# Guidelines for Medical Sciences Honours Students

These guidelines are meant to provide an **overview** for the course. Please be sure to refer to the Handbook and the syllabus for further details.

SCIE 4901 & 4902 are the compulsory Honours courses, carrying the following expectations:

- You will have to identify your supervisor prior to obtaining permission to register for the course. Look for a project that has a high probability of success in a short period of time. You may want to meet with a few potential supervisors before making your decision. Also keep in mind that you want to work with a supervisor with whom you are compatible.
- At the beginning of the project, clarify with your supervisor what the project involves and what is expected of you. During the year, you and your supervisor should meet weekly to discuss your completed work and make plans for the next steps. Remember that you will be conducting the project while carrying a load of four other courses each term.
- Registering in SCIE 4901 & 4902 will reserve weekly class times in your schedule for the Fall term. Lectures will be provided by the Honours Coordinator and by other faculty members. You must attend (view, if remote) the lectures and participate in class activities and discussions (class participation is worth **10%** of your final mark). The lecture series will be used to learn about others' projects, scientific writing, literature searches, important aspects of research (integrity, ethics, data presentation), and platform and poster presentation preparation. You will also be asked to complete four different assignments based on four lectures (*Lecture Activities)* as part of your class participation. Students will also be required to participate in three discussion boards based on topics from the lecture series (see Appendix A for discussion board guidelines and rubric). Finally, there will be time put aside for you to hone your presentation skills. This will be a short presentation (up to 10min) given a Pass/Fail grade. In addition to receiving the P/F, you will also receive a number grade and constructive feedback, which will be provided by the evaluations of the Honours coordinator and your peers (see Appendix B for mini presentation rubric). The grade may be used to determine your eligibility to give a platform presentation at the Medical Sciences Annual Symposium. For remote offerings, you will be evaluating the presentations of your peers within your group. You will be assessed on the quality, depth, and mechanics of your feedback. See Appendix C for the rubric describing how your evaluation will be assessed.
- In the case of remote learning, you will be randomly assigned to one small group, which will be maintained throughout the academic year. Each group will check in with the course coordinator twice during each term and mini presentations will occur within each group.
- After an appropriate period of training, you will be responsible for your research project yourself. This means that you will be contributing your time, energy, AND intellectual input. You may also be asked to participate in your research group meetings. You are expected to contribute a minimum of 84h and a maximum of 96h per term (that works out to about 7-8h per week and can include reading the literature and any writing required). You and your supervisor should come to an agreement on how this time will be distributed, as it may not be evenly distributed across the semester.
- **Budget your time effectively.** It is important to start your research as soon as possible and to work consistently throughout the academic year so that you finish on time. You should be coming to the end of your research by mid-February so that you can start to compile your

data/information and write your thesis. Resist the temptation to collect more data/information, even if you have not completed what you had originally planned. Otherwise, you will not leave yourself enough time to write the thesis (while finishing class reports and papers and studying for final exams). To make the most efficient use of your time, we advise you to write your Materials & Methods section and your Results section/figures while you are still gathering data.

- At the end of the Fall term, you will be asked to produce an **Interim Report**. This is an opportunity to gather feedback on your writing. You will submit an **outline** of your report to the Honours Coordinator two weeks before the report is due. The coordinator will mark this requirement. Furthermore, you will submit the completed report to the Honours Coordinator who will, in turn, send it to your supervisor for review and grading. This initial report is worth **15%** of your grade, with **5%** of that dedicated to the outline (see Appendix D for the guidelines & grading rubric).
- The **Medical Sciences Annual Symposium** is organized to provide you with an opportunity to present your Honours research to your peers, graduate students, supervisors, and faculty members. You may do so in the form of a platform presentation or a poster presentation (see Appendix E for the abstract form, which you will submit in March). Plan to practice your presentation well in advance of your presentation date and receive feedback from your research mates and supervisor so you can incorporate any changes in a timely manner. This presentation is worth **15%** of your grade (see Appendix F for the grading rubric).
- The **Honours Research Thesis** is a major body of work; therefore, we encourage you to work on it as you progress through the academic year. For instance, your Materials & Methods and your reference sections can be developed from the start. The thesis is worth **40%** of your grade and will be marked by your supervisor and at least one other reader not involved in your project (see Appendix G for guidelines & grading rubric).
- You will also be assessed on your **research effort**. This will make up **20%** of the your mark and will cover intellectual input, commitment and participation in research work and group meetings, experimental skill, interpretive ability and originality, and productivity (see Appendix H for evaluation form). **One will be completed at the end of the Fall term (worth 5%) and one at the end of the Winter term (worth 15%)**. Feedback from the first evaluation is meant to allow for improvement in the second term. This is separate from the interim report and thesis mark.

