

Student Handbook

Institute of Biomedical Engineering, UNB

April 2022

Introduction

Welcome to the Institute of Biomedical Engineering!

The purpose of this handbook is to provide you with information, which we hope will facilitate your orientation to the Institute and help to make your time here enjoyable and effective.

Your comments, at any time, concerning ways to make the Institute a more effective research environment, should be addressed to the Student Liaison Officer, Director, or Associate Director.

The Institute of Biomedical Engineering is a multidisciplinary team of scientists, clinicians, engineers, and students working in collaborative research projects. We value teamwork, professionalism, and a high standard of excellence.

Mission

To further education, research, and community service in biomedical engineering.

Vision

1. Highly qualified personnel trained at the Institute will make valuable contributions to research, clinical service, and Canada's economy.
2. Research will significantly impact fundamental and applied aspects of biomedical and rehabilitation engineering.
3. Clinical service will offer state-of-the-art solutions for clients and contribute to continuously improving outcomes.
4. The Institute's research and service capacity is an essential resource of rehabilitation expertise in Atlantic Canada, and its role will grow in importance with new partnerships.

Core Values

1. World-class research programs that are essential to training of students (graduate, undergraduate, and exchange) and staff, making an impact academically and clinically, and attracting continued research support.
2. High quality clinical service with a focus on innovative fittings providing excellent outcomes for patients.
3. The Institute has a strong cohesion amongst students, staff, and faculty, creating a unique institutional culture. This has benefits that are an essential complement to traditional research, service, and training.
4. Research and development activities producing devices and services that have commercialization potential.
5. Triennial Myoelectric Controls Symposium (MEC) is an essential activity, having established the Institute internationally as a centre of excellence. It plays an essential role in advocating progress and collegiality in the field of upper limb prosthetics.

History

Professor Robert N. Scott founded IBME and served as its first Director from 1964-1990. The IBME building was named R.N. Scott Hall in 2002. The IBME was founded in the context of a surge of congenital deficiencies caused by medication administered during pregnancies to alleviate morning sickness symptoms in the late 1950s/early 1960s. In the wake of this incident, there was a significant and compelling need to design better prosthetic devices. The IBME focused on providing myoelectric device electronics and control strategies. They went on to offer an annual training session for clinicians on how to use myoelectric prostheses (which

has evolved into the internationally-attended Myoelectric Controls Symposium) and did extensive research in pattern recognition and signal processing of myoelectric signals. Under the direction of Dr. Ed Biden [1990-2000], the Institute continued its growth in these areas and extended to include biomechanics expertise and international outreach. Dr. Bernie Hudgins was the next Director [2000-2012], and under his leadership, the Institute took on a series of high-profile development projects with collaboration from industry. IBME also broadened its scope to look at human-machine interfaces and outcome measures. Under the leadership of Dr. Kevin Englehart [2012-2018], IBME refocused its activities more towards its roots in research while at the same time broadening its vision to encourage greater collaboration with industry and identify new platforms and applications for which IBME can provide expertise. In August 2019, Dr. Jon Sensinger, former Associate Director, took on the role of Director. Dr. Sensinger's areas of interest include prosthesis design and control, mechatronics, computational motor control, and exoskeleton research.

A more in-depth history of the Institute, written by Prof. Scott, is found on the Institute's [website](#).

Institute Staff and Faculty

The [People section](#) of the Institute's website describes their affiliations and research areas.

Building Access and Security

The Institute building is open during regular University hours (8:15 a.m. to 4:30 p.m.).

The Institute's front main entrance uses a card reader system. This reader unlocks the front door automatically between 8:15 a.m. and 4:30 p.m., Monday to Friday, and locks at all other times. To enter the building, hold your UNB UCard up to the card reader, and the door will unlock. Graduate students can enter through the main entrance using their keycard 24 hours a day, seven days a week. Student interns and affiliated staff and faculty will have access between 7 a.m. and 8 p.m., seven days a week. If you forget your UCard and wish to enter outside of regular business hours, call **Security at 453-4830**, and they can let you in.

Only students enrolled within the Institute have access to the resources of the Institute. The Office Manager should be contacted if you are having access issues.

You incur direct personal responsibility for building security whenever you use the building outside normal regular hours. You must not admit unauthorized persons to the building and you must ensure that outside doors remain locked. You must ensure that exterior doors and first-floor windows are locked and that lights and equipment are turned off when you leave. Equipment capable of generating enough heat to cause a fire, such as electric kettles, coffee makers, soldering irons, battery chargers etc., require attention.

