IBEHS 3P04

Health Solutions Design Projects III: Analysis and Decision Making

Winter Term (2024)

Course **Outline**

Calendar/Course Description

Working in groups, students approach an open-ended design problem, applying design thinking, problem solving skills, systems analysis, simulation and optimization; topics in economic decision-making are introduced; oral and written communication is emphasized in the context of biomedical engineering activities.

Pre-Requisites and Anti-Requisites

Prerequisite(s): IBEHS 2P03 and registration in the Integrated Biomedical Engineering and Health Sciences (IBEHS) program

Course Schedule

The delivery of this course occurs through weekly **lectures** and tutorials (**design studio**).

LECTURES: 1 hour 50 minutes per week (check your schedule on Mosaic)

- *Location*: **Please check Mosaic**. Lectures will be recorded and available for viewing afterwards.
- *Objective*: Introduce and discuss fundamental topics related to design verification, risk management, engineering economics, ethics, and regulatory factors.

> This is an in-person lecture, and attendance is expected (**select lectures will include an in-class assignment that requires attendance**). The content is captured using Echo360. However, as most classes will be very interactive, it's recommended that recordings are only used for review of material.

TUTORIALS (DESIGN STUDIO): 1 hour 50 minutes per week (check your schedule on Mosaic).

- Location: **Please check Mosaic**
- *Objective*: Design Studio is a dedicated time to collaborate as a team on various project activities. TA's will be available for support during your scheduled time.

Instructor Office Hours and Contact Information

Dr. Colin McDonald
cmcdona@mcmaster.ca

Office Hours:
Thursday's, 1:30 – 4:30pm (**in-person or MS Teams**)
- Alternatively, send a chat message via MS Teams to request an appointment.

Instructional Support

Design Studio TAs: Each Design Studio will have 2 of the following TAs to guide and support project activities.
- Huzafa Hyde, hydeh1@mcmaster.ca
- Maliha Khan Kollins, khankolm@mcmaster.ca
- Taylor Kramer, kramet1@mcmaster.ca
- Cham Kudsi, kudsic@mcmaster.ca
- Kansas Mackay, mackak8@mcmaster.ca
- Isabelle Ragany, raganyi@mcmaster.ca
- Michael Rezk, rezkm6@mcmaster.ca
- Maria-Juliana Rivera-Madrinan, riveramm@mcmaster.ca
- Ishan Vermani, vermanii@mcmaster.ca
- Alexandra Wu, wua37@mcmaster.ca

Instructional Assistant: manages the design studio space; provides training on use of equipment; supports all project and lab activities

Parmveer (Parm) Bola
Email: bolap1@mcmaster.ca

Instructional Coordinator: coordinates scheduling and accommodations

Victoria Olubunmi
Email: olubunmv@mcmaster.ca

Course Delivery

Avenue-to-Learn will be the online management system for the course. Through **Avenue**, you will be able to:
- Find all course materials (lecture slides, lab materials, project documents, etc.)
- View course-related announcements.
- Submit course work (assignment, project deliverables) for grading.
- View your gradebook.

Consider **Avenue** to be the locker for 3P04!

Course Objectives and Learning Outcomes

Upon successful completion of the course, the student should be able to:

LO.01	Formulate a design problem by defining design inputs and design outputs (**Engineering Design**).
LO.02	Analyze a design to verify its correctness and suitability (**Engineering Design**).
LO.03	Apply economic principles towards different scenarios, including personal finance, engineering projects, and biomedical design (**Engineering Economics**).
LO.04	Evaluate if a design is worth pursuing by weighing many factors (**Decision Making**).
LO.05	Apply principles of task and project management when working in a team (**Project Management**).
LO.06	Present outcomes of an economic analysis (**Technical Communication**).

Assessments

The course is assessed in four modules: **design project**, **teamwork and project engagement**, **assignments**, and a **final exam**. The following table summarizes a breakdown of each assessment module.