You may choose to work at a research site before your fourth year. It is not mandatory, but it does provide a few advantages. Working before will allow you to become familiar with the literature in your research area. It may also allow you to obtain some of the technical skills needed for your project. This will make you more efficient in your fourth year where you are expected to significantly build upon that work. No data should be collected during this time, unless it is for background purposes only. You will be asked to indicate in your thesis whether the data is from preparatory work or from research performed during the academic year. The main work of your project should be completed during the Fall & Winter terms. **NOTE**: If you have registered in an Experiential Learning course for credit, or you have been paid for the research work, you will not be allowed to use data obtained from either of these opportunities towards your thesis.

## IMPORTANT DATES FOR STUDENTS

**Nov. 24, 2020 – Interim report outline** - submit one PDF copy to the appropriate Brightspace assignment folder by 5pm.

**Dec. 8, 2020 – Interim report** – Please ensure your supervisor sees a draft of your interim report at least once before submitting it on Dec. 8 (we recommend 10 days before it is due). They can provide feedback, including clarification, suggested changes (including alternate wording), and positive feedback, but they cannot edit. Submit one PDF copy to the appropriate Brightspace assignment folder by 5pm.

**Last week of February - Experimentation/Data collection** – You should be completing any experimentation and data collection so you can dedicate your time to writing the thesis.

**Mar. 19, 2021 – Symposium abstract submission** – submit an abstract for the end of year symposium to the appropriate Brightspace assignment folder by 5pm.

**Apr. 8, 2021 – Thesis** – Please ensure that your supervisor sees at least one draft of your thesis before submitting it on Apr. 8 (we recommend 10 days before). They can provide feedback, as in the interim report, without editing. Submit one PDF copy to the appropriate Brightspace assignment folder by 5pm.

**Apr. 9, 2021 – Medical Sciences Symposium** – You will be presenting your Honours work in either platform or poster format (your supervisor is responsible for the cost of the poster if you are presenting in that format).

## APPENDIX A – DISCUSSION BOARD GUIDELINES AND RUBRIC

The discussion boards are an integral part of your learning experience in SCIE 4901 & 4902. They will serve as a forum for commenting on the discussion topic, engaging in conversation with your peers in the group, and asking questions based on the topic. You will be required to engage in the discussions for three different modules.

Please be sure to be clear and organized in your thoughts, be respectful of everyone in the discussion, be professional in your contributions, and make sure you check your grammar and spelling. Your comments should be constructive and, if you feel there is a problem, be sure to include a resolution. Before you post, be sure you are saying exactly what you want to say. Avoid the use of ALL CAPS as it can be interpreted as shouting. Please be careful when using sarcasm or humour, as both may be misinterpreted in an online setting.

Participation will be monitored and will make up one quarter of your overall class participation grade. See the rubric below for the breakdown of how you will be evaluated and what will give you top marks. You are expected to view the discussion boards daily, engage in the discussion with three or more posts per module and initiate at least one thread during the discussion period.