These considerations also apply when you have occasion to be alone in the building at the end of the day, or find yourself the last person leaving the building.

If specific equipment is to be left operating when the building is unoccupied, please ensure you affix a notice to the equipment indicating that it is to be left on. Such a notice should be signed (legibly) and include your phone number.

Any problem associated with building security after hours should be reported promptly to the UNB Security Office, either in person (Campus Operations Building 767 Kings College Rd.) or by telephone (506-453-4830). During regular hours, contact any Institute staff or faculty.

Safety

Fire Regulations

Please take a few moments to read the fire regulations (posted in Rm 101, Rm 102, and the reception area on the 2nd floor).

It is important that all persons leave the building immediately upon hearing the local fire alarm and wait outside until authorized to enter by fire or security personnel. **Our designated meeting area is in front of the Bank/Bookstore building next door.**

Personnel Safety

Katie Wilson is the Building Safety Officer. Any safety hazard should be reported to the Building Safety Officer, who will take the necessary steps to have it corrected. Any accident should be reported immediately to both the Building Safety Officer and to the Campus Safety Coordinator (Phone 506-453-5075). An incident report should be filled out as soon as possible with the Office Manager. Any accident occurring outside normal hours should be reported to UNB Security (Phone 506-453-4830).

To have appropriate protection in the event of an electrical accident, any work involving access to electric potentials in excess of about 50 volts is restricted to situations in which there are at least two persons in the building, and the second is made aware of the activity being carried out. Note that this policy is necessary both to protect the individual and to protect the Institute, which may be held liable for the consequences of an accident if adequate supervision was not ensured.

Scent-Free Policy

The Institute has a scent-free policy. Our personnel and patients may have sensitivities to scented perfumes, colognes, body sprays, and grooming products. Chemicals in the fragrances can trigger reactions ranging from headaches to heart palpitations in people who are sensitive to them, making it difficult for them to work effectively.

Facilities

Shop-safety training is required before students use any of the equipment in the clinic (in addition to other requirements described below). This training is available several times throughout the year through the Mechanical Engineering department. Please let your supervisor know you need to take this training, and we will coordinate with you regarding the next available session.

Atlantic Clinic for Upper Limb Prosthetics

The facilities for the Atlantic Clinic for Upper Limb Prosthetics are beyond the glass doors to the left of the main floor elevator. This hallway is considered a professional clinical space and is not to be used as a throughway to other parts of the building. If you are interested in prosthetics or have questions about the clinic or how it operates, you are welcome to talk to the clinic staff when they are not busy with patients.

Under no circumstances are tools or facilities of the clinic to be used unless:

- a) You have received shop-safety training;
- b) You have been given written permission;
- c) The Prosthetics Technician has confirmed that it is ok, at that point in time, to use the equipment. This decision can change hour-by-hour depending on what clinical activities are occurring within the clinic.

The front foyer and waiting room are used frequently by clinic patients. Please respect that this is an area where patients will be waiting and sometimes consulting with clinic staff by acting professionally. Information regarding patient identity or treatment within the clinic must be kept confidential.

The kitchen and playroom on the lower level are intended as patient training areas. If they are in use by clinic staff and patients, please be respectful and wait to use those areas if possible. If you need to access something in the kitchen when a patient is present, ask permission before entering. If you use the kitchen facilities, please ensure the space is tidy and clean when you leave. Wash any dishes, utensils, or surfaces so that the area is acceptable for patient use at any time.

If the playroom is used by your children or visitors, ensure toys are clean and put away before you leave. Toys are specifically purchased and maintained for training purposes for children learning to use a prosthesis.

Electronics Shop

To maintain reasonable efficiency in the Institute, no tools or instruments are to be used at or removed from any staff or faculty bench without the permission of the faculty or staff member concerned. Technical services, tools, and equipment will be available for student use upon request.

Mail

The Office Manager will inform you if you receive any incoming mail. Outgoing personal mail, adequately stamped, may be left in the mailbag. Consult the Office Manager for details of delivery schedules, etc. In addition, there is a Canada Post mailbox located outside of the Campus Bookstore.

Telephones

The telephone (local number 458-7032) in Rm. 120 has been provided partly for student use, so that you will not have to intrude upon a faculty or staff office to use the telephone.

