examination areas and a topics list will be provided to you.

During an oral examination, each member of the examining committee will ask the candidate a series of questions specific to the chosen area. Based on the candidate's performance, the committee will recommend a Pass or Fail decision. In the case of a Fail on the student's first attempt of the oral exam in a chosen area, the student will be allowed to continue in the program until the next offering of the exam and will be required to retake the exam that time; it should be noted that students are not allowed to switch exam areas after a failure. In the case of a Fail on the student's second attempt in a chosen area, the student will be requested to withdraw from the PhD program.

Written Examination

The Written Exam may be used to assess the research capabilities and written communication skills of a PhD candidate. The format as well as the specific requirements of the exam will be determined primarily by your supervisor(s) and due within 16 months of your arrival. Upon completion, a copy of the PhD written exam must be submitted to the Director of Graduate Studies for approval.

## **g. Thesis Requirements**

In addition to the normal course requirements, all research-based graduate students (MScE and PhD) are required to write a thesis and present their work in the form of an oral defense.

### Preparation and Submission of Theses

Refer to the Graduate Calendar for submission deadlines of graduate theses. The School of Graduate Studies publishes a document, [Regulations and Guidelines for the Preparation and Submission of Graduate Theses, PhD Dissertations and Reports](#) which must be consulted before theses are drafted. The Graduate School is rigid in applying these regulations so it is advisable to be familiar with these well in advance of thesis preparation. Students are strongly encouraged to write their thesis using the Electronic Theses and Dissertations (ETD) process. A description of the process along with UNB thesis templates for LaTeX and Microsoft Word can be found at <https://www.unb.ca/etd/index.html>.

If you choose not to use the UNB thesis templates, you are cautioned to pay close attention to formatting requirements. In particular, margins should be no less than 1.5 inches on the left, and 1 inch on the top, bottom and right. The font of the main document should be 12 pt, double-spaced and single-sided. The smallest font used in figures, diagrams, equations, etc. (including superscripts and subscripts) should never be less than 8 pt. The document should be free of mechanical and grammatical errors.

Before submitting your thesis document, please provide the Graduate Program Assistant with a paper copy to review formatting. Once the Graduate Program Assistant approves the formatting and any recommended changes have been completed, the final document can be submitted. Along with the thesis document, both you and the Supervisor must sign and submit the Status of MScE Graduate Thesis or the Status of Release of PhD Graduate Thesis form (both available from Denise) that permits the release of the document and includes the suggested Committee. Candidates must submit one (1) copy and one electronic copy (pdf format) of the thesis to the Graduate Program Assistant, who will distribute the document to the agreed committee members. Committee members are permitted a minimum of 30 days to read the document and may require a committee meeting prior to the defense date.

### Page Limits for Theses

The Department imposes a strict 70 page limit on MScE theses. The page limit excludes the Title Page, Abstract, Acknowledgements, Table of Contents, Table of Symbols, Table of Figures, References, Vita, and Appendices. It is expected that the 70 page body is technically complete so that it may be used by the examining committee to evaluate the merit of the work done. The Appendices may contain supplementary detail to ensure reproducibility of the research or project findings.

Page limit restrictions on PhD theses are set by the School of Graduate Studies.

### Thesis Defense

After the Examining Committee has evaluated the thesis document, the candidate is required to defend their thesis by making a 20-30 minute oral presentation followed by a question period during which questions will be asked by members of the Examining Committee. The defence is

open for all to attend; all attendees will be given the opportunity to ask questions. Please refer to the [Thesis Submission and Assessment Guide](#).

#### *Thesis Modifications and Final Submission*

After the defense, the committee may have major or minor modifications required to produce a final copy. The supervisor is generally the one who ensures the document contains the suggested changes. In the case where a second committee read is not needed, the document may then exceed the initial 70 page restriction. Major modifications may take a few weeks or more. In the event that the Examining Committee is required to read the modified version, the page limit will remain in effect.

#### **4. Financial Support**

Refer to the Graduate Calendar for a [list of awards and scholarships](#) for which you may be eligible to apply. The Department may provide financial support for graduate students in the form of Graduate Academic Awards (GAA) or Graduate Research Award (GRA) and Teaching Assistantships (TA) (see descriptions at [Graduate student assistantships and awards](#)). Satisfactory performance is required as noted in the offer of funding.

**Graduate Student Research Assistantships (GAA or GRA):** Paid to full time Graduate Students for pursuing research work under the guidance of a faculty member during the academic year and the summer months. Graduate students who have a Graduate Academic Award (GAA) or a Graduate Research Award (GRA) for a full twelve month period may take holidays not exceeding two weeks during this period. In some cases Research Assistantships may be automatically renewed subject to satisfactory performance and availability of funding.

