IBEHS 1P10A/B

Health Solutions Design Projects I: Introduction to Engineering Fundamentals and Design

Fall/Winter Terms (2023-24)

Course **Outline**

Calendar/Course Description

This course will introduce students to a range of fundamental topics in engineering, including engineering design and communication, computation, graphics design, materials, and the engineering profession. Topics will be introduced at a general level and applied in a biomedical context through 5 design projects. This is the first in a series of 4 Health Solutions Design Projects and serves as the foundation for the courses taken in subsequent years. The course assumes no prior background in the content.

Pre-Requisites and Anti-Requisites

Prerequisite(s): Registration in the Integrated Biomedical Engineering and Health Sciences (IBEHS) program

Antirequisite(s): ENGINEER 1C03, 1D04, 1P03, 1P13 A/B, MATLS 1M03

Course Schedule

The delivery of this course occurs through 3 modules, **lectures**, tutorials (**design studio**) and laboratories (**labs**), each of which are held weekly.

LECTURES: Monday, Tuesday, and Thursday, **11:30-12:20 EST**.

- *Location*: **Please refer to Mosaic**. Lectures will be recorded and available for viewing afterwards.
- *Objective*: Introduce fundamental topics and are meant to inform lab and project activities

> This is an in-person lecture, and attendance is expected. The content is captured using Echo360 and available for review, however, should you have to be absent from lecture.

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

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

LABORATORIES (LABS): 2 hours 50 minutes/week (check your schedule on Mosaic).

- *Location*: **Please refer to Mosaic**
- *Objective*: Labs introduce and reinforce applications in computing and graphics design. During Lab, your Instructional TA will deliver a short lesson with a series of interactive demonstration. Following the lesson/demo, you will work in small groups on a given assignment.

Instructor Office Hours and Contact Information

Dr. Colin McDonald
cmcdona@mcmaster.ca

Office Hours:
Monday's, 1:30 – 3:00pm (**MS Teams**)
Thursday's, 2:30 – 4:30pm (**In-Person**)
- Alternatively, send a chat message via MS Teams to request an appointment.

Dr. Kyla Sask
ksask@mcmaster.ca

Office Hours:
Monday's, 12:30 – 1:30pm (**In-Person** or **MS Teams**)
Wednesday's, 11:30am – 12:30pm (**In-Person** or **MS Teams**)
- Alternatively, send a chat message via MS Teams to request an appointment.

Instructional Team

Instructional Assistant Intern (IAI): Your IAI will be guiding Design Studios and will serve as a point of contact for all students.

- Jala Malcolm, malcoj3@mcmaster.ca

Instructional Teaching Assistants (Instructional TAs): Your Instructional TAs will be guiding your Labs, and will be a point of contact for all students during lab activities.

- Yasemin Al-Banna, albannay@mcmaster.ca
- Isabelle Ragany, raganyi@mcmaster.ca
- Janani Sridev, sridevj@mcmaster.ca
- Isra Zahid, zahidi1@mcmaster.ca

Lab Support TAs: Each Lab section will have some of the following TA's.

- Dabeer Abdul-Azeez, abdulazd@mcmaster.ca
- Haaniya Ahmed, ahmedh93@mcmaster.ca
- Sarah Arnold, arnols5@mcmaster.ca
- Hady Ibrahim, ibrahh14@mcmaster.ca
- Varun Kothandaraman, kothandv@mcmaster.ca
- Alvin Lee, leea97@mcmaster.ca
- Fatemeh (Paria) Matipour, matipouf@mcmaster.ca
- Alicia Morielli, moriela@mcmaster.ca

Design Studio TAs: Each Design Studio will have 1-2 of the following TAs to guide and support project activities.