| Standards | 10 | 7 | 3 | 0 | Score (/10) | Weight | Total score |
|---|---|---|---|---|---|---|---|
| **Quality of post** | Comments are appropriate; thoughtful, reflective, & respectful of other's postings | Comments are appropriate; responses are respectful of other's postings | Response demonstrates minimum effort (e.g., "I agree with JJ") | No posting | | x1.5 | |
| **Relevance of post** | Posts are directly related to discussion topic | Posts are somewhat related to discussion topic | Posts are not related to discussion topic | No posting | | x1.5 | |
| **Contribution to Learning Community** | Consistently engages in discussion, motivates discussion, and moves discussion forward | Often engages in discussion, motivates discussion, and moves discussion forward | Seldom engages in discussion, motivates discussion, and moves discussion forward | Does not engage | | x1.0 | |
| **Quantity** | Three or more posts, one of which is a new thread | Three or more posts | One or two posts | No posting | | x0.5 | |
| **Delivery** | Posts in less than 24h of initial discussion | Posts within a 24h period | Posts after 24h period | No posting | | x0.25 | |
| **Grammar and clarity** | Free of grammatical errors; very clear | Some grammatical and clarity issues | Significant grammar and clarity issues | No posting | | X0.25 | |

## APPENDIX B – MINI PRESENTATION RUBRIC

**Presenter:**_____ **Date:**_____

**Evaluator (B00# if Honours student, name if not):** _____

Thoughtful, constructive feedback is valuable to everyone. Please give thought to how you rate each question and be sure to include helpful comments at the end. Keep in mind that you are going to be assessed on your quality, depth and mechanics of the feedback (e.g., grammar, spelling, use of jargon, clarity). Refer to the rubric on Brightspace for more details.

| Presentation Components | Score | Weight | Total score |
|---|---|---|---|
| **Content/Knowledge of Material**<br>1. Demonstrates appropriate knowledge and understanding of material and draw on relevant literature | /10 | x 1.0 | |
| 2. Gives accurate and complete explanations of key concepts | /10 | x 1.0 | |
| **Organization**<br>3. Appropriate level of content for time given and intended audience | /10 | x 0.5 | |
| 4. Appropriate pace and time spent on sections; presented clearly, with good flow, and in an organized manner | /10 | x 0.5 | |
| **Presentation Style & Communication**<br>5. Effective use of visual materials (slides, fonts, images) to engage audience; demonstrates confidence | /10 | x 0.5 | |
| | | **Final score (/35)** | |

**Comments:**

## APPENDIX C – RUBRIC FOR PEER EVALUATION

Evaluator: _____ Date: _____

| Standards | 10 | 7 | 3 | 0 | Score (/10) |
|---|---|---|---|---|---|
| **Quality of feedback** | Comments are appropriate; thoughtful, reflective, & respectful | Comments are appropriate and respectful | Feedback is limited to a score only | Feedback is inappropriate | |
| **Depth of feedback** | Specifies areas of excellence and those needing improvement; offers ways to improve | Indicates areas needing improvement only and does not offer solutions | Minimal feedback (e.g., *Good job*) or same feedback to everyone | Does not provide feedback to all presenters | |
| **Mechanics** | Error-free in grammar and spelling; no jargon; feedback is clear | A few errors but not distracting; no jargon; feedback is clear | A few errors; some jargon; feedback unclear | Many errors; significant jargon; feedback unclear | |

## APPENDIX D - MEDICAL SCIENCES HONOURS INTERIM REPORT GUIDELINES AND EVALUATION

### Overview

The Interim Report is due the last day of classes in the Fall term. The purpose of this report is to demonstrate that the student understands the literature related to the Honours research. Rather than extensively discussing experimentation and data (since results to this point are unlikely to make a complete story), the emphasis is placed on **background** material and providing a **rationale** for the project. As such, it serves as a mini literature review, upon which the student will expand for the Introduction section of the final thesis. One page of references is sufficient at this stage.

### Format

*General:*

The report should be written in a similar format to a scientific paper. Font should be **12-point**, **1.5-spaced** (except for references, which will be 1.0-spaced), **2.5cm margins**. Please do not use jargon or slang; try to be concise. Total number of pages of **text** should be about 10 pages (excluding figures and references).