**Graduate Student Teaching Assistantships (TA):** Students can [apply](#) for a Teaching Assistant Marking and/or Lab positions within the department at the beginning of each term. The availability of TA positions is contingent upon the undergraduate teaching requirements and the availability of funds. Once the application form is complete, please forward to ECE Graduate Studies [ece-grad@unb.ca](mailto:ece-grad@unb.ca). TA positions are awarded by the department as per the guidelines determined by the Union of Graduate Student Workers (UGSW). For more information refer to the UGSW Collective Agreement at [ugsw.ca](http://ugsw.ca). Not all students that apply will receive a TA position, nor are students guaranteed a position each term. Timesheet forms will be provided and are to be submitted to the ECE office by the end of every term. Timesheets MUST be submitted in order to be eligible for future TA positions. Continued TA positions are subject to satisfactory performance.

**Travel Grants:** General information about travel funding can be found at <https://www.unb.ca/gradstudies/current/financial/scholarships/travel-funding.html>.

A limited number of Conference Travel Grants, which cover a portion of the expenses incurred for presenting a paper related to the student's area of research may be available. To apply, please complete an application form at [Inside Graduate Studies | Travel Funding | UNB](#) 'School of Graduate Studies Travel Awards' and submit to the Graduate Program Assistant.

## 5. Visa and/or Study Permit Renewals (for Non-Canadian citizens)

It is your responsibility to ensure that your student visa and/or study permit is renewed on time and that all related fees are promptly paid. Students must have a valid expiry date to receive any form of funding. More information on Study Permit renewals and Post Graduate Work Permits (PGWP), please contact the International Student Advisor's Office ([ISAO](#)).

## 6. Computing Facilities

### a. Public Computers

The Faculty of Engineering and the UNB Integrated Technology Services Department provide students with access to Public lab computers. For information on where and how to access a public computer, please visit <https://unbcloud.sharepoint.com/sites/MyUNB/SitePages/Personal,-IT-Account,-and-Email-Options.aspx> The Help Desk at the Harriet Irving Library can provide you with assistance if required.

### b. Non-Public Computers

Each of the research labs has several computers that are dedicated for research purposes. Special permission is needed to use these machines. Please consult your supervisor or the researcher who owns the machine before using them.

The ECE Department has several personal computers distributed throughout the undergraduate laboratories that are accessible during normal business hours. Undergraduates have priority for use of these machines. Some of our labs have key access, while others use your UNB ID card for access. See Section 7 below regarding access procedures.

You can bring your own laptop or mobile device to UNB and use it on the UNB network. For more information on how to setup a mobile device, or how to connect your own laptop to the UNB network, please visit <https://unbcloud.sharepoint.com/sites/ITServices/SitePages/StudentPrinting.aspx> and review the "Printing", and "Print from my own device".

## 7. Department Labs and Graduate Research Space

<u>Lab</u>	<u>Room</u>	<u>Type</u>
Computer Engineering / Communications	ITB 205	CS (swipe card access)
Control Systems	GD123	UG (UCard tap access)
Digital / Computer	H117	CS (swipe card access)
Electricity & Magnetism / Circuits	H200/203	UG (UCard tap access)
Electronics / Electromagnetics	H114/H114-1	CS (swipe card access)
Wireless Lab	H209	Research
Machines / Power	H2	UG (UCard tap access)
Senior Project Design	H201/H202	UG (UCard tap access)
Software Engineering	GD120	CS (card swipe access)
Communications	GE137	Research (UCard tap access)
Controls / Power	H4/H4-1	Research (UCard tap access)



Smart Grid	H204	Smart-Grid Main Office
Photonics Lab	H210	Research
Institute of Biomedical Engineering	IBME	Research
Micro-Grid & Electric Machines	H3	Key
Renewable Energy	H1	Research (UCard tap access)
CubeSat Lab	H205	Research (UCard tap access)
Controls / Robotics	H5	Research
Health Technologies Lab	GD119	(UCard tap access)
Student Development Studio	H106	UG (UCard tap access)

Course access to rooms is determined by course registration and the instructor of the course.

When authorized by your faculty supervisor, access to ECE labs may be granted in one of the following ways:

- Card Swipe Access to a specific room can be requested using the <https://www.cs.unb.ca/lab-request-form> (Sponsor name 'Lavigne').
- UCard Access to a specific room can be requested via your faculty supervisor.
- Key sign-outs can be obtained with the signature of your supervisor on a key sign-out form. This form is available from the ECE Office. All keys are property of the University of New Brunswick and must be returned at the end of each term, or upon completion of a degree program.

It is the responsibility of all students in a research lab area to maintain a neat and organized room. Loss of desk space and/or lab access may result if this is not adhered to.

## 8. Laboratory Operation

### a. Equipment

All undergraduate labs are accessible during normal university business hours. Equipment must NOT be removed from any of the undergraduate labs.

### b. Security

We respectfully request your utmost cooperation in maintaining responsibility for proper use and care of all equipment, materials and supplies used in the labs.