The telephone on the Office Manager's desk is not to be used for outgoing calls of any type, as that prevents outside access to the Institute. Calls received on that telephone should be transferred promptly to another telephone, to leave the incoming line free.

Outgoing calls can be placed from any telephone on the UNB service; dial the ten-digit number for local and long-distance calls. *Long distance charges are not to be incurred by students without prior arrangement with the Office Manager.*

Facsimile

Students wishing to send a FAX message, please consult the Office Manager. Incoming FAX messages for students may be directed to the Institute's FAX machine, 506-453-4827. Incoming FAX messages are queued to the Office Manager's email address.

Photocopier and Printing

General use of the photocopier and printers is permitted without charge. If a thesis or large report is to be photocopied, please consult the Office Manager first. The Institute faculty and staff refrain from photocopying or printing unless necessary; please adopt the same policy. Details of installing the Institute printers on your personal computer can be obtained from the Project Engineer.

Data Collection Laboratory

This lab may be reserved by faculty, staff, or graduate students through a Google calendar. Because experiments often require long blocks of time, there is no formal limit on the duration of reservation. Your cooperation in keeping blocks reasonable is requested, however, in consideration of other users.

Several standard electrode lead sets are available; do not remove these from the lab. If your research requires special electrode/lead configurations, these will be provided after consultation with your supervisor. Please do not destroy general-purpose lead sets to create special ones.

Any maintenance, modification, or adjustment of lab equipment or software is the responsibility of the Project Engineer and should not be performed by any other individuals. Should any equipment or software appear to be working incorrectly, please notify the Project Engineer immediately.

Specialized lab equipment that is generally not stored in the bio-signals lab is available. Use of this equipment is by arrangement with your faculty supervisor.

Electronics Lab

There are two workbenches in the electronics lab designated for student use. If you require workbench space, please make arrangements with the Project Engineer.

No equipment, tools, or components are to be used or removed from the electronics lab unless authorized by the Project Engineer.

Any equipment or tools borrowed from the electronics lab are to be returned immediately after use.

When the Project Engineers is not present the electronics lab equipment and tools are off limits unless given previous authorization.

CARE Facilities

The [Centre for Adaptive Rehabilitation Engineering \(CARE\)](#) is the newest part of the IBME building, and includes the CAREN system, motion lab, and ADL lab. These labs are equipped with highly sensitive instrumentation and therefore, any student wishing to conduct research in the lab must first complete a lab training session. Any students wishing to schedule lab time or book a training session are asked to contact the Project Engineer.

Student Library

The student library (Room 119) is a quiet space for students to study in. There are several books, which students may borrow.

Computing

Calendars

IBME uses Google calendars to coordinate meetings between staff and students, as well as to reserve rooms (such as the Motion lab). Once you have created a Gmail account, please ask Jon Sensinger (jsensing@unb.ca) to add you to the appropriate calendars, and please put your Gmail e-mail address on the following list: www.tinyurl.com/unb-ibme-people.

Microsoft Teams

Teams is the software platform used campus-wide for virtual meetings and phoning. All IBME virtual meetings are held on this platform. The ITS Sharepoint site has numerous resources and instructions videos on how to use Teams.

Human Experimentation

Participant data collection for an approved REB shall happen only during office hours if any of the following are true:

1. Research is greater than minimal risk
2. Research participants are patients, seniors, or minors, or undergoing an intervention
3. Research requires use of CARE rehabilitation systems (CAREN lab, Stim cycle, Ekso, ZeroG, Phantom) . Rehabilitation systems is different from data collection equipment, such as EMG studies, routine gait analysis, motion data collection, Stepscan tile recordings, etc...

Research using the Stim cycle, Ekso, and CAREN should always have a trained PT or biomedical engineer present in the facility, regardless of participant type.

Experimenter as Subject

In cases where the experimenter is also the subject of the experiment, it is not necessary to acquire ethics approval or file a consent form. However, there must be another person in the building and aware of the research, for safety purposes.

Ethics Approval

It is a minimal requirement of ethical research that no experiment be conducted on a human subject without approval from the University Research Ethics Board.

To obtain appropriate consent forms, consult the Director or your supervisor.

Data Storage Protocol

All data that contains personal health information (subject names, photographs, videos, etc.) must be stored in the locked file cabinet in the Office Manager's office or a password protected, encrypted folder on a computer. All data used on personal computers should use de-identified subject codes. Truecrypt (<http://www.truecrypt.org/>) is a free, open-source encryption package that can be used to encrypt photographs and videos.