*Sections:*

Title page – name, B00#, course number and name, name of supervisor, title of report, date

Table of Contents – can use "References" tab in Word; TOC page numbers are typically Roman numerals, so can use this link for guidelines on how to use different numbering in the same document: https://bit.ly/2LmXCQ9

List of Figures/Tables/Schemata – please include at least **one** figure (with legend) highlighting results so far; if no results are available, include a figure on work flow or in the Methods section instead

List of Abbreviations – all abbreviations should be defined when first used in the document (including in the methods and figure legends); a list of these abbreviations should be included

Introduction (***3-5pages***) – this section is probably the most important at this stage, as it will cover relevant **background** material and provide a **rationale** for the project; this section will include the majority of references (cited material); it will also include the **research question/hypothesis**
(*For more information on "Research Question versus Hypothesis": see*
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2912019/pdf/0530278.pdf

Materials & Methods (***approx. 3 pages***) - This section details the specific techniques used to generate the data described within the report or methods that may be used in future data collection for this project. If more than one method is described, use subheadings – one for each method. The methods are not conversational accounts of what was done on the project. Be sure to write in the third person using past tense and passive voice.

Use clear and precise descriptions of how experimentation or data collection was done,
and the rationale for why specific procedures were chosen. The methods section should describe what was done to answer the research question, describe how it was done, justify the experimental design,

and explain how the results were analyzed. This section should describe the materials used in the study, explain how the materials were prepared for the study, describe the research protocol, explain how measurements were made and what calculations were performed, and state which statistical tests were done to analyze the data (if applicable). Note where chemicals or reagents were purchased throughout the method, if applicable. Do so chronologically and use sub-sections, if necessary. References should be used where needed and listed at the end.

The best example for your guidance will be a recent publication from the research group.
See also (posted on Brightspace):
*Kallet, R. H. How to write the methods section of a research paper. Respir Care. 2004 Oct;49(10):1229-32.*

Preliminary Results/Figure(s) (***1-2 pages***)- The purpose of this section is to practice making and formatting ONE figure, its title and its legend. Create a figure from original data (i.e. not a model or a copied figure). Figures do not need to be high resolution or publication quality, but they cannot be pixelated, fuzzy, or difficult to read when printed. Include a title, which represents the major conclusion of that figure. Write a figure legend that describes how the data was obtained in the figure in general terms. Leave specific details for the methods section. Make sure to define all abbreviations. Because this requirement is for practice purposes, it will not be graded for this report.

Have each figure, table, or schemata (with its legend) on a separate page, but interspersed in the body, rather than at the end.

Discussion – If the student has acquired preliminary results, it is recommended that they discuss what the results mean and how they may direct future experimentation/study; if they have had difficulty with data collection or analysis to date, they can suggest causes and ways to resolve the issue. This is good practice for thesis-writing, but they will not be graded on this section.

References - Use the style of references most common in the research group's field of study (i.e. the reference style of the journal in which the research group most frequently publishes).

## Submission

The student will be required to provide one copy of their report to the Honours Coordinator by the deadline provided by uploading it to the appropriate Brightspace folder. The supervisor should review the report at least once before submission. The report will make up 15% of the grade in the course. The grading rubric can be found on the next page.

## INTERIM REPORT GRADING RUBRIC

| Item | Grade |
|---|---|
| Outline submitted | /5 |
| **Introduction (3-5 pages):** The Introduction need not be an exhaustive literature review. It should serve to introduce the aspects of the scientific field that are central to your research and to familiarize a non-expert scientist with concepts that are crucial to understanding your research. It identifies the gaps, problems, and issues unresolved by the literature (i.e. provide the reader with a sense of what work has already been done and what needs to be done going forward). It leads to the rationale of your project (usually at the end of this section) and transitions to the next section of the proposal. | /15 |
| **Research Question/Hypothesis***: This should be explicit, unprovable, and non-trivial. | /5 |
| **Materials & Methods (3 pages, excl. figures)**: The methods section should clearly describe the specific design of the study and provide clear and concise description of the procedures that were performed. The purpose of sufficient detail in the methods section is so that an appropriately trained person would be able to replicate your experiments. Methods are concise & complete, appropriately referenced. Demonstrates understanding of the content and tools of the field. | /10 |
| **References:** Sources and citations are used correctly. Use the style of references most common in your field of study (i.e. the reference style of the journal in which your research group most frequently publishes). | /6 |
| **Clarity of writing and writing technique**: The document is clearly organized, writing is crisp, clear, and succinct. The writing is appropriate for the target audience. No spelling, grammar, or punctuation errors are made. | /5 |
| **Formatting:** Correct page setup, margins 2.5cm, page numbering, 1.5 line spacing; all sections included | /4 |
| TOTAL | /50 |