GRADING MODULE	WEIGHT
Design Projects**	**45%**
Milestone #0: Team Formation and Commitment	(P/F)
Milestone #1: Project Selection, Problem Definition, Planning	(5%)
Milestone #2: Engineering Specifications and Risk Assessment	(5%)
Milestone #3: Prototype Configuration and Verification Planning	(5%)
Final Submission: Design Demonstration	(10%)
Final Submission: Project Presentation	(10%)
Final Submission: Project Outcomes and Recommendations (i.e., Milestone #4)	(10%)
Teamwork and Engagement	**10%**
Project Attendance and Engagement	
Administrative Contributions	
Peer Evaluations	
Learning Portfolio	
Design Studio Activities	**1%**
Design Verification Activity	(1%)
In-Class Assignments (ICA)	**10%**
ICA #1: Design Controls	(2%)
ICA #2: Managing Risk	(2%)
ICA #3: Cash Flow Analysis	(2%)
ICA #4: Comparison Methods	(2%)
ICA #5: Depreciation and Financial Accounting	(2%)
Major Assignment	**14%**
Part A: *Interest rates*	(2%)
Part B: *Saving for a down payment*	(4%)
Part C: *Calculating mortgage payments*	(3%)
Part D: *Should you buy now, buy later, or rent?*	(5%)
Final Exam	**20%**

** A detailed grading breakdown for each Design Project can be found on Avenue the appropriate Project Module.

Materials and Fees

Textbooks

There is *no required textbook* for the course. All required reading materials will be made available for free as online documents through the course management system (**Avenue-to-Learn**).

The following optional texts are recommended and available for purchase:

- "Engineering Economics: Financial Decision Making for Engineers", by Niall M. Fraser, Elizabeth M. Jewkes, et al., 6th edition. Available via Amazon as Kindle Edition ($89.99).
    - Other editions, *including the 5th edition*, are acceptable alternatives.
- "Biomedical Engineering Design", by Joseph Tranquillo, Jay Goldberg, et al. Available via Amazon as paperback ($108) or Kindle Edition ($95.99).

Teamwork and Engagement

Teamwork and engagement will be assessed through individual design studio attendance, project contributions, peer evaluations, and a learning portfolio that documents and reflects on project activities.

The **Project Attendance and Engagement** criteria is evaluated based on design studio **attendance** and **engagement**. **Attendance** at weekly design studio's is required and expected. Students missing Design Studio will receive an email notifying them of their absence, at which point they will have an opportunity to respond and provide reason for their absence. **Failure to provide reasoning for an absence will result in a 1% deduction to your 3P04 grade for *each occurrence***. **Engagement** is evaluated based on the extent to which you are contributing to your design project responsibilities. Responsibilities will be decided upon as a team at the beginning of the project. **Failure to meet your responsibilities may result in upwards of a 50% deduction to your teamwork and engagement grade (5% of your 3P04 grade)**.

Completion and Submission of Work

It is the student's responsibility to ensure assessments are correctly submitted to the correct location, on time, and in the specified format. ***Failure to correctly submit an assignment will result in a mark deduction*** (see below).

Accommodations for Missed Academic Work

Students who miss work are required to submit a **McMaster Student Absence Form (MSAF)** to be eligible for accommodations. Please note the following accommodations and eligibility requirements:

- **Design Project Milestones 1-3**: Design project milestones are completed in teams.If all team members submit an MSAF, the deadline will be extended 48 hours from the date of the *first* submitted MSAF. If an individual student submits an MSAF, the weight of the missed milestone will be moved to Milestone #4.
    - Students that submit multiple MSAFs for project milestones may need to be removed from their team and be required to complete the entire project individually.
- **Design Project Final Submission**: Project final submissions are completed in teams and include an individual component. Accommodations will only be granted for administrative report (Type B) MSAFs and will only be discussed after the student reaches out to the instructor via email (ibio3p04@mcmaster.ca). Accommodations may include completion of individually assigned work associated with the project.

- **In-Class Assignments**: In-class assignments are completed *during* lecture and *require* attendance. If a student is absent from lecture or submits an MSAF, the weight of the missed in-class assignment will be moved to the Final exam.
- **Major Assignment**: The major assignment is completed in self-selected groups. Groups can submit the assignment as bitesize parts or cumulatively (i.e., everything at once) near the end of term.
    - If all group members submit an MSAF for a bitesize part, the accommodated part and all remaining parts will be due on the date of the cumulative deadline (Sunday March 31).
    - If all group members submit an MSAF for the cumulative submission, the deadline will be extended by 48 hours from the date of the *first* submitted MSAF.
    - If any individual student submits an MSAF for a bitesize part or the cumulative submission, the deadline will be extended 48 hours from the date of the submitted MSAF, and the student will be required to complete the missed work individually.
        - Students that submit multiple MSAFs for bitesize parts may need to be removed from their group and be required to complete the entire assignment individually.