No personal health information (including unencrypted pictures) may be stored on laptops or phones.

Students, faculty and staff should follow the same data naming convention and folder structure for their data to allow for organization across the institute.

1. All data should be stored in a project-specific subfolder in the C: drive under a folder titled "Data".

Example: *C:\Data\<ProjectSubfolder>*

2. If the study is REB approved:

The project subfolder where you store your data files should be in the format "REB"- "REB Protocol #".

Example: *C:\Data\REB-2021-003*

If it is an IBME project (does not have an associated REB):

The project subfolder where you store your data files should be in the format "IBME"- "Project #".

Example: *C:\Data\IBME-2022-002*

3. The files within the folder should be titled with the subject number and must not include any confidential or identifying information.

Example: *C:\Data\IBME-2022-002\S001*

4. If the data is for troubleshooting/debugging purposes please store it in a subfolder with a relevant title under the "Debug" folder.

Example: *C:\Data\REB-2021-003\Debug*

IBME Activities

Biochats

Biochats is a bi-weekly Teams event hosted by alternating students or faculty member where research is presented with an opportunity for questions and feedback from other IBME students, faculty and staff.

Intellectual Property

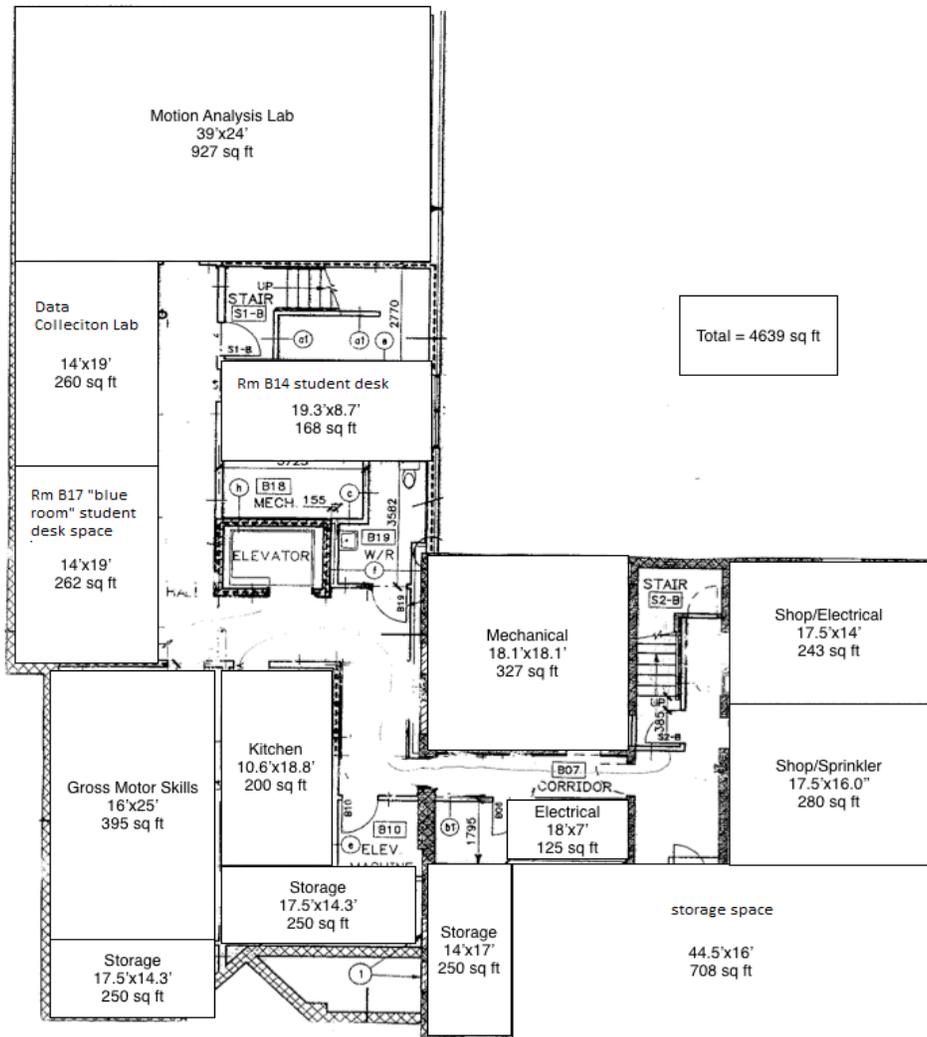
Intellectual property (including potential patents, copyrights, board layouts, and trade secrets, as well as others) are routinely created at the Institute of Biomedical Engineering. This property must be secured (e.g., filed with the government) before it is released. Please consult your advisor prior to disclosing your work to any outside group (including class presentations, posters, interviews, and reports) to see if IP should be secured prior to the disclosure.