It is requested that all students and Teaching Assistants keep laboratories and work areas locked when they are not in use. If you are the last person leaving the lab, be sure to close and lock all windows and doors. All keys that are signed out to these areas are for your own personal use and should be kept under your control. For labs that have combination security locks, you must not disclose the combination to unauthorized persons.

It is very important that only those with keys be permitted in laboratories and/or research areas. Unauthorized individuals (i.e., Friends and random curiosity seekers) should be challenged and asked to obtain visiting permission from security, faculty or staff members.

Please notify the ECE department office or security officers immediately if any evidence of theft or unlawful entry is found. Security can be contacted 24 hours a day at the Wu Center (Telephone: 506-453-4830).

**c. Safety and Emergencies**

Laboratory operations may contain some elements of danger. Safe working habits are essential in experimental work. Good housekeeping (keeping the lab areas clean and neat), using the proper tools, avoiding hazards – all contribute to safe operations. On leaving the lab for the day, check carefully that all water, power, motors, etc. are turned off.

Accidents should be reported as soon as possible to a faculty member or the UNB security office. General emergencies at night can be reported to the Security Officer in the Wu Centre (506-453-4830). THE EMERGENCY NUMBER FOR THE CITY OF FREDERICTON is 9-911. This number covers EMERGENCY calls only for fire, police, ambulance, poisoning.

**9. Shop Facilities**

The Electrical and Computer Engineering Technician Workshop (ECE Tech Shop) is located in Room D34. The priority for the Department's technicians is the maintenance and set-up of all undergraduate laboratories. Research students may obtain assistance or guidance in the construction of their own apparatus. Parts and devices required for construction of apparatus are generally available or may be ordered through the ECE Tech Shop with approval from your supervisor. **You are not to purchase items (i.e., parts or equipment) related to your research on your own credit card.** Again, all items should be purchased through the Senior Technician at the ECE Tech Shop or the main ECE office. The ECE Tech Shop may assist in construction and maintenance of apparatus according to the following:

- (i) All orders for shop work that require more than 30 minutes of technician time are to be written out on the Department Work Requisition Forms. Good dimensional drawings must be included, for all construction items. Always specify materials, dimensions and tolerances. All shop work requisitions must be signed by a faculty member. They will not be signed unless reasonably careful drawings are included.
- (ii) Requisitions must indicate the date on which the item is required.
- (iii) Consultation between the technician and the student is encouraged prior to finalizing drawings and requisitions, as well as at any or all stages during the actual shop work.
- (iv) The use of any power tools or equipment in the shop by students is forbidden unless permission is obtained from the Chief Technician (Mr. Bruce Miller). Students are permitted to enter the technician shop (D34) for purposes of consultation, assistance, etc. **ONLY**. Materials are **NOT** to be removed without the permission of the Chief Technician.

**10. Office**

**a. Correspondence**

Office staff support services are available for typing letters relevant to their thesis work or general activities pertaining to graduate work, but, not for personal matters. It is essential that copies of all such external correspondence be given to the Department Secretaries or to the thesis supervisor. Other office supplies are available for purchase at the University Bookstore.

## **b. Mail**

Personal mail is not to be delivered to the department. The mail slots allocated for graduate students are designed to allow the department, your supervisor, or the university to provide necessary information/correspondence, etc. Mail slots are also used for providing information to teaching assistants. Other mail services are available at the Student Union Welcome Centre located in Room 102 (off the main lobby) in the Student Union Building.

## **c. Telephone**

Several research labs have telephones for your use and are for local calls only. Pay phones are located through the Engineering buildings for other calls. Only emergency calls will be accepted by the department.

## **d. Photocopying**

Photocopying service is available at Graphic Services and the Engineering Library for a nominal fee.

## **e. Fax**

The ECE department does not provide fax machine services for students. However, faxing may be allowed only if related specifically to graduate work – for example, confirming conference attendance, submission of papers, etc.

## **f. Travel Administration Requirements**

Financial assistance for research related travel (e.g. conferences) should be discussed with your supervisor prior to making travel arrangements. BEFORE travelling, you should speak with the office administrator to make sure you have a clear understanding of the necessary requirements for reimbursement. Expenses incurred prior to travel (i.e., conference registration, air fare purchase) are eligible for a Travel Advance. A Travel Advance form with accompanying original receipts can be submitted for processing prior to travel. Upon your return, a Travel Expense Form must be completed with all original receipts including boarding passes for air travel, taxi's, etc. (please note that UNB Financial Services may not reimburse amounts that do not have original receipts).

## **11. Termination of Residency**

Before leaving UNB, graduate students are required to:

- (i) Clean and neaten their laboratory areas and return any items from other laboratories or the technicians shop. Check with your supervisor concerning the disposal of any materials, equipment, apparatus, etc.
- (ii) Return all borrowed books, office and lab keys, and thesis to the library, department or your supervisor.

<p><b>All property belonging to the University must be returned upon the completion of your degree. Failure to do so could result in the withholding of your diploma. Property may include software, equipment, room keys, etc.</b></p>
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