- Danny Al-Sammak, alsammad@mcmaster.ca
- Aiden Delaney, delana2@mcmaster.ca
- Kirsten Espe, espek@mcmaster.ca
- Erin Herzstein, herzstee@mcmaster.ca
- Kansas Mackay, mackak8@mcmaster.ca
- Abby McEwan, mcewaa2@mcmaster.ca
- David Nasri, nasrid1@mcmaster.ca
- Maria-Juliana Rivera-Madrinan, riveramm@mcmaster.ca
- Alexandra Wu, wua37@mcmaster.ca

Additional Instructional Support

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

Dayna Wingfield
Email: wingfied@mcmaster.ca

Faculty Mentors: Working alongside your TA's, mentors are there to provide guidance, offer feedback, and occasionally challenge you to push your own boundaries, take the road less travelled, and just generally get comfortable being uncomfortable.

- Fall Term
  - Dr. Omar Boursalie
  - Dr. Qiyin Fang
  - Dr. Vince Leung
  - Dr. Colin McDonald
  - Dr. Kyla Sask
  - Dr. Gregory Wohl
- Winter Term
  - Dr. Omar Boursalie
  - Dr. Aleksandar Jeremic
  - Dr. Colin McDonald
  - Dr. Shinya Nagasaki
  - Dr. Kyla Sask

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.
- Complete online quizzes
- Submit course work (assignment, project deliverables) for grading.
- View your gradebook.

Consider **Avenue** to be the locker for 1P10!

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 are a list of **free** materials that we will be referencing during the year:

- "A Beginners Guide to Python 3 Programming [electronic resource]", by John Hunt, 1st edition.
- "Engineering and Information: Research Skills for Engineers", by Katie Harding, Alanna Carter, Shelir Ebrahimi, and Eva Mueller.
- "Engineering Reflection Guidebook", by Kyle Ansilio, Shelir Ebrahimi, and Alanna Carter
- "New Approaches to Engineering Design Thinking Mindset: Idea Generation", by Shelir Ebrahimi, Kristina Stepanic, Armaghan Taghvaei, and Reza Yazdanpanah.

The following optional text is available for purchase:

- "The Science and Engineering of Materials", by Donald R. Askeland, 6th edition. https://www.amazon.ca/Science-Engineering-Materials-Donald-Askeland/dp/0495296023

Software

All software is free to download and install for McMaster students and is also available on McMaster Campus computers via remote access.

- Autodesk Inventor Professional **2024**
  - Register in the Education Community with your McMaster University email address.
  - To ensure compatibility with campus computers, you must select the correct version (**Autodesk Inventor 2024**) and operating system (**Windows 64-bit**).
- Python 3.8 → an executable file is also available to download from the 1P10 Avenue page.
  - This is the *recommended* version. However, newer versions are acceptable.
- Quanser Interactive Labs and associated software (**Winter Term**)
  - Download and install the Quanser software packages included in the zip folder posted on Avenue
  - Follow the Q-Labs Installation and Set-up Guide to get your laptop set up and configured

Hardware

In the **Winter Term**, you will be using a Raspberry Pi 4 to complete one of the design projects and a series of lab activities. We do recommend purchasing one from a vendor such as CanaKit or ThePiHut. Alternatively, **Raspberry Pi's can be loaned out from the Design Studio for a refundable deposit fee**. If purchasing a Raspberry Pi, you will need the **Raspberry Pi 4 Model B** with at least **2GB RAM**.

- The Raspberry Pi requires a **32GB MicroSD Card** for supporting the operating system and storing all your files. A MicroSD card can be purchased from the Campus Store (**$14.99**) or any online vendor.

For select activities, you may need additional accessories if you don't already have them. All accessories are for connecting to a Pi from your laptop and can be purchased from the Campus Store.

USB-C to Micro-SD Adapter. If you don't already have an SD-Reader, this adapter can be used for copying files from your laptop to the Pi's MicroSD card. **Price: $69.99**

Ethernet cable: Use this cable to connect your Raspberry Pi to your laptop or home router. **Price: $6.99**

USB-C to Ethernet Adapter: If you want to connect your Pi directly to your laptop, use this adapter if you don't have an ethernet port. **Price: $34.99**

*The above adapters and cables are only required if you don't already have what you need at home.