Some projects at IBME are funded by sources that require that intellectual property be assigned to the Institute, to have a single point-of-contact during negotiations with potential commercial licensees. Please ask your supervisor if your project falls under such a funding source.

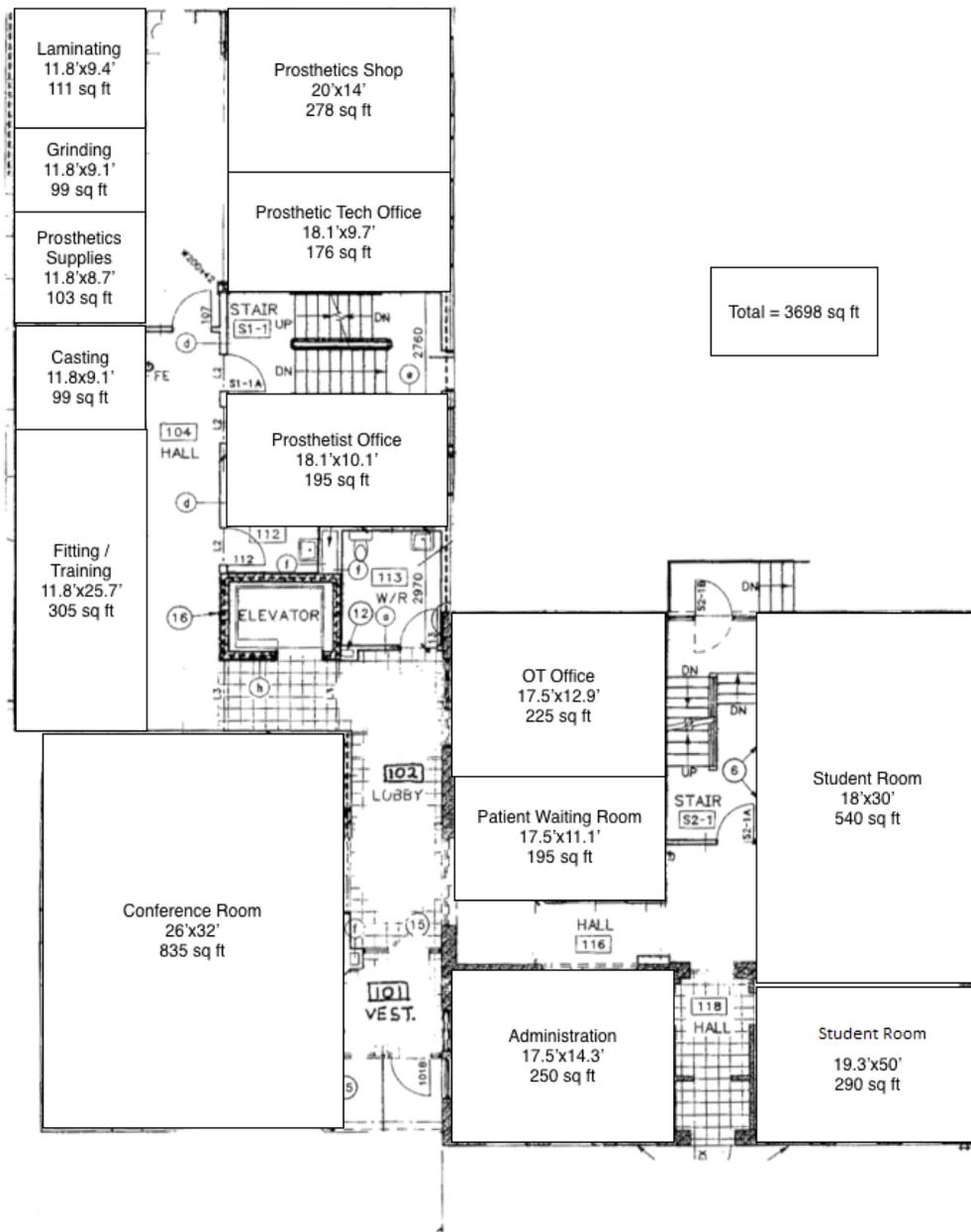
Media

The Institute is frequently at the centre of attention of the media. It is important that the activities of the Institute are represented in an accurate manner. If you are asked to speak to the media, please contact your supervisor or the Director/Associate Director prior to doing so. If you are approached by the media in an unexpected manner and are asked to comment, please be sure that your comments are accurate and appropriate, and that it is clear that you are representing yourself, not the Institute.