Submission Penalties

Please be aware of the following penalties for Design Project and Assignments:

- All worksheets and assignments must be uploaded to Avenue by the posted deadline, or they will be subject to a **late penalty of 20% per day**.
- **Any submissions deemed to be partially or fully copied will be considered an academic offence and be subject to terms laid out under the Academic Integrity Policy**.

Grading Concerns

Grades for assignments and design project work will be posted to Avenue as soon as possible upon completion. **You will have 7 days from the date your grade is posted to address any concerns you may have to instructional team**.

- Any questions/concerns must be addressed via email to ibio3p04@mcmaster.ca.
- Concerns will not be considered without submitting through the appropriate channels.
- Any concerns or appeals brought to the intention of the instructional team after 7 days from the day the grade was posted to Avenue will not be processed.

Statement on Use of Generative AI in 3P04

Students may use generative AI in this course in accordance with the guidelines outlined for each assessment, and so long as the use of generative AI is referenced and cited following posted citation instructions. Use of generative AI outside assessment guidelines or without citation will constitute academic dishonesty. It is the student's responsibility to be clear on the limitations for use for each assessment and to be clear on the expectations for citation and reference and to do so appropriately.

Examples of **acceptable** use of generative AI include working through in-class examples during lecture or brainstorming preliminary ideas for a design project. Examples of **unacceptable** use of generative AI include during a graded in-class assignment, any part of the major assignment or towards the completion of *any* final project deliverable, such as technical submissions, written work (e.g., milestones), or scripts for a presentation.

Important Dates

Fall Term	
Monday January 8	Winter Term Classes Begin!
January 8 – 12	Project Introduction (Wk-1 Design Studio)
January 15 – 19	Design Verification Activity (Wk-2 Design Studio)
January 22 – 26	In-Class Assignment #1 (Wk-3 Lecture)
January 29 – February 2	In-Class Assignment #2 (Wk-4 Lecture)
Sunday February 4	**Project Milestone #1**
February 12 – 16	**Project Milestone #2 (End of Wk-6 Design Studio)**
Sunday February 18	Major Assignment: Part A (*bitesize submission*)
February 19 – 23	**Winter Reading Week**
February 26 – March 1	In-Class Assignment #3 (Wk-7 Lecture)
Sunday March 3	Major Assignment: Part B (*bitesize submission*)
Sunday March 10	**Project Milestone #3**
March 11 – 15	In-Class Assignment #4 (Wk-9 Lecture)
Sunday March 17	Major Assignment: Part C (*bitesize submission*)
March 18 – 22	In-Class Assignment #5 (Wk-10 Lecture)
Sunday March 24	Major Assignment: Part D (*bitesize submission*)
Friday March 29	**Good Friday (no classes)**
Monday April 1	Major Assignment: Parts A-D (*Alternative Cumulative Submission*)
April 1 – 5	**Design Demonstrations (Wk-12 Design Studio)**
Monday April 8	**Project Presentations (*evening*)**
Tuesday April 9	End-of-Year iBioMed Showcase
Wednesday April 10	Winter Classes End; **Project Milestone #4 and Learning Portfolio Due**
Thursday April 11	No classes
April 12 – 25	**Winter Term Examinations** (the date of the **Final Exam** is TBD)

Inclusive Environment Statement

We consider this classroom to be a place where you will be treated with respect, and we welcome individuals of all ages, backgrounds, beliefs, ethnicities, genders, gender identities, gender expressions, national origins, religious affiliations, sexual orientations, ability – and other visible and non-visible differences. All members of this class are expected to contribute to a respectful, welcoming and inclusive environment for every other member of the class.

We will gladly honour your request to address you by an alternate name or gender pronoun. Please advise of this preference early in the semester so that we may make appropriate changes to our records.

Communication Policy

Need help and have questions related to the course? We want to make sure your questions get answered. To ensure this, it's important that the correct communication method is used.

Got a question ***during*** scheduled class hours (e.g., lecture, Design Studio)? The best way to get a prompt response is to message the person directly on **MS Teams** using the "@" tool.

Got a question ***outside*** scheduled class hours? In this case, email is the best method. Please direct all emails to ibio3p04@mcmaster.ca. This ensures your email gets directed to the most appropriate individual for the fastest response. Every attempt will be made to reply within 24 hours (excluding weekends). Please include a subject prefix of "IBEHS 3P04". Emails must be sent from your @mcmaster.ca account. Be sure to include your student number in your email.