**For more information on "Research Question versus Hypothesis": see https://cirt.gcu.edu/research/developmentresources/research_ready/quantresearch/question_hypoth*

**Comments** (Evaluate the student's grasp of the literature. Provide feedback and make suggestions for change, but please do not make the changes yourself):

_____

Supervisor's Name (Please print)

_____ _____

Suggested Final Thesis Reader #1 Suggested Final Thesis Reader #2

(Please print name & include department for both and ensure they have agreed to participate)

## APPENDIX E – SYMPOSIUM ABSTRACT FORM

STUDENT: _____

SUPERVISOR: _____

☐ Platform presentation

☐ Poster presentation

Example of abstract (250-300 words):

Acute Effects of Mechanical Stimulation on the Stiffness of Cardiac Cells

**Background:** The heart's mechanical properties are altered by mechanical stimuli, and thus susceptible to changes in the mechanical environment. Chronically, environmental changes are known to alter physical properties of cardiac tissue, which affects its mechanical performance. For instance, a chronic increase in intracardiac pressure generally results in myocardial stiffening, which can lead to heart failure. Acute changes in cardiac mechanics, on the other hand, are known to feedback on the heart's electrical activity, which can lead to deadly arrhythmias. Yet, whether these changes occur with acute mechanical stimulation is unknown. The aim of this study was to investigate the effects of acute mechanical stimulation on cardiac cell stiffness. It was hypothesized that repetitive mechanical stimulation would result in an acute increase.

**Methods:** A method was developed for measuring the stiffness of single myocytes isolated from the left ventricle of New Zealand white rabbits. This involved the use of specialized carbon-fibres that adhere to the cell surface, coupled to a custom piezo-electric micrometer position system, for controlled stretch of single cells. By stepwise stretch and calculation of applied force, this technique allowed for measurement of the force-length relationship in contracting cells, which is representative of cell stiffness.

**Results:** To validate the ability of our system to measure acute changes in cell stiffness, force-length relationships of control cells and those exposed to 10µm paclitaxel (causing microtubule hyperpolarisation) were measured, which showed an increase in stiffness in paclitaxel treated cells. When cells were instead subjected to 1min of repetitive mechanical stimulation by cyclic stretch, however, no change in stiffness was observed.

**Conclusions:** Our carbon-fibre based system allows for the measurement of stiffness in single isolated cardiac cells, however it appears that repetitive mechanical stimulation has no acute effect on cell stiffness.

## APPENDIX F - MEDICAL SCIENCES SYMPOSIUM PRESENTATION EVALUATION FORM

Please complete the following form and return it to the Honours Coordinator immediately after the presentations. Please provide thoughtful comments that will benefit the student.

STUDENT: _____ PLATFORM or POSTER (circle)
MARKER: _____

| Item | Comments | Grade |
|---|---|---|
| **Content:** Was the presented material appropriate? Was the Background explained? What details were provided?) | | /4 |
| **Understanding & Questions:** Did the student appear to understand the material/project? How well were the questions answered? Was the student prepared? | | /4 |
| **Organization:** Was the presentation well organized such that the data presented were logically analyzed and a clear concluding message conveyed? | | /4 |
| **Presentation Style:**<br>(a) Presentation material - appropriate number of slides (oral) or use of space (poster), effective use of presentation media, pointer use | | /1 |
| (b) Voice - clarity, speed | | /1 |
| (c) Manner - relaxed/nervous, eye contact with audience, enthusiasm, distracting mannerisms | | /1 |
| | TOTAL | /15 |

General Comments & Suggestions for Improvement:

## APPENDIX G - MEDICAL SCIENCES HONOURS THESIS GUIDELINES AND EVALUATION

### GUIDELINES

#### Overview

**The thesis is due the last day of classes of the Winter term.** This is the culmination of the student's hard work over the past year. Time and care should be taken to produce a polished, well-written report that demonstrates understanding of the literature, the purpose of the project, the conclusions reached from your investigation, and how this may influence further research in this area of study.