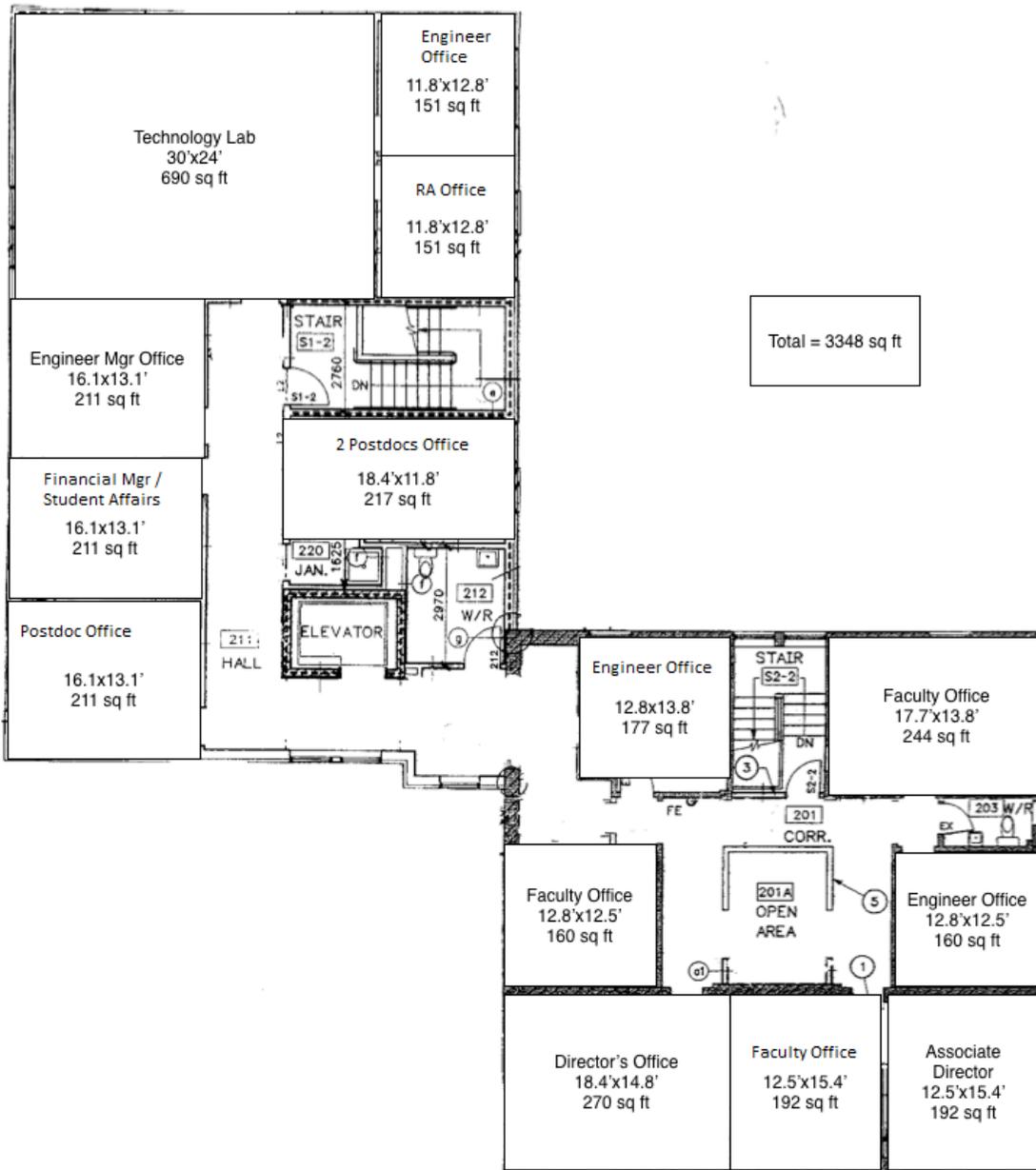
Building Layout



BASEMENT FLOOR PLAN



MAIN FLOOR PLAN



SECOND FLOOR PLAN