Accreditation

The Graduate Attributes defined in this section are measured for Accreditation purposes only and will not be directly taken into consideration in determining a student's actual grade in the course. For more information on Accreditation, please visit: https://www.engineerscanada.ca. Mapping of the course **Learning Outcomes** to the Canadian Engineering Accreditation Board (CEAB) **Graduate Attributes** are outlined in the table below:

Graduate Attribute	Learning Outcome(s)
GA02 Problem Analysis	
2.1 – Identifies and states reasonable assumptions and suitable engineering fundamentals, before proposing a solution path to a problem.	LO.02
GA03 Investigation	
3.1 - Selects appropriately from relevant knowledge base to plan appropriate data collection methods and analysis strategies.	LO.02
GA04 Design	
4.3 – Develops models or prototypes, tests, evaluates, and iterates as appropriate.	LO.01, LO.02
4.4 – Justifies and reflects on design decisions, considering limitations, assumptions, constraints and other relevant factors.	LO.01, LO.04
GA06 Individual and Teamwork	
6.1 – Actively contributes to the planning and execution of a team project.	LO.05
GA07 Communication Skills	
7.2 – Composes an effective written document for the intended audience.	LO.01, LO.02, LO.06
GA10 – Ethics and Equity	
10.1 – Applies ethical frameworks and reasoning, including in situations where there are possible conflicting interests among the stakeholders.	LO.04
GA11 – Economics and Project Management	
11.1 – Applies economic principles in decision making.	LO.03, LO.04
11.2 – Plans and effectively manages a project's time, resources, and scope, following business practices as appropriate.	LO.05
11.3 – Identifies, characterizes, assesses, and manages risks to project success.	LO.05

For more information on Accreditation, please visit: https://www.engineerscanada.ca

McMaster Approved Policy Statements

Conduct Expectations

As a McMaster student, you have the right to experience, and the responsibility to demonstrate, respectful and dignified interactions within all of our living, learning and working communities. These expectations are described in the Code of Student Rights & Responsibilities (the "Code"). All students share the responsibility of maintaining a positive environment for the academic and personal growth of all McMaster community members, **whether in person or online**.

It is essential that students be mindful of their interactions online, as the Code remains in effect in virtual learning environments. The Code applies to any interactions that adversely affect, disrupt, or interfere with reasonable participation in University activities. Student disruptions or behaviours that interfere with university functions on online platforms (e.g., use of Avenue 2 Learn, WebEx or Zoom for delivery), will be taken very seriously and will be investigated. Outcomes may include restriction or removal of the involved students' access to these platforms.

Academic Integrity

You are expected to exhibit honesty and use ethical behaviour in all aspects of the learning process. Academic credentials you earn are rooted in principles of honesty and academic integrity. **It is your responsibility to understand what constitutes academic dishonesty.**

Academic dishonesty is to knowingly act or fail to act in a way that results or could result in unearned academic credit or advantage. This behaviour can result in serious consequences, e.g. the grade of zero on an assignment, loss of credit with a notation on the transcript (notation reads: "Grade of F assigned for academic dishonesty"), and/or suspension or expulsion from the university. For information on the various types of academic dishonesty please refer to the Academic Integrity Policy, located at https://secretariat.mcmaster.ca/university-policies-procedures-guidelines/

The following illustrates only three forms of academic dishonesty:

- Plagiarism, e.g., submission of work not one's own or which other credit been obtained.
- Improper collaboration in group work.
- Copying or using unauthorized aids in tests and examinations.

Authenticity / Plagiarism Detection

In this course we will be using a web-based service (Turnitin.com) to reveal authenticity and ownership of student submitted work. Students will be expected to submit their work electronically either directly to Turnitin.com or via Avenue to Learn (A2L) plagiarism detection (a service supported by Turnitin.com) so it can be checked for academic dishonesty.

Students who do not wish to submit their work through A2L and/or Turnitin.com must still submit an electronic and/or hardcopy to the instructor. No penalty will be assigned to a student who does not submit work to Turnitin.com or A2L. All submitted work is subject to normal verification that standards of academic integrity have been upheld (e.g., on-line search, other software, etc.). To see the Turnitin.com Policy, please go to the following website: www.mcmaster.ca/academicintegrity.

Academic Accommodations for Students with Disabilities

Students with disabilities who require academic accommodation must contact Student Accessibility Services (SAS) at 905-525-9140 ext. 28652 or sas@mcmaster.ca to make arrangements with a Program Coordinator. For further information, consult McMaster University's Academic Accommodation of Students with Disabilities policy.