Information and feedback from the Interim Report can be used to help write the thesis. Supervisor's comments should help the student achieve a better scientific writing style, as well as focus the report so that it reads clearly and concisely.

#### Format

*General:*

The final thesis is written in the format of a scientific paper. Do not use the format of Nature or Science since these are brief reports. The thesis will require a more detailed Materials & Methods section than typically seen in a scientific journal article. For example, do not use "as previously described" to explain how testing was done. We would advise the student to look at past Honours theses from the research group to get a feel for how it is written.

The report should be written in technical language, but that which is accessible to non-experts in the field (the supervisor and one other reader will evaluate the thesis, so the Introduction should provide enough background to familiarize any reader with the material – see more information below in Writing Tips). All abbreviations/symbols should be defined on first mention (including in methods and figure legends). Avoid the use of jargon/slang; be concise.

The body of the thesis (which includes the Introduction, Materials & Methods, Results, and Discussion) should be about **15-20 pages** (1.5-spaced), excluding figures, tables, references (1.0-spaced), and appendices. Please use **12-point font** and **2.5cm margins** all around. Make sure to number the pages.

*Sections:*

Title page – name, B00#, course number and name, name of supervisor, date, title of report; ensure the title is informative but not extensive.

Table of Contents – can use "References" tab in Word; TOC page numbers are typically Roman numerals, so can use this link for guidelines on how to use different numbering in the same document: https://bit.ly/2LmXCQ9.

List of Figures/Tables/Schemata – the report should list figures (with legends), tables, and/or schemata **highlighting** results (i.e. not every result acquired needs to be included in thesis).

List of Abbreviations – all abbreviations should be defined when first used in the document (including in the methods and figure legends); a list of these abbreviations should be included.

Abstract – this is a short, concise summary of the important points of the report (250-300 words). It will introduce background, the problem to be addressed, provide results and conclusions. No reference should be made to any part of the report; the abstract is a stand-alone paragraph. Do not use citations in the abstract. Write this section last, as it is often the most difficult part of the report to write.

Acknowledgements - it is appropriate to acknowledge, in addition to the supervisor, any intellectual and practical assistance, advice, encouragement and sources of monetary support that contributed to the successful completion of the thesis.

Introduction - this will not be an exhaustive literature review; the point of this section is to introduce the reader to aspects of the scientific field pertinent to the project, while familiarizing a non-expert scientist with concepts crucial to understanding the research. The reader should get a sense of what work has already been done and what needs to be done going forward. The introduction must also include a **rationale** for the work. **Goals/objectives/hypotheses** should be explicit.

Materials & Methods - describe all methods used for the project, including those published methods requiring references. If new methods are created, these must be described in a way that allows others to repeat the testing. If more than one method is described, use subheadings – one for each method. The methods are not conversational accounts of what was done on the project. Be sure to write in the third person using past tense and passive voice.

Use clear and precise descriptions of how experimentation or data collection was done, and the rationale for why specific procedures were chosen. The methods section should describe what was done to answer the research question, describe how it was done, justify the experimental design, and explain how the results were analyzed. This section should describe the materials used in the study, explain how the materials were prepared for the study, describe the research protocol, explain how measurements were made and what calculations were performed, and state which statistical tests were done to analyze the data (if applicable). Note where chemicals or reagents were purchased throughout the method, if applicable. Do so chronologically (i.e. the order in which they were sued in the study) and use sub-sections, if necessary. References should be used where needed.

Results - there should be a natural flow from one test to the next. Use of subheadings is encouraged in this section. In each subsection, introduce the rationale for the testing, briefly describe what was done, and refer to the appropriate figure/table/schema that reveals the data. Figures, tables, and schemata should be interspersed with the results (i.e. not at the end of the report), but each should be **on a separate page and include the figure legend**.

Discussion - discuss the significance of the data in the context of existing published literature and indicate the next steps forward. If there has been difficulty with data collection or the techniques used, try to identify the cause(s) and suggest ways to resolve these issues. Include citations of relevant literature in this section to support the discussion.