Course Objectives and Learning Outcomes

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

LO.01	Demonstrate understanding and application of graphics design principles.
LO.02	Demonstrate understanding and application of engineering computation principles.
LO.03	Demonstrate an understanding of structure, properties, and applications of materials.
LO.04	Apply physical computing principles towards the control of smart system devices.
LO.05	Explain ethical and professional considerations of engineering activities as they relate to society.
LO.06	Demonstrate the ability of design thinking.
LO.07	Design a well-thought-out solution to a real-world problem, considering both technical and social implications of that solution.
LO.08	Demonstrate effective communication in a breadth of situations.
LO.09	Demonstrate effective application of information literacy skills.
LO.10	Demonstrate effective teamwork on a design project.
LO.11	Plan and manage time effectively to achieve project goals.
LO.12	Reflect on both past experiences and what has been learned from these experiences.

Assessments

The course is assessed in four modules: **design projects**, **teamwork and project engagement**, **labs**, and **major assessments** (i.e., exams). The following table summarizes a breakdown of each assessment module.

GRADING MODULE	WEIGHT
Design Projects**	**38%**
Design Project 0 (DP-0)	(P/F)
Design Project 1 (DP-1)	(8%)
Design Project 2 (DP-2)	(10%)
Design Project 3 (DP-3)	(10%)
Design Project 4 (DP-4)	(10%)
Teamwork and Project Engagement	**9%**
Project Attendance and Engagement	(P/F)
Administrative Responsibilities	(1.5%)
Peer Evaluation	(1.5%)
Fall-Term Learning Portfolio	(2%)
Winter-Term Learning Portfolio	(4%)
Labs	**15%**
Introductory Labs (n=2)	(P/F)
Mini-Milestone Labs (n=10)	(9%)
Environmental Engineering Labs (n=3)	(2%)
Robo-Labs (n=4)	(3%)
Pokemon Battle (n=1)	(1%)
Major Assessments	**38%**
Mid-Year Exam (December)	(12%)
Graphics Final Assessment (Week 4, Winter Term)	(7%)
Computing Final Assessment (Week 12, Winter Term)	(7%)
End-of-Year Exam (April)	(12%)

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

Teamwork and Engagement

Teamwork and engagement will be assessed through a number of means, including individual project deliverables (i.e., administrative responsibilities) submitted as part of project reports, peer evaluations at the end of each project, 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 10% deduction to your project grade for *each occurrence***. **Engagement** is evaluated based on the extent to which you are contributing to your assigned administrative responsibility. **Failure to meet your responsibilities may result in a 5% deduction (0.5-marks) to your teamwork and engagement grade for *each occurrence***. Examples warranting a deduction are outlined in the Administrative Roles and Responsibilities section of each project module.

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).

Submission Penalties

Please be aware of the following penalties for Design Project and Lab 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**.
- Submissions must be in the correct format, or they will be subject to a **10% deduction**.
  - It is your responsibility to ensure any electronic submissions can be opened by the TA
- **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**.

Completion of Major Assessments

All **Major Assessments** must be written. In a case where the component weight cannot be fulfilled as a result of unforeseen and/or uncontrollable circumstance(s), the grades assigned to that component may be pro-rated.

Grading Concerns

Grades for lab 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 electronically through an MS Form* that will be made available on Avenue (*An MS Form is like a Google Form, but it is Microsoft and not Google).
- Concerns with regards to grading will not be considered without submitting through the appropriate channels (i.e., the posted MS Form).
- 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 1P10

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 a lab or brainstorming preliminary ideas for a design project. Examples of **unacceptable** use of generative AI include during a graded lab assessment or towards the completion of *any* final project deliverable, such as technical submissions, written work (e.g., reports or posters), or scripts for a presentation.