Academic Accommodation for Religious, Indigenous, or Spiritual Observations (RISO)

Students requiring academic accommodation based on religious, indigenous or spiritual observances should follow the procedures set out in the RISO policy. Students should submit their request to their Faculty Office **normally within 10 working days** of the beginning of term in which they anticipate a need for accommodation *or* to the Registrar's Office prior to examinations. Students should also contact their instructors as soon as possible to make alternative arrangements for classes, assignments, and tests.

Academic Accommodations for Relief for Missed Academic Work: McMaster Student Absence Form (MSAF)

In the event of an absence for medical or other reasons, students should review and follow the Academic Regulation in the Undergraduate Calendar "Requests for Relief for Missed Academic Term Work".

- All MSAFs are to be directed to ibio3p04@mcmaster.ca. Sending to another email address will delay processing.
- It is the prerogative of the instructor of the course to determine the appropriate relief for missed term work in his/her course.

Courses with an On-Line Element

In this course, we will be using **Avenue-to-Learn** and **Microsoft Teams**. Students should be aware that, when they access the electronic components of this course, private information such as first and last names, usernames for the McMaster e-mail accounts, and program affiliation may become apparent to all other students in the same course. The available information is dependent on the technology used. Continuation in this course will be deemed consent to this disclosure. If you have any questions or concerns about such disclosure, please discuss this with the course instructor.

Online Proctoring

Some courses may use online proctoring software for tests and exams. This software may require students to turn on their video camera, present identification, monitor and record their computer activities, and/or lock/restrict their browser or other applications/software during tests or exams. This software may be required to be installed before the test/exam begins.

Copyright and Recording

Students are advised that lectures, demonstrations, performances, and any other course material provided by an instructor include copyright protected works. The Copyright Act and copyright law protect every original literary, dramatic, musical and artistic work, **including lectures** by University instructors

The recording of lectures, tutorials, or other methods of instruction may occur during a course. Recording may be done by either the instructor for the purpose of authorized distribution, or by a student for the purpose of personal study. Students should be aware that their voice and/or image may be recorded by others during the class. Please speak with the instructor if this is a concern for you.

Reference to Research Ethics

The two principles underlying integrity in research in a university setting are these: a researcher must be honest in proposing, seeking support for, conducting, and reporting research; a researcher must respect the rights of others in these activities. Any departure from these principles will diminish the integrity of the research enterprise. This policy applies to all those conducting research at or under the aegis of McMaster University. It is incumbent upon all members of the university community to practice and to promote ethical behaviour. To see the Policy on Research Ethics at McMaster University, please go to https://reo.mcmaster.ca/.

Extreme Circumstances

The University reserves the right to change the dates and deadlines for any or all courses in extreme circumstances (e.g., severe weather, labour disruptions, etc.). Changes will be communicated through regular McMaster communication channels, such as McMaster Daily News, A2L and/or McMaster email.

Notice Regarding Possible Course Modification

The instructor and university reserve the right to modify elements of the course during the term. The university may change the dates and deadlines for any or all courses in extreme circumstances. If either type of modification becomes necessary, reasonable notice and communication with the students will be given with explanation and the opportunity to comment on changes. It is the responsibility of the student to check their McMaster email and course websites weekly during the term and to note any changes.

Pedagogical Study

For the study of engineering education, you may be asked to provide information or feedback about course components. When possible, the instructor will share these results with participants.

Integrated Biomedical Engineering & Health Sciences (IBEHS) Labs/Design Studio Safety

Information for Laboratory Safety and Important Contacts

This document is for users of IBEHS instructional laboratories at the following locations:

- iBioMed Design Studio
- Medical Imaging/Biomaterials Lab
- Medical Instrumentation/Robotics Lab
- Genetic Engineering Lab

This document provides essential information for the healthy and safe operation of IBEHS instructional laboratories. This document is required reading for all laboratory supervisors, instructors, researchers, staff, and students working in or managing instructional laboratories in IBEHS. It is expected that revisions and updates to this document will be done continually. A McMaster University lab manual is also available to read in every laboratory.

Details on Standard Operating Procedures (SOPs), Health and Safety videos and other resources can be found online at the iBioMed Health and Safety webpage.