References – references should be cited in a standard journal format; use the style of references most common in your field of study (i.e. the reference style of the journal in which the research group most frequently publishes). An electronic reference manager (ex. Refworks, Bookends, Papers, Endnote)

should be considered. The Library offers frequent sessions on use of Refworks and the program is available for free to all university students.

Appendices (if applicable)- reserved for supplemental information (buffer solutions, computer programming code, surveys, models, etc.). The supervisor can provide advice on appropriate content.

## Submission

A draft of the thesis should be given to the supervisor in a timely manner (at least 10 days before the due date), so that constructive criticism can be provided. It is not the supervisor's job to write the thesis so the draft submitted should be in good shape and not a version that needs to be polished dramatically. The supervisor should not edit the work, just provide feedback.

The final product will be marked by the supervisor and by one additional reader. The grade will make up 40% of the student's final grade. The thesis grading rubric is found on the next page.

## HONOURS THESIS GRADING RUBRIC

STUDENT: _____
SUPERVISOR: _____
GRADED BY: _____

| Item | Comments | Grade |
|---|---|---|
| **Formatting:** margins 2.5cm around, 1.5-spacing, numbered pages, spelling, grammar, punctuation | | /4 |
| **Sections Present:** Title Page, Table of Contents, List of Figures, List of Abbreviations, Abstract, Acknowledgements, Introduction, M & M, Results (incl. figs on separate pages), Discussion, References | | /2 |
| **Abstract:** 250-300 words; introduces background, problem to be addressed, provides imp. results, conclusions | | /4 |
| **Introduction:** appropriate material; logical; references cited; writing quality; unique question id'd, rationale, goals/objectives/hypotheses | | /20 |
| **Materials & Methods:** concise & complete; referenced appropriately; demonstrated understanding of content and tools in field | | /5 |
| **Results:** well-organized; good flow; original figures, labeled clearly, neatly, legible font; figures referenced in text; correct info in figure legends (not repetitive); quantitative tools used appropriately | | /30 |
| **Discussion:** appropriate material included; logical; references cited; writing quality; significance of work; independent and critical thought | | /30 |
| **References:** sources and citations used and formatted correctly | | /5 |
| | TOTAL | /100 |

## APPENDIX H - MEDICAL SCIENCES HONOURS SUPERVISOR'S EVALUATION OF STUDENT

STUDENT: _____

SUPERVISOR: _____

Part I. Please answer questions 1-8 using the following rating scale:

1 – Poor  2 – Satisfactory  3 – Good  4 – Very Good  5 – Excellent

You will complete this form twice: once at the end of the Fall term (worth 5%) and once at the end of the Winter term (15%). Remember that these ratings will be converted into 20% of the student's final grade. Therefore, if you give the student 3/5 on each question, they will receive 24/40 or 60% on their performance. Please rate accordingly. Half marks are acceptable. Feel free to include comments, as necessary. This form will be handed back to the student, so constructive feedback is encouraged.

1. Motivation. Was the student interested in the research work? Enthusiastic? Did the student take pride in completing tasks well?

2. Initiative. Does the student initiate experiments independently when capable? Does the student ask questions or seek help when appropriate? Does the student ask for additional work?

3. Attitude. Does the student have a positive attitude about work at the research site? Does the student work well with other members of your research group?

4. Quality of Research Work. Are research techniques successfully performed by the student?

5. Ability to Learn. Did the student's quality of work improve over the course of the term? Does the student learn from their mistakes?

6. Application of Knowledge. Does the student bring an understanding of some of the relevant background material from their classes? Can the student apply this knowledge to research-related activities?

7. Planning and Time Management. Does the student allocate enough time to complete technical procedures?

8. **Dependability.** Does the student show up on time? Does the student stay until the task is complete? Does the student adapt to the direct supervisor's schedule if necessary?

Part II. Please answer the following questions with comments only. These comments will help me interpret the ratings from questions 1-8.

1. What do you feel this student did well at your research site? At what did they excel?

2. How could this student improve?

_____ _____

Supervisor Signature Date