Important Dates

Fall Term	
Tuesday September 5	Fall Classes Begin!
September 6 – 19	Design Project 0 (DP-0)
September 20 – October 24	Design Project 1 (DP-1)
Saturday September 30	**National Day for Truth and Reconciliation (no classes)**
October 9 – 13	**Fall Reading Week (no classes)**
Friday October 27	**DP-1 Presentation**
October 25 – December 5	Design Project 2 (DP-2)
Wednesday December 6	**DP-2 Presentation**
December 8 – 21	**Fall Term Examinations** (the date of the **Midyear Exam** is TBD)
Sunday January 7	**Fall Term Learning Portfolio is Due!**
Winter Term	
Monday January 8	Winter Classes Begin!
January 8 – February 16	Design Project 3 (DP-3)
January 29 – February 2	**Graphics Design Final Assessment**
February 20 – 24	**Winter Reading Week**
Friday March 1	**DP-3 Presentation**
February 26 – April 5	Design Project 4 (DP-4)
Friday March 29	**Good Friday (no classes)**
April 1 – April 5	**Computing Final Assessment**
Friday April 5	**DP-4 Presentation**
Tuesday April 9	End-of-Year Showcase
Wednesday April 10	Winter Classes End **, Winter Term Learning Portfolio is Due!**
Thursday April 11	No classes
April 12 – 25	**Winter Term Examinations** (the date of the **End-of-Year 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, lab, 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: prof1p10@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 1P10". 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)
GA01 - Knowledge Base for Engineering	
1.2 – Competence in natural sciences	LO.03
1.3 – Competence in engineering fundamentals	LO.01, LO.02, LO.03
GA02 Problem Analysis	
2.1 – Identifies and states reasonable assumptions and suitable engineering fundamentals, before proposing a solution path to a problem.	LO.04, LO.07
2.2 – Proposes problem solutions supported by substantiated reasoning, recognizing the limitations of the solutions.	LO.04, LO.07
GA03 Investigation	
3.2 - Synthesizes the results of an investigation to reach valid conclusions.	LO.07

GA04 Design	
4.1 – Defines the problem by identifying relevant context, constraints, and prior approaches before exploring potential design solutions.	LO.06, LO.07
4.2 – Explores a breadth of potential solutions, considering their benefits and trade-offs as they relate to the project requirements.	LO.06, LO.07
4.3 – Develops models or prototypes, tests, evaluates, and iterates as appropriate.	LO.06, LO.07
4.4 – Justifies and reflects on design decisions, considering limitations, assumptions, constraints and other relevant factors.	LO.07
GA05 Use of Engineering Tools	
5.2 – Successfully use engineering tools.	LO.01, LO.02
GA06 Individual and Teamwork	
6.1 – Actively contributes to the planning and execution of a team project.	LO.10
6.2 – Manages interpersonal relationships, taking leadership responsibilities as needed.	LO.10
GA07 Communication Skills	
7.1 – Demonstrates comprehension of technical and non-technical instructions and questions.	LO.08
7.2 – Composes an effective written document for the intended audience.	LO.08
7.3 – Composes and delivers an effective oral presentation for the intended audience.	LO.08
GA08 Professionalism	
8.1 – Describes the duty of a Professional Engineer to the public, client, employer, and the profession.	LO.05
GA09 Impact of Engineering on Society and the Environment	
9.2 – Evaluates social impact of engineering activities, including health, safety, legal, cultural, and other relevant factors; identifies uncertainties in decisions.	LO.07
GA10 – Ethics and Equity	
10.1 – Applies ethical frameworks and reasoning, including in situations where there are possible conflicting interests among the stakeholders.	LO.05
10.2 – Applies the principles of equity and universal design to ensure equitable treatment of all stakeholders.	LO.07
GA11 – Economics and Project Management	
11.2 – Plans and effectively manages a project's time, resources, and scope, following business practices as appropriate.	LO.11
GA12 – Life-Long Learning	
12.1 – Critically assesses one's own educational needs and opportunities for growth	LO.12
12.2 – Seeks and acquires appropriate external information as required, including showing awareness of sources of information and ability to critically evaluate them.	LO.09

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 prof1p10@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.
    - In the event an MSAF is applied to either the **Graphics Design Final Assessment** or **Computing Final Assessment**, they **will be rescheduled**.

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:

- ABB C104 (Design Studio)
- ETB 533 (Medical Imaging/Biomaterials Lab)
- ETB 534 (Medical Instrumentation/Robotics Lab)
- HSC 4N72 (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: ABB C104, ETB 533, ETB 534, HSC 4N72 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