General Health and Safety Principles

Good laboratory practice requires that every laboratory worker and supervisor observe the following:

- Food and beverages are not permitted in the instructional laboratories.
- A Laboratory Information Sheet on each lab door identifying potential hazards and emergency contact names should be known.
- Laboratory equipment should only be used for its designed purpose.
- Proper and safe use of lab equipment should be known before using it.
- The lab tech or course TA leading the lab should be informed of any unsafe conditions.
- The location and correct use of all available safety equipment should be known.
- Potential hazards and appropriate safety precautions should be determined, and the sufficiency of existing safety equipment should be confirmed before beginning new operations.
- Proper waste disposal procedures should be followed.
- Personal ergonomics should be practiced when conducting lab work.
- Current University health and safety issues and protocols should be known.

Location of Safety Equipment

Fire Extinguisher: on walls in halls outside of labs or within labs

First Aid Kit: Located in respective spaces or dial “88” after 4:30 p.m.

Telephone: on the wall of every lab near the door

Fire Alarm Pulls: Near all building exit doors on all floors

Who to Contact?

Emergency Medical / Security:

On McMaster University campus, call Security at extension **88** or **905-522-4135** from a cell phone.

Hospital Emergency Medical / Security:

For McMaster HSC, call Security at extension **5555** or **905-521-2100** from a cell phone.

Non-Emergency Accident or Incident: Immediately inform the Lab Tech, TA on duty or Course Instructor.

University Security (Enquiries / Non-Emergency):

Dial 24281 on a McMaster phone or dial 905-525-9140 ext. 24281 from a cell phone.

See Lab Tech, TA or Instructor: For problems with heat, ventilation, fire extinguishers, or immediate repairs.

Environmental & Occupational Health Support Services (EOHSS): For health and safety questions dial 24352 on a McMaster phone or dial 905-525-9140 ext. 24352 from a cell phone.

IBEHS Specific Instructional Laboratory Concerns: For non-emergency questions specific to the IBEHS laboratories, please contact appropriate personnel below from a McMaster phone:

- Leela Pilli, Labortatory Technician – x26888
- Parmveer Bola, Instructional Assistant – x23521
- Andrej Rusin, Wet Laboratory Technician – x28347
- Laura Klyne, Program Manager – x24548

In Case of a Fire (Dial 88)

When calling to report a fire, give name, exact location, and building.

1. Immediately vacate the building via the nearest Exit Route. Do not use elevators!
2. Everyone is responsible for knowing the location of the nearest fire extinguisher, the fire alarm, and the nearest fire escape.
3. The safety of all people in the vicinity of a fire is of foremost importance. But do not endanger yourself!
4. In the event of a fire in your work area shout "*Fire!*" and pull the nearest fire alarm.
5. Do not attempt to extinguish a fire unless you are confident it can be done in a prompt and safe manner utilizing a hand-held fire extinguisher. Use the appropriate fire extinguisher for the specific type of fire. Most labs are equipped with Class A, B, and C extinguishers. Do not attempt to extinguish Class D fires which involve combustible metals such as magnesium, titanium, sodium, potassium, zirconium, lithium, and any other finely divided metals which are oxidizable. Use a fire sand bucket for Class D fires.
6. Do not attempt to fight a major fire on your own.
7. If possible, make sure the room is evacuated; close but do not lock the door and safely exit the building.

Clothing on Fire

Do not use a fire extinguisher on people.

1. Douse with water from safety shower immediately or
2. Roll on the floor and scream for help or
3. Wrap with fire blanket to smother flame (a coat or other nonflammable fiber may be used if a blanket is unavailable). Do not wrap a standing person; rather, lay the victim down to extinguish the fire. The blanket should be removed once the fire is out to disperse the heat.

Equipment Failure or Hazard

Failure of equipment may be indicative of a safety hazard - You must report all incidents. Should you observe excessive heat, excessive noise, damage, and/or abnormal behaviour of the lab equipment:

1. Immediately discontinue use of the equipment.
2. In Power Lab, press the wall-mounted emergency shut-off button.
3. Inform your TA of the problem.
4. Wait for further instructions from your TA.
5. TA must file an incident report.

Protocol for Safe Laboratory Practice

Leave equipment in a safe state for the next person - if you are not sure, ask!

Defined Roles

IBEHS Lab Technician	Leela Pilli, pillil@mcmaster.ca
IBEHS Instructional Assistant	Parmveer Bola, bolap1@mcmaster.ca
IBEHS Wet Lab Tech	Andrej Rusin, rusina@mcmaster.ca
IBEHS Co-Directors	Dr. Colin McDonald, cmcdona@mcmaster.ca Dr. Michelle MacDonald, macdonml@mcmaster.ca
IBEHS Program Manager	Laura Klyne, lklyne@mcmaster.ca
IBEHS Course Instructor	Please contact your specific course instructor directly